hakkımızda/*about us*

TEGA, 30 yılı aşkın süredir plastik borulama ve vana sistemlerinin geliştirilmesinde ve üretiminde lider konumdadır. Geniş PE ve PP ürün gamı ile Dünya da 94 ülkede güvenirliğini kanıtlamıştır. İnovasyon TEGA'da kilit unsurdur. TEGA müşteri ihtiyaçlarını baz alarak yeni fikirler ve çözümler üretmekte; dizayn sınırlarını zorlamaktadır. TEGA projelerinizin gerçekleşmesi için her zaman yanınızda olacaktır.

For over 30 years Tega has been a leader in the development and manufacture of fittings and valves for plastic piping systems. Our extensive range of PE and PP fittings are relied upon in 94 countries worldwide. Innovation is a key of our business, and Tega continues to push design boundaries by introducing new ideas and solutions based on real customer needs. Let the power of Tega help your project dreams become reality.

30 tega years

TEGA WORLD

TEGA ÜRÜNLERİ 90'DAN FAZLA ÜLKEDE GÜVENLE KULLANILMAKTADIR.

TEGA PRODUCTS ARE BEING USED IN MORE THAN 90 COUNTRIES OF THE WORLD SUCCESSFULLY

Kalite/*Quality*

TEGA'nın Kalite politikası; Müşteri gereksinimlerini karşılayacak maksimum kalitede ürün ve servis sağlamaktır.

TEGA Müşterilerinin ihtiyaçlarını belirlemekte ve kaynaklarını bu ihtiyaçların hayata geçirilmesi yönünde kullanmaktadır.

TEGA

- ISO 9001:2015 Management System
- ISO 14001:2015 Çevre Yönetim Sistemi
- ISO 45001:2018 İş Sağlığı ve Güvenliği

Standartlarını özenle ve % 100 sorumlulukla takip etmektedir.

The quality policy of TEGA is to offer the high quality products and services to meet our customers' requirements.

We adapt our focus and resources to servicing the ever changing needs of customers across many industries. TEGA continually strives to exceed our customer expectations for excellence, value and quality.

TEGA manages its business according to international standards associations, including:

- *ISO 9001:2015 Quality Management System Certificate*
- *ISO 14001:2015 Environment Management System Certificate*
- *ISO 45001:2018 Safety and Health Management System Certificate*

Kalite/*Quality*

Tega labaratuvarları her çap ve tipdeki plastic fitingleri test edebilecek imkanlara sahiptir.

Tega's pioneering laboratory has the ability of testing all types and sizes of plastic fittings.

Projeler/*Projects*

d2000mm çapa kadar PN6-PN32 basınç sınıflarında özel parçalar.

Petrochemical Plants
PN6-PN32
D315-d2000

Projeler/*Projects*

BAE - D 900 mm Manşon
UAE - D 900 mm Coupler

Türkiye - Soğutma Sistemi
Turkey - Cooling System

Rusya - Termik Santral
Russia - Heat Power Plant

Hong Kong - Su Dağıtım Hattı
Hong Kong - Water Distribution Lines

USA - Sleeve Manşon Kaynak Uygulaması
USA - Winconsin Nuclear Power Plant Sleeve Coupler Installation

Yeni Zelanda - D 1000 mm Manşon
New Zealand - D1000 mm Coupler

Projeler/*Projects*

Azerbeycan - Bakü Temiz Su Hattı Su Arıtma Tesisinde 3700 adet EF Semer ve 19,500 Fiting Kullanımı
Azerbaijan - Bakü Infiltration - Water Treatment Plant 3,700 EF Saddles and 19,500 Fittings Connection

Dubai - D 900 EF Fittingler
Dubai - D900 EF Fittings

Türkiye - Endüstriyel EF Semer Kullanımı
Turkey - Industrial EF Saddle Application

Kanada Halifax - D1600 EF Manşon
Dünya'daki En Büyük Manşon!
Canada Halifax - D1600 EF Coupler Application.
The Biggest EF Coupler on The World!

Kanada - 28"x18" IPS EF Semer Canlı Hat Bağlantısı
Canada - 28"x18" IPS EF Saddle Hot Tapping Application

Projeler/*Projects*

Abu Dabi - D 1600 EF DOST Manşon
Abu Dabi - D 1600 EF DOST Coupler

İspanya - D 1600 Çıkışlı EF Semer Testi
Spain - D 1600 Outlet EF Saddle Testing

Danimarka - D 800 Bıçak Vana
Denmark -D 800 Knife Valve

Projeler/*Projects*

Türkiye / Samsun - D 1600 x 1200 Karadeniz Deniz Deşarj Sistemi
Turkey / Samsun - D 1600 x 1200 Black Sea Water Traitment System
Produced by using 1600 x 1200 EF Saddles

Türkiye / Şanlıurfa - Sulama Hidrantı
Turkey / Şanlıurfa - Irrigation Hydrant

Japonya / İnegal TE 65 Bar Testi
Japan / Reduced Tee 65 Bar Testing

EF Kaynakçı Kursları/*Training*

TEGA geliştirdiği teknolojinin ancak iyi eğitimli teknik elemanlar vasıtasıyla verimli olarak kullanılabileceğinin bilincindedir.

TEGA, teorik ve uygulamalı eğitimler düzenleyerek uygulayıcıları bilgilendirmekte ve sertifika vermektedir.

TEGA offers a thorough and intensive training package consisting of both the theoretical and the practical work of jointing PE pipe by Electrofusion technique.

Sertifikalar/*Certificates*

Sertifikalar/*Certificates*

Sadece NFS markası taşıyan ürünler sertifikalıdır.
Only the products bearing NFS mark are certified.

Tega Üretim Standartları
Related Standart by TEGA Products

- *EN 12201-3 Plastic piping systems for the supply of water Supply Polyethylene (PE) -Part 3: Fittings*
- *EN 1555-3 Plastic piping systems for the gaseous fuels-Polyethylene (PE) – Part 3: Fittings*
- *ISO 4427-3 Plastics piping systems -- Polyethylene (PE) pipes and fittings for water supply -- Part 3: Fittings*
- *ISO 4437-3 plastics piping systems for the supply of gaseous fuels -- Polyethylene (PE) -- Part 3: Fittings*
- *EN 12201-4 Plastics piping systems for the supply of water Suply Polyethylene (PE)-Part 4:Valves*
- *EN 1555-4 Plastics piping systems for the supply of gaseous fuels-Polyethylene (PE)-Part 4:Valves*
- *ASTM F 1055 -Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene and Crosslinked Polyethylene (PEX) Pipe and Tubing*
- *ASTM D 2513 Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings*
- *ASTM D 3261 Butt Heat Fusion Polyethylene (PE) Plastic Fittings for*
- *Polyethylene (PE) Plastic Pipe and Tubing*
- *AWWA C901-17 Polyethylene (PE) Pressure Pipe and Tubing, 3/4 In. (19 mm) Through 3 In. (76 mm), for Water Service*
- *AWWA C906-15 Polyethylene (PE) Pressure Pipe and Fittings, 4 In. Through 65 In. (100 mm Through 1,650 mm), for Waterworks*
- *AS/NZS 4129:2008 Fittings for polyethylene (PE) pipes for pressure applications*
- *NSF/ANSI 61: Drinking Water System Components – Health Effects by most governmental agencies that regulate drinking water supplies.*
- *FM CL1613 -(PE) Pipe and Fittings for Underground Fire Protection Service*
- *DVGW GW 335-B2- Plastics piping systems in gas and water distribution; Requirements and tests*

Kalite Sertifikaları */ Quality Certificates*

Yönetim Sistemleri / Management Systems

- *ISO 9001:2015 Management System Certificate*
- *ISO 14001:2015 Environmental management systems*
- *ISO 45001:2018 Occupational Health and Safety*
- *TSE Service Competence Certificate – Welding Machine*

Ürün Sertifikaları / Product Certificates

- *TSE EN 1555-3 Size Group 1,2,3 (Electrofusion and Spigot – Gas)*
- *TSE EN 12201-3: Size Group 1,2,3 (Electrofusion and Spigot – Water)*
- *TSE EN 1555-4 : Valves for Gas*
- *TSE EN 12201-4: Valves for Water*
- *IIP EN 1555-3 Size Group 1,2,3 (Electrofusion and Spigot – Gas)*
- *IIP EN 12201-4 Size Group 1,2,3 (Electrofusion and Spigot – Water)*
- *IIP ISO 15494 Industrial Applications*
- *DVGW Certificate Size Group 1,2,3 (Electrofusion - Water and Gas)*
- *DVGW Certificate Size Group 1,2,3 (Spigot - Water and Gas)*
- *DVGW Certificate Gate Valves*
- *INSTA SBC 1555 Size Group 1,2,3 (Electrofusion - Water and Gas)*
- *INSTA SBC 12201 Size Group 1,2,3 (Spigot - Water and Gas)*
- *ETA DENMARK –Gate Valves for Water*
- *WATERMARK – AS/NZS4129 Size Group 1,2,3 (Electrofusion and Spigot - Water and Gas)*
- *FM APPROVAL – CL1613*
- *NSF APPROVAL NSF/ANSI-61 & NSF/ANSI-61,372*
- *SVGW Certificate Size Group 50mm-500mm (Electrofusion & Spigot - Water and Gas)*
- *WRAS Certificate for Component*
- *TZW Certificate for Fittings*
- *ABS Certificate of Design Assessment*

Genel İndeks/*General Index*


TEGA
d 40 Coupler
24 Volt 55 sec. C.T. 10 min.
SDR11
TEGA
35 V 100 sec. C.T. 10 min.
SDR11

EF-METRIC
EF-METRİK

38

***EF COUPLER* / EF MANŞON**
SDR 26 PE100
WATER / SU : 6 BAR

39

***EF COUPLER* / EF MANŞON**
SDR 17 PE100
GAS / GAZ: 6 BAR
WATER / SU: 10 BAR

40

***EF COUPLER* / EF MANŞON**
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

41

***EF COUPLER* / EF MANŞON**
SDR 9 PE100
WATER / SU : 20 BAR

42

***EF COUPLER* / EF MANŞON**
SDR 7,4 PE100
WATER / SU : 25 BAR

43

***EF COUPLER* / EF MANŞON**
SDR 6 PE100
WATER / SU : 32 BAR

45

EF DOST COUPLER
EF DOST MANŞON
SDR 11 PE100
GAS / GAZ: 10 BAR
WATER / SU: 16 BAR

46

EF COUPLER (LONG)
EF MANŞON (UZUN)
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

47

***EF TAPPING TEE* / EF SERVİS TE**
SDR 11 PE100
GAS / GAZ: 10 BAR
WATER / SU: 16 BAR

50

***EF TAPPING TEE* WITH BRASS OUTLET / EF SERVİS TE DİŞLİ ÇIKIŞLI**
SDR11 PE100
WATER / SU : 16 BAR

51

EF VALVE TAPPING TEE (VS TYPE)
EF VANALI SERVİS TE (VS TİPİ)
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

53

EF VALVE TAPPING TEE (VA TYPE)
EF VANALI SERVİS TE (VA TİPİ)
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

56

EF TAPPING TEE WITH GAS-STOP
EF SERVİS TE GAZSTOPLU
SDR11 PE100
GAS / GAZ : 1-5 BAR

57

EF TAPPING TEE WITH EF END CAP
EF SERVİS TE EF KEPLİ
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

59

360° ROTATING OUTLET TAPPING TEE
360° DÖNER BAŞLIKLI VANALI SERVİS TE
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

EF-METRIC
EF-METRİK

61

360° ROTATING OUTLET TAPPING TEE
360° DÖNER BAŞLIKLI SERVİS TE
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

63

EF VALVE TAPPING TEE WITH INNER CAP
İÇ KAPAKLI VANALI SERVİS TE
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

65

***EF SADDLE* / EF SEMER**
SDR11 PE100
GAS / GAZ : 8 BAR
WATER / SU : 16 BAR

69

***EF SADDLE* / EF SEMER**
SDR17 PE100
GAS / GAZ : 4 BAR
WATER / SU : 10 BAR

71

***EF SADDLE* / EF SEMER**
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

74

EF SADDLE - STOP SYSTEM
EF SEMER - STOP SİSTEM
SDR11 PE100
GAS / GAZ : 4 BAR
WATER / SU : 10 BAR

75

EF BALLOON SADDLE
EF BALON SEMER
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

76

BIG SIZE SADDLE
EF SEMER BÜYÜK ÇIKIŞLI
SDR26 PE100
WATER / SU : PN6

77

EF REPAIR SADDLE
EF TAMİR SEMERİ
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

78

BIG SIZE EF REPAIR SADDLE
BÜYÜK ÇAP EF TAMİR SEMERİ
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

79

EF INNER SADDLE
EF İÇ SEMER
PE100

80

***EF EQUAL TEE* / EF EŞİT TE**
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

81

***EF REDUCED TEE* / EF INEGAL TE**
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

82

***EF REDUCER* / EF REDÜKSİYON**
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

84

***EF ELBOW 90°* / EF DİRSEK 90°**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

EF-METRIC
EF-METRİK

85

***EF ELBOW 45°* / EF DİRSEK 45°**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

86

***EF END CAP* / EF KEP**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

87

***EF END CAP* / EF KEP**
SDR 17 PE100
GAS / GAZ : 4 BAR
WATER / SU : 10 BAR

87

***EF END CAP* / EF KEP**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

88

EF COUPLER FOR PRE-INSULATED / DOUBLE CONTAINMENT PE PIPING SYSTEM
İZOLASYONLU / ÇİFT CİDARLI BORULAR İÇİN EF MANŞON
PE100

88

EF FLEXIBLE PATCH FOR SLEEVE COUPLERS
SLEEVE MANŞONLAR İÇİN EF KEP

89

TWIN INNER COUPLER
İKİZ İÇ MANŞON
PE100

90

***PP EF COUPLER* / PP EF MANŞON**
SDR26
WATER / SU : 6 BAR

90

***PP EF SADDLE* / PP EF SEMER**
SDR26
WATER / SU : 6 BAR

91

PP EF WELDING ADAPTOR (Male-Female)
PP EF KAYNAK ADAPTÖRÜ
SDR26
WATER / SU : 6 BAR

91

***U COUPLER* / U MANŞON**
SDR11 PE100
WATER / SU : 16 BAR

92

EF DUAL CONTAINMENT
FLEX ELBOW
SDR26 PE100
EF ÇİFT CİDARLI FLEKS DİRSEK

92

EF REDUCER (SHORT) FOR DUAL CONTAINMENT PIPES
EF REDÜKSİYON (KISA) ÇİFT CİDARLI BORULAR İÇİN

93

DUAL CONTAINMENT COUPLER
ÇİFT CİDARLI BORU MANŞONU
TYPE / TİP: EF

93

EF TANK PENETRATION SADDLE
TANK ÇIKIŞ UCU
TYPE / TİP : EF

EF-METRIC
EF-METRİK

94

EF INNER CAP FOR HORIZANTAL DRILLING
YATAY DELME İÇİN EF İÇ KEP
PE100

95

TANK OUTLET FOR PE AND PE-X TANKS/ **PE VE PE-X TANKLAR İÇİN ÇIKIŞ**
TYPE / TİP: EF

96

PE-BRASS TRANSITION COUPLER (FEMALE)
PE-PİRİNÇ GEÇİŞ MANŞONU (DİŞİ)
TYPE / TİP: EF

96

PE-BRASS TRANSITION COUPLER (MALE)
PE-PİRİNÇ GEÇİŞ MANŞONU (ERKEK)
TYPE / TİP: EF

97

PE-BRASS TRANSITION ELBOW (90°) (MALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (90°) (ERKEK)
TYPE / TİP: EF

97

PE-BRASS TRANSITION ELBOW (90°) (FEMALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (90°) (DİŞİ)
TYPE / TİP: EF

98

PE-BRASS TRANSITION ELBOW (45°) (MALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (45°) ERKEK)
TYPE / TİP: EF

98

PE-BRASS TRANSITION ELBOW (45°) (FEMALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (45°) (DİŞİ)
TYPE / TİP: EF

99

EF FLEX RESTRAINT
PE100

101

EF INNER FLEX FOR MENHOL STEPS
EF İÇ FLEX MENHOL BASAMAKLARI İÇİN

102

EF HEAVY DUTY FLEX
ENDÜSTRİYEL EF FLEX
PE100

103

EF FLANGE ADAPTOR
EF FLANŞ ADAPTÖRÜ
PE100

EF-METRIC
EF-METRİK

104

EF DOST FLANGE ADAPTOR
EF DOST FLANŞ ADAPTÖRÜ
PE100

105

EF INNER FLANGE ADAPTOR
EF İÇ FLANŞ ADAPTÖRÜ
PE100

106

EF INNER COUPLER WITH FEMALE THREAD
DİŞİ DİŞLİ EF İÇ MANŞON
PE100

107

HIGH PRESSURE SANDWICH EF COUPLER AND SANDWICH EF SADDLE
YÜKSEK BASINÇLI SANDVİÇ EF MANŞON VE SANDVİÇ EF SEMER
UP TO 100 BAR

108

BRASS OUTLET EF SADDLE SDR11
PİRİNÇ ÇIKIŞLI EF SEMER SDR11

110

WHEEL EF SADDLE
TEKERLEKLİ EF SEMER

SPIGOT-METRIC
SPIGOT-METRİK

112

***EQUAL TEE* / EŞİT TE**
SDR17 PE100
GAS / GAZ: 10 BAR
WATER / SU : 16 BAR
TYPE / TİP : SPIGOT

113

EQUAL TEE SEGMENTED
EŞİT TE KONFEKSİYON
SDR17 PE 100
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

114

EQUAL TEE (SHORT)
EŞİT TE (KISA)
SDR17 PE 100
GAS/GAZ : 4 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

115

***EQUAL TEE* / EŞİT TE**
SDR11 PE 100
GAS/GAZ: 10 BAR
WATER/SU: 16 BAR
TYPE/TİP: SPIGOT

116

EQUAL TEE SEGMENTED
EŞİT TE KONFEKSİYON
SDR11 PE 100
WATER/SU: 16 BAR
TYPE/TİP: SPIGOT

117

EQUAL TEE (SHORT)
EŞİT TE (KISA)
SDR11 PE 100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

118

***REDUCED TEE* / İNEGAL TE**
SDR17 PE100
GAS/GAZ: 6 BAR
WATER/SU: 10 BAR
TYPE/TİP: SPIGOT

122

REDUCED TEE (SHORT)
İNEGAL TE (KISA)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

125

REDUCED TEE (SHORT)
İNEGAL TE (KISA)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

128

***REDUCED TEE* / İNEGAL TE**
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

131

MACHINED EQUAL TEE (LONG)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

132

MACHINED EQUAL TEE (LONG)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

133

MACHINED EQUAL TEE (LONG)
SDR9 PE100
WATER/SU : 20 BAR

134

MACHINED EQUAL TEE (LONG)
SDR 7,4 PE100
WATER/SU : 25 BAR

135

MACHINED EQUAL TEE (SHORT)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

SPIGOT-METRIC
SPIGOT-METRİK

136

MACHINED EQUAL TEE (SHORT)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

137

MACHINED EQUAL TEE (SHORT)
SDR9 PE100
WATER/SU : 20 BAR

138

MACHINED EQUAL TEE (SHORT)
SDR7,4 PE100
WATER/SU : 25 BAR

139

MACHINED REDUCED TEE (SHORT)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

143

MACHINED REDUCED TEE (SHORT)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

147

MACHINED REDUCED TEE (SHORT)
SDR9 PE100
WATER/SU : 20 BAR

150

MACHINED REDUCED TEE (SHORT)
SDR7,4PE100
WATER/SU : 25 BAR

153

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)
SDR26 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

155

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

157

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

159

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)
SDR26 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

161

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

163

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (KISA)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

165

***CROSS TEE* / KROS TE**
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

166

***CROSS TEE* / KROS TE**
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

SPIGOT-METRIC
SPIGOT-METRİK

167

REDUCING CROSS TEE
REDÜKSİYON KROS TE
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

170

REDUCING CROSS TEE
REDÜKSİYON KROS TE
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

173

***REDUCER* / REDÜKSİYON**
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

176

REDUCER (SHORT)
REDÜKSİYON (KISA)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

178

***REDUCER* / REDÜKSİYON**
SDR11 PE100
GAS/GAZ : 10BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

181

REDUCER (SHORT)
REDÜKSİYON (KISA)
SDR11 PE100
GAS/GAZ : 10BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

183

SWEEP BEND 90°
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

184

SWEEP BEND 90°
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

185

SWEEP BEND 45°
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

186

SWEEP BEND 45°
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

187

***ELBOW (90°)* / DİRSEK (90°)**
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

188

ELBOW (90°) SEGMENTED
DİRSEK (90°) KONFEKSİYON
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

189

***ELBOW (90°)* / DİRSEK (90°)**
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

190

ELBOW (90°) SEGMENTED
DİRSEK (90°) KONFEKSİYON
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

191

ELBOW (90°) SEGMENTED (SHORT)
DİRSEK (90°) (KISA) KONFEKSİYON
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

SPIGOT-METRIC
SPIGOT-METRİK

192

ELBOW (45°) / DİRSEK (45°)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

193

ELBOW (45°) SEGMENTED(SHORT)
DİRSEK (45°) KONFEKSİYON (KISA)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

194

ELBOW (45°) SEGMENTED
DİRSEK (45°) KONFEKSİYON
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

195

ELBOW (45°) / DİRSEK (45°)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

196

ELBOW (45°) SEGMENTED
DİRSEK (45°) KONFEKSİYON
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

197

ELBOW (45°) SEGMENTED
DİRSEK (45°) KONFEKSİYON
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

198

END CAP / KEP
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

199

END CAP / KEP)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

200

FLANGE ADAPTOR
FLANŞ ADAPTÖRÜ
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

201

FLANGE ADAPTOR (SHORT)
FLANŞ ADAPTÖRÜ (KISA)
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

202

FLANGE ADAPTOR
FLANŞ ADAPTÖRÜ
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

203

FLANGE ADAPTOR (SHORT)
FLANŞ ADAPTÖRÜ (KISA)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

SPIGOT-METRIC
SPIGOT-METRİK

204

SF REDUCED FLANGE ADAPTOR
PN16 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

205

SF REDUCED FLANGE ADAPTOR
PN16 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

206

***FLANGE* / FLANŞ PN16**

207

***FLANGE* / FLANŞ PN10**

208

***FLANGE* / FLANŞ PN6**

209

PP COATED STEEL FLANGE
PP KAPLI ÇELİK FLANŞ
PN10/16

210

FLANGE ADAPTOR + INDUSTRIAL COMPOSITE FLANGE
FLANŞ ADAPTÖRÜ + ENDÜSTRİYEL KOMPOZİT FLANŞ
PN10/16

211

PE-STEEL TRANSITION FITTING (WELDED)
PE-ÇELİK GEÇİŞ FİTİNGİ (KAYNAKLI)
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

212

PE-BRASS TRANSITION FITTING MALE (THREADED)
PE-PİRİNÇ GEÇİŞ FİTİNGİ ERKEK (DİŞLİ)
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

212

PE-BRASS TRANSITION FITTING FEMALE (THREADED)
PE-PİRİNÇ GEÇİŞ FİTİNGİ DİŞİ (DİŞLİ)
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

213

PE THREADED TRANSITION FITTING (MALE)
PE DİŞLİ GEÇİŞ PARÇASI (ERKEK)
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

FLOW CONTROL-METRIC
AKIŞ KONTROL-METRİK

219

GATE VALVE – LONG SPIGOT
SÜRGÜLÜ VANA – UZUN SPİGOT
PE100 WATER / SU : PN16

220

FLANGED PE100 GATE VALVE–SHORT SPIGOT
FLANŞLI **PE100 SÜRGÜLÜ VANA – KISA SPİGOT**

220

PE100 GATE VALVE – SHORT SPIGOT
PE100 SÜRGÜLÜ VANA – KISA SPİGOT

221

PE100 GATE VALVE – LONG SPIGOT - FLANGED
PE100 SÜRGÜLÜ VANA – UZUN SPİGOT/FLANŞLI

221

PE100 GATE VALVE - FLANGED
PE100 SÜRGÜLÜ VANA – FLANŞLI

222

PE100 GATE VALVE WITH EF SADDLE
PE100 SÜRGÜLÜ VANA – SEMER ÇIKIŞLI

223

PE BALL VALVE (FULL BORE)
PE KÜRESEL VANA (TAM GEÇİŞ)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

224

PE BALL VALVE (REDUCED BORE)
PE KÜRESEL VANA (REDÜKSİYON GEÇİŞ)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

225

PE100 BALL CHECK VALVE
PE100 KÜRELİ ÇEKVALF

225

PE100 BALL CHECK VALVE - FLANGED
PE100 KÜRELİ ÇEKVALF - FLANŞLI

226

PE100 CHECK VALVE WHITH SPRING
PE100 YAYLI ÇEKVALF

226

PE100 CHECK VALVE WITH SPRING-FLANGED
PE100 YAYLI ÇEKVALF-FLANŞLI

227

PE100 A TYPE IRRIGATION HYDRANT
PE100 A TİPİ SULAMA HİDRANTI

227

PE100 D TYPE IRRIGATION HYDRANT
PE100 D TİPİ SULAMA HİDRANTI

228

PE100 H TYPE IRRIGATION HYDRANT
PE100 H TİPİ SULAMA HİDRANTI

FLOW CONTROL-METRIC
AKIŞ KONTROL-METRİK

228

PE100 FIRE HYDRANT
PE100 YANGIN HİDRATI

229

PE100 SINGLE BALL AIR RELEASE VALVE
PE100 TEK KÜRELİ VANTUZ

229

PE100 SINGLE BALL AIR RELEASE VALVE- FLANGED
PE100 TEK KÜRELİ VANTUZ FLANŞLI

229

PE100 NON SLAM DYNAMIC AIR RELEASE VALVE
PE100 DİNAMİK VANTUZ DARBESİZ

230

PE100 NON SLAM DYNAMIC AIR RELEASE VALVE-FLANGED
PE100 DİNAMİK VANTUZ DARBESİZ-FLANŞLI

230

PE100 DOUBLE BALL AIR RELEASE VALVE
PE100 ÇİFT KÜRELİ VANTUZ

230

PE100 DOUBLE BALL AIR RELEASE VALVE-FLANGED
PE100 ÇİFT KÜRELİ VANTUZ-FLANŞLI

231

PE100 KNIFE VALVE/
PE100 BIÇAK VANA

182

HINGED CHECK VALVE
MENTEŞELİ ÇEKVALF
PE100 PN 1/16

232

ULTRASONIC PREPAYABLE WATER METER
ULTRASONİK ÖN ÖDEMELİ SAYAÇ

234

PE100 PURGE VALVE
PE100 PURGE VANA

235

EF ACTUATOR BASE
EF AKTÜATÖR ALTLIĞI

236

PE100 IRRIGATION HYDRANT (REMOTE CONTROLLED ON-OFF SYSTEM)
PE100 UZAKTAN KONTROLLÜ SULAMA HİDRANTI

EF-IPS / DIPS

240

SDR26 ELECTROFUSION COUPLER, IPS DUAL RATED WATER NATURAL GAS

241

SDR17 ELECTROFUSION COUPLER, IPS DUAL RATED WATER NATURAL GAS

242

SDR11 ELECTROFUSION COUPLER, IPS DUAL RATED WATER NATURAL GAS

244

SDR6 ELECTROFUSION COUPLER, IPS

245

SDR9 ELECTROFUSION COUPLER, IPS

246

SDR7 ELECTROFUSION COUPLER, IPS

247

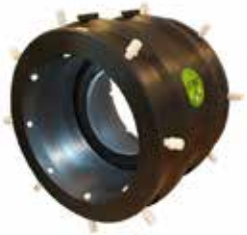
SDR26 ELECTROFUSION COUPLER, DIPS

248

SDR17 ELECTROFUSION COUPLER, DIPS

249

SDR11 ELECTROFUSION COUPLER, DIPS



251

EF DOST COUPLER

252

SDR 11 ELECTROFUSION LONG COUPLER (IPS) DUAL RATED WATER/NATURAL GAS

253

SDR11 ELECTROFUSION TAPPING TEES

257

SDR11 ELECTROFUSION SMALL BRANCH SADDLES

262

SDR11 ELECTROFUSION VALVE TAPPING TEES

265

SDR11 ELECTROFUSION VALVE TAPPING TEES (VA TYPE)

EF-IPS / DIPS

SDR11 360° ROTATING TAPPING TEES 269

SDR11 360° ROTATING TAPPING TEES 271

SDR11 ELECTROFUSION TAPPING TEES WITH INNER CAP 273

SDR11 ELECTROFUSION LARGE BRANCH SADDLES 275

SDR17 ELECTROFUSION LARGE BRANCH SADDLES 279

SDR11 ELECTROFUSION EQUAL TEES 282

SDR11 ELECTROFUSION REDUCERS 283

SDR11 ELECTROFUSION 45 DEGREE ELBOWS 284

SDR11 ELECTROFUSION 90 DEGREE ELBOWS 285

BRASS THREADED OUTLET EF SADDLE SDR11 285

EF FLEX RESTRAINT PE100 288

SPIGOT-IPS / DIPS

292

IPS EQUAL TEE
SDR17 PE100
WATER / SU : 130 PSI
GAS / GAZ : 64 PSI

292

IPS EQUAL TEE
SDR13,5 PE100
WATER / SU : 160 PSI
GAS / GAZ : 80 PSI

293

IPS EQUAL TEE
SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ : 100 PSI

293

IPS EQUAL TEE
SDR9 PE100
WATER / SU : 255 PSI
GAS / GAZ : 125 PSI

294

IPS EQUAL TEE
SDR7 PE100
WATER / SU : 355 PSI
GAS / GAZ : 125 PSI

295

IPS REDUCED TEE
SDR17 PE100
WATER / SU : 130 PSI
GAS / GAZ : 64 PSI

296

IPS REDUCED TEE
SDR13,5 PE100
WATER / SU : 160 PSI
GAS / GAZ : 80 PSI

297

IPS REDUCED TEE
SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ : 100 PSI

298

IPS REDUCED TEE
SDR9 PE100
WATER / SU : 255 PSI
GAS / GAZ : 125 PSI

299

IPS REDUCED TEE
SDR7,4 PE100
WATER / SU : 355 PSI
GAS / GAZ : 125 PSI

300

MOLDED ELBOW - 90°
SDR17 PE100
WATER / SU : 130 PSI
GAS / GAZ : 64 PSI

301

MOLDED ELBOW - 90°
SDR13,5 PE100
WATER / SU : 160 PSI
GAS / GAZ : 80 PSI

SPIGOT-IPS / DIPS

302

MOLDED ELBOW - 90°
SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ : 100 PSI

303

MOLDED ELBOW - 90°
SDR9 PE100
WATER / SU : 255 PSI
GAS / GAZ : 125 PSI

304

MOLDED ELBOW - 90°
SDR7 PE100
WATER / SU : 355 PSI
GAS / GAZ : 125 PSI

305

MOLDED ELBOW - 45°
SDR17 PE100
WATER / SU : 130 PSI
GAS / GAZ : 64 PSI

306

MOLDED ELBOW - 45°
SDR13,5 PE100
WATER / SU : 160 PSI
GAS / GAZ : 80 PSI

307

MOLDED ELBOW - 45°
SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ : 100 PSI

308

MOLDED ELBOW - 45°
SDR9 PE100
WATER / SU : 255 PSI
GAS / GAZ : 125 PSI

309

MOLDED ELBOW - 45°
SDR7 PE100
WATER / SU : 355 PSI
GAS / GAZ : 125 PSI

310

DIPS EQUAL TEE
SDR17 PE100
WATER / SU : 130 PSI
GAS / GAZ : 64 PSI

310

DIPS EQUAL TEE
SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ : 100 PSI

311

DIPS EQUAL TEE
SDR9 PE100
WATER / SU : 255 PSI
GAS / GAZ : 125 PSI

311

DIPS EQUAL TEE
SDR7,4 PE100
WATER / SU : 335 PSI
GAS / GAZ : 125 PSI

312

MOLDED FLANGE ADAPTOR
SDR17 PE100
WATER / SU : 130 PSI
GAS / GAZ: 64 PSİ

314

MOLDED FLANGE ADAPTOR
SDR13,5 PE100
WATER / SU : 160 PSI
GAS / GAZ: 80 PSİ

316

MOLDED FLANGE ADAPTOR
SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ: 100 PSİ

318

MOLDED FLANGE ADAPTOR
SDR9 PE100
WATER / SU : 255 PSI
GAS / GAZ: 125 PSİ

320

MOLDED FLANGE ADAPTOR
SDR7 PE100
WATER / SU : 355 PSI
GAS / GAZ: 125 PSİ

FLOW CONTROL-IPS / DIPS

AKIŞ KONTROL-IPS / DIPS

324

PE100 BALL CHECK VALVE
PE100 KÜRELİ ÇEKVALF

324

PE100 BALL CHECK VALVE/FLANGED
PE100 KÜRELİ ÇEKVALF - FLANŞLI

325

PE100 CHECK VALVE WITH SPRING
PE100 YAYLI ÇEKVALF

325

PE100 CHECK VALVE WITH SPRING-FLANGED
PE100 YAYLI ÇEKVALF-FLANŞLI

326

PE100 A TYPE IRRIGATION HYDRANT
PE100 A TİPİ SULAMA HİDRANTI

326

PE100 D TYPE IRRIGATION HYDRANT
PE100 D TİPİ SULAMA HİDRANTI

327

PE100 H TYPE IRRIGATION HYDRANT
PE100 H TİPİ SULAMA HİDRANTI

327

PE100 FIRE HYDRANT
PE100 YANGIN HİDRATI

329

PE100 IRRIGATION HYDRANT (REMOTE CONTROLLED ON-OFF SYSTEM)/ **PE100 UZAKTAN KONTROLLÜ SULAMA HİDRANTI**

330

PE100 SINGLE BALL AIR RELEASE VALVE
PE100 TEK KÜRELİ VANTUZ

330

PE100 SINGLE BALL AIR RELEASE VALVE- FLANGED
PE100 TEK KÜRELİ VANTUZ FLANŞLI

330

PE100 NON SLAM DYNAMIC AIR RELEASE VALVE
PE100 DİNAMİK VANTUZ DARBESİZ

331

PE100 NON SLAM DYNAMIC AIR RELEASE VALVE-FLANGED
PE100 DİNAMİK VANTUZ DARBESİZ-FLANŞLI

331

PE100 DOUBLE BALL AIR RELEASE VALVE
PE100 ÇİFT KÜRELİ VANTUZ

331

PE100 DOUBLE BALL AIR RELEASE VALVE-FLANGED
PE100 ÇİFT KÜRELİ VANTUZ-FLANŞLI

FLOW CONTROL-IPS / DIPS
AKIŞ KONTROL-IPS / DIPS

332

HINGED CHECK VALVE
PE100 PN 1/16

332

ULTRASONIC PREPAYABLE WATER METER

334

PE100 PURGE VALVE
PE100 PURGE VANA

336

PE100 GATE VALVE – LONG SPIGOT
PE100 SÜRGÜLÜ VANA – UZUN SPİGOT

337

PE100 GATE VALVE – LONG SPIGOT - FLANGED
PE100 SÜRGÜLÜ VANA – UZUN SPİGOT/FLANŞLI

337

PE100 GATE VALVE - FLANGED
PE100 SÜRGÜLÜ VANA – FLANŞLI

338

PE100 GATE VALVE WITH EF SADDLE
PE100 SÜRGÜLÜ VANA – SEMER ÇIKIŞLI

339

PE BALL VALVE (FULL BORE)
PE KÜRESEL VANA (TAM GEÇİŞ)
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

MACHINE-TOOL
MAKİNE-APARATLAR

342

SS REPAIR SADDLE
PASLANMAZ ÇELİK TAMİR SEMERİ

342

DUCT FOOT BEND
YANGIN HİDRANT ÖKÇESİ

342

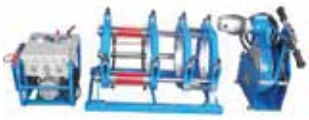
SPECIAL DUCT FOOT BEND
PE ÖZEL YANGIN HİDRANT ÖKÇESİ

343

EF WELDING MACHINE
EF KAYNAK MAKİNESİ
4000S

343

EF WELDING MACHINE
EF KAYNAK MAKİNESİ
300 LIGHT



344

BUTT WELDING MACHINE
ALIN KAYNAK MAKİNESİ

344

V TYPE ALIGNMENT CLAMP
V TİPİ EKSENLEME KELEPÇESİ

345

RE-ROUNDING TOOL
OVALLİK KELEPÇESİ

345

COUPLER CLAMP
MANŞON KELEPÇESİ

346

HAND SCRAPING TOOLS
BORU KAZIMA APARATLARI

346

ELECTRICAL PIPE SCRAPER

346

ROTARY TRAIN TYPE SCRAPER

MACHINE-TOOL
MAKİNE-APARATLAR

346

PP PIPE INNER SCRAPER

347

***SQUEEZING TOOL FOR* EF SADDLE**
SEMER SIKTIRMA APARATLARI

348

COUPLER PULLING TOOL
MANŞON ÇEKTİRME SETİ

349

PIPE CUTTER (HAND TYPE)
BORU KESME MAKASI

349

TELESCOPIC PIPE CUTTER
TELESKOPİK BORU KESİCİ

350

TEGA TELESCOPIC EXTENSION WITH SURFACE BOX FOR PE GATE VALVE
TEGA PE-SÜRGÜLÜ VANALAR İÇİN BUŞAKLELİ TELESKOPİK UZATMA KOLLARI

351

TELESCOBIC EXTENSION FOR GATE VALVE
SÜRGÜLÜ VANA İÇİN TELESKOPİK UZATMA KOLLARI

352

TELESCOBIC EXTENSION FOR BALL VALVE
KÜRESEL VANA İÇİN TELESKOPİK UZATMA KOLLARI

352

SURFACE BOX
BUŞAKLE KAZANI

354

EF SADDLE DRINLLING TOOL
PP SEMER DELME APARATI TAKIMI

354

***EXTERNAL BUTT FUSION PRESSURE* TEST TOOL**
HARİCİ ALIN KAYNAK BASINÇ TEST APARATI

EF ÜRÜNLER
EF PRODUCTS

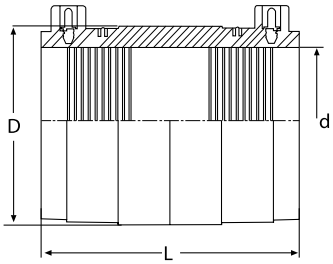
EF-METRIC

EF-METRİK

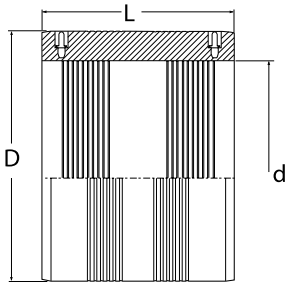
EF COUPLER / EF MANŞON

SDR 26 PE100

WATER / SU : 6 BAR



TYPE A



TYPE B

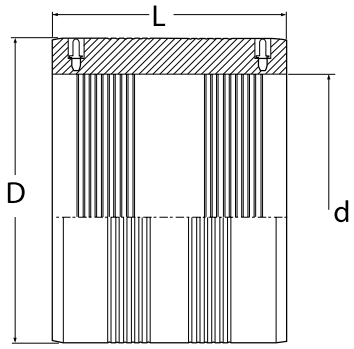
d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
50	00112600000000500000	0,10	60	75	30*40*30	30	A
63	00112600000000630000	0,12	75	83	30*40*30	30	A
75	00112600000000750000	0,13	87	83	60*40*30	36	A
90	00112600000000900000	0,25	103	100	30*40*30	18	A
110	00112600000001100000	0,34	125	100	60*40*30	24	A
125	00112600000001250000	0,38	140	100	30*40*30	16	A
140	00112600000001400000	0,67	155	160	60*40*45	12	B
160	00112600000001600000	0,80	175	160	60*40*45	12	B
180	00112600000001800000	0,93	197	160	60*40*45	12	B
200	00112600000002000000	1,15	220	165	60*40*45	8	B
225	00112600000002250000	1,25	245	165	60*40*45	7	B
250	00112600000002500000	1,65	275	165	60*40*30	4	B
280	00112600000002800000	2,00	305	165	60*40*45	3	B
315	00112600000003150000	2,50	345	165	60*40*45	3	B
355	00112600000003550000	4,00	390	180	60*40*45	3	B
400	00112600000004000000	5,50	440	220	60*40*45	2	B
450	00112600000004500000	7,00	495	220	60*60*33	1	B
500	00112600000005000000	8,70	550	220	**		B
560	00112600000005600000	12,20	615	250	**		B
630*	00112600000006300000	19,70	690	330	**		B
710*	00112600000007100000	26,00	780	330	**		B
800*	00112600000008000000	33,50	880	330	**		B
900*	00112600000009000000	48,70	990	380	**		B
1000*	00112600000010000000	72,20	1110	380	**		B
1200*	00112600000012000000	75,40	1300	400	**		B
1400*	00112600000014000000	122,00	1530	425	**		B
1600*	00112600000016000000	170,40	1750	450	**		B
2000*	00112600000020000000	268,00	2190	450	**		B

* Manşonun her iki tarafı ayrı kaynak olmaktadır. */ 2 ends of coupler fused separately*

**Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

EF COUPLER / EF MANŞON

SDR 17 PE100
GAS / GAZ: 6 BAR
WATER / SU: 10 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box
280	00111700000002800000	5,00	330	220	60*40*45	2
315	00111700000003150000	7,05	365	230	60*40*45	2
355	00111700000003550000	10,31	415	255	60*40*45	2
400	00111700000004000000	14,50	470	300	60*60*33	1
450	00111700000004500000	20,75	530	320	60*60*33	1
500	00111700000005000000	27,00	590	365	**	
560	00111700000005600000	36,50	655	400	**	
630	00111700000006300000	50,00	740	420	**	
710	00111700000007100000	66,50	840	445	**	
800	00111700000008000000	86,30	935	470	**	
900	00111700000009000000	114,00	1050	500	**	
1000	00111700000010000000	147,50	1175	500	**	
1200	00111700000012000000	170,50	1371	500	**	
1400	00111700000014000000	225,30	1600	550	**	
1600	00111700000016000000	348,00	1829	575	**	
2000	00111700000020000000	527,00	2286	575	**	

* Manşonun her iki tarafı ayrı kaynak olmaktadır. */ 2 ends of coupler fused separately*

**Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

EF-METRIC

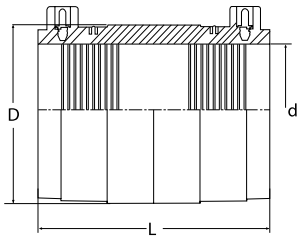
EF-METRİK

EF COUPLER / EF MANŞON

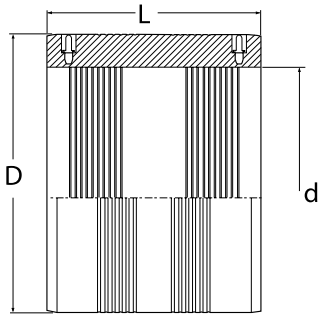
SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



TYPE A



TYPE B

d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
20	00111100000000200000	0,03	33	60	30*40*15	125	A
25	00111100000000250000	0,04	41	71	30*40*15	100	A
32	00111100000000320000	0,07	48	81	30*40*15	50	A
40	00111100000000400000	0,09	55	83	30*40*15	40	A
50	00111100000000500000	0,13	67	98	30*40*15	20	A
63	00111100000000630000	0,18	80	108	30*40*30	30	A
75	00111100000000750000	0,25	97	117	30*40*30	24	A
90	00111100000000900000	0,40	119	130	60*40*30	30	A
110	00111100000001100000	0,67	142	137	60*40*30	22	A
125	00111100000001250000	0,85	160	150	60*40*45	16	A
140	00111100000001400000	1,06	180	158	60*40*45	12	A
160	00111100000001600000	1,30	198	161	60*40*45	12	A
180	00111100000001800000	1,69	227	166	60*40*45	8	A
200	00111100000002000000	2,50	250	200	60*40*30	4	A
225	00111100000002250000	3,80	277	200	60*40*30	4	A
250	00111100000002500000	4,90	310	210	60*40*30	2	A
280	00111100000002800000	10,46	345	220	60*40*45	2	A
315	00111100000003150000	12,66	390	230	60*40*45	2	A
355	00111100000003550000	16,50	440	255	60*40*45	2	A
400	00111100000004000000	20,29	495	300	60*60*33	1	B
450*	00111100000004500000	25,00	554	320	60*60*33	1	B
500*	00111100000005000000	35,00	615	365	**	**	B
560*	00111100000005600000	48,50	690	400	**	**	B
630*	00111100000006300000	63,80	775	420	**	**	B
710*	00111100000007100000	90,00	880	445	**	**	B
800*	00111100000008000000	122,70	995	470	**	**	B
900*	00111100000009000000	150,00	1100	500	**	**	B
1000*	00111100000010000000	191,30	1230	500	**	**	B

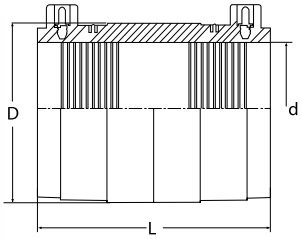
* Manşonun her iki tarafı ayrı kaynak olmaktadır. / *2 ends of coupler fused separately*

** Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

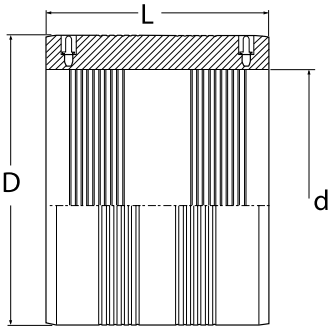
EF COUPLER / EF MANŞON

SDR 9 PE100

WATER / SU : 20 BAR



TYPE A



TYPE B

d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
63	00110900000000630000	0,45	97	118	30*40*30	24	A
75	00110900000000750000	0,60	115	150	30*40*30	13	A
90	00110900000000900000	1,00	142	167	60*40*30	22	A
110	00110900000001100000	1,56	159	170	60*40*30	16	A
125	00110900000001250000	2,30	180	170	60*40*45	12	A
140	00110900000001400000	3,00	200	185	60*40*45	10	B
160	00110900000001600000	3,50	230	190	60*40*45	8	B
180	00110900000001800000	3,60	240	190	60*40*45	4	B
200	00110900000002000000	5,70	280	200	60*40*30	2	B
225	00110900000002250000	6,30	305	200	60*40*30	2	B
250	00110900000002500000	7,50	330	220	**	**	B
280	00110900000002800000	9,50	370	220	**	**	B
315	00110900000003150000	14,40	415	230	**	**	B
355	00110900000003550000	17,00	465	255	**	**	B
400*	00110900000004000000	25,70	525	300	**	**	B
450*	00110900000004500000	34,70	590	320	**	**	B
500*	00110900000005000000	50,50	660	365	**	**	B
560*	00110900000005600000	69,80	740	400	**	**	B
630*	00110900000006300000	91,40	830	420	**	**	B

* Manşonun her iki tarafı ayrı kaynak olmaktadır. */ 2 ends of coupler fused separately*

**Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

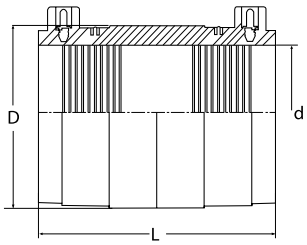
EF-METRIC

EF-METRİK

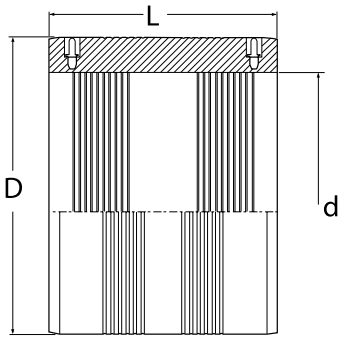
EF COUPLER / EF MANŞON

SDR 7,4 PE100

WATER / SU : 25 BAR



TYPE A



TYPE B

d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
63	00110700000000630000	0,45	97	118	30*40*30	24	A
75	00110700000000750000	0,60	115	150	30*40*30	13	A
90	00110700000000900000	1,00	142	167	60*40*30	20	A
110	00110700000001100000	1,56	159	172	60*40*45	12	A
125	00110700000001250000	2,30	180	171	60*40*45	12	A
140	00110700000001400000	3,00	200	185	60*40*45	10	B
160	00110700000001600000	3,50	230	190	60*40*45	8	B
180	00110700000001800000	4,10	248	190	60*40*45	4	B
200	00110700000002000000	5,70	280	200	60*40*30	2	B
225	00110700000002250000	6,70	310	200	60*40*30	3	B
250	00110700000002500000	9,50	347	220	**	**	B
280	00110700000002800000	12,00	390	220	**	**	B
315	00110700000003150000	17,50	440	230	**	**	B
355	00110700000003550000	21,60	490	255	**	**	B
400*	00110700000004000000	32,60	553	300	**	**	B
450*	00110700000004500000	43,40	620	320	**	**	B
500*	00110700000005000000	61,50	690	365	**	**	B
560*	00110700000005600000	87,90	780	400	**	**	B
630*	00110700000006300000	112,70	870	420	**	**	B

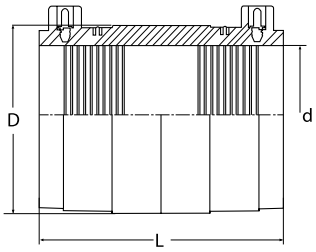
* Manşonun her iki tarafı ayrı kaynak olmaktadır. */ 2 ends of coupler fused separately*

**Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

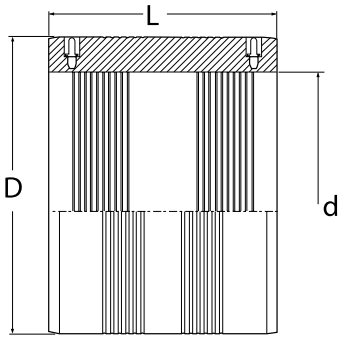
EF COUPLER / EF MANŞON

SDR 6 PE100

WATER / SU : 32 BAR



TYPE A



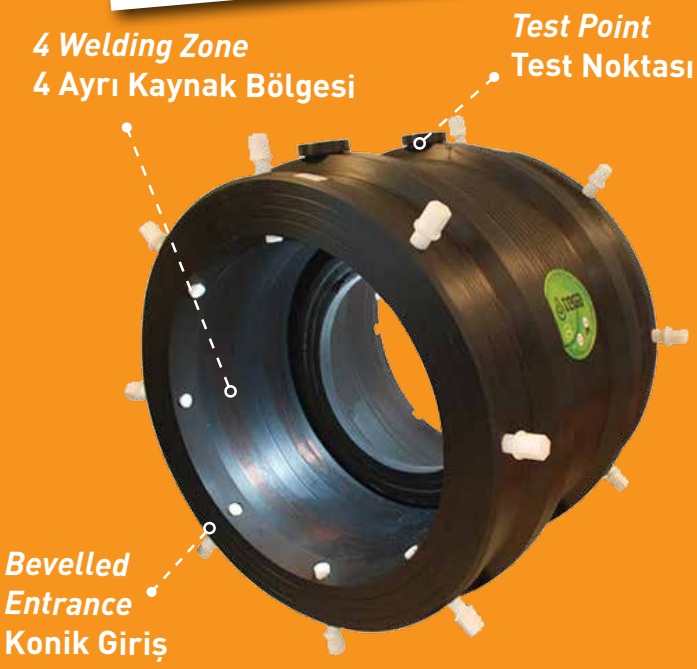
TYPE B

d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
63	00110600000000630000	0,48	97	118	30*40*30	24	A
75	00110600000000750000	0,85	115	150	30*40*30	13	A
90	00110600000000900000	1,50	142	167	60*40*30	20	A
110	00110600000001100000	2,60	180	170	60*40*45	12	A
125	00110600000001250000	2,70	195	161	60*40*45	12	A
140	00110600000001400000	3,60	220	166	60*40*45	10	B
160	00110600000001600000	5,30	250	190	60*40*45	8	B
180	00110600000001800000	5,80	270	190	60*40*45	4	B
200	00110600000002000000	8,00	305	200	60*40*30	2	B
225	00110600000002250000	10,30	345	200	60*40*45	3	B
250	00110600000002500000	13,60	380	220	**	3	B
280	00110600000002800000	17,70	430	220	**	2	B
315	00110600000003150000	22,75	480	230	**	2	B
355	00110600000003550000	33,00	545	255	**	1	B
400*	00110600000004000000	49,00	615	300	**	1	B
450*	00110600000004500000	64,00	685	320	**	1	B

* Manşonun her iki tarafı ayrı kaynak olmaktadır. */ 2 ends of coupler fused separately*

**Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

TEGA DOST MANŞON
TEGA DOST COUPLER



The Leading Edge of Electrofusion Technology!

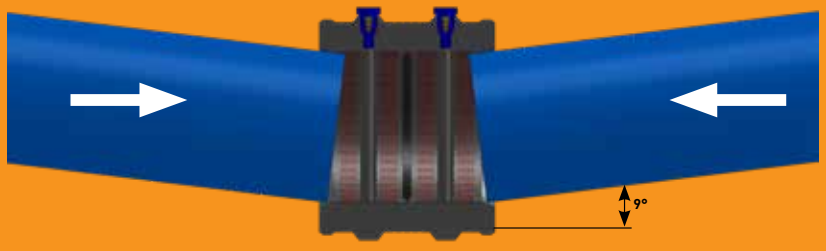
EF Teknolojisinde Gelinen Son Nokta !

Deflection can cause ovality. The ovality of the pipe can be solved by using conical enterance of the coupler. Dost coupler can tolerate up to 40 mm ovality of the pipe

Oval Boruların Manşona sokulması zor bir işlemdir. Dost Manşon konik girişi yardımıyla boruda ki ovallik alınır. Manşona borular rahatlıkla sürülür ve borudaki 40 mm'ye kadar ovallik giderilir.

Oval Pipe / Oval Boru

Circular Pipe / Dairesel Boru



Dost Coupler can accommodate up to 9° deflection of the pipe without using any tool

Borulardaki 9° ye kadar olan eksen sapmaları giderilir.

Make the hydraulic test without filling the pipe line with water

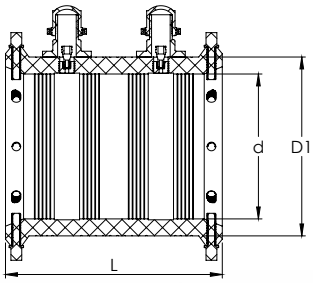
Boru hattı boşken BASINÇ TEST'i yapılmasını sağlayan inovatif tasarım

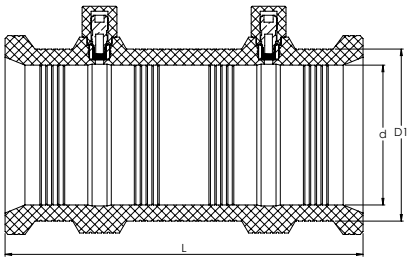
The winner of world innovation award 2014

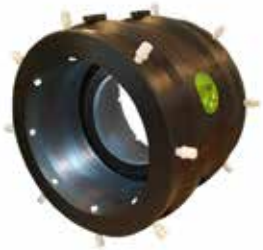
2014 DÜNYA İNOVASYON ÖDÜLÜ

EF DOST COUPLER / EF DOST MANŞON

SDR 11 PE100
GAS / GAZ: 10 BAR
WATER / SU: 16 BAR







TYPE A

TYPE B

d	CODE	Weight (kg)	D1	L	SDR	TYPE
63	00311100000000630000	0,90	80	215	11	B
90	00311100000000900000	1,60	112	290	11	B
110	00311100000001100000	2,20	145	245	11	B
125	00311100000001250000	3,30	155	360	11	B
140	00311100000001400000	3,80	173	360	11	B
160	00311100000001600000	5,50	197	430	11	B
180	00311100000001800000	7,00	223	430	11	B
200	00311100000002000000	8,30	248	430	11	B
225	00311100000002250000	11,30	277	480	11	B
250	00311100000002500000	19,60	310	600	11	A
280	00311100000002800000	22,30	345	600	11	A
315	00311100000003150000	30,20	395	620	11	A
355	00311100000003550000	37,90	440	660	11	A
400	00311100000004000000	49,60	495	700	11	A
450	00311100000004500000	62,80	555	720	11	A
500	00311100000005000000	86,30	620	780	11	A
560	00311100000005600000	108,60	695	780	11	A
630	00311100000006300000	134,10	780	780	11	A
710	00311100000007100000	168,40	870	780	11	A
800	00311100000008000000	209,10	990	800	11	A
900	00311100000009000000	260,60	1100	820	11	A
1000	00311100000010000000	247,20	1180	820	17***	A
1200	00311100000012000000	278,50	1370	820	17***	A
1400	00311100000014000000	370,00	1600	820	17***	A
1600	00311100000016000000	486,50	1830	820	17***	A
2000	00311100000020000000	637,00	2250	820	17***	A

*** *GAS* / GAZ: 4 BAR - *WATER* / SU: 10 BAR

-Talebe bağlı olarak D63 - D900 aralığında SDR17 - 21 - 26 üretilmektedir. */ Availble on request all the size from D63 to D900 as SDR17 - 21 - 26.*

EF-METRIC

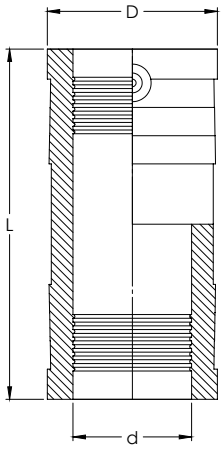
EF-METRİK

EF COUPLER (LONG)
EF MANŞON (UZUN)

SDR11 PE100

GAS / GAZ : 10 BAR

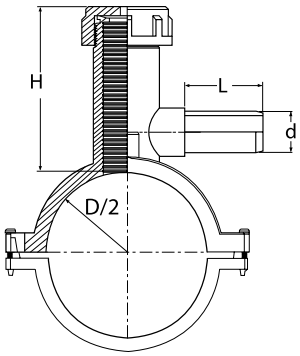
WATER / SU : 16 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box
25	00611100000000250000	0,07	34	108	40*30*15	70
32	00611100000000320000	0,12	45	128	40*30*15	35
40	00611100000000400000	0,15	51	147	40*30*30	50
50	00611100000000500000	0,28	67	162	60*40*30	48
63	00611100000000630000	0,51	86	186	60*40*30	36
75	00611100000000750000	0,78	95	220	60*40*30	24
90	00611100000000900000	1,33	117	255	60*40*30	10
110	00611100000001100000	1,85	141	257	60*40*30	8
125	00611100000001250000	2,39	156	303	60*40*30	8

EF TAPPING TEE / EF SERVİS TE

SDR 11 PE100
GAS / GAZ: 10 BAR
WATER / SU: 16 BAR




TYPE A


TYPE B


TYPE C


TYPE E

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
40*20	04611100000000400020	0,29	105	44	40*30*30	25	A
40*25	04611100000000400025	0,30	105	44	40*30*30	25	A
40*32	04611100000000400032	0,31	105	47	40*30*30	25	A
50*20	04611100000000500020	0,33	105	52	40*30*30	20	A
50*25	04611100000000500025	0,34	105	54	40*30*30	20	A
50*32	04611100000000500032	0,35	105	85	40*30*30	20	A
63*20	04611100000000630020	0,40	105	52	40*30*30	15	A
63*25	04611100000000630025	0,42	105	54	40*30*30	15	A
63*32	04611100000000630032	0,42	105	85	40*30*30	15	A
63*40	04611100000000630040	0,59	105	90	40*30*30	15	A
63*50	04611100000000630050	1,10	200	105	40*30*30	7	B
63*63	04611100000000630063	1,20	200	105	40*30*30	7	B
75*20	04611100000000750020	0,43	105	52	40*30*30	12	A
75*25	04611100000000750025	0,44	105	54	40*30*30	12	A
75*32	04611100000000750032	0,44	105	85	40*30*30	12	A
75*40	04611100000000750040	0,59	105	90	40*30*30	12	A
75*50	04611100000000750050	1,10	200	105	40*30*30	7	B
75*63	04611100000000750063	1,20	200	105	40*30*30	7	B
90*20	04611100000000900020	0,83	135	47	60*40*30	12	A
90*25	04611100000000900025	0,84	135	52	60*40*30	12	A
90*32	04611100000000900032	0,85	135	64	60*40*30	12	A
90*40	04611100000000900040	0,85	135	89	60*40*30	12	A
90*50	04611100000000900050	1,65	180	100	60*40*30	10	C
90*63	04611100000000900063	1,69	180	110	60*40*30	10	C
110*20	04611100000001100000	0,93	135	48	60*40*30	10	A
110*25	04611100000001100000	0,94	135	55	60*40*30	10	A

EF-METRIC

EF-METRİK

EF TAPPING TEE / EF SERVİS TE

SDR 11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
110*32	04611100000001100032	0,96	135	68	60*40*30	10	A
110*40	04611100000001100040	0,98	135	70	60*40*30	10	A
110*50	04611100000001100050	1,70	180	75	60*40*30	8	A
110*63	04611100000001100063	1,80	180	75	60*40*30	8	A
125*20	04611100000001250020	1,32	135	48	60*40*30	10	A
125*25	04611100000001250025	1,38	135	55	60*40*30	10	A
125*32	04611100000001250032	1,40	135	68	60*40*30	10	A
125*40	04611100000001250040	1,45	135	70	60*40*30	10	A
125*50	04611100000001250050	1,48	180	75	60*40*30	8	A
125*63	04611100000001250063	1,53	180	75	60*40*30	8	A
140*20	04611100000001400020	1,30	135	51	60*40*30	10	C
140*25	04611100000001400025	1,38	135	48	60*40*30	10	C
140*32	04611100000001400032	1,40	135	83	60*40*30	10	C
140*40	04611100000001400040	1,45	135	89	60*40*30	8	C
140*50	04611100000001400050	1,48	180	103	60*40*30	8	C
140*63	04611100000001400063	1,53	180	110	60*40*30	8	C
160*20	04611100000001600020	1,30	135	65	60*40*30	10	C
160*25	04611100000001600025	1,38	135	64	60*40*30	10	C
160*32	04611100000001600032	1,40	137	87	60*40*30	10	C
160*40	04611100000001600040	1,45	136	60	60*40*30	10	C
160*50	04611100000001600050	1,48	165	109	60*40*30	8	C
160*63	04611100000001600063	1,53	165	108	60*40*30	8	C
180*20	04611100000001800020	1,30	135	65	60*40*30	10	C
180*25	04611100000001800025	1,38	135	64	60*40*30	10	C
180*32	04611100000001800032	1,40	137	87	60*40*30	10	C
180*40	04611100000001800040	1,45	136	60	60*40*30	8	C
180*50	04611100000001800050	1,48	165	109	60*40*30	8	C
180*63	04611100000001800063	1,53	165	108	60*40*30	8	C
200*20	04611100000002000020	1,32	135	65	60*40*30	10	C
200*25	04611100000002000025	1,38	135	64	60*40*30	10	C
200*32	04611100000002000032	1,40	137	87	60*40*30	10	C
200*40	04611100000002000040	1,45	136	60	60*40*30	8	C
200*50	04611100000002000050	1,48	165	109	60*40*30	8	C
200*63	04611100000002000063	1,53	165	108	60*40*30	8	C
225*20	04611100000002250020	1,32	135	65	60*40*30	10	C
225*25	04611100000002250025	1,38	135	64	60*40*30	10	C
225*32	04611100000002250032	1,40	137	87	60*40*30	10	C

EF TAPPING TEE / EF SERVİS TE

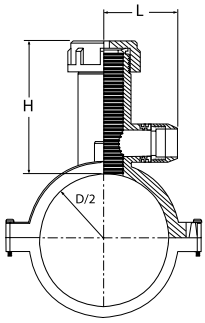
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type	
225*40	04611100000002250040	1,45	136	60	60*40*30	8	C	
225*50	04611100000002250050	1,48	165	109	60*40*30	8	C	
225*63	04611100000002250063	1,53	165	108	60*40*30	8	C	
250*20	04611100000002500020	1,30	135	65	60*40*30	12	E	
250*25	04611100000002500025	1,38	135	64	60*40*30	12	E	
250*32	04611100000002500032	1,40	137	87	60*40*30	12	E	
250*40	04611100000002500040	1,45	136	60	60*40*30	12	E	
250*50	04611100000002500050	1,48	165	109	60*40*30	12	E	
250*63	04611100000002500063	1,53	165	108	60*40*30	12	E	
280*20	04611100000002800020	1,30	135	65	60*40*30	12	E	
280*25	04611100000002800025	1,35	135	64	60*40*30	12	E	
280*32	04611100000002800032	1,38	137	87	60*40*30	12	E	
280*40	04611100000002800040	1,40	136	60	60*40*30	12	E	
280*50	04611100000002800050	1,48	165	109	60*40*30	12	E	
280*63	04611100000002800063	1,53	165	108	60*40*30	12	E	
315*20	04611100000003150020	1,30	135	65	60*40*30	12	E	
315*25	04611100000003150025	1,35	135	64	60*40*30	12	E	
315*32	04611100000003150032	1,38	137	87	60*40*30	12	E	
315*40	04611100000003150040	1,40	136	60	60*40*30	12	E	
315*50	04611100000003150050	1,48	165	109	60*40*30	12	E	
315*63	04611100000003150063	1,53	165	108	60*40*30	12	E	
355*20	04611100000003550020	1,30	205	70	60*40*30	12	E	*
355*25	04611100000003550025	1,35	205	80	60*40*30	12	E	*
355*32	04611100000003550032	1,38	205	85	60*40*30	12	E	*
355*40	04611100000003550040	1,40	205	95	60*40*30	12	E	*
355*50	04611100000003550050	1,48	205	105	60*40*30	12	E	*
355*63	04611100000003550063	1,53	205	115	60*40*30	12	E	*

* Sadece SDR17 borularda delme işlemi yapılabilir. */ Only SDR17 pipe for drilling*

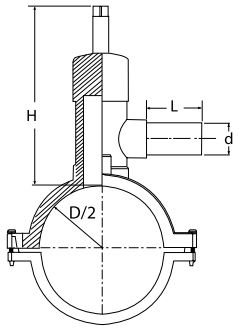
EF-METRİK

EF TAPPING TEE WITH BRASS OUTLET
EF SERVİS TE DİŞLİ ÇIKIŞLI
SDR11 PE100
WATER / SU : 16 BAR



D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	
90*20/25/32	04711101000000900020	2,15	210	117	60*40*30	10	
110*20/25/32	04711101000001100020	2,07	185	117	60*40*30	8	
125*20/25/32	04711101000001250020	2,11	185	117	60*40*30	8	
140*20/25/32	04711101000001400020	2,30	175	117	60*40*30	8	
160*20/25/32	04711101000001600020	2,32	177	117	60*40*30	8	
180*20/25/32	04711101000001800020	2,25	172	117	60*40*30	8	
200*20/25/32	04711101000002000020	2,26	172	117	60*40*30	8	
225*20/25/32	04711101000002250020	2,26	172	117	60*40*30	8	
250*20/25/32	04711101000002500020	2,00	172	117	60*40*30	10	
280*20/25/32	04711101000002800020	2,00	210	117	60*40*30	10	
315*20/25/32	04711101000003150020	2,00	210	117	60*40*30	10	
355* 20/25/32	04711101000003550020	2,00	210	117	60*40*30	10	*

* Sadece SDR17 borularda delme işlemi yapılabilir. */ Only SDR17 pipe for drilling*



EF VALVE TAPPING TEE (VS TYPE)
EF VANALI SERVİS TE (VS TİPİ)

SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR


TYPE A


TYPE B


TYPE C


TYPE E

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
63*20	04911100000000630020	0,85	160	50	40*30*30	10	A
63*25	04911100000000630025	0,85	160	50	40*30*30	10	A
63*32	04911100000000630032	0,87	160	75	30*40*30	10	A
63*40	04911100000000630040	0,88	160	75	40*30*30	10	A
63*50	04911100000000630050	2,25	270	93	30*40*30	6	B
63*63	04911100000000630063	2,35	270	93	30*40*30	6	B
75*20	04911100000000750020	0,95	160	58	30*40*30	10	A
75*25	04911100000000750025	0,95	160	58	30*40*30	10	A
75*32	04911100000000750032	1,00	160	58	30*40*30	10	A
75*40	04911100000000750040	1,01	160	58	30*40*30	10	A
75*50	04911100000000750050	2,27	270	93	30*40*30	6	B
75*63	04911100000000750063	2,28	270	93	30*40*30	6	B
90*20	04911100000000900020	1,84	215	40	60*40*30	10	A
90*25	04911100000000900025	1,70	215	50	60*40*30	10	A
90*32	04911100000000900032	1,74	215	75	60*40*30	10	A
90*40	04911100000000900040	1,75	215	82	60*40*30	10	A
90*50	04911100000000900050	2,68	250	85	60*40*30	8	C
90*63	04911100000000900063	2,69	250	85	60*40*30	8	C
110*20	04911100000001100020	1,80	215	40	60*40*30	8	A
110*25	04911100000001100025	1,85	215	57	60*40*30	8	A
110*32	04911100000001100032	1,90	215	71	60*40*30	8	A
110*40	04911100000001100040	1,95	215	72	60*40*30	8	A
110*50	04911100000001100050	2,70	250	75	60*40*30	8	A
110*63	04911100000001100063	2,73	250	75	60*40*30	8	A
125*20	04911100000001250020	2,01	215	71	60*40*30	8	A
125*25	04911100000001250025	2,02	215	72	60*40*30	8	A
125*32	04911100000001250032	2,05	215	71	60*40*30	8	A
125*40	04911100000001250040	2,09	215	72	60*40*30	8	A

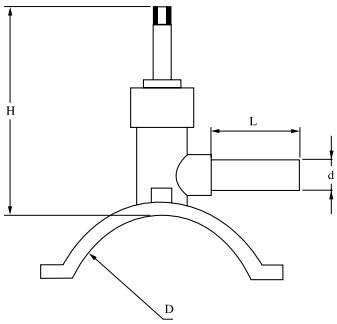
EF VALVE TAPPING TEE (VS TYPE) / EF VANALI SERVİS TE (VS TİPİ)

SDR 11 PE100 • *GAS* / GAZ : 10 BAR • *WATER* / SU : 16 BAR

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
125*50	04911100000001250050	2,70	250	77	60*40*30	8	C
125*63	04911100000001250063	2,73	250	65	60*40*30	8	C
140*20	04911100000001400020	2,10	215	71	60*40*30	8	C
140*25	04911100000001400025	2,11	215	72	60*40*30	8	C
140*32	04911100000001400032	2,12	215	71	60*40*30	10	C
140*40	04911100000001400040	2,13	215	72	60*40*30	10	C
140*50	04911100000001400050	2,88	250	75	60*40*30	6	C
140*63	04911100000001400063	2,90	250	75	60*40*30	6	C
160*20	04911100000001600020	2,15	215	40	60*40*30	8	C
160*25	04911100000001600025	2,16	215	50	60*40*30	8	C
160*32	04911100000001600032	2,17	215	67	60*40*30	8	C
160*40	04911100000001600040	2,18	215	67	60*40*30	8	C
160*50	04911100000001600050	2,92	250	75	60*40*30	6	C
160*63	04911100000001600063	2,94	250	75	60*40*30	6	C
180*20	04911100000001800020	2,19	215	40	60*40*30	8	C
180*25	04911100000001800025	2,20	215	50	60*40*30	8	C
180*32	04911100000001800032	2,21	215	74	60*40*30	8	C
180*40	04911100000001800040	2,22	215	74	60*40*30	8	C
180*50	04911100000001800050	2,92	250	74	60*40*30	8	C
180*63	04911100000001800063	2,94	250	74	60*40*30	8	C
200*20	04911100000002000020	2,23	215	40	60*40*30	8	C
200*25	04911100000002000025	2,24	215	50	60*40*30	8	C
200*32	04911100000002000032	2,25	215	75	60*40*30	8	C
200*40	04911100000002000040	2,26	215	75	60*40*30	8	C
200*50	04911100000002000050	2,85	250	75	60*40*30	8	C
200*63	04911100000002000063	2,86	250	75	60*40*30	8	C
225*20	04911100000002250020	2,23	215	40	60*40*30	8	C
225*25	04911100000002250025	2,24	215	50	60*40*30	8	C
225*32	04911100000002250032	2,25	215	75	60*40*30	8	C
225*40	04911100000002250040	2,26	215	75	60*40*30	8	C
225*50	04911100000002250050	2,85	250	75	60*40*30	8	C
225*63	04911100000002250063	2,87	250	75	60*40*30	8	C
250*20	04911100000002500020	2,48	255	40	60*40*30	8	E
250*25	04911100000002500025	2,49	255	50	60*40*30	8	E
250*32	04911100000002500032	2,50	255	75	60*40*30	8	E
250*40	04911100000002500040	2,51	255	75	60*40*30	8	E
250*50	04911100000002500050	2,54	255	75	60*40*30	8	E
250*63	04911100000002500063	2,55	255	75	60*40*30	8	E
280*20	04911100000002800020	2,48	255	40	60*40*30	8	E
280*25	04911100000002800025	2,49	255	50	60*40*30	8	E
280*32	04911100000002800032	2,50	255	75	60*40*30	8	E
280*40	04911100000002800040	2,51	255	75	60*40*30	8	E
280*50	04911100000002800050	2,54	255	75	60*40*30	8	E
280*63	04911100000002800063	2,55	255	75	60*40*30	8	E
315*20	04911100000003150020	2,48	263	40	60*40*30	8	E
315*25	04911100000003150025	2,48	263	50	60*40*30	8	E
315*32	04911100000003150032	2,46	263	75	60*40*30	8	E
315*40	04911100000003150040	2,54	263	75	60*40*30	8	E
315*50	04911100000003150050	2,56	263	75	60*40*30	8	E
315*63	04911100000003150063	2,60	263	75	60*40*30	8	E

EF VALVE TAPPING TEE (VA TYPE)
EF VANALI SERVİS TE (VA TİPİ)

SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



TYPE A

TYPE B

TYPE C

TYPE E

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
50*20	05011100000000500020	1,12	105	52	40*30*30	15	A
50*25	05011100000000500025	1,14	105	54	40*30*30	15	A
50*32	05011100000000500032	1,15	105	85	40*30*30	15	A
63*20	05011100000000630020	1,12	105	52	40*30*30	12	A
63*25	05011100000000630025	1,14	105	54	40*30*30	10	A
63*32	05011100000000630032	1,15	105	85	40*30*30	10	A
63*40	05011100000000630040	1,15	105	90	40*30*30	10	A
63*50	05011100000000630050	2,67	200	105	40*30*30	7	B
63*63	05011100000000630063	2,77	200	105	40*30*30	7	B
75*20	05011100000000750020	1,12	105	52	40*30*30	10	A
75*25	05011100000000750025	1,14	105	54	40*30*30	10	A
75*32	05011100000000750032	1,15	105	85	40*30*30	10	A
75*40	05011100000000750040	1,15	105	90	40*30*30	10	A
75*50	05011100000000750050	2,67	200	105	40*30*30	7	B
75*63	05011100000000750063	2,77	200	105	40*30*30	7	B
90*20	05011100000000900020	1,94	135	47	60*40*30	10	A
90*25	05011100000000900025	1,95	135	52	60*40*30	10	A
90*32	05011100000000900032	1,96	135	64	60*40*30	10	A
90*40	05011100000000900040	1,97	135	89	60*40*30	10	A
90*50	05011100000000900050	3,02	180	100	60*40*30	8	A
90*63	05011100000000900063	3,06	180	110	60*40*30	8	A
110*20	05011100000001100020	1,99	135	48	60*40*30	8	A
110*25	05011100000001100025	2,00	135	55	60*40*30	8	A
110*32	05011100000001100032	1,85	135	68	60*40*30	8	A
110*40	05011100000001100040	1,85	135	70	60*40*30	8	A
110*50	05011100000001100050	3,07	180	75	60*40*30	8	A

EF-METRIC

EF-METRİK

EF VALVE TAPPING TEE (VA TYPE)
EF VANALI SERVİS TE (VA TİPİ)

SDR 11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
110*63	05011100000001100063	3,07	180	75	60*40*30	8	A
125*20	05011100000001250020	1,99	135	48	60*40*30	8	A
125*25	05011100000001250025	2,00	135	55	60*40*30	8	A
125*32	05011100000001250032	2,03	135	68	60*40*30	8	A
125*40	05011100000001250040	2,04	135	70	60*40*30	8	A
125*50	05011100000001250050	3,07	180	75	60*40*30	8	A
125*63	05011100000001250063	3,07	180	75	60*40*30	8	A
140*20	05011100000001400020	2,28	135	51	60*40*30	8	C
140*25	05011100000001400025	2,25	135	48	60*40*30	8	C
140*32	05011100000001400032	2,24	135	83	60*40*30	8	C
140*40	05011100000001400040	2,27	135	89	60*40*30	8	C
140*50	05011100000001400050	3,31	180	103	60*40*30	8	C
140*63	05011100000001400063	3,39	180	110	60*40*30	8	C
160*20	05011100000001600020	1,74	135	65	60*40*30	8	C
160*25	05011100000001600025	1,75	135	64	60*40*30	8	C
160*32	05011100000001600032	1,76	137	87	60*40*30	8	C
160*40	05011100000001600040	1,77	136	60	60*40*30	8	C
160*50	05011100000001600050	2,87	165	109	60*40*30	6	C
160*63	05011100000001600063	2,87	165	108	60*40*30	6	C
180*20	05011100000001800020	1,74	135	65	60*40*30	8	C
180*25	05011100000001800025	1,75	135	64	60*40*30	8	C
180*32	05011100000001800032	1,76	137	87	60*40*30	8	C
180*40	05011100000001800040	1,77	136	60	60*40*30	8	C
180*50	05011100000001800050	2,87	165	109	60*40*30	6	C
180*63	05011100000001800063	2,87	165	108	60*40*30	6	C
200*20	05011100000002000020	1,74	135	65	60*40*30	8	C
200*25	05011100000002000025	1,75	135	64	60*40*30	8	C
200*32	05011100000002000032	1,76	137	87	60*40*30	8	C
200*40	05011100000002000040	1,77	136	60	60*40*30	8	C
200*50	05011100000002000050	2,87	165	109	60*40*30	6	C
200*63	05011100000002000063	2,87	165	108	60*40*30	6	C
225*20	05011100000002250020	1,74	135	65	60*40*30	8	C
225*25	05011100000002250025	1,97	135	64	60*40*30	8	C
225*32	05011100000002250032	2,02	137	87	60*40*30	8	C
225*40	05011100000002250040	2,01	136	60	60*40*30	8	C

EF VALVE TAPPING TEE (VA TYPE)
EF VANALI SERVİS TE (VA TİPİ)

SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

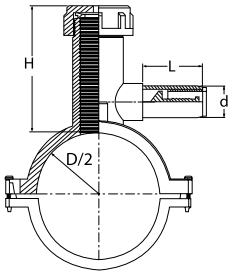
D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type	
225*50	05011100000002250050	2,82	165	109	60*40*30	6	C	
225*63	05011100000002250063	2,82	165	108	60*40*30	6	C	
250*20	05011100000002500020	2,26	135	65	60*40*30	10	E	
250*25	05011100000002500025	2,27	135	64	60*40*30	10	E	
250*32	05011100000002500032	2,28	137	87	60*40*30	10	E	
250*40	05011100000002500040	2,42	136	60	60*40*30	10	E	
250*50	05011100000002500050	2,73	165	109	60*40*30	10	E	
250*63	05011100000002500063	2,73	165	108	60*40*30	10	E	
280*20	05011100000002800020	2,26	135	65	60*40*30	10	E	
280*25	05011100000002800025	2,27	135	64	60*40*30	10	E	
280*32	05011100000002800032	2,47	137	87	60*40*30	10	E	
280*40	05011100000002800040	2,48	136	60	60*40*30	10	E	
280*50	05011100000002800050	2,73	165	109	60*40*30	8	E	
280*63	05011100000002800063	2,73	165	108	60*40*30	8	E	
315*20	05011100000003150020	2,26	135	65	60*40*30	10	E	
315*25	05011100000003150025	2,27	135	64	60*40*30	10	E	
315*32	05011100000003150032	2,29	137	87	60*40*30	10	E	
315*40	05011100000003150040	2,3	136	60	60*40*30	10	E	
315*50	05011100000003150050	2,73	165	109	60*40*30	8	E	
315*63	05011100000003150063	2,73	165	108	60*40*30	8	E	
355*20	05011100000003550020	2,80	205	70	60*40*30	10	E	*
355*25	05011100000003550025	2,80	205	80	60*40*30	10	E	*
355*32	05011100000003550032	2,78	205	85	60*40*30	10	E	*
355*40	05011100000003550040	2,86	205	95	60*40*30	10	E	*
355*50	05011100000003550050	2,88	205	105	60*40*30	8	E	*
355*63	05011100000003550063	2,92	205	115	60*40*30	8	E	*

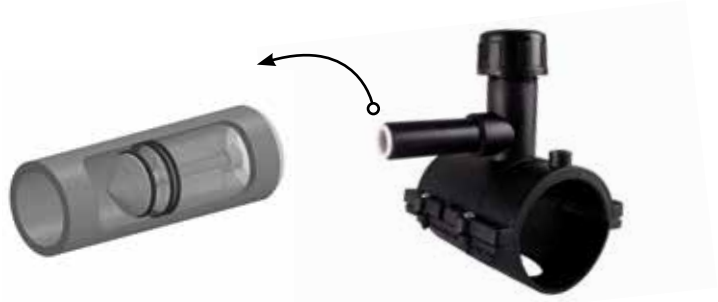
* Sadece SDR17 borularda delme işlemi yapılabilir. */ Only SDR17 pipe for drilling*

EF-METRİK

EF TAPPING TEE WITH GAS-STOP
EF SERVİS TE GAZSTOPLU
SDR11 PE100
GAS / GAZ : 1-5 BAR

OPERASYON BASINÇ ARALIĞI OPERATING PRESSURE RANGE 1-5 BAR		
	Ø20	Ø32
Vn	(SC) AT 1-5 BAR	(SC) AT 1-5 BAR
m3/h	25	100



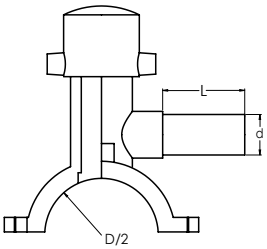


D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	
40*20	05511100000000400020	0,29	105	46	40*30*30	25	
40*32	05511100000000400032	0,32	105	50	40*30*30	25	
50*20	05511100000000500020	0,56	105	54	40*30*30	15	
50*32	05511100000000500032	0,60	105	88	40*30*30	15	
63*20	05511100000000630020	0,56	105	54	40*30*30	15	
63*32	05511100000000630032	0,60	105	88	40*30*30	15	
75*20	05511100000000750020	0,56	105	54	40*30*30	15	
75*32	05511100000000750032	0,60	105	88	40*30*30	15	
90*20	05511100000000900020	0,98	135	49	60*40*30	12	
90*32	05511100000000900032	1,01	135	67	60*40*30	12	
110*20	05511100000001100020	1,03	135	50	60*40*30	10	
110*32	05511100000001100032	1,08	135	71	60*40*30	10	
125*20	05511100000001250020	1,03	135	50	60*40*30	10	
125*32	05511100000001250032	1,08	135	71	60*40*30	10	
140*20	05511100000001400020	1,32	135	53	60*40*30	8	
140*32	05511100000001400032	1,29	135	86	60*40*30	8	
160*20	05511100000001600020	1,32	135	53	60*40*30	10	
160*32	05511100000001600032	1,29	135	86	60*40*30	10	
180*20	05511100000001800020	1,32	135	53	60*40*30	10	
180*32	05511100000001800032	1,21	135	86	60*40*30	10	
200*20	05511100000002000020	1,32	135	53	60*40*30	10	
200*32	05511100000002000032	1,21	135	86	60*40*30	10	
225*20	05511100000002250020	1,32	135	53	60*40*30	10	
225*32	05511100000002250032	1,21	135	86	60*40*30	10	
250*20	05511100000002500020	1,32	198	72	60*40*30	12	
250*32	05511100000002500032	1,31	198	88	60*40*30	12	
280*20	05511100000002800020	1,32	198	72	60*40*30	12	
280*32	05511100000002800032	1,31	198	88	60*40*30	12	
315*20	05511100000003150020	1,32	205	72	60*40*30	12	
315*32	05511100000003150032	1,31	205	88	60*40*30	12	
355*20	05511100000003550020	1,32	205	72	60*40*30	12	*
355*32	05511100000003550032	1,31	205	88	60*40*30	12	*

* Sadece SDR17 borularda delme işlemi yapılabilir. */ Only SDR17 pipe for drilling*

EF TAPPING TEE WITH EF END CAP
EF SERVİS TE EF KEPLİ

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



D*d	CODE	Kg.	L (mm)	box sizes	nos/box
63*20	11811100000000630020	0,41	52	40*30*30	10
63*25	11811100000000630025	0,42	54	40*30*30	10
63*32	11811100000000630032	0,43	85	40*30*30	10
63*40	11811100000000630040	0,44	90	40*30*30	8
63*50	11811100000000630050	1,30	105	40*30*30	5
63*63	11811100000000630063	1,31	105	40*30*30	5
75*20	11811100000000750020	0,45	52	40*30*30	10
75*25	11811100000000750025	0,46	54	40*30*30	10
75*32	11811100000000750032	0,47	85	40*30*30	10
75*40	11811100000000750040	0,48	90	40*30*30	8
75*50	11811100000000750050	1,30	105	40*30*30	5
75*63	11811100000000750063	1,31	105	40*30*30	5
90*20	11811100000000900020	0,85	52	60*40*30	10
90*25	11811100000000900025	0,86	54	60*40*30	10
90*32	11811100000000900032	0,87	85	60*40*30	10
90*40	11811100000000900040	0,88	90	60*40*30	10
90*50	11811100000000900050	1,79	100	60*40*30	8
90*63	11811100000000900063	1,80	110	60*40*30	8
110*20	11811100000001100020	0,86	52	60*40*45	8
110*25	11811100000001100025	0,87	54	60*40*45	8
110*32	11811100000001100032	0,88	85	60*40*45	8
110*40	11811100000001100040	0,89	90	60*40*45	8
110*50	11811100000001100050	1,70	100	60*40*30	6
110*63	11811100000001100063	1,80	110	60*40*30	6
125*20	11811100000001250020	0,86	52	60*40*45	8
125*25	11811100000001250025	0,87	54	60*40*45	8
125*32	11811100000001250032	0,88	85	60*40*45	8
125*40	11811100000001250040	0,89	90	60*40*45	8
125*50	11811100000001250050	1,70	100	60*40*30	6
125*63	11811100000001250063	1,80	110	60*40*30	6
140*20	11811100000001400020	1,80	52	60*40*45	8
140*25	11811100000001400025	1,90	54	60*40*45	8

EF-METRIC
EF-METRİK

EF TAPPING TEE WITH EF END CAP / EF SERVİS TE EF KEPLİ

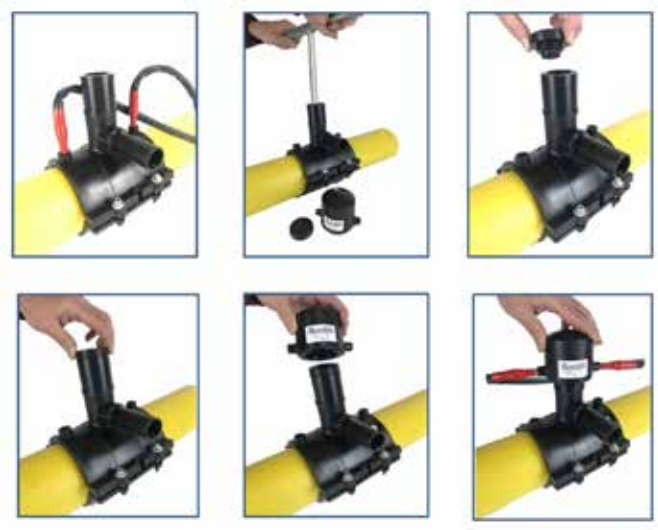
SDR11 PE100 • *GAS* / GAZ : 10 BAR • *WATER* / SU : 16 BAR

D*d	CODE	Kg.	L (mm)	box sizes	nos/box
140*32	11811100000001400032	1,91	85	60*40*45	8
140*40	11811100000001400040	1,92	90	60*40*45	8
140*50	11811100000001400050	1,93	103	60*40*30	6
140*63	11811100000001400063	1,94	110	60*40*30	6
160*20	11811100000001600020	1,80	52	60*40*45	8
160*25	11811100000001600025	1,90	54	60*40*45	8
160*32	11811100000001600032	1,91	85	60*40*45	8
160*40	11811100000001600040	1,92	90	60*40*45	8
160*50	11811100000001600050	1,93	109	60*40*30	6
160*63	11811100000001600063	1,94	108	60*40*30	6
180*20	11811100000001800020	1,80	52	60*40*45	8
180*25	11811100000001800025	1,90	54	60*40*45	8
180*32	11811100000001800032	1,91	85	60*40*45	8
180*40	11811100000001800040	1,92	90	60*40*45	8
180*50	11811100000001800050	1,93	109	60*40*30	6
180*63	11811100000001800063	1,94	108	60*40*30	6
200*20	11811100000002000020	1,80	52	60*40*45	8
200*25	11811100000002000025	1,90	54	60*40*45	8
200*32	11811100000002000032	1,91	85	60*40*45	8
200*40	11811100000002000040	1,92	90	60*40*45	8
200*50	11811100000002000050	1,93	109	60*40*30	6
200*63	11811100000002000063	1,94	108	60*40*30	6
225*20	11811100000002250020	1,83	52	60*40*45	8
225*25	11811100000002250025	1,84	54	60*40*45	8
225*32	11811100000002250032	1,85	85	60*40*45	8
225*40	11811100000002250040	1,86	90	60*40*45	8
225*50	11811100000002250050	1,87	109	60*40*30	6
225*63	11811100000002250063	1,88	108	60*40*30	6

Büyük çaplar isteğe bağlı olarak üretilmektedir. / *Bigger sizes are available upon resquest.*

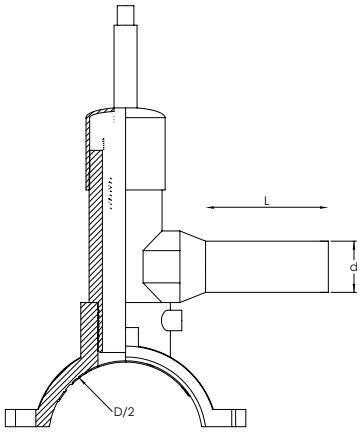
Servis te montaj adımları tamamlandıktan sonra sırasıyla aşağıdaki adımlar uygulanır:

After copletion of tapping tee installation steps, the following operations are applied respectivly:



360° ROTATING OUTLET TAPPING TEE
360° DÖNER BAŞLIKLI VANALI SERVİS TE

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
90*20	05411100000000900020	1,43	40	60*40*30	8
90*25	05411100000000900025	1,46	50	60*40*30	8
90*32	05411100000000900032	1,49	75	60*40*30	8
90*40	05411100000000900040	1,52	75	60*40*30	8
90*50	05411100000000900050	1,82	75	60*40*30	6
90*63	05411100000000900063	1,85	75	60*40*30	6
110*20	05411100000001100020	1,53	40	60*40*30	8
110*25	05411100000001100025	1,56	50	60*40*30	8
110*32	05411100000001100032	1,59	75	60*40*30	8
110*40	05411100000001100040	1,62	75	60*40*30	8
110*50	05411100000001100050	1,92	75	60*40*30	6
110*63	05411100000001100063	1,95	75	60*40*30	6
125*20	05411100000001250020	1,53	40	60*40*30	8
125*25	05411100000001250025	1,56	50	60*40*30	8
125*32	05411100000001250032	1,59	75	60*40*30	8
125*40	05411100000001250040	1,62	75	60*40*30	8
125*50	05411100000001250050	1,92	75	60*40*30	6
125*63	05411100000001250063	1,95	75	60*40*30	6
140*20	05411100000001400020	1,95	40	60*40*30	8
140*25	05411100000001400025	1,97	50	60*40*30	8
140*32	05411100000001400032	2,00	75	60*40*30	8
140*40	05411100000001400040	2,03	75	60*40*30	8
140*50	05411100000001400050	2,33	75	60*40*30	6
140*63	05411100000001400063	2,38	75	60*40*30	6
160*20	05411100000001600020	1,95	40	60*40*30	8
160*25	05411100000001600025	1,97	50	60*40*30	8
160*32	05411100000001600032	2,00	75	60*40*30	8
160*40	05411100000001600040	2,03	75	60*40*30	8
160*50	05411100000001600050	2,33	75	60*40*30	6

EF-METRIC

EF-METRİK

360° ROTATING OUTLET TAPPING TEE

360° DÖNER BAŞLIKLI VANALI SERVİS TE

SDR11 PE100

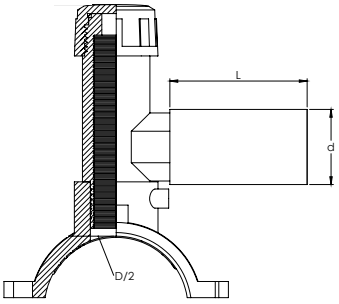
GAS / GAZ : 8 BAR

WATER / SU : 16 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
160*63	05411100000001600063	2,38	75	60*40*30	6
180*20	05411100000001800020	1,95	40	60*40*30	8
180*25	05411100000001800025	1,97	50	60*40*30	8
180*32	05411100000001800032	2,00	75	60*40*30	8
180*40	05411100000001800040	2,03	75	60*40*30	8
180*50	05411100000001800050	2,33	75	60*40*30	6
180*63	05411100000001800063	2,38	75	60*40*30	6
200*20	05411100000002000020	1,95	40	60*40*30	8
200*25	05411100000002000025	1,97	50	60*40*30	8
200*32	05411100000002000032	2,00	75	60*40*30	8
200*40	05411100000002000040	2,03	75	60*40*30	8
200*50	05411100000002000050	2,33	75	60*40*30	6
200*63	05411100000002000063	2,38	75	60*40*30	6
225*20	05411100000002250020	1,95	40	60*40*30	8
225*25	05411100000002250025	1,97	50	60*40*30	8
225*32	05411100000002250032	2,00	75	60*40*30	8
225*40	05411100000002250040	2,03	75	60*40*30	8
225*50	05411100000002250050	2,33	75	60*40*30	6
225*63	05411100000002250063	2,38	75	60*40*30	6

360° ROTATING OUTLET TAPPING TEE
360° DÖNER BAŞLIKLI SERVİS TE

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
90*20	05211100000000900020	0,76	70	60*40*30	8
90*25	05211100000000900025	0,78	80	60*40*30	8
90*32	05211100000000900032	0,80	85	60*40*30	8
90*40	05211100000000900040	0,84	95	60*40*30	8
90*50	05211100000000900050	0,86	105	60*40*30	6
90*63	05211100000000900063	0,88	115	60*40*30	6
110*20	05211100000001100020	0,86	70	60*40*30	8
110*25	05211100000001100025	0,88	80	60*40*30	8
110*32	05211100000001100032	0,90	85	60*40*30	8
110*40	05211100000001100040	0,94	95	60*40*30	8
110*50	05211100000001100050	0,96	105	60*40*30	6
110*63	05211100000001100063	0,98	115	60*40*30	6
125*20	05211100000001250020	0,86	70	60*40*30	8
125*25	05211100000001250025	0,88	80	60*40*30	8
125*32	05211100000001250032	0,90	85	60*40*30	8
125*40	05211100000001250040	0,94	95	60*40*30	8
125*50	05211100000001250050	0,96	105	60*40*30	6
125*63	05211100000001250063	0,98	115	60*40*30	6
140*20	05211100000001400020	0,91	70	60*40*30	8
140*25	05211100000001400025	0,93	80	60*40*30	8
140*32	05211100000001400032	0,95	85	60*40*30	8
140*40	05211100000001400040	0,99	95	60*40*30	8
140*50	05211100000001400050	1,01	105	60*40*30	6
140*63	05211100000001400063	1,03	115	60*40*30	6
160*20	05211100000001600020	0,91	70	60*40*30	8
160*25	05211100000001600025	0,93	80	60*40*30	8
160*32	05211100000001600032	0,95	85	60*40*30	8
160*40	05211100000001600040	0,99	95	60*40*30	8
160*50	05211100000001600050	1,01	105	60*40*30	6

EF-METRIC

EF-METRİK

360° ROTATING OUTLET TAPPING TEE

360° DÖNER BAŞLIKLI SERVİS TE

SDR11 PE100

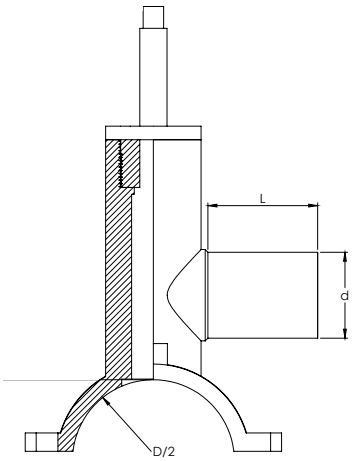
GAS / GAZ : 8 BAR

WATER / SU : 16 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
160*63	05211100000001600063	1,03	115	60*40*30	6
180*20	05211100000001800020	0,91	70	60*40*30	8
180*25	05211100000001800025	0,93	80	60*40*30	8
180*32	05211100000001800032	0,95	85	60*40*30	8
180*40	05211100000001800040	0,99	95	60*40*30	8
180*50	05211100000001800050	1,01	105	60*40*30	6
180*63	05211100000001800063	1,03	115	60*40*30	6
200*20	05211100000002000020	0,91	70	60*40*30	8
200*25	05211100000002000025	0,93	80	60*40*30	8
200*32	05211100000002000032	0,95	85	60*40*30	8
200*40	05211100000002000040	0,99	95	60*40*30	8
200*50	05211100000002000050	1,01	105	60*40*30	6
200*63	05211100000002000063	1,03	115	60*40*30	6
225*20	05211100000002250020	0,91	70	60*40*30	8
225*25	05211100000002250025	0,93	80	60*40*30	8
225*32	05211100000002250032	0,95	85	60*40*30	8
225*40	05211100000002250040	0,99	95	60*40*30	8
225*50	05211100000002250050	1,01	105	60*40*30	6
225*63	05211100000002250063	1,03	115	60*40*30	6

EF VALVE TAPPING TEE WITH INNER CAP
İÇ KAPAKLI VANALI SERVİS TE

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
63*20	05211100000000630020	0,75	52	30*40*30	10
63*25	05211100000000630025	0,75	54	30*40*30	10
63*32	05211100000000630032	0,80	85	30*40*30	10
63*40	05211100000000630040	0,80	90	30*40*30	10
75*20	05211100000000750020	0,80	52	30*40*30	10
75*25	05211100000000750025	0,80	54	30*40*30	10
75*32	05211100000000750032	0,85	85	30*40*30	10
75*40	05211100000000750040	0,85	90	30*40*30	10
90*20	05211100000000900020	0,90	52	60*40*30	8
90*25	05211100000000900025	0,90	54	60*40*30	8
90*32	05211100000000900032	0,95	85	60*40*30	8
90*40	05211100000000900040	0,95	90	60*40*30	8
110*20	05211100000001100020	1,05	52	60*40*30	8
110*25	05211100000001100025	1,05	54	60*40*30	8
110*32	05211100000001100032	1,10	85	60*40*30	8
110*40	05211100000001100040	1,10	90	60*40*30	8
125*20	05211100000001250020	1,05	52	60*40*30	8
125*25	05211100000001250025	1,05	54	60*40*30	8
125*32	05211100000001250032	1,10	85	60*40*30	8
125*40	05211100000001250040	1,10	90	60*40*30	8
140*20	05211100000001400020	1,10	52	60*40*30	8
140*25	05211100000001400025	1,10	54	60*40*30	8
140*32	05211100000001400032	1,15	85	60*40*30	8
140*40	05211100000001400040	1,15	90	60*40*30	8
160*20	05211100000001600020	1,10	52	60*40*30	8
160*25	05211100000001600025	1,10	54	60*40*30	8

EF-METRIC

EF-METRİK

EF VALVE TAPPING TEE WITH INNER CAP
İÇ KAPAKLI VANALI SERVİS TE

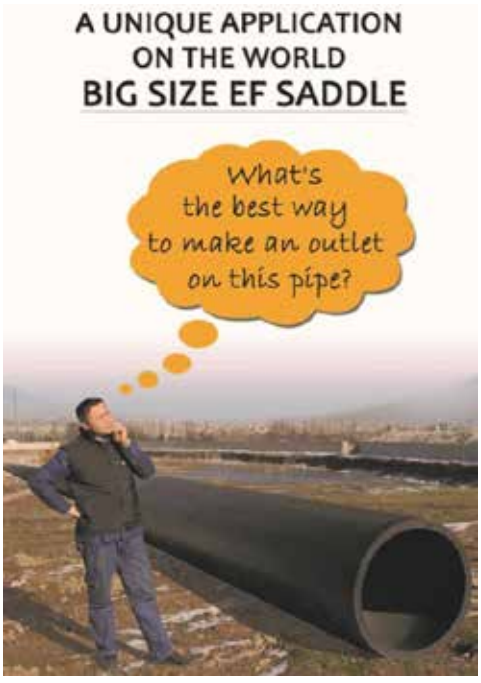
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
160*32	05211100000001600032	1,15	85	60*40*30	8
160*40	05211100000001600040	1,15	90	60*40*30	8
180*20	05211100000001800020	1,10	52	60*40*30	8
180*25	05211100000001800025	1,10	54	60*40*30	8
180*32	05211100000001800032	1,15	85	60*40*30	8
180*40	05211100000001800040	1,15	90	60*40*30	8
200*20	05211100000002000020	1,10	52	60*40*30	8
200*25	05211100000002000025	1,10	54	60*40*30	8
200*32	05211100000002000032	1,15	85	60*40*30	8
200*40	05211100000002000040	1,15	90	60*40*30	8
225*20	05211100000002250020	1,10	52	60*40*30	8
225*25	05211100000002250025	1,10	54	60*40*30	8
225*32	05211100000002250032	1,15	85	60*40*30	8
225*40	05211100000002250040	1,15	90	60*40*30	8

EF SADDLE / EF SEMER

SDR11 PE100
GAS / GAZ : 8 BAR
WATER / SU : 16 BAR

BÜYÜK ÇAP EF SEMER!
Boru hattından çıkış almanın en pratik yolu nedir?

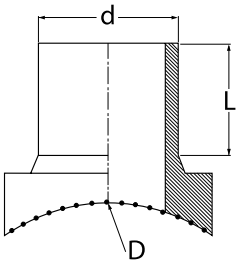


EF SADDLE / EF SEMER

SDR11 PE100

GAS / GAZ : 8 BAR

WATER / SU : 16 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
110*75	05711100000001100075	0,60	120	60*40*30	15
110*90	05711100000001100090	0,60	80	60*40*30	15
110*110	05711100000001100110	1,05	80	60*40*30	15
125*75	05711100000001250075	0,60	80	60*40*30	15
125*90	05711100000001250090	0,60	80	60*40*30	15
125*110	05711100000001250110	1,05	125	60*40*30	8
125*125	05711100000001250125	1,20	125	60*40*30	7
140*75	05711100000001400075	0,60	120	60*40*30	15
140*90	05711100000001400090	0,60	80	60*40*30	15
140*110	05711100000001400110	1,05	125	60*40*30	8
140*125	05711100000001400125	1,20	125	60*40*30	7
160*75	05711100000001600075	0,60	120	60*40*30	15
160*90	05711100000001600090	0,60	80	60*40*30	15
160*110	05711100000001600110	1,05	125	60*40*30	8
160*125	05711100000001600125	1,20	125	60*40*30	8
160*140	05711100000001600140	1,80	140	60*40*30	6
160*160	05711100000001600160	2,20	140	60*40*30	5
180*75	05711100000001800075	0,60	120	60*40*30	15
180*90	05711100000001800090	0,60	80	60*40*30	15
180*110	05711100000001800110	1,05	125	60*40*30	8
180*125	05711100000001800125	1,20	125	60*40*30	7
180*140	05711100000001800140	1,80	140	60*40*30	6
180*160	05711100000001800160	2,20	150	60*40*30	5
200*75	05711100000002000075	0,60	120	60*40*30	15
200*90	05711100000002000090	0,60	80	60*40*30	15
200*110	05711100000002000110	1,05	110	60*40*30	8
200*125	05711100000002000125	1,20	80	60*40*30	7
200*140	05711100000002000140	1,80	110	60*40*30	6
200*160	05711100000002000160	2,20	140	60*40*30	5
200*180	05711100000002000180	2,30	150	60*40*30	3
225*75	05711100000002250075	0,60	120	60*40*30	15
225*90	05711100000002250090	0,60	80	60*40*30	15
225*110	05711100000002250110	1,05	125	60*40*30	8
225*125	05711100000002250125	1,20	125	60*40*30	7
225*140	05711100000002250140	1,80	140	60*40*30	6
225*160	05711100000002250160	2,20	150	60*40*30	4
225*180	05711100000002250180	2,30	150	60*40*30	4
225*200	05711100000002250200	4,80	170	60*40*30	2

EF SADDLE / EF SEMER

SDR11 PE100• *GAS* / GAZ : 8 BAR • *WATER* / SU : 16 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
225*225	05711100000002250225	4,50	170	60*40*30	2
250*75	05711100000002500075	0,60	120	60*40*30	15
250*90	05711100000002500090	0,60	80	60*40*30	15
250*110	05711100000002500110	1,05	125	60*40*30	8
250*125	05711100000002500125	1,36	125	60*40*30	7
250*140	05711100000002500140	1,80	140	60*40*30	4
250*160	05711100000002500160	2,20	150	60*40*30	4
250*180	05711100000002500180	2,30	150	60*40*30	4
250*200	05711100000002500200	4,80	170	60*40*30	2
250*225	05711100000002500225	4,50	170	60*40*30	2
250*250	05711100000002500250	4,80	170	60*40*30	2
280*75	05711100000002800075	0,60	120	60*40*30	15
280*90	05711100000002800090	0,60	80	60*40*30	15
280*110	05711100000002800110	1,05	125	60*40*30	8
280*125	05711100000002800125	1,20	125	60*40*30	7
280*140	05711100000002800140	1,80	140	60*40*30	6
280*160	05711100000002800160	2,20	150	60*40*30	4
280*180	05711100000002800180	2,30	150	60*40*30	3
280*200	05711100000002800200	4,80	130	60*40*30	2
280*225	05711100000002800225	4,50	150	60*40*30	2
280*250	05711100000002800250	4,80	170	60*40*30	2
315*75	05711100000003150075	0,60	120	60*40*30	15
315*90	05711100000003150090	0,60	80	60*40*30	15
315*110	05711100000003150110	1,05	125	60*40*30	6
315*125	05711100000003150125	1,20	125	60*40*30	6
315*140	05711100000003150140	1,80	140	60*40*30	4
315*160	05711100000003150160	2,20	150	60*40*30	4
315*180	05711100000003150180	2,30	150	60*40*30	3
315*200	05711100000003150200	4,80	170	60*40*30	2
315*225	05711100000003150225	4,50	170	60*40*30	2
315*250	05711100000003150250	8,00	190	60*40*30	2
355*75	05711100000003550075	0,60	120	60*40*30	15
355*90	05711100000003550090	0,60	80	60*40*30	15
355*110	05711100000003550110	1,05	125	60*40*30	6
355*125	05711100000003550125	1,20	125	60*40*30	6
355*140	05711100000003550140	1,80	140	60*40*30	4
355*160	05711100000003550160	2,20	150	60*40*30	4
355*180	05711100000003550180	2,30	150	60*40*30	3
355*200	05711100000003550200	4,80	170	60*40*30	2
355*225	05711100000003550225	4,50	170	60*40*30	2
355*250	05711100000003550250	8,00	190	60*40*30	2
400*75	05711100000004000075	0,60	120	60*40*30	15
400*90	05711100000004000090	0,60	80	60*40*30	15
400*110	05711100000004000110	1,05	125	60*40*30	6
400*125	05711100000004000125	1,20	125	60*40*30	6
400*140	05711100000004000140	1,80	140	60*40*30	4
400*160	05711100000004000160	2,20	150	60*40*30	4
400*180	05711100000004000180	2,30	150	60*40*30	3
400*200	05711100000004000200	4,80	170	60*40*30	2
400*225	05711100000004000225	4,50	170	60*40*30	2
400*250	05711100000004000250	8,00	190	60*40*30	2
450*75	05711100000004500075	0,60	120	60*40*30	15
450*90	05711100000004500090	0,60	80	60*40*30	15

EF SADDLE / EF SEMER

SDR11 PE100• *GAS* / GAZ : 8 BAR • *WATER* / SU : 16 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
450*110	05711100000004500110	1,05	125	60*40*30	8
450*125	05711100000004500125	1,20	125	60*40*30	7
450*140	05711100000004500140	1,80	140	60*40*30	5
450*160	05711100000004500160	2,20	150	60*40*30	4
450*180	05711100000004500180	2,30	150	60*40*30	3
450*200	05711100000004500200	4,80	170	60*40*30	2
450*225	05711100000004500225	4,50	170	60*40*30	2
450*250	05711100000004500250	8,00	190	60*40*30	2
500*75	05711100000005000075	0,60	120	60*40*30	15
500*90	05711100000005000090	0,60	80	60*40*30	15
500*110	05711100000005000110	1,05	125	60*40*30	8
500*125	05711100000005000125	1,20	125	60*40*30	7
500*140	05711100000005000140	1,80	140	60*40*30	4
500*160	05711100000005000160	2,20	150	60*40*30	4
500*180	05711100000005000180	2,30	150	60*40*30	3
500*200	05711100000005000200	4,80	170	60*40*30	2
500*225	05711100000005000225	4,50	170	60*40*30	2
500*250	05711100000005000250	8,00	190	60*40*30	2
560*75	05711100000005600075	0,60	120	60*40*30	15
560*90	05711100000005600090	0,60	80	60*40*30	15
560*110	05711100000005600110	1,05	125	60*40*30	8
560*125	05711100000005600125	1,20	125	60*40*30	7
560*160	05711100000005600160	2,20	140	60*40*30	4
560*180	05711100000005600180	2,30	150	60*40*30	4
560*200	05711100000005600200	4,80	170	60*40*30	2
560*225	05711100000005600225	4,50	170	60*40*30	2
560*250	05711100000005600250	8,00	190	60*40*30	2
630*75	05711100000006300075	0,60	120	60*40*30	15
630*90	05711100000006300090	0,60	80	60*40*30	15
630*110	05711100000006300110	1,05	125	60*40*30	8
630*125	05711100000006300125	1,20	125	60*40*30	7
630*140	05711100000006300140	1,80	140	60*40*30	4
630*160	05711100000006300160	2,20	150	60*40*30	4
630*180	05711100000006300180	2,30	150	60*40*30	3
630*200	05711100000006300200	4,80	170	60*40*30	2
630*225	05711100000006300225	4,50	170	60*40*30	2
630*250	05711100000006300250	8,00	190	60*40*30	2
710*75	05711100000007100075	0,60	120	60*40*30	15
710*90	05711100000007100090	0,60	80	60*40*30	15
710*110	05711100000007100110	1,05	125	60*40*30	8
710*125	05711100000007100125	1,20	125	60*40*30	7
710*140	05711100000007100140	1,80	140	60*40*30	4
710*160	05711100000007100160	2,20	150	60*40*30	4
710*180	05711100000007100180	2,30	150	60*40*30	3
710*200	05711100000007100200	4,80	170	60*40*30	2
710*225	05711100000007100225	4,50	170	60*40*30	2
710*250	05711100000007100250	8,00	190	60*40*30	2
800*75	05711100000008000075	0,60	120	60*40*30	15
800*90	05711100000008000090	0,60	80	60*40*30	15
800*110	05711100000008000110	1,05	125	60*40*30	8
800*125	05711100000008000125	1,20	125	60*40*30	7
800*140	05711100000008000140	1,80	140	60*40*30	4
800*160	05711100000008000160	2,20	150	60*40*30	4

EF-METRIC
EF-METRİK

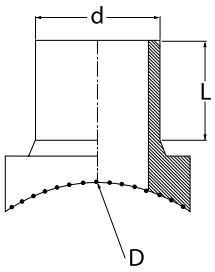
EF SADDLE / EF SEMER

SDR11 PE100• *GAS* / GAZ : 8 BAR • *WATER* / SU : 16 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
800*180	05711100000008000180	2,30	150	60*40*30	3
800*200	05711100000008000200	4,80	170	60*40*30	2
800*225	05711100000008000225	4,50	170	60*40*30	2
800*250	05711100000008000250	8,00	190	60*40*30	2
900*75	05711100000009000075	0,60	120	60*40*30	15
900*90	05711100000009000090	0,60	80	60*40*30	15
900*110	05711100000009000110	1,05	125	60*40*30	8
900*125	05711100000009000125	1,20	125	60*40*30	7
900*140	05711100000009000140	1,80	140	60*40*30	4
900*160	05711100000009000160	2,20	150	60*40*30	4
900*180	05711100000009000180	2,30	150	60*40*30	3
900*200	05711100000009000200	4,80	170	60*40*30	2
900*225	05711100000009000225	4,50	170	60*40*30	2
900*250	05711100000009000250	8,00	190	60*40*30	2
1000*75	05711100000000750075	0,60	120	60*40*30	15
1000*90	05711100000000900090	0,60	80	60*40*30	15
1000*110	05711100000001100110	1,05	125	60*40*30	8
1000*125	05711100000001250125	1,20	125	60*40*30	7
1000*140	05711100000001400140	1,80	140	60*40*30	4
1000*160	05711100000001600160	2,20	150	60*40*30	4
1000*180	05711100000001800180	2,30	150	60*40*30	3
1000*200	05711100000002000200	4,80	170	60*40*30	2
1000*225	05711100000002250225	4,50	170	60*40*30	2
1000*250	05711100000002500250	8,00	190	60*40*30	2
1200*75	05711100000012000075	0,60	120	60*40*30	15
1200*90	05711100000012000090	0,60	80	60*40*30	15
1200*110	05711100000012000110	1,05	125	60*40*30	6
1200*125	05711100000012000125	1,20	125	60*40*30	6
1200*140	05711100000012000140	1,80	140	60*40*30	4
1200*160	05711100000012000160	2,20	150	60*40*30	4
1200*180	05711100000012000180	2,30	150	60*40*30	3
1200*200	05711100000012000200	4,80	170	60*40*30	2
1200*225	05711100000012000225	4,50	170	60*40*30	2
1200*250	05711100000012000250	8,00	190	60*40*30	2
1400*75	05711100000014000075	0,60	120	60*40*30	15
1400*90	05711100000014000090	0,60	80	60*40*30	15
1400*110	05711100000014000110	1,05	125	60*40*30	8
1400*125	05711100000014000125	1,20	125	60*40*30	7
1400*140	05711100000014000140	1,80	140	60*40*30	4
1400*160	05711100000014000160	2,20	150	60*40*30	4
1400*180	05711100000014000180	2,30	150	60*40*30	3
1400*200	05711100000014000200	6,40	170	60*40*30	2
1400*225	05711100000014000225	4,80	170	60*40*30	2
1400*250	05711100000014000250	6,00	190	60*40*30	2
1600*75	05711100000016000075	0,60	120	60*40*30	15
1600*90	05711100000016000090	0,60	80	60*40*30	15
1600*110	05711100000016000110	1,05	125	60*40*30	8
1600*125	05711100000016000125	1,20	125	60*40*30	7
1600*140	05711100000016000140	1,80	140	60*40*30	4
1600*160	05711100000016000160	2,20	150	60*40*30	4
1600*180	05711100000016000180	2,30	150	60*40*30	3
1600*200	05711100000016000200	6,40	170	60*40*30	2
1600*225	05711100000016000225	4,80	170	60*40*30	2
1600*250	05711100000016000250	6,00	190	60*40*30	2

EF SADDLE / EF SEMER

SDR17 PE100
GAS / GAZ : 4 BAR
WATER / SU : 10 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
315*280	05711700000003150280	8,50	170	60*60*50	1
355*280	05711700000003550280	8,50	170	60*60*50	1
400*280	05711700000004000280	8,50	170	60*60*50	1
400*315	05711700000004000315	12,80	170	60*60*50	1
400*355	05711700000004000355	15,00	170	60*60*50	1
450*280	05711700000004500280	8,50	170	60*60*50	1
450*315	05711700000004500315	12,80	170	60*60*50	1
500*280	05711700000005000280	8,50	170	60*60*50	1
500*315	05711700000005000315	12,80	170	60*60*50	1
500*355	05711700000005000355	15,00	170	60*60*50	1
560*280	05711700000005600280	8,50	170	60*60*50	1
560*315	05711700000005600315	12,80	170	60*60*50	1
560*355	05711700000005600355	15,00	170	60*60*50	1
560*400	05711700000005600400	42,00	215	80*80*50	1
560*450	05711700000005600450	42,00	215	80*80*50	1
630*280	05711700000006300280	8,50	170	60*60*50	1
630*315	05711700000006300315	12,80	170	60*60*50	1
630*355	05711700000006300355	15,00	170	60*60*50	1
630*400	05711700000006300400	42,00	215	80*80*50	1
630*450	05711700000006300450	42,00	215	80*80*50	1
630*500	05711700000006300500	42,00	215	80*80*50	1
710*280	05711700000007100280	8,50	170	60*60*50	1
710*315	05711700000007100315	12,80	170	60*60*50	1
710*355	05711700000007100355	15,00	170	60*60*50	1
710*400	05711700000007100400	42,00	215	80*80*50	1
710*450	05711700000007100450	42,00	215	80*80*50	1
710*500	05711700000007100500	42,00	215	80*80*50	1
800*280	05711700000008000280	8,50	170	60*60*50	1
800*315	05711700000008000315	12,80	170	60*60*50	1
800*355	05711700000008000355	15,00	170	60*60*50	1
800*400	05711700000008000400	42,00	215	80*80*50	1
800*450	05711700000008000450	42,00	215	80*80*50	1

EF-METRIC

EF-METRİK

EF SADDLE / EF SEMER

SDR17 PE100

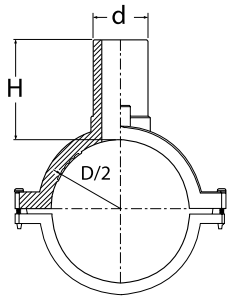
GAS / GAZ : 4 BAR

WATER / SU : 10 BAR

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
800*500	05711700000008000500	42,00	215	80*80*50	1
900*280	05711700000009000280	8,50	170	60*60*50	1
900*315	05711700000009000315	12,80	170	60*60*50	1
900*355	05711700000009000355	14,00	170	60*60*50	1
900*400	05711700000009000400	42,00	215	80*80*50	1
900*450	05711700000009000450	42,00	215	80*80*50	1
900*500	05711700000009000500	42,00	215	80*80*50	1
1000*280	05711700000010000280	8,50	170	60*60*50	1
1000*315	05711700000010000315	12,80	170	60*60*50	1
1000*355	05711700000010000355	14,00	170	60*60*50	1
1000*400	05711700000010000400	42,00	215	80*80*50	1
1000*450	05711700000010000450	42,00	215	80*80*50	1
1000*500	05711700000010000500	42,00	215	80*80*50	1
1200*280	05711700000012000280	8,50	170	60*60*50	1
1200*315	05711700000012000315	12,80	170	60*60*50	1
1200*355	05711700000012000355	14,00	170	60*60*50	1
1200*400	05711700000012000400	42,00	215	80*80*50	1
1200*450	05711700000012000450	42,00	215	80*80*50	1
1200*500	05711700000012000500	42,00	215	80*80*50	1
1400*280	05711700000014000280	8,50	170	60*60*50	1
1400*315	05711700000014000315	12,80	170	60*60*50	1
1400*355	05711700000014000355	14,00	170	60*60*50	1
1400*400	05711700000014000400	42,00	215	80*80*50	1
1400*450	05711700000014000450	42,00	215	80*80*50	1
1400*500	05711700000014000500	42,00	215	80*80*50	1
1600*280	05711700000016000280	8,50	170	60*60*50	1
1600*315	05711700000016000315	12,80	170	60*60*50	1
1600*355	05711700000016000355	14,00	170	60*60*50	1
1600*400	05711700000016000400	42,00	215	80*80*50	1
1600*450	05711700000016000450	42,00	215	80*80*50	1
1600*500	05711700000016000500	42,00	215	80*80*50	1

EF SADDLE / EF SEMER

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



TYPE A

TYPE B

TYPE C

D*d	CODE	Kg.	H (mm)	box sizes	nos/box	type
40*20	05711100000000400020	0,18	75	40*30*30	35	A
40*25	05711100000000400025	0,19	75	40*30*30	35	A
40*32	05711100000000400032	0,20	75	40*30*30	35	A
50*20	05711100000000500020	0,34	77	40*30*30	24	A
50*25	05711100000000500025	0,35	77	30*40*30	24	A
50*32	05711100000000500032	0,38	77	30*40*30	24	A
50*40	05711100000000500040	0,39	77	40*30*30	20	A
63*20	05711100000000630020	0,35	77	40*30*30	20	A
63*25	05711100000000630025	0,36	77	40*30*30	20	A
63*32	05711100000000630032	0,39	77	40*30*30	20	A
63*40	05711100000000630040	0,40	77	30*40*30	20	A
63*50	05711100000000630050	0,75	125	30*40*30	20	A
63*63	05711100000000630063	0,80	125	40*30*30	7	A
75*20	05711100000000750020	0,36	77	40*30*30	20	A
75*25	05711100000000750025	0,37	77	40*30*30	20	A
75*32	05711100000000750032	0,39	77	40*30*30	20	A
75*40	05711100000000750040	0,41	77	30*40*30	20	A
75*50	05711100000000750050	0,45	125	40*30*30	15	A
75*63	05711100000000750063	0,49	125	40*30*30	15	A
90*20	05711100000000900020	0,66	95	60*40*30	18	A
90*25	05711100000000900025	0,68	95	60*40*30	18	A
90*32	05711100000000900032	0,69	95	60*40*30	18	A
90*40	05711100000000900040	0,70	95	60*40*30	18	A
90*50	05711100000000900050	0,71	135	60*40*30	18	B
90*63	05711100000000900063	0,72	135	60*40*30	12	B

EF-METRIC

EF-METRİK

EF SADDLE / EF SEMER

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR

D*d	CODE	Kg.	H (mm)	box sizes	nos/box	type
110*20	05711100000001100020	0,73	95	60*40*30	15	A
110*25	05711100000001100025	0,74	95	60*40*30	15	A
110*32	05711100000001100032	0,75	95	60*40*30	15	A
110*40	05711100000001100040	0,76	95	60*40*30	15	A
110*50	05711100000001100050	0,77	110	60*40*30	15	A
110*63	05711100000001100063	0,78	110	60*40*30	12	A
125*20	05711100000001250020	0,75	95	60*40*30	12	A
125*25	05711100000001250025	0,75	95	60*40*30	12	A
125*32	05711100000001250032	0,76	95	60*40*30	12	A
125*40	05711100000001250040	0,78	95	60*40*30	12	A
125*50	05711100000001250050	0,79	110	60*40*30	12	A
125*63	05711100000001250063	0,80	110	60*40*30	12	A
140*20	05711100000001400020	0,92	95	60*40*30	10	B
140*25	05711100000001400025	0,93	95	60*40*30	10	B
140*32	05711100000001400032	0,93	95	60*40*30	10	B
140*40	05711100000001400040	0,94	95	60*40*30	10	B
140*50	05711100000001400050	0,95	110	60*40*30	10	B
140*63	05711100000001400063	0,96	110	60*40*30	10	B
160*20	05711100000001600020	0,93	95	60*40*30	12	B
160*25	05711100000001600025	0,94	95	60*40*30	12	B
160*32	05711100000001600032	0,95	95	60*40*30	15	B
160*40	05711100000001600040	0,96	95	60*40*30	12	B
160*50	05711100000001600050	0,99	110	60*40*30	12	B
160*63	05711100000001600063	1,00	110	60*40*30	12	B
180*20	05711100000001800020	0,93	95	60*40*30	12	B
180*25	05711100000001800025	0,95	95	60*40*30	12	B
180*32	05711100000001800032	0,96	95	60*40*30	12	B
180*40	05711100000001800040	0,97	95	60*40*30	12	B
180*50	05711100000001800050	1,00	110	60*40*30	12	B
180*63	05711100000001800063	1,01	110	60*40*30	12	B
200*20	05711100000002000020	0,89	95	60*40*30	12	B
200*25	05711100000002000025	0,90	95	60*40*30	12	B
200*32	05711100000002000032	0,91	95	60*40*30	15	B
200*40	05711100000002000040	0,92	95	60*40*30	12	B
200*50	05711100000002000050	0,93	110	60*40*30	12	B
200*63	05711100000002000063	0,94	110	60*40*30	12	B
225*20	05711100000002250020	0,90	95	60*40*30	12	B
225*25	05711100000002250025	0,91	95	60*40*30	12	B

EF SADDLE / EF SEMER

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

D*d	CODE	Kg.	H (mm)	box sizes	nos/box	type
225*32	05711100000002250032	0,92	95	60*40*30	12	B
225*40	05711100000002250040	0,93	95	60*40*30	12	B
225*50	05711100000002250050	0,94	110	60*40*30	12	B
225*63	05711100000002250063	0,95	110	60*40*30	12	B
250*20	05711100000002500020	0,54	100	60*40*30	20	C
250*25	05711100000002500025	0,50	100	60*40*30	20	C
250*32	05711100000002500032	0,51	130	60*40*30	20	C
250*40	05711100000002500040	0,52	110	60*40*30	20	C
250*50	05711100000002500050	0,58	130	60*40*30	20	C
250*63	05711100000002500063	0,58	125	60*40*30	20	C
280*20	05711100000002800020	0,49	100	60*40*30	20	C
280*25	05711100000002800025	0,50	100	60*40*30	20	C
280*32	05711100000002800032	0,51	130	60*40*30	20	C
280*40	05711100000002800040	0,52	110	60*40*30	20	C
280*50	05711100000002800050	0,58	130	60*40*30	20	C
280*63	05711100000002800063	0,58	125	60*40*30	20	C
315*20	05711100000003150020	0,51	110	60*40*30	20	C
315*25	05711100000003150025	0,47	110	60*40*30	20	C
315*32	05711100000003150032	0,48	140	60*40*30	20	C
315*40	05711100000003150040	0,49	115	60*40*30	20	C
315*50	05711100000003150050	0,55	140	60*40*30	20	C
315*63	05711100000003150063	0,55	130	60*40*30	20	C
355*20	05711100000003550020	0,46	110	60*40*30	20	C
355*25	05711100000003550025	0,47	110	60*40*30	20	C
355*32	05711100000003550032	0,48	140	60*40*30	20	C
355*40	05711100000003550040	0,49	115	60*40*30	20	C
355*50	05711100000003550050	0,55	140	60*40*30	20	C
355*63	05711100000003550063	0,55	130	60*40*30	20	C
400*20	05711100000004000020	0,48	110	60*40*30	20	C
400*25	05711100000004000025	0,44	110	60*40*30	20	C
400*32	05711100000004000032	0,45	140	60*40*30	20	C
400*40	05711100000004000040	0,46	115	60*40*30	20	C
400*50	05711100000004000050	0,52	140	60*40*30	20	C
400*63	05711100000004000063	0,52	130	60*40*30	20	C
450*20	05711100000004500020	0,43	110	60*40*30	20	C
450*25	05711100000004500025	0,44	110	60*40*30	20	C
450*32	05711100000004500032	0,45	140	60*40*30	20	C
450*40	05711100000004500040	0,46	115	60*40*30	20	C
450*50	05711100000004500050	0,52	140	60*40*30	20	C
450*63	05711100000004500063	0,52	130	60*40*30	20	C

EF-METRIC

EF-METRİK

INNOVATIVE PRODUCT

EF SADDLE - STOP SYSTEM
EF SEMER - STOP SİSTEM

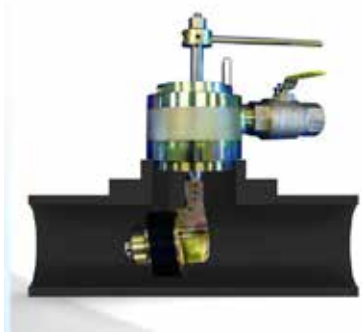
SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 10 BAR

TYPE A

TYPE B



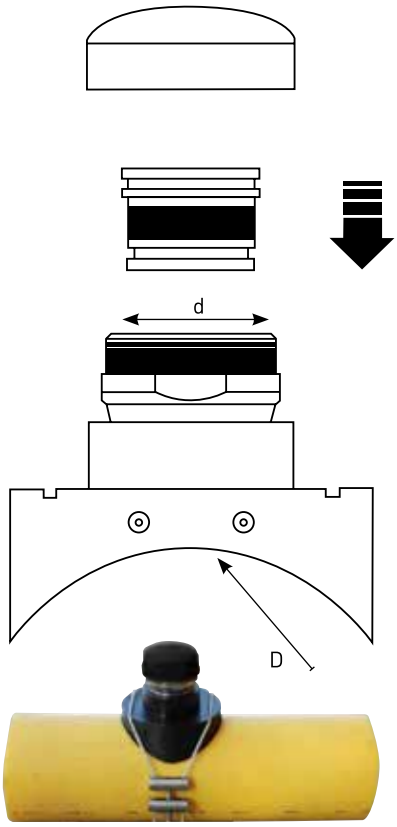
D (mm)	Code	Kg.	Type
63	05911100000000630000	1,44	A
90	05911100000000900000	2,73	A
110	05911100000001100000	3,72	A
125	05911100000001250000	4,45	A
160	05911100000001600000	17,73	B
180	05911100000001800000	19,00	B
200	05911100000002000000	25,00	B
225	05911100000002250000	29,00	B
250	05911100000002500000	36,00	B
280	05911100000002800000	50,00	B
315	05911100000003150000	58,00	B
400	05911100000004000000	65,00	B

* Bu ürün sadece Ravetti için üretilmekte ve satışı Ravetti SRL firması tarafından yapılmaktadır.

* *This product is produced for Ravetti and sell by only RavettiSRL.*

EF BALLOON SADDLE
EF BALON SEMER

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



d	CODE	D	Kg.
2 1/2"	06011101000000750073	75	2,25
2 1/2"	06011101000000900073	90	2,24
2 1/2"	06011101000001100073	110	2,22
2 1/2"	06011101000001250073	125	2,22
2 1/2"	06011101000001400073	140	2,22
2 1/2"	06011101000001600073	160	2,21
2 1/2"	06011101000001800073	180	2,21
2 1/2"	06011101000002000073	200	2,20
2 1/2"	06011101000002250073	225	2,20
2 1/2"	06011101000002500073	250	2,19
2 1/2"	06011101000002800073	280	2,19
2 1/2"	06011101000003180073	318	2,18
2 1/2"	06011101000003550073	355	2,18
2 1/2"	06011101000004000073	400	2,18

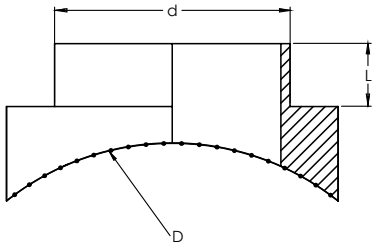
EF-METRİK

BIG SIZE SADDLE
EF SEMER BÜYÜK ÇIKIŞLI

SDR 26 PE100

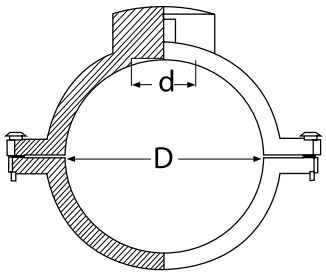
WATER/SU: PN6

(D) MAIN(mm)	(d) OUTLET(mm)
630	560
710	560
710	630
800	560
800	630
800	710
900	560
900	630
900	710
900	800
1000	560
1000	630
1000	710
1000	800
1000	900
1200	560
1200	630
1200	710
1200	800
1200	900
1200	1000
1400	560
1400	630
1400	710
1400	800
1400	900
1400	1000
1400	1200
1600	560
1600	630
1600	710
1600	800
1600	900
1600	1000
1600	1200
1600	1400
2000	1000
2000	1200
2000	1600



EF REPAIR SADDLE
EF TAMİR SEMERİ

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR




TYPE A


TYPE B


TYPE C

D	CODE	Kg.	d	box sizes	nos/box	Type
63	06311100000000630000	0,38	31	40*30*30	30	A
75	06311100000000750000	0,39	31	40*30*30	30	A
90	06311100000000900000	0,73	38	60*40*30	24	A
110	06311100000001100000	0,73	37	60*40*30	24	A
125	06311100000001250000	0,73	37	60*40*30	24	A
140	06311100000001400000	0,95	37	60*40*30	18	B
160	06311100000001600000	0,96	46	60*40*30	18	B
180	06311100000001800000	0,97	46	60*40*30	18	B
200	06311100000002000000	0,97	46	60*40*30	18	B
225	06311100000002250000	0,97	46	60*40*30	18	B
250	06311100000002500000	0,64	44	60*40*30	24	C
280	06311100000002800000	0,64	44	60*40*30	24	C
315	06311100000003150000	0,65	44	60*40*30	24	C
355	06311100000003550000	0,65	44	60*40*30	24	C
400	06311100000004000000	0,68	44	60*40*30	24	C
450	06311100000004500000	0,68	44	60*40*30	24	C
500	06311100000005000000	0,68	44	60*40*30	24	C
560	06311100000005600000	0,68	44	60*40*30	24	C
630	06311100000006300000	0,68	44	60*40*30	24	C
710	06311100000007100000	0,68	44	60*40*30	24	C
800	06311100000008000000	0,68	44	60*40*30	24	C
900	06311100000009000000	0,68	44	60*40*30	24	C

EF-METRIC

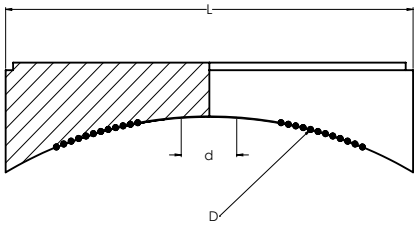
EF-METRİK

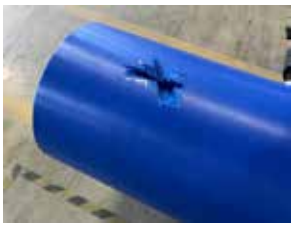
BIG SIZE EF REPAIR SADDLE
BÜYÜK ÇAP EF TAMİR SEMERİ

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR

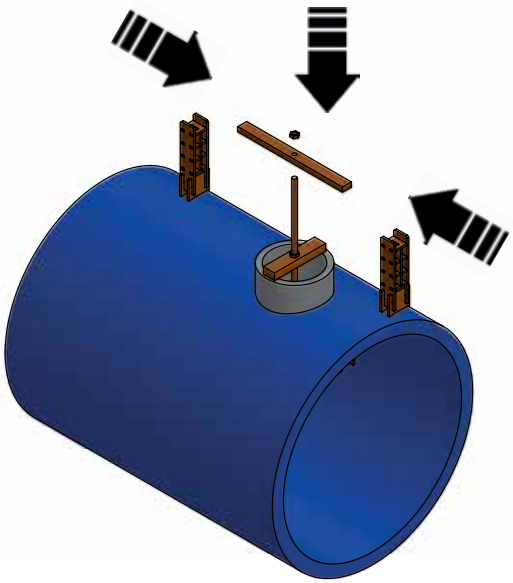




D	CODE	Kg.	d (max. Closing hole diameter)	L	box sizes	nos/box
110	06411100000001100000	0,60	80	150	60*40*30	24
125	06411100000001250000	0,60	80	180	60*40*30	18
140	06411100000001400000	0,60	120	200	60*40*30	12
160	06411100000001600000	0,60	120	200	60*40*30	12
180	06411100000001800000	0,60	150	255	60*40*30	6
200	06411100000002000000	1,80	150	255	60*40*30	6
225	06411100000002250000	1,80	190	305	60*40*30	4
250	06411100000002500000	1,80	190	305	60*40*30	4
280	06411100000002800000	6,40	230	360	60*40*30	4
315	06411100000003150000	6,00	230	360	60*40*30	4
355	06411100000003550000	5,60	230	360	60*40*30	4
400	06411100000004000000	5,70	230	360	60*40*30	4
450	06411100000004500000	5,90	230	360	60*40*30	4
500	06411100000005000000	5,70	230	360	60*40*30	4
560	06411100000005600000	5,50	230	360	60*40*30	4
630	06411100000006300000	6,90	230	360	60*40*30	4
710	06411100000007100000	7,30	230	360	60*40*30	4
800	06411100000008000000	7,40	230	360	60*40*30	4
900	06411100000009000000	7,60	230	360	60*40*30	4
1000	06411100000010000000	7,50	230	360	60*40*30	4
1200	06411100000012000000	7,40	230	360	60*40*30	4
1400	06411100000001400000	7,30	230	360	60*40*30	4
1600	06411100000001600000	7,30	230	360	60*40*30	4

EF INNER SADDLE
EF İÇ SEMER
PE100

- **Boru yüzeyi PE100'den farklı bir polimer yüzeye sahipse,**
  (If the pipe coats with any other polymer than PE100,)
- **Borunun dışı pürüzsüz bir yüzeye sahip değilse (Oluklu boru gibi),**
  (If the outer surface of the pipe has not a smooth surface (Corrugated pipes),)
- **Herhangibir nedenden dolayı borunun dış yüzeyi kaynak için uygun değilse,**
  (If the outside of the pipe is not suitable for welding because of some reason,)



EF-METRIC

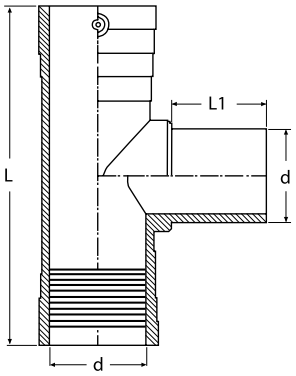
EF-METRİK

EF EQUAL TEE / EF EŞİT TE

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



TYPE A

TYPE B

TYPE C

d	CODE	Kg.	L(mm)	L1(mm)	box sizes	nos/box	Type
25	03111100000000250000	0,07	108	37	40*30*15	50	A
32	03111100000000320000	0,15	128	41	40*30*15	25	A
40	03111100000000400000	0,22	147	49	40*30*30	35	A
50	03111100000000500000	0,31	162	49	60*40*30	40	A
63	03111100000000630000	0,57	186	61	60*40*30	25	A
75	03111100000000750000	0,87	220	63	60*40*30	13	A
90	03111100000000900000	1,48	255	74	60*40*30	9	A
110	03111100000001100000	2,05	257	79	60*40*30	6	A
125	03111100000001250000	2,66	303	78	60*40*30	4	A
160	03111100000001600000	5,16	339	125	60*40*45	3	B
180	03111100000001800000	8,90	395	130	60*40*45	3	B
200	03111100000002000000	10,10	395	130	60*40*30	1	B
225	03111100000002250000	17,80	680	110	*	1	B
250	03111100000002500000	30,75	810	140	*	1	C
280	03111100000002800000	36,40	800	185	*	1	C
315	03111100000003150000	45,20	910	270	*	1	C

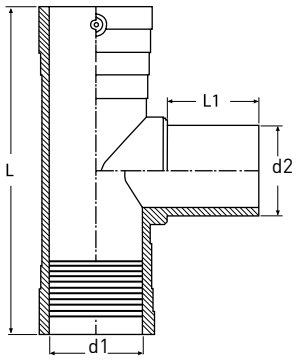
*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

EF REDUCED TEE / EF INEGAL TE

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

TYPE A

TYPE B



d1*d2	CODE	Kg.	L (mm)	L1 (mm)	box sizes	nos/box	Type
32*20	03311100000000320020	0,11	128	41	30*40*15	25	A
32*25	03311100000000320025	0,11	128	41	30*40*15	25	A
50*32	03311100000000500032	0,27	162	49	60*40*30	25	A
63*32	03311100000000630032	0,50	186	61	60*40*30	25	A
63*40	03311100000000630040	0,52	186	61	60*40*30	25	A
63*50	03311100000000630050	0,56	186	61	60*40*30	25	A
75*63	03311100000000750063	0,80	220	63	60*40*30	13	A
90*63	03311100000000900063	1,30	255	74	60*40*30	10	A
90*75	03311100000000900075	1,78	255	74	60*40*30	9	A
110*63	03311100000001100063	2,33	257	79	60*40*45	5	A
110*75	03311100000001100075	2,71	257	79	60*40*45	8	A
110*90	03311100000001100090	1,95	257	79	60*40*30	6	A
125*63	03311100000001250063	2,31	303	79	60*40*30	4	A
125*75	03311100000001250075	2,41	303	79	60*40*30	4	A
125*90	03311100000001250090	2,45	303	79	60*40*30	4	A
125*110	03311100000001250110	2,50	303	79	60*40*30	4	A
160*90	03311100000001600090	4,09	315	90	60*40*45	3	B
160*110	03311100000001600110	4,09	315	90	60*40*45	3	B
160*125	03311100000001600125	4,09	315	90	60*40*45	3	B
160*140	03311100000001600140	4,10	315	110	60*40*45	3	B
180*90	03311100000001800090	5,50	390	130	60*40*45	3	B
180*110	03311100000001800110	5,85	390	130	60*40*45	3	B
180*125	03311100000001800125	5,95	390	130	60*40*45	3	B
180*140	03311100000001800140	6,00	390	130	60*40*45	3	B
180*160	03311100000001800160	6,09	390	130	60*40*45	3	B
200*90	03311100000002000090	6,11	390	90	60*40*30	1	B
200*110	03311100000002000110	6,14	390	110	60*40*30	1	B
200*140	03311100000002000140	6,58	390	110	60*40*30	1	B
200*160	03311100000002000160	6,87	390	140	60*40*30	1	B
200*180	03311100000002000180	6,97	390	150	60*40*30	1	B

EF-METRIC

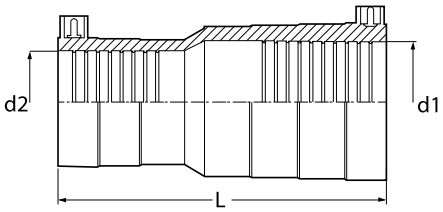
EF-METRİK

EF REDUCER / EF REDÜKSİYON

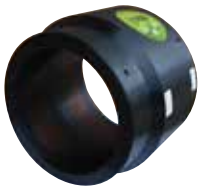
SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



TYPE A



TYPE B

d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box	Type
25*20	02911100000000250020	0,04	72	40*30*15	100	A
32*20	02911100000000320020	0,04	90	40*30*15	60	A
32*25	02911100000000320025	0,05	90	40*30*15	60	A
40*32	02911100000000400032	0,09	117	40*30*30	70	A
50*32	02911100000000500032	0,15	131	40*30*30	45	A
50*40	02911100000000500040	0,15	130	40*30*30	45	A
63*32	02911100000000630032	0,22	142	40*30*30	35	A
63*40	02911100000000630040	0,24	139	40*30*30	35	A
63*50	02911100000000630050	0,26	152	40*30*30	30	A
75*63	02911100000000750063	0,41	173	60*40*30	35	A
90*63	02911100000000900063	0,58	190	60*40*30	30	A
90*75	02911100000000900075	0,55	215	60*40*45	24	A
110*63	02911100000001100063	0,88	209	60*40*45	25	A
110*75	02911100000001100075	0,95	215	60*40*45	24	A
110*90	02911100000001100090	1,09	215	60*40*45	24	A
125*63	02911100000001250063	1,33	223	60*40*45	15	A
125*90	02911100000001250090	1,80	222	60*40*45	15	A
125*110	02911100000001250110	1,50	223	60*40*45	15	A
160*90	02911100000001600090	2,00	203	60*40*45	6	B
160*110	02911100000001600110	2,11	203	60*40*45	6	B
160*125	02911100000001600125	2,30	203	60*40*45	6	B
180*125	02911100000001800125	2,80	203	60*40*30	3	B
200*110	02911100000002000110	2,80	213	60*40*30	3	B
200*160	02911100000002000160	3,00	213	60*40*30	3	B
225*200	02911100000002250200	6,30	240	60*40*30	2	B
250*200	02911100000002500200	8,70	240	60*40*30	2	B
250*225	02911100000002500225	7,80	240	60*40*30	2	B
280*200	02911100000002800200	12,40	250	60*40*45	1	B
280*225	02911100000002800225	12,30	250	60*40*45	1	B
280*250	02911100000002800250	10,70	250	60*40*45	1	B
315*225	02911100000003150225	18,10	280	60*40*45	1	B

EF REDUCER / EF REDÜKSİYON

SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box	Type
315*250	02911100000003150250	15,80	280	60*40*45	1	B
315*280	02911100000003150280	13,90	280	60*40*45	1	B
355*250	02911100000003550250	18,40	280	60*40*45	1	B
355*280	02911100000003550280	19,60	280	60*40*45	1	B
355*315	02911100000003550315	23,10	280	*	*	B
400*280	02911100000004000280	27,50	300	*	*	B
400*315	02911100000004000315	27,10	310	*	*	B
400*355	02911100000004000355	31,30	320	*	*	B
450*315	02911100000004500315	37,50	340	*	*	B
450*355	02911100000004500355	36,40	340	*	*	B
450*400	02911100000004500400	45,20	340	*	*	B
500*355	02911100000005000355	48,10	350	*	*	B
500*400	02911100000005000400	68,70	380	*	*	B
500*450	02911100000005000450	64,40	400	*	*	B
560*450	02911100000005600450	74,00	420	*	*	B
560*500	02911100000005600500	75,00	430	*	*	B
630*560	02911100000006300560	102,60	440	*	*	B
710*630	02911100000007100630	152,00	470	*	*	B
800*630	02911100000008000630	171,90	470	*	*	B
800*710	02911100000008000710	170,00	480	*	*	B
900*710	02911100000009000710	232,40	500	*	*	B
900*800	02911100000009000800	270,00	500	*	*	B
1000*800	02911100000010000800	247,10	520	*	*	B
1000*900	02911100000010000900	288,70	520	*	*	B
1200*1000	02911100000012001000	271,90	520	*	*	B
1400*1200	02911100000014001200	301,80	520	*	*	B

*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

EF-METRIC

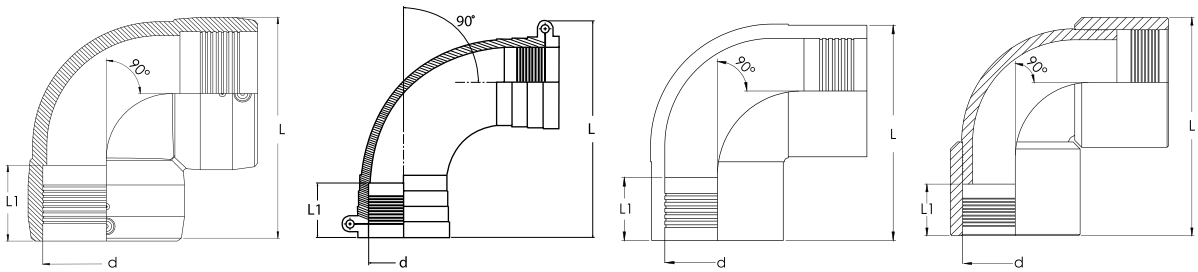
EF-METRİK

EF ELBOW 90° / EF DİRSEK 90°

SDR 11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



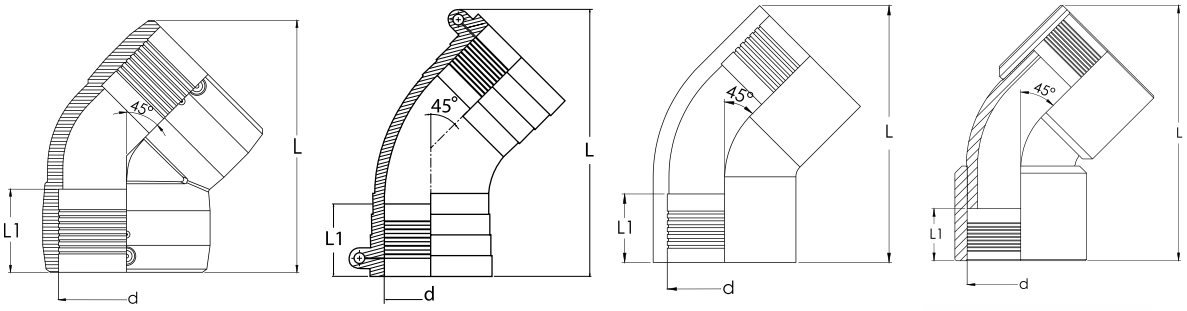
TYPE A TYPE B TYPE C TYPE D

d	CODE	Kg.	L(mm)	L1 (mm)	box sizes	nos/box	Type
20	02211100000000200000	0,08	98	38	30*40*15	60	B
25	02211100000000250000	0,05	98	38	30*40*15	70	A
32	02211100000000320000	0,09	109	41	30*40*30	60	B
40	02211100000000400000	0,18	131	47	30*40*30	35	B
50	02211100000000500000	0,27	155	51	30*40*30	20	B
63	02211100000000630000	0,50	189	48	60*40*30	40	A
75	02211100000000750000	0,74	211	65	60*40*30	15	B
90	02211100000000900000	1,16	242	70	60*40*30	16	A
110	02211100000001100000	1,29	274	76	60*40*45	10	A
125	02211100000001250000	2,86	297	82	60*40*30	6	A
140	02211100000001400000	3,00	300	95	60*40*30	3	C
160	02211100000001600000	3,63	293	98	60*40*30	2	C
180	02211100000001800000	6,50	335	110	60*40*45	2	C
200	02211100000002000000	9,30	400	120	60*40*30	1	C
225	02211100000002250000	18,32	460	110	60*60*33	1	C
250	02211100000002500000	23,00	450	130	*	1	C
315	02211100000003150000	35,00	540	115	*	1	D

*Karton kutu kullanılmaz. Sadece Euro paletler kullanılmaktadır. / *No carton box is used.Only Euro pallets are being used..*

EF ELBOW 45° / EF DİRSEK 45°

SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



TYPE A | TYPE B | TYPE C | TYPE D

d	CODE	Kg.	L(mm)	L1 (mm)	box sizes	nos/box	Type
25	02411100000000250000	0,06	106	38	40*30*15	80	B
32	02411100000000320000	0,05	116	41	40*30*30	80	B
40	02411100000000400000	0,13	139	47	40*30*30	55	B
50	02411100000000500000	0,23	166	51	40*30*30	32	B
63	02411100000000630000	0,40	197	58	40*30*30	25	A
75	02411100000000750000	0,58	216	66	60*40*30	20	B
90	02411100000000900000	0,94	242	72	60*40*30	20	A
110	02411100000001100000	1,01	268	76	60*40*30	12	A
125	02411100000001250000	2,59	302	82	60*40*30	6	A
140	02411100000001400000	2,80	302	75	60*40*30	3	C
160	02411100000001600000	3,00	300	70	60*40*30	2	C
180	02411100000001800000	4,90	325	80	60*40*30	1	C
200	02411100000002000000	8,50	325	80	60*40*30	1	C
225	02411100000002250000	14,13	570	110	60*60*33	1	C
250	02411100000002500000	21,00	650	110	*		C
315	02411100000003150000	34,20	750	115	*		D

*Karton kutu kullanılmaz. Sadece Euro paletler kullanılmaktadır. / *No carton box is used.Only Euro pallets are being used..*

EF-METRIC

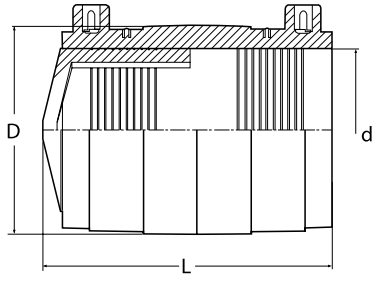
EF-METRİK

EF END CAP / EF KEP

SDR 11 PE100

GAS / GAZ : 10 BAR

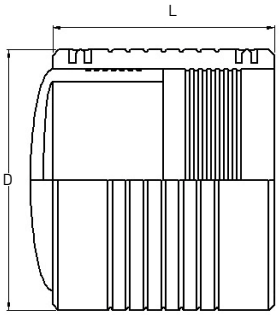
WATER / SU : 16 BAR



d	CODE	Kg.	D(mm)	L(mm)	box sizes	nos/box
20	03911100000000200000	0,05	33	68	30*40*15	100
25	03911100000000250000	0,07	41	82	30*40*15	80
32	03911100000000320000	0,09	48	89	30*40*30	60
40	03911100000000400000	0,12	55	97	30*40*30	50
50	03911100000000500000	0,19	67	110	30*40*30	40
63	03911100000000630000	0,30	80	134	30*40*30	30
75	03911100000000750000	0,49	97	145	30*40*30	24
90	03911100000000900000	0,78	115	163	60*40*30	24
110	03911100000001100000	1,29	142	198	60*40*30	20
125	03911100000001250000	1,39	159	185	60*40*45	16
140	03911100000001400000	2,03	180	192	60*40*45	12
160	03911100000001600000	2,72	204	210	60*40*45	12
180	03911100000001800000	3,71	232	221	60*40*45	8
200	03911100000002000000	4,38	247	224	60*40*45	6
225	03911100000002250000	6,00	277	270	60*40*30	2
250	03911100000002500000	8,20	310	290	60*40*45	2
280	03911100000002800000	10,05	345	300	60*40*45	2
315	03911100000003150000	19,10	390	290	60*40*45	2
355	03911100000003550000	22,00	440	300	*	*
400	03911100000004000000	29,36	495	350	*	*
450	03911100000004500000	36,51	554	370	*	*
500	03911100000005000000	51,66	615	415	*	*
560	03911100000005600000	73,36	690	460	*	*
630	03911100000006300000	92,90	775	480	*	*
710	03911100000007100000	130,70	880	505	*	*

*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

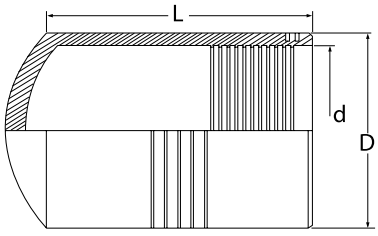
EF END CAP / EF KEP
SDR 17 PE100
GAS / GAZ : 6 BAR
WATER / SU : 10 BAR



d	CODE	Kg.	D(mm)	L(mm)	box sizes	nos/box
200	03911700000002000000	4,66	245	220	60*40*45	6
225	03911700000002250000	6,24	260	230	60*40*30	2
250	03911700000002500000	8,10	285	240	60*40*45	2
280	03911700000002800000	11,20	325	240	60*40*45	2
315	03911700000003150000	15,05	360	345	60*40*45	2
355	03911700000003550000	15,60	440	300	60*40*45	2
400	03911700000004000000	21,10	495	350	*	*
450	03911700000004500000	29,45	554	370	*	*
500	03911700000005000000	38,80	615	415	*	*
560	03911700000005600000	54,65	690	460	*	*
630	03911700000006300000	73,50	775	480	*	*
710	03911700000007100000	101,50	880	505	*	*

*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

EF END CAP / EF KEP
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



Tek parça enjeksiyon baskı
One piece injected

d	CODE	Kg.	D(mm)	L(mm)	box sizes	nos/box
110	03911100000001100000	1,39	140	97	60*40*30	16
160	03911100000001600000	2,89	200	115	60*40*30	12
200	03911100000002000000	4,85	250	140	60*40*30	4
250	03911100000002500000	6,10	315	170	60*40*30	2
315	03911100000003150000	10,80	400	220	*	*
400	03911100000004000000	16,90	500	230	*	*
500	03911100000005000000	32,50	630	280	*	*
560	03911100000005600000	42,70	710	270	*	*

*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No carton box is used. Only Euro pallets are being used.*

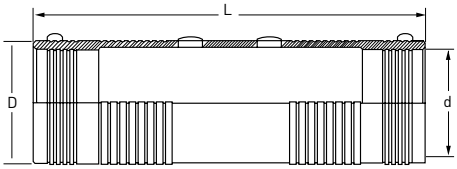
EF-METRIC

EF-METRİK

EF COUPLER FOR PRE-INSULATED / DOUBLE CONTAINMENT PE PIPING SYSTEM

İZOLASYONLU / ÇİFT CİDARLI BORULAR İÇİN EF MANŞON

PE100



d	CODE	Kg.	D (mm)	L(mm)
90	00511100000000900000	1,09	100	560
110	00511100000001100000	1,41	123	560
125	00511100000001250000	1,74	138	560
140	00511100000001400000	2,27	153	560
160	00511100000001600000	2,87	173	560
180	00511100000001800000	3,57	197	560
200	00511100000002000000	4,52	220	560
225	00511100000002250000	5,54	244	560
250	00511100000002500000	6,95	273	560
280	00511100000002800000	8,80	300	560
315	00511100000003150000	11,19	345	560
355	00511100000003550000	14,11	390	560
400	00511100000004000000	17,94	435	560
450	00511100000004500000	22,13	490	560
500	00511100000005000000	27,72	545	560
560	00511100000005600000	35,13	610	560
630	00511100000006300000	44,55	685	560
710	00511100000007100000	56,45	770	560

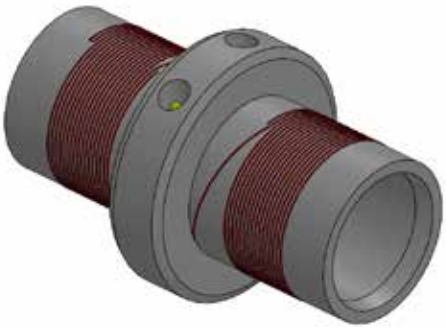
EF FLEXIBLE PATCH FOR SLEEVE COUPLERS

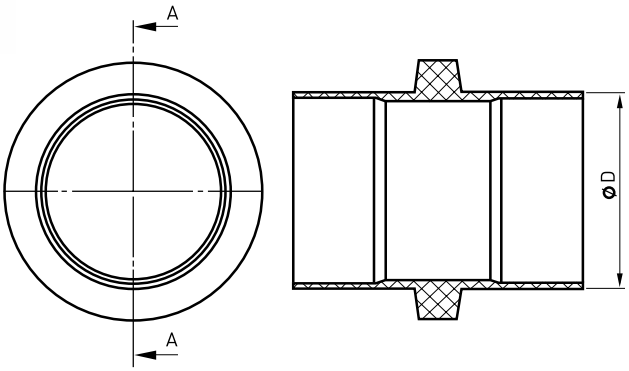
SLEEVE MANŞONLAR İÇİN EF KEP

Main Pipe size/ Boru çapı	CODE	d
90-630	1825002	152

d: diameter of hole (delik çapı)

TWIN INNER COUPLER
İKİZ İÇ MANŞON
PE100





-Talebe bağlı olarak D32-D1600 aralığında üretilmektedir.

-Available on resquest all the size from D32 to D1600.

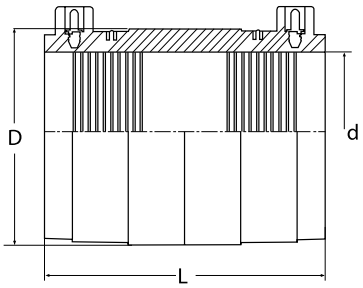
EF-METRIC

EF-METRİK

PP EF COUPLER /PP EF MANŞON

SDR 26

WATER / SU : 6 BAR



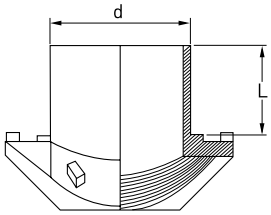
d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box
110	00172600200001100000	0,33	128	110	60*40*30	24
160	00172600200001600000	0,80	175	160	60*40*45	12
200	00172600200002000000	1,16	220	165	60*40*45	8
250	00172600200002500000	1,68	275	165	60*40*30	4
315	00172600200003150000	2,63	345	165	60*40*45	3
400	00172600200004000000	5,80	440	225	60*60*33	1
500	00172600200005000000	9,40	555	225	*	*
630	00172600200006300000	19,70	690	330	*	*
710	00172600200007100000	26,00	780	330	*	*
800	00172600200008000000	33,00	880	330	*	*

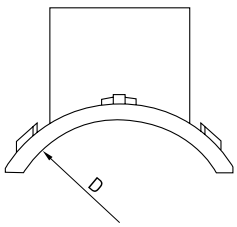
*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. */ No carton box is used. Only Euro pallets are being used.*

PP EF SADDLE/ PP EF SEMER

SDR 26

WATER / SU : 6 BAR

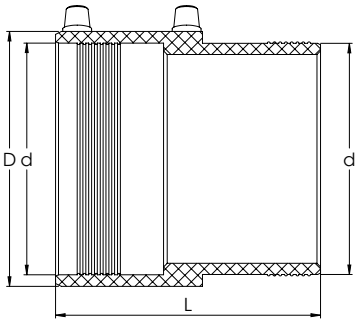




D/d	CODE	Kg.	L(mm)	box sizes	nos/box
200/160	06172600200002000000	1,28	150	30x30x30	1
250/160	06172600200002500000	1,45	150	30x30x30	1
280/160	06172600200002800000	1,46	150	30x30x30	1
315/160	06172600200003150000	1,48	150	30x30x30	1
400/160	06172600200004000000	1,53	150	30x30x30	1
500/160	06172600200005000000	1,60	150	30x30x30	1

PP EF WELDING ADAPTOR (Male-Female)
PP EF KAYNAK ADAPTÖRÜ

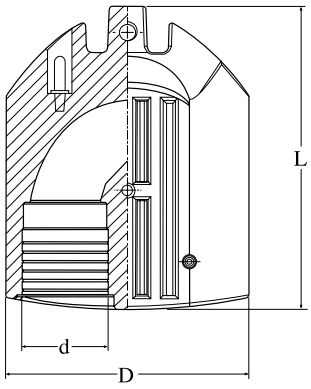
SDR26
WATER / SU : 6 BAR



d	CODE	D (mm)	L (mm)	box sizes	nos/box
110	12172600200001100000	128	147	60*45*40	12
160	12172600200001600000	177	184	60*45*40	12
200	12172600200002000000	222	197	60*45*40	8

U COUPLER / U MANŞON

SDR11 PE100
WATER / SU : 16 BAR

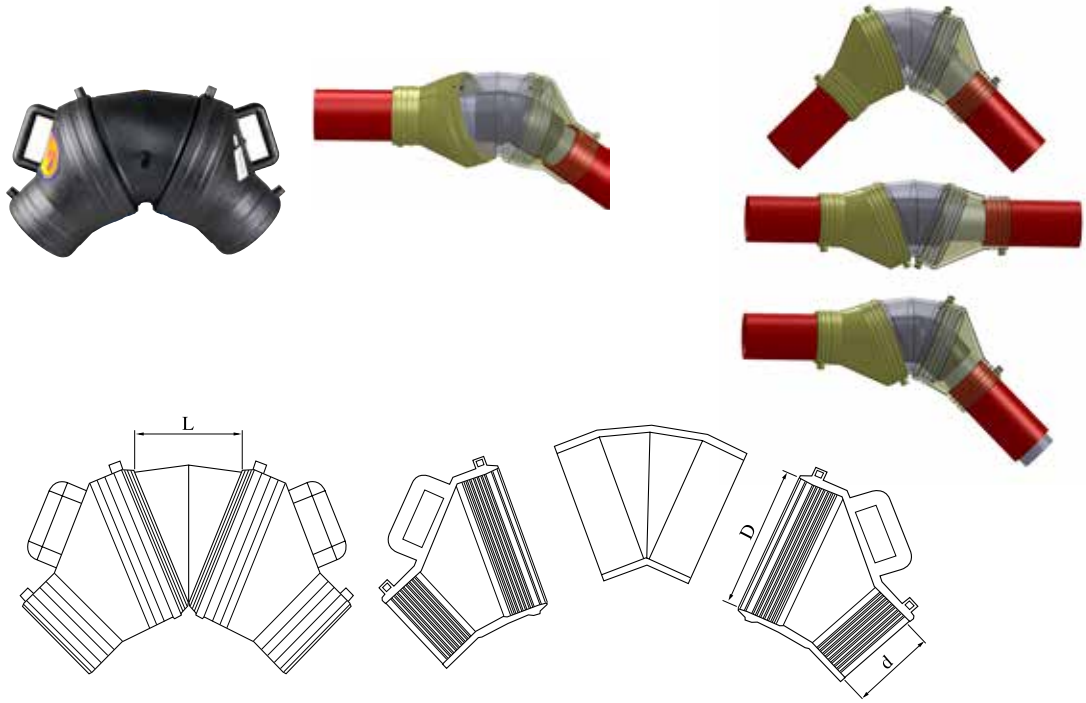


d	CODE	D (mm)	L (mm)	box sizes	nos/box
32	01111100000000320000	90	110	30*40*15	25

EF-METRIC

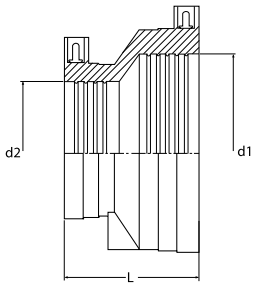
EF-METRİK

EF DUAL CONTAINMENT FLEX
ELBOW TEGA-HALOCK
SDR 26 PE100



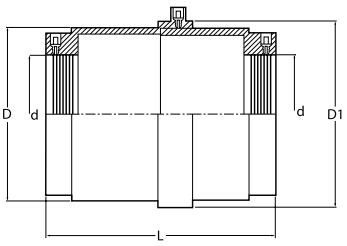
For dual containment pipe	CODE	d	D	L	kg	box sizes	nos/box
110/90	02612600000001100090	110,7	185,1	178	2,81	60*40*30	2

EF REDUCER (SHORT) FOR DUAL CONTAINMENT PIPES
EF REDÜKSİYON (KISA) ÇİFT CİDARLI BORULAR İÇİN



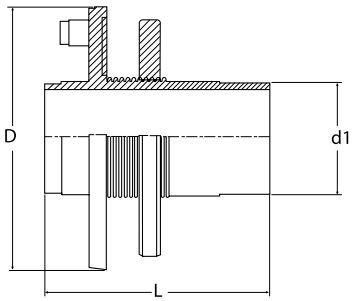
d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
75*63	02911100000000750063	0,19	70	40*30*30	48
110*75	02911100000001100075	0,39	90	60*40*30	35

DUAL CONTAINMENT COUPLER
ÇİFT CİDARLI BORU MANŞONU
TYPE / TİP: EF



d	Code	Description	Kg.	D(mm)	D1(mm)	L(mm)	box sizes	nos/box
110	00711100000001100090	For 110x90 dual containment pipe	1,45	160	180	225	60*40*30	6

EF TANK PENETRATION SADDLE
TANK ÇIKIŞ UCU
TYPE / TİP : EF



d1	CODE	Kg.	D(mm)	L (mm)	box sizes	nos/box
63	09711100000000630000	0,61	163	153	60*40*30	15
75	09711100000000750000	0,66	174	153	60*40*30	15
110	09711100000001100000	0,79	210	153	60*40*30	12

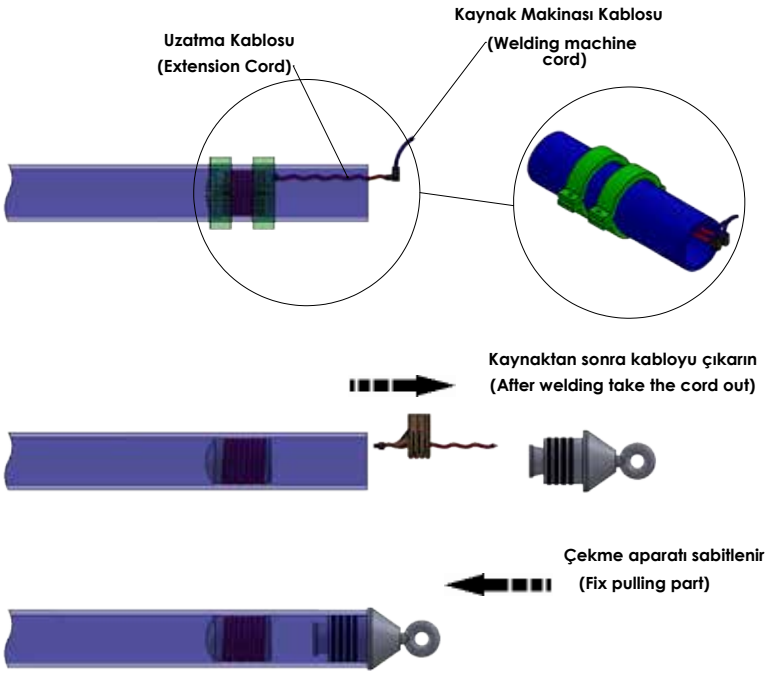
EF-METRIC

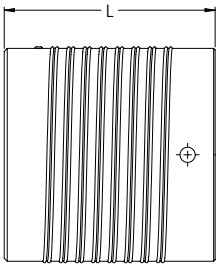
EF-METRİK

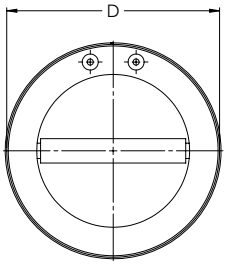
EF INNER CAP FOR HORIZANTAL DRILLING

YATAY DELME İÇİN EF İÇ KEP

PE 100

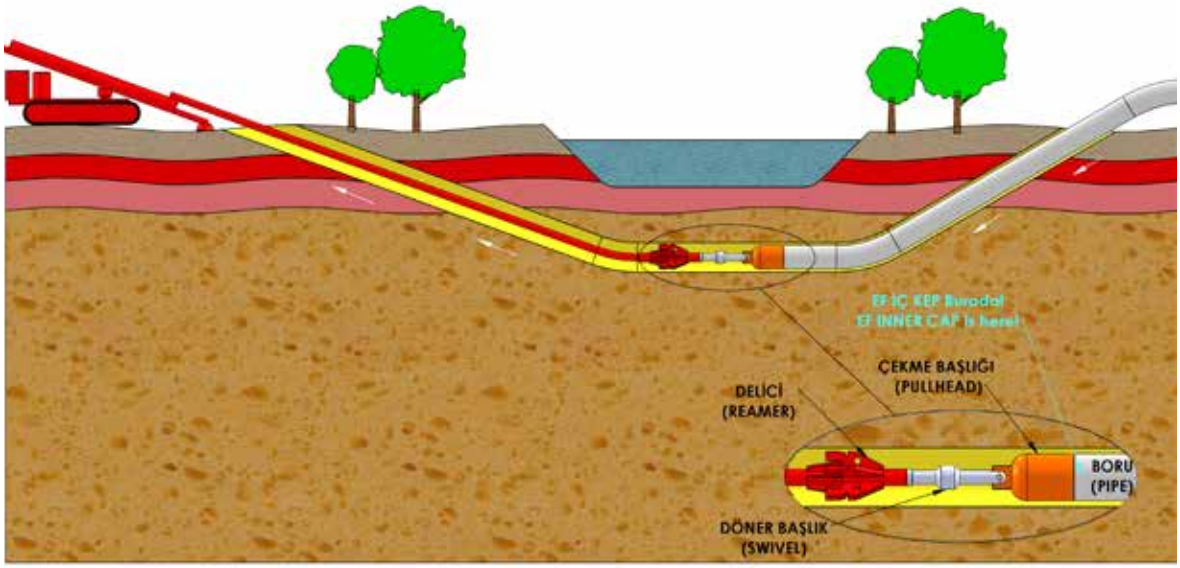




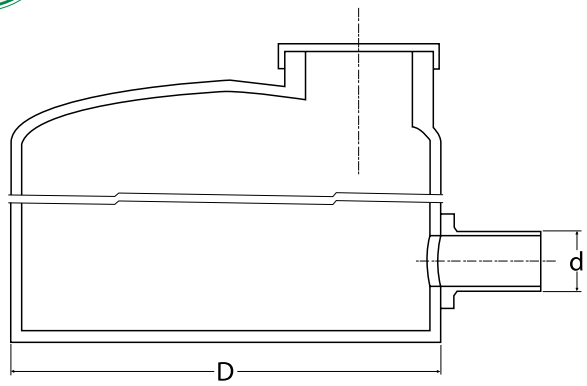


Yatay delme operasyonu esnasında, PE boru çamur ile dolabilir. Borunun içinin temizlenmesi hem zor hem de maliyeti yüksek bir çalışmadır. TEGA EF İç Kep bu soruna inovatif bir çözüm olarak üretilmiştir. Delme işleminden önce EF İç Kep boruya kaynatılır. Boruyu yüzeye çıkardıktan sonra EF İç Kep kesilir.

-During HD Operation, PE pipe may be filled with mud. Cleaning inside of the pipe is a difficult and expensive work. TEGA EF Inner Cap is an INNOVATIVE solution to prevent it. Before pushing the PE pipet to the ground, EF Inner Cap weld to the pipe. After taking PE pipe end to the ground level, EF Inner Cap must be cut.



TANK OUTLET FOR PE AND PE-X TANKS
PE VE PE-X TANKLAR İÇİN ÇIKIŞ

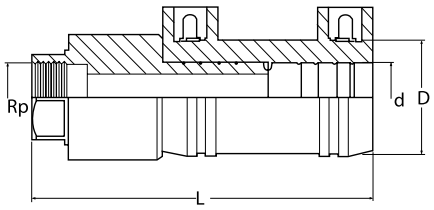


D (mm)	d (mm)
160-5000	32, 40, 50, 63, 75, 90, 110, 125, 140, 160, 180, 200, 225, 280, 315, 355, 400, 450, 500, 560, 630, 710, 800, 900, 1000, 1200

EF-METRIC

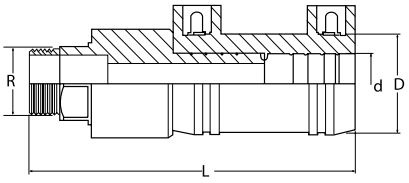
EF-METRİK

PE-BRASS TRANSITION COUPLER (FEMALE)
PE-PİRİNÇ GEÇİŞ MANŞONU (DİŞİ)
TYPE / TİP: EF



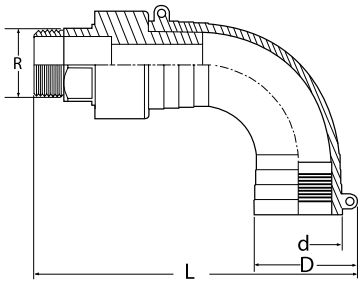
d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	04311101000000200021	0,12	108	33	40*30*15	75
25-3/4"	04311101000000250026	0,17	114	41	40*30*15	50
32 - 1"	04311101000000320033	0,26	130	48	40*30*30	60
40 - 1 1/4"	04311101000000400042	0,32	140	55	40*30*30	40
50 - 1 1/2"	04311101000000500048	0,47	140	55	40*30*30	30
63 - 2"	04311101000000630060	0,77	172	80	40*30*30	18
75 - 2 1/2"	04311101000000750073	1,15	181	94	40*30*30	10

PE-BRASS TRANSITION COUPLER (MALE)
PE-PİRİNÇ GEÇİŞ MANŞONU (ERKEK)
TYPE / TİP: EF



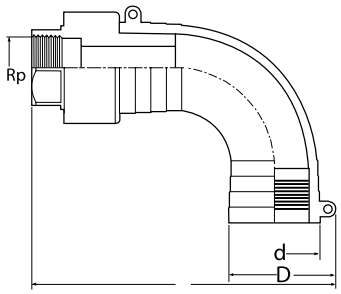
d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	02711102000000200021	0,14	122	33	40*30*15	75
20-3/4"	02711102000000200026	0,14	122	33	40*30*15	75
25-3/4"	02711102000000250026	0,19	128	41	40*30*15	50
32 - 3/4"	02711102000000320026	0,32	150	48	40*30*30	60
32 - 1/2"	02711102000000320021	0,32	150	48	40*30*30	60
32 - 1"	02711102000000320033	0,32	150	48	40*30*30	60
32 -1 1/4"	02711102000000320042	0,32	150	48	40*30*30	60
40 - 1 1/4"	02711102000000400042	0,44	160	55	40*30*30	40
50 - 1 1/2"	02711102000000500048	0,56	175	67	40*30*30	30
63 - 2"	02711102000000630060	0,75	200	80	40*30*30	18
75 - 2 1/2"	02711102000000750073	1,25	206	94	40*30*30	16
90 - 3"	02711102000000900088	1,85	225	115	60*40*30	15
110 - 4"	04311102000001100114	2,82	244	132	60*40*30	15

PE-BRASS TRANSITION ELBOW (90°) (MALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (90°) (ERKEK)
TYPE / TİP: EF



d-R	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	02711102000000200021	0,18	155	36	40*30*30	60
20-3/4"	02711102000000200026	0,18	155	36	40*30*30	60
25-3/4"	02711102000000250026	0,18	155	37	40*30*30	60
32 - 1"	02711102000000320033	0,32	180	44	40*30*30	40
32 - 3/4"	02711102000000320026	0,32	180	44	40*30*30	40
32 - 1/2"	02711102000000320021	0,32	180	44	40*30*30	40
40 - 1 1/4"	02711102000000400042	0,53	200	54	40*30*30	24
50 - 1 1/2"	02711102000000500048	0,70	230	67	40*30*30	20
63 - 2"	02711102000000630060	1,07	270	84	40*30*30	10
75 - 2 1/2"	02711102000000750073	1,70	304	100	40*30*30	6
90 - 3"	02711102000000900088	2,31	295	120	60*40*45	8
110 - 4"	04311102000001100114	3,42	307	138	60*40*45	8

PE-BRASS TRANSITION ELBOW (90°) (FEMALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (90°) (DİŞİ)
TYPE / TİP: EF

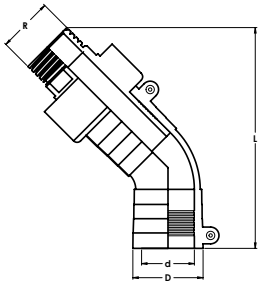


d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	02711101000000200021	0,16	135	36	40*30*30	60
25-3/4"	02711101000000250026	0,18	135	37	40*30*30	60
32 - 1"	02711101000000320033	0,28	155	44	40*30*30	40
40 - 1 1/4"	02711101000000400042	0,41	180	54	40*30*30	24
50 - 1 1/2"	02711101000000500048	0,59	210	67	40*30*30	20
63 - 2"	02711101000000630060	1,07	245	84	40*30*30	10
75 - 2 1/2"	02711101000000750073	1,60	284	100	40*30*30	5

EF-METRIC

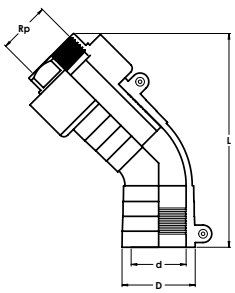
EF-METRİK

PE-BRASS TRANSITION ELBOW (45°) (MALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (45°) ERKEK)
TYPE / TİP: EF



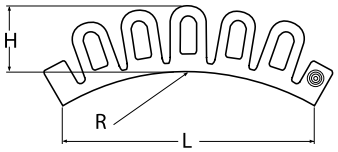
d-R	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20 - 1/2"	02811102000000200021	0,19	140	37	40*30*30	60
20-3/4"	02811102000000200026	0,19	140	37	40*30*30	60
25-3/4"	02811102000000250026	0,19	140	37	40*30*30	60
32 - 1"	02811102000000320033	0,32	185	43	40*30*30	40
32 - 3/4"	02811102000000320026	0,32	185	43	40*30*30	40
32 - 1/2"	02811102000000320021	0,32	185	43	40*30*30	40
40 - 1 1/4"	02811102000000400042	0,48	205	53	40*30*30	30
50 - 1 1/2"	02811102000000500048	0,66	240	66	40*30*30	20
63 - 2"	02811102000000630060	0,97	295	83	40*30*30	10
75 - 2 1/2"	02811102000000750073	1,50	283	100	40*30*30	8
90 - 3"	02811102000000900088	2,14	300	120	60*40*30	8
110- 4"	02811102000001100114	3,65	281	138	60*40*30	8

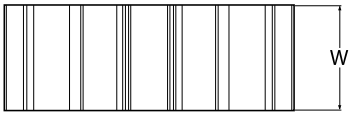
PE-BRASS TRANSITION ELBOW (45°) (FEMALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (45°) (DİŞİ)
TYPE / TİP: EF



d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	02811101000000200021	0,14	155	37	40*30*30	60
25-3/4"	02811101000000250026	0,17	155	37	40*30*30	60
32 - 1"	02811101000000320033	0,26	160	43	40*30*30	40
40 - 1 1/4"	02811101000000400042	0,36	190	53	40*30*30	30
50 - 1 1/2"	02811101000000500048	0,55	220	66	40*30*30	20
63 - 2"	02811101000000630060	0,97	275	83	40*30*30	10
75 - 2 1/2"	02811101000000750073	1,40	268	100	40*30*30	5

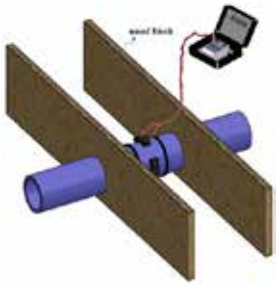
EF FLEX RESTRAINT
PE100





Main Pipe size/ Boru çapı (R)	CODE	L	H	W
110-1600	01311100000001101600	152	40	63

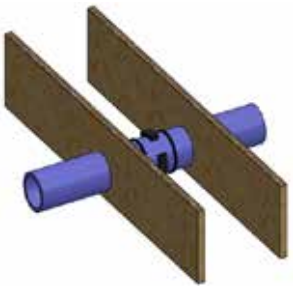
- Maksimum eksenel yük 42,3 kN. Beton duvar geçişlerinde pratik çözüm.
- *Max permissible axial force 42,3kN Simple solution for concrete wall transition.*



SORUN / PROBLEM

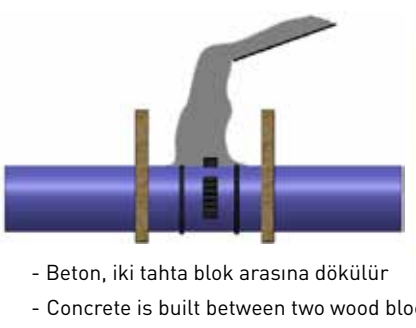
- Isıl genleşmeden dolayı, PE boru hareket eder ve boru - beton arasında boşluk oluşur.
- *Because of the thermal expansion, PE pipe moves each side and a gap occurs between pipe and concrete.*

EF FLEX RESTRAINT'ler boruya kaynatılır.
EF FLEX RESTRAINTs are welded to the pipe.



ÇÖZÜM / *SOLUTION*

- Borunun hareket etmesini ve boşluk oluşmasını engellemek için, EF FLEX RESTRAINT'ler boruya kaynatılarak sabitlenir.
- To prevent movement of pipe and gap, EF FLEX RESTRAINTs are fixed to the pipe by welding.



- Beton, iki tahta blok arasına dökülür
- Concrete is built between two wood blocks.

- İki tahta blok betondan ayırılır.
- *Two wood blocks are separated from concrete.*
- Sadece beton blok kalır ve EF Flex Restraintler borunun stabil kalmasını sağlar.
- *Only concrete block stands and EF Flex Restraints keep pipe stable.*

EF-METRIC

EF-METRİK

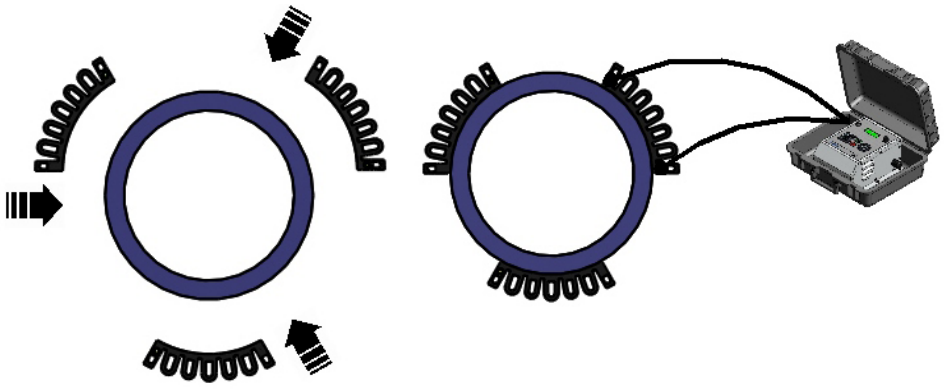
EF FLEX RESTRAINT

PE100

- Beton duvar geçişlerinde kritik kuvvet, borudaki ısıl genleşmenin neden olduğu eksenel yüktür.
- Tega Flex parçalarının herbiri 42,3 kN'a kadar eksenel yük taşıyabilir.
- Herbir boru çapı için gerekli flex sayısı tabloda verilmiştir.

- *For wall transition the only critical force on the pipe is thermal expansion of the pipe system*
- *Tega EF Flex Restraint compete enough axial force to resist expansion. (42,3kN / each flex)*
- *Use enough number of flex restraint on your pipe diameter.*

d (mm)	Sdr11 Quantity of Restraints Needed	Sdr17 Quantity of Restraints
160	2	2
180	2	2
200	2	2
225	2	2
250	2	2
280	2	2
315	3	2
355	4	3
400	5	3
450	6	4
500	7	5
560	8	6
630	10	7
710	13	9
800	17	11
900	21	14
1000	26	18
1200	37	25
1400	46	31
1600	57	39



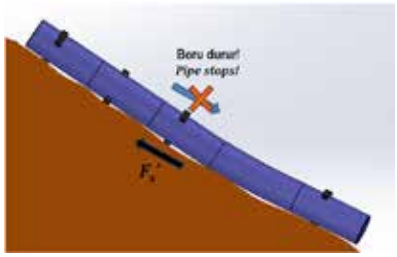
Flex parçalar, aynı zamanda birbirinin içerisine sokularak boruların merkezlenmesi içinde kullanılabilirler.
Flex restraints also can be used for centering and easy sliding of a PE pipe in another pipe.

EF FLEX RESTRAINT
PE100

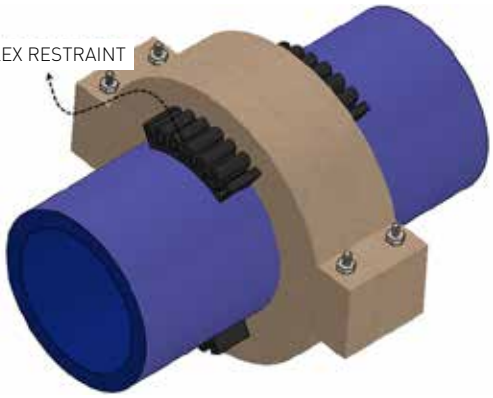
Kaymayı önlemek için, bloklar boruya sabitlenmelidir.
To prevent slipping, blocks must be fixed to the pipe.

EF FLEX RESTRAINT'ler boruya kaynak yapılır ve blokların kaymasını engeller.
EF FLEX RESTRAINTs are welded to the pipe and prevents blocks to slip.

Boru kaymasını önleme / *Prevents slipping pipes*

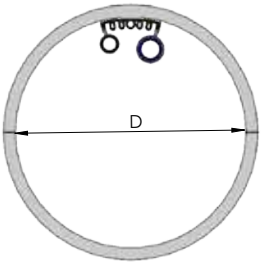


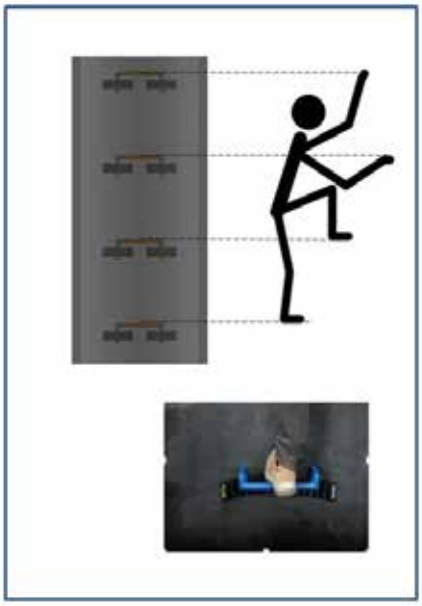
EF FLEX RESTRAINT



EF INNER FLEX FOR MANHOLE STEPS
EF İÇ FLEX MENHOL BASAMAKLARI İÇİN
300 < D < 4000 mm

Boru Montajı İçin EF İç Flex *(EF Inner Flex Pipe Installation) :*



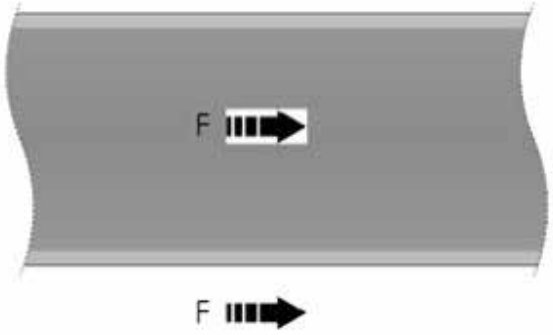


EF-METRIC

EF-METRİK

HEAVY DUTY EF FLEX
ENDÜSTRİYEL EF FLEX

PE100

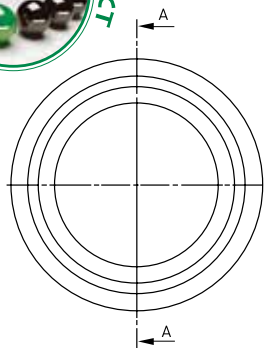


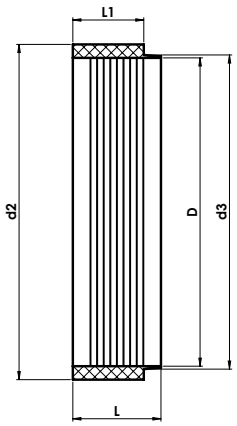
Neden ENDÜSTRİYEL EF FLEX?
Why is HEAVY DUTY EF FLEX?)

Borular için taşıma kulplarına ihtiyacınız olduğunda, ENDÜSTRİYEL EF FLEX 1000 KN eksenel kuvvete direnç gösterebilir. Tega bu yenilikçi ürünü, 4000 mm çapa kadar olan endüstriyel boru uygulamaları için üretiyor.

If you need HANDLES on a PE100 pipe, HEAVY EF FLEX can resist up to 1000 KN axial force! Tega has created this innovative product, for industrial application; the pipes up to 4000 mm diameter.

EF FLANGE ADAPTOR
EF FLANŞ ADAPTÖRÜ
PE100





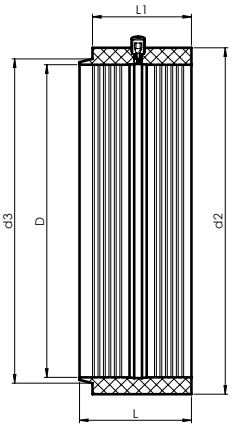
- Talebe bağlı olarak D110 - D1200 aralığında üretilmektedir.
- *Available on request all the size from D110 to D1200.*

CODE	D	d2	d3	L1	L
09811100000001100000	110	158	125	77	102
09811100000001250000	125	158	132	77	102
09811100000001400000	140	188	155	85	110
09811100000001600000	160	212	175	85	110
09811100000001800000	180	212	185	85	110
09811100000002000000	200	268	232	85	120
09811100000002250000	225	268	235	95	120
09811100000002500000	250	320	285	95	120
09811100000002800000	280	320	291	95	120
09811100000003150000	315	370	335	95	135
09811100000003550000	355	430	373	110	150
09811100000004000000	400	482	427	120	160
09811100000004500000	450	585	514	130	170
09811100000005000000	500	585	530	140	180
09811100000005600000	560	685	615	145	180
09811100000006300000	630	685	642	145	180
09811100000007100000	710	800	737	145	180
09811100000008000000	800	905	840	145	180
09811100000009000000	900	1005	944	145	180
09811100000010000000	1000	1110	1047	145	180
09811100000012000000	1200	1330	1245	145	180

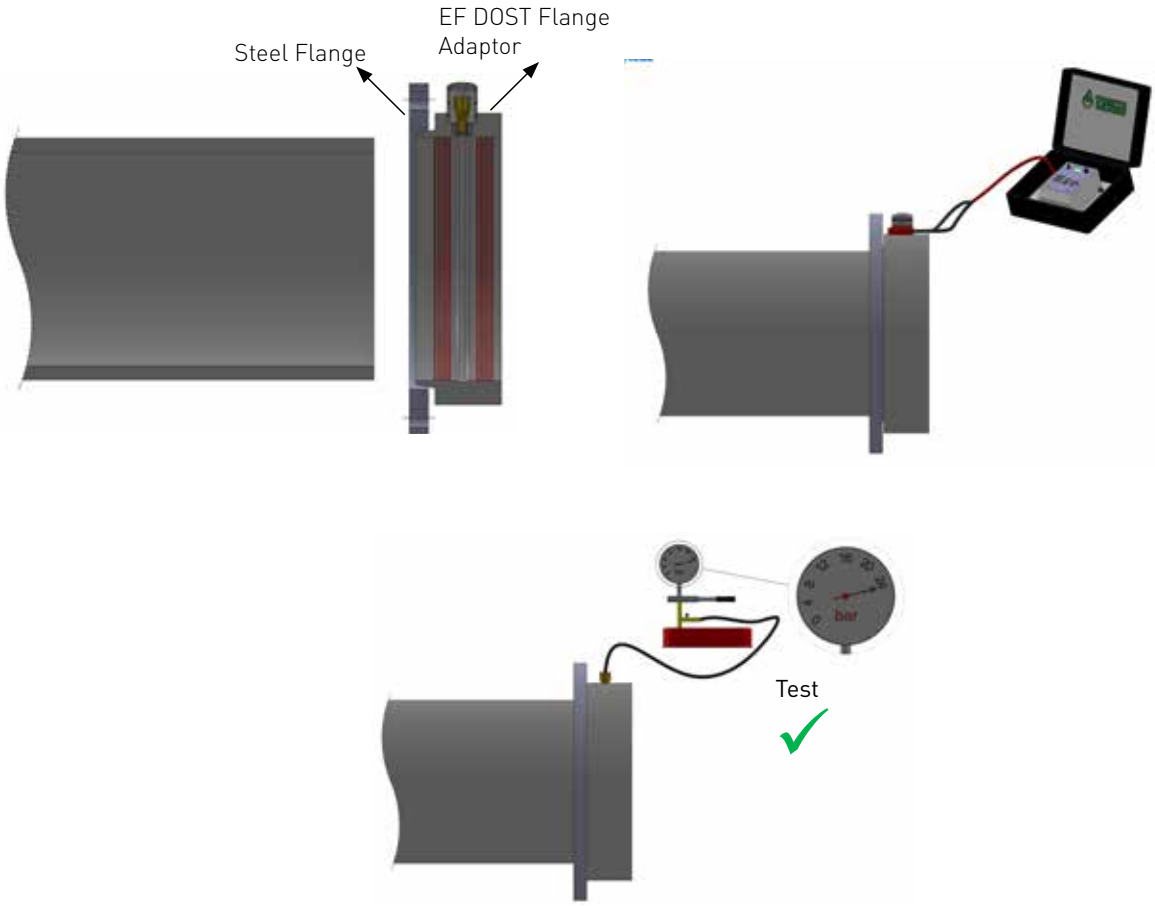
EF-METRIC

EF-METRİK

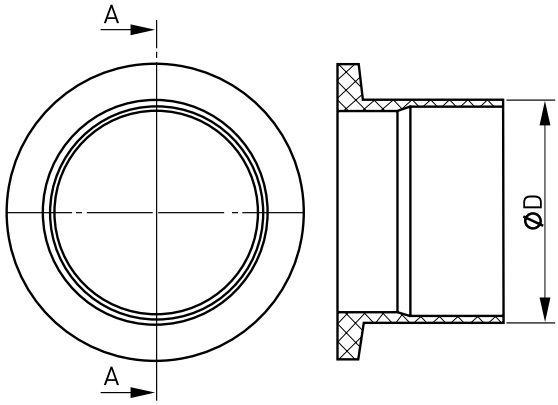
EF DOST FLANGE ADAPTOR
EF DOST FLANŞ ADAPTÖRÜ
PE100



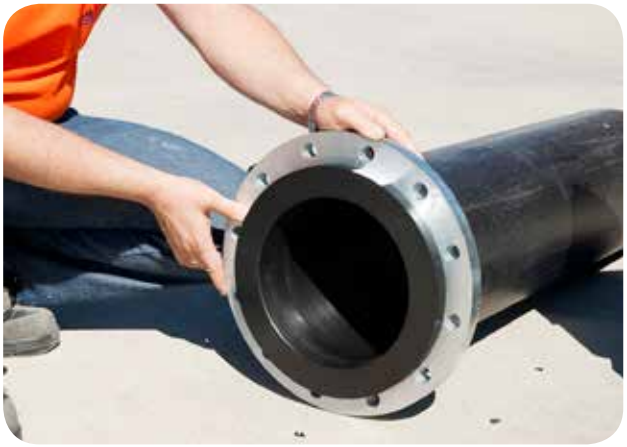
- Talebe bağlı olarak D160 - D1600 aralığında üretilmektedir.
- *Available on request all the size from D160 to D1600.*



EF INNER FLANGE ADAPTOR
EF İÇ FLANŞ ADAPTÖRÜ
PE100

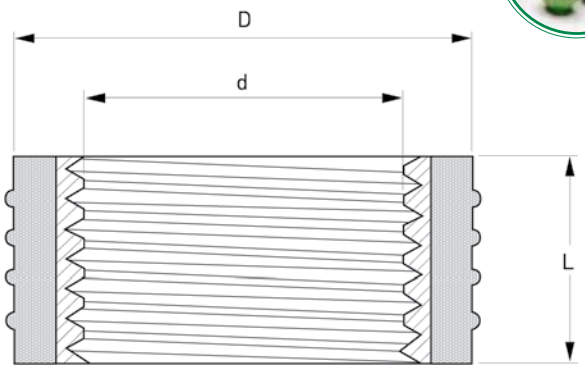


- Talebe bağlı olarak D160 - D1600 aralığında üretilmektedir.
- *Available on request all the size from D160 to D1600.*



EF-METRIC
EF-METRİK

EF INNER COUPLER WITH FEMALE THREAD
DİŞİ DİŞLİ EF İÇ MANŞON
PE100

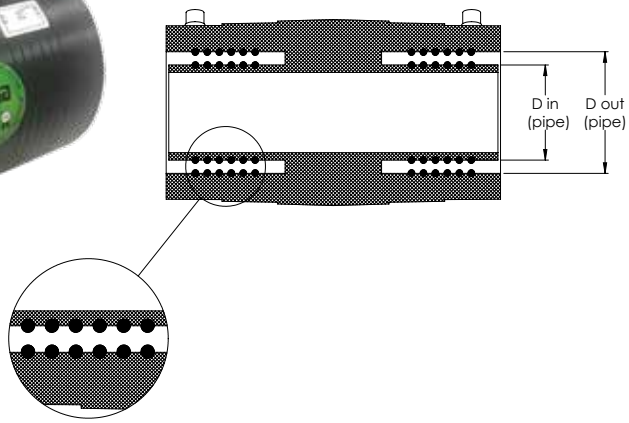


part of PE	Threaded Size
Available on request	1"
Available on request	2"
Available on request	3"
Available on request	4"
Available on request	6"

HIGH PRESSURE SANDWICH EF COUPLER AND SANDWICH EF SADDLE
YÜKSEK BASINÇLI SANDVİÇ EF MANŞON VE SANDVİÇ EF SEMER
UP TO 100 BAR

INNOVATIVE PRODUCT

PATENTED PRODUCT

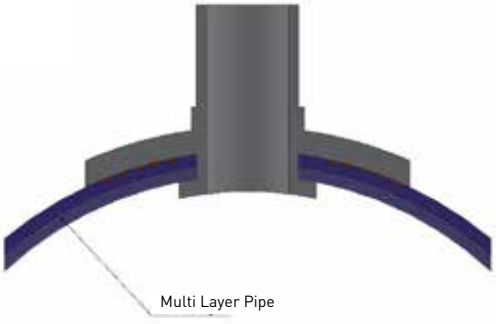


Yüksek basınçlı ve PRT (ısıya dayanıklı) borularda
For PRT (Temperature Resistance) and High Pressure Pipes Up to PN100:
Problem: The inner layer must be protected from the contact of water or any liquid.

Solution

Sandwich coupler

Sandwich saddle



EF-METRIC

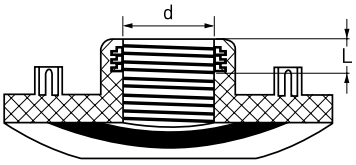
EF-METRİK

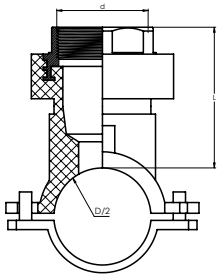
BRASS OUTLET EF SADDLE SDR11

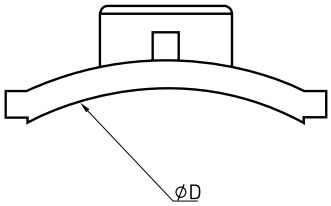
PİRİNÇ ÇIKIŞLI EF SEMER SDR11

GAS / GAZ : 10

WATER / SU : 16







TYPE A TYPE B TYPE C

D	d	CODE	L	Kg.	box sizes	nos/box	type
50	3/4"	06511101000000500026	12	0.50	30*40*30	12	B
63	3/4"	06511101000000630026	12	0.73	30*40*30	12	B
75	3/4"	06511101000000750026	12	0.69	30*40*30	12	B
90	3/4"	06511101000000900026	12	0.65	30*40*30	12	A
110	3/4"	06511101000001100026	12	0.71	30*40*30	12	A
125	3/4"	06511101000001250026	12	0.71	30*40*30	12	A
140	3/4"	06511101000001400026	12	0.93	30*40*30	12	A
160	3/4"	06511101000001600026	12	0.93	30*40*30	12	A
180	3/4"	06511101000001800026	12	0.93	30*40*30	12	A
200	3/4"	06511101000002000026	12	0.93	30*40*30	12	A
225	3/4"	06511101000002250026	12	0.93	30*40*30	12	A
250	3/4"	06511101000002500026	12	0.63	30*40*30	12	C
280	3/4"	06511101000002800026	12	0.63	30*40*30	12	C
315	3/4"	06511101000003150026	12	0.62	30*40*30	12	C
355	3/4"	06511101000003550026	12	0.62	30*40*30	12	C
400	3/4"	06511101000004000026	12	0.62	30*40*30	12	C
450	3/4"	06511101000004500026	12	0.61	30*40*30	12	C
500	3/4"	06511101000005000026	12	0.61	30*40*30	12	C
560	3/4"	06511101000005600026	12	0.61	30*40*30	12	C
630	3/4"	06511101000006300026	12	0.60	30*40*30	12	C

BRASS OUTLET EF SADDLE SDR11
PİRİNÇ ÇIKIŞLI EF SEMER SDR11

GAS / GAZ : 10
WATER / SU : 16

D	d	CODE	L	Kg.	box sizes	nos/box	type
710	3/4"	06511101000007100026	12	0.60	30*40*30	12	C
63	1"	06511101000000630033	12	0.75	30*40*30	12	B
75	1"	06511101000000750033	12	0.71	30*40*30	12	B
90	1"	06511101000000900033	12	0.67	30*40*30	12	A
110	1"	06511101000001100033	12	0.73	30*40*30	12	A
125	1"	06511101000001250033	12	0.73	30*40*30	12	A
140	1"	06511101000001400033	12	0.95	30*40*30	12	A
160	1"	06511101000001600033	12	0.95	30*40*30	12	A
180	1"	06511101000001800033	12	0.95	30*40*30	12	A
200	1"	06511101000002000033	12	0.95	30*40*30	12	A
225	1"	06511101000002250033	12	0.95	30*40*30	12	A
250	1"	06511101000002500033	12	0.64	30*40*30	12	C
280	1"	06511101000002800033	12	0.64	30*40*30	12	C
315	1"	06511101000003150033	12	0.63	30*40*30	12	C
355	1"	06511101000003550033	12	0.63	30*40*30	12	C
400	1"	06511101000004000033	12	0.63	30*40*30	12	C
450	1"	06511101000004500033	12	0.62	30*40*30	12	C
500	1"	06511101000005000033	12	0.62	30*40*30	12	C
560	1"	06511101000005600033	12	0.62	30*40*30	12	C
630	1"	06511101000006300033	12	0.61	30*40*30	12	C
710	1"	06511101000007100033	12	0.61	30*40*30	12	C
63	2"	06511101000000630060	20	1,12	30*40*30	12	B
75	2"	06511101000000750060	20	1,08	30*40*30	12	B
90	2"	06511101000000900060	20	1,04	30*40*30	12	B
110	2"	06511101000001100060	20	1,10	30*40*30	12	B
125	2"	06511101000001250060	20	1,10	30*40*30	12	B
140	2"	06511101000001400060	20	1,32	30*40*30	12	B
160	2"	06511101000001600060	20	1,32	30*40*30	12	B
180	2"	06511101000001800060	20	1,32	30*40*30	12	B
200	2"	06511101000002000060	20	1,32	30*40*30	12	B
225	2"	06511101000002250060	20	1,32	30*40*30	12	B
250	2"	06511101000002500060	20	0.77	30*40*30	12	C
280	2"	06511101000002800060	20	0.77	30*40*30	12	C
315	2"	06511101000003150060	20	0.76	30*40*30	12	C
355	2"	06511101000003550060	20	0.76	30*40*30	12	C
400	2"	06511101000004000060	20	0.76	30*40*30	12	C
450	2"	06511101000004500060	20	0.75	30*40*30	12	C
500	2"	06511101000005000060	20	0.75	30*40*30	12	C
560	2"	06511101000005600060	20	0.75	30*40*30	12	C
630	2"	06511101000006300060	20	0.74	30*40*30	12	C
710	2"	06511101000007100060	20	0.74	30*40*30	12	C

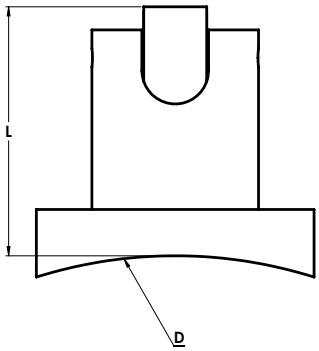
EF-METRIC

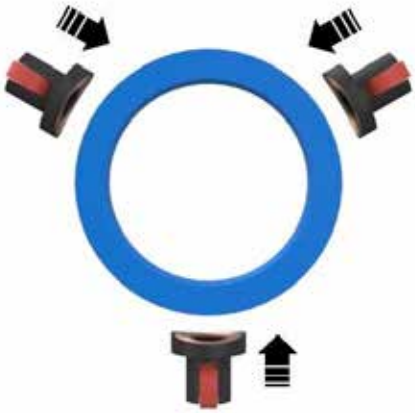
EF-METRİK

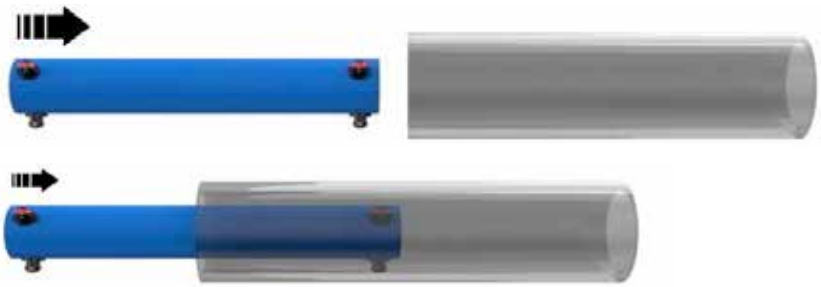
EF WHEEL SADDLE
TEKERLEKLİ EF SEMER

- PE boruların her türden başka boruların içerisine sürülmesi için ideal parça.
- PE boru çevresine istenilen sayıda "EF tekerlekli semer" EF kaynak yöntemi ile birleştirilir.
- Her bir tekerlekli semer 275 kg yük taşıyabilir.

- *Ideal for placing the PE pipes into all types of pipes*
- *Any number of EF Wheel saddles can be fused around PE pipe*
- *Each saddle can carry a load of 275 kg.*







L isteğe göre değiştirilebilir

L can be changed on demand.

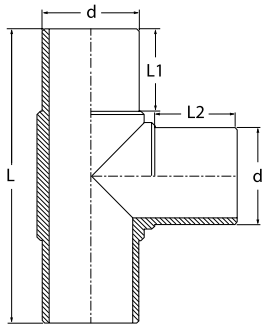
SPİGOT ÜRÜNLER
SPIGOT PRODUCTS

SPIGOT-METRIC

SPIGOT-METRİK

EQUAL TEE / EŞİT TE

SDR17 PE100
GAS / GAZ: 6 BAR
WATER / SU : 10 BAR
TYPE / TİP : SPIGOT

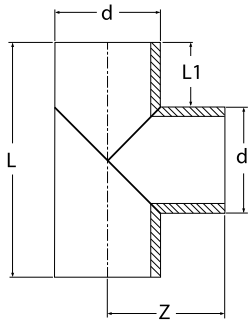


d	CODE	Kg.	L (mm)	L1/L2 (mm)	box sizes	nos/box
63	03111710000000630000	0,32	218	64	40*30*30	16
75	03111710000000750000	0,80	275	76	60*40*30	20
90	03111710000000900000	0,70	275	76	60*40*45	20
110	03111710000001100000	1,30	340	85	60*40*45	12
125	03111710000001250000	1,45	360	90	60*40*45	8
140	03111710000001400000	2,10	396	100	60*40*30	4
160	03111710000001600000	3,75	560	107	60*40*45	4
180	03111710000001800000	5,60	565	127	60*40*45	2
200	03111710000002000000	5,40	500	120	60*40*45	2
225	03111710000002250000	7,40	540	130	60*40*30	1
250	03111710000002500000	11,80	602	140	60*60*33	1
280	03111710000002800000	18,80	630	185	**	
315	03111710000003150000	23,00	760	160	**	

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / No box is used. Only Euro pallets are being used.

EQUAL TEE SEGMENTED
EŞİT TE KONFEKSİYON

SDR17 PE 100
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

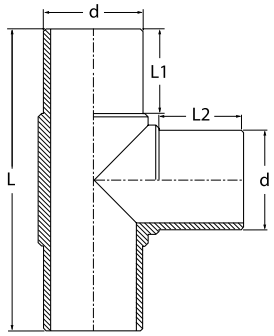


d	CODE	Kg.	L (mm)	L1 (mm)	Z (mm)	nos/box
355	03211710000003550000	32,00	960	300	480	**
400	03211710000004000000	42,00	1000	300	500	**
450	03211710000004500000	56,00	1050	300	525	**
500	03211710000005000000	79,00	1200	350	600	**
560	03211710000005600000	104,00	1260	350	630	**
630	03211710000006300000	139,00	1330	350	665	**
710	03211710000007100000	194,00	1410	350	705	**
800	03211710000008000000	252,00	1500	350	750	**
900	03211710000009000000	352,00	1800	450	900	**
1000	03211710000010000000	437,00	2000	480	980	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / No box is used. Only Euro pallets are being used.

EQUAL TEE (SHORT) / EŞİT TE (KISA)

SDR17 PE 100
GAS/GAZ : 4 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

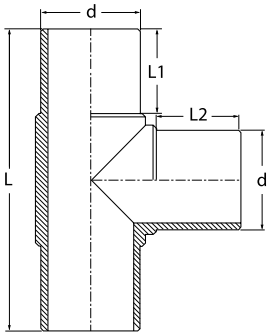


d	CODE	Kg.	L (mm)	L1-L2 (mm)	box sizes	nos/box
110	03111710000101100000	1,00	320	80	60*40*45	12
125	03111710000101250000	1,20	335	80	60*40*30	6
140	03111710000101400000	1,90	350	80	60*40*30	4
160	03111710000101600000	3,50	370	80	60*40*45	3
180	03111710000101800000	5,00	390	80	60*40*45	2
200	03111710000102000000	5,10	410	80	60*40*45	2
225	03111710000102250000	6,90	435	80	60*40*30	1
250	03111710000102500000	11,10	460	80	60*40*30	1
280	03111710000102800000	21,10	600	150	*	*
315	03111710000103150000	24,40	710	160	*	*

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being* used.

EQUAL TEE / EŞİT TE

SDR11 PE 100
GAS/GAZ: 10 BAR
WATER/SU: 16 BAR
TYPE/TİP: SPIGOT



d	CODE	Kg.	L(mm)	L1(mm)	box sizes	nos/box
32	03111110000000320000	0,22	178	58	40*30*30	50
40	03111110000000400000	0,22	178	58	40*30*30	50
50	03111110000000500000	0,22	188	60	40*30*30	30
63	03111110000000630000	0,39	218	64	40*30*30	16
75	03111110000000750000	1,01	275	76	60*40*30	20
90	03111110000000900000	0,89	275	76	60*40*45	20
110	03111110000001100000	1,80	340	85	60*40*45	12
125	03111110000001250000	2,17	360	90	60*40*45	8
140	03111110000001400000	3,01	396	100	60*40*30	4
160	03111110000001600000	4,99	560	107	60*40*45	4
180	03111110000001800000	7,00	565	127	60*40*45	2
200	03111110000002000000	7,60	500	120	60*40*45	2
225	03111110000002250000	10,00	540	130	60*40*30	1
250	03111110000002500000	14,20	602	140	60*60*33	1
280	03111110000002800000	23,00	630	185	**	1
315	03111110000003150000	27,00	670	270	**	1

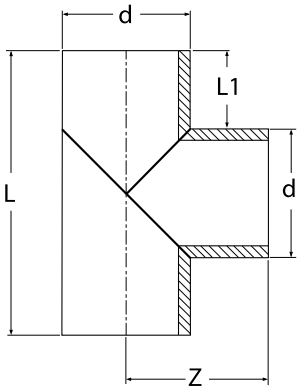
(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / No box is used. Only Euro pallets are being used.

SPIGOT-METRIC

SPIGOT-METRİK

EQUAL TEE SEGMENTED
EŞİT TE KONFEKSİYON

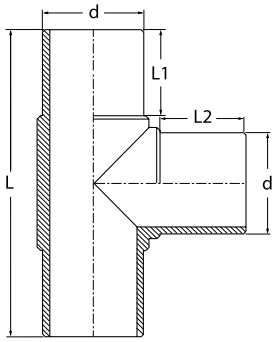
SDR11 PE 100
WATER/SU: 16 BAR
TYPE/TİP: SPIGOT



d	CODE	Kg.	L (mm)	L1 (mm)	Z (mm
355	03211110000003550000	47,00	960	300	480
400	03211110000004000000	62,00	1000	300	500
450	03211110000004500000	83,00	1050	300	525
500	03211110000005000000	116,00	1200	350	600
560	03211110000005600000	153,00	1260	350	630
630	03211110000006300000	204,00	1330	350	665
710	03211110000007100000	286,00	1410	350	705
800	03211110000008000000	305,00	1500	350	750

EQUAL TEE (SHORT) / EŞİT TE (KISA)

SDR11 PE 100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L (mm)	L1-L2 (mm)	box sizes	nos/box
110	03111110000101100000	1,60	320	80	60*40*45	12
125	03111110000101250000	1,90	335	80	60*40*30	6
140	03111110000101400000	2,70	350	80	60*40*30	4
160	03111110000101600000	4,00	370	80	60*40*45	3
180	03111110000101800000	5,80	390	80	60*40*45	2
200	03111110000102000000	7,00	410	80	60*40*45	2
225	03111110000102250000	9,20	435	80	60*40*30	1
250	03111110000102500000	13,70	460	80	60*40*30	1
280	03111110000102800000	24,25	600	150	*	*
315	03111110000103150000	26,65	710	160	*	*

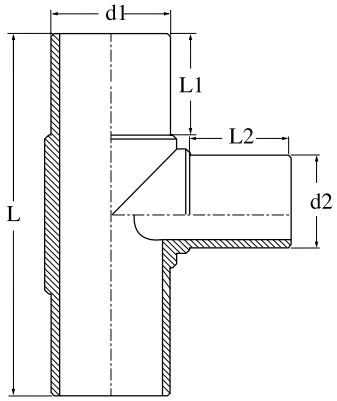
(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

REDUCED TEE / İNEGAL TE

SDR17 PE100
GAS/GAZ: 6 BAR
WATER/SU: 10 BAR
TYPE/TİP: SPIGOT



d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box
110*63	03311710000001100063	1,23	340	95	65	60*40*45	12
110*90	03311710000001100090	1,30	340	95	75	60*40*45	12
125*90	03311710000001250090	1,60	360	95	85	60*40*45	9
125*110	03311710000001250110	1,75	360	95	90	60*40*45	9
140*90	03311710000001400090	2,25	400	100	95	60*40*30	4
140*110	03311710000001400110	2,00	400	100	100	60*40*30	4
140*125	03311710000001400125	2,45	400	120	90	60*40*30	4
160*90	03311710000001600090	3,75	560	150	90	60*40*45	5
160*110	03311710000001600110	3,60	560	150	95	60*40*45	5
160*125	03311710000001600125	3,95	560	150	95	60*40*45	5
160*140	03311710000001600140	3,60	415	100	110	60*40*45	5
180*90	03311710000001800090	5,00	560	145	90	60*40*45	4
180*110	03311710000001800110	5,00	560	145	80	60*40*45	4
180*125	03311710000001800125	5,30	560	145	90	60*40*45	4
180*140	03311710000001800140	4,10	430	105	110	60*40*45	4
180*160	03311710000001800160	5,80	470	105	140	60*40*45	4
200*90	03311710000002000090	4,58	500	120	90	60*40*45	3
200*110	03311710000002000110	4,65	500	120	90	60*40*45	3
200*125	03311710000002000125	5,10	430	115	90	60*40*30	2
200*140	03311710000002000140	5,95	470	140	110	60*40*30	2
200*160	03311710000002000160	5,40	515	140	140	60*40*45	3
200*180	03311710000002000180	7,40	485	115	140	60*40*30	2
225*90	03311710000002250090	6,95	540	130	85	60*40*45	2
225*110	03311710000002250110	7,18	540	130	90	60*40*45	2
225*125	03311710000002250125	7,30	540	130	95	60*40*45	2
225*140	03311710000002250140	6,30	460	120	110	60*40*45	2
225*160	03311710000002250160	7,45	540	130	110	60*40*45	2
225*180	03311710000002250180	7,65	530	130	115	60*40*45	2
250*90	03311710000002500090	10,00	600	140	100	60*40*30	1
250*110	03311710000002500110	5,78	460	155	110	60*40*30	1
250*125	03311710000002500125	7,30	470	130	90	60*40*30	1
250*140	03311710000002500140	10,40	510	140	110	60*40*30	1

***REDUCED TEE* / İNEGAL TE**

SDR17 PE100 • *GAS*/GAZ: 6 BAR • *WATER*/SU: 10 BAR • *TYPE*/TİP: SPIGOT

d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box	
250*160	03311710000002500160	9,40	520	130	140	60*40*30	1	*
250*180	03311710000002500180	9,70	525	130	150	60*40*45	1	*
250*200	03311710000002500200	10,80	600	140	130	60*40*45	1	*
250*225	03311710000002500225	10,60	575	130	150	60*40*45	1	*
280*63	03311710000002800063	5,90	430	140	85	60*40*45	1	**
280*90	03311710000002800090	7,10	440	140	90	60*40*30	1	**
280*110	03311710000002800110	8,80	490	140	110	60*40*30	1	**
280*125	03311710000002800125	8,90	490	140	90	60*40*30	1	**
280*140	03311710000002800140	9,20	505	140	110	60*60*33	1	**
280*160	03311710000002800160	11,20	545	140	140	***		**
280*180	03311710000002800180	11,40	545	140	150	***		**
280*200	03311710000002800200	12,70	595	140	130	***		**
280*225	03311710000002800225	12,50	595	140	150	***		**
315*90	03311710000003150090	9,20	465	150	90	***		**
315*110	03311710000003150110	10,90	510	150	110	***		**
315*125	03311710000003150125	11,00	510	150	90	***		**
315*140	03311710000003150140	15,50	525	150	110	***		**
315*160	03311710000003150160	13,50	565	150	140	***		**
315*180	03311710000003150180	13,90	570	150	150	***		**
315*200	03311710000003150200	14,80	615	150	130	***		**
315*225	03311710000003150225	15,00	615	150	150	***		**
315*250	03311710000003150250	18,30	655	150	145	***		**
315*280	03311710000003150280	20,60	740	150	185	***		**
355*90	03311710000003550090	12,00	495	165	90	***		**
355*110	03311710000003550110	14,00	540	165	110	***		**
355*125	03311710000003550125	14,10	540	165	90	***		**
355*140	03311710000003550140	14,50	555	165	110	***		**
355*160	03311710000003550160	16,90	595	165	140	***		**
355*180	03311710000003550180	17,10	595	165	150	***		**
355*200	03311710000003550200	18,80	645	165	130	***		**
355*225	03311710000003550225	18,60	645	165	150	***		**
355*250	03311710000003550250	22,10	685	165	145	***		**
355*280	03311710000003550280	24,80	770	165	185	***		**
355*315	03311710000003550315	46,70	820	165	165	***		**
400*90	03311710000004000090	15,80	525	180	90	***		**
400*110	03311710000004000110	18,00	570	180	110	***		**
400*125	03311710000004000125	18,10	570	180	90	***		**
400*140	03311710000004000140	18,60	585	180	110	***		**
400*160	03311710000004000160	21,20	625	180	140	***		**
400*180	03311710000004000180	21,50	625	180	150	***		**
400*200	03311710000004000200	23,50	675	180	130	***		**
400*225	03311710000004000225	23,30	675	180	150	***		**
400*250	03311710000004000250	27,00	715	180	145	***		**
400*280	03311710000004000280	30,20	800	180	185	***		**
400*315	03311710000004000315	52,40	850	180	165	***		**
400*355	03311710000004000355	54,80	850	180	165	***		**
450*90	03311710000004500090	20,80	555	195	90	***		**
450*110	03311710000004500110	23,40	600	195	110	***		**
450*125	03311710000004500125	23,50	600	195	90	***		**
450*140	03311710000004500140	24,10	615	195	110	***		**
450*160	03311710000004500160	27,00	655	195	140	***		**

SPIGOT-METRIC

SPIGOT-METRİK

***REDUCED TEE* / İNEGAL TE**

SDR17 PE100 • *GAS*/GAZ: 6 BAR • *WATER*/SU: 10 BAR • *TYPE*/TİP: SPIGOT

d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box
450*180	03311710000004500180	27,20	655	195	150	***	**
450*200	03311710000004500200	29,60	705	195	130	***	**
450*225	03311710000004500225	29,40	705	195	150	***	**
450*250	03311710000004500250	33,40	745	195	145	***	**
450*280	03311710000004500280	37,20	830	195	185	***	**
450*315	03311710000004500315	59,80	880	195	165	***	**
450*355	03311710000004500355	64,60	880	195	165	***	**
450*400	03311710000004500400	64,60	880	195	190	***	**
500*90	03311710000005000090	27,20	595	215	90	***	**
500*110	03311710000005000110	30,10	640	215	110	***	**
500*125	03311710000005000125	30,20	640	215	90	***	**
500*140	03311710000005000140	31,00	655	215	110	***	**
500*160	03311710000005000160	34,20	695	215	140	***	**
500*180	03311710000005000180	34,50	695	215	150	***	**
500*200	03311710000005000200	37,30	745	215	130	***	**
500*225	03311710000005000225	37,10	745	215	150	***	**
500*250	03311710000005000250	41,40	785	215	145	***	**
500*280	03311710000005000280	46,00	870	215	185	***	**
500*315	03311710000005000315	66,80	920	215	165	***	**
500*355	03311710000005000355	69,80	920	215	165	***	**
500*400	03311710000005000400	72,80	920	215	190	***	**
500*450	03311710000005000450	67,80	920	215	210	***	**
560*90	03311710000005600090	36,00	635	235	90	***	**
560*110	03311710000005600110	39,40	680	235	110	***	**
560*125	03311710000005600125	39,50	680	235	90	***	**
560*140	03311710000005600140	40,50	695	235	110	***	**
560*160	03311710000005600160	44,10	735	235	140	***	**
560*180	03311710000005600180	44,40	735	235	150	***	**
560*200	03311710000005600200	47,70	785	235	130	***	**
560*225	03311710000005600225	47,50	785	235	150	***	**
560*250	03311710000005600250	52,30	825	235	145	***	**
560*280	03311710000005600280	57,80	910	235	188	***	**
560*315	03311710000005600315	81,30	960	235	165	***	**
560*355	03311710000005600355	83,70	960	235	165	***	**
560*400	03311710000005600400	86,70	960	235	190	***	**
560*450	03311710000005600450	81,70	960	235	210	***	**
560*500	03311710000005600500	145,00	1180	235	230	***	**
630*90	03311710000006300090	48,10	675	255	90	***	**
630*110	03311710000006300110	52,20	720	255	110	***	**
630*125	03311710000006300125	52,30	720	255	90	***	**
630*140	03311710000006300140	53,50	735	255	110	***	**
630*160	03311710000006300160	57,70	775	255	140	***	**

REDUCED TEE / İNEGAL TE

SDR17 PE 100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box	
630*180	03311710000006300180	58,00	775	255	150	***		**
630*200	03311710000006300200	62,00	825	255	130	***		**
630*225	03311710000006300225	61,80	825	255	150	***		**
630*250	03311710000006300250	67,20	865	255	145	***		**
630*280	03311710000006300280	73,90	950	255	185	***		**
630*315	03311710000006300315	98,20	1000	255	165	***		**
630*355	03311710000006300355	101,50	1000	255	165	***		**
630*400	03311710000006300400	104,50	1000	255	190	***		**
630*450	03311710000006300450	99,50	1000	255	210	***		**
630*500	03311710000006300500	166,30	1220	255	230	***		**
630*560	03311710000006300560	158,00	1220	255	250	***		**

Büyük çaplar isteğe bağlı olarak üretilmektedir/ *Bigger sizes are available upon request.*

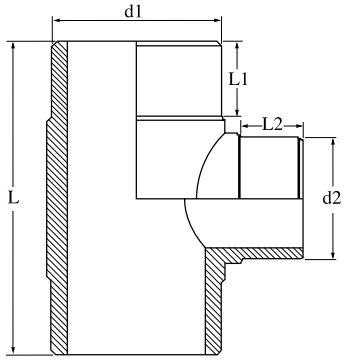
(*) : Enjeksiyon baskı / *Injected*

(**) : EF semer kullanılarak üretilmektedir. / *Produced by EF saddle*

(***) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. (Only Euro pallets are being used.*

REDUCED TEE (SHORT) / İNEGAL TE (KISA)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
160*75	03311710000101600075	1,40	275	60	75	60*40*45	4	**
160*90	03311710000101600090	1,50	275	60	95	60*40*45	3	*
160*140	03311710000101600140	2,30	335	60	110	60*40*45	2	*
180*75	03311710000101800075	1,80	275	60	75	60*40*45	2	**
180*110	03311710000101800110	2,30	320	60	105	60*40*45	2	*
180*125	03311710000101800125	2,50	320	60	110	60*40*45	2	*
180*140	03311710000101800140	2,70	335	60	110	60*40*45	2	**
180*160	03311710000101800160	3,40	375	60	120	60*40*45	2	**
200*75	03311710000102000075	2,20	275	60	75	60*40*45	2	**
200*90	03311710000102000090	2,30	275	60	90	60*40*45	2	*
200*125	03311710000102000125	2,90	320	60	110	60*40*45	2	**
200*140	03311710000102000140	3,20	335	60	10	60*40*45	2	*
200*160	03311710000102000160	3,90	375	60	120	60*40*45	2	**
200*180	03311710000102000180	4,30	375	60	125	60*40*45	2	*
225*75	03311710000102250075	3,60	375	60	75	60*40*45	2	**
225*90	03311710000102250090	2,80	275	60	90	60*40*45	2	*
225*110	03311710000102250110	3,40	320	60	105	60*40*45	2	*
225*125	03311710000102250125	3,50	320	60	110	60*40*45	2	**
225*140	03311710000102250140	3,90	335	60	110	60*40*45	2	**
225*160	03311710000102250160	4,60	375	60	120	60*40*45	2	*
225*180	03311710000102250180	5,00	375	60	125	60*40*45	2	**
225*200	03311710000102250200	6,00	425	60	130	60*40*30	2	**
250*75	03311710000102500075	3,20	275	60	75	60*40*45	2	**
250*90	03311710000102500090	3,30	275	60	90	60*40*45	2	*
250*110	03311710000102500110	4,00	320	60	105	60*40*30	1	*
250*125	03311710000102500125	4,10	320	60	110	60*40*30	1	*
250*140	03311710000102500140	4,60	335	60	110	60*40*30	1	**
250*160	03311710000102500160	5,40	375	60	120	60*40*30	1	*
250*180	03311710000102500180	5,80	375	60	125	60*40*45	1	*
250*200	03311710000102500200	6,80	425	60	130	60*40*45	1	*

REDUCED TEE (SHORT) / İNEGAL TE (KISA)

SDR17 PE100 • *GAS*/GAZ: 6 BAR • *WATER*/SU: 10 BAR • *TYPE*/TİP: SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
250*225	03311710000102500225	7,10	425	60	130	60*40*45	1	**
280*75	03311710000102800075	4,00	275	60	75	60*40*30	1	**
280*90	03311710000102800090	4,10	275	60	90	60*40*30	1	**
280*110	03311710000102800110	4,90	320	60	105	60*40*30	1	**
280*125	03311710000102800125	5,00	320	60	110	60*40*30	1	**
280*140	03311710000102800140	5,50	335	60	110	60*40*30	1	**
280*160	03311710000102800160	6,40	375	60	120	60*40*30	1	**
280*180	03311710000102800180	6,80	375	60	125	***		**
280*200	03311710000102800200	7,90	425	60	130	***		**
280*225	03311710000102800225	8,30	425	60	130	***		**
280*250	03311710000102800250	10,40	465	60	145	***		**
315*90	03311710000103150090	5,10	275	60	90	***		**
315*110	03311710000103150110	6,10	320	60	105	***		**
315*125	03311710000103150125	6,20	320	60	110	***		**
315*140	03311710000103150140	6,70	335	60	110	***		**
315*160	03311710000103150160	7,80	375	60	120	***		**
315*180	03311710000103150180	8,20	375	60	125	***		**
315*200	03311710000103150200	9,50	425	60	130	***		**
315*225	03311710000103150225	9,90	425	60	130	***		**
315*250	03311710000103150250	12,10	465	60	145	***		**
315*280	03311710000103150280	14,00	560	60	150	***		**
355*90	03311710000103550090	7,70	335	90	90	***		**
355*110	03311710000103550110	9,00	380	90	105	***		**
355*125	03311710000103550125	9,10	380	90	110	***		**
355*140	03311710000103550140	9,60	395	90	110	***		**
355*160	03311710000103550160	10,80	435	90	120	***		**
355*180	03311710000103550180	11,30	435	90	125	***		**
355*200	03311710000103550200	12,80	485	90	130	***		**
355*225	03311710000103550225	13,10	485	90	130	***		**
355*250	03311710000103550250	15,60	525	90	145	***		**
355*280	03311710000103550280	11,10	620	90	150	***		**
400*90	03311710000104000090	9,70	335	90	90	***		**
400*110	03311710000104000110	11,10	380	90	105	***		**
400*125	03311710000104000125	11,30	380	90	110	***		**
400*140	03311710000104000140	12,00	395	90	110	***		**
400*160	03311710000104000160	13,40	435	90	120	***		**
400*180	03311710000104000180	13,90	435	90	125	***		**
400*200	03311710000104000200	15,70	485	90	130	***		**
400*225	03311710000104000225	16,00	485	90	130	***		**
400*250	03311710000104000250	18,70	525	90	145	***		**
400*280	03311710000104000280	21,60	620	90	150	***		**
400*315	03311710000104000315	23,70	670	90	155	***		**
450*90	03311710000104500090	12,30	335	90	90	***		**
450*110	03311710000104500110	14,00	380	90	105	***		**
450*125	03311710000104500125	14,10	380	90	110	***		**
450*140	03311710000104500140	15,00	395	90	110	***		**
450*160	03311710000104500160	16,70	435	90	120	***		**
450*180	03311710000104500180	17,20	435	90	125	***		

REDUCED TEE (SHORT) / İNEGAL TE (KISA)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

ODE Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box		
450*200	03311710000104500200	19,40	485	90	130	***	**
450*225	03311710000104500225	19,70	485	90	130	***	**
450*250	03311710000104500250	22,70	525	90	145	***	**
450*280	03311710000104500280	26,30	620	90	150	***	**
450*315	03311710000104500315	28,70	670	90	155	***	**
500*90	03311710000105000090	15,00	335	90	90	***	**
500*110	03311710000105000110	17,20	380	90	105	***	**
500*125	03311710000105000125	17,30	380	90	110	***	**
500*140	03311710000105000140	18,20	395	90	110	***	**
500*160	03311710000105000160	20,30	435	90	120	***	**
500*180	03311710000105000180	20,70	435	90	125	***	**
500*200	03311710000105000200	23,40	485	90	130	***	**
500*225	03311710000105000225	23,80	485	90	130	***	**
500*250	03311710000105000250	27,10	525	90	145	***	**
500*280	03311710000105000280	31,50	620	90	150	***	**
560*90	03311710000105600090	19,90	335	90	90	***	**
560*110	03311710000105600110	22,50	380	90	105	***	**
560*125	03311710000105600125	22,70	380	90	110	***	**
560*140	03311710000105600140	23,70	395	90	110	***	**
560*160	03311710000105600160	26,30	435	90	120	***	**
560*180	03311710000105600180	26,70	435	90	125	***	**
560*200	03311710000105600200	30,00	485	90	130	***	**
560*225	03311710000105600225	30,30	485	90	130	***	**
560*250	03311710000105600250	34,00	525	90	145	***	**
560*280	03311710000105600280	39,50	620	90	150	***	**
630*90	03311710000106300090	25,10	335	90	90	***	**
630*110	03311710000106300110	28,40	400	100	105	***	**
630*125	03311710000106300125	28,50	400	100	110	***	**
630*140	03311710000106300140	29,80	415	100	110	***	**
630*160	03311710000106300160	33,00	455	100	120	***	**
630*180	03311710000106300180	33,40	455	100	125	***	**
630*200	03311710000106300200	37,40	505	100	130	***	**
630*225	03311710000106300225	37,70	505	100	130	***	**
630*250	03311710000106300250	42,00	545	100	145	***	**
630*280	03311710000106300280	48,90	640	100	150	***	**
630*315	03311710000106300315	53,10	690	100	155	***	**

Büyük çaplar isteğe bağlı olarak üretilmektedir/ *Bigger sizes are available upon request.*

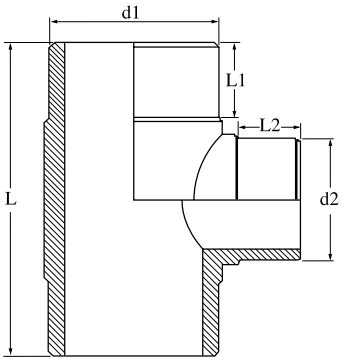
(*) : Enjeksiyon baskı / *Injected*

(**) : EF semer kullanılarak üretilmektedir. / *Produced by EF saddle*

(***) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. (Only Euro pallets are being used.*

REDUCED TEE (SHORT) / İNEGAL TE (KISA)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
160*75	03311110000101600075	2,10	275	60	75	60*40*45	4
160*90	03311110000101600090	2,20	275	60	95	60*40*45	3
160*140	03311110000101600140	3,40	335	60	110	60*40*45	2
180*75	03311110000101800075	2,60	275	60	75	60*40*45	2
180*110	03311110000101800110	3,40	320	60	105	60*40*45	2
180*125	03311110000101800125	3,60	320	60	110	60*40*45	2
180*140	03311110000101800140	4,00	335	60	110	60*40*45	2
180*160	03311110000101800160	4,90	375	60	120	60*40*45	2
200*75	03311110000102000075	3,20	275	60	75	60*40*45	2
200*90	03311110000102000090	3,25	275	60	90	60*40*45	2
200*125	03311110000102000125	4,20	320	60	110	60*40*45	2
200*140	03311110000102000140	4,70	335	60	10	60*40*45	2
200*160	03311110000102000160	5,60	375	60	120	60*40*45	2
200*180	03311110000102000180	6,20	375	60	125	60*40*45	2
225*75	03311110000102250075	5,20	375	60	75	60*40*45	2
225*90	03311110000102250090	4,00	275	60	90	60*40*45	2
225*110	03311110000102250110	4,90	320	60	105	60*40*45	2
225*125	03311110000102250125	5,00	320	60	110	60*40*45	2
225*140	03311110000102250140	5,60	335	60	110	60*40*45	2
225*160	03311110000102250160	6,60	375	60	120	60*40*45	2
225*180	03311110000102250180	7,30	375	60	125	60*40*45	2
225*200	03311110000102250200	8,60	425	60	130	60*40*30	2
250*75	03311110000102500075	4,70	275	60	75	60*40*45	2
250*90	03311110000102500090	4,80	275	60	90	60*40*45	2
250*110	03311110000102500110	5,90	320	60	105	60*40*30	1
250*125	03311110000102500125	6,00	320	60	110	60*40*30	1

REDUCED TEE (SHORT) / İNEGAL TE (KISA)

SDR11 PE100 • *GAS*/GAZ : 10 BAR • *WATER*/SU : 16 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
250*140	03311110000102500140	6,60	335	60	110	60*40*30	1
250*160	03311110000102500160	7,80	375	60	120	60*40*30	1
250*180	03311110000102500180	8,40	375	60	125	60*40*45	1
250*200	03311110000102500200	9,80	425	60	130	60*40*45	1
250*225	03311110000102500225	10,30	425	60	130	60*40*45	1
280*75	03311110000102800075	5,80	275	60	75	60*40*30	1
280*90	03311110000102800090	5,90	275	60	90	60*40*30	1
280*110	03311110000102800110	7,10	320	60	105	60*40*30	1
280*125	03311110000102800125	7,30	320	60	110	60*40*30	1
280*140	03311110000102800140	7,90	335	60	110	60*40*30	1
280*160	03311110000102800160	9,30	375	60	120	60*40*30	1
280*180	03311110000102800180	9,90	375	60	125	***	
280*200	03311110000102800200	11,50	425	60	130	***	
280*225	03311110000102800225	12,00	425	60	130	***	
280*250	03311110000102800250	15,10	465	60	145	***	
315*90	03311110000103150090	7,40	275	60	90	***	
315*110	03311110000103150110	8,90	320	60	105	***	
315*125	03311110000103150125	9,00	320	60	110	***	
315*140	03311110000103150140	9,70	335	60	110	***	
315*160	03311110000103150160	11,30	375	60	120	***	
315*180	03311110000103150180	11,90	375	60	125	***	
315*200	03311110000103150200	13,80	425	60	130	***	
315*225	03311110000103150225	14,30	425	60	130	***	
315*250	03311110000103150250	17,60	465	60	145	***	
355*90	03311110000103550090	11,10	335	90	90	***	
355*110	03311110000103550110	13,00	380	90	105	***	
355*125	03311110000103550125	13,10	380	90	110	***	
355*140	03311110000103550140	13,90	395	90	110	***	
355*160	03311110000103550160	15,80	435	90	120	***	
355*180	03311110000103550180	16,40	435	90	125	***	
355*200	03311110000103550200	18,60	485	90	130	***	
355*225	03311110000103550225	19,10	485	90	130	***	
355*250	03311110000103550250	22,70	525	90	145	***	
400*90	03311110000104000090	14,10	335	90	90	***	
400*110	03311110000104000110	16,30	380	90	105	***	
400*125	03311110000104000125	16,40	380	90	110	***	
400*140	03311110000104000140	17,40	395	90	110	***	
400*160	03311110000104000160	19,50	435	90	120	***	
400*180	03311110000104000180	20,10	435	90	125	***	
400*200	03311110000104000200	22,80	485	90	130	***	
400*225	03311110000104000225	23,30	485	90	130	***	
400*250	03311110000104000250	27,20	525	90	145	***	
450*90	03311110000104500090	17,80	335	90	90	***	
450*110	03311110000104500110	20,40	380	90	105	***	
450*125	03311110000104500125	20,50	380	90	110	***	
450*140	03311110000104500140	21,70	395	90	110	***	
450*160	03311110000104500160	24,30	435	90	120	***	
450*180	03311110000104500180	24,90	435	90	125	***	
450*200	03311110000104500200	28,10	485	90	130	***	

REDUCED TEE (SHORT) / İNEGAL TE (KISA)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
450*225	03311110000104500225	28,60	485	90	130	***		**
450*250	03311110000104500250	32,90	525	90	145	***		**
500*90	03311110000105000090	21,80	335	90	90	***		**
500*110	03311110000105000110	25,00	380	90	105	***		**
500*125	03311110000105000125	25,10	380	90	110	***		**
500*140	03311110000105000140	26,40	395	90	110	***		**
500*160	03311110000105000160	29,50	435	90	120	***		**
500*180	03311110000105000180	30,10	435	90	125	***		**
500*200	03311110000105000200	34,00	485	90	130	***		**
500*225	03311110000105000225	34,50	485	90	130	***		**
500*250	03311110000105000250	39,30	525	90	145	***		**
560*90	03311110000105600090	28,80	335	90	90	***		**
560*110	03311110000105600110	32,70	380	90	105	***		**
560*125	03311110000105600125	32,90	380	90	110	***		**
560*140	03311110000105600140	34,40	395	90	110	***		**
560*160	03311110000105600160	38,20	435	90	120	***		**
560*180	03311110000105600180	38,80	435	90	125	***		**
560*200	03311110000105600200	43,40	485	90	130	***		**
560*225	03311110000105600225	43,90	485	90	130	***		**
560*250	03311110000105600250	49,30	525	90	145	***		**
630*90	03311110000106300090	36,40	335	90	90	***		**
630*110	03311110000106300110	41,20	400	100	105	***		**
630*125	03311110000106300125	41,40	400	100	110	***		**
630*140	03311110000106300140	43,30	415	100	110	***		**
630*160	03311110000106300160	47,90	455	100	120	***		**
630*180	03311110000106300180	48,50	455	100	125	***		**
630*200	03311110000106300200	54,20	505	100	130	***		**
630*225	03311110000106300225	54,70	505	100	130	***		**
630*250	03311110000106300250	61,00	545	100	145	***		**

Büyük çaplar isteğe bağlı olarak üretilmektedir/ *Bigger sizes are available upon request.*

(*) : Enjeksiyon baskı / *Injected*

(**) : EF semer kullanılarak üretilmektedir. / *Produced by EF saddle*

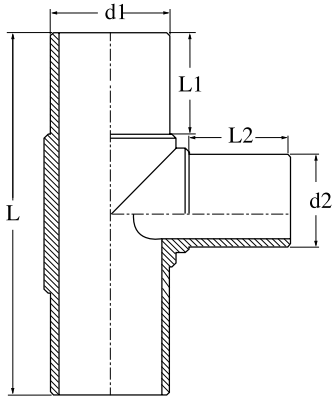
(***) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. (Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

REDUCED TEE / İNEGAL TE

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
50*32	03311110000000500032	0,20	190	60	65	40*30*30	30
50*40	03311110000000500040	0,20	196	60	60	40*30*30	30
63*32	03311110000000630032	0,33	220	64	75	40*30*30	20
63*40	03311110000000630040	0,34	220	64	58	40*30*30	20
63*50	03311110000000630050	0,35	220	64	62	40*30*30	16
75*32	03311110000000750032	0,90	277	76	60	60*40*30	16
75*40	03311110000000750040	0,92	277	79	60	60*40*30	16
75*63	03311110000000750063	0,95	277	77	85	60*40*30	16
90*50	03311110000000900050	0,90	305	85	85	60*40*30	15
90*63	03311110000000900063	0,90	305	85	85	60*40*30	15
90*75	03311110000000900075	0,90	305	85	85	60*40*30	15
110*90	03311110000001100090	1,52	340	95	75	60*40*45	12
110*32	03311110000001100032	1,40	340	95	80	60*40*45	12
110*50	03311110000001100050	1,45	340	95	85	60*40*45	12
110*63	03311110000001100063	1,45	340	95	65	60*40*45	12
110*90	03311110000001100090	1,52	340	95	75	60*40*45	12
125*90	03311110000001250090	1,92	360	95	85	60*40*45	9
125*110	03311110000001250110	2,07	360	95	90	60*40*45	9
140*90	03311110000001400090	2,68	400	100	95	60*40*30	4
140*110	03311110000001400110	2,79	400	100	100	60*40*30	4
140*125	03311110000001400125	3,20	400	120	90	60*40*30	4
160*90	03311110000001600090	4,45	560	150	90	60*40*45	5
160*110	03311110000001600110	4,60	560	150	95	60*40*45	5
160*125	03311110000001600125	4,65	560	150	95	60*40*45	5
160*140	03311110000001600140	5,00	560	100	140	60*40*45	5
180*90	03311110000001800090	6,00	560	145	90	60*40*30	2
180*110	03311110000001800110	6,00	560	145	80	60*40*30	2
180*125	03311110000001800125	6,20	560	145	90	60*40*30	2
180*140	03311110000001800140	5,82	430	105	140	60*40*30	2

REDUCED TEE / İNEGAL TE

SDR11 PE100 • *GAS*/GAZ : 10 BAR • *WATER*/SU : 16 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
180*160	03311110000001800160	7,60	470	105	150	60*40*30	2	*
200*90	03311110000002000090	6,10	500	120	90	60*40*45	3	*
200*110	03311110000002000110	6,20	500	120	90	60*40*45	3	*
200*125	03311110000002000125	6,60	430	115	125	60*40*45	3	*
200*140	03311110000002000140	7,00	470	140	110	60*40*45	3	*
200*160	03311110000002000160	7,30	490	140	140	60*40*45	3	*
200*180	03311110000002000180	9,00	485	115	150	60*40*45	3	*
225*90	03311110000002250090	8,20	540	130	85	60*40*45	2	*
225*110	03311110000002250110	8,45	540	130	90	60*40*45	2	*
225*125	03311110000002250125	8,60	540	130	95	60*40*45	2	*
225*140	03311110000002250140	8,30	460	120	110	60*40*45	2	*
225*160	03311110000002250160	8,80	540	130	110	60*40*45	2	*
225*180	03311110000002250180	9,00	540	130	115	60*40*45	2	*
225*200	03311110000002250200	11,80	560	120	130	60*40*45	2	*
250*90	03311110000002500090	7,89	450	155	90	60*40*30	1	*
250*110	03311110000002500110	8,50	460	155	110	60*40*30	1	*
250*125	03311110000002500125	9,70	470	130	125	60*40*30	1	*
250*140	03311110000002500140	10,00	485	130	140	60*40*30	1	*
250*160	03311110000002500160	10,79	530	160	140	60*40*30	1	*
250*180	03311110000002500180	12,50	525	130	150	60*40*45	1	*
250*200	03311110000002500200	14,80	610	145	130	60*40*45	1	*
250*225	03311110000002500225	16,62	575	130	170	60*40*45	1	*
280*90	03311110000002800090	10,00	440	140	80	***		*
280*110	03311110000002800110	11,95	490	140	110	***		*
280*125	03311110000002800125	12,00	490	140	90	***		*
280*140	03311110000002800140	12,50	505	140	110	***		*
280*160	03311110000002800160	14,70	545	140	140	***		*
280*180	03311110000002800180	15,00	545	140	150	***		*
280*200	03311110000002800200	16,60	595	140	130	***		*
280*225	03311110000002800225	16,40	595	140	150	***		*
280*250	03311110000002800250	19,80	635	140	145	***		*
315*90	03311110000003150090	13,00	465	150	90	***		*
315*110	03311110000003150110	15,10	510	150	110	***		*
315*125	03311110000003150125	15,20	510	150	90	***		*
315*140	03311110000003150140	15,70	525	150	110	***		*
315*160	03311110000003150160	18,20	565	150	140	***		*
315*180	03311110000003150180	18,60	570	150	150	***		*
315*200	03311110000003150200	20,30	615	150	130	***		*
315*225	03311110000003150225	20,10	615	150	150	***		*
315*250	03311110000003150250	23,70	655	150	145	***		*
355*90	03311110000003550090	17,20	495	165	90	***		**
355*110	03311110000003550110	19,60	540	165	110	***		**
355*125	03311110000003550125	19,70	540	165	90	***		**
355*140	03311110000003550140	20,30	555	165	110	***		**
355*160	03311110000003550160	23,00	595	165	140	***		**
355*180	03311110000003550180	23,30	595	165	150	***		**
355*200	03311110000003550200	25,50	645	165	130	***		**
355*225	03311110000003550225	25,30	645	165	150	***		**

SPIGOT-METRIC

SPIGOT-METRİK

REDUCED TEE / İNEGAL TE

SDR11 PE100 • *GAS*/GAZ : 10 BAR • *WATER*/SU : 16 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
355*250	03311110000003550250	29,20	685	165	145	***	**
400*110	03311110000004000110	25,60	570	180	110	***	**
400*125	03311110000004000125	25,70	570	180	90	***	**
400*140	03311110000004000140	26,40	585	180	110	***	**
400*160	03311110000004000160	29,50	625	180	140	***	**
400*180	03311110000004000180	29,80	625	180	150	***	**
400*200	03311110000004000200	32,50	675	180	130	***	**
400*225	03311110000004000225	32,30	675	180	150	***	**
400*250	03311110000004000250	36,50	715	180	145	***	**
450*90	03311110000004500090	30,10	555	195	90	***	**
450*110	03311110000004500110	33,40	600	195	110	***	**
450*125	03311110000004500125	33,50	600	195	90	***	**
450*140	03311110000004500140	34,40	615	195	110	***	**
450*160	03311110000004500160	38,00	655	195	140	***	**
450*180	03311110000004500180	38,20	655	195	150	***	**
450*200	03311110000004500200	41,40	705	195	130	***	**
450*225	03311110000004500225	41,20	705	195	150	***	**
450*250	03311110000004500250	46,00	745	195	145	***	**
500*90	03311110000005000090	39,60	595	215	90	***	**
500*110	03311110000005000110	43,40	640	215	110	***	**
500*125	03311110000005000125	43,60	640	215	90	***	**
500*140	03311110000005000140	44,60	655	215	110	***	**
500*160	03311110000005000160	48,70	695	215	140	***	**
500*180	03311110000005000180	49,00	695	215	150	***	**
500*200	03311110000005000200	52,80	745	215	130	***	**
500*225	03311110000005000225	52,60	745	215	150	***	**
500*250	03311110000005000250	58,00	785	215	145	***	**
560*90	03311110000005600090	52,70	635	235	90	***	**
560*110	03311110000005600110	57,30	680	235	110	***	**
560*125	03311110000005600125	57,40	680	235	90	***	**
560*140	03311110000005600140	58,80	695	235	110	***	**
560*160	03311110000005600160	63,50	735	235	140	***	**
560*180	03311110000005600180	63,80	735	235	150	***	**
560*200	03311110000005600200	68,40	785	235	130	***	**
560*225	03311110000005600225	68,20	785	235	150	***	**
560*250	03311110000005600250	74,00	825	235	145	***	**
630*90	03311110000006300090	70,00	675	255	90	***	**
630*110	03311110000006300110	75,40	720	255	110	***	**
630*125	03311110000006300125	75,50	720	255	90	***	**
630*140	03311110000006300140	77,20	735	255	110	***	**
630*160	03311110000006300160	82,70	775	255	140	***	**
630*180	03311110000006300180	83,00	775	255	150	***	**
630*200	03311110000006300200	88,70	825	255	130	***	**
630*225	03311110000006300225	88,50	825	255	150	***	**
630*250	03311110000006300250	95,00	865	255	145	***	**

Büyük çaplar isteğe bağlı olarak üretilmektedir/ *Bigger sizes are available upon request.*

(*) : Enjeksiyon baskı */ Injected*

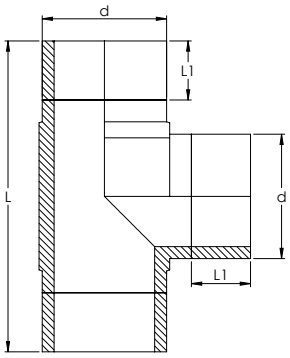
(**) : EF semer kullanılarak üretilmektedir. */ Produced by EF saddle*

(***) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. (Only Euro pallets are being used.*

MACHINED EQUAL TEE (LONG)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

NO DERATING FACTOR!



d	CODE	L1	L	Kg
355	11911710000003550000	175	925	68,70 **
400	11911710000004000000	190	1000	91,00 **
450	11911710000004500000	205	1080	121,60 **
500	11911710000005000000	225	1170	160,00 **
560	11911710000005600000	245	1270	213,40 **
630	11911710000006300000	265	1380	287,00 **
710	11911710000007100000	292	1514	390,50 **
800	11911710000008000000	322	1684	536,90 **
900	11911710000009000000	355	1850	734,90 **
1000	11911710000010000000	389	2018	986,60 **
1200	11911710000012000000	455	2350	1634,20 **
1400	11911710000014000000	522	2684	2480,30 **
1600	11911710000016000000	589	3018	3622,00 **
2000	11911710000020000000	589	3418	7175,50 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

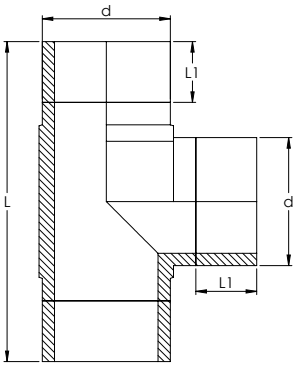
MACHINED EQUAL TEE (LONG)

SDR11 PE100

GAS/GAZ : 10 BAR

WATER/SU : 16 BAR

NO DERATING FACTOR!



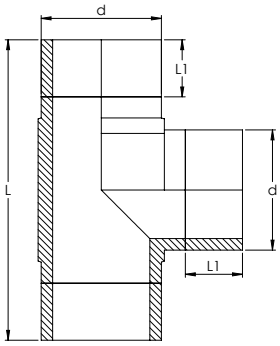
d	CODE	L1	L	Kg	
355	11911110000003550000	175	925	68,70	**
400	11911110000004000000	190	1000	91,00	**
450	11911110000004500000	205	1080	121,60	**
500	11911110000005000000	225	1170	160,00	**
560	11911110000005600000	245	1270	213,40	**
630	11911110000006300000	265	1380	287,00	**
710	11911110000007100000	292	1514	390,50	**
800	11911110000008000000	322	1684	536,90	**
900	11911110000009000000	355	1850	734,90	**
1000	11911110000010000000	389	2018	986,60	**
1200	11911110000012000000	455	2350	1634,20	**
1400	11911110000014000000	522	2684	2480,30	**
1600	11911110000016000000	589	3018	3622,00	**
2000	11911110000020000000	589	3418	8230,80	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED EQUAL TEE (LONG)

SDR9 PE100
WATER/SU : 20 BAR

NO DERATING FACTOR!



d	CODE	L1	L	Kg	
355	11910910000003550000	175	925	88,60	**
400	11910910000004000000	190	1000	118,30	**
450	11910910000004500000	205	1080	158,70	**
500	11910910000005000000	225	1170	209,20	**
560	11910910000005600000	245	1270	280,50	**
630	11910910000006300000	265	1380	378,80	**
710	11910910000007100000	292	1514	518,50	**
800	11910910000008000000	322	1684	716,70	**
900	11910910000009000000	355	1850	984,40	**
1000	11910910000010000000	389	2018	1321,40	**
1200	11910910000012000000	455	2350	2193,20	**
1400	11910910000014000000	522	2684	3346,40	**
1600	11910910000016000000	589	3018	4892,10	**

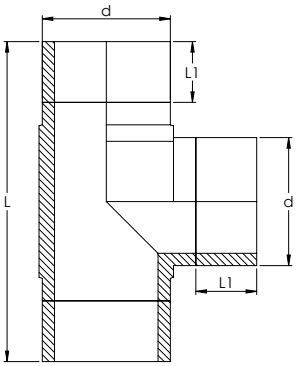
(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED EQUAL TEE (LONG)

SDR7,4 PE100

WATER/SU : 25 BAR

NO DERATING FACTOR!



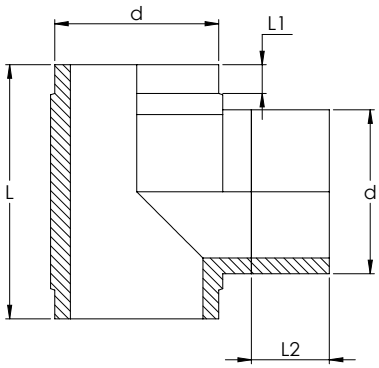
d	CODE	L1	L	Kg
355	11910710000003550000	175	925	96,90 **
400	11910710000004000000	190	1000	130,20 **
450	11910710000004500000	205	1080	174,80 **
500	11910710000005000000	225	1170	231,10 **
560	11910710000005600000	245	1270	310,00 **
630	11910710000006300000	265	1380	419,20 **
710	11910710000007100000	292	1514	574,70 **
800	11910710000008000000	322	1684	795,30 **
900	11910710000009000000	355	1850	1093,70 **
1000	11910710000010000000	389	2018	1468,50 **
1200	11910710000012000000	455	2350	2438,90 **
1400	11910710000014000000	522	2684	3727,60 **
1600	11910710000016000000	589	3018	5450,20 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmak*tadır. / No box is used. Only Euro pallets are being used.*

MACHINED EQUAL TEE (SHORT)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

NO DERATING FACTOR!



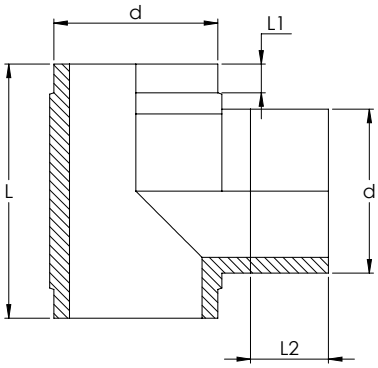
d	CODE	L1	L2	L	Kg
355	11911710000103550000	70	175	575	60,95 **
400	11911710000104000000	70	190	620	80,40 **
450	11911710000104500000	70	205	670	107,00 **
500	11911710000105000000	70	225	720	140,30 **
560	11911710000105600000	70	245	780	186,50 **
630	11911710000106300000	70	265	850	250,20 **
710	11911710000107100000	70	292	930	339,20 **
800	11911710000108000000	80	322	1040	465,00 **
900	11911710000109000000	80	355	1140	634,60 **
1000	11911710000110000000	80	389	1240	850,80 **
1200	11911710000112000000	80	455	1440	1405,50 **
1400	11911710000114000000	80	522	1640	2123,30 **
1600	11911710000116000000	80	589	1840	3095,90 **
2000	11911710000120000000	80	589	2240	6239,90 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED EQUAL TEE SDR11 (SHORT)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

NO DERATING FACTOR!



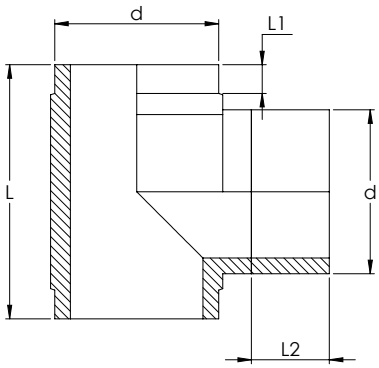
d	CODE	L1	L2	L	Kg
355	11911110000103550000	70	175	575	69,50 **
400	11911110000104000000	70	190	620	92,20 **
450	11911110000104500000	70	205	670	122,90 **
500	11911110000105000000	70	225	720	161,30 **
560	11911110000105600000	70	245	780	214,80 **
630	11911110000106300000	70	265	850	288,90 **
710	11911110000107100000	70	292	930	392,90 **
800	11911110000108000000	80	322	1040	540,60 **
900	11911110000109000000	80	355	1140	739,40 **
1000	11911110000110000000	80	389	1240	990,90 **
1200	11911110000112000000	80	455	1440	1638,50**
1400	11911110000114000000	80	522	1640	2483,00**
1600	11911110000116000000	80	589	1840	3621,90**
2000	11911110000120000000	80	589	2240	6986,90**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmak*tadır. / No box is used. Only Euro pallets are being used.*

MACHINED EQUAL TEE (SHORT)

SDR9 PE100
WATER/SU : 20 BAR

NO DERATING FACTOR!



d	CODE	L1	L2	L	Kg
355	11910910000103550000	70	175	575	74,90 **
400	11910910000104000000	70	190	620	99,50 **
450	11910910000104500000	70	205	670	132,90 **
500	11910910000105000000	70	225	720	174,40 **
560	11910910000105600000	70	245	780	232,80 **
630	11910910000106300000	70	265	850	313,50 **
710	11910910000107100000	70	292	930	427,20 **
800	11910910000108000000	80	322	1040	588,70 **
900	11910910000109000000	80	355	1140	805,90 **
1000	11910910000110000000	80	389	1240	1079,90 **
1200	11910910000112000000	80	455	1440	1786,50 **
1400	11910910000114000000	80	522	1640	2711,50 **
1600	11910910000116000000	80	589	1840	3956,20 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmak*tadır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

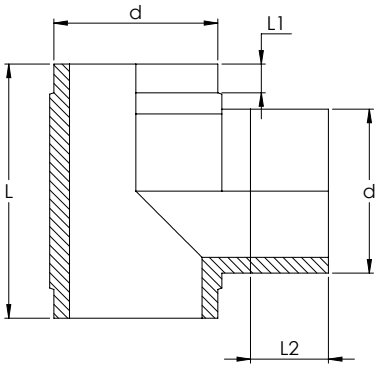
SPIGOT-METRİK

MACHINED EQUAL TEE SDR11 (SHORT)

SDR7,4 PE100

WATER/SU : 25 BAR

NO DERATING FACTOR!



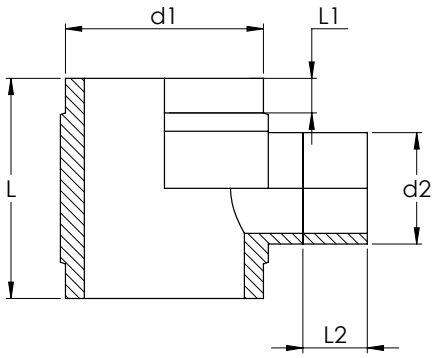
d	CODE	L1	L	Kg	
355	11910710000103550000	70	175	575	80,80 **
400	11910710000104000000	70	190	620	107,80 **
450	11910710000104500000	70	205	670	144,20 **
500	11910710000105000000	70	225	720	189,70 **
560	11910710000105600000	70	245	780	253,40 **
630	11910710000106300000	70	265	850	341,60 **
710	11910710000107100000	70	292	930	466,20 **
800	11910710000108000000	80	322	1040	643,40 **
900	11910710000109000000	80	355	1140	881,60 **
1000	11910710000110000000	80	389	1240	1181,60 **
1200	11910710000112000000	80	455	1440	1955,70 **
1400	11910710000114000000	80	522	1640	2973,00 **
1600	11910710000116000000	80	589	1840	4338,30 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

NO DERATING FACTOR!



d1*d2	CODE	L1	L2	L	Kg	
355*90	12011710000103550090	70	89	310	17,90	**
355*110	12011710000103550110	70	92	330	20,50	**
355*125	12011710000103550125	70	97	345	22,10	**
355*140	12011710000103550140	70	102	360	23,70	**
355*160	12011710000103550160	70	108	380	26,50	**
355*180	12011710000103550180	70	115	400	29,20	**
355*200	12011710000103550200	70	122	420	31,90	**
355*225	12011710000103550225	70	130	445	35,70	**
355*250	12011710000103550250	70	140	470	39,80	**
355*280	12011710000103550280	70	149	500	45,20	**
400*110	12011710000104000110	70	92	330	23,80	**
400*125	12011710000104000125	70	97	345	25,90	**
400*140	12011710000104000140	70	102	360	28,10	**
400*160	12011710000104000160	70	108	380	30,60	**
400*180	12011710000104000180	70	115	400	34,00	**
400*200	12011710000104000200	70	122	420	37,10	**
400*225	12011710000104000225	70	130	445	41,50	**
400*250	12011710000104000250	70	140	470	45,60	**
400*280	12011710000104000280	70	149	500	51,70	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg	
400*315	12011710000104000110	70	160	535	59,60	**
450*125	12011710000104500125	70	97	345	30,20	**
450*140	12011710000104500140	70	102	360	32,70	**
450*160	12011710000104500160	70	108	380	36,00	**
450*180	12011710000104500180	70	115	400	39,40	**
450*200	12011710000104500200	70	122	420	44,00	**
450*225	12011710000104500225	70	130	445	47,90	**
450*250	12011710000104500250	70	140	470	53,10	**
450*280	12011710000104500280	70	149	500	59,40	**
450*315	12011710000104500315	70	160	535	67,60	**
450*355	12011710000104500355	70	175	575	78,20	**
500*140	12011710000105000140	70	102	360	38,40	**
500*160	12011710000105000160	70	108	380	41,70	**
500*180	12011710000105000180	70	115	400	45,50	**
500*200	12011710000105000200	70	122	420	49,50	**
500*225	12011710000105000225	70	130	445	55,10	**
500*250	12011710000105000250	70	140	470	61,00	**
500*280	12011710000105000280	70	149	500	68,20	**
500*315	12011710000105000315	70	160	535	76,60	**
500*355	12011710000105000355	70	175	575	88,40	**
500*400	12011710000105000400	70	190	620	103,10	**
560*160	12011710000105600160	70	108	380	48,90	**
560*180	12011710000105600180	70	115	400	52,70	**
560*200	12011710000105600200	70	122	420	57,90	**
560*225	12011710000105600225	70	130	445	62,90	**
560*250	12011710000105600250	70	140	470	69,50	**
560*280	12011710000105600280	70	149	500	78,40	**
560*315	12011710000105600315	70	160	535	88,90	**
560*355	12011710000105600355	70	175	575	101,30	**
560*400	12011710000105600400	70	190	620	116,70	**
560*450	12011710000105600450	70	205	670	135,70	**
630*180	12011710000106300180	70	115	400	62,40	**
630*200	12011710000106300200	70	122	420	66,90	**
630*225	12011710000106300225	70	130	445	74,20	**
630*250	12011710000106300250	70	140	470	81,80	**
630*280	12011710000106300280	70	149	500	91,10	**
630*315	12011710000106300315	70	160	535	102,00	**
630*355	12011710000106300355	70	175	575	117,20	**
630*400	12011710000106300400	70	190	620	133,40	**
630*450	12011710000106300450	70	205	670	155,00	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg
630*500	12011710000106300500	70	225	720	179,90 **
710*180	12011710000107100180	70	115	400	74,30 **
710*200	12011710000107100200	70	122	420	79,60 **
710*225	12011710000107100225	70	130	445	88,00 **
710*250	12011710000107100250	70	140	470	96,80 **
710*280	12011710000107100280	70	149	500	105,20 **
710*315	12011710000107100315	70	160	535	118,80 **
710*355	12011710000107100355	70	175	575	134,90 **
710*400	12011710000107100400	70	190	620	154,90 **
710*450	12011710000107100450	70	205	670	177,90 **
710*500	12011710000107100500	70	225	720	206,20 **
710*560	12011710000107100560	70	245	780	240,20 **
800*200	12011710000108000200	80	122	440	97,30 **
800*225	12011710000108000225	80	130	465	107,10 **
800*250	12011710000108000250	80	140	490	114,90 **
800*280	12011710000108000280	80	149	520	127,10 **
800*315	12011710000108000315	80	160	555	141,50 **
800*355	12011710000108000355	80	175	595	158,30 **
800*400	12011710000108000400	80	190	640	181,10 **
800*450	12011710000108000450	80	205	690	207,30 **
800*500	12011710000108000500	80	225	740	239,60 **
800*560	12011710000108000560	80	245	800	273,80 **
800*630	12011710000108000630	80	265	870	324,50 **
900*225	12011710000109000225	80	130	465	127,80 **
900*250	12011710000109000220	80	140	490	137,10 **
900*280	12011710000109000280	80	149	520	148,20 **
900*315	12011710000109000315	80	160	555	167,90 **
900*355	12011710000109000355	80	175	595	187,40 **
900*400	12011710000109000400	80	190	640	209,70 **
900*450	12011710000109000450	80	205	690	239,60 **
900*500	12011710000109000500	80	225	740	271,60 **
900*560	12011710000109000560	80	245	800	315,50 **
900*630	12011710000109000630	80	265	870	367,60 **
900*710	12011710000109000710	80	292	950	441,70 **
1000*250	12011710000110000250	80	140	490	161,10 **
1000*280	12011710000110000280	80	149	520	173,90 **
1000*315	12011710000110000315	80	160	555	192,70 **
1000*355	12011710000110000355	80	175	595	214,70 **
1000*400	12011710000110000400	80	190	640	244,40 **
1000*450	12011710000110000450	80	205	690	278,50 **
1000*500	12011710000110000500	80	225	740	309,50 **
1000*560	12011710000110000560	80	245	800	358,80 **
1000*630	12011710000110000630	80	265	870	417,50 **
1000*710	12011710000110000710	80	292	950	493,90 **

SPIGOT-METRIC

SPIGOT-METRİK

MACHINED REDUCED TEE (SHORT)

SDR17 PE100 • *GAS*/GAZ : 6 BAR • *WATER*/SU : 10 BAR

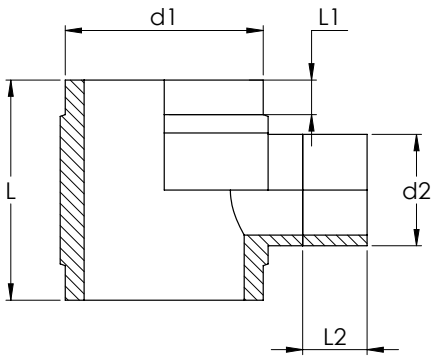
d1*d2	CODE	L1	L2	L	Kg
1000*800	12011710000110000800	80	322	1040	591,10 **
1200*280	12011710000112000280	80	149	520	230,90 **
1200*315	12011710000112000315	80	160	555	254,90 **
1200*355	12011710000112000355	80	175	595	282,90 **
1200*400	12011710000112000400	80	190	640	315,00 **
1200*450	12011710000112000450	80	205	690	351,30 **
1200*500	12011710000112000500	80	225	740	396,10 **
1200*560	12011710000112000560	80	245	800	450,00 **
1200*630	12011710000112000630	80	265	870	522,20 **
1200*710	12011710000112000710	80	292	950	607,20 **
1200*800	12011710000112000800	80	322	1040	726,10 **
1200*900	12011710000112000900	80	355	1140	863,80 **
1400*315	12011710000114000315	80	160	555	319,60 **
1400*355	12011710000114000355	80	175	595	353,70 **
1400*400	12011710000114000400	80	190	640	392,60 **
1400*450	12011710000114000450	80	205	690	444,10 **
1400*500	12011710000114000500	80	225	740	490,80 **
1400*560	12011710000114000560	80	245	800	555,90 **
1400*630	12011710000114000630	80	265	870	642,80 **
1400*710	12011710000114000710	80	292	950	745,20 **
1400*800	12011710000114000800	80	322	1040	876,20 **
1400*900	12011710000114000900	80	355	1140	1040,70 **
1400*1000	12011710000114001000	80	389	1240	1204,70 **
1600*355	12011710000116000355	80	175	595	437,80 **
1600*400	12011710000116000400	80	190	640	477,10 **
1600*450	12011710000116000450	80	205	690	538,10 **
1600*500	12011710000116000500	80	225	740	593,30 **
1600*560	12011710000116000560	80	245	800	670,20 **
1600*630	12011710000116000630	80	265	870	761,30 **
1600*710	12011710000116000710	80	292	950	880,60 **
1600*800	12011710000116000800	80	322	1040	1033,30 **
1600*900	12011710000116000900	80	355	1140	1209,90 **
1600*1000	12011710000116001000	80	389	1240	1416,30 **
1600*1200	12011710000116001200	80	455	1440	1893,50 **
2000*400	12011710000120000400	80	190	640	723,30 **
2000*450	12011710000120000450	80	205	690	789,00 **
2000*500	12011710000120000500	80	225	740	881,90 **
2000*560	12011710000120000560	80	245	800	978,80 **
2000*630	12011710000120000630	80	265	870	1109,20 **
2000*710	12011710000120000710	80	292	950	1225,30 **
2000*800	12011710000120000800	80	322	1040	1456,60 **
2000*900	12011710000120000900	80	355	1140	1702,30 **
2000*1000	12011710000120001000	80	389	1240	1966,10 **
2000*1200	12011710000120001200	80	455	1440	2572,10 **
2000*1400	12011710000120001400	80	522	1640	3282,90 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

NO DERATING FACTOR!



d1*d2	CODE	L1	L2	L	Kg
355*90	12011110000103550090	70	89	310	21,30 **
355*110	12011110000103550110	70	92	330	24,10 **
355*125	12011110000103550125	70	97	345	25,90 **
355*140	12011110000103550140	70	102	360	27,70 **
355*160	12011110000103550160	70	108	380	30,80 **
355*180	12011110000103550180	70	115	400	33,80 **
355*200	12011110000103550200	70	122	420	36,80 **
355*225	12011110000103550225	70	130	445	41,10 **
355*250	12011110000103550250	70	140	470	45,60 **
355*280	12011110000103550280	70	149	500	51,70 **
400*110	12011110000104000110	70	92	330	28,40 **
400*125	12011110000104000125	70	97	345	30,70 **
400*140	12011110000104000140	70	102	360	33,20 **
400*160	12011110000104000160	70	108	380	36,00 **
400*180	12011110000104000180	70	115	400	39,80 **
400*200	12011110000104000200	70	122	420	43,30 **
400*225	12011110000104000225	70	130	445	48,20 **
400*250	12011110000104000250	70	140	470	52,80 **
400*280	12011110000104000280	70	149	500	59,70 **
400*315	12011110000104000110	70	160	535	68,50 **
450*125	12011110000104500125	70	97	345	36,20 **
450*140	12011110000104500140	70	102	360	39,00 **
450*160	12011110000104500160	70	108	380	42,70 **
450*180	12011110000104500180	70	115	400	46,50 **
450*200	12011110000104500200	70	122	420	51,50 **
450*225	12011110000104500225	70	130	445	56,00 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

MACHINED REDUCED TEE (SHORT)

SDR11 PE100

GAS/GAZ : 10 BAR

WATER/SU : 16 BAR

d1*d2	CODE	L1	L2	L	Kg
450*250	12011110000104500250	70	140	470	62,00 **
450*280	12011110000104500280	70	149	500	69,10 **
450*315	12011110000104500315	70	160	535	78,30 **
450*355	12011110000104500355	70	175	575	90,20 **
500*140	12011110000105000140	70	102	360	46,00 **
500*160	12011110000105000160	70	108	380	49,80 **
500*180	12011110000105000180	70	115	400	54,20 **
500*200	12011110000105000200	70	122	420	58,70 **
500*225	12011110000105000225	70	130	445	65,10 **
500*250	12011110000105000250	70	140	470	71,70 **
500*280	12011110000105000280	70	149	500	79,70 **
500*315	12011110000105000315	70	160	535	89,30 **
500*355	12011110000105000355	70	175	575	102,60 **
500*400	12011110000105000400	70	190	620	119,10 **
560*160	12011110000105600160	70	108	380	59,10 **
560*180	12011110000105600180	70	115	400	63,50 **
560*200	12011110000105600200	70	122	420	69,30 **
560*225	12011110000105600225	70	130	445	75,10 **
560*250	12011110000105600250	70	140	470	82,60 **
560*280	12011110000105600280	70	149	500	92,50 **
560*315	12011110000105600315	70	160	535	104,30 **
560*355	12011110000105600355	70	175	575	118,40 **
560*400	12011110000105600400	70	190	620	135,80 **
560*450	12011110000105600450	70	205	670	157,30 **
630*180	12011110000106300180	70	115	400	76,00 **
630*200	12011110000106300200	70	122	420	81,20 **
630*225	12011110000106300225	70	130	445	89,50 **
630*250	12011110000106300250	70	140	470	98,20 **
630*280	12011110000106300280	70	149	500	108,60 **
630*315	12011110000106300315	70	160	535	121,00 **
630*355	12011110000106300355	70	175	575	138,20 **
630*400	12011110000106300400	70	190	620	156,70 **
630*450	12011110000106300450	70	205	670	181,00 **
630*500	12011110000106300500	70	225	720	209,00 **
710*180	12011110000107100180	70	115	400	91,50 **
710*200	12011110000107100200	70	122	420	97,60 **
710*225	12011110000107100225	70	130	445	107,30 **
710*250	12011110000107100250	70	140	470	117,30 **
710*280	12011110000107100280	70	149	500	127,20 **
710*315	12011110000107100315	70	160	535	142,70 **
710*355	12011110000107100355	70	175	575	160,90 **
710*400	12011110000107100400	70	190	620	183,60 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR

d1*d2	CODE	L1	L2	L	Kg
710*450	12011110000107100450	70	205	1254	285,70 **
710*500	12011110000107100500	70	225	1304	315,60 **
710*560	12011110000107100560	70	245	1364	356,10 **
800*200	12011110000108000200	80	122	440	121,20 **
800*225	12011110000108000225	80	130	465	132,40 **
800*250	12011110000108000250	80	140	490	141,80 **
800*280	12011110000108000280	80	149	520	155,80 **
800*315	12011110000108000315	80	160	555	172,30 **
800*355	12011110000108000355	80	175	595	191,80 **
800*400	12011110000108000400	80	190	640	217,70 **
800*450	12011110000108000450	80	205	690	247,60 **
800*500	12011110000108000500	80	225	740	283,90 **
800*560	12011110000108000560	80	245	800	323,20 **
800*630	12011110000108000630	80	265	870	380,40 **
900*225	12011110000109000225	80	130	465	159,80 **
900*250	12011110000109000220	80	140	490	170,90 **
900*280	12011110000109000280	80	149	520	184,30 **
900*315	12011110000109000315	80	160	555	206,60 **
900*355	12011110000109000355	80	175	595	229,30 **
900*400	12011110000109000400	80	190	640	255,40 **
900*450	12011110000109000450	80	205	690	289,60 **
900*500	12011110000109000500	80	225	740	326,20 **
900*560	12011110000109000560	80	245	800	375,90 **
900*630	12011110000109000630	80	265	870	435,30 **
900*710	12011110000109000710	80	292	950	518,90 **
1000*250	12011110000110000250	80	140	490	202,60 **
1000*280	12011110000110000280	80	149	520	218,10 **
1000*315	12011110000110000315	80	160	555	240,20 **
1000*355	12011110000110000355	80	175	595	265,90 **
1000*400	12011110000110000400	80	190	640	300,00 **
1000*450	12011110000110000450	80	205	690	339,10 **
1000*500	12011110000110000500	80	225	740	375,50 **
1000*560	12011110000110000560	80	245	800	431,50 **
1000*630	12011110000110000630	80	265	870	498,50 **
1000*710	12011110000110000710	80	292	950	585,40 **
1000*800	12011110000110000800	80	322	1040	695,60 **
1200*280	12011110000112000280	80	149	520	294,10 **
1200*315	12011110000112000315	80	160	555	322,60 **
1200*355	12011110000112000355	80	175	595	355,80 **
1200*400	12011110000112000400	80	190	640	393,80 **
1200*450	12011110000112000450	80	205	690	436,90 **
1200*500	12011110000112000500	80	225	740	488,70 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being*

SPIGOT-METRIC

SPIGOT-METRİK

MACHINED REDUCED TEE (SHORT)

SDR11 PE100

GAS/GAZ : 10 BAR

WATER/SU : 16 BAR

d1*d2	CODE	L1	L2	L	Kg
1200*560	12011110000112000560	80	245	800	551,40 **
1200*630	12011110000112000630	80	265	870	634,20 **
1200*710	12011110000112000710	80	292	950	732,20 **
1200*800	12011110000112000800	80	322	1040	866,90 **
1200*900	12011110000112000900	80	355	1140	1024,00 **
1400*315	12011110000114000315	80	160	555	411,20 **
1400*355	12011110000114000355	80	175	595	452,20 **
1400*400	12011110000114000400	80	190	640	499,00 **
1400*450	12011110000114000450	80	205	690	559,30 **
1400*500	12011110000114000500	80	225	740	615,10 **
1400*560	12011110000114000560	80	245	800	691,30 **
1400*630	12011110000114000630	80	265	870	791,70 **
1400*710	12011110000114000710	80	292	950	910,20 **
1400*800	12011110000114000800	80	322	1040	1060,50 **
1400*900	12011110000114000900	80	355	1140	1248,20 **
1400*1000	12011110000114001000	80	389	1240	1437,20 **
1600*355	12011110000116000355	80	175	595	566,00 **
1600*400	12011110000116000400	80	190	640	615,40 **
1600*450	12011110000116000450	80	205	690	687,60 **
1600*500	12011110000116000500	80	225	740	754,40 **
1600*560	12011110000116000560	80	245	800	845,30 **
1600*630	12011110000116000630	80	265	870	953,10 **
1600*710	12011110000116000710	80	292	950	1092,30 **
1600*800	12011110000116000800	80	322	1040	1268,50 **
1600*900	12011110000116000900	80	355	1140	1472,60 **
1600*1000	12011110000116001000	80	389	1240	1708,40 **
1600*1200	12011110000116001200	80	455	1440	2250,90 **
2000*400	12011110000120000400	80	190	640	934,70 **
2000*450	12011110000120000450	80	205	690	1017,20 **
2000*500	12011110000120000500	80	225	740	1127,20 **
2000*560	12011110000120000560	80	245	800	1244,70 **
2000*630	12011110000120000630	80	265	870	1399,50 **
2000*710	12011110000120000710	80	292	950	1544,30 **
2000*800	12011110000120000800	80	322	1040	1808,70 **
2000*900	12011110000120000900	80	355	1140	2092,70 **
2000*1000	12011110000120001000	80	389	1240	2396,20 **
2000*1200	12011110000120001200	80	455	1440	3087,80 **
2000*1400	12011110000120001400	80	522	1640	3894,20 **

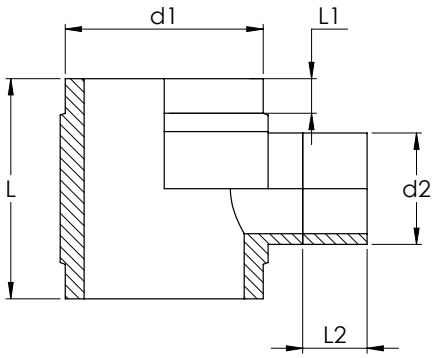
(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR9 PE100

WATER/SU : 20 BAR

NO DERATING FACTOR!



d1*d2	CODE	L1	L2	L	Kg
355*90	12010910000103550090	70	89	310	23,40 **
355*110	12010910000103550110	70	92	330	26,30 **
355*125	12010910000103550125	70	97	345	28,20 **
355*140	12010910000103550140	70	102	360	30,20 **
355*160	12010910000103550160	70	108	380	33,50 **
355*180	12010910000103550180	70	115	400	36,70 **
355*200	12010910000103550200	70	122	420	39,90 **
355*225	12010910000103550225	70	130	445	44,50 **
355*250	12010910000103550250	70	140	470	49,40 **
355*280	12010910000103550280	70	149	500	55,80 **
400*110	12010910000104000110	70	92	330	31,20 **
400*125	12010910000104000125	70	97	345	33,70 **
400*140	12010910000104000140	70	102	360	36,30 **
400*160	12010910000104000160	70	108	380	39,40 **
400*180	12010910000104000180	70	115	400	43,40 **
400*200	12010910000104000200	70	122	420	47,10 **
400*225	12010910000104000225	70	130	445	52,30 **
400*250	12010910000104000250	70	140	470	57,30 **
400*280	12010910000104000280	70	149	500	64,60 **
400*315	12010910000104000110	70	160	535	74,10 **
450*125	12010910000104500125	70	97	345	39,90 **
450*140	12010910000104500140	70	102	360	42,90 **
450*160	12010910000104500160	70	108	380	46,90 **
450*180	12010910000104500180	70	115	400	51,00 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR9 PE100

WATER/SU : 20 BAR

d1*d2	CODE	L1	L2	L	Kg
450*200	12010910000104500200	70	122	420	56,30 **
450*225	12010910000104500225	70	130	445	61,20 **
450*250	12010910000104500250	70	140	470	67,50 **
450*280	12010910000104500280	70	149	500	75,10 **
450*315	12010910000104500315	70	160	535	85,10 **
450*355	12010910000104500355	70	175	575	97,70 **
500*140	12010910000105000140	70	102	360	50,80 **
500*160	12010910000105000160	70	108	380	54,90 **
500*180	12010910000105000180	70	115	400	59,60 **
500*200	12010910000105000200	70	122	420	64,40 **
500*225	12010910000105000225	70	130	445	71,20 **
500*250	12010910000105000250	70	140	470	78,30 **
500*280	12010910000105000280	70	149	500	86,90 **
500*315	12010910000105000315	70	160	535	97,30 **
500*355	12010910000105000355	70	175	575	111,40 **
500*400	12010910000105000400	70	190	620	129,10 **
560*160	12010910000105600160	70	108	380	65,40 **
560*180	12010910000105600180	70	115	400	70,30 **
560*200	12010910000105600200	70	122	420	76,50 **
560*225	12010910000105600225	70	130	445	82,80 **
560*250	12010910000105600250	70	140	470	90,80 **
560*280	12010910000105600280	70	149	500	101,40 **
560*315	12010910000105600315	70	160	535	114,10 **
560*355	12010910000105600355	70	175	575	129,20 **
560*400	12010910000105600400	70	190	620	148,00 **
560*450	12010910000105600450	70	205	670	171,00 **
630*180	12010910000106300180	70	115	400	84,50 **
630*200	12010910000106300200	70	122	420	90,20 **
630*225	12010910000106300225	70	130	445	99,10 **
630*250	12010910000106300250	70	140	470	108,40 **
630*280	12010910000106300280	70	149	500	119,70 **
630*315	12010910000106300315	70	160	535	133,10 **
630*355	12010910000106300355	70	175	575	151,40 **
630*400	12010910000106300400	70	190	620	171,40 **
630*450	12010910000106300450	70	205	670	197,50 **
630*500	12010910000106300500	70	225	720	227,40 **
710*180	12010910000107100180	70	115	400	102,20 **
710*200	12010910000107100200	70	122	420	109,00 **
710*225	12010910000107100225	70	130	445	119,40 **
710*250	12010910000107100250	70	140	470	130,20 **
710*280	12010910000107100280	70	149	500	141,10 **
710*315	12010910000107100315	70	160	535	157,70 **
710*355	12010910000107100355	70	175	575	177,40 **

MACHINED REDUCED TEE (SHORT)

SDR9 PE100

WATER/SU : 20 BAR

d1*d2	CODE	L1	L2	L	Kg
710*400	12010910000107100400	70	190	620	201,70 **
710*450	12010910000107100450	70	205	670	229,90 **
710*500	12010910000107100500	70	225	720	263,90 **
710*560	12010910000107100560	70	245	780	305,50 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

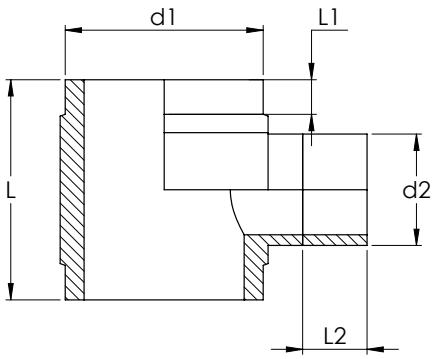
SPIGOT-METRIC

SPIGOT-METRİK

MACHINED REDUCED TEE (SHORT)

SDR7,4 PE100

WATER/SU : 10 BAR



d1*d2	CODE	L1	L2	L	Kg
355*90	12010710000103550090	70	89	310	25,60 **
355*110	12010710000103550110	70	92	330	28,70 **
355*125	12010710000103550125	70	97	345	30,80 **
355*140	12010710000103550140	70	102	360	32,90 **
355*160	12010710000103550160	70	108	380	36,50 **
355*180	12010710000103550180	70	115	400	39,80 **
355*200	12010710000103550200	70	122	420	43,30 **
355*225	12010710000103550225	70	130	445	48,20 **
355*250	12010710000103550250	70	140	470	53,50 **
355*280	12010710000103550280	70	149	500	60,40 **
400*110	12010710000104000110	70	92	330	34,30 **
400*125	12010710000104000125	70	97	345	37,00 **
400*140	12010710000104000140	70	102	360	39,80 **
400*160	12010710000104000160	70	108	380	43,20 **
400*180	12010710000104000180	70	115	400	47,40 **
400*200	12010710000104000200	70	122	420	51,40 **
400*225	12010710000104000225	70	130	445	57,00 **
400*250	12010710000104000250	70	140	470	62,50 **
400*280	12010710000104000280	70	149	500	70,30 **
400*315	12010710000104000110	70	160	535	80,40 **
450*125	12010710000104500125	70	97	345	44,10 **
450*140	12010710000104500140	70	102	360	47,30 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR7,4 PE100

WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg
450*160	12010710000104500160	70	108	380	51,50 **
450*180	12010710000104500180	70	115	400	56,00 **
450*200	12010710000104500200	70	122	420	61,60 **
450*225	12010710000104500225	70	130	445	67,00 **
450*250	12010710000104500250	70	140	470	73,70 **
450*280	12010710000104500280	70	149	500	82,00 **
450*315	12010710000104500315	70	160	535	92,60 **
450*355	12010710000104500355	70	175	575	106,30 **
500*140	12010710000105000140	70	102	360	56,30 **
500*160	12010710000105000160	70	108	380	60,80 **
500*180	12010710000105000180	70	115	400	65,80 **
500*200	12010710000105000200	70	122	420	71,00 **
500*225	12010710000105000225	70	130	445	78,30 **
500*250	12010710000105000250	70	140	470	86,00 **
500*280	12010710000105000280	70	149	500	95,30 **
500*315	12010710000105000315	70	160	535	106,50 **
500*355	12010710000105000355	70	175	575	121,70 **
500*400	12010710000105000400	70	190	620	140,70 **
560*160	12010710000105600160	70	108	380	72,60 **
560*180	12010710000105600180	70	115	400	77,90 **
560*200	12010710000105600200	70	122	420	84,60 **
560*225	12010710000105600225	70	130	445	91,50 **
560*250	12010710000105600250	70	140	470	100,20 **
560*280	12010710000105600280	70	149	500	111,50 **
560*315	12010710000105600315	70	160	535	125,20 **
560*355	12010710000105600355	70	175	575	141,50 **
560*400	12010710000105600400	70	190	620	161,70 **
560*450	12010710000105600450	70	205	670	186,50 **
630*180	12010710000106300180	70	115	400	94,10 **
630*200	12010710000106300200	70	122	420	100,30 **
630*225	12010710000106300225	70	130	445	109,90 **
630*250	12010710000106300250	70	140	470	120,00 **
630*280	12010710000106300280	70	149	500	132,20 **
630*315	12010710000106300315	70	160	535	146,70 **
630*355	12010710000106300355	70	175	575	166,40 **
630*400	12010710000106300400	70	190	620	188,10 **
630*450	12010710000106300450	70	205	670	216,20 **
630*500	12010710000106300500	70	225	720	248,60 **
710*180	12010710000107100180	70	115	400	114,30 **
710*200	12010710000107100200	70	122	420	121,70 **
710*225	12010710000107100225	70	130	445	133,00 **
710*250	12010710000107100250	70	140	470	144,80 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being used.*

MACHINED REDUCED TEE (SHORT)

SDR7,4 PE100

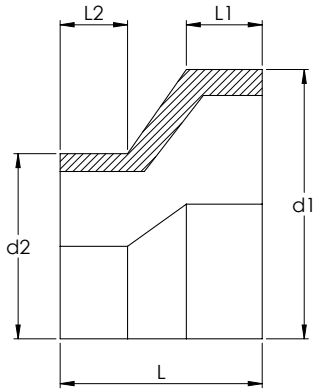
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg
710*280	12010710000107100280	70	149	500	156,70 **
710*315	12010710000107100315	70	160	535	174,70 **
710*355	12010710000107100355	70	175	575	196,00 **
710*400	12010710000107100400	70	190	620	222,30 **
710*450	12010710000107100450	70	205	670	252,80 **
710*500	12010710000107100500	70	225	720	289,50 **
710*560	12010710000107100560	70	245	780	334,30 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)

SDR26 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR



d1*d2	CODE	L1	L2	L	Kg
160*90	03012610000101600090	54	40	140	0,40 **
160*110	03012610000101600110	45	40	120	0,35 **
160*125	03012610000101600125	44	40	110	0,35 **
160*140	03012610000101600140	43	40	100	0,30 **
180*110	03012610000101800110	54	40	140	0,52 **
180*125	03012610000101800125	52	40	130	0,49 **
180*140	03012610000101800140	51	40	120	0,47 **
180*160	03012610000101800160	43	40	100	0,40 **
200*125	03012610000102000125	61	40	150	0,68 **
200*140	03012610000102000140	50	40	130	0,61 **
200*160	03012610000102000160	51	40	120	0,58 **
200*180	03012610000102000180	43	40	100	0,49 **
225*140	03012610000102250140	65	40	160	0,91 **
225*160	03012610000102250160	57	40	140	0,83 **
225*180	03012610000102250180	48	40	120	0,72 **
225*200	03012610000102250200	50	40	110	0,68 **
250*160	03012610000102500160	72	40	170	1,20 **
250*180	03012610000102500180	64	40	150	1,09 **
250*200	03012610000102500200	55	40	130	0,96 **
250*225	03012610000102500225	50	40	110	0,83 **
280*180	03012610000102800180	76	40	180	1,58 **
280*200	03012610000102800200	68	40	160	1,44 **
280*225	03012610000102800225	62	40	140	1,30 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)

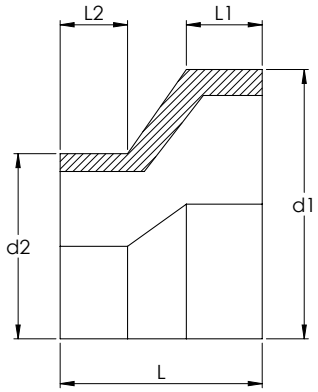
SDR26 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg	
280*250	03012610000102800250	57	40	120	1,14	**
315*200	03012610000103150200	78	40	190	2,08	**
315*225	03012610000103150225	72	40	170	1,93	**
315*250	03012610000103150250	67	40	150	1,75	**
315*280	03012610000103150280	64	40	130	1,55	**
355*225	03012610000103550225	89	40	210	2,91	**
355*250	03012610000103550250	84	40	190	2,71	**
355*280	03012610000103550280	61	40	150	2,21	**
355*315	03012610000103550315	61	40	130	1,97	**
400*250	03012610000104000250	98	40	230	4,00	**
400*280	03012610000104000280	85	40	200	3,59	**
400*315	03012610000104000315	75	40	170	3,16	**
400*355	03012610000104000355	68	40	140	2,69	**
450*280	03012610000104500280	106	40	251	5,47	**
450*315	03012610000104500315	96	40	220	4,97	**
450*355	03012610000104500355	89	40	190	4,46	**
450*400	03012610000104500400	75	40	150	3,64	**
500*280	03012610000105000280	118	40	291	7,52	**
500*315	03012610000105000315	107	40	261	6,83	**
500*355	03012610000105000355	101	40	230	6,41	**
500*400	03012610000105000400	96	40	200	5,80	**
500*450	03012610000105000450	85	40	160	4,79	**
560*400	03012610000105600400	112	40	251	8,75	**
560*450	03012610000105600450	101	40	210	7,62	**
560*500	03012610000105600500	90	40	170	6,36	**
630*450	03012610000106300450	121	40	271	11,89	**
630*500	03012610000106300500	109	40	230	10,47	**
630*560	03012610000106300560	94	40	180	8,50	**
710*560	03012610000107100560	98	40	231	13,21	**
710*630	03012610000107100630	88	40	174	10,43	**
800*630	03012610000108000630	121	40	271	19,60	**
800*710	03012610000108000710	76	40	190	14,25	**
900*710	03012610000109000710	133	40	281	25,83	**
900*800	03012610000109000800	70	40	210	19,73	**
1000*800	03012610000110000800	141	40	301	34,13	**
1000*900	03012610000110000900	106	40	220	25,95	**
1200*1000	03012610000112001000	149	40	311	51,34	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR



d1*d2	CODE	L1	L2	L	Kg
160*90	03011710000101600090	54	40	140	0,55 **
160*110	03011710000101600110	45	40	120	0,50 **
160*125	03011710000101600125	44	40	110	0,45 **
160*140	03011710000101600140	43	40	100	0,45 **
180*110	03011710000101800110	54	40	140	0,69 **
180*125	03011710000101800125	52	40	130	0,66 **
180*140	03011710000101800140	51	40	120	0,64 **
180*160	03011710000101800160	43	40	100	0,55 **
200*125	03011710000102000125	61	40	150	0,91 **
200*140	03011710000102000140	50	40	130	0,82 **
200*160	03011710000102000160	51	40	120	0,79 **
200*180	03011710000102000180	43	40	100	0,68 **
225*140	03011710000102250140	65	40	160	1,23 **
225*160	03011710000102250160	57	40	140	1,12 **
225*180	03011710000102250180	48	40	120	0,99 **
225*200	03011710000102250200	50	40	110	0,95 **
250*160	03011710000102500160	72	40	170	1,62 **
250*180	03011710000102500180	64	40	150	1,48

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)

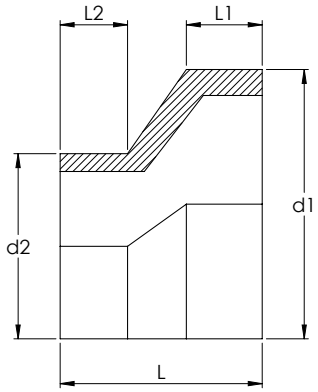
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg
250*200	03011710000102500200	55	40	130	1,33 **
250*225	03011710000102500225	50	40	110	1,17 **
280*180	03011710000102800180	76	40	180	2,14 **
280*200	03011710000102800200	68	40	160	1,97 **
280*225	03011710000102800225	62	40	140	1,80 **
280*250	03011710000102800250	57	40	120	1,60 **
315*200	03011710000103150200	78	40	190	2,83 **
315*225	03011710000103150225	72	40	170	2,64 **
315*250	03011710000103150250	67	40	150	2,42 **
315*280	03011710000103150280	64	40	130	2,19 **
355*225	03011710000103550225	89	40	210	3,98 **
355*250	03011710000103550250	84	40	190	3,73 **
355*280	03011710000103550280	61	40	150	3,05 **
355*315	03011710000103550315	61	40	130	2,77 **
400*250	03011710000104000250	98	40	230	5,47 **
400*280	03011710000104000280	85	40	200	4,93 **
400*315	03011710000104000315	75	40	170	4,38 **
400*355	03011710000104000355	68	40	140	3,79 **
450*280	03011710000104500280	106	40	251	7,52 **
450*315	03011710000104500315	96	40	220	6,87 **
450*355	03011710000104500355	89	40	190	6,22 **
450*400	03011710000104500400	75	40	150	5,13 **
500*280	03011710000105000280	118	40	291	10,34 **
500*315	03011710000105000315	107	40	261	9,34 **
500*355	03011710000105000355	101	40	230	8,90 **
500*400	03011710000105000400	96	40	200	8,12 **
500*450	03011710000105000450	85	40	160	6,80 **
560*400	03011710000105600400	112	40	251	12,18 **
560*450	03011710000105600450	101	40	210	10,69 **
560*500	03011710000105600500	90	40	170	9,03 **
630*450	03011710000106300450	121	40	271	16,61 **
630*500	03011710000106300500	109	40	230	14,72 **
630*560	03011710000106300560	94	40	180	12,06 **
710*560	03011710000107100560	98	40	231	18,50 **
710*630	03011710000107100630	88	40	174	14,76 **
800*630	03011710000108000630	121	40	271	27,58 **
800*710	03011710000108000710	76	40	190	20,17 **
900*710	03011710000109000710	133	40	281	36,33 **
900*800	03011710000109000800	70	40	210	27,95 **
1000*800	03011710000110000800	141	40	301	48,17 **
1000*900	03011710000110000900	106	40	220	36,89 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR



d1*d2	CODE	L1	L2	L	Kg
160*90	03011110000101600090	54	40	140	0,75 **
160*110	03011110000101600110	45	40	120	0,65 **
160*125	03011110000101600125	44	40	110	0,65 **
160*140	03011110000101600140	43	40	100	0,62 **
180*110	03011110000101800110	54	40	140	0,94 **
180*125	03011110000101800125	52	40	130	0,92 **
180*140	03011110000101800140	51	40	120	0,89 **
180*160	03011110000101800160	43	40	100	0,79 **
200*125	03011110000102000125	61	40	150	1,26 **
200*140	03011110000102000140	50	40	130	1,13 **
200*160	03011110000102000160	51	40	120	1,11 **
200*180	03011110000102000180	43	40	100	0,98 **
225*140	03011110000102250140	65	40	160	1,69 **
225*160	03011110000102250160	57	40	140	1,56 **
225*180	03011110000102250180	48	40	120	1,40 **
225*200	03011110000102250200	50	40	110	1,36

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (SHORT)
EKSANTRİK REDÜKSİYON (KISA)

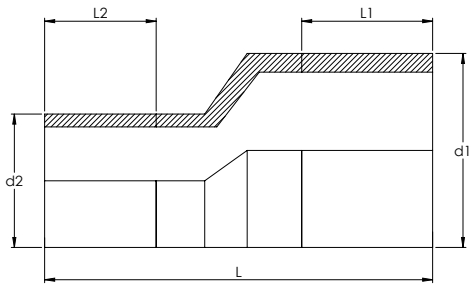
SDR11 PE100 / *GAS*/GAZ : 10 BAR
WATER/SU : 16 BAR

d1*d2	CODE	L1	L2	L	Kg
250*160	03011110000102500160	72	40	170	2,25 **
250*180	03011110000102500180	64	40	150	2,08 **
250*200	03011110000102500200	55	40	130	1,88 **
250*225	03011110000102500225	50	40	110	1,69 **
280*180	03011110000102800180	76	40	180	2,99 **
280*200	03011110000102800200	68	40	160	2,77 **
280*225	03011110000102800225	62	40	140	2,55 **
280*250	03011110000102800250	57	40	120	2,30 **
315*200	03011110000103150200	78	40	190	3,96 **
315*225	03011110000103150225	72	40	170	3,72 **
315*250	03011110000103150250	67	40	150	3,44 **
315*280	03011110000103150280	64	40	130	3,15 **
355*225	03011110000103550225	89	40	210	5,59 **
355*250	03011110000103550250	84	40	190	5,28 **
355*280	03011110000103550280	61	40	150	4,32 **
355*315	03011110000103550315	61	40	130	3,99 **
400*250	03011110000104000250	98	40	230	7,74 **
400*280	03011110000104000280	85	40	200	7,00 **
400*315	03011110000104000315	75	40	170	6,25 **
400*355	03011110000104000355	68	40	140	5,47 **
450*280	03011110000104500280	106	40	251	10,65 **
450*315	03011110000104500315	96	40	220	9,77 **
450*355	03011110000104500355	89	40	190	8,91 **
450*400	03011110000104500400	75	40	150	7,43 **
500*280	03011110000105000280	118	40	291	14,65 **
500*315	03011110000105000315	107	40	261	13,17 **
500*355	03011110000105000355	101	40	230	12,69 **
500*400	03011110000105000400	96	40	200	11,67 **
500*450	03011110000105000450	85	40	160	9,87 **
560*400	03011110000105600400	112	40	251	17,43 **
560*450	03011110000105600450	101	40	210	15,38 **
560*500	03011110000105600500	90	40	170	13,09 **
630*450	03011110000106300450	121	40	271	23,83 **
630*500	03011110000106300500	109	40	230	21,20 **
630*560	03011110000106300560	94	40	180	17,50 **
710*560	03011110000107100560	98	40	231	26,65 **
710*630	03011110000107100630	88	40	174	21,42 **
800*630	03011110000108000630	121	40	271	39,89 **
800*710	03011110000108000710	76	40	190	29,33 **
900*710	03011110000109000710	133	40	281	52,67 **
900*800	03011110000109000800	70	40	210	40,76 **
1000*800	03011110000110000800	141	40	301	70,00 **
1000*900	03011110000110000900	106	40	220	53,93 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)

SDR26 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR



d1*d2	CODE	L1	L2	L	Kg
160*90	03012610000001600090	108	89	337	0,83 **
160*110	03012610000001600110	108	92	320	0,83 **
160*125	03012610000001600125	108	97	315	0,86 **
160*140	03012610000001600140	108	102	310	0,89 **
180*110	03012610000001800110	115	92	347	1,10 **
180*125	03012610000001800125	115	97	342	1,12 **
180*140	03012610000001800140	115	102	337	1,15 **
180*160	03012610000001800160	115	108	323	1,18 **
200*125	03012610000002000125	122	97	369	1,45 **
200*140	03012610000002000140	122	102	354	1,43 **
200*160	03012610000002000160	122	108	350	1,50 **
200*180	03012610000002000180	122	115	337	1,52 **
225*140	03012610000002250140	130	102	392	1,95 **
225*160	03012610000002250160	130	108	378	1,95 **
225*180	03012610000002250180	130	115	365	1,97 **
225*200	03012610000002250200	130	122	362	2,06 **
250*160	03012610000002500160	140	108	418	2,58 **
250*180	03012610000002500180	140	115	405	2,59 **
250*200	03012610000002500200	140	122	392	2,60 **
250*225	03012610000002500225	140	130	380	2,68 **
280*180	03012610000002800180	149	115	444	3,44 **
280*200	03012610000002800200	149	122	431	3,44 **
280*225	03012610000002800225	149	130	419	3,51 **
280*250	03012610000002800250	149	140	409	3,60 **
315*200	03012610000003150200	160	122	472	4,58 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)

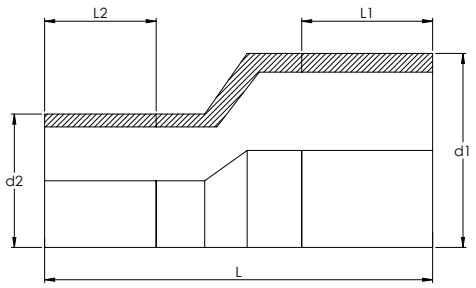
SDR26 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg	
315*225	03012610000003150225	160	130	460	4,64	**
315*250	03012610000003150250	160	140	450	4,72	**
315*280	03012610000003150280	160	149	439	4,88	**
355*225	03012610000003550225	175	130	515	6,37	**
355*250	03012610000003550250	175	140	505	6,43	**
355*280	03012610000003550280	175	149	474	6,28	**
355*315	03012610000003550315	175	160	465	6,54	**
400*250	03012610000004000250	190	140	560	8,72	**
400*280	03012610000004000280	190	149	539	8,67	**
400*315	03012610000004000315	190	160	520	8,74	**
400*355	03012610000004000355	190	175	505	9,02	**
450*280	03012610000004500280	205	149	605	11,89	**
450*315	03012610000004500315	205	160	585	11,90	**
450*355	03012610000004500355	205	175	570	12,13	**
450*400	03012610000004500400	205	190	545	12,31	**
500*280	03012610000005000280	225	149	665	15,72	**
500*315	03012610000005000315	225	160	646	15,13	**
500*355	03012610000005000355	225	175	630	15,86	**
500*400	03012610000005000400	225	190	615	16,26	**
500*450	03012610000005000450	225	205	590	16,59	**
560*400	03012610000005600400	245	190	686	21,67	**
560*450	03012610000005600450	245	205	660	21,89	**
560*500	03012610000005600500	245	225	640	22,41	**
630*450	03012610000006300450	265	205	741	29,60	**
630*500	03012610000006300500	265	225	720	29,94	**
630*560	03012610000006300560	265	245	690	30,43	**
710*560	03012610000007100560	292	245	768	40,23	**
710*630	03012610000007100630	292	265	731	40,87	**
800*630	03012610000008000630	322	265	858	57,15	**
800*710	03012610000008000710	322	292	804	56,88	**
900*710	03012610000009000710	355	292	928	78,28	**
900*800	03012610000009000800	355	322	887	79,29	**
1000*800	03012610000010000800	389	322	1012	105,92	**
1000*900	03012610000010000900	389	355	964	107,56	**
1200*1000	03012610000012001000	455	389	1155	177,35	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR



d1*d2	CODE	L1	L2	L	Kg
160*90	03011710000001600090	108	89	337	1,15 **
160*110	03011710000001600110	108	92	320	1,17 **
160*125	03011710000001600125	108	97	315	1,21 **
160*140	03011710000001600140	108	102	310	1,27 **
180*110	03011710000001800110	115	92	347	1,54 **
180*125	03011710000001800125	115	97	342	1,58 **
180*140	03011710000001800140	115	102	337	1,64 **
180*160	03011710000001800160	115	108	323	1,70 **
200*125	03011710000002000125	122	97	369	2,04 **
200*140	03011710000002000140	122	102	354	2,02 **
200*160	03011710000002000160	122	108	350	2,13 **
200*180	03011710000002000180	122	115	337	2,20 **
225*140	03011710000002250140	130	102	392	2,74 **
225*160	03011710000002250160	130	108	378	2,76 **
225*180	03011710000002250180	130	115	365	2,81 **
225*200	03011710000002250200	130	122	362	2,97 **
250*160	03011710000002500160	140	108	418	3,63 **
250*180	03011710000002500180	140	115	405	3,67 **
250*200	03011710000002500200	140	122	392	3,72 **
250*225	03011710000002500225	140	130	380	3,86 **
280*180	03011710000002800180	149	115	444	4,84 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC
SPIGOT-METRİK

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)

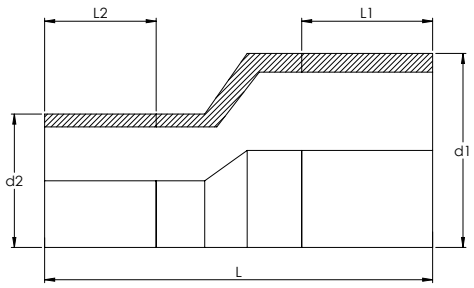
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR

d1*d2	CODE	L1	L2	L	Kg	
280*200	03011710000002800200	149	122	431	4,87	**
280*225	03011710000002800225	149	130	419	5,00	**
280*250	03011710000002800250	149	140	409	5,17	**
315*200	03011710000003150200	160	122	472	6,47	**
315*225	03011710000003150225	160	130	460	6,58	**
315*250	03011710000003150250	160	140	450	6,73	**
315*280	03011710000003150280	160	149	439	7,02	**
355*225	03011710000003550225	175	130	515	9,02	**
355*250	03011710000003550250	175	140	505	9,14	**
355*280	03011710000003550280	175	149	474	8,97	**
355*315	03011710000003550315	175	160	465	9,43	**
400*250	03011710000004000250	190	140	560	12,32	**
400*280	03011710000004000280	190	149	539	12,30	**
400*315	03011710000004000315	190	160	520	12,48	**
400*355	03011710000004000355	190	175	505	12,98	**
450*280	03011710000004500280	205	149	605	16,83	**
450*315	03011710000004500315	205	160	585	16,92	**
450*355	03011710000004500355	205	175	570	17,35	**
450*400	03011710000004500400	205	190	545	17,72	**
500*280	03011710000005000280	225	149	665	22,25	**
500*315	03011710000005000315	225	160	646	21,40	**
500*355	03011710000005000355	225	175	630	22,64	**
500*400	03011710000005000400	225	190	615	23,30	**
500*450	03011710000005000450	225	205	590	23,93	**
560*400	03011710000005600400	245	190	686	30,94	**
560*450	03011710000005600450	245	205	660	31,41	**
560*500	03011710000005600500	245	225	640	32,33	**
630*450	03011710000006300450	265	205	741	42,30	**
630*500	03011710000006300500	265	225	720	43,00	**
630*560	03011710000006300560	265	245	690	43,93	**
710*560	03011710000007100560	292	245	768	57,65	**
710*630	03011710000007100630	292	265	731	58,88	**
800*630	03011710000008000630	322	265	858	81,98	**
800*710	03011710000008000710	322	292	804	81,85	**
900*710	03011710000009000710	355	292	928	112,17	**
900*800	03011710000009000800	355	322	887	114,08	**
1000*800	03011710000010000800	389	322	1012	152,00	**
1000*900	03011710000010000900	389	355	964	154,90	**

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR



d1*d2	CODE	L1	L2	L	Kg
160*90	03011110000001600090	108	89	337	1,63 **
160*110	03011110000001600110	108	92	320	1,67 **
160*125	03011110000001600125	108	97	315	1,76 **
160*140	03011110000001600140	108	102	310	1,85 **
180*110	03011110000001800110	115	92	347	2,19 **
180*125	03011110000001800125	115	97	342	2,28 **
180*140	03011110000001800140	115	102	337	2,38 **
180*160	03011110000001800160	115	108	323	2,48 **
200*125	03011110000002000125	122	97	369	2,92 **
200*140	03011110000002000140	122	102	354	2,91 **
200*160	03011110000002000160	122	108	350	3,10 **
200*180	03011110000002000180	122	115	337	3,22 **
225*140	03011110000002250140	130	102	392	3,92 **
225*160	03011110000002250160	130	108	378	3,99 **
225*180	03011110000002250180	130	115	365	4,08 **
225*200	03011110000002250200	130	122	362	4,34 **
250*160	03011110000002500160	140	108	418	5,24 **
250*180	03011110000002500180	140	115	405	5,31 **
250*200	03011110000002500200	140	122	392	5,41 **
250*225	03011110000002500225	140	130	380	5,66 **
280*180	03011110000002800180	149	115	444	7,00 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmakt*adır. / No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

ECCENTRIC REDUCER (LONG)
EKSANTRİK REDÜKSİYON (UZUN)

SDR11 PE100

GAS/GAZ : 10 BAR

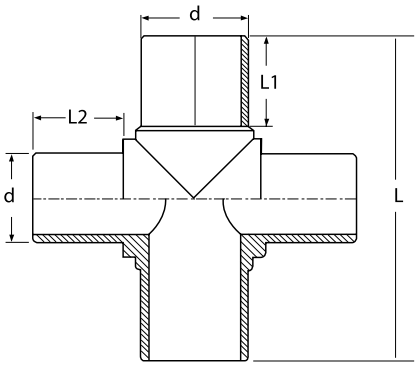
WATER/SU : 16 BAR

d1*d2	CODE	L1	L2	L	Kg
280*200	03011110000002800200	149	122	431	7,05 **
280*225	03011110000002800225	149	130	419	7,28 **
280*250	03011110000002800250	149	140	409	7,58 **
315*200	03011110000003150200	160	122	472	9,33 **
315*225	03011110000003150225	160	130	460	9,53 **
315*250	03011110000003150250	160	140	450	9,80 **
315*280	03011110000003150280	160	149	439	10,27 **
355*225	03011110000003550225	175	130	515	13,00 **
355*250	03011110000003550250	175	140	505	13,25 **
355*280	03011110000003550280	175	149	474	13,04 **
355*315	03011110000003550315	175	160	465	13,80 **
400*250	03011110000004000250	190	140	560	17,87 **
400*280	03011110000004000280	190	149	539	17,88 **
400*315	03011110000004000315	190	160	520	18,22 **
400*355	03011110000004000355	190	175	505	19,04 **
450*280	03011110000004500280	205	149	605	24,40 **
450*315	03011110000004500315	205	160	585	24,60 **
450*355	03011110000004500355	205	175	570	25,34 **
450*400	03011110000004500400	205	190	545	26,02 **
500*280	03011110000005000280	225	149	665	32,30 **
500*315	03011110000005000315	225	160	646	30,96 **
500*355	03011110000005000355	225	175	630	32,94 **
500*400	03011110000005000400	225	190	615	34,08 **
500*450	03011110000005000450	225	205	590	35,14 **
560*400	03011110000005600400	245	190	686	45,13 **
560*450	03011110000005600450	245	205	660	45,95 **
560*500	03011110000005600500	245	225	640	47,48 **
630*450	03011110000006300450	265	205	741	61,75 **
630*500	03011110000006300500	265	225	720	62,95 **
630*560	03011110000006300560	265	245	690	64,53 **
710*560	03011110000007100560	292	245	768	84,50 **
710*630	03011110000007100630	292	265	731	86,61 **
800*630	03011110000008000630	322	265	858	120,28 **
800*710	03011110000008000710	322	292	804	120,55 **
900*710	03011110000009000710	355	292	928	164,93 **
900*800	03011110000009000800	355	322	887	168,22 **
1000*800	03011110000010000800	389	322	1012	223,64 **
1000*900	03011110000010000900	389	355	964	228,63 **

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being used.*

***CROSS TEE* / KROS TE**

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

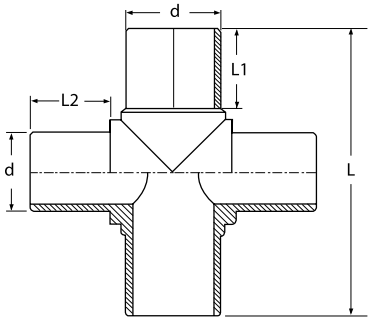


d	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
90	03511110000000900000	1,68	370	105	105	60*40*45	12	
110	03511110000001100000	2,80	370	105	105	60*40*45	5	
125	03511110000001250000	3,50	360	100	90	60*40*45	5	*
140	03511110000001400000	5,00	390	100	110	60*40*30	4	*
160	03511110000001600000	6,50	420	105	140	60*40*30	2	*
180	03511110000001800000	7,60	450	120	150	60*40*30	2	*
200	03511110000002000000	13,50	520	125	130	60*40*30	2	*
225	03511110000002250000	14,40	540	135	150	60*40*45	2	*
250	03511110000002500000	22,50	560	120	145	60*40*45	1	*

(*) : EF semer kullanılarak üretilmektedir. / *Produced by EF saddle*

CROSS TEE / KROS TE

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



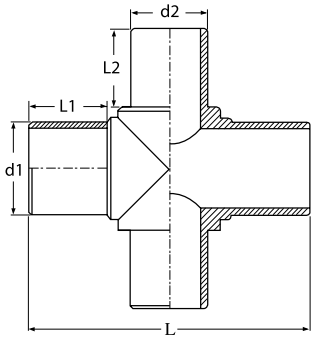
d	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
110	03511710000001100000	2,40	370	105	105	60*40*45	5	*
125	03511710000001250000	3,10	360	100	90	60*40*45	5	*
140	03511710000001400000	4,50	390	100	110	60*40*30	4	*
160	03511710000001600000	5,80	420	105	140	60*40*30	2	*
180	03511710000001800000	6,50	450	120	150	60*40*30	2	*
200	03511710000002000000	12,00	520	125	130	60*40*30	2	*
225	03511710000002250000	13,00	540	135	150	60*40*45	2	*
250	03511710000002500000	20,00	560	120	145	60*40*45	1	*
280	03511710000002800000	23,00	570	125	185	**		*
315	03511710000003150000	28,00	650	130	165	**		*

(*) : EF semer kullanılarak üretilmektedir. */ Produced by EF saddle*

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. */ No box is used. Only Euro pallets are being used.*

REDUCING CROSS TEE
REDÜKSİYON KROS TE

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
110*90	03611110000001100090	2,24	330	95	90	60*40*45	12	
125*90	03611110000001250090	2,55	330	95	90	60*40*45	9	*
125*110	03611110000001250110	3,53	350	95	110	60*40*45	9	*
140*90	03611110000001400090	3,09	370	110	90	60*40*30	4	*
140*110	03611110000001400110	4,04	380	110	110	60*40*30	4	*
140*125	03611110000001400125	4,34	380	120	90	60*40*30	4	*
160*90	03611110000001600090	3,87	400	120	90	60*40*30	2	*
160*110	03611110000001600110	4,83	410	120	110	60*40*30	2	*
160*125	03611110000001600125	5,20	420	120	90	60*40*30	2	*
160*140	03611110000001600140	6,60	450	120	110	60*40*30	2	*
180*90	03611110000001800090	4,65	410	125	90	60*40*30	2	*
180*110	03611110000001800110	5,64	420	125	110	60*40*30	2	*
180*125	03611110000001800125	6,02	430	125	90	60*40*30	2	*
180*140	03611110000001800140	7,47	460	125	110	60*40*30	2	*
180*160	03611110000001800160	8,44	480	125	140	60*40*30	2	*
200*90	03611110000002000090	5,57	420	130	90	60*40*30	2	*
200*110	03611110000002000110	6,57	430	130	110	60*40*30	2	*
200*125	03611110000002000125	6,98	440	130	90	60*40*30	2	*
200*140	03611110000002000140	8,38	460	130	110	60*40*30	2	*
200*160	03611110000002000160	9,39	480	130	140	60*40*30	2	*
200*180	03611110000002000180	9,59	480	130	150	60*40*30	2	*
225*90	03611110000002250090	6,96	440	140	90	60*40*45	2	*
225*110	03611110000002250110	8,00	450	140	110	60*40*45	2	*
225*125	03611110000002250125	8,43	460	140	90	60*40*45	2	*
225*140	03611110000002250140	10,02	490	140	110	60*40*45	2	*

SPIGOT-METRIC

SPIGOT-METRİK

REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
225*160	03611110000002250160	11,08	510	140	140	60*40*45	2	*
225*180	03611110000002250180	11,28	510	140	150	60*40*45	2	*
250*90	03611110000002500090	8,65	460	150	90	60*40*45	1	*
250*110	03611110000002500110	9,71	470	150	110	**		*
250*125	03611110000002500125	10,18	480	150	90	**		*
250*140	03611110000002500140	11,86	510	150	110	**		*
250*160	03611110000002500160	12,99	530	150	140	**		*
250*180	03611110000002500180	13,19	530	150	150	**		*
250*200	03611110000002500200	18,50	560	150	130	**		*
250*225	03611110000002500225	18,00	560	150	150	**		*
280*90	03611110000002800090	10,74	470	160	90	**		*
280*110	03611110000002800110	12,05	490	160	110	**		*
280*125	03611110000002800125	12,55	500	160	90	**		*
280*140	03611110000002800140	14,36	530	160	110	**		*
280*160	03611110000002800160	15,57	550	160	140	**		*
280*180	03611110000002800180	15,77	550	160	150	**		*
280*200	03611110000002800200	21,10	570	160	130	**		*
280*225	03611110000002800225	20,55	570	160	150	**		*
315*90	03611110000003150090	14,05	500	170	90	**		*
315*110	03611110000003150110	15,21	510	170	110	**		*
315*125	03611110000003150125	15,76	520	170	90	**		*
315*140	03611110000003150140	17,74	550	170	110	**		*
315*160	03611110000003150160	19,05	570	170	140	**		*
315*180	03611110000003150180	19,25	570	170	150	**		*
315*200	03611110000003150200	24,00	570	170	130	**		*
315*225	03611110000003150225	23,80	580	170	150	**		*
315*250	03611110000003150250	32,00	630	170	145	**		*
355*90	03611110000003550090	18,48	530	185	90	**		*
355*110	03611110000003550110	19,70	540	185	110	**		*
355*125	03611110000003550125	20,33	550	185	90	**		*
355*140	03611110000003550140	22,51	580	185	110	**		*
355*160	03611110000003550160	23,98	600	185	140	**		*
355*180	03611110000003550180	24,16	600	185	150	**		*
355*200	03611110000003550200	29,00	600	185	130	**		*
355*225	03611110000003550225	28,50	600	185	150	**		*
355*250	03611110000003550250	37,00	650	185	145	**		*
400*90	03611110000004000090	23,97	550	200	90	**		*
400*110	03611110000004000110	25,70	570	200	110	**		*
400*125	03611110000004000125	26,41	580	200	90	**		*
400*140	03611110000004000140	28,85	610	200	110	**		*

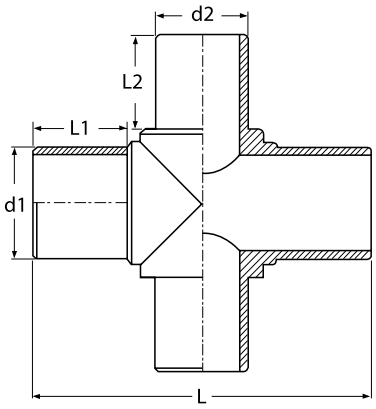
REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
400*160	03611110000004000160	30,48	630	200	140	**	*
400*180	03611110000004000180	30,68	630	200	150	**	*
400*200	03611110000004000200	36,00	640	200	130	**	*
400*225	03611110000004000225	35,50	640	200	150	**	*
400*250	03611110000004000250	45,00	700	200	145	**	*
450*90	03611110000004500090	31,60	580	215	90	**	*
450*110	03611110000004500110	33,50	600	215	110	**	*
450*125	03611110000004500125	34,30	610	215	90	**	*
450*140	03611110000004500140	37,10	640	215	110	**	*
450*160	03611110000004500160	39,00	660	215	140	**	*
450*180	03611110000004500180	39,10	660	215	150	**	*
450*200	03611110000004500200	44,00	660	215	130	**	*
450*225	03611110000004500225	43,60	660	215	150	**	*
450*250	03611110000004500250	53,00	710	215	145	**	*
500*90	03611110000005000090	41,40	620	235	90	**	*
500*110	03611110000005000110	43,00	630	235	110	**	*
500*125	03611110000005000125	43,90	640	235	90	**	*
500*140	03611110000005000140	47,00	670	235	110	**	*
500*160	03611110000005000160	49,15	690	235	140	**	*
500*180	03611110000005000180	53,20	690	235	150	**	*
500*200	03611110000005000200	55,50	710	235	130	**	*
500*225	03611110000005000225	55,00	710	235	150	**	*
500*250	03611110000005000250	65,20	760	235	145	**	*
560*90	03611110000005600090	55,00	660	255	90	**	*
560*110	03611110000005600110	57,50	680	255	110	**	*
560*125	03611110000005600125	58,60	690	255	90	**	*
560*140	03611110000005600140	62,25	720	255	110	**	*
560*160	03611110000005600160	64,68	740	255	140	**	*
560*180	03611110000005600180	64,80	740	255	150	**	*
560*200	03611110000005600200	70,70	750	255	130	**	*
560*225	03611110000005600225	70,10	750	255	150	**	*
560*250	03611110000005600250	81,10	800	255	145	**	*
630*90	03611110000006300090	73,10	700	275	90	**	*
630*110	03611110000006300110	76,10	720	275	110	**	*
630*125	03611110000006300125	77,40	730	275	90	**	*
630*140	03611110000006300140	81,70	760	275	110	**	*
630*160	03611110000006300160	84,50	780	275	140	**	*
630*180	03611110000006300180	84,70	780	275	150	**	*
630*200	03611110000006300200	89,78	780	275	130	**	*
630*225	03611110000006300225	89,10	780	275	150	**	*
630*250	03611110000006300250	100,30	820	275	145	**	*

REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
110*90	03611710000001100090	1,70	330	95	90	60*40*45	12	*
125*90	03611710000001250090	1,90	330	95	90	60*40*45	9	*
125*110	03611710000001250110	2,80	350	95	110	60*40*45	9	*
140*90	03611710000001400090	2,25	370	110	90	60*40*30	4	*
140*110	03611710000001400110	3,10	380	110	110	60*40*30	4	*
140*125	03611710000001400125	3,40	380	120	90	60*40*30	4	*
160*90	03611710000001600090	2,70	400	120	90	60*40*30	2	*
160*110	03611710000001600110	3,60	410	120	110	60*40*30	2	*
160*125	03611710000001600125	3,92	420	120	90	60*40*30	2	*
160*140	03611710000001600140	5,10	450	120	110	60*40*30	2	*
180*90	03611710000001800090	3,20	410	125	90	60*40*30	2	*
180*110	03611710000001800110	4,10	420	125	110	60*40*30	2	*
180*125	03611710000001800125	4,40	430	125	90	60*40*30	2	*
180*140	03611710000001800140	5,60	460	125	110	60*40*30	2	*
180*160	03611710000001800160	6,50	480	125	140	60*40*30	2	*
200*90	03611710000002000090	3,80	420	130	90	60*40*30	2	*
200*110	03611710000002000110	4,68	430	130	110	60*40*30	2	*
200*125	03611710000002000125	5,00	440	130	90	60*40*30	2	*
200*140	03611710000002000140	6,20	460	130	110	60*40*30	2	*
200*160	03611710000002000160	7,10	480	130	140	60*40*30	2	*
200*180	03611710000002000180	7,30	480	130	150	60*40*30	2	*
225*90	03611710000002250090	4,70	440	140	90	60*40*45	2	*
225*110	03611710000002250110	5,60	450	140	110	60*40*45	2	*
225*125	03611710000002250125	5,90	460	140	90	60*40*45	2	*
225*140	03611710000002250140	7,60	460	140	90	60*40*45	2	*

(*) : EF semer kullanılarak üretilmektedir. */ Produced by EF saddle*

REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR17 PE100 • *GAS*/GAZ : 6 BAR • *WATER*/SU : 10 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
225*160	03611710000002250160	8,10	510	140	140	60*40*45	2	*
225*180	03611710000002250180	8,30	510	140	150	60*40*45	2	*
250*90	03611710000002500090	5,70	460	150	90	60*40*45	1	*
250*110	03611710000002500110	6,60	470	150	110	**		*
250*125	03611710000002500125	7,00	480	150	90	**		*
250*140	03611710000002500140	8,40	510	150	110	**		*
250*160	03611710000002500160	9,30	530	150	140	**		*
250*180	03611710000002500180	9,50	530	150	150	**		*
250*200	03611710000002500200	14,30	560	150	130	**		*
250*225	03611710000002500225	13,80	560	150	150	**		*
280*90	03611710000002800090	7,00	470	160	90	**		*
280*110	03611710000002800110	8,00	490	160	110	**		*
280*125	03611710000002800125	8,45	500	160	90	**		*
280*140	03611710000002800140	9,90	530	160	110	**		*
280*160	03611710000002800160	10,90	550	160	140	**		*
280*180	03611710000002800180	11,10	550	160	150	**		*
280*200	03611710000002800200	15,90	570	160	130	**		*
280*225	03611710000002800225	15,30	570	160	150	**		*
315*90	03611710000003150090	9,00	500	170	90	**		*
315*110	03611710000003150110	10,00	510	170	110	**		*
315*125	03611710000003150125	10,40	520	170	90	**		*
315*140	03611710000003150140	12,00	550	170	110	**		*
315*160	03611710000003150160	13,00	570	170	140	**		*
315*180	03611710000003150180	13,20	570	170	150	**		*
315*200	03611710000003150200	17,80	570	170	130	**		*
315*225	03611710000003150225	17,40	580	170	150	**		*
315*250	03611710000003150250	24,50	630	170	145	**		*
315*280	03611710000003150280	25,50	630	170	185	**		*
355*90	03611710000003550090	11,80	530	185	90	**		*
355*110	03611710000003550110	12,80	540	185	110	**		*
355*125	03611710000003550125	13,30	550	185	90	**		*
355*140	03611710000003550140	15,00	580	185	110	**		*
355*160	03611710000003550160	16,10	600	185	140	**		*
355*180	03611710000003550180	16,30	600	185	150	**		*
355*200	03611710000003550200	20,80	600	185	130	**		*
355*225	03611710000003550225	20,30	600	185	150	**		*
355*250	03611710000003550250	27,70	650	185	145	**		*
355*280	03611710000003550280	28,60	650	185	185	**		*
355*315	03611710000003550315	30,90	720	185	165	**		*
400*90	03611710000004000090	15,10	550	200	90	**		*
400*110	03611710000004000110	16,50	570	200	110	**		*
400*125	03611710000004000125	17,00	580	200	90	**		*
400*140	03611710000004000140	18,80	610	200	110	**		*
400*160	03611710000004000160	20,10	630	200	140	**		*
400*180	03611710000004000180	20,30	630	200	150	**		*
400*200	03611710000004000200	25,10	640	200	130	**		*
400*225	03611710000004000225	24,50	640	200	150	**		*
400*250	03611710000004000250	32,40	700	200	145	**		*
400*280	03611710000004000280	33,30	700	200	185	**		*

SPIGOT-METRIC

SPIGOT-METRİK

REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR17 PE100 • *GAS*/GAZ : 6 BAR • *WATER*/SU : 10 BAR • *TYPE*/TİP : SPIGOT

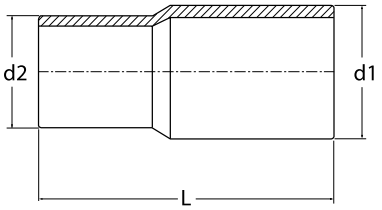
d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
400*315	03611710000004000315	36,00	770	200	165	**		*
450*90	03611710000004500090	19,90	580	215	90	**		*
450*110	03611710000004500110	21,30	600	215	110	**		*
450*125	03611710000004500125	22,00	610	215	90	**		*
450*140	03611710000004500140	23,00	640	215	110	**		*
450*160	03611710000004500160	25,40	660	215	140	**		*
450*180	03611710000004500180	25,50	660	215	150	**		*
450*200	03611710000004500200	30,10	660	215	130	**		*
450*225	03611710000004500225	29,50	660	215	150	**		*
450*250	03611710000004500250	37,50	710	215	145	**		*
450*280	03611710000004500280	38,40	710	215	185	**		*
450*315	03611710000004500315	42,00	790	215	165	**		*
500*90	03611710000005000090	25,90	620	235	90	**		*
500*110	03611710000005000110	27,10	630	235	110	**		*
500*125	03611710000005000125	27,70	640	235	90	**		*
500*140	03611710000005000140	30,00	670	235	110	**		*
500*160	03611710000005000160	31,60	690	235	140	**		*
500*180	03611710000005000180	31,80	690	235	150	**		*
500*200	03611710000005000200	37,10	710	235	130	**		*
500*225	03611710000005000225	36,60	710	235	150	**		*
500*250	03611710000005000250	45,00	760	235	145	**		*
500*280	03611710000005000280	45,80	760	235	185	**		*
500*315	03611710000005000315	49,50	830	235	165	**		*
560*90	03611710000005600090	34,10	660	255	90	**		*
560*110	03611710000005600110	35,90	680	255	110	**		*
560*125	03611710000005600125	36,70	690	255	90	**		*
560*140	03611710000005600140	39,30	720	255	110	**		*
560*160	03611710000005600160	41,00	740	255	140	**		*
560*180	03611710000005600180	41,20	740	255	150	**		*
560*200	03611710000005600200	46,25	750	255	130	**		*
560*225	03611710000005600225	45,70	750	255	150	**		*
560*250	03611710000005600250	54,60	800	255	145	**		*
560*280	03611710000005600280	55,50	800	255	185	**		*
560*315	03611710000005600315	60,00	870	255	165	**		*
630*90	03611710000006300090	45,50	700	275	90	**		*
630*110	03611710000006300110	47,50	720	275	110	**		*
630*125	03611710000006300125	48,50	730	275	90	**		*
630*140	03611710000006300140	51,40	760	275	110	**		*
630*160	03611710000006300160	53,40	780	275	140	**		*
630*180	03611710000006300180	53,60	780	275	150	**		*
630*200	03611710000006300200	58,10	780	275	130	**		*
630*225	03611710000006300225	57,60	780	275	150	**		
630*250	03611710000006300250	66,50	820	275	145	**		*
630*280	03611710000006300280	67,40	820	275	185	**		*
630*315	03611710000006300315	73,40	900	275	165	**		*

(*) : EF semer kullanılarak üretilmektedir. */ Produced by EF saddle*

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. */ No box is used. Only Euro pallets are being used.*

REDUCER / REDÜKSİYON

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
75*63	02911710000000750063	0,20	166	40*30*30	25
90*63	02911710000000900063	0,25	180	60*40*30	36
90*75	02911710000000900075	0,30	180	60*40*30	36
110*63	02911710000001100063	0,40	198	60*40*45	40
110*75	02911710000001100075	0,42	183	60*40*45	40
110*90	02911710000001100090	0,49	205	60*40*30	30
125*63	02911710000001250063	0,55	210	60*40*30	18
125*75	02911710000001250075	0,54	200	60*40*30	18
125*90	02911710000001250090	0,60	205	60*40*30	18
125*110	02911710000001250110	0,65	205	60*40*45	25
140*90	02911710000001400090	0,75	225	60*40*45	20
140*110	02911710000001400110	0,82	225	60*40*45	20
140*125	02911710000001400125	0,85	225	60*40*45	20
160*90	02911710000001600090	0,88	230	60*40*45	18
160*110	02911710000001600110	0,91	230	60*40*45	15
160*125	02911710000001600125	1,00	230	60*40*45	15
160*140	02911710000001600140	1,20	235	60*40*45	13
180*90	02911710000001800090	1,40	300	60*40*45	6
180*110	02911710000001800110	1,56	300	60*40*45	6
180*125	02911710000001800125	1,70	300	60*40*45	6
180*140	02911710000001800140	1,80	300	60*40*45	6
180*160	02911710000001800160	1,90	300	60*40*45	6
200*110	02911710000002000110	1,95	320	60*40*45	6
200*125	02911710000002000125	2,10	320	60*40*45	6
200*140	02911710000002000140	2,20	310	60*40*45	6
200*160	02911710000002000160	2,25	320	60*40*45	6

SPIGOT-METRIC

SPIGOT-METRİK

REDUCER **/ REDÜKSİYON**

SDR17 PE100 • *GAS*/GAZ : 6 BAR • *WATER*/SU : 10 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
200*180	02911710000002000180	2,30	310	60*40*45	6
225*110	02911710000002250110	2,00	315	60*40*45	5
225*125	02911710000002250125	2,15	315	60*40*45	5
225*140	02911710000002250140	2,25	300	60*40*45	4
225*160	02911710000002250160	2,30	315	60*40*45	4
225*180	02911710000002250180	2,60	310	60*40*45	4
225*200	02911710000002250200	3,10	315	60*40*45	3
250*110	02911710000002500110	3,10	335	60*40*45	3
250*125	02911710000002500125	3,20	335	60*40*45	3
250*140	02911710000002500140	3,30	335	60*40*45	3
250*160	02911710000002500160	3,40	315	60*40*45	3
250*180	02911710000002500180	3,74	340	60*40*45	3
250*200	02911710000002500200	3,15	340	60*40*45	3
250*225	02911710000002500225	4,50	360	60*40*45	2
280*125	02911710000002800125	4,60	345	60*40*45	2
280*140	02911710000002800140	4,70	345	60*40*45	2
280*160	02911710000002800160	4,80	345	60*40*45	2
280*180	02911710000002800180	4,90	345	60*40*45	2
280*200	02911710000002800200	5,10	365	60*40*45	2
280*225	02911710000002800225	5,30	370	60*40*45	2
280*250	02911710000002800250	6,70	385	60*40*45	2
315*180	02911710000003150180	8,00	345	*	
315*200	02911710000003150200	9,30	365	*	
315*225	02911710000003150225	9,80	370	*	
315*250	02911710000003150250	10,50	385	*	
315*280	02911710000003150280	8,80	385	*	
355*180	02911710000003550180	12,10	345	*	
355*200	02911710000003550200	13,00	365	*	
355*225	02911710000003550225	13,80	370	*	
355*250	02911710000003550250	14,20	370	*	
355*280	02911710000003550280	12,40	370	*	
355*315	02911710000003550315	11,00	380	*	
400*250	02911710000004000250	23,80	390	*	
400*280	02911710000004000280	21,50	400	*	
400*315	02911710000004000315	16,00	400	*	
400*355	02911710000004000355	14,60	410	*	
450*250	02911710000004500250	26,80	440	*	
450*280	02911710000004500280	25,30	440	*	
450*315	02911710000004500315	25,00	440	*	
450*355	02911710000004500355	20,10	440	*	
450*400	02911710000004500400	23,10	450	*	
500*315	02911710000005000315	29,20	460	*	
500*355	02911710000005000355	25,60	460	*	
500*400	02911710000005000400	27,20	470	*	
500*450	02911710000005000450	27,40	470	*	

REDUCER / REDÜKSİYON

SDR17 PE100 • *GAS*/GAZ : 6 BAR • *WATER*/SU : 10 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
560*355	02911710000005600355	37,00	500	*	
560*400	02911710000005600400	33,20	500	*	
560*450	02911710000005600450	35,50	500	*	
560*500	02911710000005600500	37,40	500	*	
630*500	02911710000006300500	47,60	530	*	
630*560	02911710000006300560	51,00	540	*	
710*560	02911710000007100560	63,00	550	*	
710*630	02911710000007100630	66,20	550	*	
800*630	02911710000008000630	83,00	570	*	
800*710	02911710000008000710	85,00	570	*	
900*710	02911710000009000710	130,00	620	*	
900*800	02911710000009000800	127,50	620	*	
1000*900	02911710000010000900	135,00	620	*	
1200*1000	02911710000012001000	200,00	620	*	
1400*1200	02911710000014001200	250,00	620	*	
1600*1200	02911710000016001200	435,00	620	*	

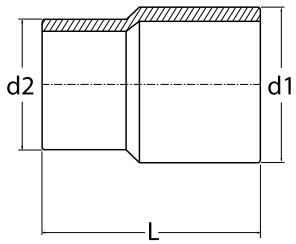
(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used./Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

REDUCER (SHORT) / REDÜKSİYON (KISA)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
280*250	02911710000102800250	6,00	250	60*40*45	2
315*180	02911710000103150180	6,50	250	60*40*45	2
315*200	02911710000103150200	6,70	250	60*40*45	2
315*225	02911710000103150225	7,80	250	60*40*45	2
315*250	02911710000103150250	6,50	250	60*40*45	2
315*280	02911710000103150280	6,90	250	60*40*45	1
355*180	02911710000103550180	10,00	280	60*40*45	1
355*200	02911710000103550200	11,00	280	60*40*45	1
355*225	02911710000103550225	11,30	280	60*40*45	1
355*250	02911710000103550250	12,00	270	60*40*45	1
355*280	02911710000103550280	10,50	270	60*40*45	1
355*315	02911710000103550315	8,00	260	60*40*45	1
400*250	02911710000104000250	19,80	300	60*40*45	1
400*280	02911710000104000280	18,50	290	60*40*45	1
400*315	02911710000104000315	14,00	280	60*40*45	1
400*355	02911710000104000355	10,80	270	60*40*45	1
450*250	02911710000104500250	22,40	320	*	
450*280	02911710000104500280	22,10	310	*	
450*315	02911710000104500315	23,00	300	*	
450*355	02911710000104500355	18,20	290	*	
450*400	02911710000104500400	21,80	280	*	
500*315	02911710000105000315	27,30	310	*	
500*355	02911710000105000355	23,80	300	*	
500*400	02911710000105000400	25,70	290	*	
500*450	02911710000105000450	25,90	280	*	
560*355	02911710000105600355	34,00	320	*	
560*400	02911710000105600400	31,20	320	*	
560*450	02911710000105600450	32,80	300	*	
560*500	02911710000105600500	34,30	290	*	

REDUCER (SHORT)
REDÜKSİYON (KISA)

SDR17 PE100
G AS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
630*500	02911710000106300500	42,60	320	*	
630*560	02911710000106300560	46,20	300	*	
710*560	02911710000107100560	54,10	320	*	
710*630	02911710000107100630	58,70	300	*	
800*630	02911710000108000630	73,00	360	*	
800*710	02911710000108000710	75,60	340	*	
900*710	02911710000109000710	97,80	370	*	
900*800	02911710000109000800	78,60	350	*	
1000*900	02911710000110000900	80,00	370	*	
1200*1000	02911710000112001000	165,00	380	*	
1400*1200	02911710000114001200	202,70	470	*	
1600*1200	02911710000116001200	355,20	470	*	

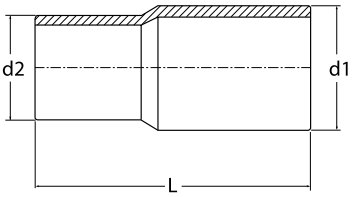
(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

REDUCER / REDÜKSİYON

SDR11 PE100
GAS/GAZ : 10BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
32*20	02911110000000320020	0,02	90	40*30*15	100
32*25	02911110000000320025	0,03	99	40*30*15	100
40*20	02911110000000400020	0,04	108	40*30*30	100
40*25	02911110000000400025	0,04	108	40*30*30	100
40*32	02911110000000400032	0,04	108	40*30*30	100
50*20	02911110000000500020	0,19	245	40*30*30	60
50*25	02911110000000500025	0,19	245	40*30*30	60
50*32	02911110000000500032	0,08	130	40*30*30	50
50*40	02911110000000500040	0,09	130	40*30*30	50
63*32	02911110000000630032	0,12	145	40*30*30	50
63*40	02911110000000630040	0,12	145	40*30*30	50
63*50	02911110000000630050	0,13	145	40*30*30	45
75*63	02911110000000750063	0,24	166	40*30*30	25
90*63	02911110000000900063	0,32	180	60*40*30	36
90*75	02911110000000900075	0,38	180	60*40*30	36
110*63	02911110000001100063	0,49	198	60*40*45	40
110*75	02911110000001100075	0,50	183	60*40*45	40
110*90	02911110000001100090	0,60	205	60*40*45	30
125*63	02911110000001250063	0,66	190	60*40*45	30
125*75	02911110000001250075	0,70	200	60*40*45	25
125*90	02911110000001250090	0,73	205	60*40*45	25
125*110	02911110000001250110	0,79	205	60*40*45	25
140*90	02911110000001400090	0,98	225	60*40*45	20
140*110	02911110000001400110	1,03	225	60*40*45	20
140*125	02911110000001400125	1,14	225	60*40*45	20
160*90	02911110000001600090	1,19	230	60*40*45	18

REDUCER / REDÜKSİYON

SDR11 PE100 • *GAS*/GAZ : 10BAR • *WATER*/SU : 16 BAR • *TYPE*/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
160*110	02911110000001600110	1,27	230	60*40*45	15
160*125	02911110000001600125	1,38	230	60*40*45	15
160*140	02911110000001600140	1,49	235	60*40*45	13
180*90	02911110000001800090	1,90	300	60*40*30	7
180*110	02911110000001800110	1,95	300	60*40*30	7
180*125	02911110000001800125	2,13	300	60*40*30	6
180*140	02911110000001800140	2,24	300	60*40*30	6
180*160	02911110000001800160	2,47	300	60*40*30	6
200*110	02911110000002000110	2,61	320	60*40*30	6
200*125	02911110000002000125	2,83	320	60*40*30	6
200*140	02911110000002000140	2,88	320	60*40*30	6
200*160	02911110000002000160	3,00	320	60*40*30	6
200*180	02911110000002000180	3,20	320	60*40*30	6
225*110	02911110000002250110	3,02	315	60*40*45	6
225*125	02911110000002250125	3,12	315	60*40*45	6
225*140	02911110000002250140	3,04	300	60*40*45	4
225*160	02911110000002250160	3,10	315	60*40*45	4
225*180	02911110000002250180	3,26	315	60*40*45	4
225*200	02911110000002250200	3,62	315	60*40*45	3
250*110	02911110000002500110	4,12	335	40*40*45	4
250*125	02911110000002500125	4,20	335	60*40*45	4
250*140	02911110000002500140	4,23	335	60*40*45	4
250*160	02911110000002500160	4,27	315	60*40*45	4
250*180	02911110000002500180	4,68	340	60*40*45	4
250*200	02911110000002500200	4,84	340	60*40*45	2
250*225	02911110000002500225	6,20	365	60*40*45	2
280*125	02911110000002800125	5,60	345	60*40*45	2
280*140	02911110000002800140	5,60	345	60*40*45	2
280*160	02911110000002800160	5,80	345	60*40*45	2
280*180	02911110000002800180	5,60	345	60*40*45	2
280*200	02911110000002800200	6,80	365	60*40*45	2
280*225	02911110000002800225	7,20	365	60*40*45	2
280*250	02911110000002800250	8,00	385	60*40*45	2
315*180	02911110000003150180	10,20	380	60*40*45	2
315*200	02911110000003150200	10,60	380	60*40*45	2
315*225	02911110000003150225	10,70	370	60*40*45	2
315*250	02911110000003150250	11,60	380	60*40*45	2
315*280	02911110000003150280	11,80	380	60*40*45	2
355*180	02911110000003550180	13,20	370	60*40*45	1
355*200	02911110000003550200	13,70	370	60*40*45	1
355*225	02911110000003550225	15,30	370	60*40*45	1
355*250	02911110000003550250	17,00	370	60*40*45	1
355*280	02911110000003550280	13,00	370	60*40*45	1
355*315	02911110000003550315	13,20	380	60*40*45	1
400*250	02911110000004000250	20,10	390	60*40*45	1
400*280	02911110000004000280	21,00	400	60*40*45	1
400*315	02911110000004000315	18,50	400	60*40*45	1

SPIGOT-METRIC
SPIGOT-METRİK

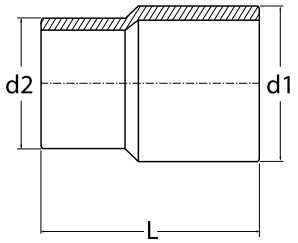
REDUCER / REDÜKSİYON
SDR11 PE100
GAS/GAZ : 10BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
400*355	02911110000004000355	19,30	410	60*40*45	1
450*250	02911110000004500250	26,00	440	*	
450*280	02911110000004500280	26,20	440	*	
450*315	02911110000004500315	25,50	440	*	
450*355	02911110000004500355	25,60	440	*	
450*400	02911110000004500400	27,70	450	*	
500*315	02911110000005000315	35,00	460	*	
500*355	02911110000005000355	33,90	460	*	
500*400	02911110000005000400	32,00	470	*	
500*450	02911110000005000450	32,00	470	*	
560*355	02911110000005600355	45,00	500	*	
560*400	02911110000005600400	43,80	500	*	
560*450	02911110000005600450	42,00	500	*	
560*500	02911110000005600500	44,00	500	*	
630*500	02911110000006300500	56,00	530	*	
630*560	02911110000006300560	60,00	540	*	
710*560	02911110000007100560	74,00	550	*	
710*630	02911110000007100630	78,00	550	*	
800*630	02911110000008000630	98,00	570	*	
800*710	02911110000008000710	100,00	570	*	
900*710	02911110000009000710	154,00	620	*	
900*800	02911110000009000800	150,00	620	*	

(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being used.*

REDUCER (SHORT) / REDÜKSİYON (KISA)

SDR11 PE100
GAS/GAZ : 10BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
280*250	02911110000102800250	7,20	250	60*40*45	2
315*180	02911110000103150180	9,20	250	60*40*45	2
315*200	02911110000103150200	9,40	250	60*40*45	2
315*225	02911110000103150225	9,50	250	60*40*45	2
315*250	02911110000103150250	8,70	250	60*40*45	2
315*280	02911110000103150280	8,80	250	60*40*45	1
355*180	02911110000103550180	12,00	280	60*40*45	1
355*200	02911110000103550200	12,50	280	60*40*45	1
355*225	02911110000103550225	14,10	280	60*40*45	1
355*250	02911110000103550250	15,80	270	60*40*45	1
355*280	02911110000103550280	11,50	270	60*40*45	1
355*315	02911110000103550315	11,60	260	60*40*45	1
400*250	02911110000104000250	17,00	300	60*40*45	1
400*280	02911110000104000280	18,00	290	60*40*45	1
400*315	02911110000104000315	15,50	280	60*40*45	1
400*355	02911110000104000355	16,30	270	60*40*45	1
450*250	02911110000104500250	22,00	320	*	
450*280	02911110000104500280	22,20	310	*	
450*315	02911110000104500315	23,10	300	*	
450*355	02911110000104500355	23,60	290	*	
450*400	02911110000104500400	23,80	280	*	
500*315	02911110000105000315	30,00	310	*	
500*355	02911110000105000355	28,90	300	*	
500*400	02911110000105000400	25,20	290	*	
500*450	02911110000105000450	24,30	280	*	
560*355	02911110000105600355	39,10	320	*	
560*400	02911110000105600400	37,70	320	*	
560*450	02911110000105600450	38,00	300	*	

SPIGOT-METRIC

SPIGOT-METRİK

REDUCER (SHORT) / REDÜKSİYON (KISA)

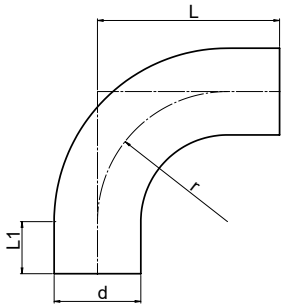
SDR11 PE100
GAS/GAZ : 10BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
560*500	02911110000105600500	40,00	290	*	
630*500	02911110000106300500	48,30	320	*	
630*560	02911110000106300560	51,70	300	*	
710*560	02911110000107100560	63,20	320	*	
710*630	02911110000107100630	64,50	300	*	
800*630	02911110000108000630	89,30	360	*	
800*710	02911110000108000710	90,70	340	*	
900*710	02911110000109000710	140,30	370	*	
900*800	02911110000109000800	144,80	350	*	

(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır./ *No box is used. Only Euro pallets are being used.*

SWEEP BEND 90°

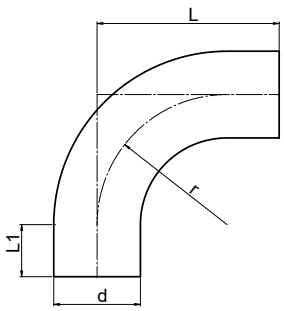
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR



Code	d	r
12211710000001100000	110	
12211710000001250000	125	
12211710000001400000	140	
12211710000001600000	160	
12211710000001800000	180	
12211710000002000000	200	
12211710000002250000	225	
12211710000002500000	250	r=1,5*d
12211710000002800000	280	
12211710000003150000	315	
12211710000003550000	355	
12211710000004000000	400	
12211710000004500000	450	
12211710000005000000	500	
12211710000005600000	560	
12211710000006300000	630	

SWEEP BEND 90°

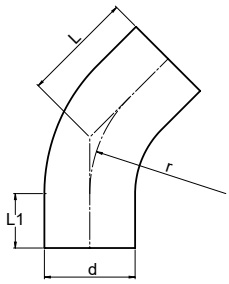
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR



Code	d	r
12211110000001100000	110	
12211110000001250000	125	
12211110000001400000	140	
12211110000001600000	160	
12211110000001800000	180	
12211110000002000000	200	
12211110000002250000	225	
12211110000002500000	250	
12211110000002800000	280	r=1,5*d
12211110000003150000	315	
12211110000003550000	355	
12211110000004000000	400	
12211110000004500000	450	
12211110000005000000	500	
12211110000005600000	560	
12211110000006300000	630	

SWEEP BEND 45°

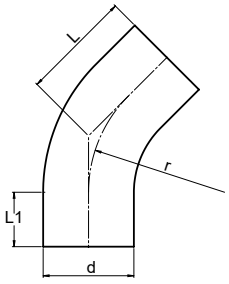
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR



Code	d	r
12311710000001100000	110	
12311710000001250000	125	
12311710000001400000	140	
12311710000001600000	160	
12311710000001800000	180	
12311710000002000000	200	
12311710000002250000	225	
12311710000002500000	250	
12311710000002800000	280	r=1,5*d
12311710000003150000	315	
12311710000003550000	355	
12311710000004000000	400	
12311710000004500000	450	
12311710000005000000	500	
12311710000005600000	560	
12311710000006300000	630	

SWEEP BEND 45°

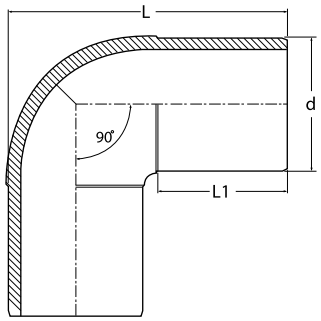
SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR



Code	d	r
12211710000001100000	110	
12211710000001250000	125	
12211710000001400000	140	
12211710000001600000	160	
12211710000001800000	180	
12211710000002000000	200	
12211710000002250000	225	
12211710000002500000	250	r=1,5*d
12211710000002800000	280	
12211710000003150000	315	
12211710000003550000	355	
12211710000004000000	400	
12211710000004500000	450	
12211710000005000000	500	
12211710000005600000	560	
12211710000006300000	630	

ELBOW (90°) / DİRSEK (90°)

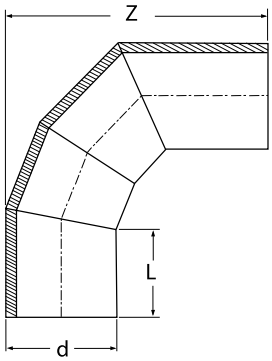
SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L(mm)	L1 (mm)	box sizes	nos/box
63	02211710000000630000	0,26	167	63	30*40*30	24
75	02211710000000750000	0,58	184	88	60*40*30	24
90	02211710000000900000	0,59	187	90	60*40*30	24
110	02211710000001100000	0,80	225	90	60*40*30	10
125	02211710000001250000	1,20	240	108	60*40*30	10
140	02211710000001400000	1,50	240	100	60*40*45	10
160	02211710000001600000	2,30	288	112	60*40*45	6
180	02211710000001800000	4,10	335	135	60*40*45	4
200	02211710000002000000	4,40	335	121	60*40*45	4
225	02211710000002250000	6,80	370	140	60*40*30	2
250	02211710000002500000	6,60	410	150	60*40*45	2
280	02211710000002800000	14,50	460	150	60*40*45	2
315	02211710000003150000	20,70	485	150	60*40*33	1

ELBOW (90°) SEGMENTED
DİRSEK (90°) KONFEKSİYON

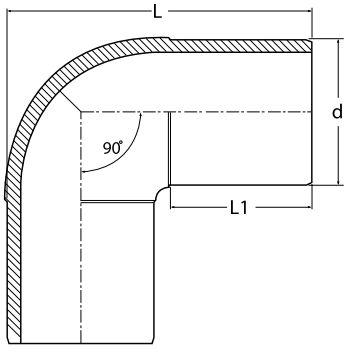
SDR17 PE100
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L(mm)	Z (mm)	nos/box
90	02311710000000900000	0,64	110	264	1
110	02311710000001100000	1,06	115	293	1
125	02311710000001250000	1,42	120	305	1
140	02311710000001400000	1,93	125	330	1
160	02311710000001600000	2,64	130	345	1
180	02311710000001800000	3,55	135	368	1
200	02311710000002000000	5,40	145	463	1
225	02311710000002250000	7,10	150	481	1
250	02311710000002500000	9,45	160	518	1
280	02311710000002800000	12,43	170	542	1
315	02311710000003150000	16,41	180	562	1
355	02311710000003550000	22,65	195	611	1
400	02311710000004000000	30,60	210	649	1
450	02311710000004500000	41,22	225	689	1
500	02311710000005000000	57,04	245	775	1
560	02311710000005600000	97,15	305	1.070	1
630	02311710000006300000	126,96	305	1.105	1
710	02311710000007100000	167,03	305	1.145	1
800	02311710000008000000	223,54	320	1.205	1
900	02311710000009000000	302,84	350	1.285	1
1000	02311710000001000000	387,96	350	1.335	1

ELBOW (90°) / DİRSEK (90°)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L1(mm)	L (mm)	box sizes	nos/box
20	02211110000000200000	0,02	36	60	30*40*15	100
25	02211110000000250000	0,03	43	80	30*40*15	100
32	02211110000000320000	0,05	50	90	30*40*30	60
40	02211110000000400000	0,08	53	100	30*40*30	40
50	02211110000000500000	0,31	57	163	30*40*30	40
63	02211110000000630000	0,30	63	167	30*40*30	20
75	02211110000000750000	0,66	88	184	60*40*30	24
90	02211110000000900000	0,64	90	187	60*40*30	24
110	02211110000001100000	1,06	90	225	60*40*30	10
125	02211110000001250000	1,44	108	240	60*40*30	10
140	02211110000001400000	1,74	100	240	60*40*45	10
160	02211110000001600000	2,80	112	288	60*40*45	6
180	02211110000001800000	5,00	135	335	60*40*45	4
200	02211110000002000000	5,00	121	335	60*40*45	4
225	02211110000002250000	7,80	140	370	60*40*45	2
250	02211110000002500000	10,70	160	410	60*40*45	2
280	02211110000002800000	13,20	150	460	60*40*30	1
315	02211110000003150000	24,20	150	485	60*60*33	1

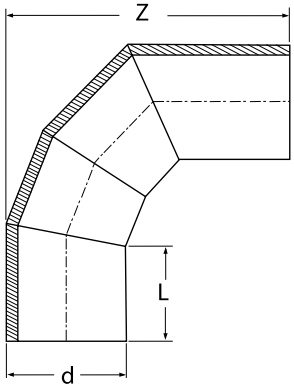
(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. */ No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

ELBOW (90°) SEGMENTED
DİRSEK (90°) KONFEKSİYON

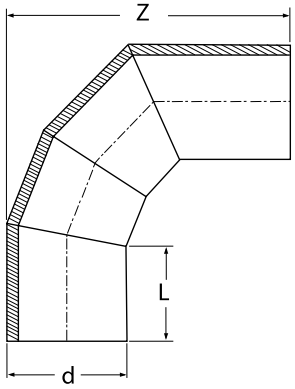
SDR11 PE100
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L (mm)	Z (mm)
90	02311110000000900000	0,95	110	264
110	02311110000001100000	1,55	115	293
125	02311110000001250000	2,10	120	305
140	02311110000001400000	2,85	125	330
160	02311110000001600000	3,88	130	345
180	02311110000001800000	5,22	135	368
200	02311110000002000000	7,95	145	463
225	02311110000002250000	10,45	150	481
250	02311110000002500000	13,90	160	518
280	02311110000002800000	18,29	170	542
315	02311110000003150000	24,12	180	562
355	02311110000003550000	33,30	195	611
400	02311110000004000000	45,00	210	649
450	02311110000004500000	60,63	225	689
500	02311110000005000000	83,88	245	775
560	02311110000005600000	143,06	305	1.070
630	02311110000006300000	186,82	305	1.105
710	02311110000007100000	245,63	305	1.145
800	02311110000008000000	328,73	320	1.205
900	02311110000009000000	445,35	350	1.285
1000	02311110000001000000	570,53	350	1.335

ELBOW (90°) SEGMENTED (SHORT)
DİRSEK (90°) (KISA) KONFEKSİYON

SDR17 PE100
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



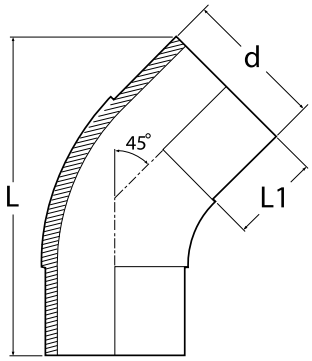
d	CODE	Kg.	L(mm)	Z (mm)	nos/box
125	02311710000101250000	1,27	90	275	1
140	02311710000101400000	1,69	91	297	1
160	02311710000101600000	2,31	93	309	1
180	02311710000101800000	3,15	100	333	1
200	02311710000102000000	4,98	115	433	1
225	02311710000102250000	6,34	107	438	1
250	02311710000102500000	8,36	110	468	1
280	02311710000102800000	10,95	115	487	1
315	02311710000103150000	14,32	120	502	1
355	02311710000103550000	19,86	132	548	1
400	02311710000104000000	27,52	155	594	1
450	02311710000104500000	36,97	165	629	1
500	02311710000105000000	52,66	195	725	1
560	02311710000105600000	97,15	305	1.070	1
630	02311710000106300000	126,96	305	1.105	1
710	02311710000107100000	167,03	305	1.145	1
800	02311710000108000000	220,17	305	1.190	1
900	02311710000109000000	290,06	305	1.240	1
1000	02311710000101000000	372,19	305	1.290	1

SPIGOT-METRIC

SPIGOT-METRİK

ELBOW (45°) / DİRSEK (45°)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

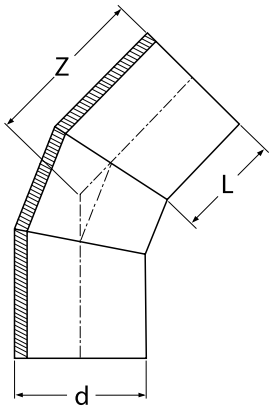


d	CODE	Kg.	L(mm)	L1 (mm)	box sizes	nos/box
63	02411710000000630000	0,16	160	65	40*30*30	30
75	02411710000000750000	0,38	210	88	60*40*30	30
90	02411710000000900000	0,39	215	90	60*40*30	25
110	02411710000001100000	0,69	250	92	60*40*30	15
125	02411710000001250000	1,00	285	100	60*40*45	12
140	02411710000001400000	2,10	315	115	60*40*45	10
160	02411710000001600000	2,00	320	115	60*40*45	6
180	02411710000001800000	3,20	360	120	60*40*45	4
200	02411710000002000000	3,60	360	120	60*40*45	4
225	02411710000002250000	5,40	450	140	60*40*45	2
250	02411710000002500000	6,00	450	140	60*40*30	1
280	02411710000002800000	9,40	450	140	**	1
315	02411710000003150000	16,20	500	150	**	1

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / No box is used. Only Euro pallets are being used.

ELBOW (45°) SEGMENTED (SHORT)
DİRSEK (45°) KONFEKSİYON (KISA)

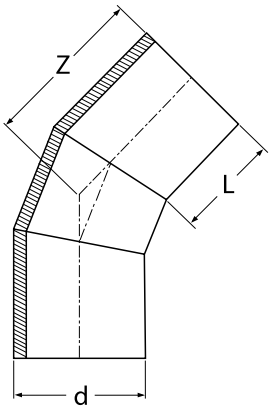
SDR17 PE100
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L(mm)	Z (mm)
125	02511710000101250000	0,87	90	164
140	02511710000101400000	1,16	91	174
160	02511710000101600000	1,57	93	180
180	02511710000101800000	2,14	100	194
200	02511710000102000000	3,30	115	243
225	02511710000102250000	4,12	107	240
250	02511710000102500000	5,25	110	248
280	02511710000102800000	6,89	115	259
315	02511710000103150000	9,13	120	271
355	02511710000103550000	12,60	132	294
400	02511710000104000000	17,78	155	327
450	02511710000104500000	24,10	165	350
500	02511710000105000000	34,56	195	406
560	02511710000105600000	65,27	305	613
630	02511710000106300000	84,55	305	627
710	02511710000107100000	110,20	305	644
800	02511710000108000000	143,93	305	662
900	02511710000109000000	187,80	305	683
1000	02511710000101000000	238,80	305	704

ELBOW (45°) SEGMENTED
DİRSEK (45°) KONFEKSİYON

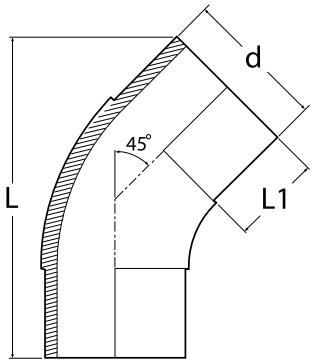
SDR17 PE100
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L(mm)	Z (mm)
125	02511710000001250000	1,04	120	194
140	02511710000001400000	1,40	125	208
160	02511710000001600000	1,90	130	217
180	02511710000001800000	2,54	135	229
200	02511710000002000000	3,71	145	273
225	02511710000002250000	4,88	150	283
250	02511710000002500000	6,35	160	298
280	02511710000002800000	8,40	170	314
315	02511710000003150000	11,22	180	331
355	02511710000003550000	15,38	195	357
400	02511710000004000000	20,86	210	382
450	02511710000004500000	28,35	225	410
500	02511710000005000000	38,95	245	456
560	02511710000005600000	65,28	305	613
630	02511710000006300000	84,55	305	627
710	02511710000007100000	110,20	305	644
800	02511710000008000000	147,29	320	677
900	02511710000009000000	200,58	350	728
1000	02511710000001000000	254,60	350	749

ELBOW (45°) / DİRSEK (45°)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

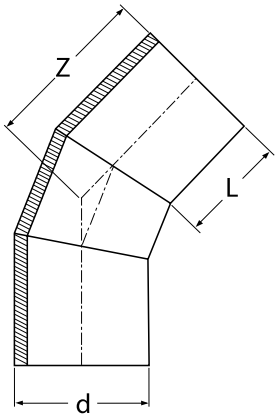


d	CODE	Kg.	L(mm)	L1 (mm)	box sizes	nos/box
20	02411110000000200000	0,02	36	80	40*30*15	150
25	02411110000000250000	0,03	43	100	40*30*15	150
32	02411110000000320000	0,04	50	115	40*30*30	100
40	02411110000000400000	0,07	53	130	40*30*30	80
50	02411110000000500000	0,11	57	140	40*30*30	50
63	02411110000000630000	0,19	65	160	40*30*30	30
75	02411110000000750000	0,44	88	210	60*40*30	30
90	02411110000000900000	0,49	90	215	60*40*30	25
110	02411110000001100000	0,88	92	250	60*40*30	15
125	02411110000001250000	1,20	100	285	60*40*45	12
140	02411110000001400000	2,60	115	315	60*40*45	10
160	02411110000001600000	2,47	115	320	60*40*45	6
180	02411110000001800000	3,80	120	360	60*40*45	5
200	02411110000002000000	4,24	120	360	60*40*45	4
225	02411110000002250000	6,50	140	450	60*40*45	2
250	02411110000002500000	7,20	140	450	60*40*45	2
280	02411110000002800000	17,40	140	450	**	1
315	02411110000003150000	17,20	150	500	**	1

(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. */ No box is used. Only Euro pallets are being used.*

ELBOW (45°) SEGMENTED
DİRSEK (45°) KONFEKSİYON

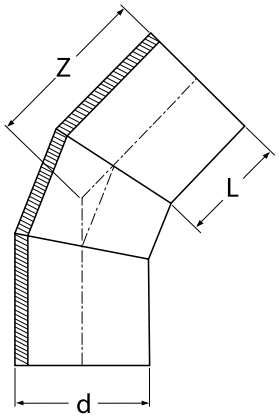
SDR11 PE100
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L(mm)	Z (mm)
90	02511110000000900000	0,70	110	171
110	02511110000001100000	1,13	115	186
125	02511110000001250000	1,53	120	194
140	02511110000001400000	2,05	125	208
160	02511110000001600000	2,80	130	217
180	02511110000001800000	3,73	135	229
200	02511110000002000000	5,46	145	273
225	02511110000002250000	7,17	150	283
250	02511110000002500000	9,33	160	298
280	02511110000002800000	12,35	170	314
315	02511110000003150000	16,50	180	331
355	02511110000003550000	22,61	195	357
400	02511110000004000000	30,68	210	382
450	02511110000004500000	41,70	225	410
500	02511110000005000000	57,27	245	456
560	02511110000005600000	96,00	305	613
630	02511110000006300000	124,34	305	627
710	02511110000007100000	162,06	305	644
800	02511110000008000000	216,60	320	677
900	02511110000009000000	294,96	350	728
1000	02511110000001000000	374,41	350	749

ELBOW (45°) SEGMENTED (SHORT)
DİRSEK (45°) KONFEKSİYON (KISA)

SDR11 PE100
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



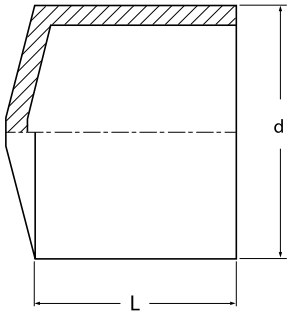
d	CODE	Kg.	L(mm)	Z (mm)
90	02511110000100900000	0,57	80	141
110	02511110000101100000	0,98	90	161
125	02511110000101250000	1,29	90	164
140	02511110000101400000	1,71	91	174
160	02511110000101600000	2,31	93	180
180	02511110000101800000	3,15	100	194
200	02511110000102000000	4,84	115	243
225	02511110000102250000	6,05	107	240
250	02511110000102500000	7,72	110	248
280	02511110000102800000	10,13	115	259
315	02511110000103150000	13,43	120	271
355	02511110000103550000	18,52	132	294
400	02511110000104000000	26,15	155	327
450	02511110000104500000	35,44	165	350
500	02511110000105000000	50,83	195	406
560	02511110000105600000	96,00	305	613
630	02511110000106300000	124,34	305	627
710	02511110000107100000	162,06	305	644
800	02511110000108000000	211,65	305	662
900	02511110000109000000	276,18	305	683
1000	02511110000101000000	351,21	305	704

SPIGOT-METRIC

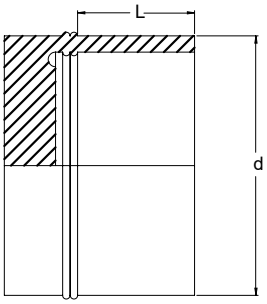
SPIGOT-METRİK

END CAP / KEP

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



TYPE A



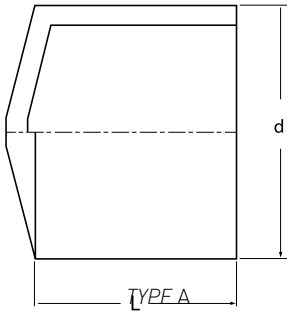
TYPE B

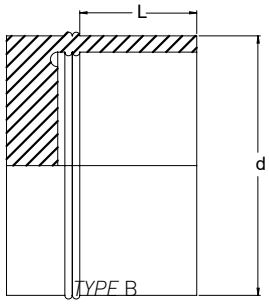
d	CODE	Kg.	L (mm)	box sizes	nos/box	Type
63	03911710000000630000	0,08	70	40*30*30	50	A
75	03911710000000750000	0,14	77	40*30*30	50	A
90	03911710000000900000	0,19	72	40*30*30	36	A
110	03911710000001100000	0,30	88	60*40*30	48	A
125	03911710000001250000	0,43	87	60*40*30	40	A
140	03911710000001400000	0,60	98	60*40*30	16	A
160	03911710000001600000	0,72	93	60*40*30	14	A
180	03911710000001800000	1,16	116	60*40*30	12	A
200	03911710000002000000	1,41	115	60*40*30	12	A
225	03911710000002250000	1,95	130	60*40*30	7	A
250	03911710000002500000	3,22	140	60*40*30	4	A
280	03911710000002800000	3,86	157	60*40*30	4	A
315	03911710000003150000	4,92	170	60*40*30	2	A
355	03911710000003550000	12,00	175	60*40*45	1	B
400	03911710000004000000	15,00	190	*	*	B
450	03911710000004500000	19,00	205	*	*	B
500	03911710000005000000	25,00	225	*	*	B
560	03911710000005600000	32,00	245	*	*	B
630	03911710000006300000	42,00	265	*	*	B
710	03911710000007100000	55,00	295	*	*	B
800	03911710000008000000	74,00	325	*	*	B
900	03911710000009000000	97,00	355	*	*	B
1000	03911710000010000000	126,00	390	*	*	B
1200	03911710000012000000	198,00	455	*	*	B
1400	03911710000014000000	293,00	525	*	*	B
1600	03911710000016000000	412,00	590	*	*	B

(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being used.*

END CAP / KEP

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT





D	CODE	KG.	L (MM)	BOX SIZES	NOS/BOX	TYPE
20	03911110000000200000	0,01	29	40*30*15	300	A
25	03911110000000250000	0,01	35	40*30*15	250	A
32	03911110000000320000	0,01	38	40*30*15	150	A
40	03911110000000400000	0,03	47	40*30*15	100	A
50	03911110000000500000	0,04	56	40*30*15	75	A
63	03911110000000630000	0,09	70	40*30*15	50	A
75	03911110000000750000	0,17	77	40*30*30	50	A
90	03911110000000900000	0,22	72	40*30*30	36	A
110	03911110000001100000	0,36	88	60*40*30	48	A
125	03911110000001250000	0,52	87	60*40*30	40	A
140	03911110000001400000	0,72	98	60*40*30	16	A
160	03911110000001600000	0,87	93	60*40*30	14	A
180	03911110000001800000	1,39	116	60*40*30	12	A
200	03911110000002000000	1,70	115	60*40*30	12	B
225	03911110000002250000	2,34	130	60*40*30	7	B
250	03911110000002500000	3,86	140	60*40*30	4	B
280	03911110000002800000	4,63	157	60*40*30	4	B
315	03911110000003150000	5,90	170	60*40*30	2	B
355	03911110000003550000	14,00	175	60*40*45	1	B
400	03911110000004000000	18,00	190	*	*	B
450	03911110000004500000	23,00	205	*	*	B
500	03911110000005000000	30,00	225	*	*	B
560	03911110000005600000	39,00	245	*	*	B
630	03911110000006300000	52,00	265	*	*	B
710	03911110000007100000	69,00	295	*	*	B
800	03911110000008000000	93,00	325	*	*	B
900	03911110000009000000	124,00	355	*	*	B
1000	03911110000010000000	162,00	390	*	*	B
1200	03911110000012000000	257,00	455	*	*	B
1400	03911110000014000000	384,00	525	*	*	B
1600	03911110000016000000	545,00	590	*	*	B

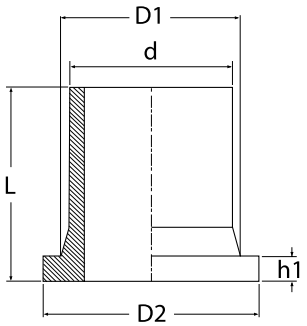
(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. / *No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

FLANGE ADAPTOR / FLANŞ ADAPTÖRÜ

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT

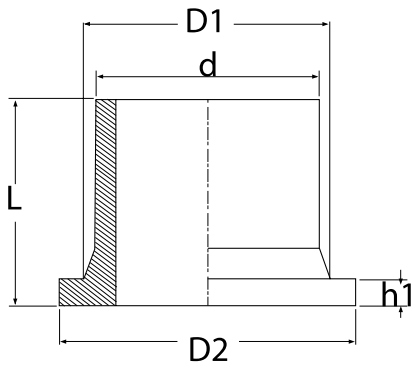


d	CODE	Kg.	L (mm)	D1 (mm)	D2 (mm)	h1 (mm)	box sizes	nos/box
63	01711710000000630000	0,20	95	75	102	14	60*40*30	60
75	01711710000000750000	0,32	125	89	122	16	60*40*30	40
90	01711710000000900000	0,38	140	105	138	17	60*40*30	30
110	01711710000001100000	0,50	160	125	158	18	60*40*30	24
125	01711710000001250000	0,75	170	132	158	18	60*40*45	24
140	01711710000001400000	0,95	200	155	188	18	60*40*45	12
160	01711710000001600000	1,38	200	175	212	18	60*40*45	12
180	01711710000001800000	1,51	200	185	212	20	60*40*45	12
200	01711710000002000000	2,47	200	232	268	24	60*40*45	6
225	01711710000002250000	2,51	200	235	268	24	60*40*45	6
250	01711710000002500000	3,94	204	285	320	25	60*40*30	2
280	01711710000002800000	4,38	204	291	320	25	60*40*30	2
315	01711710000003150000	6,00	225	335	370	25	60*40*45	2
355	01711710000003550000	8,50	244	373	430	30	60*40*45	2
400	01711710000004000000	11,20	270	427	482	33	60*40*45	1
450-A	0171171000000450000A	16,50	315	514	585	46	60*60*33	1
450-B	0171171000000450000B	16,50	315	458	530	46	60*60*33	1
500	01711710000005000000	22,60	322	530	585	46	*	
560	01711710000005600000	31,00	355	615	685	50	*	
630	01711710000006300000	35,40	355	642	685	50	*	
710	01711710000007100000	43,00	390	737	800	60	*	
800	01711710000008000000	48,40	390	840	905	60	*	
900	01711710000009000000	74,00	455	944	1005	60	*	
1000	01711710000001000000	105,00	509	1047	1110	60	*	
1200	01711710000001200000	157,60	575	1245	1330	60	*	
1400	01711710000001400000	201,00	-	-	-	-	*	
1600	01711710000001600000	282,20	-	-	-	-	*	
2000	01711710000002000000	320,40	-	-	-	-	*	

(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. *No box is used. (Only Euro pallets are being used.)*

FLANGE ADAPTOR (SHORT)
FLANŞ ADAPTÖRÜ (KISA)

SDR17 PE100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TİP : SPIGOT



d	CODE	Kg.	L (mm)	D1 (mm)	D2 (mm)	h1 (mm)	box sizes	nos/box
140	01711710000101400000	0,95	81	155	188	18	60x40x30	12
160	01711710000101600000	1,10	86	175	212	28	60x40x30	12
180	01711710000101800000	1,20	95	185	212	20	60x40x45	12
200	01711710000102000000	2,20	114	232	268	24	60x40x30	6
225	01711710000102250000	2,10	109	235	268	24	60x40x45	6
250	01711710000102500000	3,60	125	285	320	25	60x40x30	4
280	01711710000102800000	3,40	125	291	320	25	60x40x30	2
315	01711710000103150000	5,10	145	335	370	25	60x40x45	3
355	01711710000103550000	3,96	150	373	430	30	60x40x45	1
400	01711710000104000000	5,89	158	427	482	33	60x60x33	1
450-A	0171171000010450000A	13,80	186	514	585	46	60x60x33	1
450-B	0171171000010450000B	13,80	186	458	530	46	60x60x33	1
500	01711710000105000000	16,85	176	530	585	46	*	
560	01711710000105600000	21,90	190	615	685	56	*	
630	01711710000106300000	23,50	170	642	685	60	*	
710	01711710000107100000	32,00	210	737	800	60	*	
800	01711710000108000000	34,60	210	840	905	60	*	
900	01711710000109000000	46,20	240	944	1005	60	*	
1000	01711710000101000000	53,00	260	1047	1110	60	*	
1200	01711710000101200000	68,80	260	1245	1330	60	*	
1400	01711710000101400000	-	-	-	-	-	*	
1600	01711710000101600000	-	-	-	-	-	*	
2000	01711710000102000000	-	-	-	-	-	*	

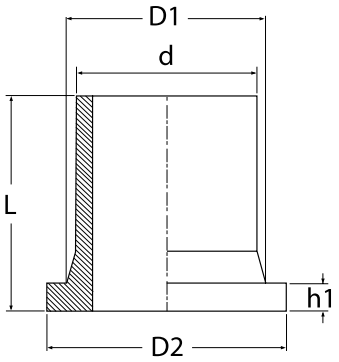
(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır./ *No box is used. Only Euro pallets are being used.*

SPIGOT-METRIC

SPIGOT-METRİK

FLANGE ADAPTOR / FLANŞ ADAPTÖRÜ

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



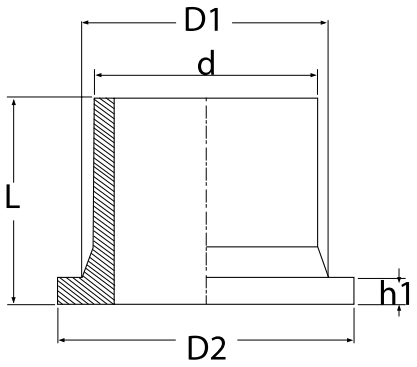
d	CODE	Kg.	L (mm)	D1 (mm)	D2 (mm)	h1 (mm)	box sizes	nos/box
20	01711110000000200000	0,03	85	27	45	7	30*40*15	90
25	01711110000000250000	0,06	85	33	58	9	30*40*15	85
32	01711110000000320000	0,07	85	40	68	10	30*40*15	75
40	01711110000000400000	0,09	85	50	78	11	30*40*30	70
50	01711110000000500000	0,13	85	61	88	12	30*40*30	70
63	01711110000000630000	0,18	95	75	102	14	60*40*30	60
75	01711110000000750000	0,33	125	89	122	16	60*40*30	40
90	01711110000000900000	0,48	140	105	138	17	60*40*30	30
110	01711110000001100000	0,68	160	125	158	18	60*40*30	24
125	01711110000001250000	0,99	170	132	158	25	60*40*45	24
140	01711110000001400000	1,25	200	155	188	25	60*40*45	12
160	01711110000001600000	1,85	200	175	212	25	60*40*45	12
180	01711110000001800000	1,95	200	185	212	30	60*40*45	12
200	01711110000002000000	3,20	200	232	268	32	60*40*45	6
225	01711110000002250000	3,44	200	235	268	32	60*40*45	6
250	01711110000002500000	5,26	204	285	320	35	60*40*30	2
280	01711110000002800000	6,12	204	291	320	35	60*40*30	2
315	01711110000003150000	8,35	225	335	370	35	60*40*45	2
355	01711110000003550000	10,40	244	373	430	40	60*40*45	2
400	01711110000004000000	15,40	270	427	482	46	60*60*33	1
450-A	0171111000000450000A	26,80	315	514	585	60	60*60*33	1
450-B	0171111000000450000B	25,10	315	458	530	60	60*60*33	1
500	01711110000005000000	32,20	322	530	585	60	*	
560	01711110000005600000	47,80	355	615	685	60	*	
630	01711110000006300000	51,50	355	642	685	60	*	
710	01711110000007100000	69,50	390	737	800	60	*	
800	01711110000008000000	84,10	390	840	905	60	*	
900	01711110000009000000	107,80	455	944	1005	60	*	

-Talebe bağlı olarak D2000'e kadar üretim yapılmaktadır. / *Production up to D2000 is available upon request.*

(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır./ *No box is used. Only Euro pallets are being used.*

FLANGE ADAPTOR (SHORT)
FLANŞ ADAPTÖRÜ (KISA)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



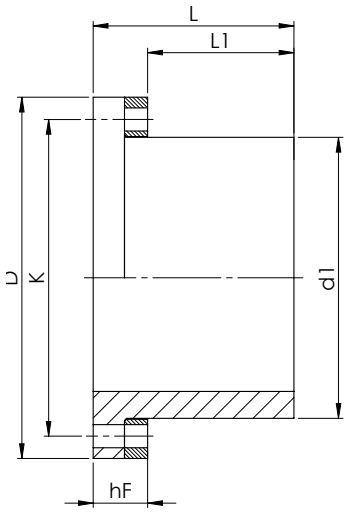
d	CODE	Kg.	L (mm)	D1 (mm)	D2 (mm)	h1 (mm)	box sizes	nos/box
140	01711110000101400000	1,20	88	155	188	25	60x40x30	12
160	01711110000101600000	1,45	93	175	212	25	60x40x30	12
180	01711710000101800000	1,70	105	185	212	30	60x40x45	12
200	01711110000102000000	2,75	122	232	268	32	60x40x30	6
225	01711710000102250000	2,90	117	235	268	32	60x40x45	6
250	01711710000102500000	4,60	135	285	320	35	60x40x30	4
280	01711710000102800000	4,60	135	291	320	35	60x40x30	2
315	01711110000103150000	6,90	155	335	370	35	60x40x45	3
355	01711110000103550000	6,17	160	373	430	40	60x40x45	1
400	01711110000104000000	11,50	171	427	482	46	60x60x33	1
450-A	0171111000010450000A	20,10	200	514	585	60	60x60x33	1
450-B	0171111000010450000B	20,10	200	458	530	60	60x60x33	1
500	01711110000105000000	22,60	190	530	585	60	*	*
560	01711110000105600000	31,10	200	615	685	60	*	*
630	01711110000106300000	34,90	180	642	685	60	*	*
710	01711110000107100000	39,30	210	737	800	60	*	*
800	01711110000108000000	53,20	210	840	905	60	*	*
900	01711110000109000000	71,00	240	944	1005	60	*	*

-Talebe bağlı olarak D2000'e kadar üretim yapılmaktadır. / *Production up to D2000 is available upon request.*

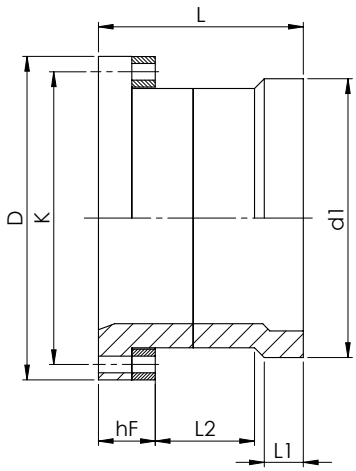
(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır./ *No box is used. Only Euro pallets are being used.*

SF REDUCED FLANGE ADAPTOR

PN16 PE100



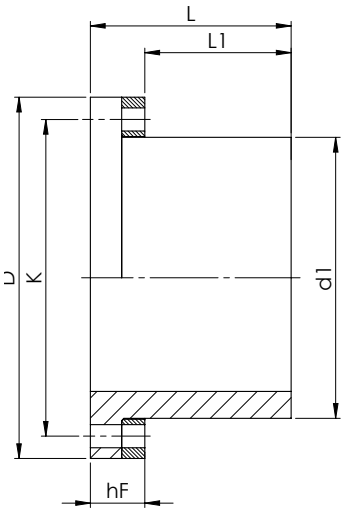
Type - A



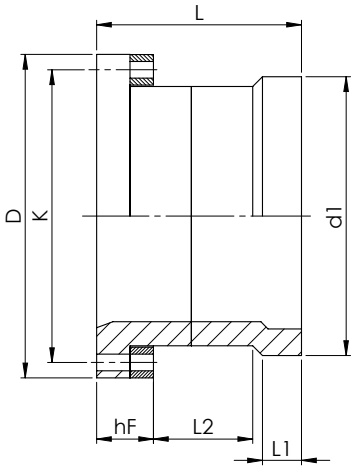
Type - B

DN	d1	K	D	n x ØL	Bolts	hF	L1	L2	L	Type
65	90	145	185	8x18	M16	37	70	-	107	A
80	110	160	200	8x18	M16	38	90	-	128	A
100	140	180	220	8x18	M16	47	103	-	150	A
125	160	210	250	8x18	M16	47	113	-	160	A
125	180	210	250	8x18	M16	52	113	-	165	A
150	200	240	285	8x23	M20	56	131	-	187	A
200	250	295	340	12x22	M20	61	154	-	215	A
250	315	355	405	12x26	M24	67	158	-	225	A
300	355	410	460	12x26	M24	75	169	-	244	A
350	400	470	520	16x26	M24	84	186	-	270	A
400	450	525	580	16x30	M27	102	213	-	315	A
400	500	525	580	16x30	M27	102	70	178	370	B
500	560	650	715	20x33	M30	106	249	-	355	A
500	630	650	715	20x33	M30	106	60	199	390	B
600	710	770	840	20x36	M33	115	275	-	390	A
700	800	840	910	24x36	M33	123	70	207	450	B
800	900	950	1025	24x39	M36	134	70	216	470	B
900	1000	1050	1125	28x39	M36	142	70	218	480	B
1000	1200	1170	1255	28x42	M39	150	70	230	510	B

SF REDUCED FLANGE ADAPTOR
PN10 PE100



Type - A



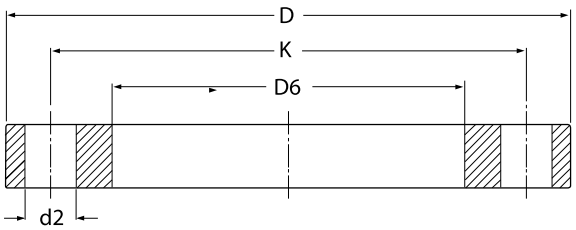
Type - B

DN	d1	K	D	n x ØL	Bolts	hF	L1	L2	L	Type
65	90	145	185	8x18	M16	37	70	-	107	A
80	110	160	200	8x18	M16	38	90	-	128	A
100	140	180	220	8x18	M16	40	103	-	143	A
125	160	210	250	8x18	M16	40	113	-	153	A
125	180	210	250	8x18	M16	42	113	-	155	A
150	200	240	285	8x23	M20	48	131	-	179	A
200	250	295	340	8x23	M20	49	154	-	203	A
250	315	350	395	12x23	M20	51	164	-	215	A
300	355	400	445	12x23	M20	56	178	-	234	A
350	400	460	505	16x23	M20	63	194	-	257	A
400	450	515	565	16x27	M24	78	223	-	301	A
400	500	515	565	16x27	M24	78	70	202	370	B
500	560	620	670	20x27	M24	88	257	-	345	A
500	630	620	670	20x27	M24	88	60	207	385	B
600	710	725	780	20x30	M27	102	60	228	420	B
700	800	840	895	24x30	M27	110	85	220	450	B
800	900	950	1015	24x33	M30	116	85	234	470	B
900	1000	1050	1115	28x33	M30	122	85	238	480	B
1000	1200	1160	1230	28x36	M33	130	85	250	510	B

SPIGOT-METRIC

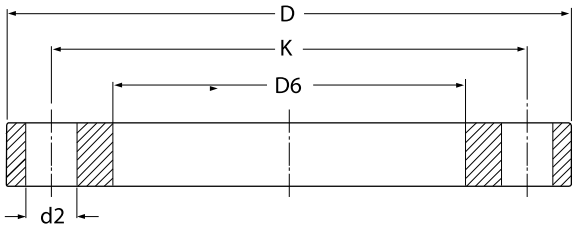
SPIGOT-METRİK

FLANGE ELECTROGALVANIZED STEEL
FLANŞ GALVANİZ KAPLAMA ÇELİK
PN16



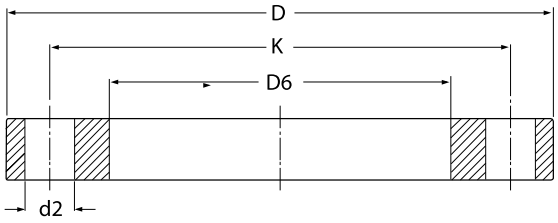
CODE	Steel Nominal DN	PE Equivalent d	D6(mm)	K(mm)	D(mm)	d2(mm)	nad	kg
06701120300000200000	15	20	28	65	95	14	4	0,60
06701120300000250000	20	25	34	75	105	14	4	1,00
06701120300000320000	25	32	42	85	115	14	4	1,10
06701120300000400000	32	40	51	100	140	18	4	1,60
06701120300000500000	40	50	62	110	150	18	4	1,70
06701120300000630000	50	63	78	125	165	18	4	2,20
06701120300000750000	65	75	92	145	185	18	4	2,80
06701120300000900000	80	90	108	160	200	18	8	3,20
06701120300001100000	100	110	128	180	220	18	8	3,60
06701120300001250000	100	125	135	180	220	18	8	3,40
06701120300001400000	125	140	158	210	250	18	8	4,60
06701120300001600000	150	160	178	240	285	22	8	6,40
06701120300001800000	150	180	188	240	285	22	8	5,80
06701120300002000000	200	200	235	295	340	22	12	8,00
06701120300002250000	200	225	238	295	340	22	12	7,80
06701120300002500000	250	250	288	355	405	26	12	11,80
06701120300002800000	250	280	294	355	405	26	12	11,20
06701120300003150000	300	315	338	410	460	26	12	16,20
06701120300003550000	350	355	376	470	520	26	16	22,80
06701120300004000000	400	400	430	525	580	30	16	28,40
0670112030000450000A	500	450-A	517	650	715	33	20	45,10
0670112030000450000B	500	450-B	517	585	715	33	20	49,40
06701120300005000000	500	500	533	650	715	33	20	43,60
06701120300005600000	600	560	618	770	840	36	20	66,20
06701120300006300000	600	630	645	770	840	36	20	58,40
06701120300007100000	700	710	740	840	910	36	24	56,60
06701120300008000000	800	800	843	950	1025	39	24	59,00
06701120300009000000	900	900	947	1050	1125	39	28	84,50
06701120300010000000	1000	1000	1050	1170	1255	42	28	115,00
06701120300012000000	1200	1200	1260	1390	1485	48	32	172,00
06701120300014000000	1400	1400	1480	1590	1685	48	36	240,00
06701120300016000000	1600	1600	1670	1820	1930	55	40	343,00

FLANGE ELECTROGALVANIZED STEEL
FLANŞ GALVANİZ KAPLAMA ÇELİK
PN10



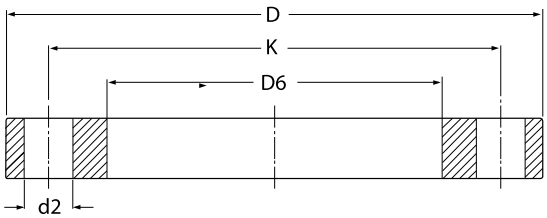
CODE	Steel Nominal DN	PE Equivalent d	D6(mm)	K(mm)	D(mm)	d2(mm)	nad	kg
06701720300000200000	15	20	28	65	95	14	4	0,60
06701720300000250000	20	25	34	75	105	14	4	1,00
06701720300000320000	25	32	42	85	115	14	4	1,10
06701720300000400000	32	40	51	100	140	18	4	1,60
06701720300000500000	40	50	62	110	150	18	4	1,70
06701720300000630000	50	63	78	125	165	18	4	2,20
06701720300000750000	65	75	92	145	185	18	4	2,80
06701720300000900000	80	90	108	160	200	18	8	3,20
06701720300001100000	100	110	128	180	220	18	8	3,60
06701720300001250000	100	125	135	180	220	18	8	3,40
06701720300001400000	125	140	158	210	250	18	8	4,60
06701720300001600000	150	160	178	240	285	22	8	6,40
06701720300001800000	150	180	188	240	285	22	8	5,80
06701720300002000000	200	200	235	295	340	22	8	8,40
06701720300002250000	200	225	238	295	340	22	8	8,20
06701720300002500000	250	250	288	350	395	22	12	11,60
06701720300002800000	250	280	294	350	395	22	12	10,40
06701720300003150000	300	315	338	400	445	22	12	13,00
06701720300003550000	350	355	376	460	505	22	16	17,80
06701720300004000000	400	400	430	515	565	26	16	20,80
0670172030000450000A	500	450-A	517	620	670	26	20	25,30
0670172030000450000B	500	450-B	517	565	670	26	20	30,00
06701720300005000000	500	500	533	620	670	26	20	26,80
06701720300005600000	600	560	618	725	780	30	20	36,40
06701720300006300000	600	630	645	725	780	30	20	30,40
06701720300007100000	700	710	740	840	895	30	24	44,60
06701720300008000000	800	800	843	950	1015	33	24	60,00
06701720300009000000	900	900	947	1050	1115	33	28	65,50
06701720300010000000	1000	1000	1050	1160	1230	36	28	80,60
06701720300012000000	1200	1200	1260	1380	1455	39	32	136,00
06701720300014000000	1400	1400	1480	1590	1675	42	36	194,00
06701720300016000000	1600	1600	1670	1820	1915	48	40	282,00

FLANGE ELECTROGALVANIZED STEEL
FLANŞ GALVANİZ KAPLAMA ÇELİK
PN6



CODE	Steel Nominal DN	PE Equivalent d	D6(mm)	K(mm)	D(mm)	d2(mm)	nad	kg
06702620300000200000	15	20	28	55	80	11	4	0,20
06702620300000250000	20	25	34	65	90	11	4	0,40
06702620300000320000	25	32	42	75	100	11	4	0,50
06702620300000400000	32	40	51	90	120	14	4	0,70
06702620300000500000	40	50	62	100	130	14	4	0,90
06702620300000630000	50	63	78	110	140	14	4	1,00
06702620300000750000	65	75	92	130	160	14	4	1,50
06702620300000900000	80	90	108	150	190	18	4	2,00
06702620300001100000	100	110	128	170	210	18	4	2,30
06702620300001250000	100	125	135	170	210	18	4	2,10
06702620300001400000	125	140	158	200	240	18	8	3,30
06702620300001600000	150	160	178	225	265	18	8	4,00
06702620300001800000	150	180	188	225	265	18	8	3,60
06702620300002000000	200	200	235	280	320	18	8	5,90
06702620300002250000	200	225	238	280	320	18	8	5,70
06702620300002500000	250	250	288	335	375	18	12	8,60
06702620300002800000	250	280	294	335	375	18	12	8,10
06702620300003150000	300	315	338	395	440	22	12	11,60
06702620300003550000	350	355	376	445	490	22	12	15,50
06702620300004000000	400	400	430	495	540	22	16	18,00
0670262030000450000A	500	450-A	517	600	645	22	20	33,10
0670262030000450000B	500	450-B	517	600	645	22	20	30,50
06702620300005000000	500	500	533	600	645	22	20	30,50
06702620300005600000	600	560	618	705	755	26	20	44,70
06702620300006300000	600	630	645	705	755	26	20	39,40
06702620300007100000	700	710	740	810	860	26	24	37,00
06702620300008000000	800	800	843	920	975	30	24	46,20
06702620300009000000	900	900	947	1020	1075	30	24	55,00
06702620300010000000	1000	1000	1050	1120	1175	30	28	71,20
06702620300012000000	1200	1200	1260	1340	1405	33	32	100,30
06702620300014000000	1400	1400	1480	1560	1630	36	36	138,00
06702620300016000000	1600	1600	1670	1760	1830	36	40	196,30

PP COATED STEEL FLANGE
PP KAPLI ÇELİK FLANŞ
PN10/16

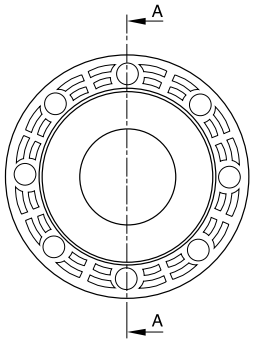


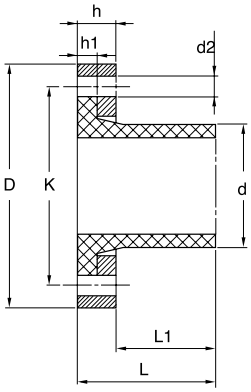
Steel Nominal DN	PE Equivalent d	CODE	D6(mm)	K(mm)	D(mm)	d2(mm)	n ad	kg	
50	63	07081120000000630000	78	125	165	18	4	1,40	
65	75	07081120000000750000	92	145	185	18	4	1,80	
80	90	07081120000000900000	108	160	200	18	8	3,20	
100	110	07081120000001100000	128	180	220	18	8	3,60	
100	125	07081120000001250000	135	180	220	18	8	3,40	
150	160	07081120000001600000	178	240	285	22	8	6,40	
150	180	07081120000001800000	188	240	285	22	8	5,80	
200	200	07081720000002000000	235	295	340	22	8	6,10	*
200	225	07081720000002250000	238	295	340	22	8	6,10	*
200	200	07081120000002000000	235	295	340	22	12	6,10	**
200	225	07081120000002250000	238	295	340	22	12	6,10	**

* PN10 içindir.*(For PN10.)*

**PN16 içindir. *(For PN16.)*

FLANGE ADAPTOR + INDUSTRIAL COMPOSITE FLANGE
FLANŞ ADAPTÖRÜ + ENDÜSTRİYEL KOMPOZİT FLANŞ
PN10/16





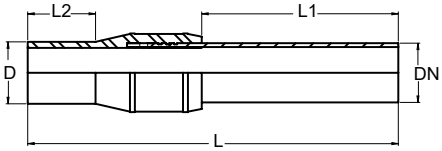
d	CODE	d2	D	K	L	L1	h	h1	n
90	06881120000000900000	18	198	160	121	82	34	16	8
110	06881120000001100000	19	112	180	129	94	31	18	8
125	06881120000001250000	19	1125	180	147	109	31	25	8
160	06881120000001600000	22	285	240	152	96	50	25	8
180	06881120000001800000	22	285	240	164	115	50	30	8

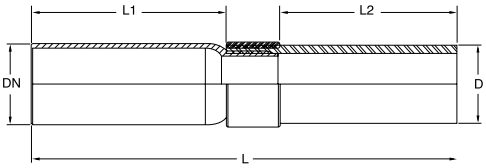
PE-STEEL TRANSITION FITTING (WELDED)
PE-ÇELİK GEÇİŞ FİTİNGİ (KAYNAKLI)

GAS/GAZ : 10 BAR
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT

TYPE A

TYPE B



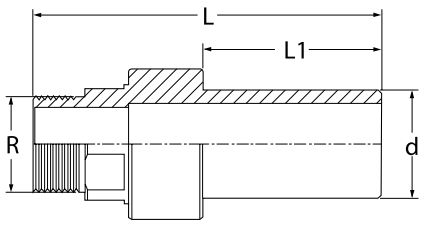


D-DN	CODE	Kg.	L	L1	L2	*TYPE*
20-1/2"	04411110000000200021	0,50	217	46	137	B
25-3/4"	04411110000000250026	0,70	217	50	137	A
32-1"	04411110000000320033	1,00	455	275	90	A
40-1 1/4"	04411110000000400042	0,70	243	85	111	B
50-1 1/2"	04411110000000500048	0,85	243	85	111	B
63 - 2"	04411110000000630060	2,40	530	295	145	A
90 - 3"	04411110000000900088	4,50	590	215	195	B
110-4"	04411110000001100114	10,20	755	320	265	B
125-4"	04411110000001250114	11,00	740	300	265	B
160-6"	04411110000001600168	27,80	725	275	240	B
180-6"	04411110000001800168	28,20	770	300	275	B
200-8"	04411110000002000219	57,60	790	300	275	B
225-8"	04411110000002250219	50,00	810	300	275	B
250-10"	04411110000002500273	60,00	750	365	285	B
280-10"	04411110000002800273	69,80	780	380	300	B
315-12"	04411110000003150323	70,40	810	395	310	B
355-14"	04411110000003550355	127,40	860	405	350	B
400-16"	04411110000004000406	190,30	950	415	410	B
450-18"	04411110000004500457	210,80	995	430	430	B
500-20"	04411110000005000508	282,90	1040	445	445	B

SPIGOT-METRIC
SPIGOT-METRİK

PE-BRASS TRANSITION FITTING MALE (THREADED)
PE-PİRİNÇ GEÇİŞ FİTİNGİ ERKEK (DİŞLİ)

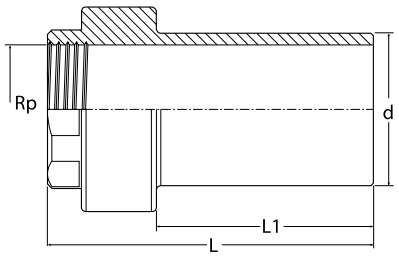
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d-R	CODE	Kg.	L	L1
20-1/2"	04311112000000200021	0,10	90	45
20-3/4"	04311112000000200026	0,13	90	45
25-3/4"	04311112000000250026	0,13	90	45
32-3/4"	04311112000000320026	0,24	110	48
32-1/2"	04311112000000320021	0,24	110	48
32-1"	04311112000000320033	0,18	110	48
40-1 1/4"	04311112000000400042	0,35	115	55
50-1 1/2"	04311112000000500048	0,43	125	65
63-2"	04311112000000630060	0,57	140	72
75-2 1/2"	04311112000000750073	0,90	148	79
90-3"	04311112000000900088	1,46	180	80
110-4"	04311112000001100114	2,45	220	93

PE-BRASS TRANSITION FITTING FEMALE (THREADED)
PE-PİRİNÇ GEÇİŞ FİTİNGİ DİŞİ (DİŞLİ)

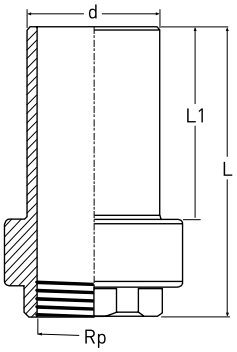
WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d-Rp	CODE	Kg.	L	L1
20-1/2"	04311111000000200021	0,08	78	45
25-3/4"	04311111000000250026	0,11	78	45
32-1"	04311111000000320033	0,18	90	48
40-1 1/4"	04311111000000400042	0,23	95	55
50-1 1/2"	04311111000000500048	0,32	105	65
63-2"	04311111000000630060	0,68	115	73
75-2 1/2"	04311111000000630060	0,80	128	79

PE THREADED TRANSITION FITTING (MALE)
PE DİŞLİ GEÇİŞ PARÇASI (ERKEK)

WATER/SU : 16 BAR
TYPE/TİP : SPIGOT



d-Rp	CODE	Kg.	L	L1
20-1/2"	04511112000000200021	0,04	70	40
32-1"	04511112000000320033	0,05	80	45
50-1 1/2"	04511112000000500048	0,10	114	67
63-2"	04511112000000630060	0,15	124	74

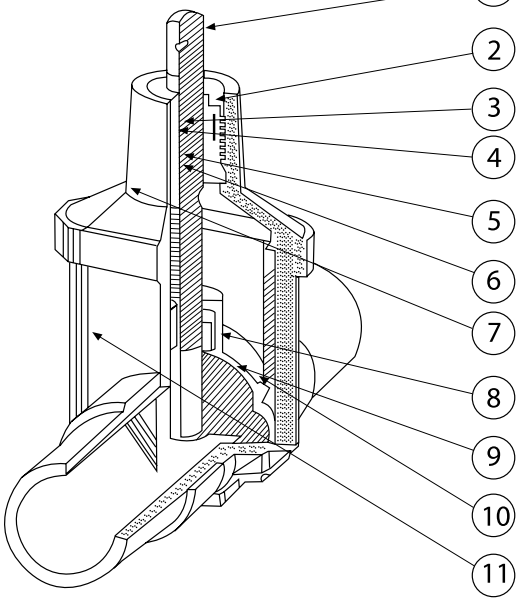
AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

FLOW CONTROL-METRIC

AKIŞ KONTROL-METRİK

SÜRGÜLÜ VANALAR / *GATE VALVES*

MALZEME LİSTESİ / *MATERIAL LIST*



1. Mil 420 kalite paslanmaz çelik (talebe bağlı 304 veya 316 tipi mevcuttur)
   Spindle Stainless Steel 420 (304 or 316 is available upon request)
2. Yatak MS58 Prinç (Talebe bağlı DZR tipi mevcuttur)
   Bearing MS58 Brass (DZR is available upon request)
3. O-Ring Tip1 (NBR)
   O-Ring TYPE1 (NBR)
4. Baskı Bileziği MS58 Prinç (Talebe bağlı DZR tipi mevcuttur)
   Thrust collar MS58 (DZR is available upon request)
5. O-Ring Tip2 (NBR)
   O-Ring TYPE1 (NBR)
6. Bilezik (Pom)
   Collet (Pom)
7. Kapak (PE100)
   Bonnet (PE100)
8. Klepe Somunu MS58 pirinç (Talebe bağlı DZR tipi mevcuttur)
   Wedge nut MS58 (DZR is available upon request)
9. Klepe (Dökme Demir GGG-40)
10. *Wedge Coating (EPDM Rubber)*
11. Gövde (PE100)
    Body (PE100)

EN 12201-4

- Su tedariki için plastik borulama sistemi
  Plastic piping system for WATER supply

EN 917

- 20 °C'de hidrostatik basınç – 100 saat
  Hydrostatic strength at 20°C - 100 hrs
- 80 °C'de hidrostatik basınç – 165 saat
  Hydrostatic strength at 80°C - 165 hrs
- 80 °C'de hidrostatik basınç – 1000 saat
  Hydrostatic strength at 80°C - 1000 hrs

EN 1074-1 EN 1074-2

- Su tedariki için vanalar / *Valves for WATER supply*

EN 1680

- Vanaların çalışma mekanizmasının bükülme esnasında ve büküldükten sonra sızdırmazlık deneyi
  Leak tightness under and after bending applied to the operating mechanism

EN 1705

- Darbe yüküne mukavemet / *Impact loading*

EN 12100

- Destekler arasındaki eğilme mukavemeti
  Resistance to bending between supports

İLGİLİ STANDARTLAR
RELATED STANDARDS

EN 28233

- Çalışma Torku / *Operating Torque*
- Kapama mukavemeti / *Stop Resistance*
- Tahrik mekanizması direnci
  Actuation mechanism resistance

ISO 5208

- Vana yatağı ve salmastranın sızdırmazlığı
  Leak tightness of seat and packing

ISO 10933

- Çekme yükü altında sızdırmazlık testi
  Leak tightness under tensile load

DIN 3352

- Döküm çelik sürgülü vana (ilgili parçaları)
  Cast Iron gate valve (related parts)

DIN 3202/F5 -- EN558-1 (Series 15)

- Alından alına ölçüler / *Face to face dimension*

Flanş için Delik Ebatı / *Drilling Dimension for Flange*

ISO 7005-2 (EN 1092-2)

PE SÜRGÜLÜ VANA BİR HAYAL Mİ?

Uzun yıllardan beri PE malzemeden sürgülü vana üretilmesi fikri vana üreticileri ve mühendisler arasında tartışılmıştır.
Bu yolda yapılmış bazı başarısız teşebbüsler de olmuştur. Ancak, bu fikrin hayata geçirilmesinin mümkün olmadığı; PE malzemenin kalıplama özelliklerinin sürgülü vana prensibi ile uyuşmasının mümkün olmadığına inanılmıştır.

IS PE GATE VALVE JUST A DREAM?

For many years, the idea of the production of Gate valve from the PE material has been discussed between valve manufacturers and engineers.
Some unsuccessful tries have been made on this way. However, the implementation of this idea is believed to be impossible because of PE molding material specification is assumed as not compatible with the principle of the gate valve.

TEGA BİR HAYALİ GERÇEKLEŞTİRİYOR

2005 yılından itibaren TEGA AR-GE grubu bu hayali gerçekleştirmek için yoğun bir çaba içerisine girmiş ve sayısız hesaplama, analiz, deneme yapmıştır.
6 yıllık bu sürecin sonunda istenen teknik kriterlere ulaşmış ve dünyada bir ilki başarmışlardır. Dünyadaki büyük vana üreticilerinin hayal etmekten bile vazgeçtikleri bu rüyayı gerçekleştiren TEGA Mühendislik ve AR-GE grubu haklı bir gurur yaşamaktadır.

TEGA REALIZES OWN DREAM

Since 2005, TEGA R & D group has entered into an intensive effort to realize this dream, and attempted numerous calculations, analysis and tests on this way.
At the end of six-year period, TEGA has managed to reach to the needed technical criteria and has succeed the first in the world. Even the biggest manufacturers gave up to dream on this way TEGA Engineering R & D Group feel right proud of their success.

FLOW CONTROL-METRIC
AKIŞ KONTROL-METRİK

PE SÜRGÜLÜ VANANIN AVANTAJLARI

Dayanıklılık

- Gövde ve çıkışların tamamı PE
- Korozyon ve kimyasallara karşı yüksek dayanım
- Kırılmalara karşı yüksek dayanım
- %100 Sızdırmazlık

Montaj

- Flanş ve mekanik bağlantı gerektirmez
- Metal vanalarla kıyaslandığında çok hafif
- Yüksek esneklik

THE ADVANTAGES OF PE GATE VALVE

Durability

- *Complete PE body and outlets*
- *High resistance to corrosion and chemicals*
- *High resistance to break*
- *EPDM sealing*

Installation

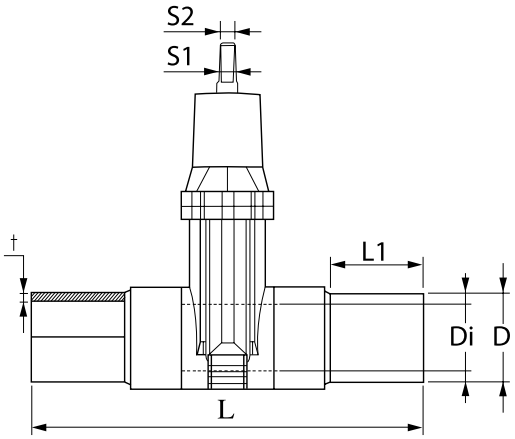
- *No need for flange or mechanical connections*
- *Low weight compared with metal valves*
- *High flexibility*

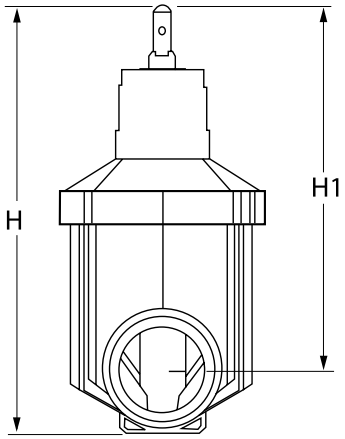
- İleri mühendislik tasarımı
- Hassas imalat süreçleri
- Yüksek kalite kriterleri
- 100% kalite kontrol

- *Advanced design of engineering*
- *Processing of Sensitive Procurement*
- *High Quality Criteria*
- *100% Quality Control*

GATE VALVE – LONG SPIGOT
SÜRGÜLÜ VANA – UZUN SPİGOT

PE100 *WATER* / SU : PN16





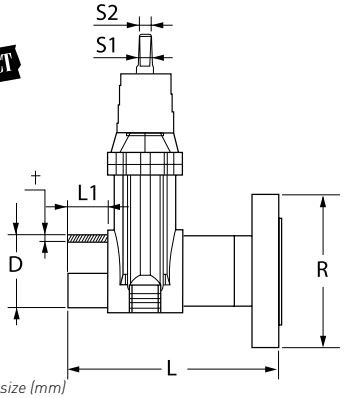
Metrik (mm) / Metric size (mm)

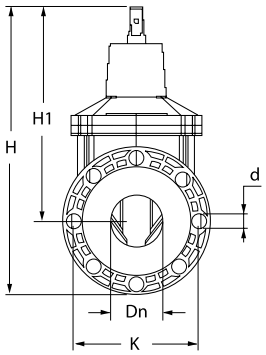
Code (420 SS+MS 58)	Code (316 SS+DZR)	D	Di	L	L1	H	H1	t	S1	S2
07311110000000320000	07211110000000320000	32	25	254	88	224	200	3,4	15	12
07311110000000400000	07211110000000400000	40	31	276	93	238	214	4,2	15	12
07311110000000500000	07211110000000500000	50	40	320	103	260	225	5,2	17	14
07311110000000630000	07211110000000630000	63	51	370	115	300	255	6,5	17	14
07311110000000750000	07211110000000750000	75	61	380	125	345	300	7,6	20,5	17
07311110000000900000	07211110000000900000	90	73	430	160	400	335	9	20,5	17
07311110000001100000	07211110000001100000	110	90	640	160	430	365	11	23	19
07311110000001250000	07211110000001250000	125	90	640	160	430	365	11	23	19
07311110000001400000	07211110000001400000	140	130	805	215	570	480	14	23	19
07311110000001600000	07211110000001600000	160	130	805	215	570	480	16	23	19
07311110000001800000	07211110000001800000	180	130	805	215	570	480	16	23	19
07311110000002000000	07211110000002000000	200	130	805	235	570	480	18	23	19
07311110000002250000	07211110000002250000	225	130	805	235	570	480	20	23	19

FLOW CONTROL-METRIC

AKIŞ KONTROL-METRİK

GATE VALVE – SHORT SPIGOT/FLANGED
SÜRGÜLÜ VANA – KISA SPİGOT/FLANŞLI
WATER / SU : PN16 PE100

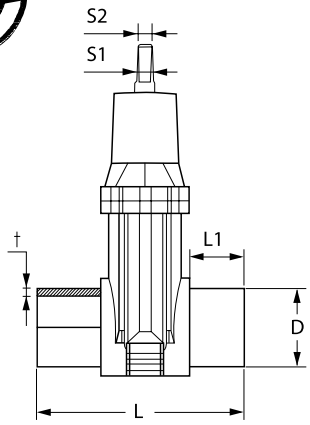


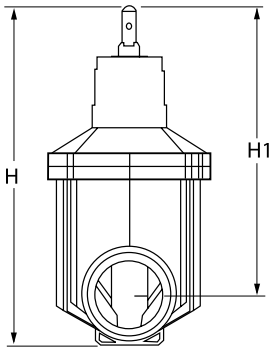


Metrik (mm) / Metric size (mm)

Code (420 SS+MS 58)	Code (316 SS+DZR)	D	Dn	L	L1	H	H1	t	S1	S2
09911110000100900000	07411110000100900000	90	80	355	160	335	400	9	20,5	17
09911110000101100000	07411110000101100000	110	100	386	160	365	430	11	23	19
09911110000101600000	07411110000101600000	160	150	420	215	480	570	16	23	19

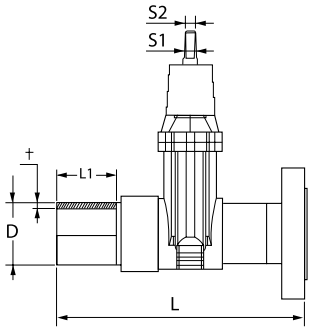
GATE VALVE – SHORT SPIGOT
SÜRGÜLÜ VANA – KISA SPİGOT
WATER / SU : PN16 PE100

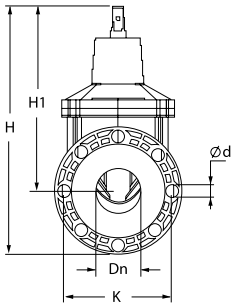




Code (420 SS+MS 58)	Code (316 SS+DZR)	D	L	L1	H	H1	t	S1	S2
07311110000100900000	07211110000100900000	90	265	80	365	310	9	20,5	17
07311110000101100000	07211110000101100000	110	293	90	430	375	11	23	19
07311110000101600000	07211110000101600000	160	340	95	540	460	16	23	19

GATE VALVE – LONG SPIGOT / FLANGED
SÜRGÜLÜ VANA – UZUN SPİGOT/FLANŞLI
WATER / SU : PN16 PE100

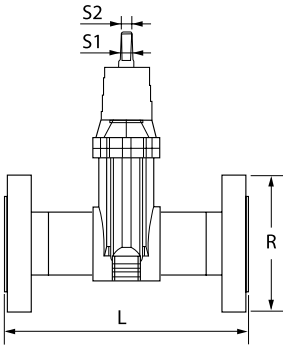


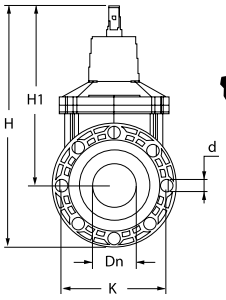


Metrik (mm) - Flanş ölçüsü: ISO 7005-2 / Metric size (mm) – Drilling dimensions for flange: ISO 7005-2

Code (420 SS+MS 58)	Code (316 SS+DZR)	D	Dn	L	L1	H	H1	t	S1	S2	K	R	d/Qty
09911110000000900000	07411110000000900000	90	80	510	160	365	310	9	20,5	17	160	200	18/8
09911110000001100000	07411110000001100000	110	100	545	150	430	375	11	23	19	180	220	18/8
09911110000001250000	07411110000001250000	125	100	555	150	430	375	13	23	19	180	220	18/8
09911110000001600000	07411110000001600000	160	150	598	200	540	460	16	23	19	240	285	23/8

GATE VALVE - FLANGED
SÜRGÜLÜ VANA – FLANŞLI
WATER / SU : PN16 PE100





Metrik (mm) - Flanş ölçüsü: ISO 7005-2 / Metric size (mm) – Drilling dimensions for flange: ISO 7005-2

Code (420 SS+MS 58)	Code (316 SS+DZR)	Dn	PE'ye göre	L	R	H	H1	K	S1	S2	d/Qty
09911110000100900000	07411110000100900000	80	90	203	200	365	310	160	20,5	17	18/8
09911110000101100000	07411110000101100000	110	110	229	220	430	375	180	23	19	18/8
09911110000101250000	07411110000101250000	125	125	229	220	430	375	180	23	19	18/8
09911110000101600000	07411110000101600000	160	160	267	285	540	460	240	23	19	23/8

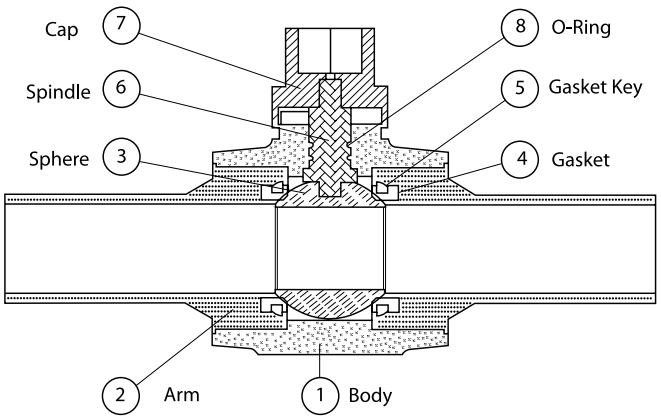
FLOW CONTROL-METRIC
AKIŞ KONTROL-METRİK

GATE VALVE with EF SADDLE
SÜRGÜLÜ VANA – SEMER ÇIKIŞLI
WATER / SU : PN16 PE100

CODE	CODE	D	L1	R	H1	S1	S2
10011110000000630000	07511110000000630000	63	115	75...710	300	17	14
10011110000000750000	07511110000000750000	75	125	90...710	345	20,5	17
10011110000000900000	07511110000000900000	90	160	110...1600	400	20,5	17
10011110000001100000	07511110000001100000	110	160	125...1600	430	23	19
10011110000001250000	07511110000001250000	125	160	140..1600	430	23	19
10011110000001400000	07511110000001400000	140	215	160...1600	570	23	19
10011110000001600000	07511110000001600000	160	215	180...1600	570	23	19
10011110000001800000	07511110000001800000	180	215	200...1600	570	23	19
10011110000002000000	07511110000002000000	200	235	225...1600	570	23	19
10011110000002250000	07511110000002250000	225	235	250...1600	570	23	19

PE100 BALL VALVES
PE100 KÜRESEL VANALAR

COMPONENT LIST
MALZEME LİSTESİ



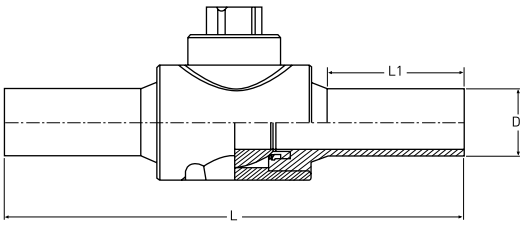
Parça No/Part No	Parça Adı/Part Name	Malzeme/Material
1	Gövde / Body	PE100
2	Kol / Arm	PE100
3	Küre / Sphere	POM/PE 100
4	Conta / *Gasket*	EPDM
5	Conta Kilidi / *Gasket* Key	PE 100
6	Mil / Spindle	POM
7	Kapak / Cap	POM
8	O-ring / O-ring	EPDM/NBR

FLOW CONTROL-METRIC

AKIŞ KONTROL-METRİK

BALL VALVE (FULL BORE)
KÜRESEL VANA (TAM GEÇİŞ)

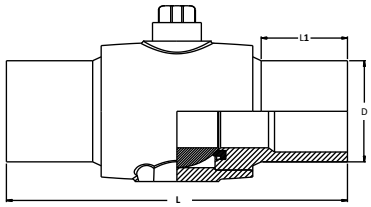
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR PE100



D	CODE	L (mm)	L1 (mm)
20	07711110000000200000	280	70
25	07711110000000250000	250	60
32	07711110000000320000	270	65
40	07711110000000400000	360	100
50	07711110000000500000	360	100
63	07711110000000630000	370	110
75	07711110000000750000	420	125
90	07711110000000900000	510	115
110	07711110000001100000	520	125
125	07711110000001250000	530	130
140	07711110000001400000	610	155
160	07711110000001600000	620	160
200	07711110000002000000	698	210
225	07711110000002250000	753	230
250	07711110000002500000	852	230
280	07711110000002800000	878	220
315	07711110000003150000	946	230
355	07711110000003550000	1064	254
400	07711110000004000000	1227	300
450	07711110000004500000	1346	320
500	07711110000005000000	1516	366
560	07711110000005600000	1593	400

BALL VALVE (REDUCED BORE)
KÜRESEL VANA (REDÜKSİYON GEÇİŞ)

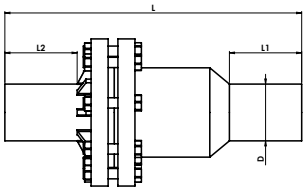
GAS/GAZ : 10 BAR *WATER*/SU : 16 BAR
PE100



D	CODE	L (mm)	L1 (mm)
180	07611110000001800000	620	160

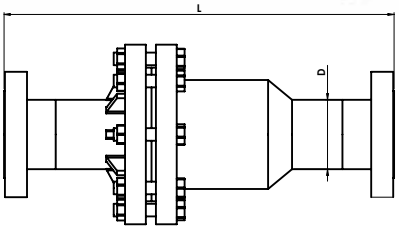
PE 100 CHECK VALVE

BALL CHECK VALVE
KÜRELİ ÇEKVALF
SDR11 PE100



CODE	D	L	L1	L2	AĞIRLIK
07811110000000900000	90	570	130	140	3,5
07811110000001100000	110	580	140	140	3,7

BALL CHECK VALVE - FLANGED
KÜRELİ ÇEKVALF - FLANŞLI
SDR11 PE100

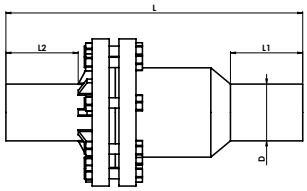


CODE	D	L	AĞIRLIK
10111110000000900000	90	560	4,7
10111110000001100000	110	560	4,8

FLOW CONTROL-METRIC

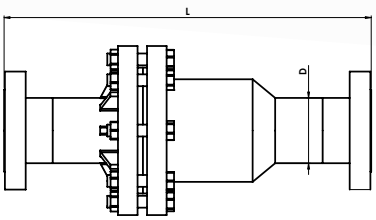
AKIŞ KONTROL-METRİK

CHECK VALVE WITH SPRING
YAYLI ÇEKVALF
SDR11 PE100



CODE	D	L	L1	L2	AĞIRLIK
08011110000000900000	90	570	130	140	3,6
08011110000001100000	110	580	140	140	3,8

CHECK VALVE WITH SPRING-FLANGED
YAYLI ÇEKVALF-FLANŞLI
SDR11 PE100

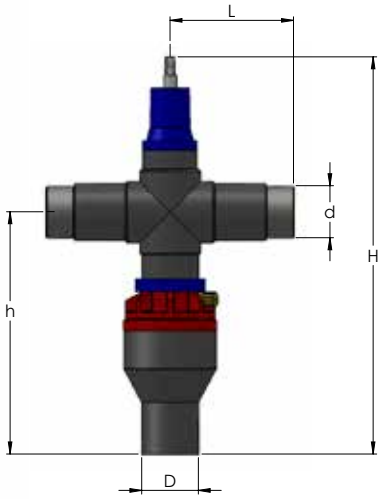


CODE	D	L	AĞIRLIK
08111110000000900000	90	560	4,8
08111110000001100000	110	560	5

HYDRANT-HİDRANT

A TYPE IRRIGATION HYDRANT
A TİPİ SULAMA HİDRANTI

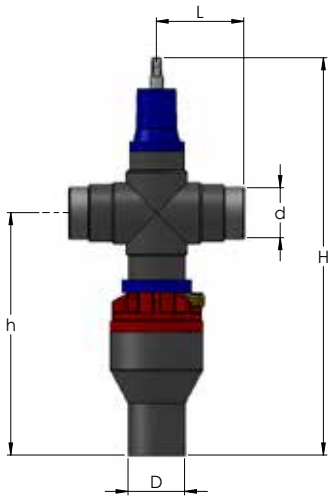
SDR11 PE100



CODE	Tip	D	d	H	h	L
08211110000001100000	A	110 (PE100)	65/80 (Dişli)	760	460	240
08211110000001600000	A	160 (PE100)	100 (Dişli)	910	600	320

D TYPE IRRIGATION HYDRANT
D TİPİ SULAMA HİDRANTI

SDR11 PE100



CODE	Tip	D	d	H	h	L
08311110000001100000	D	110 (PE100)	65/80 (Dişli)	760	460	170
08311110000001600000	D	160 (PE100)	100 (Dişli)	910	600	180

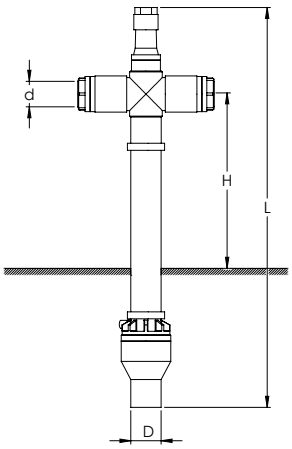
FLOW CONTROL-METRIC

AKIŞ KONTROL-METRİK

H TYPE IRRIGATION HYDRANT
H TİPİ SULAMA HİDRANTI
SDR11 PE100

CODE	Tip	D	d	H	h	L
08411110000001100000	H	110 (PE100)	80 (Dişli)	355	185	440

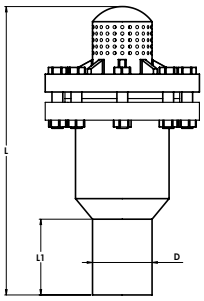
FIRE HYDRANT
YANGIN HİDRANTI
SDR11 PE100



CODE	Tip	D	d	H	L
08611110000001100000	YANGIN HİDRANTI	110 (PE100)	2 1/2	630	1435
08611110000001100000		110 (PE100)	2 1/2	630	1750
08611110000001100000		110 (PE100)	2 1/2	630	2150

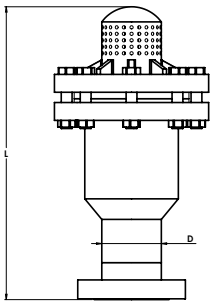
VANTUZ-AIR RELEASE

PE100 SINGLE BALL AIR RELEASE VALVE
PE100 TEK KÜRELİ VANTUZ
SDR11 PE100

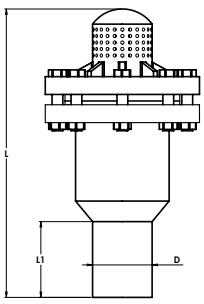
CODE	D	L	L1	AĞIRLIK
08811110000000900000	90	530	130	3,4
08811110000001100000	110	540	140	3,7

PE100 SINGLE BALL AIR RELEASE VALVE- FLANGED
PE100 TEK KÜRELİ VANTUZ FLANŞLI
SDR11 PE100

CODE	D	L	AĞIRLIK
08911110000000900000	90	530	4
08911110000001100000	110	530	4,3

NON SLAM DYNAMIC AIR RELEASE VALVE
DİNAMİK VANTUZ DARBESİZ
SDR11 PE100

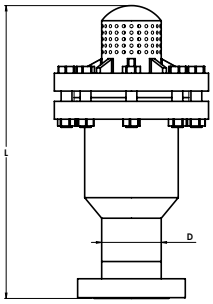



CODE	D	L	L1	AĞIRLIK
09011110000000900000	90	530	130	4,1
09011110000001100000	110	540	140	4,4

FLOW CONTROL-METRIC

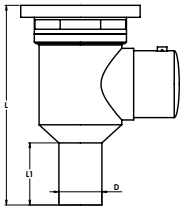
AKIŞ KONTROL-METRİK

NON SLAM DYNAMIC AIR RELEASE VALVE-FLANGED
PE100 DİNAMİK VANTUZ DARBESİZ-FLANŞLI
SDR11 PE100

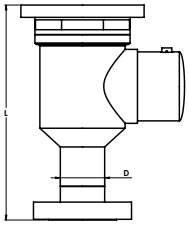
CODE	D	L	AĞIRLIK
09111110000000900000	90	530	4,7
09111110000001100000	110	530	5

DOUBLE BALL AIR RELEASE VALVE
ÇİFT KÜRELİ VANTUZ
SDR11 PE100

CODE	D	L	L1	AĞIRLIK
09211110000000900000	90	420	130	5,6
09211110000001100000	110	430	140	5,8

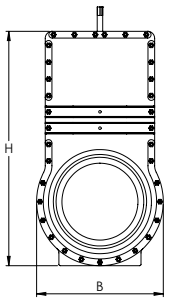
DOUBLE BALL AIR RELEASE VALVE-FLANGED
ÇİFT KÜRELİ VANTUZ-FLANŞLI
SDR11 PE100

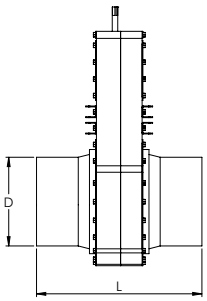



CODE	D	L	AĞIRLIK
09311110000000900000	90	420	6,2
09311110000001100000	110	420	6,3

KNIFE VALVE
BIÇAK VANA
PE100 SDR17-26

- **Composite or SS Blade**
- **Spigot Outlets**
- **PN 2-6 BAR**
- **No Groove (Alternative)**





ÜRÜN KODU	D	H	B	L	BAR	SDR
07111710000001100000	110	451	139	420	6	SDR17
07111710000001600000	160	565	320	500	6	SDR17
07112610000001600000	160	565	320	500	6	SDR26
07112610000002000000	200	632	355	545	6	SDR26
07112610000002250000	225	678	377	545	6	SDR26
07112610000002500000	250	719	398	555	6	SDR26
07112610000002800000	280	767	425	555	6	SDR26
07112610000003150000	315	832	455	595	6	SDR26
07112610000003550000	355	912	495	630	6	SDR26
07112610000004000000	400	992	535	685	6	SDR26
07112610000004500000	450	1400	610	810	2	SDR26
07112610000005000000	500	1500	750	824	2	SDR26
07112610000005600000	560	1600	810	890	2	SDR26
07112610000006300000	630	1700	900	890	2	SDR26
07112610000007100000	710	1800	950	960	2	SDR26
07112610000008000000	800	2000	1000	960	2	SDR26
07112610000009000000	900	1926	1010	960	2	SDR26

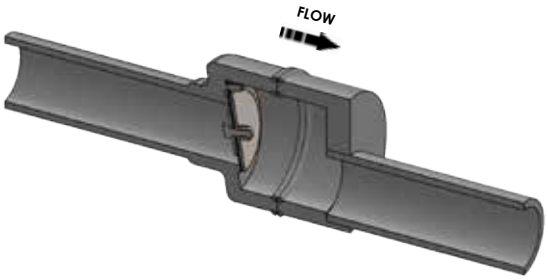
*d 110 - d 315 : PN 2 BAR or PN 6 BAR
*d 355 - d 800 PN 2 BAR

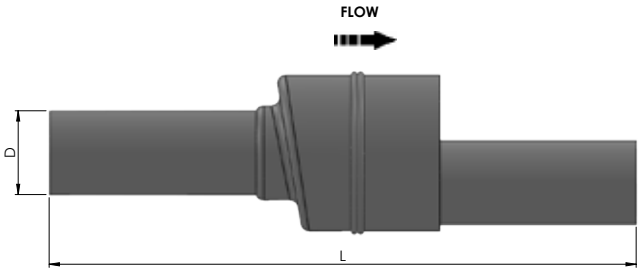
FLOW CONTROL-METRIC

AKIŞ KONTROL-METRİK

HINGED CHECK VALVE
MENTEŞELİ ÇEKVALF

PE100 PN 1/16





Up Stream Pressure → 16 Bar.
Down Stream Pressure → 1 Bar.

CODE	D	L (mm)
07911110000000320000	32	210
07911110000000400000	40	275
07911110000000500000	50	300
07911110000000630000	63	310

ULTRASONIC PREPAYABLE WATER METER
ULTRASONİK ÖN ÖDEMELİ SAYAÇ

NB 2275

Normatif belgeler ve uygulanabilir standartlar:
Normative documents and applicable harmonized standards:
OIML R 49 -1 :2006; OIML R 49 - 2:2006
EN 14154-1:2005 + A2; EN 14154-3:2005 + A2

TEGA REMOTE CONTROLED IRRIGATION SYSTEM
TEGA SULAMA KONTROL OTOMASYONU (SUKO)

TEGA Sulama Kontrol Otomasyonu (SUKO) temel şartlar baz alınarak geliştirilmiştir.
TEGA Irrigation Control Automation (SUKO) is developed on this basis.

1- Arzu edilen saatte sahaya su verilir,
2- Su sayacına uzaktan ulaşım sağlayarak kontrol eder ve açma / kapama yapılır,
3- Merkezi yönetim sistemi ile kolay faturalandırma,
4- Günlük, haftalık, aylık sulama planları oluşturma
5- Sıcaklık bilgisi, topraktaki nem vs. izlenebilir (desktop ve ya cep telefonu ile)
6- PE100 gövde ve ekipmanları ile sıfır sızdırmazlık, uzun ömür, sıcak-soğuğa dayanır
7- Sistem, elektronik/ teknolojik parça donanımı sayesinde bütçe dostudur
8- Yönetme/İşletme/Kontrol kolaylığı (masaüstü bilgisayar, tablet veya cep telefonu)
9- Sonuç olarak, Tega su sınırlı iken etkin kullanılması için global çözümler sunar. Ayrıca Planlama, Denetim Yönetim periyodu boyunca da yaratıcı çözümler sunmaktadır.

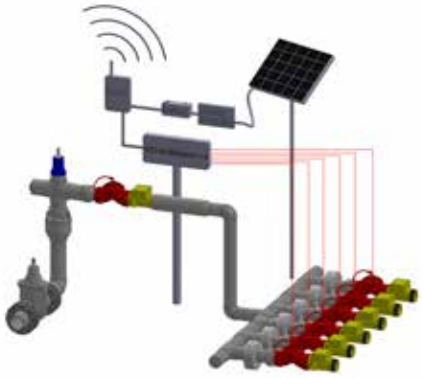
1- To give the water to the field at desired time.
2- To read the meter with remote access and to open/ close.
3- Easy billing by centralized management system
4- Daily, weekly, monthly irrigation schedules.
5- The monitoring information of temperature and moisture of soil and etc... (from desktop or mobile phone)
6- Zero leakage with PE100 Body and Assemblies, long life, resistance to hot-cold.
7- By means of assembled electronic/technologic parts, the system is cost friendly.
8- Easy of management / operating / (by desktop, tablet pc or mobile device)
9- As a result, TEGA submits global solutions to use the water efficiently while it is limited also submitting innovative solutions by planning, auditing, managing all along the period.

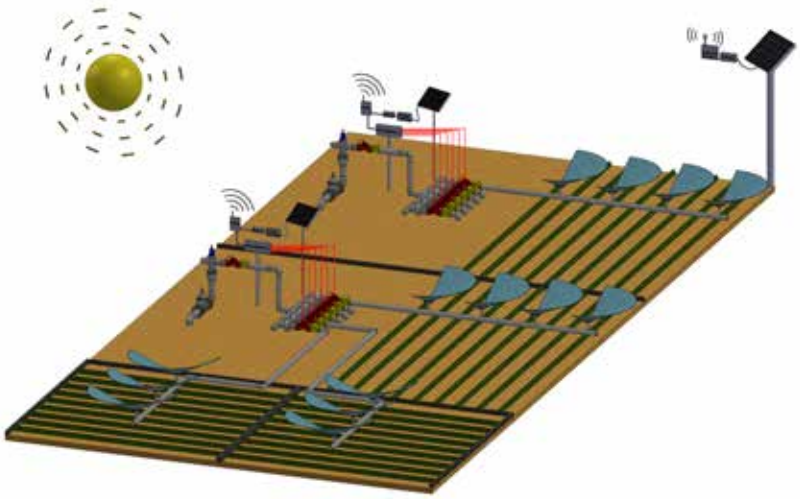
OTOMATİK SAYAÇ OKUMA

Su sayaçları, su kullanımının izlenmesi ve su akış geri beslemesi olmak üzere iki büyük rol üstlenir. İki bilgi de değerlendirilir ve merkezi kısmın arka uç lokasyonda işlenir. Sayaçlar faturalandırma, planlanan teslim süresi ve iyileştirme için sürekli okunur.

AUTOMATIC METER READING

Water meters perform two major roles, keeping track of water usages and water flow feedback. Both information is evaluated and processed both at local and at central system back-end. Meters are read continuously for billing, planned delivery and optimization.





OTOMATİK KONTROL VANALARI

Vana giriş / çıkış kontrol ekipmanları, hem online ve hem de offline sulama kontrolu için çok önemli bir yer teşkil etmektedir. Hidrant ve akış kontrol cihazlarından gelen geri bildirimlerle kontrol edilen vana, sahada özerk, kontrollü ve daha da entegre bir sistem oluşturur.

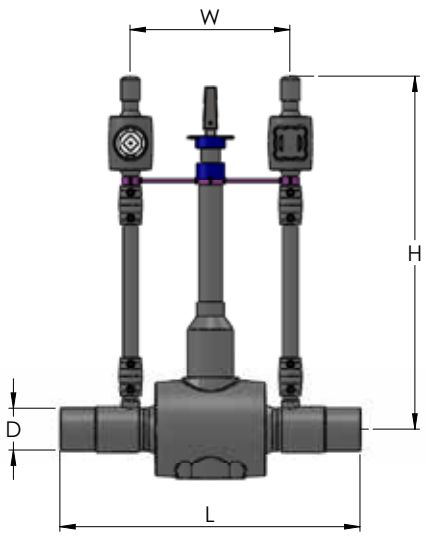
AUTOMATIC CONTROL OF VALVES

Valve control I/O devices are crucial for irrigation which should be done either at online or offline stages. Valve controlling with feedback(s) from hydrant and flow controllers would form an autonomous, controlled and yet further integrated system in the field.

FLOW CONTROL-METRIC

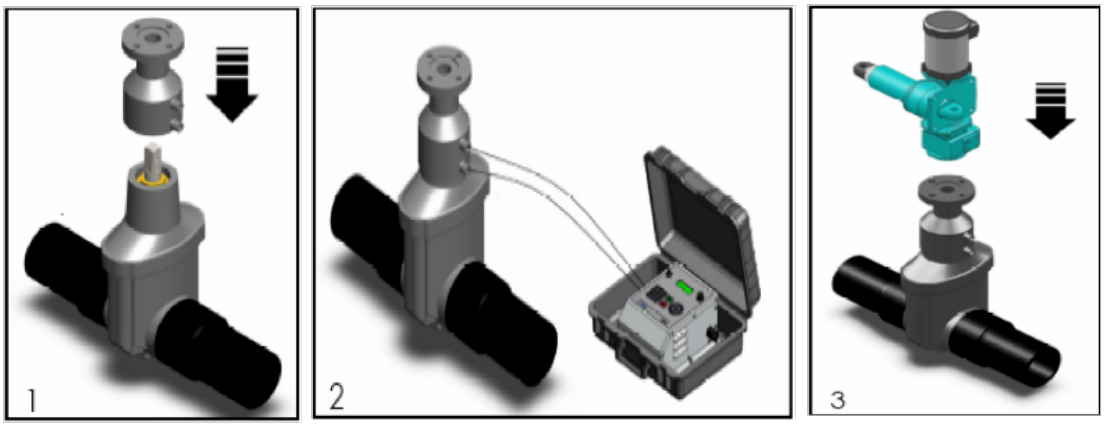
AKIŞ KONTROL-METRİK

PURGE VALVE
PURGE VANA
SDR11 PE100



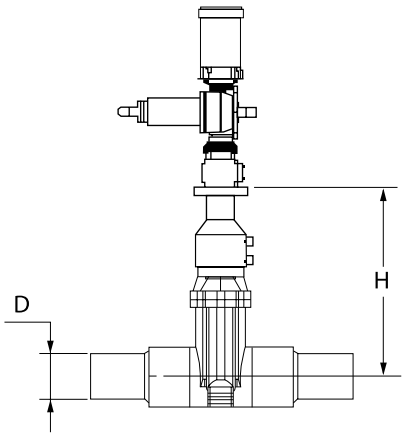
CODE	D	L	H	W
09411110000000630000	63	480	730	240
09411110000000900000	90	650	760	345
09411110000001100000	110	655	760	345
09411110000001250000	125	715	810	355
09411110000001600000	160	730	810	380
09411110000002000000	200	835	950	470
09411110000002500000	250	930	950	490
09411110000003150000	315	1015	950	505

EF ACTUATOR BASE
EF AKTÜATÖR ALTLIĞI

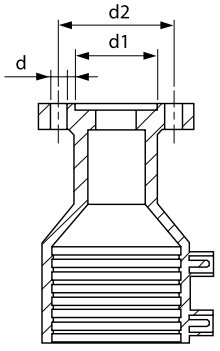


Tega, PE-EF Aktüatör altlıklarını kullanarak, sürgülü vananızı aktüatör monte edecek şekle getirebilirsiniz. Vana dünyasındaki en pratik sistemdir.
Do your "gate valve with actuator" on job site yourself by using TEGA EF actuator base! Most practical system on the world.

Monte edilen flanş ölçüsü ISO 5211/NFE 29-401 (F07) standardına uygundur.
Maks. Tork = 40 N.m
Maks. İtme kuv.= 20 N.m



Mounting Flange Dimension according to standart ISO 5211/NFE 29-401 (F07)
Torque max. = 40 N.m Thrust max.= 20 N.m



EF Aktüatör Altlığı / *EF Actuator Base*

d/Qty	d1	d2
10/4	56	70

ÜRÜN KODU / *PRODUCT CODE*	D	H1
09511100000000630000	63	250
09511100000000900110	90 - 110	323 - 386
09511100000001250000	125	386
09511100000001600000	160	425
09511100000001800000	180	425

FLOW CONTROL-METRIC

AKIŞ KONTROL-METRİK

IRRIGATION HYDRANT
(REMOTE CONTROLLED ON-OFF SYSTEM)
UZAKTAN KONTROLLÜ SULAMA HİDRANTI

PE100

CODE	D	d	H	h	L	*TYPE*
08511110000001100000	110	65/80	760	460	240	A
08511110000001100000	110	65/80	760	460	170	D
08511110000001600000	160	100	910	600	180	D

TEGA

- *Digital metering of the water consumption*
  Dijital sayaç

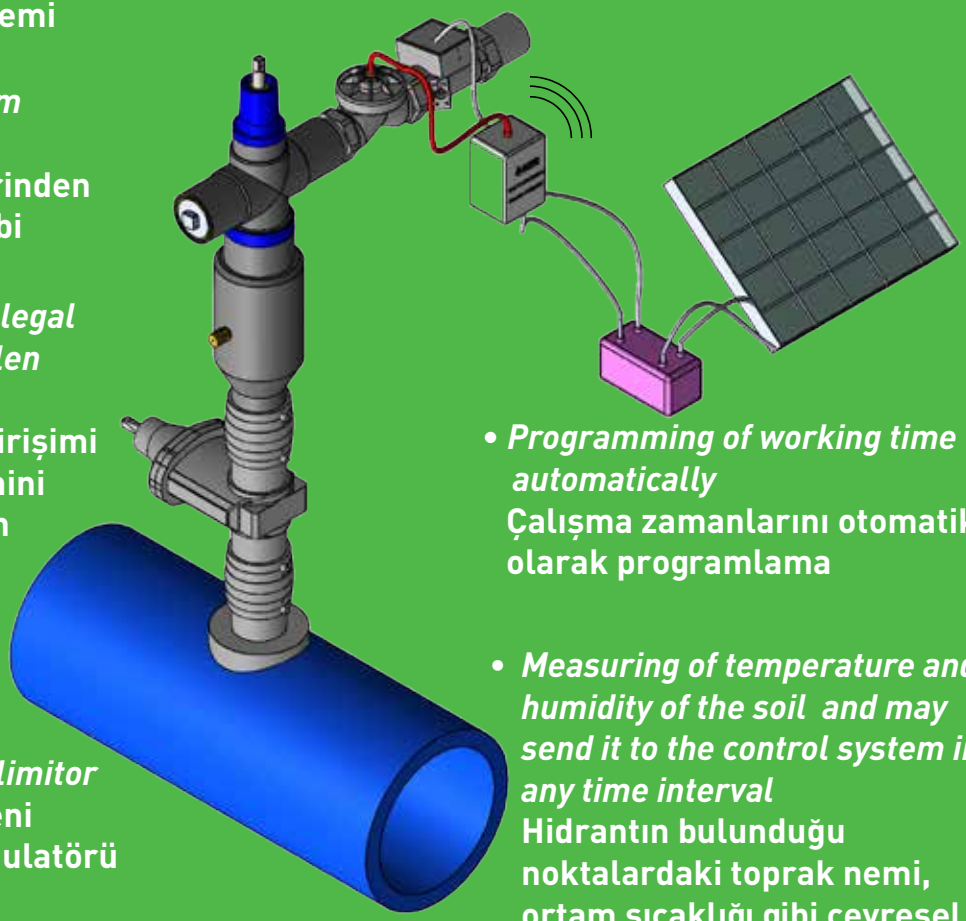
- *Remote controlled on-off system*
  Uzaktan kontrollü açma-kapama sistemi

- *Following all system on a google map*
  Google harita üzerinden tüm sistemin takibi

- *Alarm system for illegal water intake or stolen of valve*
  Vananın çalınma girişimi veya illegal su temini halinde aktive olan alarm sistemi

- *Innovative-New generation water regulator and flow limitor*
  Yeni geliştirilen yeni jenerasyon su regulatörü ve akış limitörü

- *Producing its energy from a solar panel and storing it in a battery*
  Güneş enerji panelinden elektrik (Sahada elektrik bağlantısı gerektirmez.)



- *Programming of working time automatically*
  Çalışma zamanlarını otomatik olarak programlama

- *Measuring of temperature and humidity of the soil and may send it to the control system in any time interval*
  Hidrantın bulunduğu noktalardaki toprak nemi, ortam sıcaklığı gibi çevresel faktörlerin ölçümü ve merkezi sisteme on-line bağlantı.

PE 100 IRRIGATION HYDRANT

PE 100 SULAMA HİDRANTI

REMOTE CONTROLLED
SOLAR ENERGY SUPPLY
DIGITAL WATER METERING

UZAKTAN KONTROL
GÜNEŞ ENERJİSİ DESTEKLİ
DİJİTAL SU SAYACI

PE 100 Gate Valve

The future VALVE

- *World Wide Patent*
- **Proven through extensive testing**

The missing link for the 'jointless' pipeline system

- **Reduced mechanical jointing**
- **100% leak tight**
- **100% recyclable**
- **100% corrosion resistant**
- **Light weight for ease of handling and installation. Upto 1/3 of the weight of traditional Gate Valves**

- **DN32 - DN225**
- **PE100 SDR11**
- **PN 16**

Tested succesfully to temperatures → 50°C in desert environments

Successfully tested in freezing temperatures down to -20°C

FIRST IN THE WORLD

EF INCH SIZE

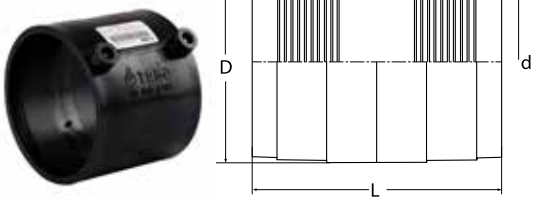
EF-IPS/DIPS

SDR26 ELECTROFUSION COUPLER, IPS DUAL RATED WATER/NATURAL GAS

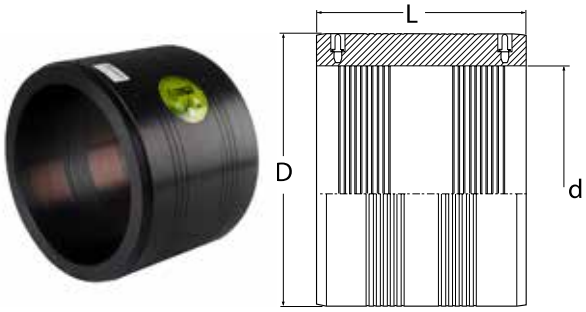
Water - 100 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 60 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513 ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201, ISO-9001 Certified



TYPE A



TYPE B

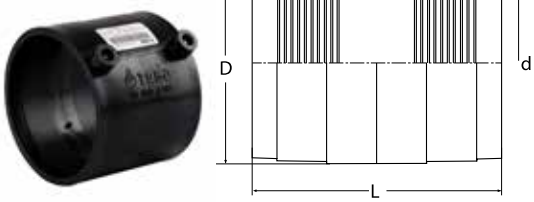
Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code
3"	3,500	4,06	3,94	0,45	A	00112600001000880000
4"	4,500	4,92	3,94	0,43	A	00112600001001140000
5"	5,563	6,10	6,30	1,08	B	00112600001001360000
6"	6,625	7,36	6,69	1,88	B	00112600001001680000
7"	7,125	7,75	6,69	1,62	B	00112600001001800000
8"	8,625	9,57	6,69	3,12	B	00112600001002190000
10"	10,750	12,01	6,69	5,22	B	00112600001002730000
12"	12,750	14,56	7,09	5,90	B	00112600001003230000
14"	14,000	15,28	7,09	7,20	B	00112600001003550000
16"	16,000	17,64	8,66	12,99	B	00112600001004060000
18"	18,000	19,88	9,06	17,57	B	00112600001004570000
20"	20,000	22,64	9,06	27,73	B	00112600001005080000
22" (1)	22,000	24,21	9,84	27,40	B	00112600001005580000
24" (1)	24,000	26,38	13,78	44,94	B	00112600001006090000
26" (1)	26,000	28,90	13,78	59,68	B	00112600001006600000
28" (1)	28,000	30,71	13,78	59,66	B	00112600001007110000
30" (1)	30,000	33,07	13,78	72,66	B	00112600001007620000
32" (1)	32,000	35,04	13,78	76,44	B	00112600001008120000
34" (1)	34,000	37,40	14,96	98,93	B	00112600001008630000
36" (1)	36,000	40,55	14,96	141,98	B	00112600001009140000
40" (1)	40,000	44,49	14,96	154,45	B	00112600001010160000
42" (1)	42,000	46,46	19,69	211,28	B	00112600001010660000
48" (1)	48,000	53,15	19,69	279,16	B	00112600001012190000
54" (1)	54,000	59,06	19,69	306,29	B	00112600001013710000
63" (1)	63,000	68,50	19,69	387,90	B	00112600001016000000

(1) Separate fusion zones

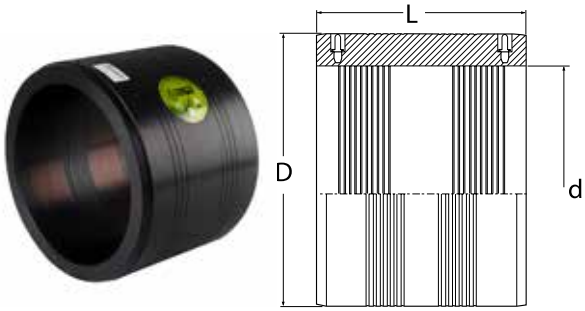
SDR17 ELECTROFUSION COUPLER, IPS DUAL RATED WATER/NATURAL GAS

Water - 160 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 100 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513 ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 Certified



TYPE A



TYPE B

Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code
6"	6,625	7,76	7,48	3,31	A	00111700001001680000
7"	7,125	8,27	7,48	3,58	A	00111700001001800000
8"	8,625	10,31	8,03	7,00	A	00111700001002190000
10"	10,750	12,60	8,66	10,18	A	00111700001002730000
12"	12,750	14,96	9,06	15,10	A	00111700001003230000
14"	14,000	16,34	10,00	19,32	A	00111700001003550000
16" (1)	16,000	18,50	11,81	27,78	A	00111700001004060000
18" (1)	18,000	20,87	12,60	38,21	B	00111700001004570000
20" (1)	20,000	23,23	14,41	54,75	B	00111700001005080000
22" (1)	22,000	25,79	15,75	77,60	B	00111700001005580000
24" (1)	24,000	27,95	15,75	88,05	B	00111700001006090000
26" (1)	26,000	30,51	16,54	114,78	B	00111700001006600000
28" (1)	28,000	33,07	17,52	147,71	B	00111700001007110000
30" (1)	30,000	35,43	17,52	169,57	B	00111700001007620000
32" (1)	32,000	37,20	18,50	181,46	B	00111700001008120000
34" (1)	34,000	40,16	18,90	234,93	B	00111700001008630000
36" (1)	36,000	41,73	19,69	238,80	B	00111700001009140000
40" (1)	40,000	46,85	19,69	318,86	B	00111700001010160000
42" (1)	42,000	49,21	19,69	352,58	B	00111700001010660000
48" (1)	48,000	55,12	20,67	413,04	B	00111700001012190000
54" (1)	54,000	62,20	21,65	562,07	B	00111700001013710000

(1) Separate fusion zones

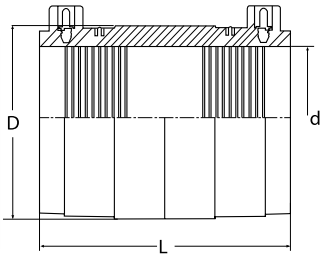
EF-IPS/DIPS

SDR11 ELECTROFUSION COUPLER, IPS DUAL RATED WATER/NATURAL GAS

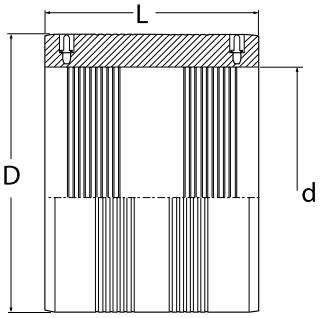
Water - 200-240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513 ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 Certified



TYPE A



TYPE B

3/4"	1,050	1,61	2,80	0,11	A	00111700001000260000	
1"	1,315	1,89	3,23	0,16	A	00111700001000330000	
1 1/4"	1,660	2,17	3,39	0,18	A	00111700001000420000	
1 1/2"	1,900	2,64	3,86	0,35	A	00111700001000480000	
2"	2,375	3,15	4,21	0,49	A	00111700001000600000	
3"	3,500	4,53	5,91	0,89	A	00111700001000880000	
4"	4,500	5,59	6,69	1,40	A	00111700001001140000	
5"	5,563	7,09	6,73	3,53	A	00111700001001360000	
6"	6,625	8,41	7,56	4,75	A	00111700001001680000	
7"	7,125	9,06	7,48	5,65	B	00111700001001800000	
8"	8,625	10,75	7,87	9,25	A	00111700001002190000	
10"	10,750	13,39	8,66	14,99	B	00111700001002730000	*
12"	12,750	15,35	9,06	18,03	B	00111700001003230000	
14"	14,000	17,32	10,00	28,34	B	00111700001003550000	**
16" (1)	16,000	19,29	11,81	37,35	B	00111700001004060000	
18" (1)	18,000	21,57	12,60	48,52	B	00111700001004570000	**
20" (1)	20,000	24,21	14,41	73,07	B	00111700001005080000	**
22" (1)	22,000	27,17	15,75	108,88	B	00111700001005580000	**
24" (1)	24,000	29,72	15,75	131,86	B	00111700001006090000	
26" (1)	26,000	32,28	16,54	164,87	B	00111700001006600000	
28" (1)	28,000	34,65	17,52	198,58	B	00111700001007110000	*

EF-IPS/DIPS

ELECTROFUSION COUPLERS, DUAL RATED WATER/NATURAL GAS

WATER - 200-240 PSI AT 73 DEG F SUSTAINABLE MAXIMUM OPERATING PRESSURE

GAS - 150 PSI AT 73 DEG F

- SUSTAINABLE MAXIMUM OPERATING PRESSURE SUITABLE FOR *WATER*, FLUIDS & SLURRY'S
- ENGINEERED FOR PE3408, PE4710 & PE100 HDPE PIPE SYSTEMS
- MANUFACTURED IN ACCORDANCE WITH ASTM F-714, ASTM F-1055, ASTM D-2513 ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 CERTIFIED

Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code	
30" (1)	30,000	37,01	17,52	223,98	B	00111700001007620000	
32" (1)	32,000	38,98	18,50	249,45	B	00111700001008120000	
34" (1)	34,000	42,13	18,90	318,26	B	00111700001008630000	**
36" (1)	36,000	44,09	19,69	347,46	B	00111700001009140000	
40" (1)	40,000	47,24	19,69	338,71	B	00111700001010160000	
42" (1)	42,000	51,18	19,69	456,00	B	00111700001010660000	**

(1) Separate fusion zones

* 220 PSI

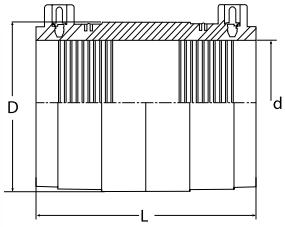
** 200 PSI

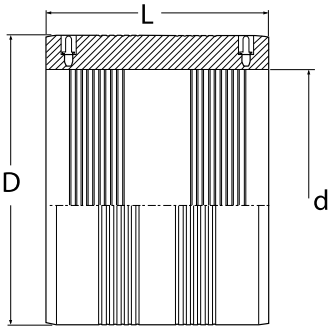
EF-IPS/DIPS

SDR6 ELECTROFUSION COUPLER, IPS

Water - 460 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids&Slurry's
- Engineered for PE3408, PE4710&PE100 HDPE Pipe Sytems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513 ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 Certified





Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code
2"	2,375	3,80	6,65	0,45	A	00110600001000600000
3"	3,500	5,60	6,57	1,00	A	00110600001000880000
4"	4,500	7,87	7,28	3,00	A	00110600001001140000
6"	6,625	10,23	7,56	5,70	A	00110600001001680000
8"	8,625	13,38	7,87	10,20	B	00110600001002190000
10"	10,750	16,50	8,66	16,90	B	00110600001002730000
12"	12,750	19,29	9,06	23,40	B	00110600001003230000
14"	14,000	21,65	10,00	33,60	B	00110600001003550000
16" (1)	16,000	24,40	11,81	49,60	B	00110600001004060000
18" (1)	18,000	27,55	12,60	67,60	B	00110600001004570000

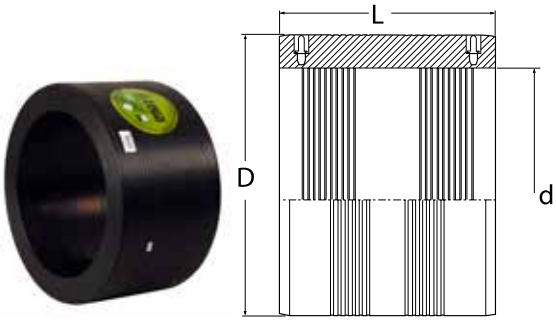
(1) Separate fusion zones

SDR9 ELECTROFUSION COUPLER IPS

Water 300 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201, ISO-9001 Certified

TYPE A



TYPE B

Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code
2"	2,375	3,82	4,65	1,13	A	00110900001000600000
3"	3,500	5,59	6,57	3,40	A	00110900001000880000
4"	4,500	6,26	6,69	3,45	A	00110900001001140000
5"	5,563	7,87	7,28	6,16	A	00110900001001360000
6"	6,625	9,06	7,48	7,76	A	00110900001001680000
7"	7,125	9,65	8,66	9,97	B	00110900001001800000
8"	8,625	12,01	7,87	14,96	B	00110900001002190000
10"	10,750	14,57	8,66	22,79	B	00110900001002730000
12"	12,750	16,73	9,06	28,94	B	00110900001003230000
14"	14,000	18,31	10,04	38,03	B	00110900001003550000
16" (1)	16,000	20,87	11,81	57,69	B	00110900001004060000
18" (1)	18,000	23,62	12,60	80,26	B	00110900001004570000
20" (1)	20,000	25,98	14,37	107,66	B	00110900001005080000
22" (1)	22,000	29,13	15,75	156,40	B	00110900001005580000
24" (1)	24,000	32,68	16,54	221,40	B	00110900001006090000

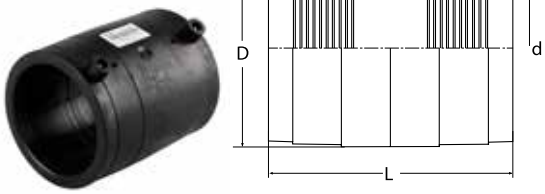
(1) Separate fusion zones

EF-IPS/DIPS

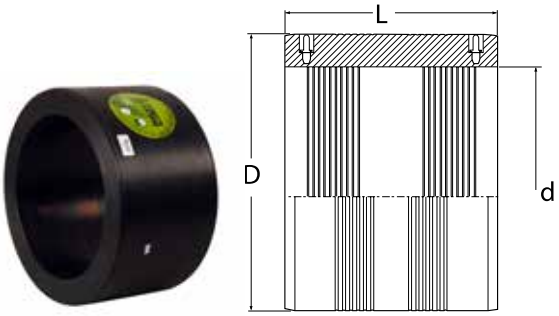
SDR7 ELECTROFUSION COUPLER IPS

Water 360 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201, ISO-9001 Certified



TYPE A



TYPE B

Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code	
2"	2,375	3,82	4,65	1,13	A	00110700001000600000	
3"	3,500	5,59	6,57	3,40	A	00110700001000880000	
4"	4,500	6,26	6,77	3,49	A	00110700001001140000	
5"	5,563	8,03	7,28	6,65	A	00110700001001360000	
6"	6,625	9,45	7,48	9,24	A	00110700001001680000	
7"	7,125	9,76	7,48	9,08	B	00110700001001800000	*
8"	8,625	12,20	7,87	15,98	B	00110700001002190000	
10"	10,750	15,35	8,66	28,34	B	00110700001002730000	
12"	12,750	17,32	9,06	33,90	B	00110700001003230000	*
14"	14,000	19,29	10,04	48,15	B	00110700001003550000	*
16" (1)	16,000	21,77	11,81	70,10	B	00110700001004060000	*
18" (1)	18,000	24,41	12,60	93,23	B	00110700001004570000	*
20" (1)	20,000	27,17	14,37	132,22	B	00110700001005080000	*
22" (1)	22,000	30,71	15,75	196,80	B	00110700001005580000	

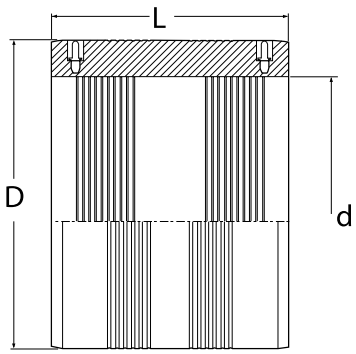
(1) Separate fusion zones

* 350 PSI

SDR26 ELECTROFUSION COUPLER DIPS

Water - 100 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 Certified



Nominal DIPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	Item Code
4"	4,800	5,30	3,94	0,55	00112600002001210000
6"	6,900	7,67	6,30	1,87	00112600002001750000
10"	11,100	12,20	6,50	4,50	00112600002002810000
12"	13,200	14,75	7,08	8,30	00112600002003350000
14"	15,300	17,10	8,66	13,80	00112600002003880000
16"	17,400	19,25	8,66	16,20	00112600002004220000
18"	19,500	21,50	8,66	20,60	00112600002004950000
20"	21,600	24,20	9,84	29,20	00112600002005480000
24" (1)	25,800	28,40	12,90	48,20	00112600002006550000
30" (1)	32,000	35,40	13,70	75,50	00112600002008120000
36" (1)	38,300	42,10	15,00	124,00	00112600002009720000

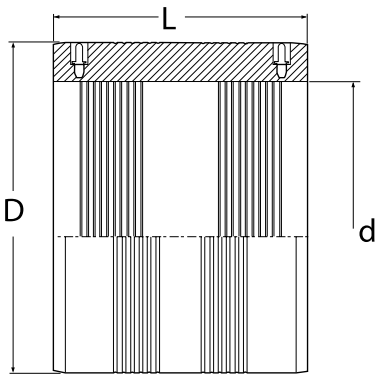
(1) Separate fusion zones

EF-IPS/DIPS

SDR17 ELECTROFUSION COUPLER DIPS

Water 160 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA, C-906, DIN 16963, EN1555, EN12201 ISO-9001 Certified



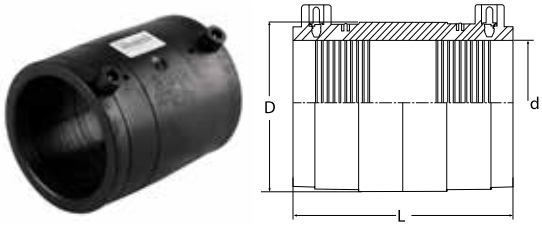
Nominal DIPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	Item Code
6"	6,900	8,10	7,50	3,50	00111700002001750000
8"	9,050	10,60	7,80	5,70	00111700002002290000
10"	11,100	13,00	8,60	10,60	00111700002002810000
12"	13,200	15,35	9,50	16,00	00111700002003350000
14" (1)	15,300	18,30	11,80	29,80	00111700002003880000
16" (1)	17,400	20,86	12,60	45,10	00111700002004220000
18" (1)	19,500	23,20	14,40	54,60	00111700002004950000
20" (1)	21,600	26,50	15,70	88,50	00111700002005480000
24" (1)	25,800	30,50	16,50	112,70	00111700002006550000
30" (1)	32,000	37,40	18,50	179,50	00111700002008120000

(1) Separate fusion zones

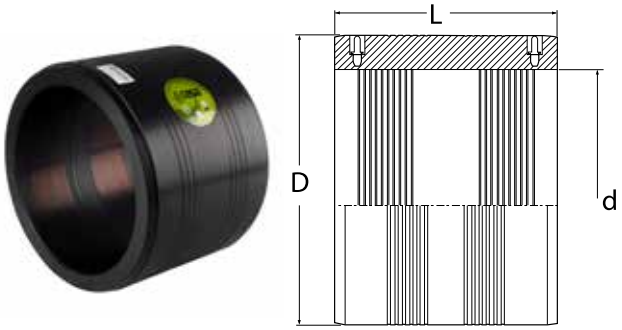
SDR11 ELECTROFUSION COUPLER DIPS

Water 200-240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-906, DIN16963, EN1555, EN12201, ISO-9001 Certified



TYPE A



TYPE B

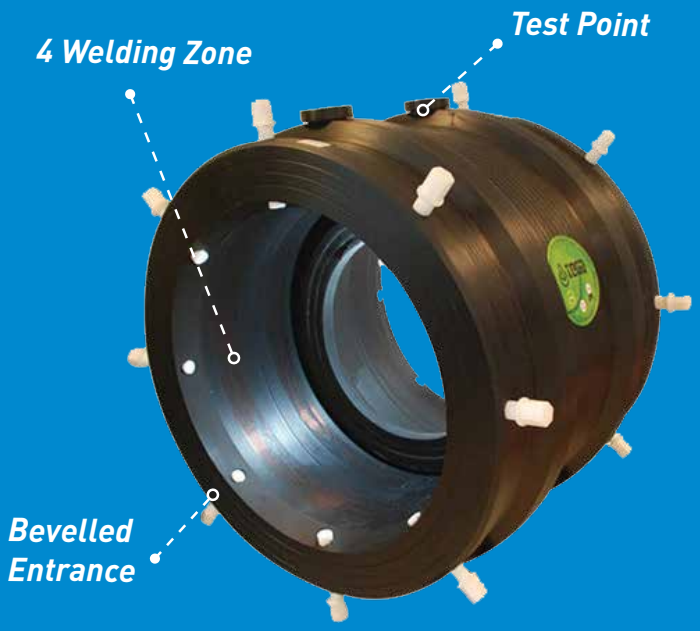
Nominal DIPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	*TYPE*	Item Code	
4"	4,800	6,30	6,60	3,00	A	00111100002001210000	
6"	6,900	8,40	7,50	4,70	A	00111100002001750000	
8"	9,050	10,60	8,00	6,70	A	00111100002002290000	***
10"	11,100	13,00	8,60	13,80	B	00111100002002810000	**
12"	13,200	15,35	9,50	24,00	B	00111100002003350000	
14" (1)	15,300	18,30	11,80	41,50	B	00111100002003880000	
16" (1)	17,400	20,86	12,60	56,30	B	00111100002004220000	
18" (1)	19,500	23,20	14,40	68,50	B	00111100002004950000	**
20" (1)	21,600	26,50	15,70	115,00	B	00111100002005480000	
24" (1)	25,800	31,50	16,50	156,50	B	00111100002006550000	
30" (1)	32,000	38,50	18,50	246,60	B	00111100002008120000	***

(1) Separate fusion zones

** 220 psi

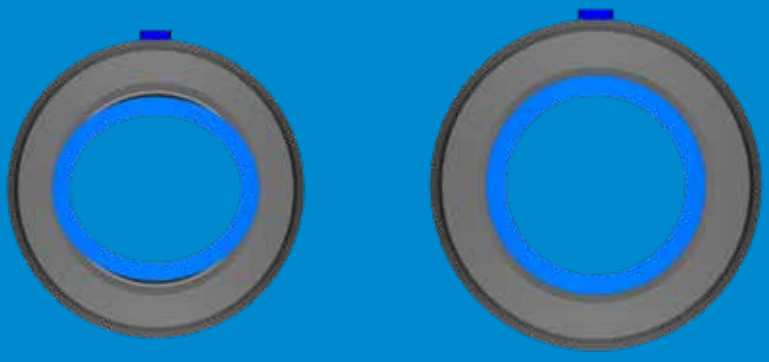
*** 200 psi

TEGA DOST COUPLER



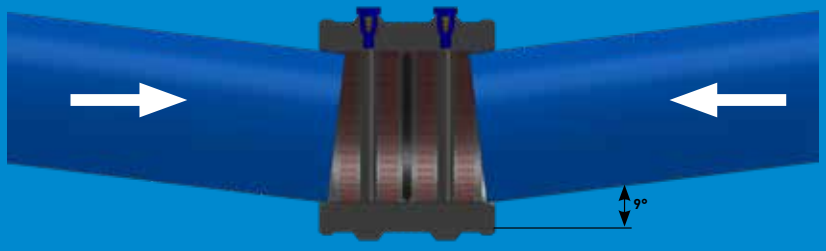
The Leading Edge Of Electrofusion Technology!

Deflection can cause ovality. The ovality of the pipe can be solved by using conical enterance of the coupler. Dost coupler can tolerate up to 10% ovality of the pipe

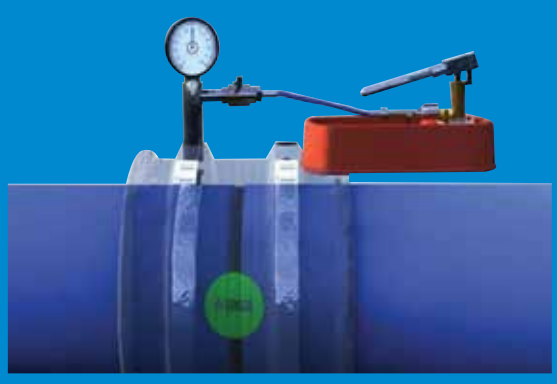


Oval Pipe

Circular Pipe



Dost Coupler can accommodate up to 9° deflection of the pipe without using any tool

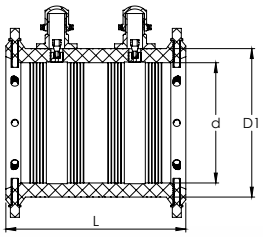


Make the hydraulic test without filling the pipe line with water

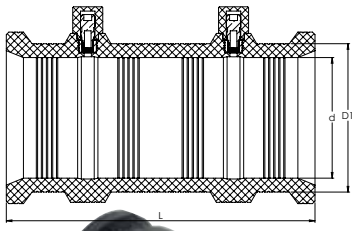
The winner of world innovation award 2014

EF DOST COUPLER / EF DOST MANŞON

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-906 DIN16963, EN1555, EN12201, ISO-9001 Certified



TYPE A



TYPE B

d	CODE	Weight(kg)	ID (Nominal) d	D1	L	SDR	*TYPE*
2"	00311100001000600000	0,80	2,375	3,15	8,46	11	B
3"	00311100001000880000	1,60	3,500	4,41	11,42	11	B
4"	00311100001001140000	2,90	4,500	5,70	13,38	11	B
5"	00311100001001360000	2,90	5,563	5,51	14,17	11	B
6"	00311100001001680000	6,90	6,625	8,46	16,93	11	B
8"	00311100001002190000	11,50	8,625	10,83	18,90	11	B
10"	00311100001002730000	23,50	10,750	13,58	23,62	11	A
12"	00311100001003230000	31,60	12,750	15,55	24,30	11	A
14"	00311100001003550000	43,50	14,000	17,52	25,80	11	A
16"	00311100001004060000	55,50	16,000	19,49	27,56	11	A
18"	00311100001004570000	67,00	18,000	21,85	28,35	11	A
20"	00311100001005080000	92,50	20,000	24,41	30,07	11	A
22"	00311100001005580000	116,70	22,000	27,36	30,07	11	A
24"	00311100001006090000	144,90	24,000	29,92	30,07	11	A
26"	00311100001006600000	155,70	26,000	32,48	30,07	11	A
28"	00311100001007110000	186,40	28,000	34,45	33,07	11	A
30"	00311100001007620000	208,00	30,000	37,00	33,07	11	A
32"	00311100001008120000	220.40	32,000	38,98	33,07	11	A
36"	00311100001009140000	306,60	36,000	44,09	33,07	11	A
40"	00311100001010160000	283,10	40,000	47,64	33,07	17*	A
42"	00311100001010660000	269,00	42,000	48,82	33,07	17*	A
48"	00311100001012190000	314,10	48,000	55,12	33,07	17*	A
54"	00311100001013710000	396,20	54,000	62,21	33,07	17*	A
63"	00311100001016000000	552,30	63,000	72,05	33,07	17*	A

* *GAS* / GAZ: 4 BAR - *WATER* / SU: 10 BAR

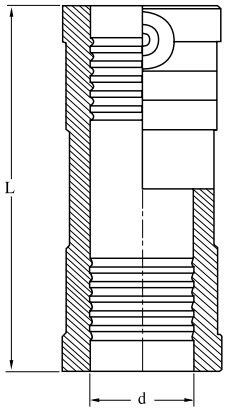
EF-IPS/DIPS

SDR 11 ELECTROFUSION LONG COUPLER (IPS) DUAL RATED WATER/NATURAL GAS

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 Certified



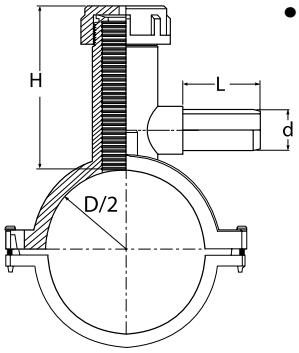
Nominal Pipe Size (d)	Base Norm	L	Unit Weight in lbs.	Item Code
3/4"	IPS	4,25	1,43	00611100001000260000
1"	CTS	5,04	0,26	00611100001000280000
1"	IPS	5,04	0,26	00611100001000330000
1 1/4"	IPS	6,38	0,33	00611100001000420000
1 1/2"	IPS	6,38	0,61	00611100001000480000
2"	IPS	7,32	1,13	00611100001000600000
3"	IPS	10,04	2,94	00611100001000880000
4"	IPS	11,93	5,28	00611100001001140000

SDR11 ELECTROFUSION TAPPING TEES DUAL RATED WATER/NATURAL GAS

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified




TYPE A


TYPE B


TYPE C


TYPE D

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
1 1/4"	IPS	1/2"	CTS	4,13	1,73	0,64	A	04611100013000420015
1 1/4"	IPS	1/2"	IPS	4,13	1,73	0,66	A	04611100001000420021
1 1/4"	IPS	3/4"	CTS	4,13	1,73	0,66	A	04611100013000420022
1 1/4"	IPS	3/4"	IPS	4,13	1,73	0,66	A	04611100001000420026
1 1/4"	IPS	1"	CTS	4,13	1,73	0,68	A	04611100013000420028
1 1/4"	IPS	1"	IPS	4,13	1,85	0,68	A	04611100001000420033
1 1/2"	IPS	1/2"	CTS	4,13	2,05	1,06	A	04611100013000480015
1 1/2"	IPS	1/2"	IPS	4,13	2,05	1,12	A	04611100001000480021
1 1/2"	IPS	3/4"	CTS	4,13	2,05	1,15	A	04611100013000480022
1 1/2"	IPS	3/4"	IPS	4,13	2,13	1,26	A	04611100001000480026
1 1/2"	IPS	1"	CTS	4,13	2,13	1,28	A	04611100013000480028
1 1/2"	IPS	1"	IPS	4,13	3,35	1,30	A	04611100001000480033
1 1/2"	IPS	1 1/4"	CTS	4,13	3,35	1,30	A	04611100013000480034
2"	IPS	1/2"	CTS	4,13	2,05	1,19	A	04611100013000600015
2"	IPS	1/2"	IPS	4,13	2,05	1,23	A	04611100001000600021
2"	IPS	3/4"	CTS	4,13	2,05	1,23	A	04611100013000600022
2"	IPS	3/4"	IPS	4,13	2,13	1,28	A	04611100001000600026
2"	IPS	1"	CTS	4,13	2,13	1,28	A	04611100013000600028
2"	IPS	1"	IPS	4,13	3,35	1,30	A	04611100001000600033
2"	IPS	1 1/4"	IPS	4,13	3,54	1,30	A	04611100001000600042

SDR11 ELECTROFUSION TAPPING TEES
DUAL RATED WATER/NATURAL GAS
WATER - 240 PSI AT 73 DEG F SUSTAINABLE MAXIMUM OPERATING PRESSURE
GAS - 150 PSI AT 73 DEG F SUSTAINABLE MAXIMUM OPERATING PRESSURE
- SUITABLE FOR *WATER*, FLUIDS & SLURRY'S
- ENGINEERED FOR PE3408, PE4710 & PE100 HDPE PIPE SYSTEMS
- MANUFACTURED IN ACCORDANCE WITH ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 CERTIFIED

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	tem Code
2"	IPS	1 1/4"	CTS	4,13	3,35	1,30	A	04611100013000600034
2"	IPS	1 1/2"	IPS	7,87	4,53	2,43	B	04611100001000600048
2"	IPS	2"	IPS	7,87	4,53	2,65	B	04611100001000600060
3"	IPS	1/2"	CTS	5,31	1,85	2,14	A	04611100013000880015
3"	IPS	1/2"	IPS	5,31	1,85	2,16	A	04611100001000880021
3"	IPS	3/4"	CTS	5,31	1,85	2,16	A	04611100013000880022
3"	IPS	3/4"	IPS	5,31	2,05	2,18	A	04611100001000880026
3"	IPS	1"	CTS	5,31	2,05	2,18	A	04611100013000880028
3"	IPS	1"	IPS	5,31	2,52	2,21	A	04611100001000880033
3"	IPS	1 1/4"	IPS	5,31	3,50	2,23	A	04611100001000880042
3"	IPS	1 1/4"	CTS	5,31	2,52	2,21	A	04611100013000880034
3"	IPS	1 1/2"	IPS	7,09	3,94	3,20	C	04611100001000880048
3"	IPS	2"	IPS	7,09	4,33	3,29	C	04611100001000880060
4"	IPS	1/2"	CTS	5,31	1,89	2,25	A	04611100013001140015
4"	IPS	1/2"	IPS	5,31	1,89	2,27	A	04611100001001140021
4"	IPS	3/4"	CTS	5,31	1,89	2,27	A	04611100013001140022
4"	IPS	3/4"	IPS	5,31	2,17	2,29	A	04611100001001140026
4"	IPS	1"	CTS	5,31	2,17	2,34	A	04611100013001140028
4"	IPS	1"	IPS	5,31	2,68	2,36	A	04611100001001140033
4"	IPS	1 1/4"	IPS	5,31	2,76	2,38	A	04611100001001140042
4"	IPS	1 1/4"	CTS	5,31	2,68	2,36	A	04611100013001140034
4"	IPS	1 1/2"	IPS	7,09	2,95	2,38	C	04611100001001140048
4"	IPS	2"	IPS	7,09	2,95	3,31	C	04611100001001140060
5"	IPS	1/2"	CTS	5,31	2,01	2,91	C	04611100013001360015
5"	IPS	1/2"	IPS	5,31	2,01	2,91	C	04611100001001360021
5"	IPS	3/4"	CTS	5,31	2,01	2,93	C	04611100013001360022
5"	IPS	3/4"	IPS	5,31	1,89	2,93	C	04611100001001360026
5"	IPS	1"	CTS	5,31	1,89	2,93	C	04611100013001360028
5"	IPS	1"	IPS	5,31	3,27	2,95	C	04611100001001360033
5"	IPS	1 1/4"	IPS	5,31	3,50	2,98	C	04611100001001360042
5"	IPS	1 1/4"	CTS	5,31	3,27	2,95	C	04611100013001360034
5"	IPS	1 1/2"	IPS	7,09	4,06	3,84	C	04611100001001360048
5"	IPS	2"	IPS	7,09	4,33	4,01	C	04611100001001360060
6"	IPS	1/2"	CTS	5,31	2,01	1,72	C	04611100013001680015
6"	IPS	1/2"	IPS	5,31	2,01	1,72	C	04611100001001680021
6"	IPS	3/4"	CTS	5,31	2,01	1,72	C	04611100013001680022
6"	IPS	3/4"	IPS	5,31	1,89	1,74	C	04611100001001680026
6"	IPS	1"	CTS	5,31	1,89	1,74	C	04611100013001680028
6"	IPS	1"	IPS	5,31	3,27	1,76	C	04611100001001680033
6"	IPS	1 1/4"	IPS	5,31	3,50	1,79	C	04611100001001680042
6"	IPS	1 1/4"	CTS	5,31	3,27	1,76	C	04611100013001680034
6"	IPS	1 1/2"	IPS	7,09	4,06	2,87	C	04611100001001680048
6"	IPS	2"	IPS	7,09	4,33	2,87	C	04611100001001680060
7"	IPS	1/2"	CTS	5,31	2,01	1,70	C	04611100013001800015
7"	IPS	1/2"	IPS	5,31	2,01	1,72	C	04611100001001800021
7"	IPS	3/4"	CTS	5,31	2,01	1,72	C	04611100013001800022
7"	IPS	3/4"	IPS	5,31	1,89	1,74	C	04611100001001800026
7"	IPS	1"	CTS	5,31	1,89	1,74	C	04611100013001800028
7"	IPS	1"	IPS	5,31	3,27	1,76	C	04611100001001800033
7"	IPS	1 1/4"	IPS	5,31	3,50	1,79	C	04611100001001800042

SDR11 ELECTROFUSION TAPPING TEES
DUAL RATED WATER/NATURAL GAS
WATER - 240 PSI AT 73 DEG F SUSTAINABLE MAXIMUM OPERATING PRESSURE
GAS - 150 PSI AT 73 DEG F SUSTAINABLE MAXIMUM OPERATING PRESSURE
• SUITABLE FOR *WATER*, FLUIDS & SLURRY'S
• ENGINEERED FOR PE3408, PE4710 & PE100 HDPE PIPE SYSTEMS
• MANUFACTURED IN ACCORDANCE WITH ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 CERTIFIED

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
7"	IPS	1 1/4"	CTS	5,31	3,27	1,76	C	04611100013001800034
7"	IPS	1 1/2"	IPS	7,09	3,39	2,87	C	04611100001001800048
7"	IPS	2"	IPS	7,09	3,39	2,87	C	04611100001001800060
8"	IPS	1/2"	CTS	5,31	2,01	1,72	C	04611100013002190015
8"	IPS	1/2"	IPS	5,31	2,01	1,72	C	04611100001002190021
8"	IPS	3/4"	CTS	5,31	2,01	1,74	C	04611100013002190022
8"	IPS	3/4"	IPS	5,31	1,89	1,76	C	04611100001002190026
8"	IPS	1"	CTS	5,31	1,89	1,76	C	04611100013002190028
8"	IPS	1"	IPS	5,31	3,27	1,79	C	04611100001002190033
8"	IPS	1 1/4"	IPS	5,31	3,50	1,81	C	04611100001002190042
8"	IPS	1 1/4"	CTS	5,31	3,27	1,79	C	04611100013002190034
8"	IPS	1 1/2"	IPS	7,09	3,39	2,76	C	04611100001002190048
8"	IPS	2"	IPS	7,09	4,45	2,76	C	04611100001002190060
10"	IPS	1/2"	CTS	5,31	2,01	1,72	D	04611100013002730015
10"	IPS	1/2"	IPS	5,31	2,01	1,72	D	04611100001002730021
10"	IPS	3/4"	CTS	5,31	2,01	1,72	D	04611100013002730022
10"	IPS	3/4"	IPS	5,31	1,89	1,74	D	04611100001002730026
10"	IPS	1"	CTS	5,31	1,89	1,74	D	04611100013002730028
10"	IPS	1"	IPS	5,31	3,27	1,76	D	04611100001002730033
10"	IPS	1 1/4"	IPS	5,31	3,50	1,79	D	04611100001002730042
10"	IPS	1 1/4"	CTS	5,31	3,27	1,76	D	04611100013002730034
10"	IPS	1 1/2"	IPS	7,09	3,39	2,76	D	04611100001002730048
10"	IPS	2"	IPS	7,09	4,45	2,76	D	04611100001002730060
3"	DIPS	1/2"	CTS	5,31	1,89	2,21	A	04611100023001000015
3"	DIPS	1/2"	IPS	5,31	1,89	2,25	A	04611100021001000021
3"	DIPS	3/4"	CTS	5,31	1,89	2,25	A	04611100023001000022
3"	DIPS	3/4"	IPS	5,31	2,17	2,29	A	04611100021001000026
3"	DIPS	1"	CTS	5,31	2,17	2,29	A	04611100023001000028
3"	DIPS	1"	IPS	5,31	2,68	2,36	A	04611100021001000033
3"	DIPS	1 1/4"	IPS	5,31	2,76	2,38	A	04611100021001000042
3"	DIPS	1 1/4"	CTS	5,31	2,68	2,36	A	04611100023001000034
3"	DIPS	1 1/2"	IPS	7,09	2,95	3,31	C	04611100021001000048
3"	DIPS	2"	IPS	7,09	2,95	3,31	C	04611100021001000060
4"	DIPS	1/2"	CTS	5,31	1,89	2,27	A	04611100023001210015
4"	DIPS	1/2"	IPS	5,31	1,89	2,29	A	04611100021001210021
4"	DIPS	3/4"	CTS	5,31	1,89	2,29	A	04611100023001210022
4"	DIPS	3/4"	IPS	5,31	2,17	2,32	A	04611100021001210026
4"	DIPS	1"	CTS	5,31	2,17	2,32	A	04611100023001210028
4"	DIPS	1"	IPS	5,31	2,68	2,36	A	04611100021001210033
4"	DIPS	1 1/4"	IPS	5,31	2,76	2,38	A	04611100021001210042
4"	DIPS	1 1/4"	CTS	5,31	2,68	2,36	A	04611100023001210034
4"	DIPS	1 1/2"	IPS	7,09	2,95	3,31	C	04611100021001210048
4"	DIPS	2"	IPS	7,09	2,95	3,31	C	04611100021001210060
6"	DIPS	1/2"	CTS	5,31	2,01	1,72	D	04611100023001750015
6"	DIPS	1/2"	IPS	5,31	2,01	1,72	D	04611100021001750021
6"	DIPS	3/4"	CTS	5,31	2,01	1,72	D	04611100023001750022
6"	DIPS	3/4"	IPS	5,31	1,89	1,74	D	04611100021001750026
6"	DIPS	1"	CTS	5,31	1,89	1,76	D	04611100023001750028
6"	DIPS	1"	IPS	5,31	3,27	1,76	D	04611100021001750033

EF-IPS/DIPS

SDR11 ELECTROFUSION TAPPING TEES DUAL RATED WATER/NATURAL GAS

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

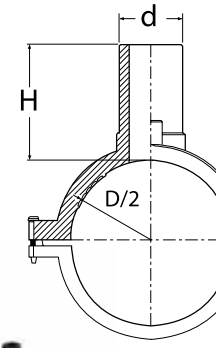
BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
6"	DIPS	1 1/4"	IPS	5,31	3,50	1,79	D	04611100021001750042
6"	DIPS	1 1/4"	CTS	5,31	3,27	1,76	D	04611100023001750034
6"	DIPS	1 1/2"	IPS	7,09	3,39	2,87	D	04611100021001750048
6"	DIPS	2"	IPS	7,09	3,39	2,87	D	04611100021001750060
8"	DIPS	1/2"	CTS	5,31	2,01	1,72	D	04611100023002290015
8"	DIPS	1/2"	IPS	5,31	2,01	1,74	D	04611100021002290021
8"	DIPS	3/4"	CTS	5,31	2,01	1,74	D	04611100023002290022
8"	DIPS	3/4"	IPS	5,31	1,89	1,74	D	04611100021002290026
8"	DIPS	1"	CTS	5,31	1,89	1,76	D	04611100023002290028
8"	DIPS	1"	IPS	5,31	3,27	1,79	D	04611100021002290033
8"	DIPS	1 1/4"	IPS	5,31	3,50	1,81	D	04611100021002290042
8"	DIPS	1 1/4"	CTS	5,31	3,27	1,79	D	04611100023002290034
8"	DIPS	1 1/2"	IPS	7,09	3,39	2,76	D	04611100021002290048
8"	DIPS	2"	IPS	7,09	4,45	2,76	D	04611100021002290060
10"	DIPS	1/2"	CTS	5,31	2,01	1,72	D	04611100023002810015
10"	DIPS	1/2"	IPS	5,31	2,01	1,72	D	04611100021002810021
10"	DIPS	3/4"	CTS	5,31	2,01	1,74	D	04611100023002810022
10"	DIPS	3/4"	IPS	5,31	1,89	1,74	D	04611100021002810026
10"	DIPS	1"	CTS	5,31	1,89	1,74	D	04611100023002810028
10"	DIPS	1"	IPS	5,31	3,27	1,76	D	04611100021002810033
10"	DIPS	1 1/4"	IPS	5,31	3,50	1,81	D	04611100021002810042
10"	DIPS	1 1/4"	CTS	5,31	3,27	1,76	D	04611100023002810034
10"	DIPS	1 1/2"	IPS	7,09	3,39	2,76	D	04611100021002810048
10"	DIPS	2"	IPS	7,09	4,45	2,76	D	04611100021002810060

SDR11 ELECTROFUSION SMALL BRANCH SADDLES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201



TYPE A

TYPE B

TYPE C

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	Unit Weight in lbs	*TYPE*	Item Code
1 1/4"	IPS	1/2"	CTS	2,95	0,32	A	05711100013000420015
1 1/4"	IPS	1/2"	IPS	2,95	0,33	A	05711100001000420021
1 1/4"	IPS	3/4"	CTS	2,95	0,33	A	05711100013000420022
1 1/4"	IPS	3/4"	IPS	2,95	0,36	A	05711100001000420026
1 1/4"	IPS	1"	CTS	2,95	0,39	A	05711100013000420028
1 1/4"	IPS	1"	IPS	2,95	0,4	A	05711100001000420033
1 1/2"	IPS	1/2"	CTS	2,95	0,33	A	05711100013000480015
1 1/2"	IPS	1/2"	IPS	2,95	0,35	A	05711100001000480021
1 1/2"	IPS	3/4"	CTS	2,95	0,36	A	05711100013000480022
1 1/2"	IPS	3/4"	IPS	2,95	0,37	A	05711100001000480026
1 1/2"	IPS	1"	CTS	2,95	0,37	A	05711100013000480028
1 1/2"	IPS	1"	IPS	2,95	0,41	A	05711100001000480033
1 1/2"	IPS	1 1/4"	CTS	2,95	0,41	A	05711100013000480034
2"	IPS	1/2"	CTS	3,03	0,77	A	05711100013000600015
2"	IPS	1/2"	IPS	3,03	0,77	A	05711100001000600021
2"	IPS	3/4"	CTS	3,03	0,77	A	05711100013000600022
2"	IPS	3/4"	IPS	3,03	0,79	A	05711100001000600026
2"	IPS	1"	CTS	3,03	0,79	A	05711100013000600028
2"	IPS	1"	IPS	3,03	0,86	A	05711100001000600033
2"	IPS	1 1/4"	IPS	3,03	0,88	A	05711100001000600042

SDR11 ELECTROFUSION SMALL BRANCH SADDLES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	Unit Weight in lbs	*TYPE*	Item Code
2"	IPS	1 1/4"	CTS	3,03	0,86	A	05711100013000600034
2"	IPS	1 1/2"	IPS	4,92	1,65	A	05711100001000600048
2"	IPS	2"	IPS	4,92	1,76	A	05711100001000600060
3"	IPS	1/2"	CTS	3,74	1,46	A	05711100013000880015
3"	IPS	1/2"	IPS	3,74	1,46	A	05711100001000880021
3"	IPS	3/4"	CTS	3,74	1,46	A	05711100013000880022
3"	IPS	3/4"	IPS	3,74	1,50	A	05711100001000880026
3"	IPS	1"	CTS	3,74	1,50	A	05711100013000880028
3"	IPS	1"	IPS	3,74	1,52	A	05711100001000880033
3"	IPS	1 1/4"	IPS	3,74	1,54	A	05711100001000880042
3"	IPS	1 1/4"	CTS	3,74	1,52	A	05711100013000880034
3"	IPS	1 1/2"	IPS	5,31	1,57	A	05711100001000880048
3"	IPS	2"	IPS	5,31	1,59	A	05711100001000880060
4"	IPS	1/2"	CTS	3,74	1,61	A	05711100013001140015
4"	IPS	1/2"	IPS	3,74	1,61	A	05711100001001140021
4"	IPS	3/4"	CTS	3,74	1,61	A	05711100013001140022
4"	IPS	3/4"	IPS	3,74	1,63	A	05711100001001140026
4"	IPS	1"	CTS	3,74	1,63	A	05711100013001140028
4"	IPS	1"	IPS	3,74	1,65	A	05711100001001140033
4"	IPS	1 1/4"	IPS	3,74	1,68	A	05711100001001140042
4"	IPS	1 1/4"	CTS	3,74	1,65	A	05711100013001140034
4"	IPS	1 1/2"	IPS	5,31	1,70	A	05711100001001140048
4"	IPS	2"	IPS	5,31	1,72	A	05711100001001140060
6"	IPS	1/2"	CTS	3,74	2,05	B	05711100013001680015
6"	IPS	1/2"	IPS	3,74	2,05	B	05711100001001680021
6"	IPS	3/4"	CTS	3,74	2,05	B	05711100013001680022
6"	IPS	3/4"	IPS	3,74	2,09	B	05711100001001680026
6"	IPS	1"	CTS	3,74	2,09	B	05711100013001680028
6"	IPS	1"	IPS	3,74	2,12	B	05711100001001680033
6"	IPS	1 1/4"	IPS	3,74	2,14	B	05711100001001680042
6"	IPS	1 1/4"	CTS	3,74	2,12	B	05711100013001680034
6"	IPS	1 1/2"	IPS	5,31	2,20	B	05711100001001680048
6"	IPS	2"	IPS	5,31	2,23	B	05711100001001680060
7"	IPS	1/2"	CTS	3,74	2,05	B	05711100013001800015
7"	IPS	1/2"	IPS	3,74	2,05	B	05711100001001800021
7"	IPS	3/4"	CTS	3,74	2,05	B	05711100013001800022
7"	IPS	3/4"	IPS	3,74	2,09	B	05711100001001800026
7"	IPS	1"	CTS	3,74	2,09	B	05711100013001800028
7"	IPS	1"	IPS	3,74	2,12	B	05711100001001800033
7"	IPS	1 1/4"	IPS	3,74	2,14	B	05711100001001800042
7"	IPS	1 1/4"	CTS	3,74	2,12	B	05711100013001800034
7"	IPS	1 1/2"	IPS	5,31	2,20	B	05711100001001800048
7"	IPS	2"	IPS	5,31	2,23	B	05711100001001800060
8"	IPS	1/2"	CTS	3,74	1,98	B	05711100013002190015
8"	IPS	1/2"	IPS	3,74	1,98	B	05711100001002190021
8"	IPS	3/4"	CTS	3,74	1,98	B	05711100013002190022
8"	IPS	3/4"	IPS	3,74	2,01	B	05711100001002190026
8"	IPS	1"	CTS	3,74	2,01	B	05711100013002190028
8"	IPS	1"	IPS	3,74	2,03	B	05711100001002190033
8"	IPS	1 1/4"	IPS	3,74	2,05	B	05711100001002190042

SDR11 ELECTROFUSION SMALL BRANCH SADDLES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	Unit Weight in lbs	*TYPE*	Item Code
8"	IPS	1 1/4"	CTS	3,74	2,03	B	05711100013002190034
8"	IPS	1 1/2"	IPS	5,31	2,07	B	05711100001002190048
8"	IPS	2"	IPS	5,31	2,09	B	05711100001002190060
10"	IPS	1/2"	CTS	3,94	1,46	C	05711100013002730015
10"	IPS	1/2"	IPS	3,94	1,46	C	05711100001002730021
10"	IPS	3/4"	CTS	3,94	1,46	C	05711100013002730022
10"	IPS	3/4"	IPS	3,94	1,46	C	05711100001002730026
10"	IPS	1"	CTS	3,94	1,46	C	05711100013002730028
10"	IPS	1"	IPS	5,12	1,48	C	05711100001002730033
10"	IPS	1 1/4"	IPS	4,13	1,50	C	05711100001002730042
10"	IPS	1 1/4"	CTS	5,12	1,48	C	05711100013002730034
10"	IPS	1 1/2"	IPS	5,12	1,50	C	05711100001002730048
10"	IPS	2"	IPS	4,92	1,50	C	05711100001002730060
12"	IPS	1/2"	CTS	3,94	1,48	C	05711100013003230015
12"	IPS	1/2"	IPS	3,94	1,48	C	05711100001003230021
12"	IPS	3/4"	CTS	3,94	1,48	C	05711100013003230022
12"	IPS	3/4"	IPS	3,94	1,50	C	05711100001003230026
12"	IPS	1"	CTS	3,94	1,50	C	05711100013003230028
12"	IPS	1"	IPS	5,12	1,52	C	05711100001003230033
12"	IPS	1 1/4"	IPS	4,13	1,54	C	05711100001003230042
12"	IPS	1 1/4"	CTS	5,12	1,52	C	05711100013003230034
12"	IPS	1 1/2"	IPS	5,12	1,54	C	05711100001003230048
12"	IPS	2"	IPS	4,92	1,54	C	05711100001003230060
14"	IPS	1/2"	CTS	3,94	1,68	C	05711100013003550015
14"	IPS	1/2"	IPS	3,94	1,68	C	05711100001003550021
14"	IPS	3/4"	CTS	3,94	1,68	C	05711100013003550022
14"	IPS	3/4"	IPS	3,94	1,70	C	05711100001003550026
14"	IPS	1"	CTS	3,94	1,70	C	05711100013003550028
14"	IPS	1"	IPS	5,12	1,72	C	05711100001003550033
14"	IPS	1 1/4"	IPS	4,13	1,68	C	05711100001003550042
14"	IPS	1 1/4"	CTS	5,12	1,72	C	05711100013003550034
14"	IPS	1 1/2"	IPS	5,12	1,70	C	05711100001003550048
14"	IPS	2"	IPS	4,92	1,72	C	05711100001003550060
16"	IPS	1/2"	CTS	3,94	0,95	C	05711100013004060015
16"	IPS	1/2"	IPS	3,94	0,95	C	05711100001004060021
16"	IPS	3/4"	CTS	3,94	0,95	C	05711100013004060022
16"	IPS	3/4"	IPS	3,94	0,97	C	05711100001004060026
16"	IPS	1"	CTS	3,94	0,97	C	05711100013004060028
16"	IPS	1"	IPS	5,12	0,99	C	05711100001004060033
16"	IPS	1 1/4"	IPS	4,13	1,01	C	05711100001004060042
16"	IPS	1 1/4"	CTS	5,12	0,99	C	05711100013004060034
16"	IPS	1 1/2"	IPS	5,12	1,15	C	05711100001004060048
16"	IPS	2"	IPS	4,92	1,15	C	05711100001004060060
18"	IPS	1/2"	CTS	3,94	0,95	C	05711100013004570015
18"	IPS	1/2"	IPS	3,94	0,95	C	05711100001004570021
18"	IPS	3/4"	CTS	3,94	0,95	C	05711100013004570022
18"	IPS	3/4"	IPS	3,94	0,97	C	05711100001004570026
18"	IPS	1"	CTS	3,94	0,97	C	05711100013004570028
18"	IPS	1"	IPS	5,12	0,99	C	05711100001004570033
18"	IPS	1 1/4"	IPS	4,13	1,01	C	05711100001004570042

SDR11 ELECTROFUSION SMALL BRANCH SADDLES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	Unit Weight in lbs	*TYPE*	Item Code
18"	IPS	1 1/4"	CTS	5,12	0,99	C	05711100013004570034
18"	IPS	1 1/2"	IPS	5,12	1,15	C	05711100001004570048
18"	IPS	2"	IPS	4,92	1,15	C	05711100001004570060
3"	DIPS	1/2"	CTS	3,74	1,61	A	05711100023001000015
3"	DIPS	1/2"	IPS	3,74	1,61	A	05711100021001000021
3"	DIPS	3/4"	CTS	3,74	1,61	A	05711100023001000022
3"	DIPS	3/4"	IPS	3,74	1,63	A	05711100021001000026
3"	DIPS	1"	CTS	3,74	1,63	A	05711100023001000028
3"	DIPS	1"	IPS	3,74	1,65	A	05711100021001000033
3"	DIPS	1 1/4"	IPS	3,74	1,68	A	05711100021001000042
3"	DIPS	1 1/4"	CTS	3,74	1,65	A	05711100023001000034
3"	DIPS	1 1/2"	IPS	5,31	1,70	A	05711100021001000048
3"	DIPS	2"	IPS	5,31	1,72	A	05711100021001000060
4"	DIPS	1/2"	CTS	3,74	1,65	B	05711100023001210015
4"	DIPS	1/2"	IPS	3,74	1,65	B	05711100021001210021
4"	DIPS	3/4"	CTS	3,74	1,65	B	05711100023001210022
4"	DIPS	3/4"	IPS	3,74	1,65	B	05711100021001210026
4"	DIPS	1"	CTS	3,74	1,65	B	05711100023001210028
4"	DIPS	1"	IPS	3,74	1,68	B	05711100021001210033
4"	DIPS	1 1/4"	IPS	3,74	1,72	B	05711100021001210042
4"	DIPS	1 1/4"	CTS	3,74	1,68	B	05711100023001210034
4"	DIPS	1 1/2"	IPS	5,31	1,74	B	05711100021001210048
4"	DIPS	2"	IPS	5,31	1,76	B	05711100021001210060
6"	DIPS	1/2"	CTS	3,74	2,05	B	05711100023001750015
6"	DIPS	1/2"	IPS	3,74	2,05	B	05711100021001750021
6"	DIPS	3/4"	CTS	3,74	2,05	B	05711100023001750022
6"	DIPS	3/4"	IPS	3,74	2,09	B	05711100021001750026
6"	DIPS	1"	CTS	3,74	2,09	B	05711100023001750028
6"	DIPS	1"	IPS	3,74	2,12	B	05711100021001750033
6"	DIPS	1 1/4"	IPS	3,74	2,14	B	05711100021001750042
6"	DIPS	1 1/4"	CTS	3,74	2,12	B	05711100023001750034
6"	DIPS	1 1/2"	IPS	5,31	2,20	B	05711100021001750048
6"	DIPS	2"	IPS	5,31	2,23	B	05711100021001750060
8"	DIPS	1/2"	CTS	3,94	1,98	B	05711100023002290015
8"	DIPS	1/2"	IPS	3,94	1,98	B	05711100021002290021
8"	DIPS	3/4"	CTS	3,94	1,98	B	05711100023002290022
8"	DIPS	3/4"	IPS	3,94	2,01	B	05711100021002290026
8"	DIPS	1"	CTS	3,94	2,01	B	05711100023002290028
8"	DIPS	1"	IPS	5,12	2,03	B	05711100021002290033
8"	DIPS	1 1/4"	IPS	4,13	2,05	B	05711100021002290042
8"	DIPS	1 1/4"	CTS	5,12	2,03	B	05711100023002290034
8"	DIPS	1 1/2"	IPS	5,12	2,07	B	05711100021002290048
8"	DIPS	2"	IPS	4,92	2,09	B	05711100021002290060
10"	DIPS	1/2"	CTS	3,94	1,46	C	05711100023002810015
10"	DIPS	1/2"	IPS	3,94	1,46	C	05711100021002810021
10"	DIPS	3/4"	CTS	3,94	1,46	C	05711100023002810022
10"	DIPS	3/4"	IPS	3,94	1,46	C	05711100021002810026
10"	DIPS	1"	CTS	3,94	1,46	C	05711100023002810028
10"	DIPS	1"	IPS	5,12	1,48	C	05711100021002810033
10"	DIPS	1 1/4"	IPS	4,13	1,50	C	05711100021002810042

SDR11 ELECTROFUSION SMALL BRANCH SADDLES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

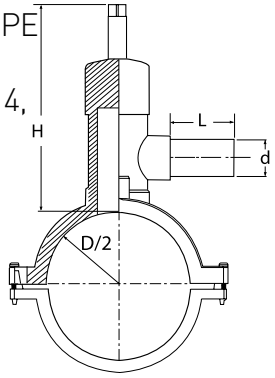
- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	Unit Weight in lbs	*TYPE*	Item Code
10"	DIPS	1 1/4"	CTS	5,12	1,48	C	05711100023002810034
10"	DIPS	1 1/2"	IPS	5,12	1,50	C	05711100021002810048
10"	DIPS	2"	IPS	4,92	1,50	C	05711100021002810060
12"	DIPS	1/2"	CTS	3,94	1,68	C	05711100023003350015
12"	DIPS	1/2"	IPS	3,94	1,68	C	05711100021003350021
12"	DIPS	3/4"	CTS	3,94	1,68	C	05711100023003350022
12"	DIPS	3/4"	IPS	3,94	1,70	C	05711100021003350026
12"	DIPS	1"	CTS	3,94	1,70	C	05711100023003350028
12"	DIPS	1"	IPS	5,12	1,72	C	05711100021003350033
12"	DIPS	1 1/4"	IPS	4,13	1,68	C	05711100021003350042
12"	DIPS	1 1/4"	CTS	5,12	1,72	C	05711100023003350034
12"	DIPS	1 1/2"	IPS	5,12	1,70	C	05711100021003350048
12"	DIPS	2"	IPS	4,92	1,72	C	05711100021003350060
14"	DIPS	1/2"	CTS	3,94	0,95	C	05711100023003880015
14"	DIPS	1/2"	IPS	3,94	0,95	C	05711100021003880021
14"	DIPS	3/4"	CTS	3,94	0,95	C	05711100023003880022
14"	DIPS	3/4"	IPS	3,94	0,97	C	05711100021003880026
14"	DIPS	1"	CTS	3,94	0,97	C	05711100023003880028
14"	DIPS	1"	IPS	5,12	0,99	C	05711100021003880033
14"	DIPS	1 1/4"	IPS	4,13	1,01	C	05711100021003880042
14"	DIPS	1 1/4"	CTS	5,12	0,99	C	05711100023003880034
14"	DIPS	1 1/2"	IPS	5,12	1,15	C	05711100021003880048
14"	DIPS	2"	IPS	4,92	1,15	C	05711100021003880060
16"	DIPS	1/2"	CTS	3,94	0,95	C	05711100023004220015
16"	DIPS	1/2"	IPS	3,94	0,95	C	05711100021004220021
16"	DIPS	3/4"	CTS	3,94	0,95	C	05711100023004220022
16"	DIPS	3/4"	IPS	3,94	0,97	C	05711100021004220026
16"	DIPS	1"	CTS	3,94	0,97	C	05711100023004220028
16"	DIPS	1"	IPS	5,12	0,99	C	05711100021004220033
16"	DIPS	1 1/4"	IPS	4,13	1,01	C	05711100021004220042
16"	DIPS	1 1/4"	CTS	5,12	0,99	C	05711100023004220034
16"	DIPS	1 1/2"	IPS	5,12	1,15	C	05711100021004220048
16"	DIPS	2"	IPS	4,92	1,15	C	05711100021004220060

SDR11 ELECTROFUSION VALVE TAPPING TEES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201, ISO-9001 Certified




TYPE A


TYPE B


TYPE C


TYPE D

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
2"	IPS	1/2"	CTS	6,30	1,97	1,83	A	04911100013000600015
2"	IPS	1/2"	IPS	6,30	1,97	1,87	A	04911100001000600021
2"	IPS	3/4"	CTS	6,30	1,97	1,87	A	04911100013000600022
2"	IPS	3/4"	IPS	6,30	1,97	1,90	A	04911100001000600026
2"	IPS	1"	CTS	6,30	1,97	1,90	A	04911100013000600028
2"	IPS	1"	IPS	6,30	2,95	1,92	A	04911100001000600033
2"	IPS	1 1/4"	IPS	6,30	2,95	1,94	B	04911100001000600042
2"	IPS	1 1/4"	CTS	6,30	2,95	1,92	A	04911100013000600034
2"	IPS	1 1/2"	IPS	10,63	3,66	4,63	B	04911100001000600048
2"	IPS	2"	IPS	10,63	3,66	4,74	B	04911100001000600060
3"	IPS	1/2"	CTS	8,46	1,57	3,75	A	04911100013000880015
3"	IPS	1/2"	IPS	8,46	1,57	3,79	A	04911100001000880021
3"	IPS	3/4"	CTS	8,46	1,57	3,79	A	04911100013000880022
3"	IPS	3/4"	IPS	8,46	1,97	3,81	A	04911100001000880026
3"	IPS	1"	CTS	8,46	1,97	3,81	A	04911100013000880028
3"	IPS	1"	IPS	8,46	2,95	3,84	A	04911100001000880033
3"	IPS	1 1/4"	IPS	8,46	3,23	3,86	A	04911100001000880042
3"	IPS	1 1/4"	CTS	8,46	2,95	3,84	A	04911100013000880034
3"	IPS	1 1/2"	IPS	9,84	3,35	5,91	C	04911100001000880048
3"	IPS	2"	IPS	9,84	3,35	5,93	C	04911100001000880060

SDR11 ELECTROFUSION VALVE TAPPING TEES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
4"	IPS	1/2"	CTS	8,46	1,57	3,84	A	04911100013001140015
4"	IPS	1/2"	IPS	8,46	1,57	3,90	A	04911100001001140021
4"	IPS	3/4"	CTS	8,46	1,57	3,90	A	04911100013001140022
4"	IPS	3/4"	IPS	8,46	2,24	3,92	A	04911100001001140026
4"	IPS	1"	CTS	8,46	2,24	3,92	A	04911100013001140028
4"	IPS	1"	IPS	8,46	2,80	3,95	A	04911100001001140033
4"	IPS	1 1/4"	IPS	8,46	2,83	3,99	A	04911100001001140042
4"	IPS	1 1/4"	CTS	8,46	2,80	3,95	A	04911100013001140034
4"	IPS	1 1/2"	IPS	9,84	2,95	5,95	C	04911100001001140048
4"	IPS	2"	IPS	9,84	2,95	6,02	C	04911100001001140060
6"	IPS	1/2"	CTS	8,46	1,57	4,32	C	04911100013001680015
6"	IPS	1/2"	IPS	8,46	1,57	4,39	C	04911100001001680021
6"	IPS	3/4"	CTS	8,46	1,57	4,39	C	04911100013001680022
6"	IPS	3/4"	IPS	8,46	1,97	4,41	C	04911100001001680026
6"	IPS	1"	CTS	8,46	1,97	4,41	C	04911100013001680028
6"	IPS	1"	IPS	8,46	2,64	4,43	C	04911100001001680033
6"	IPS	1 1/4"	IPS	8,46	2,64	4,45	C	04911100001001680042
6"	IPS	1 1/4"	CTS	8,46	2,64	4,43	C	04911100013001680034
6"	IPS	1 1/2"	IPS	9,84	2,95	6,44	C	04911100001001680048
6"	IPS	2"	IPS	9,84	2,95	6,48	C	04911100001001680060
7"	IPS	1/2"	CTS	8,46	1,57	4,32	C	04911100013001800015
7"	IPS	1/2"	IPS	8,46	1,57	4,39	C	04911100001001800021
7"	IPS	3/4"	CTS	8,46	1,57	4,39	C	04911100013001800022
7"	IPS	3/4"	IPS	8,46	1,97	4,41	C	04911100001001800026
7"	IPS	1"	CTS	8,46	1,97	4,41	C	04911100013001800028
7"	IPS	1"	IPS	8,46	2,91	4,43	C	04911100001001800033
7"	IPS	1 1/4"	IPS	8,46	2,91	4,45	C	04911100001001800042
7"	IPS	1 1/4"	CTS	8,46	2,91	4,43	C	04911100013001800034
7"	IPS	1 1/2"	IPS	9,84	2,91	6,44	C	04911100001001800048
7"	IPS	2"	IPS	9,84	2,91	6,48	C	04911100001001800060
8"	IPS	1/2"	CTS	8,46	1,57	4,19	C	04911100013002190015
8"	IPS	1/2"	IPS	8,46	1,57	4,26	C	04911100001002190021
8"	IPS	3/4"	CTS	8,46	1,57	4,26	C	04911100013002190022
8"	IPS	3/4"	IPS	8,46	1,97	4,26	C	04911100001002190026
8"	IPS	1"	CTS	8,46	1,97	4,26	C	04911100013002190028
8"	IPS	1"	IPS	8,46	2,95	4,28	C	04911100001002190033
8"	IPS	1 1/4"	IPS	8,46	2,95	4,30	C	04911100001002190042
8"	IPS	1 1/4"	CTS	8,46	2,95	4,28	C	04911100013002190034
8"	IPS	1 1/2"	IPS	9,84	2,95	6,28	C	04911100001002190048
8"	IPS	2"	IPS	9,84	2,95	6,33	C	04911100001002190060
10"	IPS	1/2"	CTS	10,04	1,57	5,40	D	04911100013002730015
10"	IPS	1/2"	IPS	10,04	1,57	5,47	D	04911100001002730021
10"	IPS	3/4"	CTS	10,04	1,57	5,49	D	04911100013002730022
10"	IPS	3/4"	IPS	10,04	1,97	5,49	D	04911100001002730026
10"	IPS	1"	CTS	10,04	1,97	5,49	D	04911100013002730028
10"	IPS	1"	IPS	10,04	2,95	5,51	D	04911100001002730033
10"	IPS	1 1/4"	IPS	10,04	2,95	5,53	D	04911100001002730042
10"	IPS	1 1/4"	CTS	10,04	2,95	5,51	D	04911100013002730034
10"	IPS	1 1/2"	IPS	10,04	2,95	5,60	D	04911100001002730048
10"	IPS	2"	IPS	10,04	2,95	5,62	D	04911100001002730060

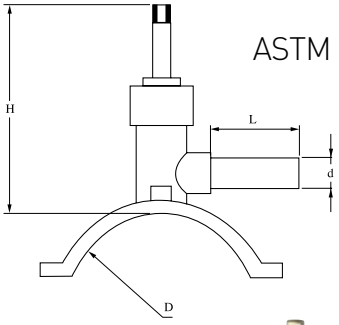
SDR11 ELECTROFUSION VALVE TAPPING TEES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
3"	DIPS	1/2"	CTS	8,46	1,57	3,86	A	04911100023001000015
3"	DIPS	1/2"	IPS	8,46	1,57	3,90	A	04911100021001000021
3"	DIPS	3/4"	CTS	8,46	1,57	3,90	A	04911100023001000022
3"	DIPS	3/4"	IPS	8,46	2,24	3,92	A	04911100021001000026
3"	DIPS	1"	CTS	8,46	2,24	3,92	A	04911100023001000028
3"	DIPS	1"	IPS	8,46	2,80	3,95	A	04911100021001000033
3"	DIPS	1 1/4"	IPS	8,46	2,83	3,99	A	04911100021001000042
3"	DIPS	1 1/4"	CTS	8,46	2,80	3,95	A	04911100023001000034
3"	DIPS	1 1/2"	IPS	9,84	2,95	5,95	C	04911100021001000048
3"	DIPS	2"	IPS	9,84	2,95	6,02	C	04911100021001000060
4"	DIPS	1/2"	CTS	8,46	2,80	3,86	A	04911100023001210015
4"	DIPS	1/2"	IPS	8,46	2,80	3,90	A	04911100021001210021
4"	DIPS	3/4"	CTS	8,46	2,80	3,90	A	04911100023001210022
4"	DIPS	3/4"	IPS	8,46	2,83	3,92	A	04911100021001210026
4"	DIPS	1"	CTS	8,46	2,83	3,92	A	04911100023001210028
4"	DIPS	1"	IPS	8,46	2,80	3,95	A	04911100021001210033
4"	DIPS	1 1/4"	IPS	8,46	2,83	3,99	A	04911100021001210042
4"	DIPS	1 1/4"	CTS	8,46	2,80	3,95	A	04911100023001210034
4"	DIPS	1 1/2"	IPS	9,84	3,03	5,95	C	04911100021001210048
4"	DIPS	2"	IPS	9,84	2,56	6,02	C	04911100021001210060
6"	DIPS	1/2"	CTS	8,46	1,57	4,34	C	04911100023001750015
6"	DIPS	1/2"	IPS	8,46	1,57	4,39	C	04911100021001750021
6"	DIPS	3/4"	CTS	8,46	1,57	4,39	C	04911100023001750022
6"	DIPS	3/4"	IPS	8,46	1,97	4,41	C	04911100021001750026
6"	DIPS	1"	CTS	8,46	1,97	4,41	C	04911100023001750028
6"	DIPS	1"	IPS	8,46	2,91	4,43	C	04911100021001750033
6"	DIPS	1 1/4"	IPS	8,46	2,91	4,45	C	04911100021001750042
6"	DIPS	1 1/4"	CTS	8,46	2,91	4,43	C	04911100023001750034
6"	DIPS	1 1/2"	IPS	9,84	2,91	6,44	C	04911100021001750048
6"	DIPS	2"	IPS	9,84	2,91	6,48	C	04911100021001750060
8"	DIPS	1/2"	CTS	10,04	1,57	4,21	C	04911100023002290015
8"	DIPS	1/2"	IPS	10,04	1,57	4,26	C	04911100021002290021
8"	DIPS	3/4"	CTS	10,04	1,57	4,26	C	04911100023002290022
8"	DIPS	3/4"	IPS	10,04	1,97	4,26	C	04911100021002290026
8"	DIPS	1"	CTS	10,04	1,97	4,26	C	04911100023002290028
8"	DIPS	1"	IPS	10,04	2,95	4,28	C	04911100021002290033
8"	DIPS	1 1/4"	IPS	10,04	2,95	4,30	C	04911100021002290042
8"	DIPS	1 1/4"	CTS	10,04	2,95	4,28	C	04911100023002290034
8"	DIPS	1 1/2"	IPS	10,04	2,95	6,28	C	04911100021002290048
8"	DIPS	2"	IPS	10,04	2,95	6,33	C	04911100021002290060
10"	DIPS	1/2"	CTS	10,04	1,57	5,40	D	04911100023002810015
10"	DIPS	1/2"	IPS	10,04	1,57	5,47	D	04911100021002810021
10"	DIPS	3/4"	CTS	10,04	1,57	5,47	D	04911100023002810022
10"	DIPS	3/4"	IPS	10,04	1,97	5,49	D	04911100021002810026
10"	DIPS	1"	CTS	10,04	1,97	5,49	D	04911100023002810028
10"	DIPS	1"	IPS	10,04	2,95	5,51	D	04911100021002810033
10"	DIPS	1 1/4"	IPS	10,04	2,95	5,53	D	04911100021002810042
10"	DIPS	1 1/4"	CTS	10,04	2,95	5,51	D	04911100023002810034
10"	DIPS	1 1/2"	IPS	10,04	2,95	5,60	D	04911100021002810048
10"	DIPS	2"	IPS	10,04	2,95	5,62	D	04911100021002810060

SDR11 ELECTROFUSION VALVE TAPPING TEES (VA TYPE)

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified



TYPE A

TYPE B

TYPE C

TYPE D

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
2"	IPS	1/2"	CTS	4,13	2,05	2,43	A	05011100013000600015
2"	IPS	1/2"	IPS	4,13	2,05	2,47	A	05011100001000600021
2"	IPS	3/4"	CTS	4,13	2,05	2,47	A	05011100013000600022
2"	IPS	3/4"	IPS	4,13	2,13	2,51	A	05011100001000600026
2"	IPS	1"	CTS	4,13	2,13	2,51	A	05011100013000600028
2"	IPS	1"	IPS	4,13	3,35	2,54	A	05011100001000600033
2"	IPS	1 1/4"	IPS	4,13	3,54	2,54	B	05011100001000600042
2"	IPS	1 1/4"	CTS	4,13	3,35	2,54	A	05011100013000600034
2"	IPS	1 1/2"	IPS	7,87	4,53	3,66	B	05011100001000600048
2"	IPS	2"	IPS	7,87	4,53	3,88	B	05011100001000600060
3"	IPS	1/2"	CTS	5,31	1,85	4,26	A	05011100013000880015
3"	IPS	1/2"	IPS	5,31	1,85	4,28	A	05011100001000880021
3"	IPS	3/4"	CTS	5,31	1,85	4,28	A	05011100013000880022
3"	IPS	3/4"	IPS	5,31	2,05	4,30	A	05011100001000880026
3"	IPS	1"	CTS	5,31	2,05	4,30	A	05011100013000880028
3"	IPS	1"	IPS	5,31	2,52	4,32	A	05011100001000880033
3"	IPS	1 1/4"	IPS	5,31	3,50	4,34	A	05011100001000880042
3"	IPS	1 1/4"	CTS	5,31	2,52	4,32	A	05011100013000880034
3"	IPS	1 1/2"	IPS	7,09	3,94	6,66	C	05011100001000880048
3"	IPS	2"	IPS	7,09	4,33	6,75	C	05011100001000880060

SDR11 ELECTROFUSION VALVE
TAPPING TEES (VA TYPE)
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
4"	IPS	1/2"	CTS	5,31	1,89	4,37	A	05011100013001140015
4"	IPS	1/2"	IPS	5,31	1,89	4,39	A	05011100001001140021
4"	IPS	3/4"	CTS	5,31	1,89	4,39	A	05011100013001140022
4"	IPS	3/4"	IPS	5,31	2,17	4,41	A	05011100001001140026
4"	IPS	1"	CTS	5,31	2,17	4,45	A	05011100013001140028
4"	IPS	1"	IPS	5,31	2,68	4,48	A	05011100001001140033
4"	IPS	1 1/4"	IPS	5,31	2,76	4,50	A	05011100001001140042
4"	IPS	1 1/4"	CTS	5,31	2,68	4,48	A	05011100013001140034
4"	IPS	1 1/2"	IPS	7,09	2,95	5,84	C	05011100001001140048
4"	IPS	2"	IPS	7,09	2,95	6,77	C	05011100001001140060
5"	IPS	1/2"	CTS	5,31	2,01	5,03	C	05011100013001360015
5"	IPS	1/2"	IPS	5,31	2,01	5,03	C	05011100001001360021
5"	IPS	3/4"	CTS	5,31	2,01	5,05	C	05011100013001360022
5"	IPS	3/4"	IPS	5,31	1,89	5,05	C	05011100001001360026
5"	IPS	1"	CTS	5,31	1,89	5,05	C	05011100013001360028
5"	IPS	1"	IPS	5,31	3,27	5,07	C	05011100001001360033
5"	IPS	1 1/4"	IPS	5,31	3,50	5,09	C	05011100001001360042
5"	IPS	1 1/4"	CTS	5,31	3,27	5,07	C	05011100013001360034
5"	IPS	1 1/2"	IPS	7,09	4,06	7,30	C	05011100001001360048
5"	IPS	2"	IPS	7,09	4,33	7,47	C	05011100001001360060
6"	IPS	1/2"	CTS	5,31	2,01	3,84	D	05011100013001680015
6"	IPS	1/2"	IPS	5,31	2,01	3,84	D	05011100001001680021
6"	IPS	3/4"	CTS	5,31	2,01	3,84	D	05011100013001680022
6"	IPS	3/4"	IPS	5,31	1,89	3,86	D	05011100001001680026
6"	IPS	1"	CTS	5,31	1,89	3,86	D	05011100013001680028
6"	IPS	1"	IPS	5,31	3,27	3,88	D	05011100001001680033
6"	IPS	1 1/4"	IPS	5,31	3,50	3,90	D	05011100001001680042
6"	IPS	1 1/4"	CTS	5,31	3,27	3,88	D	05011100013001680034
6"	IPS	1 1/2"	IPS	7,09	4,06	6,33	D	05011100001001680048
6"	IPS	2"	IPS	7,09	4,33	6,33	D	05011100001001680060
7"	IPS	1/2"	CTS	5,31	2,01	3,81	D	05011100013001800015
7"	IPS	1/2"	IPS	5,31	2,01	3,84	D	05011100001001800021
7"	IPS	3/4"	CTS	5,31	2,01	3,84	D	05011100013001800022
7"	IPS	3/4"	IPS	5,31	1,89	3,86	D	05011100001001800026
7"	IPS	1"	CTS	5,31	1,89	3,86	D	05011100013001800028
7"	IPS	1"	IPS	5,31	3,27	3,88	D	05011100001001800033
7"	IPS	1 1/4"	IPS	5,31	3,50	3,90	D	05011100001001800042
7"	IPS	1 1/4"	CTS	5,31	3,27	3,88	D	05011100013001800034
7"	IPS	1 1/2"	IPS	7,09	3,39	6,33	D	05011100001001800048
7"	IPS	2"	IPS	7,09	3,39	6,33	D	05011100001001800060
8"	IPS	1/2"	CTS	5,31	2,01	3,84	D	05011100013002190015
8"	IPS	1/2"	IPS	5,31	2,01	3,84	D	05011100001002190021
8"	IPS	3/4"	CTS	5,31	2,01	3,86	D	05011100013002190022
8"	IPS	3/4"	IPS	5,31	1,89	3,88	D	05011100001002190026
8"	IPS	1"	CTS	5,31	1,89	3,88	D	05011100013002190028
8"	IPS	1"	IPS	5,31	3,27	3,90	D	05011100001002190033
8"	IPS	1 1/4"	IPS	5,31	3,50	3,92	D	05011100001002190042
8"	IPS	1 1/4"	CTS	5,31	3,27	3,90	D	05011100013002190034
8"	IPS	1 1/2"	IPS	7,09	3,39	6,22	D	05011100001002190048
8"	IPS	2"	IPS	7,09	4,45	6,22	D	05011100001002190060

SDR11 ELECTROFUSION VALVE TAPPING TEES (VA TYPE)

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
10"	IPS	1/2"	CTS	5,31	2,01	4,98	D	05011100013002730015
10"	IPS	1/2"	IPS	5,31	2,01	4,98	D	05011100001002730021
10"	IPS	3/4"	CTS	5,31	2,01	4,98	D	05011100013002730022
10"	IPS	3/4"	IPS	5,31	1,89	5,01	D	05011100001002730026
10"	IPS	1"	CTS	5,31	1,89	5,01	D	05011100013002730028
10"	IPS	1"	IPS	5,31	3,27	5,03	D	05011100001002730033
10"	IPS	1 1/4"	IPS	5,31	3,50	5,05	D	05011100001002730042
10"	IPS	1 1/4"	CTS	5,31	3,27	5,03	D	05011100013002730034
10"	IPS	1 1/2"	IPS	7,09	3,39	6,02	D	05011100001002730048
10"	IPS	2"	IPS	7,09	4,45	6,02	D	05011100001002730060
3"	DIPS	1/2"	CTS	5,31	1,89	4,32	A	05011100023001000015
3"	DIPS	1/2"	IPS	5,31	1,89	4,37	A	05011100021001000021
3"	DIPS	3/4"	CTS	5,31	1,89	4,37	A	05011100023001000022
3"	DIPS	3/4"	IPS	5,31	2,17	4,41	A	05011100021001000026
3"	DIPS	1"	CTS	5,31	2,17	4,41	A	05011100023001000028
3"	DIPS	1"	IPS	5,31	2,68	4,48	A	05011100021001000033
3"	DIPS	1 1/4"	IPS	5,31	2,76	4,50	A	05011100021001000042
3"	DIPS	1 1/4"	CTS	5,31	2,68	4,48	A	05011100023001000034
3"	DIPS	1 1/2"	IPS	7,09	2,95	6,77	C	05011100021001000048
3"	DIPS	2"	IPS	7,09	2,95	6,77	C	05011100021001000060
4"	DIPS	1/2"	CTS	5,31	1,89	4,39	A	05011100023001210015
4"	DIPS	1/2"	IPS	5,31	1,89	4,41	A	05011100021001210021
4"	DIPS	3/4"	CTS	5,31	1,89	4,41	A	05011100023001210022
4"	DIPS	3/4"	IPS	5,31	2,17	4,43	A	05011100021001210026
4"	DIPS	1"	CTS	5,31	2,17	4,43	A	05011100023001210028
4"	DIPS	1"	IPS	5,31	2,68	4,48	A	05011100021001210033
4"	DIPS	1 1/4"	IPS	5,31	2,76	4,50	A	05011100021001210042
4"	DIPS	1 1/4"	CTS	5,31	2,68	4,48	A	05011100023001210034
4"	DIPS	1 1/2"	IPS	7,09	2,95	6,77	C	05011100021001210048
4"	DIPS	2"	IPS	7,09	2,95	6,77	C	05011100021001210060
6"	DIPS	1/2"	CTS	5,31	2,01	3,84	D	05011100023001750015
6"	DIPS	1/2"	IPS	5,31	2,01	3,84	D	05011100021001750021
6"	DIPS	3/4"	CTS	5,31	2,01	3,84	D	05011100023001750022
6"	DIPS	3/4"	IPS	5,31	1,89	3,86	D	05011100021001750026
6"	DIPS	1"	CTS	5,31	1,89	3,88	D	05011100023001750028
6"	DIPS	1"	IPS	5,31	3,27	3,88	D	05011100021001750033
6"	DIPS	1 1/4"	IPS	5,31	3,50	3,90	D	05011100021001750042
6"	DIPS	1 1/4"	CTS	5,31	3,27	3,88	D	05011100023001750034
6"	DIPS	1 1/2"	IPS	7,09	3,39	6,33	D	05011100021001750048
6"	DIPS	2"	IPS	7,09	3,39	6,33	D	05011100021001750060
8"	DIPS	1/2"	CTS	5,31	2,01	3,84	D	05011100023002290015
8"	DIPS	1/2"	IPS	5,31	2,01	3,86	D	05011100021002290021
8"	DIPS	3/4"	CTS	5,31	2,01	3,86	D	05011100023002290022
8"	DIPS	3/4"	IPS	5,31	1,89	3,86	D	05011100021002290026
8"	DIPS	1"	CTS	5,31	1,89	3,88	D	05011100023002290028
8"	DIPS	1"	IPS	5,31	3,27	3,90	D	05011100021002290033
8"	DIPS	1 1/4"	IPS	5,31	3,50	3,92	D	05011100021002290042
8"	DIPS	1 1/4"	CTS	5,31	3,27	3,90	D	05011100023002290034
8"	DIPS	1 1/2"	IPS	7,09	3,39	6,22	D	05011100021002290048
8"	DIPS	2"	IPS	7,09	4,45	6,22	D	05011100021002290060

EF-IPS/DIPS

SDR11 ELECTROFUSION VALVE TAPPING TEES (VA TYPE)

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

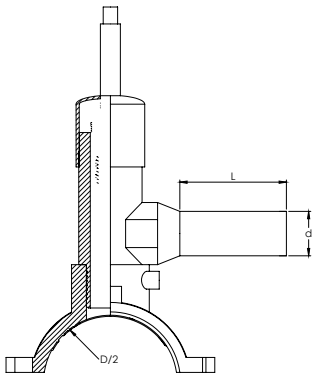
- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

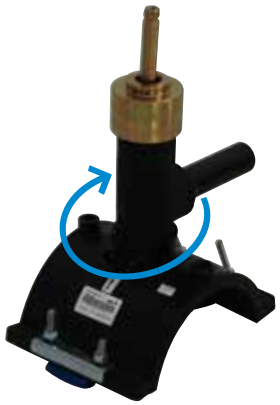
BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	L	Unit Weight in lbs	*TYPE*	Item Code
10"	DIPS	1/2"	CTS	5,31	2,01	4,98	D	05011100023002810015
10"	DIPS	1/2"	IPS	5,31	2,01	4,98	D	05011100021002810021
10"	DIPS	3/4"	CTS	5,31	2,01	5,01	D	05011100023002810022
10"	DIPS	3/4"	IPS	5,31	1,89	5,01	D	05011100021002810026
10"	DIPS	1"	CTS	5,31	1,89	5,01	D	05011100023002810028
10"	DIPS	1"	IPS	5,31	3,27	5,03	D	05011100021002810033
10"	DIPS	1 1/4"	IPS	5,31	3,50	5,07	D	05011100021002810042
10"	DIPS	1 1/4"	CTS	5,31	3,27	5,03	D	05011100023002810034
10"	DIPS	1 1/2"	IPS	7,09	3,39	6,02	D	05011100021002810048
10"	DIPS	2"	IPS	7,09	4,45	6,02	D	05011100021002810060

SDR11 360° ROTATING TAPPING TEES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201, ISO-9001





BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item Code
3"	IPS	1/2"	CTS	1,57	1,43	05411100013000880015
3"	IPS	1/2"	IPS	1,57	1,43	05411100001000880021
3"	IPS	3/4"	CTS	1,57	1,43	05411100013000880022
3"	IPS	3/4"	IPS	1,97	1,46	05411100001000880026
3"	IPS	1"	CTS	1,97	1,46	05411100013000880028
3"	IPS	1"	IPS	2,95	1,49	05411100001000880033
3"	IPS	1 1/4"	IPS	2,95	1,52	05411100001000880042
3"	IPS	1 1/4"	CTS	2,95	1,52	05411100013000880034
3"	IPS	1 1/2"	IPS	2,95	1,82	05411100001000880048
3"	IPS	2"	IPS	2,95	1,83	05411100001000880060
4"	IPS	1/2"	CTS	2,76	1,53	05411100013001140015
4"	IPS	1/2"	IPS	2,76	1,53	05411100001001140021
4"	IPS	3/4"	CTS	2,76	1,53	05411100013001140022
4"	IPS	3/4"	IPS	3,15	1,56	05411100001001140026
4"	IPS	1"	CTS	3,35	1,56	05411100013001140028
4"	IPS	1"	IPS	3,35	1,59	05411100001001140033
4"	IPS	1 1/4"	IPS	3,74	1,62	05411100001001140042
4"	IPS	1 1/4"	CTS	2,86	1,62	05411100013001140034
4"	IPS	1 1/2"	IPS	4,13	1,92	05411100001001140048
4"	IPS	2"	IPS	4,53	1,95	05411100001001140060
6"	IPS	1/2"	CTS	2,76	1,95	05411100013001680015
6"	IPS	1/2"	IPS	2,76	1,95	05411100001001680021
6"	IPS	3/4"	CTS	2,76	1,95	05411100013001680022
6"	IPS	3/4"	IPS	3,15	1,56	05411100001001680026
6"	IPS	1"	CTS	3,35	1,97	05411100013001680028
6"	IPS	1"	IPS	3,35	2,00	05411100001001680033
6"	IPS	1 1/4"	IPS	3,74	2,03	05411100001001680042
6"	IPS	1 1/4"	CTS	2,86	2,00	05411100013001680034

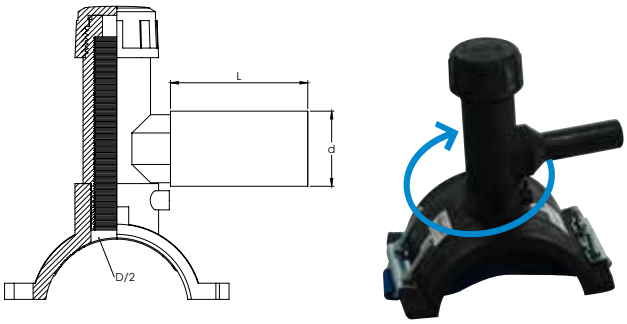
SDR11 360⁰ ROTATING TAPPING TEES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035,ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201, ISO-9001

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
6"	IPS	1 1/2"	IPS	4,13	2,33	05411100001001680048
6"	IPS	2"	IPS	4,53	2,38	05411100001001680060
8"	IPS	1/2"	CTS	2,76	1,95	05411100013002190015
8"	IPS	1/2"	IPS	2,76	1,95	05411100001002190021
8"	IPS	3/4"	CTS	2,76	1,95	05411100013002190022
8"	IPS	3/4"	IPS	3,15	1,56	05411100001002190026
8"	IPS	1"	CTS	3,35	1,97	05411100013002190028
8"	IPS	1"	IPS	3,35	2,00	05411100001002190033
8"	IPS	1 1/4"	IPS	3,74	2,03	05411100001002190042
8"	IPS	1 1/4"	CTS	2,86	2,00	05411100013002190034
8"	IPS	1 1/2"	IPS	4,13	2,33	05411100001002190048
8"	IPS	2"	IPS	4,53	2,38	05411100001002190060
3"	DIPS	1/2"	CTS	2,76	1,53	05411100023001000015
3"	DIPS	1/2"	IPS	2,76	1,53	05411100021001000021
3"	DIPS	3/4"	CTS	2,76	1,53	05411100023001000022
3"	DIPS	3/4"	IPS	3,15	1,56	05411100021001000026
3"	DIPS	1"	CTS	3,35	1,56	05411100023001000028
3"	DIPS	1"	IPS	3,35	1,59	05411100021001000033
3"	DIPS	1 1/4"	IPS	3,74	1,62	05411100021001000042
3"	DIPS	1 1/4"	CTS	2,86	1,62	05411100023001000034
3"	DIPS	1 1/2"	IPS	4,13	1,92	05411100021001000048
3"	DIPS	2"	IPS	4,53	1,95	05411100021001000060
4"	DIPS	1/2"	CTS	2,76	1,53	05411100023001210015
4"	DIPS	1/2"	IPS	2,76	1,53	05411100021001210021
4"	DIPS	3/4"	CTS	2,76	1,53	05411100023001210022
4"	DIPS	3/4"	IPS	3,15	1,56	05411100021001210026
4"	DIPS	1"	CTS	3,35	1,56	05411100023001210028
4"	DIPS	1"	IPS	3,35	1,59	05411100021001210033
4"	DIPS	1 1/4"	IPS	3,74	1,62	05411100021001210042
4"	DIPS	1 1/4"	CTS	2,86	1,62	05411100023001210034
4"	DIPS	1 1/2"	IPS	4,13	1,92	05411100021001210048
4"	DIPS	2"	IPS	4,53	1,95	05411100021001210060
6"	DIPS	1/2"	CTS	2,76	1,95	05411100023001750015
6"	DIPS	1/2"	IPS	2,76	1,95	05411100021001750021
6"	DIPS	3/4"	CTS	2,76	1,95	05411100023001750022
6"	DIPS	3/4"	IPS	3,15	1,97	05411100021001750026
6"	DIPS	1"	CTS	3,35	1,97	05411100023001750028
6"	DIPS	1"	IPS	3,35	2,00	05411100021001750033
6"	DIPS	1 1/4"	IPS	3,74	2,03	05411100021001750042
6"	DIPS	1 1/4"	CTS	2,86	2,00	05411100023001750034
6"	DIPS	1 1/2"	IPS	4,13	2,33	05411100021001750048
6"	DIPS	2"	IPS	4,53	2,38	05411100021001750060
8"	DIPS	1/2"	CTS	2,76	1,95	05411100023002290015
8"	DIPS	1/2"	IPS	2,76	1,95	05411100021002290021
8"	DIPS	3/4"	CTS	2,76	1,95	05411100023002290022
8"	DIPS	3/4"	IPS	3,15	1,97	05411100021002290026
8"	DIPS	1"	CTS	3,35	1,97	05411100023002290028
8"	DIPS	1"	IPS	3,35	2,00	05411100021002290033
8"	DIPS	1 1/4"	IPS	3,74	2,03	05411100021002290042
8"	DIPS	1 1/4"	CTS	2,86	2,00	05411100023002290034
8"	DIPS	1 1/2"	IPS	4,13	2,33	05411100021002290048
8"	DIPS	2"	IPS	4,53	2,38	05411100021002290060

SDR11 360° ROTATING TAPPING TEES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Suitable for *WATER*, Fluids & Slurry's
Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems

- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201, ISO-9001



BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
3"	IPS	1/2"	CTS	2,76	0,76	04811100013000880015
3"	IPS	1/2"	IPS	2,76	0,76	04811100001000880021
3"	IPS	3/4"	CTS	2,76	0,76	04811100013000880022
3"	IPS	3/4"	IPS	3,15	0,78	04811100001000880026
3"	IPS	1"	CTS	3,35	0,78	04811100013000880028
3"	IPS	1"	IPS	3,35	0,80	04811100001000880033
3"	IPS	1 1/4"	IPS	3,74	0,84	04811100001000880042
3"	IPS	1 1/4"	CTS	2,86	0,84	04811100013000880034
3"	IPS	1 1/2"	IPS	4,13	0,86	04811100001000880048
3"	IPS	2"	IPS	4,53	0,88	04811100001000880060
4"	IPS	1/2"	CTS	2,76	0,86	04811100013001140015
4"	IPS	1/2"	IPS	2,76	0,86	04811100001001140021
4"	IPS	3/4"	CTS	2,76	0,86	04811100013001140022
4"	IPS	3/4"	IPS	3,15	0,88	04811100001001140026
4"	IPS	1"	CTS	3,35	0,88	04811100013001140028
4"	IPS	1"	IPS	3,35	0,90	04811100001001140033
4"	IPS	1 1/4"	IPS	3,74	0,94	04811100001001140042
4"	IPS	1 1/4"	CTS	2,86	0,94	04811100013001140034
4"	IPS	1 1/2"	IPS	4,13	0,96	04811100001001140048
4"	IPS	2"	IPS	4,53	0,98	04811100001001140060
6"	IPS	1/2"	CTS	2,76	0,91	04811100013001680015
6"	IPS	1/2"	IPS	2,76	0,91	04811100001001680021
6"	IPS	3/4"	CTS	2,76	0,91	04811100013001680022
6"	IPS	3/4"	IPS	3,15	0,93	04811100001001680026
6"	IPS	1"	CTS	3,35	0,93	04811100013001680028
6"	IPS	1"	IPS	3,35	0,95	04811100001001680033
6"	IPS	1 1/4"	IPS	3,74	0,99	04811100001001680042
6"	IPS	1 1/4"	CTS	2,86	0,99	04811100013001680034
6"	IPS	1 1/2"	IPS	4,13	1,01	04811100001001680048

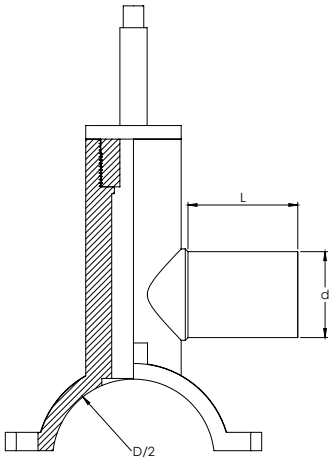
SDR11 360⁰ ROTATING TAPPING TEES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055,
ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906
DIN16963, EN1555, EN12201, ISO-9001

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
6"	IPS	2"	IPS	4,53	1,03	04811100001001680060
8"	IPS	1/2"	CTS	2,76	0,91	04811100013002190015
8"	IPS	1/2"	IPS	2,76	0,91	04811100001002190021
8"	IPS	3/4"	CTS	2,76	0,91	04811100013002190022
8"	IPS	3/4"	IPS	3,15	0,93	04811100001002190026
8"	IPS	1"	CTS	3,35	0,93	04811100013002190028
8"	IPS	1"	IPS	3,35	0,95	04811100001002190033
8"	IPS	1 1/4"	IPS	3,74	0,99	04811100001002190042
8"	IPS	1 1/4"	CTS	2,86	0,99	04811100013002190034
8"	IPS	1 1/2"	IPS	4,13	1,01	04811100001002190048
8"	IPS	2"	IPS	4,53	1,03	04811100001002190060
3"	DIPS	1/2"	CTS	2,76	0,86	04811100023001000015
3"	DIPS	1/2"	IPS	2,76	0,86	04811100021001000021
3"	DIPS	3/4"	CTS	2,76	0,86	04811100023001000022
3"	DIPS	3/4"	IPS	3,15	0,88	04811100021001000026
3"	DIPS	1"	CTS	3,35	0,88	04811100023001000028
3"	DIPS	1"	IPS	3,35	0,90	04811100021001000033
3"	DIPS	1 1/4"	IPS	3,74	0,94	04811100021001000042
3"	DIPS	1 1/4"	CTS	2,86	0,94	04811100023001000034
3"	DIPS	1 1/2"	IPS	4,13	0,96	04811100021001000048
3"	DIPS	2"	IPS	4,53	0,98	04811100021001000060
4"	DIPS	1/2"	CTS	2,76	0,86	04811100023001210015
4"	DIPS	1/2"	IPS	2,76	0,86	04811100021001210021
4"	DIPS	3/4"	CTS	2,76	0,86	04811100023001210022
4"	DIPS	3/4"	IPS	3,15	0,88	04811100021001210026
4"	DIPS	1"	CTS	3,35	0,88	04811100023001210028
4"	DIPS	1"	IPS	3,35	0,90	04811100021001210033
4"	DIPS	1 1/4"	IPS	3,74	0,94	04811100021001210042
4"	DIPS	1 1/4"	CTS	2,86	0,94	04811100023001210034
4"	DIPS	1 1/2"	IPS	4,13	1,01	04811100021001210048
4"	DIPS	2"	IPS	4,53	1,03	04811100021001210060
6"	DIPS	1/2"	CTS	2,76	0,91	04811100023001750015
6"	DIPS	1/2"	IPS	2,76	0,91	04811100021001750021
6"	DIPS	3/4"	CTS	2,76	0,91	04811100023001750022
6"	DIPS	3/4"	IPS	3,15	0,93	04811100021001750026
6"	DIPS	1"	CTS	3,35	0,93	04811100023001750028
6"	DIPS	1"	IPS	3,35	0,95	04811100021001750033
6"	DIPS	1 1/4"	IPS	3,74	0,99	04811100021001750042
6"	DIPS	1 1/4"	CTS	2,86	0,99	04811100023001750034
6"	DIPS	1 1/2"	IPS	4,13	1,01	04811100021001750048
6"	DIPS	2"	IPS	4,53	1,03	04811100021001750060
8"	DIPS	1/2"	CTS	2,76	0,91	04811100023002290015
8"	DIPS	1/2"	IPS	2,76	0,91	04811100021002290021
8"	DIPS	3/4"	CTS	2,76	0,91	04811100023002290022
8"	DIPS	3/4"	IPS	3,15	0,93	04811100021002290026
8"	DIPS	1"	CTS	3,35	0,93	04811100023002290028
8"	DIPS	1"	IPS	3,35	0,95	04811100021002290033
8"	DIPS	1 1/4"	IPS	3,74	0,99	04811100021002290042
8"	DIPS	1 1/4"	CTS	2,86	0,99	04811100023002290034
8"	DIPS	1 1/2"	IPS	4,13	1,01	04811100021002290048
8"	DIPS	2"	IPS	4,53	1,03	04811100021002290060

SDR11 ELECTROFUSION TAPPING TEES WITH INNER CAP

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201, ISO-9001



BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
2"	IPS	1/2"	CTS	2,05	0,75	05211100013000600015
2"	IPS	1/2"	IPS	2,05	0,75	05211100001000600021
2"	IPS	3/4"	CTS	2,05	0,75	05211100013000600022
2"	IPS	3/4"	IPS	2,13	0,75	05211100001000600026
2"	IPS	1"	CTS	2,13	0,75	05211100013000600028
2"	IPS	1"	IPS	3,35	0,80	05211100001000600033
2"	IPS	1 1/4"	IPS	3,54	0,80	05211100001000600042
2"	IPS	1 1/4"	CTS	3,35	0,80	05211100013000600034
3"	IPS	1/2"	CTS	1,85	0,90	05211100013000880015
3"	IPS	1/2"	IPS	1,85	0,90	05211100001000880021
3"	IPS	3/4"	CTS	1,85	0,90	05211100013000880022
3"	IPS	3/4"	IPS	2,05	0,90	05211100001000880026
3"	IPS	1"	CTS	2,05	0,90	05211100013000880028
3"	IPS	1"	IPS	2,52	0,95	05211100001000880033
3"	IPS	1 1/4"	IPS	3,50	0,95	05211100001000880042
3"	IPS	1 1/4"	CTS	2,52	0,95	05211100013000880034
4"	IPS	1/2"	CTS	1,89	1,05	05211100013001140015
4"	IPS	1/2"	IPS	1,89	1,05	05211100001001140021
4"	IPS	3/4"	CTS	1,89	1,05	05211100013001140022
4"	IPS	3/4"	IPS	2,17	1,05	05211100001001140026
4"	IPS	1"	CTS	2,17	1,05	05211100013001140028
4"	IPS	1"	IPS	2,68	1,10	05211100001001140033
4"	IPS	1 1/4"	IPS	2,76	1,10	05211100001001140042
4"	IPS	1 1/4"	CTS	2,68	1,10	05211100013001140034

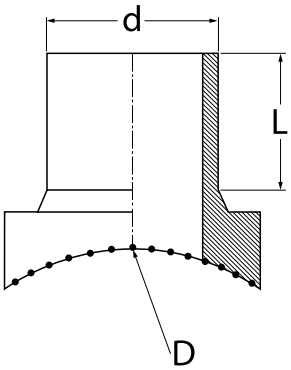
SDR11 ELECTROFUSION TAPPING TEES WITH INNER CAP
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035,ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
6"	IPS	1/2"	CTS	1,89	1,10	05211100013001680015
6"	IPS	1/2"	IPS	1,89	1,10	05211100001001680021
6"	IPS	3/4"	CTS	1,89	1,10	05211100013001680022
6"	IPS	3/4"	IPS	2,17	1,10	05211100001001680026
6"	IPS	1"	CTS	2,17	1,10	05211100013001680028
6"	IPS	1"	IPS	2,68	1,15	05211100001001680033
6"	IPS	1 1/4"	IPS	2,76	1,15	05211100001001680042
6"	IPS	1 1/4"	CTS	2,68	1,15	05211100013001680034
8"	IPS	1/2"	CTS	1,89	1,10	05211100013002190015
8"	IPS	1/2"	IPS	1,89	1,10	05211100001002190021
8"	IPS	3/4"	CTS	1,89	1,10	05211100013002190022
8"	IPS	3/4"	IPS	2,17	1,10	05211100001002190026
8"	IPS	1"	CTS	2,17	1,10	05211100013002190028
8"	IPS	1"	IPS	2,68	1,15	05211100001002190033
8"	IPS	1 1/4"	IPS	2,76	1,15	05211100001002190042
8"	IPS	1 1/4"	CTS	2,68	1,15	05211100013002190034
3"	DIPS	1/2"	CTS	1,89	1,05	05211100023001000015
3"	DIPS	1/2"	IPS	1,89	1,05	05211100021001000021
3"	DIPS	3/4"	CTS	1,89	1,05	05211100023001000022
3"	DIPS	3/4"	IPS	2,17	1,05	05211100021001000026
3"	DIPS	1"	CTS	2,17	1,05	05211100023001000028
3"	DIPS	1"	IPS	2,68	1,10	05211100021001000033
3"	DIPS	1 1/4"	IPS	2,76	1,10	05211100021001000042
3"	DIPS	1 1/4"	CTS	2,68	1,10	05211100023001000034
4"	DIPS	1/2"	CTS	2,05	1,05	05211100023001210015
4"	DIPS	1/2"	IPS	2,52	1,05	05211100021001210021
4"	DIPS	3/4"	CTS	3,50	1,05	05211100023001210022
4"	DIPS	3/4"	IPS	2,52	1,05	05211100021001210026
4"	DIPS	1"	CTS	3,94	1,05	05211100023001210028
4"	DIPS	1"	IPS	1,85	1,10	05211100021001210033
4"	DIPS	1 1/4"	IPS	1,85	1,10	05211100021001210042
4"	DIPS	1 1/4"	CTS	1,85	1,10	05211100023001210034
6"	DIPS	1/2"	CTS	2,52	1,10	05211100023001750015
6"	DIPS	1/2"	IPS	3,50	1,10	05211100021001750021
6"	DIPS	3/4"	CTS	2,52	1,10	05211100023001750022
6"	DIPS	3/4"	IPS	3,94	1,10	05211100021001750026
6"	DIPS	1"	CTS	3,35	1,10	05211100023001750028
6"	DIPS	1"	IPS	3,35	1,15	05211100021001750033
6"	DIPS	1 1/4"	IPS	3,74	1,15	05211100021001750042
6"	DIPS	1 1/4"	CTS	2,86	1,15	05211100023001750034
8"	DIPS	1/2"	CTS	2,76	1,10	05211100023002290015
8"	DIPS	1/2"	IPS	2,76	1,10	05211100021002290021
8"	DIPS	3/4"	CTS	2,76	1,10	05211100023002290022
8"	DIPS	3/4"	IPS	3,15	1,10	05211100021002290026
8"	DIPS	1"	CTS	3,35	1,10	05211100023002290028
8"	DIPS	1"	IPS	3,35	1,15	05211100021002290033
8"	DIPS	1 1/4"	IPS	3,74	1,15	05211100021002290042
8"	DIPS	1 1/4"	CTS	2,86	1,15	05211100023002290034

SDR11 ELECTROFUSION LARGE BRANCH SADDLES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified



BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
3"	IPS	3"	IPS	3,54	1,32	05711100001000880088
4"	IPS	3"	IPS	3,54	1,32	05711100001001140088
4"	IPS	4"	IPS	3,54	2,65	05711100001001140114
5"	IPS	3"	IPS	3,54	1,32	05711100001001360088
5"	IPS	4"	IPS	3,54	2,65	05711100001001360114
6"	IPS	3"	IPS	3,54	1,32	05711100001001680088
6"	IPS	4"	IPS	3,54	2,65	05711100001001680114
6"	IPS	5"	IPS	4,33	3,97	05711100001001680136
6"	IPS	6"	IPS	5,91	4,20	05711100001001680168
7"	IPS	3"	IPS	3,54	1,32	05711100001001800088
7"	IPS	4"	IPS	3,54	2,65	05711100001001800114
7"	IPS	5"	IPS	4,33	3,97	05711100001001800136
7"	IPS	6"	IPS	5,91	5,07	05711100001001800168
8"	IPS	3"	IPS	3,54	1,32	05711100001002190088
8"	IPS	4"	IPS	3,54	2,65	05711100001002190114
8"	IPS	5"	IPS	4,33	3,97	05711100001002190136
8"	IPS	6"	IPS	5,91	5,07	05711100001002190168
8"	IPS	7"	IPS	5,91	5,07	05711100001002190180
8"	IPS	8"	IPS	5,91	5,07	05711100001002190219
10"	IPS	3"	IPS	3,54	1,32	05711100001002730088
10"	IPS	4"	IPS	3,54	2,65	05711100001002730114
10"	IPS	5"	IPS	4,33	3,97	05711100001002730136
10"	IPS	6"	IPS	5,91	5,07	05711100001002730168
10"	IPS	7"	IPS	5,91	5,07	05711100001002730180

SDR11 ELECTROFUSION LARGE BRANCH SADDLES
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
10"	IPS	8"	IPS	5,91	9,92	05711100001002730219
12"	IPS	3"	IPS	3,54	1,32	05711100001003230088
12"	IPS	4"	IPS	3,54	2,65	05711100001003230114
12"	IPS	5"	IPS	4,33	3,97	05711100001003230136
12"	IPS	6"	IPS	5,91	5,07	05711100001003230168
12"	IPS	7"	IPS	5,91	5,07	05711100001003230180
12"	IPS	8"	IPS	5,91	9,92	05711100001003230219
14"	IPS	3"	IPS	3,54	1,32	05711100001003550088
14"	IPS	4"	IPS	3,54	2,65	05711100001003550114
14"	IPS	5"	IPS	4,33	3,97	05711100001003550136
14"	IPS	6"	IPS	5,91	5,07	05711100001003550168
14"	IPS	7"	IPS	5,91	5,07	05711100001003550180
14"	IPS	8"	IPS	5,91	9,92	05711100001003550219
16"	IPS	3"	IPS	3,54	1,32	05711100001004060088
16"	IPS	4"	IPS	3,54	2,65	05711100001004060114
16"	IPS	5"	IPS	4,33	3,97	05711100001004060136
16"	IPS	6"	IPS	5,91	5,07	05711100001004060168
16"	IPS	7"	IPS	5,91	5,07	05711100001004060180
16"	IPS	8"	IPS	5,91	9,92	05711100001004060219
18"	IPS	3"	IPS	3,54	1,32	05711100001004570088
18"	IPS	4"	IPS	3,54	2,65	05711100001004570114
18"	IPS	5"	IPS	4,33	3,97	05711100001004570136
18"	IPS	6"	IPS	5,91	5,07	05711100001004570168
18"	IPS	7"	IPS	5,91	5,07	05711100001004570180
18"	IPS	8"	IPS	5,91	9,92	05711100001004570219
20"	IPS	3"	IPS	3,54	1,32	05711100001005080088
20"	IPS	4"	IPS	3,54	2,65	05711100001005080114
20"	IPS	5"	IPS	4,33	3,97	05711100001005080136
20"	IPS	6"	IPS	5,91	5,07	05711100001005080168
20"	IPS	7"	IPS	5,91	5,07	05711100001005080180
20"	IPS	8"	IPS	5,91	9,92	05711100001005080219
22"	IPS	3"	IPS	3,54	1,32	05711100001005580088
22"	IPS	4"	IPS	3,54	2,65	05711100001005580114
22"	IPS	5"	IPS	4,33	3,97	05711100001005580136
22"	IPS	6"	IPS	5,91	5,07	05711100001005580168
22"	IPS	7"	IPS	5,91	5,07	05711100001005580180
22"	IPS	8"	IPS	5,91	9,92	05711100001005580219
24"	IPS	3"	IPS	3,54	1,32	05711100001006090088
24"	IPS	4"	IPS	3,54	2,65	05711100001006090114
24"	IPS	5"	IPS	4,33	3,97	05711100001006090136
24"	IPS	6"	IPS	5,91	5,07	05711100001006090168
24"	IPS	7"	IPS	5,91	5,07	05711100001006090180
24"	IPS	8"	IPS	5,91	9,92	05711100001006090219
30"	IPS	3"	IPS	3,54	1,32	05711100001007620088
30"	IPS	4"	IPS	3,54	2,65	05711100001007620114
30"	IPS	5"	IPS	4,33	3,97	05711100001007620136
30"	IPS	6"	IPS	5,91	5,07	05711100001007620168
30"	IPS	7"	IPS	5,91	5,07	05711100001007620180
30"	IPS	8"	IPS	5,91	9,92	05711100001007620219
32"	IPS	3"	IPS	3,54	1,32	05711100001008120088

SDR11 ELECTROFUSION LARGE BRANCH SADDLES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
32"	IPS	4"	IPS	3,54	2,65	05711100001008120114
32"	IPS	5"	IPS	4,33	3,97	05711100001008120136
32"	IPS	6"	IPS	5,91	5,07	05711100001008120168
32"	IPS	7"	IPS	5,91	5,07	05711100001008120180
32"	IPS	8"	IPS	5,91	9,92	05711100001008120219
36"	IPS	3"	IPS	3,54	1,32	05711100001009140088
36"	IPS	4"	IPS	3,54	2,65	05711100001009140114
36"	IPS	5"	IPS	4,33	3,97	05711100001009140136
36"	IPS	6"	IPS	5,91	5,07	05711100001009140168
36"	IPS	7"	IPS	5,91	5,07	05711100001009140180
36"	IPS	8"	IPS	5,91	9,92	05711100001009140219
42"	IPS	3"	IPS	3,54	1,32	05711100001010660088
42"	IPS	4"	IPS	3,54	2,65	05711100001010660114
42"	IPS	5"	IPS	4,33	3,97	05711100001010660136
42"	IPS	6"	IPS	5,91	5,07	05711100001010660168
42"	IPS	7"	IPS	5,91	5,07	05711100001010660180
42"	IPS	8"	IPS	5,91	9,92	05711100001010660219
48"	IPS	3"	IPS	3,54	1,32	05711100001012190088
48"	IPS	4"	IPS	3,54	2,65	05711100001012190114
48"	IPS	5"	IPS	4,33	3,97	05711100001012190136
48"	IPS	6"	IPS	5,91	5,07	05711100001012190168
48"	IPS	7"	IPS	5,91	5,07	05711100001012190180
48"	IPS	8"	IPS	5,91	9,92	05711100001012190219
54"	IPS	3"	IPS	3,54	1,32	05711100001013710088
54"	IPS	4"	IPS	3,54	2,65	05711100001013710114
54"	IPS	5"	IPS	4,33	3,97	05711100001013710136
54"	IPS	6"	IPS	5,91	5,07	05711100001013710168
54"	IPS	7"	IPS	5,91	5,07	05711100001013710180
54"	IPS	8"	IPS	5,91	9,92	05711100001013710219
63"	IPS	3"	IPS	3,54	1,32	05711100001016000088
63"	IPS	4"	IPS	3,54	2,65	05711100001016000114
63"	IPS	5"	IPS	4,33	3,97	05711100001016000136
63"	IPS	6"	IPS	5,91	5,07	05711100001016000168
63"	IPS	7"	IPS	5,91	5,07	05711100001016000180
63"	IPS	8"	IPS	5,91	9,92	05711100001016000219
6"	DIPS	4"	DIPS	3,54	2,65	05711100002001750121
8"	DIPS	4"	DIPS	3,54	2,65	05711100002002290121
8"	DIPS	6"	DIPS	5,91	5,07	05711100002002290175
10"	DIPS	4"	DIPS	3,54	2,65	05711100002002810121
10"	DIPS	6"	DIPS	5,91	5,07	05711100002002810175
10"	DIPS	8"	DIPS	5,71	19,84	05711100002002810229
12"	DIPS	4"	DIPS	3,54	2,65	05711100002003350121
12"	DIPS	6"	DIPS	5,91	5,07	05711100002003350175
12"	DIPS	8"	DIPS	5,71	18,74	05711100002003350229
14"	DIPS	4"	DIPS	3,54	2,65	05711100002003880121

EF-IPS/DIPS

SDR11 ELECTROFUSION LARGE BRANCH SADDLES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

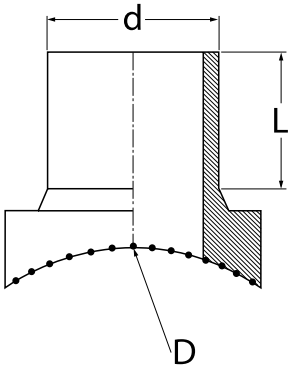
BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
14"	DIPS	6"	DIPS	5,91	5,07	05711100002003880175
14"	DIPS	8"	DIPS	5,71	18,74	05711100002003880229
16"	DIPS	4"	DIPS	3,54	2,65	05711100002004220121
16"	DIPS	6"	DIPS	5,91	5,07	05711100002004220175
16"	DIPS	8"	DIPS	5,71	18,74	05711100002004220229
18"	DIPS	4"	DIPS	3,54	2,65	05711100002004950121
18"	DIPS	6"	DIPS	5,91	5,07	05711100002004950175
18"	DIPS	8"	DIPS	5,71	18,74	05711100002004950229
20"	DIPS	4"	DIPS	3,54	2,65	05711100002005480121
20"	DIPS	6"	DIPS	5,91	5,07	05711100002005480175
20"	DIPS	8"	DIPS	5,71	18,74	05711100002005480229
24"	DIPS	4"	DIPS	3,54	2,65	05711100002006550121
24"	DIPS	6"	DIPS	5,91	5,07	05711100002006550175
24"	DIPS	8"	DIPS	5,71	18,74	05711100002006550229
30"	DIPS	4"	DIPS	3,54	2,65	05711100002008120121
30"	DIPS	6"	DIPS	5,91	5,07	05711100002008120175
30"	DIPS	8"	DIPS	5,71	18,74	05711100002008120229
36"	DIPS	4"	DIPS	3,54	2,65	05711100002009720121
36"	DIPS	6"	DIPS	5,91	5,07	05711100002009720175
36"	DIPS	8"	DIPS	5,71	18,74	05711100002009720229
42"	DIPS	4"	DIPS	3,54	2,65	05711100002011300121
42"	DIPS	6"	DIPS	5,91	5,07	05711100002011300175
42"	DIPS	8"	DIPS	5,71	18,74	05711100002011300229
48"	DIPS	4"	DIPS	3,54	2,65	05711100002012900121
48"	DIPS	6"	DIPS	5,91	5,07	05711100002012900175
48"	DIPS	8"	DIPS	5,71	18,74	05711100002012900229

SDR17 ELECTROFUSION LARGE BRANCH SADDLES

Water - 160 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 90 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513,ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified



BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
12"	IPS	10"	IPS	6,70	18,74	05711700001003230273
14"	IPS	10"	IPS	6,70	18,74	05711700001003550273
14"	IPS	12"	IPS	6,70	33,07	05711700001003550323
16"	IPS	10"	IPS	6,70	18,74	05711700001004060273
16"	IPS	12"	IPS	6,70	33,07	05711700001004060323
18"	IPS	10"	IPS	6,70	18,74	05711700001004570273
18"	IPS	12"	IPS	6,70	33,07	05711700001004570323
18"	IPS	14"	IPS	6,70	33,07	05711700001004570355
20"	IPS	10"	IPS	6,70	18,74	05711700001005080273
20"	IPS	12"	IPS	6,70	33,07	05711700001005080323
20"	IPS	14"	IPS	6,70	33,07	05711700001005080355
20"	IPS	16"	IPS	8,46	92,60	05711700001005080406
22"	IPS	10"	IPS	6,70	18,74	05711700001005580273
22"	IPS	12"	IPS	6,70	33,07	05711700001005580323
22"	IPS	14"	IPS	6,70	33,07	05711700001005580355
22"	IPS	16"	IPS	8,46	92,60	05711700001005580406
22"	IPS	16"	IPS	8,46	92,60	05711700001005580406
22"	IPS	18"	IPS	8,46	92,60	05711700001005580457
24"	IPS	10"	IPS	6,70	18,74	05711700001006090273
24"	IPS	12"	IPS	6,70	33,07	05711700001006090323

SDR17 ELECTROFUSION LARGE BRANCH SADDLES
Water - 160 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 90 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
24"	IPS	14"	IPS	6,70	33,07	05711700001006090355
24"	IPS	16"	IPS	8,46	92,60	05711700001006090406
24"	IPS	18"	IPS	8,46	92,60	05711700001006090457
30"	IPS	10"	IPS	6,70	18,74	05711700001007620273
30"	IPS	12"	IPS	6,70	33,07	05711700001007620323
30"	IPS	14"	IPS	6,70	33,07	05711700001007620355
30"	IPS	16"	IPS	8,46	92,60	05711700001007620406
30"	IPS	18"	IPS	8,46	92,60	05711700001007620457
30"	IPS	20"	IPS	8,46	92,60	05711700001007620508
32"	IPS	10"	IPS	6,70	18,74	05711700001008120273
32"	IPS	12"	IPS	6,70	33,07	05711700001008120323
32"	IPS	14"	IPS	6,70	33,07	05711700001008120355
32"	IPS	16"	IPS	8,46	92,60	05711700001008120406
32"	IPS	18"	IPS	8,46	92,60	05711700001008120457
32"	IPS	20"	IPS	8,46	92,60	05711700001008120508
36"	IPS	10"	IPS	6,70	18,74	05711700001009140273
36"	IPS	12"	IPS	6,70	33,07	05711700001009140323
36"	IPS	14"	IPS	6,70	33,07	05711700001009140355
36"	IPS	16"	IPS	8,46	92,60	05711700001009140406
36"	IPS	18"	IPS	8,46	92,60	05711700001009140457
36"	IPS	20"	IPS	8,46	92,60	05711700001009140508
42"	IPS	10"	IPS	6,70	18,74	05711700001010660273
42"	IPS	12"	IPS	6,70	33,07	05711700001010660323
42"	IPS	14"	IPS	6,70	33,07	05711700001010660355
42"	IPS	16"	IPS	8,46	92,60	05711700001010660406
42"	IPS	18"	IPS	8,46	92,60	05711700001010660457
42"	IPS	20"	IPS	8,46	92,60	05711700001010660508
48"	IPS	10"	IPS	6,70	18,74	05711700001012190273
48"	IPS	12"	IPS	6,70	33,07	05711700001012190323
48"	IPS	14"	IPS	6,70	33,07	05711700001012190355
48"	IPS	16"	IPS	8,46	92,60	05711700001012190406
48"	IPS	18"	IPS	8,46	92,60	05711700001012190457
48"	IPS	20"	IPS	8,46	92,60	05711700001012190508
54"	IPS	10"	IPS	6,70	18,74	05711700001013710273
54"	IPS	12"	IPS	6,70	33,07	05711700001013710323
54"	IPS	14"	IPS	6,70	33,07	05711700001013710355
54"	IPS	16"	IPS	8,46	92,60	05711700001013710406
54"	IPS	18"	IPS	8,46	92,60	05711700001013710457
54"	IPS	20"	IPS	8,46	92,60	05711700001013710508
63"	IPS	10"	IPS	6,70	18,74	05711700001016000273
63"	IPS	12"	IPS	6,70	33,07	05711700001016000323
63"	IPS	14"	IPS	6,70	33,07	05711700001016000355
63"	IPS	16"	IPS	8,46	92,60	05711700001016000406
63"	IPS	18"	IPS	8,46	92,60	05711700001016000457
63"	IPS	20"	IPS	8,46	92,60	05711700001016000508
12"	DIPS	10"	DIPS	6,70	18,74	05711700002003350281
14"	DIPS	10"	DIPS	6,70	18,74	05711700002003880281
14"	DIPS	12"	DIPS	6,70	33,07	05711700002003880335
16"	DIPS	10"	DIPS	6,70	18,74	05711700002004220281

SDR17 ELECTROFUSION LARGE BRANCH SADDLES

Water - 160 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 90 PSI at 73 Deg F Sustainable Maximum Operating Pressure
• Suitable for *WATER*, Fluids & Slurry's
• Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
• Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
16"	DIPS	12"	DIPS	6,70	33,07	05711700002004220335
18"	DIPS	10"	DIPS	6,70	18,74	05711700002004950281
18"	DIPS	12"	DIPS	6,70	33,07	05711700002004950335
20"	DIPS	10"	DIPS	6,70	18,74	05711700002005480281
20"	DIPS	12"	DIPS	6,70	33,07	05711700002005480335
20"	DIPS	14"	DIPS	8,46	92,60	05711700002005480388
20"	DIPS	16"	DIPS	8,46	92,60	05711700002005480422
24"	DIPS	10"	DIPS	6,70	18,74	05711700002006550281
24"	DIPS	12"	DIPS	6,70	33,07	05711700002006550335
24"	DIPS	14"	DIPS	8,46	92,60	05711700002006550388
24"	DIPS	16"	DIPS	8,46	92,60	05711700002006550422
24"	DIPS	18"	DIPS	8,46	92,60	05711700002006550495
30"	DIPS	10"	DIPS	6,70	18,74	05711700002008120281
30"	DIPS	12"	DIPS	6,70	33,07	05711700002008120335
30"	DIPS	14"	DIPS	8,46	92,60	05711700002008120388
30"	DIPS	16"	DIPS	8,46	92,60	05711700002008120422
30"	DIPS	18"	DIPS	8,46	92,60	05711700002008120495
36"	DIPS	10"	DIPS	6,70	18,74	05711700002009720281
36"	DIPS	12"	DIPS	6,70	33,07	05711700002009720335
36"	DIPS	14"	DIPS	8,46	92,60	05711700002009720388
36"	DIPS	16"	DIPS	8,46	92,60	05711700002009720422
36"	DIPS	18"	DIPS	8,46	92,60	05711700002009720495
42"	DIPS	10"	DIPS	6,70	18,74	05711700002011300281
42"	DIPS	12"	DIPS	6,70	33,07	05711700002011300335
42"	DIPS	14"	DIPS	8,46	92,60	05711700002011300388
42"	DIPS	16"	DIPS	8,46	92,60	05711700002011300422
42"	DIPS	18"	DIPS	8,46	92,60	05711700002011300495
48"	DIPS	10"	DIPS	6,70	18,74	05711700002012900281
48"	DIPS	12"	DIPS	6,70	33,07	05711700002012900335
48"	DIPS	14"	DIPS	8,46	92,60	05711700002012900388
48"	DIPS	16"	DIPS	8,46	92,60	05711700002012900422
48"	DIPS	18"	DIPS	8,46	92,60	05711700002012900495

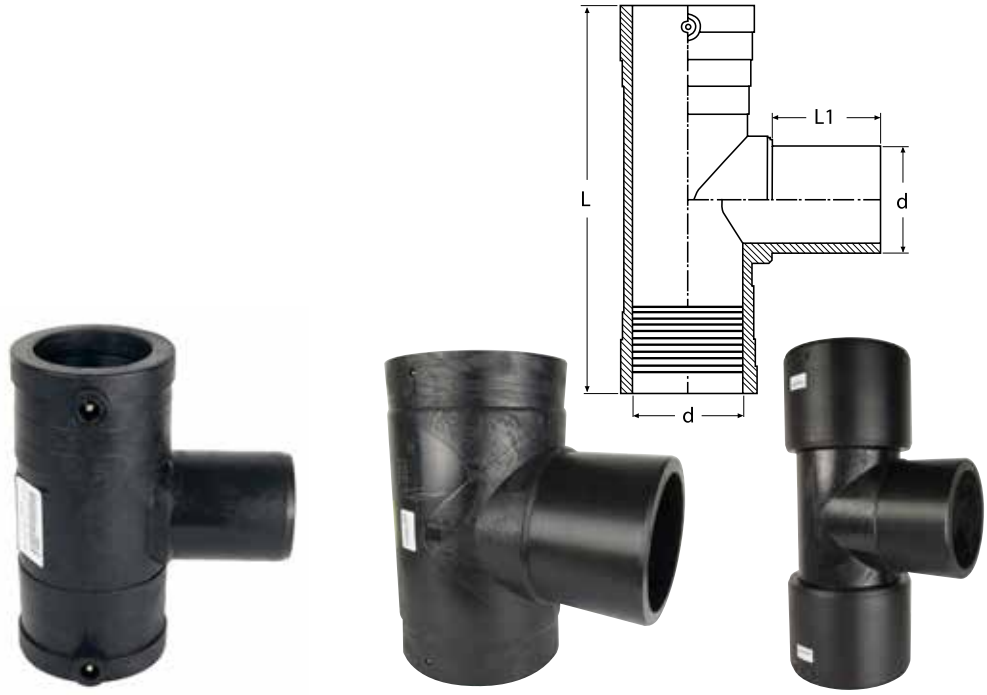
EF-IPS/DIPS

SDR11 ELECTROFUSION EQUAL TEES

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906 DIN16963, EN1555, EN12201 ISO-9001 Certified



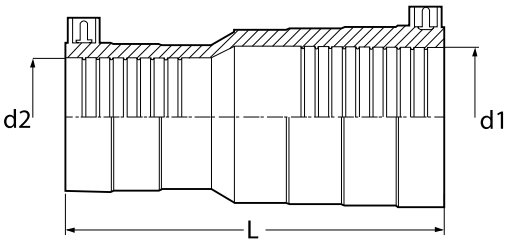
TYPE A *TYPE* B *TYPE* C

Nominal Pipe Size d	Base Norm	L	L1	Unit Weight in lbs.	Item Code	*TYPE*
3/4" IPS	IPS	4,25	1,46	1,59	03111100001000260000	A
1" CTS	CTS	5,04	1,61	0,29	03111100003000280000	A
1" IPS	IPS	5,04	1,61	0,29	03111100001000330000	A
1 1/4" IPS	IPS	6,38	1,93	0,37	03111100001000420000	A
1 1/2" IPS	IPS	6,38	1,93	0,68	03111100001000480000	A
2" IPS	IPS	7,32	2,40	1,26	03111100001000600000	A
3" IPS	IPS	10,04	2,91	3,26	03111100001000880000	A
4" IPS	IPS	11,93	3,11	5,86	03111100001001140000	A
6" IPS	IPS	19,00	4,75	11,46	03111100001001680000	B
8" IPS	IPS	19,00	5,20	36,15	03111100001002190000	C

SDR11 ELECTROFUSION REDUCERS

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified



Nominal Pipe Size	L	Unit Weight in lbs.	Item Code
1" IPS X 1/2" IPS	3,54	0,09	02911100001000330021
1" IPS X 3/4" CTS	3,54	0,11	02911100013000330022
1" IPS X 3/4" IPS	3,54	0,09	02911100001000330026
1 1/4" IPS X 1" IPS	4,61	0,20	02911100001000420033
1 1/2" IPS X 1" IPS	5,16	0,33	02911100001000480033
2" IPS X 1" IPS	5,59	0,49	02911100001000600033
2" IPS X 1 1/4" IPS	5,47	0,53	02911100001000600042
2" IPS X 1 1/2" IPS	5,98	0,57	02911100001000600042
3" IPS X 2" IPS	7,48	1,28	02911100001000880060
4" IPS X 2" IPS	8,23	1,94	02911100001001140060
4" IPS X 3" IPS	8,46	2,40	02911100001001140088

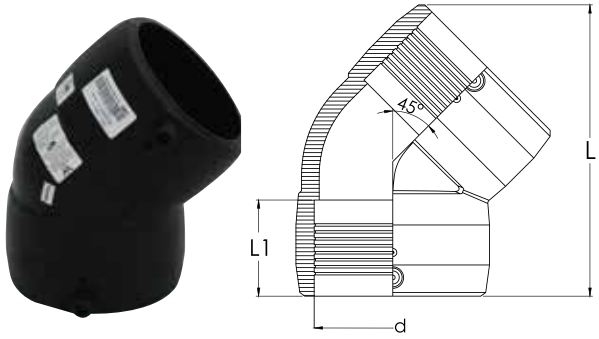
EF-IPS/DIPS

SDR11 ELECTROFUSION 45 DEGREE ELBOWS

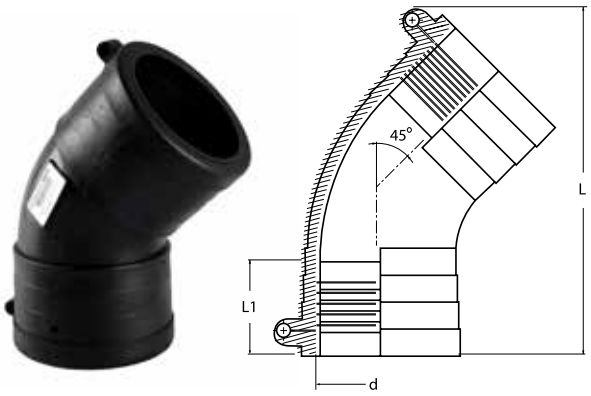
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified



TYPE A



TYPE B

Nominal Pipe Size d	Base Norm	L	L1	Unit Weight in lbs.	Item Code	*TYPE*
3/4"	IPS	4,17	1,50	0,13	02411100001000260000	A
1"	CTS	4,57	1,61	0,18	02411100003000280000	A
1"	IPS	4,57	1,61	0,18	02411100001000330000	A
1 1/4"	IPS	5,47	1,85	0,29	02411100001000420000	A
1 1/2"	IPS	6,54	2,01	0,51	02411100001000480000	A
2"	IPS	7,76	2,28	0,88	02411100001000600000	A
3"	IPS	9,53	2,83	2,07	02411100001000880000	A
4"	IPS	11,89	3,23	5,71	02411100001001140000	A
6"	IPS	17,14	4,75	4,00	02411100001001680000	B

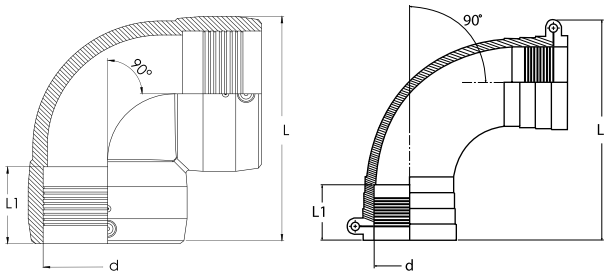
SDR11 ELECTROFUSION 90 DEGREE ELBOWS

Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201

ISO-9001 Certified



TYPE A

TYPE B

Nominal Pipe Size d	Base Norm	L	L1	Unit Weight in lbs.	Item Code	*TYPE*
3/4"	IPS	3,86	1,50	0,15	02211100001000260000	A
1"	CTS	4,29	1,61	0,31	02211100003000280000	A
1"	IPS	4,29	1,61	0,22	02211100001000330000	A
1 1/4"	IPS	5,16	1,85	0,37	02211100001000420000	A
1 1/2"	IPS	6,10	2,01	0,62	02211100001000480000	A
2"	IPS	7,44	1,89	1,15	02211100001000600000	A
3"	IPS	9,53	2,76	2,45	02211100001000880000	A
4"	IPS	11,69	3,23	6,61	02211100001001140000	A
6"	IPS	17,14	4,75	5,50	02211100001001680000	B

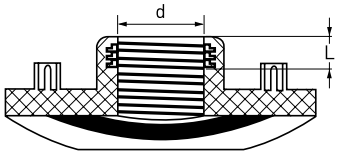
EF-IPS/DIPS

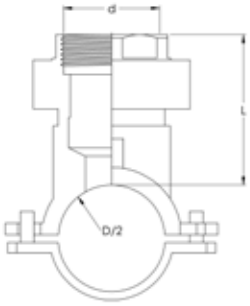
BRASS THREADED OUTLET ELECTROFUSION SADDLES SDR11

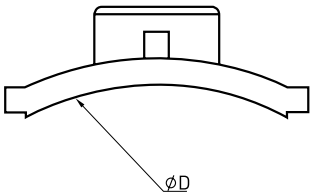
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified







TYPE A

TYPE B

TYPE C

D	d	Item Code	L	Unit Weight in lbs.	Box sizes	nos/box	*TYPE*
2"	3/4"	06511101001000600026	12	0.73	30*40*30	12	B
3"	3/4"	06511101001000880026	12	0.65	30*40*30	12	A
4"	3/4"	06511101001001140026	12	0.71	30*40*30	12	A
6"	3/4"	06511101001001680026	12	0.93	30*40*30	12	A
8"	3/4"	06511101001002190026	12	0.93	30*40*30	12	A
10"	3/4"	06511101001002730026	12	0.63	30*40*30	12	C
12"	3/4"	06511101001003230026	12	0.62	30*40*30	12	C
14"	3/4"	06511101001003550026	12	0.62	30*40*30	12	C
16"	3/4"	06511101001004060026	12	0.62	30*40*30	12	C
18"	3/4"	06511101001004570026	12	0.61	30*40*30	12	C
20"	3/4"	06511101001005080026	12	0.61	30*40*30	12	C
22"	3/4"	06511101001005580026	12	0.61	30*40*30	12	C
24"	3/4"	06511101001006090026	12	0.60	30*40*30	12	C
26"	3/4"	06511101001006600026	12	0.60	30*40*30	12	C
28"	3/4"	06511101001007110026	12	0.60	30*40*30	12	C

BRASS THREADED OUTLET ELECTROFUSION SADDLES SDR11

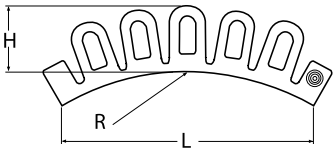
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure
Gas - 150 PSI at 73 Deg F Sustainable Maximum Operating Pressure

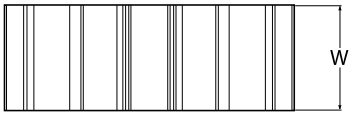
- Suitable for *WATER*, Fluids & Slurry's
- Engineered for PE3408, PE4710 & PE100 HDPE Pipe Systems
- Manufactured in accordance with ASTM F-714, ASTM F-1055, ASTM D-2513, ASTM D-3035, ASTM D-3261, ASTM D-3350, AWWA C-901, AWWA C-906, DIN16963, EN1555, EN12201 ISO-9001 Certified

D	d	CODE	L	Kg.	box sizes	nos/box	*TYPE*
2"	1"	06511101001000600033	12	0.75	30*40*30	12	B
3"	1"	06511101001000880033	12	0.67	30*40*30	12	A
4"	1"	06511101001001140033	12	0.73	30*40*30	12	A
6"	1"	06511101001001680033	12	0.95	30*40*30	12	A
8"	1"	06511101001002190033	12	0.95	30*40*30	12	A
10"	1"	06511101001002730033	12	0.64	30*40*30	12	C
12"	1"	06511101001003230033	12	0.63	30*40*30	12	C
14"	1"	06511101001003550033	12	0.63	30*40*30	12	C
16"	1"	06511101001004060033	12	0.63	30*40*30	12	C
18"	1"	06511101001004570033	12	0.62	30*40*30	12	C
20"	1"	06511101001005080033	12	0.62	30*40*30	12	C
22"	1"	06511101001005580033	12	0.62	30*40*30	12	C
24"	1"	06511101001006090033	12	0.61	30*40*30	12	C
26"	1"	06511101001006600033	12	0.61	30*40*30	12	C
28"	1"	06511101001007110033	12	0.61	30*40*30	12	C
2"	2"	06511101001000600060	20	43800	30*40*30	12	B
3"	2"	06511101001000880060	20	43556	30*40*30	12	B
4"	2"	06511101001001140060	20	43466	30*40*30	12	B
6"	2"	06511101001001680060	20	11689	30*40*30	12	B
8"	2"	06511101001002190060	20	11689	30*40*30	12	B
10"	2"	06511101001002730060	20	0.77	30*40*30	12	C
12"	2"	06511101001003230060	20	0.76	30*40*30	12	C
14"	2"	06511101001003550060	20	0.76	30*40*30	12	C
16"	2"	06511101001004060060	20	0.76	30*40*30	12	C
18"	2"	06511101001004570060	20	0.75	30*40*30	12	C
20"	2"	06511101001005080060	20	0.75	30*40*30	12	C
22"	2"	06511101001005580060	20	0.75	30*40*30	12	C
24"	2"	06511101001006090060	20	0.74	30*40*30	12	C
26"	2"	06511101001006600060	20	0.74	30*40*30	12	C
28"	2"	06511101001007110060	20	0.74	30*40*30	12	C

EF-IPS/DIPS

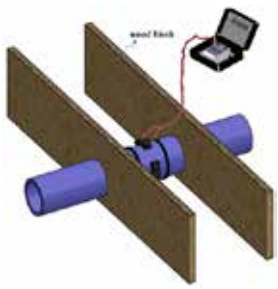
EF FLEX RESTRAINT
PE100





Main Pipe size	CODE	L	H	W
6" - 54"	01311100001001681371	152	40	63

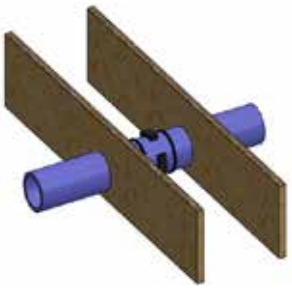
Max permissible axial fource 42,3kN Simple solution for concrete wall transition.



PROBLEM

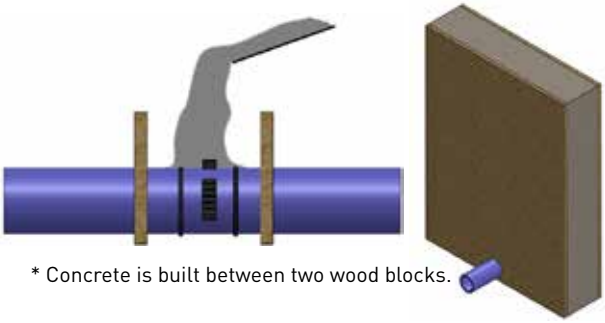
Because of the thermal expansion, PE pipe moves each side and a gap occurs between pipe and concrete.

EF FLEX RESTRAINTs are welded to the pipe.



SOLUTION

* To prevent movement of pipe and gap, EF FLEX RESTRAINTs are fixed to the pipe by welding.



* Concrete is built between two wood blocks.

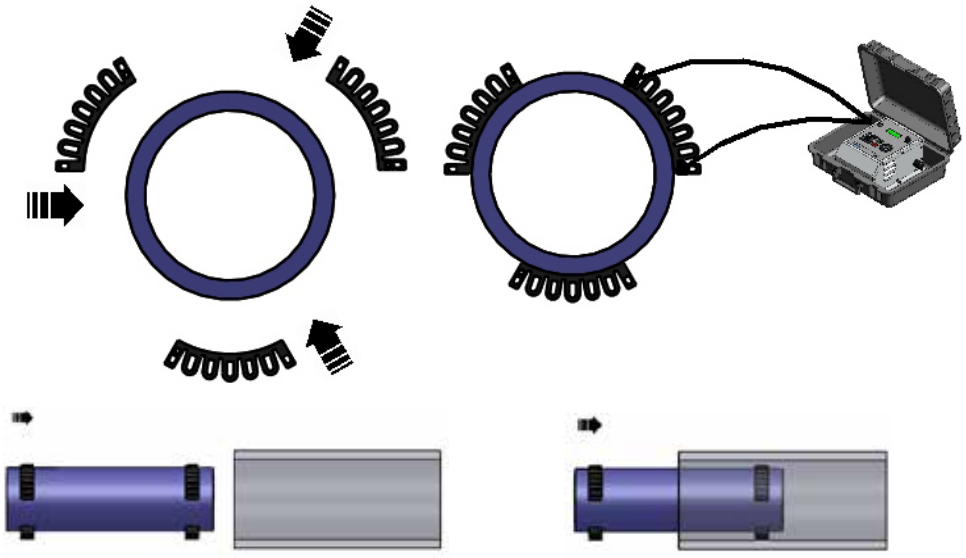
** Two wood blocks are separated from concrete.*

** Only concrete block stands and EF Flex Restraints keep pipe stable.*

- *For wall transition the only critical force on the pipe is thermal expension of the pipe system*
- *Tega EF Flex Restrain compete enough axial force to resist expension. (42,3kN / each flex)*
- *Use enough number of flex restraint on your pipe diameter.*

d (mm)	Sdr11 Quantity of Restraints Needed	Sdr17 Quantity of Restraints
6"	2	2
8"	2	2
10"	2	2
12"	3	2
14"	4	3
16"	5	3
18"	6	4
20"	7	5
22"	8	6
24"	10	7
26"	10	7
28"	13	9
30"	13	9
32"	17	11
34"	17	11
36"	21	14
42"	26	18
48"	30	21
54"	37	25

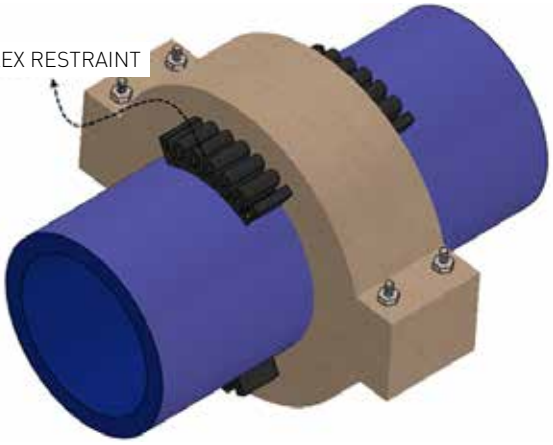
It can be fusible to SDR 9-26 pipes.



Flex restraints also can be used for centering and easy sliding of a PE pipe in another pipe.

EF-IPS/DIPS

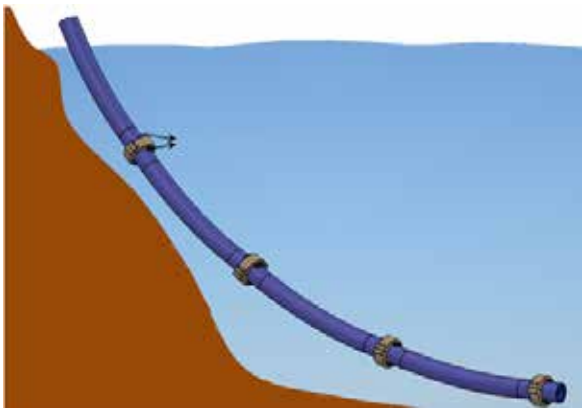
EF FLEX RESTRAINT



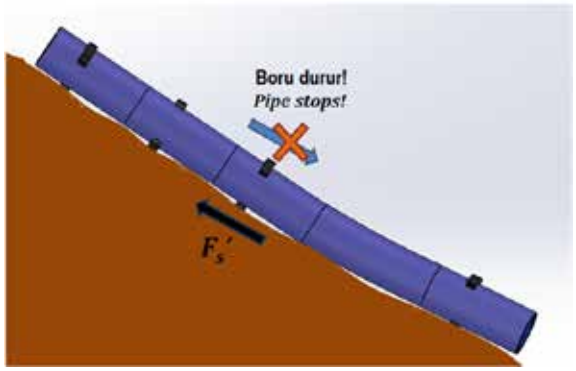
To prevent slipping, blocks must be fixed to the pipe.

EF FLEX RESTRAINTs are welded to the pipe and prevents blocks to slip.

Sinkers or thrust blocks do not slip anymore



Prevents slipping pipes



SPIGOT - INCH SIZE

SPIGOT - INCH SIZE

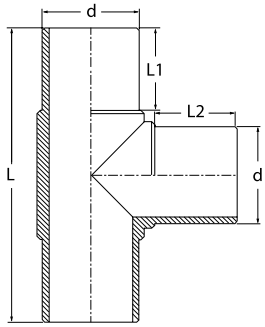
SPIGOT-IPS/DIPS

IPS EQUAL TEE

SDR17 PE100

WATER / SU : 130 PSI

GAS / GAZ : 64 PSI



Nominal IPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
2"	2,38	2,67	9,67	0,59	03111710001000600000
3"	3,50	3,31	11,97	1,49	03111710001000880000
4"	4,50	3,42	14,16	2,80	03111710001001140000
6"	6,63	4,05	17,70	7,35	03111710001001680000
8"	8,63	4,61	20,08	14,79	03111710001002190000
10"	10,75	5,70	25,98	33,75	03111710001002730000
12"	12,75	6,49	29,72	53,36	03111710001003230000

IPS EQUAL TEE

SDR13,5 PE100

WATER / SU : 160 PSI

GAS / GAZ : 80 PSI

Nominal IPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
2"	2,38	2,67	9,67	0,71	03111310001000600000
3"	3,50	3,31	11,97	1,80	03111310001000880000
4"	4,50	3,42	14,16	3,39	03111310001001140000
6"	6,63	4,05	17,70	8,91	03111310001001680000
8"	8,63	4,61	20,08	17,72	03111310001002190000
10"	10,75	5,70	25,98	39,73	03111310001002730000
12"	12,75	6,49	29,72	62,94	03111310001003230000

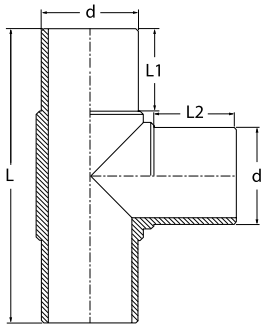
SPIGOT-IPS/DIPS

IPS EQUAL TEE

SDR11 PE100

WATER / SU *:* 200 PSI

GAS / GAZ*:* 100 PSI



Nominal IPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
2"	2,38	2,67	9,67	0,82	03111110001000600000
3"	3,50	3,31	11,97	2,11	03111110001000880000
4"	4,50	3,42	14,16	3,98	03111110001001140000
6"	6,63	4,05	17,70	10,46	03111110001001680000
8"	8,63	4,61	20,08	20,65	03111110001002190000
10"	10,75	5,70	25,98	45,71	03111110001002730000
12"	12,75	6,49	29,72	72,51	03111110001003230000

IPS EQUAL TEE

SDR9 PE100

WATER / SU : 255 PSI

GAS / GAZ : 125 PSI

Nominal IPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
2"	2,38	2,67	9,67	0,95	03110910001000600000
3"	3,50	3,31	11,97	2,47	03110910001000880000
4"	4,50	3,42	14,16	4,68	03110910001001140000
6"	6,63	4,05	17,70	12,31	03110910001001680000
8"	8,63	4,61	20,08	24,15	03110910001002190000
10"	10,75	5,70	25,98	52,86	03110910001002730000
12"	12,75	6,49	29,72	83,94	03110910001003230000

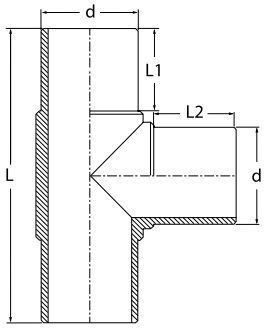
SPIGOT-IPS/DIPS

IPS EQUAL TEE

SDR7 PE100

WATER / SU : 355 PSI

GAS / GAZ: 125 PSI



Nominal IPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
2"	2,38	2,67	9,67	1,15	03110710001000600000
3"	3,50	3,31	11,97	2,99	03110710001000880000
4"	4,50	3,42	14,16	5,71	03110710001001140000
6"	6,63	4,05	17,70	15,04	03110710001001680000
8"	8,63	4,61	20,08	29,29	03110710001002190000
10"	10,75	5,70	25,98	63,43	03110710001002730000
12"	12,75	6,49	29,72	100,80	03110710001003230000

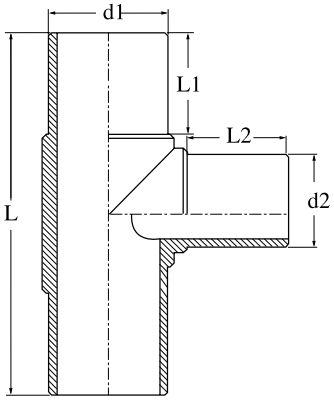
SPIGOT-IPS/DIPS

IPS REDUCED TEE

SDR17 PE100

WATER / SU : 64 PSI

GAS / GAZ : 130 PSI



Nominal IPS Size	Base OD (Nominal) d1	Outlet OD (Nominal) d2	L1	L2	L	Unit Weight in lbs	Code
3" IPS X 2" IPS	3,50	2,38	3,31	2,68	11,97	1,29	03311710001000880060
4" IPS X 2" IPS	4,50	2,38	3,43	2,68	14,16	2,32	03311710001001140060
4" IPS X 3" IPS	4,50	3,50	3,43	3,31	14,16	2,49	03311710001001140088
6" IPS X 2" IPS	6,63	2,38	4,06	2,68	17,70	6,04	03311710001001680060
6" IPS X 3" IPS	6,63	3,50	4,06	3,31	17,70	6,19	03311710001001680088
6" IPS X 4" IPS	6,63	4,50	4,06	3,43	17,70	6,44	03311710001001680114
8" IPS X 2" IPS	8,63	2,38	4,61	2,68	20,08	12,66	03311710001002190060
8" IPS X 3" IPS	8,63	3,50	4,61	3,31	20,08	12,76	03311710001002190088
8" IPS X 4" IPS	8,63	4,50	4,61	3,43	20,08	12,86	03311710001002190114
8" IPS X 6" IPS	8,63	6,63	4,61	4,06	20,08	13,39	03311710001002190168
10" IPS X 4" IPS	10,75	4,50	5,71	3,43	25,98	28,68	03311710001002730114
10" IPS X 6" IPS	10,75	6,63	5,71	4,06	25,98	29,16	03311710001002730168
10" IPS X 8" IPS	10,75	8,63	5,71	4,92	25,98	30,42	03311710001002730219
12" IPS X 6" IPS	12,75	6,63	6,50	4,06	29,72	49,44	03311710001003230168
12" IPS X 8" IPS	12,75	8,63	6,50	4,92	29,72	52,00	03311710001003230219
12" IPS X 10" IPS	12,75	10,75	6,50	5,71	29,72	54,25	03311710001003230273

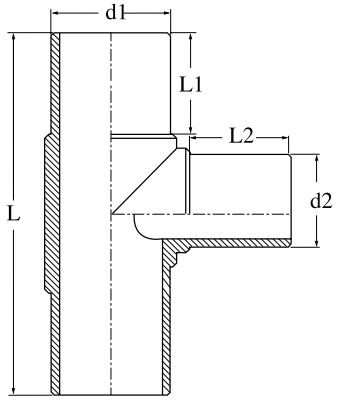
SPIGOT-IPS/DIPS

IPS REDUCED TEE

SDR13,5 PE100

WATER / SU : 160 PSI

GAS / GAZ : 80 PSI



Nominal IPS Size	Base OD (Nominal) d1	Outlet OD (Nominal) d2	L1	L2	L	Unit Weight in lbs	Code
3" IPS X 2" IPS	3,50	2,38	3,31	2,68	11,97	1,55	03311310001000880060
4" IPS X 2" IPS	4,50	2,38	3,43	2,68	14,16	2,79	03311310001001140060
4" IPS X 3" IPS	4,50	3,50	3,43	3,31	14,16	3,02	03311310001001140088
6" IPS X 2" IPS	6,63	2,38	4,06	2,68	17,70	7,26	03311310001001680060
6" IPS X 3" IPS	6,63	3,50	4,06	3,31	17,70	7,46	03311310001001680088
6" IPS X 4" IPS	6,63	4,50	4,06	3,43	17,70	7,77	03311310001001680114
8" IPS X 2" IPS	8,63	2,38	4,61	2,68	20,08	14,99	03311310001002190060
8" IPS X 3" IPS	8,63	3,50	4,61	3,31	20,08	15,13	03311310001002190088
8" IPS X 4" IPS	8,63	4,50	4,61	3,43	20,08	15,28	03311310001002190114
8" IPS X 6" IPS	8,63	6,63	4,61	4,06	20,08	16,00	03311310001002190168
10" IPS X 4" IPS	10,75	4,50	5,71	3,43	25,98	33,44	03311310001002730114
10" IPS X 6" IPS	10,75	6,63	5,71	4,06	25,98	34,14	03311310001002730168
10" IPS X 8" IPS	10,75	8,63	5,71	4,92	25,98	35,79	03311310001002730219
12" IPS X 6" IPS	12,75	6,63	6,50	4,06	29,72	57,21	03311310001003230168
12" IPS X 8" IPS	12,75	8,63	6,50	4,92	29,72	60,17	03311310001003230219
12" IPS X 10" IPS	12,75	10,75	6,50	5,71	29,72	63,00	03311310001003230273

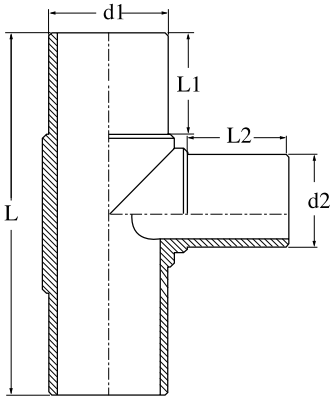
SPIGOT-IPS/DIPS

IPS REDUCED TEE

SDR11 PE100

WATER / SU : 200 PSI

GAS / GAZ: 100 PSI



Nominal IPS Size	Base OD (Nominal) d1	Outlet OD (Nominal) d2	L1	L2	L	Unit Weight in lbs	Code
3" IPS X 2" IPS	3,50	2,38	3,31	2,68	11,97	1,80	03311110001000880060
4" IPS X 2" IPS	4,50	2,38	3,43	2,68	14,16	3,26	03311110001001140060
4" IPS X 3" IPS	4,50	3,50	3,43	3,31	14,16	3,54	03311110001001140088
6" IPS X 2" IPS	6,63	2,38	4,06	2,68	17,70	8,48	03311110001001680060
6" IPS X 3" IPS	6,63	3,50	4,06	3,31	17,70	8,72	03311110001001680088
6" IPS X 4" IPS	6,63	4,50	4,06	3,43	17,70	9,10	03311110001001680114
8" IPS X 2" IPS	8,63	2,38	4,61	2,68	20,08	17,32	03311110001002190060
8" IPS X 3" IPS	8,63	3,50	4,61	3,31	20,08	17,50	03311110001002190088
8" IPS X 4" IPS	8,63	4,50	4,61	3,43	20,08	17,70	03311110001002190114
8" IPS X 6" IPS	8,63	6,63	4,61	4,06	20,08	18,60	03311110001002190168
10" IPS X 4" IPS	10,75	4,50	5,71	3,43	25,98	38,20	03311110001002730114
10" IPS X 6" IPS	10,75	6,63	5,71	4,06	25,98	39,11	03311110001002730168
10" IPS X 8" IPS	10,75	8,63	5,71	4,92	25,98	41,15	03311110001002730219
12" IPS X 6" IPS	12,75	6,63	6,50	4,06	29,72	64,98	03311110001003230168
12" IPS X 8" IPS	12,75	8,63	6,50	4,92	29,72	68,33	03311110001003230219
12" IPS X 10 IPS	12,75	10,75	6,50	5,71	29,72	71,74	03311110001003230273

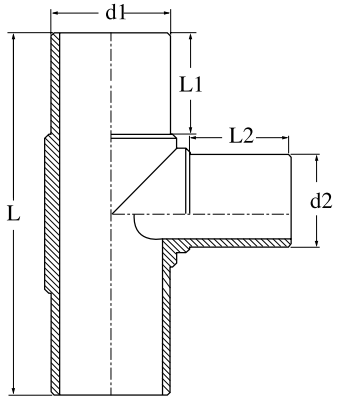
SPIGOT-IPS/DIPS

IPS REDUCED TEE

SDR9 PE100

WATER / SU : 255 PSI

GAS / GAZ : 125 PSI



Nominal IPS Size	Base OD (Nominal) d1	Outlet OD (Nominal) d2	L1	L2	L	Unit Weight in lbs	Code
3" IPS X 2" IPS	3,50	2,38	3,31	2,68	11,97	2,10	03310910001000880060
4" IPS X 2" IPS	4,50	2,38	3,43	2,68	14,16	3,82	03310910001001140060
4" IPS X 3" IPS	4,50	3,50	3,43	3,31	14,16	4,15	03310910001001140088
6" IPS X 2" IPS	6,63	2,38	4,06	2,68	17,70	9,93	03310910001001680060
6" IPS X 3" IPS	6,63	3,50	4,06	3,31	17,70	10,22	03310910001001680088
6" IPS X 4" IPS	6,63	4,50	4,06	3,43	17,70	10,68	03310910001001680114
8" IPS X 2" IPS	8,63	2,38	4,61	2,68	20,08	20,08	03310910001002190060
8" IPS X 3" IPS	8,63	3,50	4,61	3,31	20,08	20,31	03310910001002190088
8" IPS X 4" IPS	8,63	4,50	4,61	3,43	20,08	20,56	03310910001002190114
8" IPS X 6" IPS	8,63	6,63	4,61	4,06	20,08	21,70	03310910001002190168
10" IPS X 4" IPS	10,75	4,50	5,71	3,43	25,98	43,85	03310910001002730114
10" IPS X 6" IPS	10,75	6,63	5,71	4,06	25,98	45,02	03310910001002730168
10" IPS X 8" IPS	10,75	8,63	5,71	4,92	25,98	47,54	03310910001002730219
12" IPS X 6" IPS	12,75	6,63	6,50	4,06	29,72	74,19	03310910001003230168
12" IPS X 8" IPS	12,75	8,63	6,50	4,92	29,72	78,03	03310910001003230219
12" IPS X 10" IPS	12,75	10,75	6,50	5,71	29,72	82,16	03310910001003230273

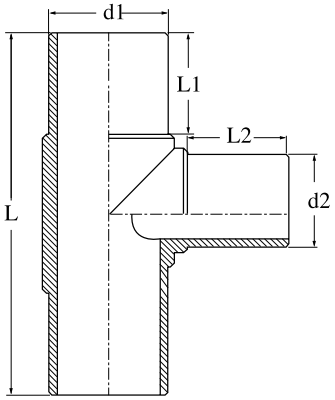
SPIGOT-IPS/DIPS

IPS REDUCED TEE

SDR7 PE100

WATER / SU : 335 PSI

GAS / GAZ: 125 PSI



Nominal IPS Size	Base OD (Nominal) d1	Outlet OD (Nominal) d2	L1	L2	L	Unit Weight in lbs	Code
3" IPS X 2" IPS	3,50	2,38	3,31	2,68	11,97	2,54	03310710001000880060
4" IPS X 2" IPS	4,50	2,38	3,43	2,68	14,16	4,63	03310710001001140060
4" IPS X 3" IPS	4,50	3,50	3,43	3,31	14,16	5,05	03310710001001140088
6" IPS X 2" IPS	6,63	2,38	4,06	2,68	17,70	12,04	03310710001001680060
6" IPS X 3" IPS	6,63	3,50	4,06	3,31	17,70	12,41	03310710001001680088
6" IPS X 4" IPS	6,63	4,50	4,06	3,43	17,70	13,00	03310710001001680114
8" IPS X 2" IPS	8,63	2,38	4,61	2,68	20,08	24,08	03310710001002190060
8" IPS X 3" IPS	8,63	3,50	4,61	3,31	20,08	24,39	03310710001002190088
8" IPS X 4" IPS	8,63	4,50	4,61	3,43	20,08	24,75	03310710001002190114
8" IPS X 6" IPS	8,63	6,63	4,61	4,06	20,08	26,24	03310710001002190168
10" IPS X 4" IPS	10,75	4,50	5,71	3,43	25,98	52,12	03310710001002730114
10" IPS X 6" IPS	10,75	6,63	5,71	4,06	25,98	53,72	03310710001002730168
10" IPS X 8" IPS	10,75	8,63	5,71	4,92	25,98	56,96	03310710001002730219
12" IPS X 6" IPS	12,75	6,63	6,50	4,06	29,72	87,68	03310710001003230168
12" IPS X 8" IPS	12,75	8,63	6,50	4,92	29,72	92,27	03310710001003230219
12" IPS X 10" IPS	12,75	10,75	6,50	5,71	29,72	97,51	03310710001003230273

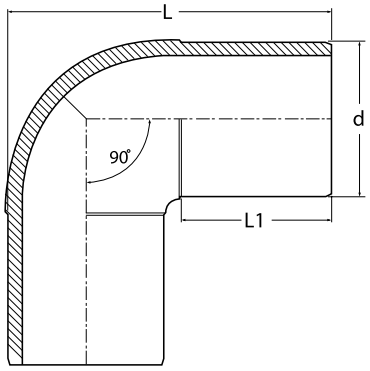
SPIGOT-IPS/DIPS

MOLDED ELBOW - 90°

SDR17 PE100

WATER / SU : 130 PSI

GAS / GAZ : 64 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Code
2"	IPS	5,63	2,64	0,38	02211710001000600000
3"	IPS	7,44	3,46	0,94	02211710001000880000
4"	IPS	8,39	3,54	1,55	02211710001001140000
6"	IPS	12,01	4,37	5,98	02211710001001680000
8"	IPS	15,35	5,12	13,37	02211710001002190000
10"	IPS	18,50	5,91	25,02	02211710001002730000
12"	IPS	20,69	6,30	34,63	02211710001003230000
4"	DIPS	8,98	3,66	2,17	02211710002001140000
6"	DIPS	12,01	4,37	5,66	02211710002001680000
8"	DIPS	15,75	5,12	14,64	02211710002002190000
10"	DIPS	18,50	5,91	23,77	02211710002002730000
12"	DIPS	21,67	6,89	38,17	02211710002003230000

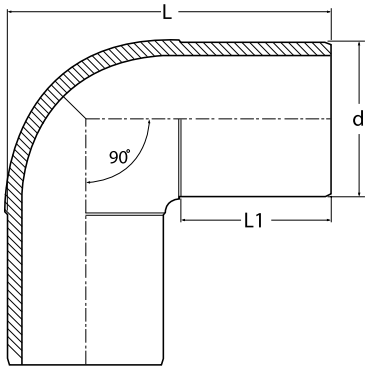
SPIGOT-IPS/DIPS

MOLDED ELBOW - 90°

SDR13,5 PE100

WATER / SU : 160 PSI

GAS / GAZ: 80 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Code
2"	IPS	5,63	2,64	0,45	02211310001000600000
3"	IPS	7,44	3,46	1,13	02211310001000880000
4"	IPS	8,39	3,54	1,91	02211310001001140000
6"	IPS	12,01	4,37	7,00	02211310001001680000
8"	IPS	15,35	5,12	15,58	02211310001002190000
10"	IPS	18,50	5,91	29,07	02211310001002730000
12"	IPS	20,69	6,30	40,89	02211310001003230000
4"	DIPS	8,98	3,66	2,58	02211310002001140000
6"	DIPS	12,01	4,37	6,78	02211310002001680000
8"	DIPS	15,75	5,12	17,10	02211310002002190000
10"	DIPS	18,50	5,91	28,09	02211310002002730000
12"	DIPS	21,67	6,89	45,23	02211310002003230000

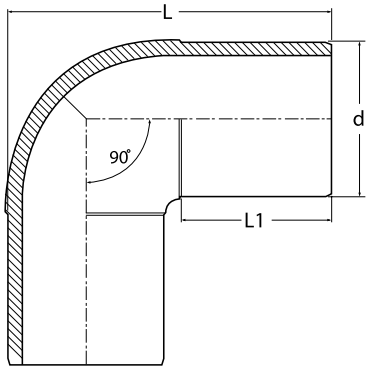
SPIGOT-IPS/DIPS

MOLDED ELBOW - 90°

SDR11 PE100

WATER / SU : 200 PSI

GAS / GAZ : 100 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Code
2"	IPS	5,63	2,64	0,52	02211110001000600000
3"	IPS	7,44	3,46	1,34	02211110001000880000
4"	IPS	8,39	3,54	2,26	02211110001001140000
6"	IPS	12,01	4,37	8,05	02211110001001680000
8"	IPS	15,35	5,12	17,92	02211110001002190000
10"	IPS	18,50	5,91	33,36	02211110001002730000
12"	IPS	20,69	6,30	47,47	02211110001003230000
4"	DIPS	8,98	3,66	3,01	02211110002001140000
6"	DIPS	12,01	4,37	7,95	02211110002001680000
8"	DIPS	15,75	5,12	19,75	02211110002002190000
10"	DIPS	18,50	5,91	32,65	02211110002002730000
12"	DIPS	21,67	6,89	52,77	02211110002003230000

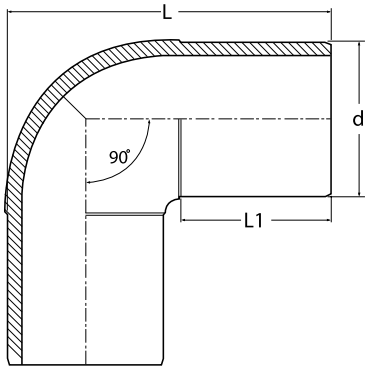
SPIGOT-IPS/DIPS

MOLDED ELBOW - 90°

SDR9 PE100

WATER / SU : 255 PSI

GAS / GAZ: 125 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Code
2"	IPS	5,63	2,64	0,60	02210910001000600000
3"	IPS	7,44	3,46	1,58	02210910001000880000
4"	IPS	8,39	3,54	2,68	02210910001001140000
6"	IPS	12,01	4,37	9,27	02210910001001680000
8"	IPS	15,35	5,12	20,60	02210910001002190000
10"	IPS	18,50	5,91	38,28	02210910001002730000
12"	IPS	20,69	6,30	55,06	02210910001003230000
4"	DIPS	8,98	3,66	3,51	02210910002001140000
6"	DIPS	12,01	4,37	9,26	02210910002001680000
8"	DIPS	15,75	5,12	22,76	02210910002002190000
10"	DIPS	18,50	5,91	37,91	02210910002002730000
12"	DIPS	21,67	6,89	61,33	02210910002003230000

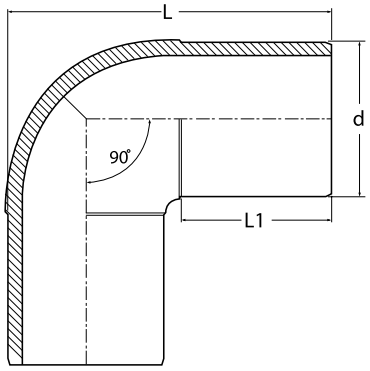
SPIGOT-IPS/DIPS

MOLDED ELBOW - 90°

SDR7 PE100

WATER / SU : 335 PSI

GAS / GAZ : 125PSI



d	Base Norm	L	L1	Unit Weight in lbs	Code
2"	IPS	5,63	2,64	0,88	02210710001000600000
3"	IPS	7,44	3,46	1,98	02210710001000880000
4"	IPS	8,39	3,54	4,62	02210710001001140000
6"	IPS	12,01	4,37	11,66	02210710001001680000
8"	IPS	15,35	5,12	21,34	02210710001002190000
10"	IPS	18,50	5,91	42,32	02210710001002730000
12"	IPS	20,69	6,30	70,40	02210710001003230000
4"	DIPS	8,98	3,66	4,62	02210710002001140000
6"	DIPS	12,01	4,37	11,88	02210710002001680000
8"	DIPS	15,75	5,12	21,78	02210710002002190000
10"	DIPS	18,50	5,91	45,54	02210710002002730000
12"	DIPS	21,67	6,89	71,94	02210710002003230000

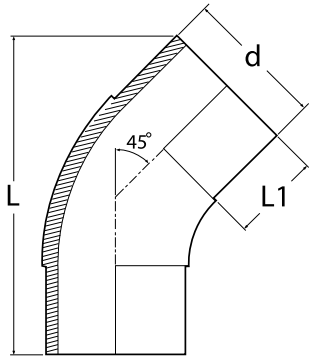
SPIGOT-IPS/DIPS

MOLDED ELBOW - 45°

SDR17 PE100

WATER / SU : 130 PSI

GAS / GAZ : 64 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Item Code
2"	IPS	6,32	2,52	0,28	02411710001000600000
3"	IPS	8,72	3,50	0,87	02411710001000880000
4"	IPS	10,38	3,54	1,63	02411710001001140000
6"	IPS	13,01	4,33	4,88	02411710001001680000
8"	IPS	16,24	5,12	8,98	02411710001002190000
10"	IPS	19,17	5,91	16,06	02411710001002730000
12"	IPS	21,19	6,30	22,66	02411710001003230000
4"	DIPS	11,23	3,94	2,00	02411710002001140000
6"	DIPS	13,10	4,33	4,01	02411710002001680000
8"	DIPS	16,53	5,12	10,05	02411710002002190000
10"	DIPS	19,29	5,91	15,99	02411710002002730000
12"	DIPS	22,50	6,89	26,90	02411710002003230000

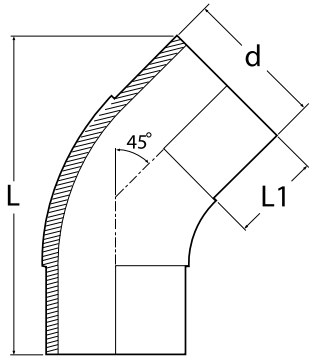
SPIGOT-IPS/DIPS

MOLDED ELBOW - 45°

SDR13,5 PE100

WATER / SU : 160 PSI

GAS / GAZ : 80 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Item Code
2"	IPS	6,32	2,52	0,34	02411310001000600000
3"	IPS	8,72	3,50	0,93	02411310001000880000
4"	IPS	10,38	3,54	1,69	02411310001001140000
6"	IPS	13,01	4,33	5,02	02411310001001680000
8"	IPS	16,24	5,12	10,99	02411310001002190000
10"	IPS	19,17	5,91	20,06	02411310001002730000
12"	IPS	21,19	6,30	28,66	02411310001003230000
4"	DIPS	11,23	3,94	2,24	02411310002001140000
6"	DIPS	13,10	4,33	5,01	02411310002001680000
8"	DIPS	16,53	5,12	12,05	02411310002002190000
10"	DIPS	19,29	5,91	19,89	02411310002002730000
12"	DIPS	22,50	6,89	32,19	02411310002003230000

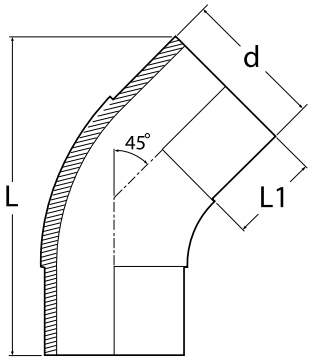
SPIGOT-IPS/DIPS

MOLDED ELBOW - 45°

SDR11 PE100

WATER / SU : 200 PSI

GAS / GAZ: 100 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Item Code
2"	IPS	6,32	2,52	0,40	02411110001000600000
3"	IPS	8,72	3,50	1,09	02411110001000880000
4"	IPS	10,38	3,54	2,01	02411110001001140000
6"	IPS	13,01	4,33	5,87	02411110001001680000
8"	IPS	16,24	5,12	12,80	02411110001002190000
10"	IPS	19,17	5,91	23,32	02411110001002730000
12"	IPS	21,19	6,30	33,63	02411110001003230000
4"	DIPS	11,23	3,94	2,64	02411110002001140000
6"	DIPS	13,10	4,33	5,95	02411110002001680000
8"	DIPS	16,53	5,12	14,09	02411110002002190000
10"	DIPS	19,29	5,91	23,36	02411110002002730000
12"	DIPS	22,50	6,89	37,93	02411110002003230000

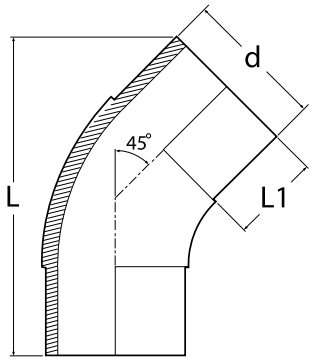
SPIGOT-IPS/DIPS

MOLDED ELBOW - 45°

SDR9 PE100

WATER / SU : 255 PSI

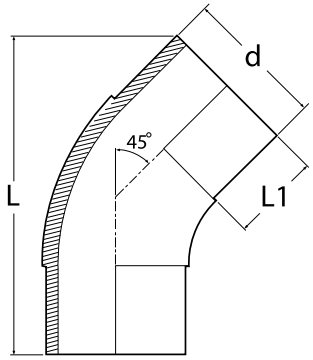
GAS / GAZ : 125 PSI



d	Base Norm	L	L1	Unit Weight in lbs	Item Code
2"	IPS	6,32	2,52	0,46	02410910001000600000
3"	IPS	8,72	3,50	1,29	02410910001000880000
4"	IPS	10,38	3,54	2,39	02410910001001140000
6"	IPS	13,01	4,33	6,85	02410910001001680000
8"	IPS	16,24	5,12	14,88	02410910001002190000
10"	IPS	19,17	5,91	27,07	02410910001002730000
12"	IPS	21,19	6,30	39,35	02410910001003230000
4"	DIPS	11,23	3,94	3,10	02410910002001140000
6"	DIPS	13,10	4,33	7,00	02410910002001680000
8"	DIPS	16,53	5,12	16,40	02410910002002190000
10"	DIPS	19,29	5,91	27,36	02410910002002730000
12"	DIPS	22,50	6,89	44,44	02410910002003230000

MOLDED ELBOW - 45°

SDR7 PE100
WATER / SU : 335 PSI
GAS / GAZ : 125 PSI

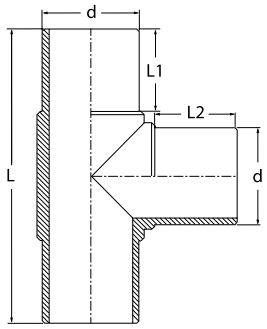


d	Base Norm	L	L1	Unit Weight in lbs	Item Code
2"	IPS	6,32	2,52	0,66	02410710001000600000
3"	IPS	8,72	3,50	1,76	02410710001000880000
4"	IPS	10,38	3,54	3,52	02410710001001140000
6"	IPS	13,01	4,33	8,58	02410710001001680000
8"	IPS	16,24	5,12	17,38	02410710001002190000
10"	IPS	19,17	5,91	32,56	02410710001002730000
12"	IPS	21,19	6,30	46,86	02410710001003230000
4"	DIPS	11,23	3,94	3,74	02410710002001140000
6"	DIPS	13,10	4,33	9,02	02410710002001680000
8"	DIPS	16,53	5,12	18,04	02410710002002190000
10"	DIPS	19,29	5,91	33,22	02410710002002730000
12"	DIPS	22,50	6,89	49,72	02410710002003230000

SPIGOT-IPS/DIPS

DIPS EQUAL TEE

SDR17 PE100
WATER / SU : 130PSI
GAS / GAZ: 64 PSI



Nominal DIPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
4"	4,800	3,54	13,98	3,67	03111710002001140000
6"	6,900	3,03	16,54	9,40	03111710002001680000
8"	9,050	4,61	20,08	13,78	03111710002002190000
10"	11,100	5,70	25,98	32,04	03111710002002730000
12"	13,200	6,49	29,72	50,43	03111710002003230000

DIPS EQUAL TEE

SDR11 PE100
WATER / SU : 200 PSI
GAS / GAZ : 100 PSI

Nominal DIPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
4"	4,800	3,54	13,98	4,96	03111110002001140000
6"	6,900	3,03	16,54	12,56	03111110002001680000
8"	9,050	4,61	20,08	20,21	03111110002002190000
10"	11,100	5,70	25,98	44,72	03111110002002730000
12"	13,200	6,49	29,72	70,84	03111110002003230000

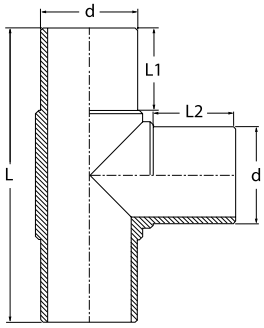
SPIGOT-IPS/DIPS

DIPS EQUAL TEE

SDR9 PE100

WATER / SU : 255 PSI

GAS / GAZ: 125 PSI



Nominal DIPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
4"	4,800	3,54	13,98	5,73	03110910002001140000
6"	6,900	3,03	16,54	14,38	03110910002001680000
8"	9,050	4,61	20,08	24,04	03110910002002190000
10"	11,100	5,70	25,98	52,31	03110910002002730000
12"	13,200	6,49	29,72	82,95	03110910002003230000

DIPS EQUAL TEE

SDR7 PE100

WATER / SU : 335 PSI

GAS / GAZ : 125 PSI

Nominal DIPS Size	OD (Nominal) d	L1	L	Unit Weight in lbs	Code
4"	4,800	3,54	13,98	6,88	03110710002001140000
6"	6,900	3,03	16,54	17,13	03110710002001680000
8"	9,050	4,61	20,08	29,69	03110710002002190000
10"	11,100	5,70	25,98	63,52	03110710002002730000
12"	13,200	6,49	29,72	100,95	03110710002003230000

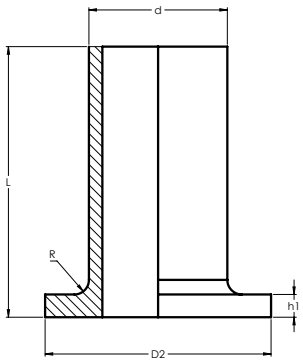
SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR17 PE100

WATER / SU : 130 PSI

GAS / GAZ: 64 PSI



d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
2"	IPS	3,88	4,64	0,39	0,25	0,27	01711710001000600000
3"	IPS	5,00	4,89	0,39	0,25	0,52	01711710001000880000
4"	IPS	6,63	6,50	0,50	0,38	1,16	01711710001001140000
6"	IPS	8,50	7,53	0,78	0,38	2,71	01711710001001680000
8"	IPS	10,63	7,13	1,00	0,38	4,42	01711710001002190000
10"	IPS	12,75	7,41	1,28	0,38	7,08	01711710001002730000
12"	IPS	15,75	9,29	1,54	0,38	13,15	01711710001003230000
14"	IPS	17,38	9,38	1,63	0,50	16,33	01711710001003550000
16"	IPS	19,75	9,88	1,88	0,50	22,86	01711710001004060000
18"	IPS	21,13	10,13	2,00	0,50	27,44	01711710001004570000
20"	IPS	23,38	10,65	2,27	0,50	36,03	01711710001005080000
22"	IPS	25,50	11,13	2,50	0,50	45,40	01711710001005580000
24"	IPS	27,75	11,44	2,75	0,50	56,23	01711710001006090000
26"	IPS	30,00	12,63	2,50	0,50	69,31	01711710001006600000
28"	IPS	32,25	12,76	2,63	0,50	81,64	01711710001007110000
30"	IPS	34,25	13,00	2,75	0,50	94,59	01711710001007620000
32"	IPS	36,75	13,75	3,00	0,50	115,89	01711710001008120000
34"	IPS	38,50	13,88	3,00	0,50	128,37	01711710001008630000
36"	IPS	40,75	14,31	3,00	0,50	147,38	01711710001009140000
40"	IPS	45,13	15,63	3,00	0,50	193,83	01711710001010160000

SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR17 PE100

WATER / SU : 130 PSI

GAS / GAZ: 164 PSI

d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
42"	IPS	47,38	15,76	3,13	0,50	217,09	01711710001010660000
48"	IPS	53,75	16,51	3,63	0,75	299,17	01711710001012190000
54"	IPS	60,00	24,13	4,00	0,75	521,02	01711710001013710000
63"	IPS	66,75	25,13	4,63	0,75	690,93	01711710001016000000
4"	DIPS	6,63	6,50	0,50	0,44	1,26	01711710002001140000
6"	DIPS	8,50	7,50	0,75	0,44	2,78	01711710002001680000
8"	DIPS	10,63	7,13	1,00	0,44	4,56	01711710002002190000
10"	DIPS	12,75	7,38	1,25	0,44	7,12	01711710002002730000
12"	DIPS	15,75	9,25	1,50	0,44	13,25	01711710002003230000
14"	DIPS	17,38	9,50	1,75	0,44	17,36	01711710002003550000
16"	DIPS	19,75	10,00	2,00	0,44	23,95	01711710002004060000
18"	DIPS	21,13	10,38	2,25	0,44	29,05	01711710002004570000
20"	DIPS	23,38	10,88	2,50	0,44	37,60	01711710002005080000
24"	DIPS	27,75	11,69	3,00	0,50	57,82	01711710002006090000
30"	DIPS	27,75	11,69	3,00	0,50	104,54	01711710002007620000
36"	DIPS	34,25	13,88	3,63	0,50	170,35	01711710002009140000
42"	DIPS	40,75	15,81	4,50	0,50	227,18	01711710002010660000
48"	DIPS	47,38	16,13	3,50	0,50	302,93	01711710002012190000

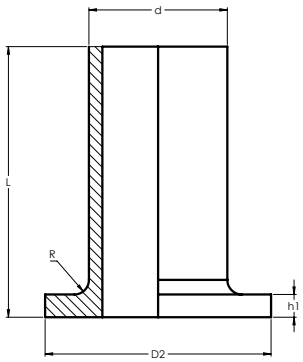
SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR13,5 PE100

WATER / SU : 160 PSI

GAS / GAZ: 80 PSI



d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
2"	IPS	3,88	4,64	0,39	0,25	0,31	01711310001000600000
3"	IPS	5,00	4,89	0,39	0,25	0,61	01711310001000880000
4"	IPS	6,63	6,50	0,50	0,38	1,37	01711310001001140000
6"	IPS	8,50	7,53	0,78	0,38	3,21	01711310001001680000
8"	IPS	10,63	7,13	1,00	0,38	5,22	01711310001002190000
10"	IPS	12,75	7,41	1,28	0,38	8,36	01711310001002730000
12"	IPS	15,75	9,29	1,54	0,38	15,42	01711310001003230000
14"	IPS	17,38	9,38	1,63	0,50	19,09	01711310001003550000
16"	IPS	19,75	9,88	1,88	0,50	26,65	01711310001004060000
18"	IPS	21,13	10,13	2,00	0,50	32,38	01711310001004570000
20"	IPS	23,38	10,65	2,27	0,50	42,38	01711310001005080000
22"	IPS	25,50	11,13	2,50	0,50	53,50	01711310001005580000
24"	IPS	27,75	11,44	2,75	0,50	66,12	01711310001006090000
26"	IPS	30,00	12,63	2,50	0,50	82,09	01711310001006600000
28"	IPS	32,25	12,76	2,63	0,50	96,59	01711310001007110000
30"	IPS	34,25	13,00	2,75	0,50	112,04	01711310001007620000
32"	IPS	36,75	13,75	3,00	0,50	136,87	01711310001008120000
34"	IPS	38,50	14,13	3,25	0,50	156,72	01711310001008630000
36"	IPS	40,75	14,81	3,50	0,50	184,96	01711310001009140000
40"	IPS	45,13	16,38	3,75	0,50	249,30	01711310001010160000

SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR13,5 PE100

WATER / SU : 160 PSI

GAS / GAZ: 80 PSI

d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
42"	IPS	47,38	16,63	4,00	0,50	281,75	01711310001010660000
48"	IPS	53,75	17,38	4,50	0,75	385,07	01711310001012190000
54"	IPS	60,00	25,13	5,00	0,75	666,34	01711310001013710000
63"	IPS	66,75	26,38	5,88	0,75	898,69	01711310001016000000
4"	DIPS	6,63	6,50	0,50	0,44	1,48	01711310002001140000
6"	DIPS	8,50	7,50	0,75	0,44	3,33	01711310002001680000
8"	DIPS	10,63	7,13	1,00	0,44	5,43	01711310002002190000
10"	DIPS	12,75	7,38	1,25	0,44	8,48	01711310002002730000
12"	DIPS	15,75	9,25	1,50	0,44	15,66	01711310002003230000
14"	DIPS	17,38	9,50	1,75	0,44	20,68	01711310002003550000
16"	DIPS	19,75	10,00	2,00	0,44	28,47	01711310002004060000
18"	DIPS	21,13	10,38	2,25	0,44	34,97	01711310002004570000
20"	DIPS	23,38	10,88	2,50	0,44	45,16	01711310002005080000
24"	DIPS	27,75	11,69	3,00	0,50	69,42	01711310002006090000
30"	DIPS	34,25	13,88	3,63	0,50	125,80	01711310002007620000
36"	DIPS	40,75	15,81	4,50	0,50	205,09	01711310002009140000
42"	DIPS	47,38	17,13	4,50	0,50	297,55	01711310002010660000
48"	DIPS	53,75	17,88	5,00	0,75	402,80	01711310002012190000

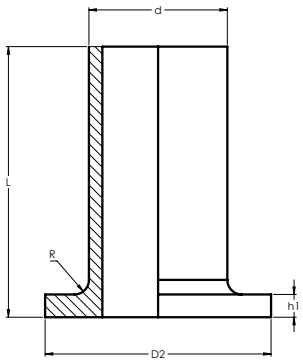
SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR11 PE100

WATER / SU *:* 200 PSI

GAS / GAZ*:* 100 PSI



d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
2"	IPS	3,88	4,64	0,39	0,25	0,35	01711110001000600000
3"	IPS	5,00	4,91	0,41	0,25	0,71	01711110001000880000
4"	IPS	6,63	6,50	0,50	0,38	1,57	01711110001001140000
6"	IPS	8,50	7,53	0,78	0,38	3,73	01711110001001680000
8"	IPS	10,63	7,13	1,00	0,38	6,06	01711110001002190000
10"	IPS	12,75	7,41	1,28	0,38	9,72	01711110001002730000
12"	IPS	15,75	9,29	1,54	0,38	17,81	01711110001003230000
14"	IPS	17,38	9,38	1,63	0,50	22,01	01711110001003550000
16"	IPS	19,75	9,88	1,88	0,50	30,70	01711110001004060000
18"	IPS	21,13	10,13	2,00	0,50	37,59	01711110001004570000
20"	IPS	23,38	10,65	2,27	0,50	49,18	01711110001005080000
22"	IPS	25,50	11,13	2,50	0,50	62,05	01711110001005580000
24"	IPS	27,75	11,44	2,75	0,50	76,57	01711110001006090000
26"	IPS	30,00	13,13	3,00	0,50	101,90	01711110001006600000
28"	IPS	32,25	13,38	3,25	0,50	121,38	01711110001007110000
30"	IPS	34,25	13,75	3,50	0,50	142,55	01711110001007620000
32"	IPS	36,75	14,38	3,63	0,50	170,81	01711110001008120000
34"	IPS	38,50	14,76	3,88	0,50	195,00	01711110001008630000
36"	IPS	40,75	15,44	4,13	0,50	229,24	01711110001009140000
40"	IPS	45,13	17,13	4,50	0,50	311,41	01711110001010160000

SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR11 PE100

WATER / SU : 200 PSI

GAS / GAZ: 100 PSI

d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
42"	IPS	47,38	17,63	5,00	0,50	358,17	01711110001010660000
48"	IPS	53,75	18,38	5,50	0,75	582,28	01711110001012190000
54"	IPS	60,00	26,26	6,13	0,75	835,70	01711110001013710000
63"	IPS	66,75	25,13	-	0,75	1014,28	01711110001016000000
4"	DIPS	6,63	6,56	0,56	0,44	1,76	01711110002001140000
6"	DIPS	8,50	7,53	0,78	0,44	3,94	01711110002001680000
8"	DIPS	10,63	7,19	1,06	0,44	6,48	01711110002002190000
10"	DIPS	12,75	7,38	1,25	0,44	9,92	01711110002002730000
12"	DIPS	15,75	9,25	1,50	0,44	18,24	01711110002003230000
14"	DIPS	17,38	9,50	1,75	0,44	24,20	01711110002003550000
16"	DIPS	19,75	10,00	2,00	0,44	33,29	01711110002004060000
18"	DIPS	21,13	10,38	2,25	0,44	41,33	01711110002004570000
20"	DIPS	23,38	10,88	2,50	0,44	53,41	01711110002005080000
24"	DIPS	27,75	11,69	3,00	0,50	82,01	01711110002006090000
30"	DIPS	34,25	13,88	3,63	0,50	148,79	01711110002007620000
36"	DIPS	40,75	15,81	4,50	0,50	242,49	01711110002009140000
42"	DIPS	47,38	17,63	5,00	0,50	365,30	01711110002010660000
48"	DIPS	53,75	16,63	-	0,75	446,79	01711110002012190000

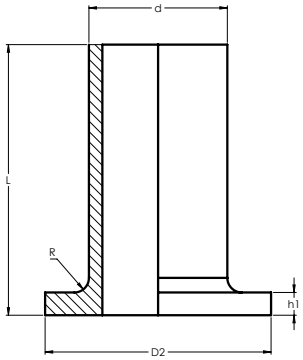
SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR9 PE100

WATER / SU : 255 PSI

GAS / GAZ: 125 PSI



d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
2"	IPS	3,88	4,64	0,39	0,25	0,40	01710910001000600000
3"	IPS	5,00	5,00	0,50	0,25	0,87	01710910001000880000
4"	IPS	6,63	6,01	0,63	0,38	1,78	01710910001001140000
6"	IPS	8,50	7,75	1,00	0,38	4,61	01710910001001680000
8"	IPS	10,63	7,38	1,25	0,38	7,49	01710910001002190000
10"	IPS	12,75	7,63	1,50	0,38	11,84	01710910001002730000
12"	IPS	15,75	9,26	1,88	0,38	21,27	01710910001003230000
14"	IPS	17,38	9,75	2,00	0,50	27,26	01710910001003550000
16"	IPS	19,75	10,25	2,25	0,50	37,73	01710910001004060000
18"	IPS	21,13	10,63	2,50	0,50	47,04	01710910001004570000
20"	IPS	23,38	11,26	2,88	0,50	62,02	01710910001005080000
22"	IPS	25,50	11,76	3,13	0,50	78,04	01710910001005580000
24"	IPS	27,75	12,05	3,36	0,50	95,70	01710910001006090000
26"	IPS	30,00	13,76	3,63	0,50	126,47	01710910001006600000
28"	IPS	32,25	14,13	3,88	0,50	151,24	01710910001007110000
30"	IPS	34,25	14,57	4,19	0,50	178,16	01710910001007620000
32"	IPS	36,75	15,38	4,50	0,50	216,53	01710910001008120000
34"	IPS	38,50	16,25	4,75	0,50	252,71	01710910001008630000
36"	IPS	40,75	17,19	5,00	0,50	299,22	01710910001009140000
40"	IPS	45,13	-	5,50	0,50	371,34	01710910001010160000

SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR9 PE100

WATER / SU : 255 PSI

GAS / GAZ: 125 PSI

d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
42"	IPS	47,38	-	5,88	0,50	425,24	01710910001010660000
48"	IPS	53,75	-	6,75	0,75	582,28	01710910001012190000
54"	IPS	60,00	-	-	0,75	972,68	01710910001013710000
63"	IPS	66,75	-	-	0,75	1173,82	01710910001016000000
4"	DIPS	6,63	6,07	0,69	0,44	1,98	01710910002001140000
6"	DIPS	8,50	7,75	1,00	0,44	4,84	01710910002001680000
8"	DIPS	10,63	7,38	1,25	0,44	7,88	01710910002002190000
10"	DIPS	12,75	7,76	1,63	0,44	12,49	01710910002002730000
12"	DIPS	15,75	9,26	1,88	0,44	21,91	01710910002003230000
14"	DIPS	17,38	9,88	2,13	0,44	29,91	01710910002003550000
16"	DIPS	19,75	10,50	2,50	0,44	41,64	01710910002004060000
18"	DIPS	21,13	10,88	2,75	0,44	51,39	01710910002004570000
20"	DIPS	23,38	11,38	3,00	0,44	66,13	01710910002005080000
24"	DIPS	27,75	12,32	3,63	0,50	102,31	01710910002006090000
30"	DIPS	34,25	14,88	4,50	0,50	189,16	01710910002007620000
36"	DIPS	40,75	17,69	5,50	0,50	319,95	01710910002009140000
42"	DIPS	47,38	-	-	0,50	433,58	01710910002010660000
48"	DIPS	53,75	-	-	0,75	512,63	01710910002012190000

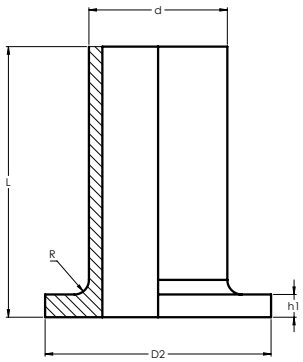
SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR7 PE100

WATER / SU *:* 335 PSI

GAS / GAZ*:* 125 PSI



d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
2"	IPS	3,88	4,69	0,44	0,25	0,48	01710710001000600000
3"	IPS	5,00	5,13	0,63	0,25	1,09	01710710001000880000
4"	IPS	6,63	6,26	0,88	0,38	2,33	01710710001001140000
6"	IPS	8,50	7,94	1,19	0,38	5,77	01710710001001680000
8"	IPS	10,63	8,13	1,63	0,38	10,11	01710710001002190000
10"	IPS	12,75	8,50	2,00	0,38	16,22	01710710001002730000
12"	IPS	15,75	9,66	2,81	0,38	27,12	01710710001003230000
14"	IPS	17,38	10,63	2,50	0,50	36,17	01710710001003550000
16"	IPS	19,75	11,32	2,88	0,50	50,74	01710710001004060000
18"	IPS	21,13	11,75	3,25	0,50	63,72	01710710001004570000
20"	IPS	23,38	12,57	3,63	0,50	84,27	01710710001005080000
22"	IPS	25,50	12,97	3,94	0,50	104,96	01710710001005580000
24"	IPS	27,75	13,78	4,28	0,50	132,80	01710710001006090000
26"	IPS	30,00	15,01	4,63	0,50	168,99	01710710001006600000
28"	IPS	32,25	15,63	5,00	0,50	204,92	01710710001007110000
30"	IPS	34,25	16,26	5,38	0,50	243,00	01710710001007620000
32"	IPS	36,75	16,88	5,75	0,50	290,98	01710710001008120000
34"	IPS	38,50	18,26	6,13	0,50	347,28	01710710001008630000
36"	IPS	40,75	19,63	6,50	0,50	417,58	01710710001009140000
40"	IPS	45,13	-	-	0,50	-	01710710001010160000

SPIGOT-IPS/DIPS

MOLDED FLANGE ADAPTOR

SDR7 PE100

WATER / SU : 335 PSI

GAS / GAZ: 125 PSI

d	Base Norm	D2	L	h1	R	Unit Weight in lbs	Item Code
42"	IPS	47,38	-	-	0,50	-	01710710001010660000
48"	IPS	53,75	-	-	0,75	-	01710710001012190000
54"	IPS	60,00	-	-	0,75	-	01710710001013710000
63"	IPS	66,75	-	-	0,75	-	01710710001016000000
4"	DIPS	6,63	6,26	0,88	0,44	2,51	01710710002001140000
6"	DIPS	8,50	8,00	1,25	0,44	6,16	01710710002001680000
8"	DIPS	10,63	8,13	1,63	0,44	10,65	01710710002002190000
10"	DIPS	12,75	8,50	2,00	0,44	16,71	01710710002002730000
12"	DIPS	15,75	9,76	2,38	0,44	28,41	01710710002003230000
14"	DIPS	17,38	10,88	2,75	0,44	40,47	01710710002003550000
16"	DIPS	19,75	11,57	3,13	0,44	56,09	01710710002004060000
18"	DIPS	21,13	12,00	3,50	0,44	69,73	01710710002004570000
20"	DIPS	23,38	12,94	4,00	0,44	92,58	01710710002005080000
24"	DIPS	27,75	14,13	4,63	0,50	143,75	01710710002006090000
30"	DIPS	34,25	16,63	5,75	0,50	259,81	01710710002007620000
36"	DIPS	40,75	20,13	7,00	0,50	446,93	01710710002009140000
42"	DIPS	47,38	-	-	0,50	-	01710710002010660000
48"	DIPS	53,75	-	-	0,75	-	01710710002012190000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M.T.

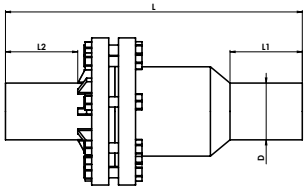
AKIŞ KONTROL - INCH SIZE

FLOW CONTROL - INCH SIZE

PE 100 CHECK VALVE

BALL CHECK VALVE

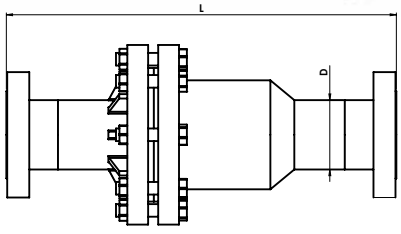
SDR11 PE100



CODE	D	L	L1	L2	WEIGHT
07811110001000880000	3" IPS	22,44	5,12	5,51	3,45
07811110001001140000	4" IPS	21,65	5,51	5,51	3,80

BALL CHECK VALVE - FLANGED

SDR11 PE100

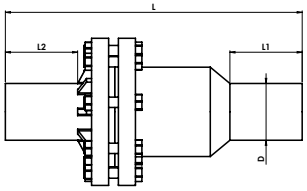


CODE	D	L	WEIGHT
10111110001000880000	3" IPS	22,05	4,65
10111110001001140000	4" IPS	22,05	4,90

AKIŞ KONTROL-IPS/DIPS

PE100 CHECK VALVE WITH SPRING

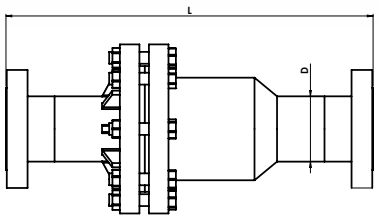
SDR11 PE100



CODE	D	L	L1	L2	WEIGHT
08011110001000880000	3" IPS	22,44	5,12	5,51	3,55
08011110001001140000	4" IPS	22,83	5,51	5,51	3,90

CHECK VALVE WITH SPRING-FLANGED

SDR11 PE100



CODE	D	L	WEIGHT
08111110001000880000	3" IPS	22,05	4,75
08111110001001140000	4" IPS	22,05	5,10

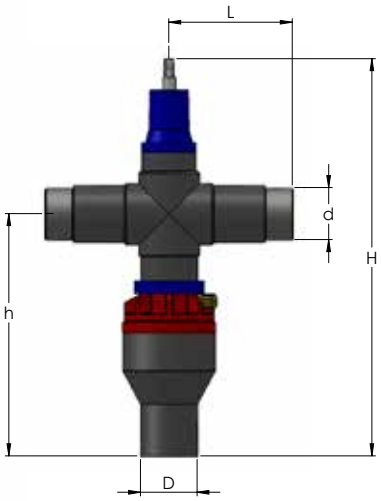
FLOW CONTROL-IPS/DIPS

AKIŞ KONTROL-IPS/DIPS

HYDRANT-HİDRANT

A TYPE IRRIGATION HYDRANT

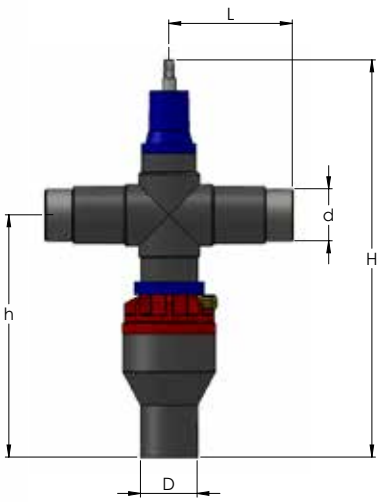
SDR11 PE100



CODE	Tip	D	d	H	h	L
08211110001001140073	A	4 " IPS	2 1/2 "- 3"	29,92	18,11	9,45
08211110001001680114	A	6 " IPS	4"	35,83	23,62	12,60

D TYPE IRRIGATION HYDRANT

SDR11 PE100



CODE	Tip	D	d	H	h	L
08311110001001140073	D	4 " IPS	2 1/2 "- 3"	29,92	18,11	6,69
08311110001001680114	D	6 " IPS	4"	35,83	23,62	7,09

AKIŞ KONTROL-IPS/DIPS

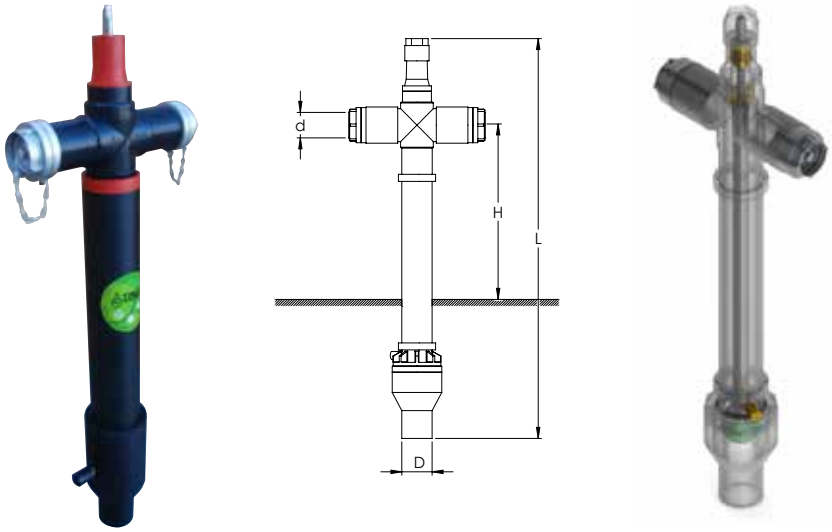
H TYPE IRRIGATION HYDRANT

SDR11 PE100

CODE	Tip	D	d	H	h	L
08411110001001140088	H	4 " IPS	3"	13,97	7,28	17,32

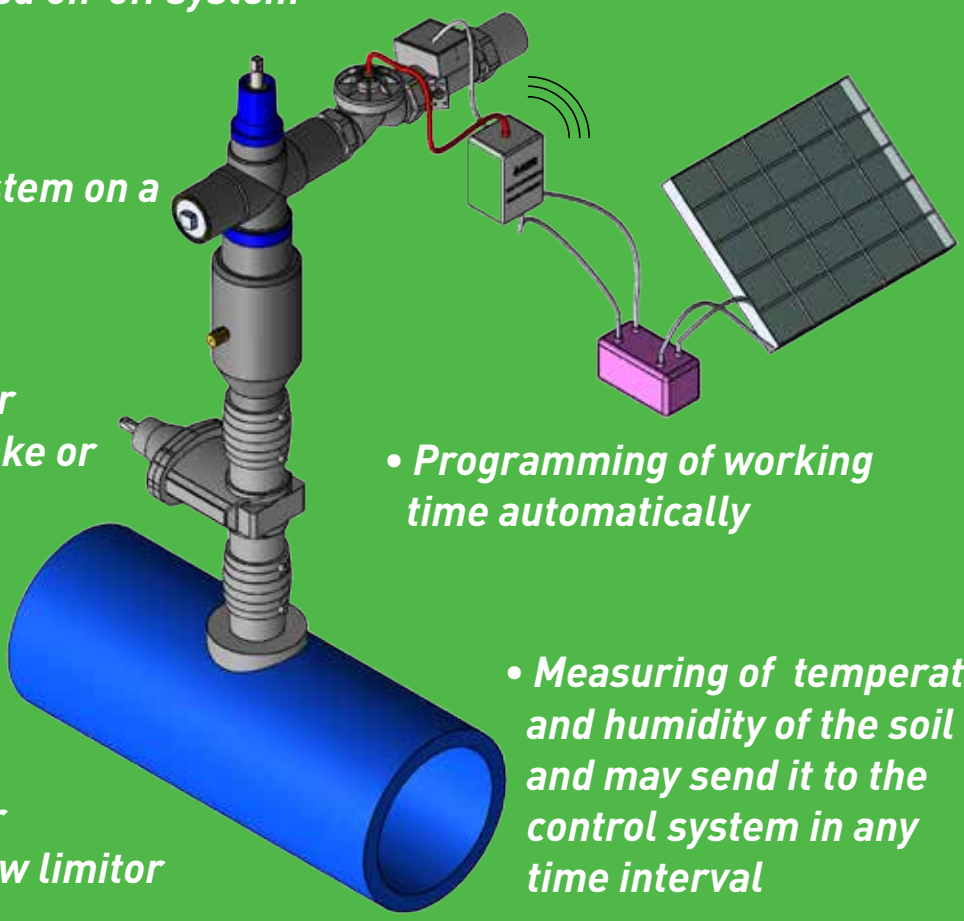
FIRE HYDRANT

SDR11 PE100



CODE	Tip	D	d	H	L
08611110001001140073	FIRE HYDRANT	4 " IPS	2 1/2	24,80	56,50
08611110001001140073		4 " IPS	2 1/2	24,80	68,90
08611110001001140073		4 " IPS	2 1/2	24,80	84,65

- *Digital metering of the water consumption*
- *Producing its energy from a solar panel and storing it in a battery*
- *Remote controlled on-off system*
- *Following all system on a google map*
- *Alarm system for illegal water intake or stolen of valve*
- *Programming of working time automatically*
- *Measuring of temperature and humidity of the soil and may send it to the control system in any time interval*
- *Innovative-New generation water regulator and flow limitor*



PE 100 IRRIGATION HYDRANT

- **REMOTE CONTROLLED**
- **SOLAR ENERGY SUPPLY**
- **DIGITAL WATER METERING**

AKIŞ KONTROL-IPS/DIPS

IRRIGATION HYDRANT
REMOTE CONTROLLED ON-OFF SYSTEM

SDR11 PE100

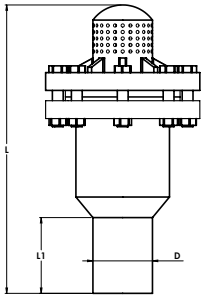
Code	D	d	H	h	L	*TYPE*
08511110001001140073	4"	2 1/2 " - 3"	29,92"	18,11"	9,45"	A
08511110001001140073	4"	2 1/2 " - 3"	29,92"	18,11"	6,69"	D
08511110001001680114	6"	4 "	35,83"	23,62"	7,08"	D

AKIŞ KONTROL-IPS/DIPS

VANTUZ-AIR RELEASE

SINGLE BALL AIR RELEASE VALVE

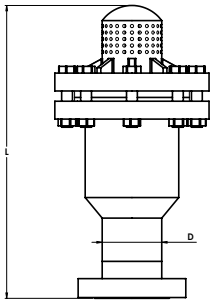
SDR11 PE100



CODE	D	L	L1	WEIGHT
08811110001000880000	3" IPS	20,87	5,12	3,35
08811110001001140000	4" IPS	21,26	5,51	3,80

SINGLE BALL AIR RELEASE VALVE- FLANGED

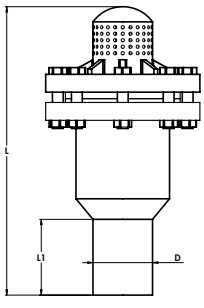
SDR11 PE100



CODE	D	L	WEIGHT
08911110001000880000	3" IPS	20,87	4,05
08911110001001140000	4" IPS	20,87	4,40

NON SLAM DYNAMIC AIR RELEASE VALVE

SDR11 PE100

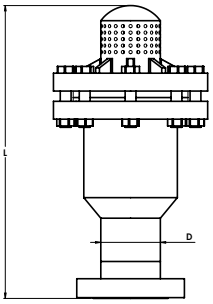


CODE	D	L	L1	WEIGHT
09011110001000880000	3" IPS	20,87	5,12	4,15
09011110001001140000	4" IPS	21,26	5,51	4,35

AKIŞ KONTROL-IPS/DIPS

NON SLAM DYNAMIC AIR RELEASE VALVE-FLANGED

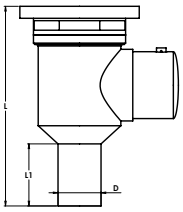
SDR11 PE100



CODE	D	L	WEIGHT
09111110001000880000	3" IPS	20,87	4,65
09111110001001140000	4" IPS	20,87	5,10

DOUBLE BALL AIR RELEASE VALVE

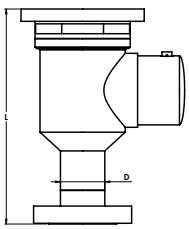
SDR11 PE100



CODE	D	L	L1	WEIGHT
09211110001000880000	3" IPS	16,54	5,12	5,55
09211110001001140000	4" IPS	16,93	5,51	5,90

PE100 DOUBLE BALL AIR RELEASE VALVE-FLANGED

PE100



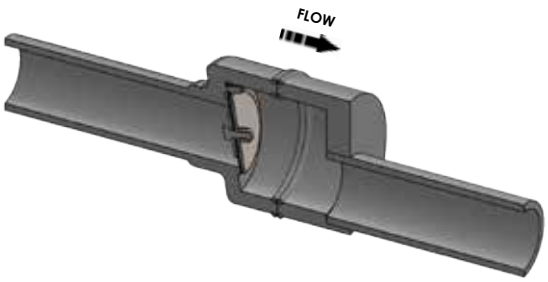
CODE	D	L	WEIGHT
09311110001000880000	3" IPS	16,54	6,15
09311110001001140000	4" IPS	16,54	6,40

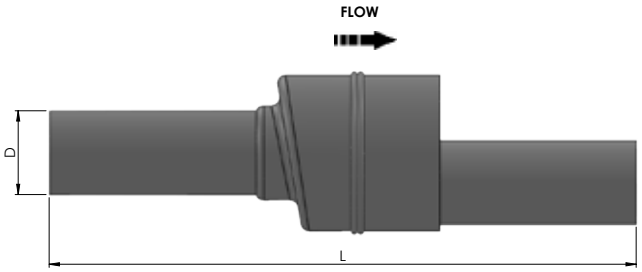
FLOW CONTROL-IPS/DIPS

AKIŞ KONTROL-IPS/DIPS

HINGED CHECK VALVE

PE100 PN 1/16





Up Stream Pressure → 16 Bar.
Down Stream Pressure → 1 Bar.

CODE	D	L
07911110001000330000	1" IPS	8,26
07911110001000420000	1 1/4" IPS	10,82
07911110001000480000	1 1/2" IPS	11,81
07911110001000600000	2"	12,20

ULTRASONIC PREPAYABLE WATER METER

NB 2275

Normative documents and applicable harmonized standards:
OIML R 49 -1 :2006; OIML R 49 - 2:2006
EN 14154-1:2005 + A2; EN 14154-3:2005 + A2

AKIŞ KONTROL-IPS/DIPS

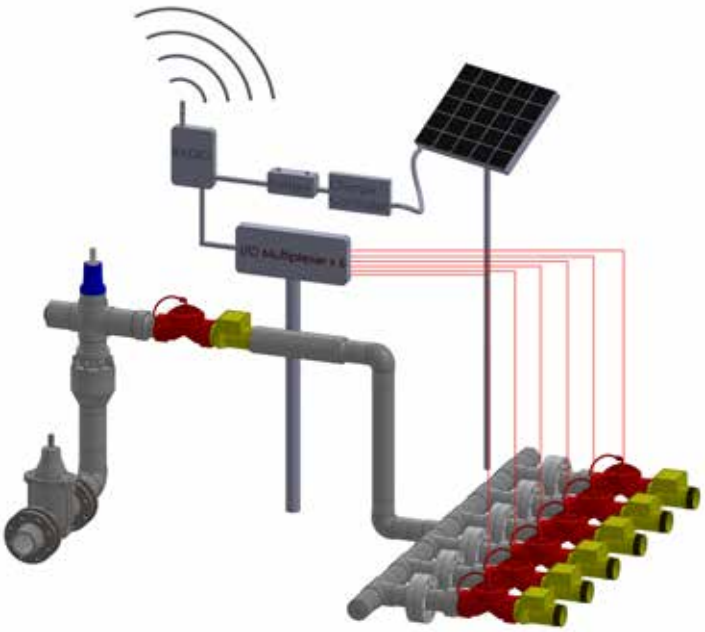
TEGA REMOTE CONTROLED IRRIGATION SYSTEM

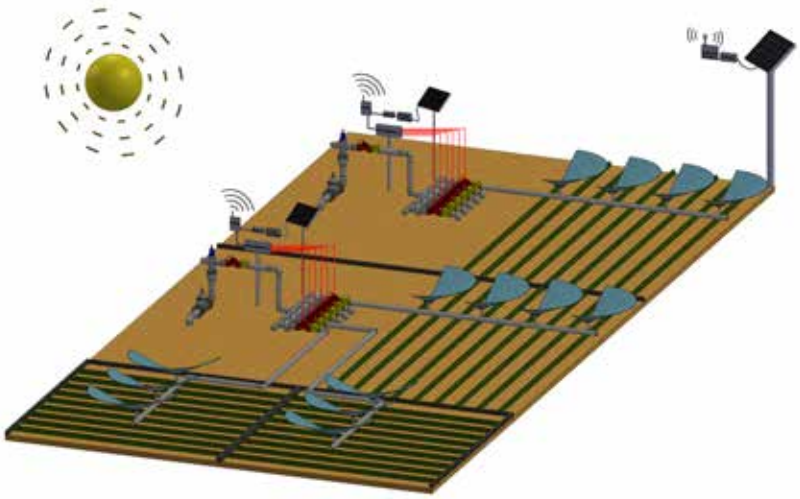
TEGA Irrigation Control Automation (SUKO) is developed on this basis.

1- *To give the water to the field at desired time.*
2- *To read the meter with remote access and to open/close.*
3- *Easy billing by centralized management system*
4- *Daily, weekly, monthly irrigation schedules.*
5- *The monitoring information of temperature and moisture of soil and etc... (from desktop or mobile phone)*
6- *Zero leakage with PE100 Body and Assemblies, long life, resistance to hot-cold.*
7- *By means of assembled electronic/technologic parts, the system is cost friendly.*
8- *Easy of management / operating / (by desktop, tablet pc or mobile device)*
9- *As a result, TEGA submits global solutions to use the water efficiently while it is limited also submitting innovative solutions by planning, auditing, managing all along the period.*

AUTOMATIC METER READING

Water meters perform two major roles, keeping track of water usages and water flow feedback. Both information is evaluated and processed both at local and at central system back-end. Meters are read continuously for billing, planned delivery and optimization.





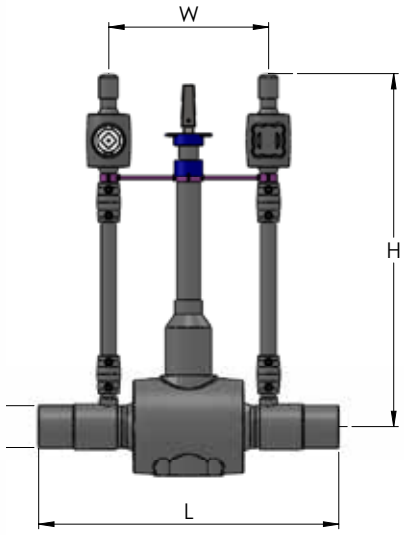
AUTOMATIC CONTROL OF VALVES

Valve control I/O devices are crucial for irrigation which should be done either at on-line or offline stages. Valve controlling with feedback(s) from hydrant and flow controllers would form an autonomous, controlled and yet further integrated system in the field.

AKIŞ KONTROL-IPS/DIPS

PURGE VALVE

SDR11 PE100



CODE	D	L	H	W
09411110001000600000	2 IPS	18,88 "	16,93 "	9,45 "
09411110001000880000	3 IPS	25,79 "	29,92 "	13,58 "
09411110001001140000	4 IPS	25,79 "	29,92 "	13,58 "
09411110001001680000	6 IPS	28,74 "	31,89 "	14,96 "
09411110001002190000	8 IPS	32,87 "	37,40 "	18,50 "
09411110001002730000	10 IPS	36,61 "	37,40 "	19,29 "
09411110001003230000	12 IPS	39,96 "	37,40 "	19,88 "

PE 100 Gate Valve

The future VALVE

- **World Wide Patent**
- **Proven through extensive testing**

The missing link for the 'jointless' pipeline system

- **Reduced mechanical jointing**
- **100% leak tight**
- **100% recyclable**
- **100% corrosion resistant**

Light weight for ease of handling and installation. Upto 1/3 of the weight of traditional Gate Valves

- **DN1 - DN8**
- **PE100 SDR11**
- **PN 16**

Tested succesfully to temperatures → 50°C in desert environments

Successfully tested in freezing temperatures down to -20°C

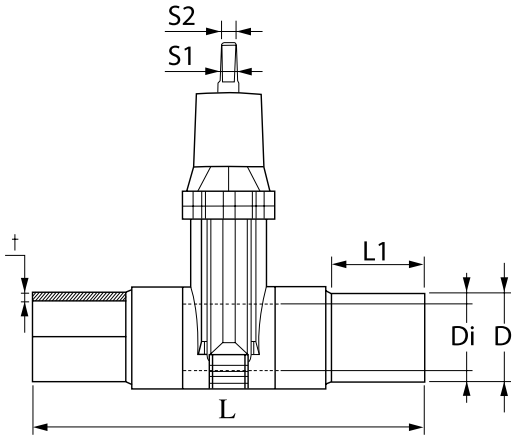
FIRST IN THE WORLD

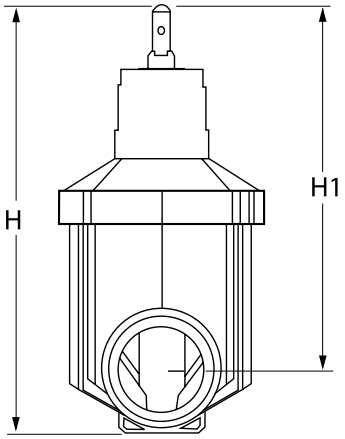
FLOW CONTROL-IPS/DIPS

AKIŞ KONTROL-IPS/DIPS

PE100 GATE VALVE – LONG SPIGOT

WATER : PN16



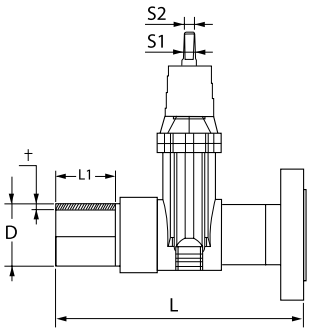


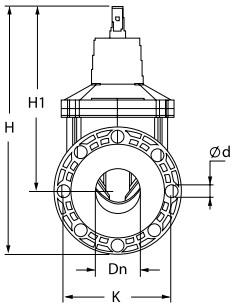
İnç / Inch siz

PRODUCT CODE (420 SS+MS 58)	PRODUCT CODE (316 SS+DZR)	D	L	L1	H	H1	t	S1	S2
0731110001000330000	0721110001000330000	1" IPS	9,00	3,46	8,82	7,87	0,13	0,59	0,47
0731110001000420000	0721110001000420000	1 1/4" IPS	10,87	3,66	9,37	8,43	0,17	0,59	0,47
0731110001000880000	0721110001000880000	3" IPS	16,92"	6.300"	15,75"	13,188"	0,35"	0,81"	0,67"
0731110001001140000	0721110001001140000	4" IPS	25,19"	6.300"	16.93"	14,37"	0.45"	0,91"	0,75"
0731110001001680000	0721110001001680000	6" IPS	31,700"	8,460"	22,44"	18,897"	0,670"	0,91"	0,75"
0731110001002190000	0721110001002190000	8" IPS	31,700"	8,460"	22,44"	18,897"	0,880"	0,91"	0,75"

PE100 GATE VALVE – LONG SPIGOT / FLANGED

WATER : PN16



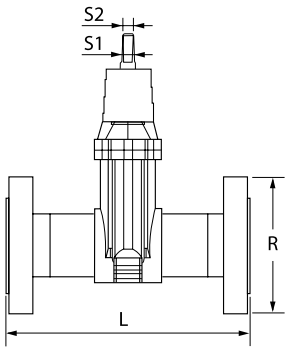


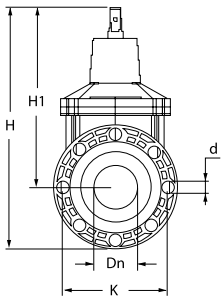
İnç – Flanş ölçüsü: ASME B 16.1 / Inch - Drilling dimensions for flange: ASME B 16.1

PRODUCT CODE (420 SS+MS 58)	PRODUCT CODE (316 SS+DZR)	Dn	L	L1	H	H1	t	S1	S2	K	R	d/Qty
09911110001000880000	07411110001000880000	3"IPS	20.07"	2.56"	11.22"	9.84"	0.26"	0.75"	0.63"	6.62"	8.25"	0.87"/8
09911110001001140000	07411110001001140000	4"IPS	21.45"	3.35"	16.93"	14.76"	0.44"	0.75"	0.63"	7.87"	10.00"	0.87"/8
09911110001001680000	07411110001001680000	6"IPS	23.54"	3.94"	21.26"	18.11"	0.71"	0.75	0.63"	10.62"	12.50"	0.87"/12

PE100 GATE VALVE - FLANGED

WATER : PN16





İnç – Flanş ölçüsü: ASME B 16.1 / Inch - Drilling dimensions for flange: ASME B 16.1

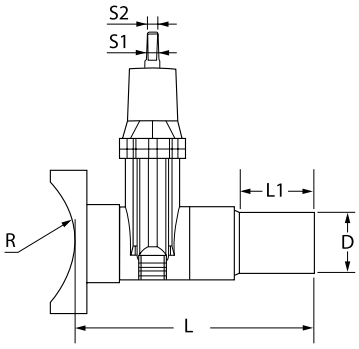
PRODUCT CODE (420 SS+MS 58)	PRODUCT CODE (316 SS+DZR)	Dn	R	H	H1	K	S1	S2	d/Q-ty
09911110001100880000	07411110001100880000	3"IPS	8.25"	11.22"	9.84"	6.62"	0.75"	0.63"	0.87"/8
09911110001101140000	07411110001101140000	4"IPS	10.00"	16.93"	14.76"	7.78"	0.75"	0.63"	0.87"/8
09911110001101680000	07411110001101680000	6"IPS	12.50"	21.26"	18.11"	10.62"	0.75"	0.63"	0.87"/12

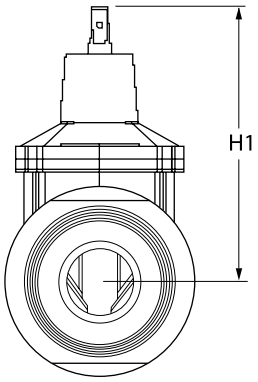
FLOW CONTROL-IPS/DIPS

AKIŞ KONTROL-IPS/DIPS

PE100 GATE VALVE with EF SADDLE

WATER : PN16





PRODUCT CODE (420 SS+MS 58)	PRODUCT CODE (316 SS+DZR)	Dn	R	L	L1	H1	S1	S2
10011110001000880000	07211110001000880000	3"IPS	4" ... 63"	19,880"	6.300"	13,188"	0,81"	0,67"
10011110001001140000	07211110001001140000	4"IPS	6" ... 63"	21,100"	6.300"	14,37"	0,91"	0,75"
10011110001001680000	07211110001001680000	6"IPS	8" ... 63"	23,700"	8,460"	18,897"	0,91"	0,75"
10011110001002190000	07211110001002190000	8"IPS	10" ... 63"	23,700"	8,460"	18,897"	0,91"	0,75"

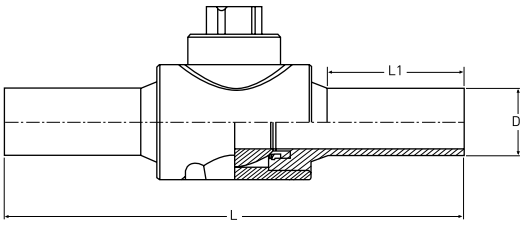
AKIŞ KONTROL-IPS/DIPS

PE BALL VALVE (FULL BORE)

SDR11 PE100

GAS : 10 BAR

WATER : 16 BAR



IPS	CODE	L	L1
1" IPS	07711110001000330000	10,63	2,56
2" IPS	07711110001000600000	14,57	4,33
3" IPS	07711110001000880000	20,08	4,53
4" IPS	07711110001001140000	20,47	4,92
6" IPS	07711110001001680000	24,41	6,30
8" IPS	07711110001002190000	29,65	9,06
10" IPS	07711110001002730000	34,57	8,66
12" IPS	07711110001003230000	37,24	9,06
14" IPS	07711110001003550000	41,89	10,00
16" IPS	07711110001004060000	48,31	11,81
18" IPS	07711110001004570000	52,99	12,60
20" IPS	07711110001005080000	59,69	14,41
22" IPS	07711110001005580000	62,72	15,75


PE 100 ELEKTRO-SCHWEISSFITTING-SYSTEME
POLYETHYLEN (PE) ELECTROFUSION FITTINGS SYSTEM
tega

MAKİNE VE APARATLAR
MACHINES & TOOLS

MACHINE-TOOL

MAKİNE-APARATLAR

SS REPAIR SADDLE
PASLANMAZ ÇELİK TAMİR SEMERİ

Pipe diameter	CODE
63	10211120300000630000
75	10211120300000750000
90	10211120300000900000
110	10211120300001100000
125	10211120300001250000
140	10211120300001400000
160	10211120300001600000
180	10211120300001800000
200	10211120300002000000
225	10211120300002250000
250	10211120300002500000
280	10211120300002800000
315	10211120300003150000
355	10211120300003550000
400	10211120300004000000
450	10211120300004500000
500	10211120300005000000
560	10211120300005600000
630	10211120300006300000

DUCT FOOT BEND
YANGIN HİDRANT ÖKÇESİ

PE Pipe - D	HYDRANT - d	CODE
d 90	d 80	10311110000000900000
d 110	d 100	10311110000001100000

SPECIAL DUCT FOOT BEND
PE ÖZEL YANGIN HİDRANT ÖKÇESİ

PE Pipe - D	HYDRANT - d	CODE
d 110	80	10411110000001100000

EF WELDING MACHINES
EF KAYNAK MAKİNESİ

TEGA 4000 S

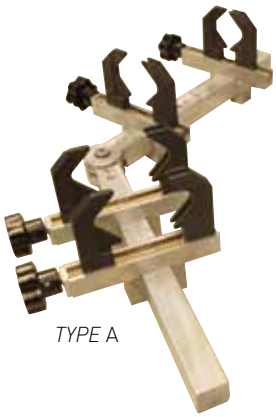
TEGA 300 LIGHT

Teknik Özellikler / Technical Features	TEGA 4000 S	TEGA 300 LIGHT
Çıkış voltajı / Output voltage	8-48 V	8-48 V
Nominal voltaj / Nominal voltage	230 V	180 V - 280 V (230 V)
Frekans / Frequency	50/60 Hz	40/70 Hz
Güç / Power	2,2 KW	1,7 KW
Max. akım / Max. output current	120 A	65 A
Çalışma sıcaklığı / Ambient temperature	-20 +60°C	-20 +60°C
Hafıza / Memory	1800 kayıt/records	500 kayıt/records
Koruma sınıfı / Protection class	IP54	IP54 (IP64 optional)
Boyutlar / Dimensions	545x435x230	210x235x225
Ağırlık / Weight	22 kg	8,1 kg
Kaynak kablosu uzunluğu / Length of welding cable	4 mt	3,2 mt
Çalışma modu / Operation mode	Barcode/Manuel	Barcode/Manuel

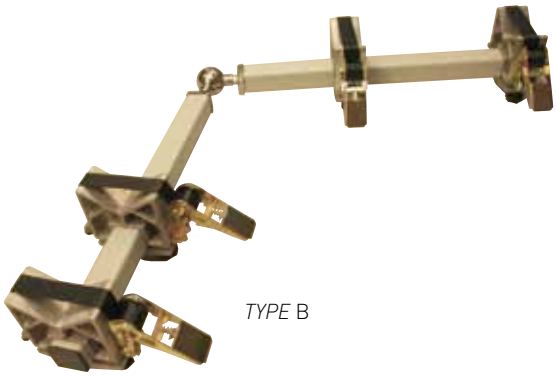
BUTT WELDING MACHINE
ALIN KAYNAK MAKİNESİ

PE PIPE DIMENSION İNTERVAL - D	CODE
d 40 - 160	10501120300000400160
d 63 - 160	10501120300000630160
d 75 - 250	10501120300000750250
d 90 - 315	10501120300000900315
d 180 - 500	10501120300001800500
d 200 - 450	10501120300002000450
d 315 - 630	10501120300003150630
d 500 - 800	10501120300005000800
d 710 - 1000	10501120300007101000
d 710 - 1200	10501120300007101200

V TYPE ALIGNMENT CLAMP
V TİPİ EKSENLEME KELEPÇESİ



TYPE A



TYPE B

DIAMETER / ÇAP	CODE	*TYPE*
20-63	10601120300000200063	A
63-125	10601120300000630125	B

RE-ROUNDING TOOL
OVALLİK KELEPÇESİ

DIAMETER / ÇAP	CODE
63	10701120300000630000
90	10701120300000900000
110	10701120300001100000
125	10701120300001250000
140	10701120300001400000
160	10701120300001600000
180	10701120300001800000
200	10701120300002000000
225	10701120300002250000
250	10701120300002500000
280	10701120300002800000
315	10701120300003150000
355	10701120300003550000
400	10701120300004000000
450	10701120300004500000

COUPLER CLAMP
MANŞON KELEPÇESİ

DIAMETER / ÇAP	CODE
63	10801120300000630000
90	10801120300000900000
110	10801120300001100000
125	10801120300001250000
140	10801120300001400000
160	10801120300001600000
180	10801120300001800000
200	10801120300002000000
225	10801120300002250000
250	10801120300002500000
280	10801120300002800000
315	10801120300003150000
355	10801120300003550000
400	10801120300004000000
450	10801120300004500000

MACHINE-TOOL
MAKİNE-APARATLAR

PIPE SCRAPING TOOLS
BORU KAZIMA APARATLARI

Hand Scraper / Kazıma Bıçağı

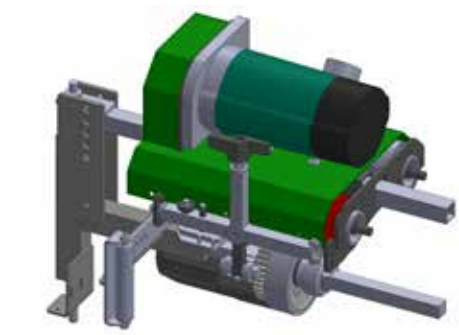
DIAMETER / ÇAP	CODE
20-2000	10901120300000202000

DIAMETER / ÇAP	CODE
75-200	11001120300000750200

DIAMETER / ÇAP	CODE
75-315	11001120300000750315

DIAMETER / ÇAP	CODE
355-710	11001120300003550710

Electrical Pipe Scraper



DIAMETER / ÇAP	CODE
500-2000	11001120300005002000

Rotary Train Type Scraper

DIAMETER / ÇAP	CODE
75-2000	11001120300000752000

PP Pipe Inner Scraper

DIAMETER / ÇAP	CODE
110-160-200	11001120300001100200

SQUEEZING TOOLS FOR EF SADDLE
SEMER SIKTIRMA APARATLARI

Spider Squeezing Tool Type A
Semer Sıkıştırma Aparatı TİP A

DIAMETER / ÇAP	CODE
225 - 630 mm	11001120300002250630
560 - 1600 mm	11001120300005601600

4 Piece Inner Squeezing Tool for EF Saddle Type B
Semer Sıkıştırma Aparatı TİP B

DIAMETER / ÇAP	CODE
225 - 630 mm	11101120300002250630

TEGA Vacum Squeezing Tool Type C
Semer Sıkıştırma Aparatı TİP C

DIAMETER / ÇAP	CODE
225 - 630 mm	11201120300002250630

MACHINE-TOOL

MAKİNE-APARATLAR

COUPLER PULLING TOOL
MANŞON ÇEKTİRME SETİ

DIAMETER / ÇAP	CODE
D 315 - 900	13701120300002250630

PIPE CUTTERS
BORU KESME APARATLARI

Telescopic Pipe Cutter / Teleskopik Boru Kesici

DIAMETER / ÇAP	CODE
40-125	11401120300000400125
110-160	11401120300001100160

Pipe Cutter (hand type) / Boru Kesme Makası

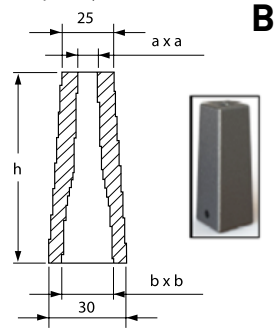
DIAMETER / ÇAP	CODE
20-40	11501120300000200040
20-63	11501120300000200063

MACHINE-TOOL

MAKİNE-APARATLAR

TELESCOBIC EXTENSION FOR GATE VALVE WITH SURFACE BOX
TEGA PE-SÜRGÜLÜ VANALAR İÇİN BUŞAKLELİ TELESKOPİK UZATMA KOLLARI

Anahtar adaptörü/
Key Adaptor



axa	bxb	h
10x10	14x14	95

Tega buşakle kazanları özel komposit malzemeden üretilmişlerdir. 90° asfalt sıcaklıklarına dayanıklı olan buşakle kazanları yüksek trafik yüklerine mukavemet edecek tasarım ve imalat özelliklerine sahiptir.

Tega Surface Box is being produced from special composite material. Surface Box is designed and manufactured to resist asphalt temperature up to 90 °C and has capability to resist for high traffic loads.

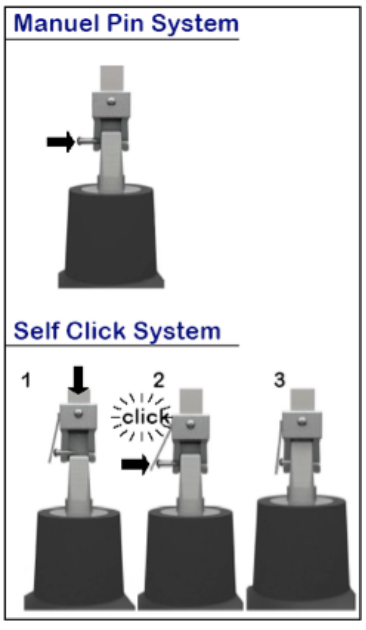
Sürgülü Vana
GATE VALVE

Tega teleskopik uzatma kolları, minimum 0,7 m, maksimum 2 m. aralığında kullanılabilen dört ayrı tipte üretilmektedir. Pe plastik kılıfları ve çelik kare anahtarları teleskopik özelliktedir.
Anahtar adaptörü ve vana mili adaptörü GGG-40 kalitesinde, yüksek hassasiyetli çelik dökümdür.

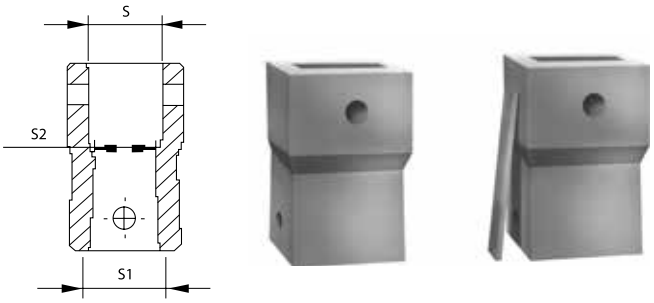
Tega telescopic extension spindles are being produced as 4 different sizes between 0.7 m and 2 m. PE plastic covers and steel square keys are also telescopic. Spindle Adaptor and Key adaptor are being produced from GGG-40 high sensitive quality cast steel.

TEGA TELESCOPIC EXTENSIONS
(TELESKOPİK UZATMA KOLLARI)

Tip/*TYPE*	Uzunluk/Length (min.) m	Uzunluk/Length (max.) m
A	0,45	0,7
B	0,6	1
C	1	1,5
D	1,2	2



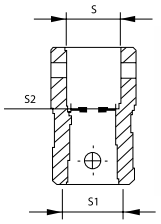
Vana mili adaptörü / *Spindle Adaptor*



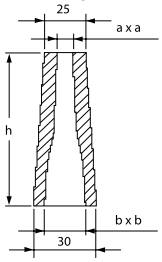
d	SXS	S2	S1
32-63	20x20	14,5	17,5
75-90	25x25	18,8	21,5
110-125	25x25	20,8	23,5
140-225	25x25	20,8	23,5

TELESCOBIC EXTENSION
FOR GATE VALVE / SÜRGÜLÜ VANA İÇİN

Telescobic Bottom Side
Vana Spindle Adaptor

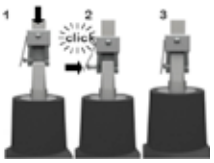


S x S	S1	S2
20 x 20	17,5	14,5
25 x 25	21,5	18,8
25 x 25	23,5	20,8



Telescobic Top Side
Key Adaptor

a x a	b x b	h
10 x 10	14 x 14	95



CODE	LENGTH	PRODUCT NAME
2303000	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SİZE A (0,45mt - 0,70mt) (D75-90 GATE VALVE)
2303001	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SİZE B (0,60mt - 1,00mt) (D75-90 GATE VALVE)
2303002	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SİZE C (1,00mt - 1,50mt) (D75-90 GATE VALVE)
2303003	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SİZE D (1,20mt - 2,00mt) (D75-90 GATE VALVE)
2303014	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8)- SİZE A (0,45mt-0,70mt) (D75-90 GATE VALVE) WITH CLICK SYSTEM
2303015	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8)- SİZE B (0,60mt-1,00mt) (D75-90 GATE VALVE) WITH CLICK SYSTEM
2303016	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8)- SİZE C (1,00mt-1,50mt) (D75-90 GATE VALVE) WITH CLICK SYSTEM
2303017	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8)- SİZE D (1,20mt-2,00mt) (D75-90 GATE VALVE) WITH CLICK SYSTEM
2303018	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:17.5- S2:14.5) - SİZE A (0,45mt - 0,70mt) (D32-63 GATE VALVE)
2303019	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:17.5- S2:14.5) - SİZE B (0,6mt - 1,00mt) (D32-63 GATE VALVE)
2303020	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:17.5- S2:14.5) - SİZE C (1,0mt - 1,50mt) (D32-63 GATE VALVE)
2303021	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:17.5- S2:14.5) - SİZE D (1,2mt - 2,00mt) (D32-63 GATE VALVE)
2303022	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:17.5- S2:14.5)- SİZE A (0,45mt - 0,70mt) (D32-63 GATE VALVE) WITH CLICK SYSTEM
2303023	0,60mt-1,0mt	TELESCOBIC EXTENSION(S1:17.5- S2:14.5) - SİZE B (0,6mt - 1,00mt) (D32-63 GATE VALVE) WITH CLICK SYSTEM
2303024	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:17.5- S2:14.5) - SİZE C (1,0mt - 1,50mt) (D32-63 GATE VALVE) WITH CLICK SYSTEM
2303025	1,2mt-2,0mt	TELESCOBIC EXTENSION(S1:17.5- S2:14.5) - SİZE D (1,2mt - 2,00mt) (D32-63 GATE VALVE) WITH CLICK SYSTEM
2303077	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE A (0,45mt - 0,70mt) (D110-125 GATE VALVE)
2303027	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE B (0,60mt - 1,00mt) (D110-125 GATE VALVE)
2303079	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE C (1,00mt - 1,50mt) (D110-125 GATE VALVE)
2303080	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE D (1,20mt - 2,00mt) (D110-125 GATE VALVE)
2303081	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE A (0,45mt-0,70mt) (D110-125 GATE VALVE) WITH CLICK SYSTEM
2303082	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE B (0,60mt-1,00mt) (D110-125 GATE VALVE) WITH CLICK SYSTEM
2303083	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE C (1,00mt-1,50mt) (D110-125 GATE VALVE) WITH CLICK SYSTEM
2303084	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE D (1,20mt-2,00mt) (D110-125 GATE VALVE) WITH CLICK SYSTEM
2303120	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE A (0,45mt - 0,70mt) (D140-180 GATE VALVE)
2303121	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE C (0,60mt - 1,00mt) (D140-180 GATE VALVE)
2303122	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE B (1,00mt - 1,50mt) (D140-180 GATE VALVE)
2303123	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SİZE D (1,20mt - 2,00mt) (D140-180 GATE VALVE)
2303124	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8)-SİZE A (0,45mt-0,70mt)(D140-180 GATE VALVE) WITH CLICK SYSTEM
2303125	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8)-SİZE B (0,60mt-1,00mt)(D140-180 GATE VALVE) WITH CLICK SYSTEM
2303126	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8)-SİZE C (1,00mt-1,50mt)(D140-180 GATE VALVE) WITH CLICK SYSTEM
2303127	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8)-SİZE D (1,20mt-2,00mt)(D140-180 GATE VALVE) WITH CLICK SYSTEM

MACHINE-TOOL

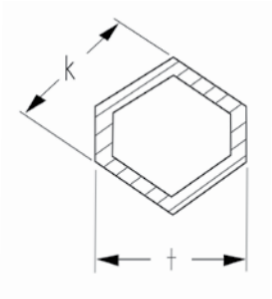
MAKİNE-APARATLAR

TELESCOBIC EXTENSION

FOR BALL VALVE / KÜRESEL VANA İÇİN

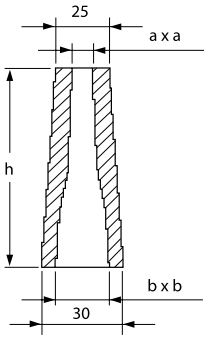
Telescobic Bottom Side

Vana Spindle Adaptor



Telescobic Top Side

Key Adaptor

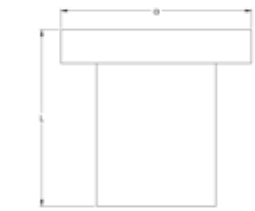


t	k
30	30
50	50

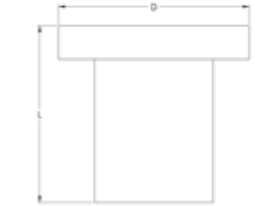
a x a	b x b	h
10 x 10	14 x 14	95

SIZE	CODE	LENGTH
50X50	2303006	0,45mt-0,70mt
50X50	2303007	0,60mt-1,00mt
50X50	2303008	1,00mt-1,50mt
50X50	2303009	1,20mt-2,00mt
30X30	2303010	0,45mt-0,70mt
30X30	2303011	0,60mt-1,00mt
30X30	2303012	1,00mt-1,50mt
30X30	2303013	1,20mt-2,00mt

SURFACE BOX / BUŞAKLE KAZANI



a x a	L
175 x 175	185



D	L
195	185

YESTERDAY
DÜN

TODAY AND TOMORROW
BUGÜN VE YARIN

MACHINE-TOOL

MAKİNE-APARATLAR

EF SADDLE DRILLING TOOL
PP SEMER DELME APARAT TAKIMI

DIAMETER / ÇAP	CODE
90-315 mm	12401110200000900315

BUTT WELDING TEST TOOL
ALIN KAYNAK TEST APARATI

DIAMETER / ÇAP	CODE
160-630 mm	12501110300001600630

MONTAJ
INSTALLATION

INSTALLATION
MONTAJ

ELECTROFUSION WELDING INSTRUCTION FOR LARGE SIZE PE100 EF COUPLERS
BÜYÜK ÇAPLI PE100 EF MANŞONLAR İÇİN ELEKTROFÜZYON KAYNAK UYGULAMASI

355 < d ≤ 1600

ÖNEMLİ NOTLAR

- Aşağıdaki talimatlar adım adım izlenmelidir.
- Dar toleranslı boru kullanılması tavsiye edilir.
- Kaynatılabilir borunun SDR değeri EF manşon üzerindeki barkod etiketinde bulunmaktadır.
- Montaj teknisyeni büyük manşon montajı konusunda eğitilmiş ve sertifikalandırılmış olmalıdır.
- PP, PVC gibi diğer boru malzemeleri ile kaynak yapılamaz.
- Montaj yapılacak bölgenin ortam sıcaklığı 0°C-45°C aralığında olmalıdır. Ortam sıcaklığı bu sınırlar içinde değilse mutlaka kaynak çadırı kurulmalıdır.
- Güvenlik açısından kaynak esnasında kaynak bölgesinden en az 1 mt uzakta durulması tavsiye edilir.
- Kalibrasyon gerektiren tüm cihazların kalibrasyonu yaptırılmış olmalıdır.
- Montaj işleminden önce kullanılacak fittinglerin hasarlı olup olmadığı kontrol edilmelidir.

IMPORTANT NOTES

- *Below instructions should be followed absolutely step by step.*
- *We recommend using pipes with limited dimension tolerance range.*
- *The fusible pipe series are shown in the SDR labeling on coupler.*
- *Installation technician must be trained and certified to install Tega large diameter couplers.*
- *Fusion with other pipe materials such as PP, PVC etc. is not possible.*
- *Installation can be done at ambient temperatures between 0 °C and +45 °C. If ambient temperature is not within these limits use of welding tent is required.*
- *For general safety reasons, keep a distance of min. 1 m to the fusion site during fusion process.*
- *Make sure equipment that requires calibration is calibrated*
- *Fitting should be inspected for damage before installing*

Dekupaj Testere/*Jigsaw*

Kazıma Aparatları/*Scrapers*

Boru Kalemi/*Marker*

Boşluk Mastarı ve Kumpas/
Gap gauge and Vernier Caliper

EF Kaynak Makinası/
EF Welding Machine

-Ovallik kelepçesi/
Re-rounding clamp

-PE temizleme solüsyonu ve bez/
PE cleaning agent and cloth

-Kaynak koşulları elverişsiz ise;
/If the welding conditions are not suitable;
Kaynak çadırı/*Welding tent*

1. Borunun Kesilmesi:

Boru kendi ekseni ile dik açı yapacak şekilde kesilmelidir. Kesme işlemi için PE boru kesici veya plastic malzeme kesmek için uygun dişleri olan bir testere kullanılabilir.

Dikkat

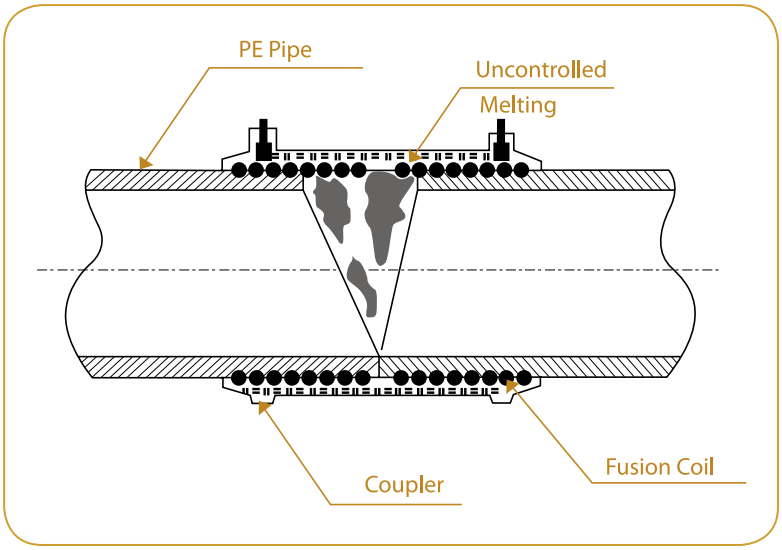
Borunun düzgün bir şekilde kesilmemesi, manşondaki metal sargıların belli bölgelerde boruya temas etmemesine neden olur. Bu ise aşırı ısınmaya ve erimiş malzemenin kontrolsüz bir biçimde akmasına neden olabilir. (Fig. 1)

1. Pipe Cutting:

For the pipe cutting, a suitable cutter for plastics must be used. The pipes are to be cut square with this cutting tool.

Attention

If the pipe is not cut at right angles, fusion coil partially may not being covered by pipe, which causes uncontrolled flow of molten due to overheating. (Fig. 1)



(Fig.1)

2. Kaynak Alanının İşaretlenmesi

Kaynak alanı, borunun manşonun içine gireceği derinlik olarak tanımlanabilir. Manşonun boyunu ölçün ve yarı uzunluğunu hesaplayın (Fig. 2) Manşon yarı boyu + 10 mm'lik uzunluğu boru üzerinde işaretleyin (Fig. 3).

2. Marking the fusion zone:

Fusion zone which is the insertion depth of coupler, must be marked with a marker on the pipe end or on the spigot end. Measure the total length of coupler and calculate the half length. (Fig. 2) Mark the coupler half length + 10 mm on pipe surface (Fig. 3)

(Fig. 2)

(Fig. 3)

3. Ovalliğin Kontrol Edilmesi

PE borularda var olabilecek ovallik mutlaka kontrol edilmelidir. Bu kontrolü Fig. 4 ve 5'te gösterildiği gibi borunun birkaç noktasından yapın.

(Fig. 4)

3. Controlling ovality

PE pipes may loose their roundness during storage. For this purpose measure pipe ovality as illustrated in Fig. 4 and 5.

(Fig. 5)

Eğer boruda ovallik varsa ovallik kelepçesi kullanın (Fig.6).

If pipe is out of round or has a flat spot, use of the rerounding clamp is required (Fig.6).

(Fig. 6)

Ovallik kelepçesi takıldıktan sonra boru ovalliği tekrar kontrol edin ve gerekiyorsa kelepçe yeniden pozisyonlandırın (Fig. 7 and 8).

After installation of the re-round clamp, check roundness of pipe against measuring pipe diameter. If pipe is still oval, re-position the rerouding clamp (Fig. 7 and 8).

(Fig. 7)

(Fig. 8)

4. Boru Yüzeyinin Kazınması

Kaynak işlemine başlamadan once boru yüzeyinde oluşan oksitli tabakayı temizlemek için bir kazıyıcı yardımıyla boruyu kazıyın (Fig. 9).

4. Scraping The Pipe Surface

In order to remove the oxide layer of the pipe, scrape carefully the fusion zone (Fig. 9).

(Fig. 9)

Dikkat

Oksitli tabakanın tamamen ortadan kalkması için borunun üzerindeki işaret silinecek ve talaş oluşacak kadar kazınması gerekmektedir.

Yüzeyi kazınmış olan boruyu kirden ve istenmeyen hava şartlarından uzak tutmaya özen gösterin.

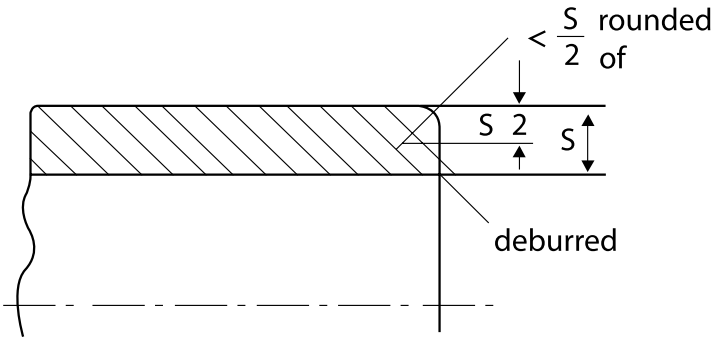
Borunun ucunda oluşabilecek talaşlar bir kazıma bıçağı ile temizlenmeli ve köşeler yuvarlatılmalıdır (Fig. 10).

Attention

In order to remove the oxide layer completely, the pipe must be scraped so that shavings are formed and marking line is removed.

The prepared surface must be protected against unfavorable weather conditions.

After that,the internal edge must be deburred and the outer edge rounded off as illustrated in fig.10



5. Kaynak Bölgesinin Temizlenmesi:

Manşonu ambalajından çıkartın ve hasarlı olup olmadığı kontrol edin. Manşonun kaynak alanına kirli veya yağlı elle ellemeyin (Fig.11).

5. Degreasing of the Fusion Zone:

Remove coupler from its packaging without touching the fusion surface. Make a visual check to ensure coupler is undamaged (Fig.11).

(Fig. 11a)

(Fig. 11b)

Kaynak yapılacak boru ve manşon yüzeyleri temiz olmalı, yüzey üzerinde yağ, kir vs. olmamalıdır. Kaynak işlemine başlamadan önce manşonun iç, borunun dış yüzeyini uygun bir temizleme maddesi ile temizleyin (Fig. 12 ve 13).

The prepared pipe end or spigot end and internal face of coupler must be degreased with a suitable cleaning agent and a white absorbent and nonfibrous cloth (Fig. 12 and 13).

(Fig. 12)

(Fig. 13)

Temizleme maddesi olarak izopropil alkol kullanılabilir. (Alkol içeriği hacimce %96'dan az olmamalıdır). Temizleme maddesini emici özelliğine sahip ve parçacık bırakmayan bir bez üzerine dökerek kullanın.

As a cleaning agent; isopropyl alcohol can be used (The alcohol content mustn't be less than 96% by volume).

Dikkat

Temizlenmiş yüzeyleri kirden ve istenmeyen hava şartlarından uzak tutmaya özen gösterilmelidir.

Attention

Degreased surfaces must be protected against dirt or unfavorable weather conditions.

6. Borunun Manşon İçine Yerleştirilmesi:

Manşonu, borunun işaretli alanını içine alacak şekilde boruya sokun. Borunun işaretlenmiş bölgesi manşon içine rahatlıkla girebilmelidir. Bunun için gerekirse boruyu tekrar kazıyın.

6. Inserting of the pipe end or spigot end into the coupler:

Push coupler onto pipe up to the marking zone (contact terminals of coupler must be easily accessible).

Dikkat

Boruyu manşon içine sokarken manşonun kontak terminallerinin üstte kalmasına dikkat edilmelidir. Borular eğilme gerilimine maruz kalmamalı ve manşonun içerisinde kendi ağırlıklarını rahatlıkla taşıyabilmelidir. Borunun serbest uçlarına destek konulabilir.

Diğer boru ucunu da aynı şekilde hazırlayın. Boru ve manşonun aynı eksende olduğundan emin olunmalıdır (Fig. 14).

Attention

Do not let pipes support their own weight in the coupler (if necessary support under pipe).

Prepare the second pipe same as first one and follow same steps.

Ensure coupler and pipes are both on the same axis (Fig.14). Ensure tension-free fixing of the joint. A non-tension free joint may result in a defective joint during fusion.

(Fig. 14)

Boru ve manşon arasındaki boşluğu boru çevresi boyunca kontrol edin. Lokal boşluklar varsa tahta parçaları (en fazla 3 cm uzunluğunda) yardımıyla ovalliği dağıtın ve tüm boru çevresi boyunca boşlukların eşit olmasını sağlayın (Fig. 15). Boşlukları ölçün. Boşluk 2 mm'den küçükse Elektrofüzyon Kaynak işlemine geçin.

Check the gap between pipe and coupler on whole circumference. Use metal sticks to distribute local gaps (length of sticks must be 30 mm max)(Fig. 15). So ensure equalized gaps on whole circumference. Measure gaps all around the pipe. If it is less than 2 mm pass Fusion procedure.

(Fig. 15)

7. Elektrofüzyon Kaynak:

Montaj talimatları adım adım izlenmiş ve herhangi bir problem yok ise kaynak işlemi universal bir EF kaynak makinesi kullanılarak yapılabilir. Makinenin soket uçlarını manşonun kontak terminallerine sokun (Fig. 16). Kaynak bilgileri manşon üzerindeki barkod etiketinde bulunmaktadır. Kaynak bilgilerini barkod okuyucu yardımıyla otomatik olarak veya manuel olarak makineye girin (Fig. 17). Makine ekranındaki bilgiler ile barkod üzerindeki bilgileri kontrol edin.
Kaynağı başlatın. Kaynak işlemi tamamlandıktan sonra, mutlaka soğuma süresi kadar bekleyin. Bu süre içerisinde kaynak yapılmış bölgeyi hareket ettirmeyin.

7. Fusion:

Provided that information given in instructions are followed step by step, connect fusion cables to the terminals of the first side of the coupler (Fig.16). Fusion parameters are contained in the main barcode. Fusion data can be transffered to machine by using reader (Fig.17).
After reading of barcode, compare data on barcode and data shown on display. Start fusion process. Wait until cooling time has elapsed before moving pipe and coupler. Cooling time is given on barcode and identified by CT.

(Fig. 16)

(Fig. 17)

Dikkat

Kaynak işlemi esnasında herhangi bir hata oluşur ise eriyen PE malzeme etrafa sıçrayabilir. Bu nedenle güvenlik açısından, kaynak işlemi esnasında en az 1 mt uzakta durmaya dikkat edin.
Kaynak işlemi herhangi bir nedenle (enerji kesintisi, vb.) kesintiye uğrar ise kaynaklı parçanın soğuması için yeteri kadar beklendikten sonra kaynak işlemine devam edilebilir. TEGA Manşonlarının soğuma süreleri barkod etiketleri üzerinde verilmiştir.

Attention

As a safety precaution, be careful to stay at least 1 m away from the fusion area.
If the fusion process is interrupted for any reason (e.g. due to power failure) the fusion process can be repeated after the joint cooled adequately. Find these cooling times on TEGA Couplers' barcode labels.

USER MANUAL INSTALLATION INSTRUCTIONS FOR EF INNER FLEX
EF İÇ FLEX MONTAJ ADIMLARI

1- Flex ve kaynak adaptörünü boru üzerine yerleştirelim.
1- Flex and welding apparatus are placed on the pipe.

2- Boru üzerinde kaynak yapılacak bölgeyi işaretleyelim.
2- Mark the location on the pipe where flex restraint will be welded.

3- İşaretli bölgeyi bir el kazıyıcı kullanarak kazıyın.
3- Scrape the marked area by using a hand scraper.

4-Kazıdığınız bölgeyi uygun bir temizlik maddesiyle temizleyin. Temizlik bezi kullanın (Elyafsız)
4- Scraped area and the fusion area of the flex must be cleaned with a suitable cleaning agent. Use cleaning cloth (Nonfibrous)

5- Cihaz yardımı ile iç bükme yapılır ve vidalar sabitlenir.
5- Inner flex is placed with the help of the apparatus. And the screws are fixed.

6-Kaynak barkodu okutularak kaynak yapılır.
6- Welding is done by reading of the barcode.

7-Soğuma süresi tamamlanınca montaj aparatı sökülür.
7- The apparatus is removed when the cooling time is completed.

INSTALLATION
MONTAJ

ELECTROFUSION WELDING INSTRUCTION FOR SMALL SIZE PE100 EF COUPLERS
KÜÇÜK ÇAPLI PE100 EF MANŞONLAR İÇİN ELEKTROFÜZYON KAYNAK UYGULAMASI

20 < d ≤ 355

ÖNEMLİ NOTLAR

- Aşağıdaki talimatlar adım adım izlenmelidir.
- Dar toleranslı boru kullanılması tavsiye edilir.
- Kaynatılabilir borunun SDR değeri EF manşon üzerindeki barkod etiketinde bulunmaktadır.
- Montaj teknisyeni büyük manşon montajı konusunda eğitilmiş ve sertifikalandırılmış olmalıdır.
- PP, PVC gibi diğer boru malzemeleri ile kaynak yapılamaz.
- Montaj yapılacak bölgenin ortam sıcaklığı -5°C +45°C aralığında olmalıdır. Ortam sıcaklığı bu sınırlar içinde değilse mutlaka kaynak çadırı kurulmalıdır.
- Güvenlik açısından kaynak esnasında kaynak bölgesinden en az 1 mt uzakta durulması tavsiye edilir.
- Kalibrasyon gerektiren tüm cihazların kalibrasyonu yaptırılmış olmalıdır.
- Montaj işleminden önce kullanılacak fittinglerin hasarlı olup olmadığı kontrol edilmelidir.

IMPORTANT NOTES

- *Below instructions should be followed absolutely step by step.*
- *We recommend using pipes with limited dimension tolerance range.*
- *The fusible pipe series are shown in the SDR labeling on coupler.*
- *Installation technician must be trained and certified to install Tega large diameter couplers.*
- *Fusion with other pipe materials such as PP, PVC etc. is not possible.*
- *Installation can be done at ambient temperatures between -5 °C and +45 °C. If ambient temperature is not within these limits use of welding tent is required.*
- *For general safety reasons, keep a distance of min. 1 m to the fusion site during fusion process.*
- *Make sure equipment that requires calibration is calibrated*
- *Fitting should be inspected for damage before installing*

Kazıma Aparatları/Scrapers

Boru Kalemi/Marker

Boşluk Mastarı ve Kumpas
Gap gauge and Vernier Caliper

Ef Kaynak Makinesi ve Jeneratör

-Ovallik kelepçesi / *Re-rounding clamp*

-PE temizleme solüsyonu ve bez
PE cleaning agent and cloth

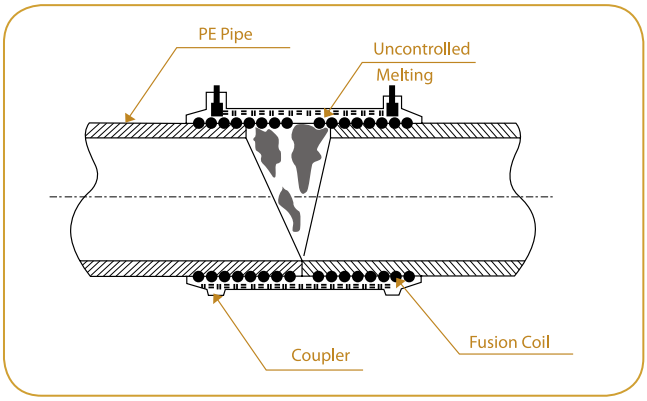
-Kaynak çadırı/*Welding tent*

1. Borunun kesilmesi:

Boru, kendi ekseni ile dik açı yapacak şekilde kesilmelidir. Kesme işlemi için PE boru kesici veya plastik malzeme kesmek için uygun dişleri olan bir testere kullanılabilir. Borunun düzgün bir şekilde kesilmemesi, fitingdeki metal sargıların belli bölgelerde boruya temas etmemesine neden olur. Bu ise aşırı ısınmaya ve erimiş malzemenin kontrolsüz bir şekilde akmasına yol açabilir. (Fig. 1)

1. Pipe Cutting:

For the pipe cutting, a suitable cutter for plastics must be used. The pipes are to be cut square with this cutting tool. If the pipe is not cut at right angles, this results in contact between heating coils and the pipe, which causes uncontrolled flow of molten due to overheating. (Fig. 1)



(Fig.1)

2. Kaynak alanının işaretlenmesi ve borunun kazınması:

Kaynak alanı, borunun manşonun içine gireceği derinlik olarak tanımlanabilir (manşonun ucundan orta noktasına kadar olan mesafe).

Manşonun boyunu ölçün ve yarı uzunluğunu hesaplayın (Fig. 2). Hesaplanan uzunluğu bir kalem ile boru üzerinde işaretleyin. (Fig. 3)

2. Marking and scrapping of the fusion zone:

Fusion zone which is the insertion depth of fitting, must be marked with a marker on the pipe end or on the spigot end. Measure the total length of coupler and calculate the half length. (Fig. 2) Mark the measured length on pipe surface with a marker (Fig.3)

(Fig. 2)

(Fig. 3)

Kaynak işlemine başlamadan önce, boru yüzeyinde oluşan oksitli tabakayı temizlemek için bir kazıyıcı yardımıyla boruyu kazıyın.(Fig. 4)

In order to remove the oxide layer of the pipe, scrape carefully the fusion zone using a scraper. (Fig. 4)

(Fig. 4)

Dikkat

Oksitli tabakanın tamamen ortadan kalkması için borunun üzerindeki işaret silinecek ve talaş oluşacak kadar kazınması gerekmektedir.

Yüzeyi kazınmış olan boruyu kirden ve istenmeyen hava şartlarından uzak tutmaya özen gösterin.

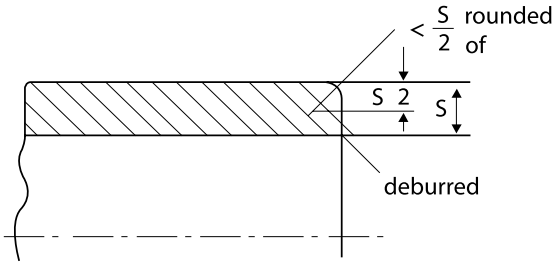
Borunun ucunda oluşabilecek talaşlar bir kazıma bıçağı ile temizlenmeli ve köşeler yuvarlatılmalıdır. (Fig. 4).

Attention

In order to remove the oxide layer completely, the pipe must be scraped so that shavings are formed and marking line is removed. This operation ensures removal of oxide layer, which may cause unsuitability for the jointing.

The prepared surface must be protected against unfavorable weather conditions.

After that, the internal edge must be deburred and the outer edge rounded off as illustrated in fig. 4



3. Oval boruların düzeltilmesi:

Borular depolama esnasında dairesel formlarını kaybederek ovalleşebilirler. Borudaki ovallik boru dış çapının %1,5'inden fazla olmamalıdır. Aksi takdirde boru kelepçesi kullanılmalıdır.

3. Getting Rid of Ovalization

The ovality of the pipes in the fusion zone mustn't be more than 1.5 % of the outer diameter of the pipe. If necessary, rerounding clamps must be used.

(Fig. 5)

4. Fiting yüzeyinin temizlenmesi:

Fitingi ambalajından çıkartın ve hasarlı olup olmadığını kontrol edin. Fitingin kaynak alanına kirli veya yağlı elle dokunmayın. Kaynak yapılacak boru ve fiting yüzeyleri temiz olmalı, yüzey üzerinde yağ, kir vs. olmamalıdır. Kaynak işlemine başlamadan önce, fitingin iç, borunun dış yüzeyini uygun bir temizleme maddesi ile temizleyin. Temizleme maddesi olarak izopropil alkol kullanılabilir. (Alkol içeriği hacimce %96'dan az olmamalıdır). Temizleme maddesini emici özelliğine sahip bir kağıt veya parçacık bırakmayan bir bez üzerine dökerek kullanın. (Fig. 5-6)

4. Degreasing of the Fusion Zone:

Remove fitting from its package without touching the fusion zone. Make a visual check to ensure fiting is undamaged. The prepared end or spigot end and internal face of coupler must be degreased with a suitable cleaning agent and a white absorbent and nonfibrous cloth. (Fig. 5-6)

As a cleaning agent; isopropyl alcohol can be used (The alcohol content mustn't be less than 96% by volume).

(Fig. 6)

Dikkat

Temizlenmiş yüzeyleri kirden ve istenmeyen hava şartlarından uzak tutmaya özen gösterin.

Attention

Degreased surfaces must be protected against dirt or unfavorable weather conditions.

5. Borunun fiting içine yerleştirilmesi:

Birleştirme esnasında boru ile fitingi birbirine göre kesinlikle eğik tutmayın. Borunun işaretlenmiş bölgesi fiting içerisine rahatlıkla girebilmelidir. Bunun için gerekirse boruyu tekrar kazıyın. (Fig. 7-8-9-10)

5. Inserting of the pipe end or spigot end into the coupler:

Inserting of the pipe end or spigot end into the coupler must be done without causing any tilting with respect to each other's (Fig. 7-8-9-10)

(Fig. 7)

(Fig. 8)

(Fig. 9)

(Fig. 10)

Dikkat

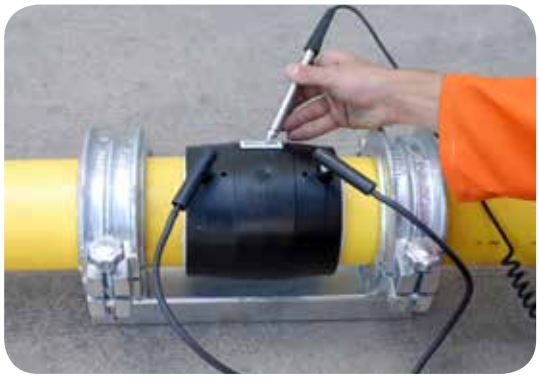
Boruyu fitingin içine sokarken fitingin kontak terminallerinin üstte kalmasına dikkat edilmelidir. Boru fiting içerisine yerleştirildikden sonra rahatlıkla döndürülebilmelidir. Borular eğilme gerilimine maruz kalmamalı ve fiting içerisinde kendi ağırlıklarını rahatlıkla taşıyabilmelidir. Borunun serbest uçlarına destek konulabilir.

Attention

The contact terminals of the coupler must be easily accessible.

In order to get of bending stresses, be sure that couplers can be turned easily and do not let the pipes to support their own weight in the fitting.

In inserting operation, it must be ensured that pipe end or spigot end contacts with the stoppers of the coupler.



(Fig. 11)

6. Kaynak işleminin yapılması:

Montaj talimatları adım adım izlenmiş ve herhangi bir problem yok ise kaynak işlemi universal bir EF kaynak makinesi kullanılarak yapılabilir. Bunun için, kaynak bilgilerinin manuel olarak veya bir barkod okuyucu yardımıyla kaynak makinesine girilmesi gerekmektedir. (Fig. 11)

6. Fusion:

Provided that the information given in the operating instructions are followed step by step and there is no problem, the fusion process can be started after data of the coupler is set to the fusion control unit by manually or by means of bar-code reader. (Fig. 11)

Dikkat

Universal bir kaynak makinesi kullanın.
Elektrofüzyon manşonların üzerinde kaynak indikatörleri (meme) bulunmaktadır. Kaynak işlemi başladıktan sonra dışarı çıkan bu memeler kaynak işleminin tamamlandığını gösterir.
Kaynak işlemi esnasında herhangi bir hata oluşur ise eriyen PE malzeme etrafa sıçrayabilir. Bu nedenle güvenlik açısından, kaynak işlemi esnasında en az 1 m uzakta durmaya dikkat edin.
Kaynak işlemi herhangi bir nedenle (enerji kesintisi, vb.) kesintiye uğrar ise kaynaklı parçanın soğuması için yeteri kadar beklendikten sonra kaynak işlemine devam edilebilir. TEGA Manşonlarının soğuma süreleri barkod etiketleri üzerinde verilmiştir.

Attention

Use only universal Fusion Control Unit.
During Fusion operation, fusion indicators which shows the completion of process must be observed. There may be less or more melt in the indicators. This is because of the gap formed between the coupler and pipe end or spigot end.
As a safety precaution, be careful to stay at least 1 m away from the fusion area.
If the fusion process is interrupted for any reason (e.g. due to power failure) the fusion process can be repeated after the joint cooled adequately. Find these cooling times on TEGA Couplers' barcode labels.

EF TAPPING TEE MONTAGE INSTRUCTION
EF SERVİS TE MONTAJ TALİMATLARI

1. Kaynak alanının boru üzerinde işaretlenmesi ve oksitli yüzeyin temizlenmesi:

Kaynak Alanı: Taping Te'lerde kaynak alanı, taping tenin üst kısmında tel sargının bulunduğu alandır. Boru yüzeyindeki oksitli tabakayı kazımadan önce kaynak alanını boru üzerine işaretleyin (Fig. 1)

1. Marking of Fusion Zone and Scraping of Fusion Zone:

Different from the couplers, in Tapping Fittings, Fusion Zone is the area where the resistance wires exists and which is located to the upper side of the fitting Before scraping, fusion zone must be marked with a marker on the pipe (Fig.1)

(Fig. 1)

(Fig. 2)

Daha sonra bir kazıyıcı ile oksitli tabakayı boru üzerinden tamamen kazıyın (Fig.2). Oksitli tabakanın tamamen kazınmaması bağlantıda sızıntılar oluşmasına yol açabilir. Kazıma işlemi kaynak işleminin hemen öncesinde yapılmalıdır.

In order to remove the oxide layer, scrape carefully the whole circumference of the fusion zone using a hand scraper (Fig.2).
This scraping operation must be carried out just before jointing.

Dikkat

Oksitli tabakanın tamamen ortadan kalkması için borunun üzerindeki işaret silinecek ve talaş oluşacak kadar kazınması gerekmektedir. Kazınmış yüzey toz, kir ve istenmeyen hava şartlarına karşı korunmalıdır.

Attention

In order to remove the oxide layer completely, the pipe must be scraped so that shavings are formed and marking line is removed. This operation ensures removal of oxide layer, which may cause unsuitability for the jointing. The prepared surface must be protected against unfavorable weather conditions.

2. Temizleme: Kaynak yapılacak boru ve fitingin yüzeyleri temiz olmalı, yüzey üzerinde yağ, kir, vs. olmamalıdır.
Kaynak işlemine başlamadan önce, fitingin iç, borunun dış yüzeyini uygun bir temizleme maddesi ile temizleyin.
Temizleme maddesi olarak izopropil alkol kullanılabilir (Alkol içeriği hacimce %96'dan az olmamalıdır). Temizleme maddesini beyaz ve emici özelliğe sahip bir kağıt veya parçacık bırakmayan bir bez üzerine dökerek kullanın. (Fig.3)

2. Degreasing of the Fusion Zone: *The prepared pipe and internal face of fitting must be degreased with a suitable cleaning agent and a white absorbent and nonfibrous cloth. (Fig.3)*
As a cleaning agent, isopropyl alcohol can be used. (The alcohol content mustn't be less than 96% by volume).


(Fig. 3)

Dikkat

Temizlenmiş yüzeyleri kirden ve istenmeyen hava şartlarından uzak tutmaya özen gösterin.

Attention

Degreased surfaces must be protected against dirt or unfavorable weather conditions.

3. Birleştirme: Fitingi hazırlanan borunun üzerine doğru pozisyonda yerleştirin ve dört vidayı sırasıyla bir tornavida yardımıyla sıkın. (Fig.4)

3. Attaching Tapping Tees: *After correct positioning is done on the prepared pipe, fitting is closed and fully tighten four screws uniformly by using a suitable screwdriver (Fig.4)*


(Fig. 4)

4. Kaynak işleminin yapılması: Montaj talimatları adım adım izlenmiş ve her hangi bir problem yok ise kaynak işlemi universal bir EF kaynak makinası kullanılarak yapılabilir. Bunun için, kaynak bilgilerinin manuel olarak veya barkod okuyucu yardımıyla kaynak makinasına girilmesi gerekmektedir. (Fig.5)

4. Fusion: *Provided that the information given in the operating instructions are followed step by step and there is no problem, the fusion process can be started after fusion data of the tapping fittings is set to the fusion control unit by manually or by means of bar-code reader (Fig.5).*

(Fig. 5)

Dikkat

Universal bir kaynak makinası kullanın. Kaynak işlemi esnasında her hangi bir hata oluşur ise eriyen PE malzeme etrafa sıçrayabilir. Bu nedenle güvenlik açısından, kaynak işlemi esnasında en az 1 m uzakta durmaya dikkat edin.
Taping Te branşmanını delmeden önce soğuma süreleri beklenmelidir. Soğuma süreleri Taping Te üzerindeki barkod etiketlerinde mevcuttur.

Attention

Please use an universal welding machine. If any error occurs during the welding operation, the melt PE material can slosh into the operation area. Because of this reason, please be careful about standing at least 1 meter far away from the welding area.
The cooling times must be waited before the drilling of the branch ducts of Tapping Tee. The cooling times are shown on the barcode labels those are attached on Tapping Tee.

5. Ana boruyu delmeden kaynağın test edilmesi: Ana boru delinmeden önce servis te kaynağının kontrolü yapılmalıdır. Bunun için servis hattının bağlanması gerekir (Fig. 6)

5. Testing the fusion of tapping tee before drilling main pipe: It is recommended to test fusion area before drilling the main pipe. Before doing this, service line should be connected to tapping tee (Fig. 6)

(Fig. 6)

Test düzeneğinin bağlantı parçasını servis borusu ucuna bağlayın (Fig. 7)

Connect the test plug and service pipe Fig. 7)

(Fig. 7)

Test basıncı uygulayın ve kaynakta sızdırma olup olmadığını kontrol edin. (Fig. 8)

Apply test pressure and ensure that there is no leakage. Fig. 8)

(Fig. 8)

6. Branşmanın delinmesi:

Kaynak işlemi tamamlandıktan ve soğuma süresi beklendikten sonra branşman kapağını çıkartın ve dikkatli bir şekilde kirlenmeyecek bir yere koyun. Daha sonra alyan anahtarı yardımıyla branşman içindeki deliciyi çevirmeye başlayın. Delme işlemi tamamlandıktan sonra deliciyi yukarı çekerek ilk pozisyonuna getirin. Daha sonra kapağı sıkıca kapatın. (Fig. 9)

6. Carrying out the tapping operation:

The cap on the tapping fitting is first unscrewed and put somewhere it cannot become soiled. After that, by means of a suitable hexagon wrench, the integral cutter is screwed down. (Fig. 9)

(Fig. 9)

INSTALLATION
MONTAJ

INSTRUCTION FOR COIL PIPES OR PIPES WHICH HAS NOT FREE STRESS
KANGAL BORU VEYA ÜZERİNDE KASINTI OLAN BORULARLA İLGİLİ MONTAJ TALİMATLARI

Boruda kasıntının fazla olduğu durumlarda "V clamp kullanılmalıdır.

PE borularda,
- Ovallik ve
- Kasıntı iki ayrı problemdir.

Kasıntıyı almak için "V clamp"; ovalliği almak için ise "ovallik kelepçesi" kullanılmalıdır.

If there is a stress on the pipe you should use "V clamp".

There are two problems on PE pipes:
- *Ovalization and*
- *Stress on the pipe*

"V clamp" should be used to getting rid of swank and "rerounding tool" should be used to become straight ovalization.

"V clamp" aşağıdaki şekilde ayarlanarak kullanılır.

"V clamp" is used as the following pictures.

EF SADDLE OPERATION INSTRUCTION
EF SEMER MONTAJ TALİMATI

TEGA EF semer sistemleri 20 yıl boyunca başarılı olarak kullanılmaktadır. Şimdiye kadar çok düşük limitlerde başarısız uygulamalar rapor edilmiştir. Eğer TEGA kaynak prosüdürlerini dikkatli bir şekilde uygularsanız, başarılı kaynak yapabilirsiniz. TEGA ,takip eden sayfalarda EF semerlerin yüksek güvenilir testi hakkında tavsiyeler de bulunmuştur.

TEGA EF Saddle System has been used last 20 years successfully. Very limited unsccessfull Ef Saddle installation has been reported to TEGA up to now. If you follow TEGA welding procedures strictly, your welding will be fine, instead of it, TEGA recommend "high safely test step for EF saddle" which is given next pages

1

EF Saddle and belts before welding.
Montaj öncesinde EF Semer ve kayışlar

2

Put the EF Saddle on the welding point of pipe and draw interior and exterior circles.
EF Semeri boru üzerinde kaynak yapılacak noktaya koyarak iç ve dış çemberleri çiziniz.

3

Make a 10mm hole on the interior circle by the help of a drill.
İç çember üzerine matkapla 10'luk delik açınız.

4

Pierce the pipe from starting the hole which was opened with an electrical saw as shape of the interior circle.
Dekopaj testeresiyle, açılan delikten başlayarak, iç çemberi izleyerek, boruyu deliniz.

5

Drilled hole
Delinmiş boru

6

Scrape the thick field between interior and exterior circle to get the oxide layer on the pipe.
Boru üzerindeki oksit tabakasını almak için, iç ve dış çember arasında kalan alanı kazıyınız.

7

Clean the area that you was scraped before with an appropriate chemical. (Isopropyl alcohol)
Kazıdığınız bölgeyi uygun bir kimyasalla temizleyiniz. (İzopropil alkol)

8

EF Saddle must be cleaned with an appropriate chemical before welding.
Kaynak öncesinde EF semeri de aynı kimyasalla temizleyiniz.

9

Press the EF Saddle strongly by the help of strap.
Fix the EF Saddle on pipe as seen in the picture.
Be sure that the internal diameter of EF Saddle is on the top of the hole on the pipe.
EF Semeri boru üzerine, resimde görüldüğü şekilde, sabitleyiniz. EF Semerin iç çapıyla boruda açılan deliğin üst üste geldiğine emin olunuz. Semeri kayış yardımıyla olabildiğince güçlü olarak sıkıştırınız.

10

Put the adaptor pins of EF welding machine on EF Saddle and load welding data to EF welding machine by the help of barcode reader.
EF kaynak makinesinin uçlarını EF Semere bağlayınız ve barkodu okutarak kaynak bilgilerini EF Kaynak makinenize yükleyiniz. Kaynak işlemini tamamlayınız.

11

After the welding was completed, you should not take out strap system up to cooling duration. During this waiting time, EF welding machine can be used for another process.
Kaynak bittikten sonra, soğuma süresi bitinceye kadar kayışı çıkarmayın. Bu süre zarfında kaynak makinenizi başka bir kaynak işlemi için kullanabilirsiniz.

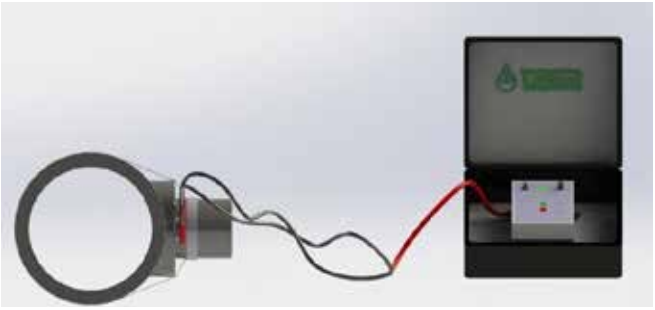
12

Take off the straps after cooling.
Soğuma işleminden sonra kayışları sökünüz.

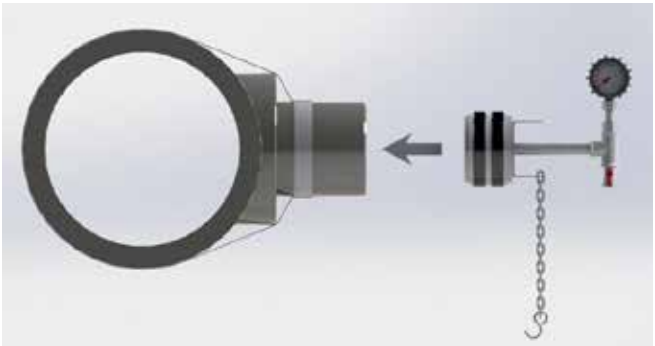
HIGH SAFETY TEST STEPS FOR EF SADDLE
ELEKTRO FÜZYON SEMER İÇİN YÜKSEK GÜVENLİK ADIMLARI

(TEGA recommends these test procedure for EF Saddle)
(TEGA nın tavsiye ettiği elektro füzyon semer test prosedürleri)

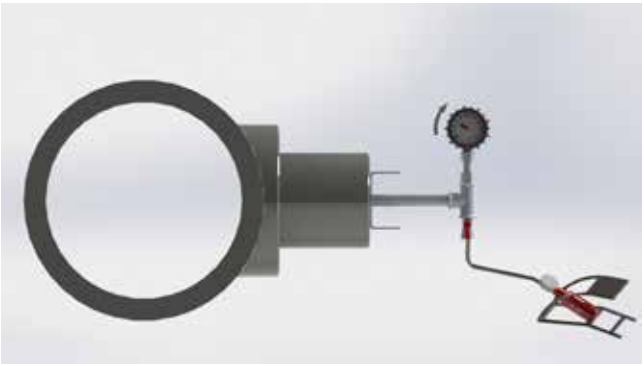
Scrape the pipe.
Boruyu kazıyın.



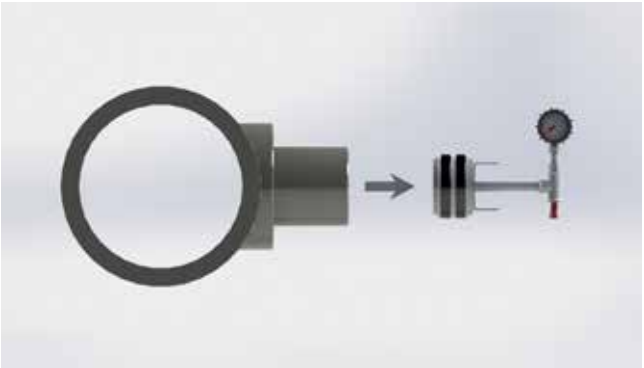
Squeeze EF Saddle and weld it.
Semeri sabitleyin ve kaynatın.



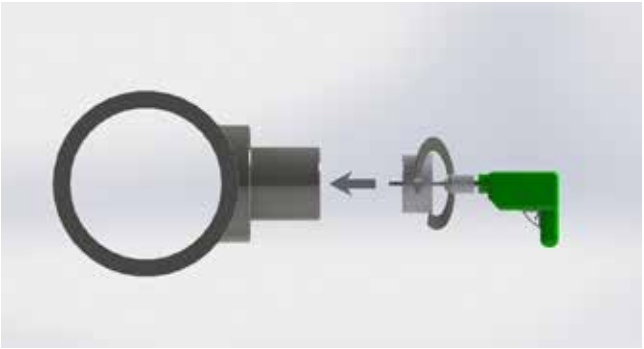
After cooling time, push the test plug and tight it.
Connect the plug to the saddle outlet by a rope for safety.
Soğuma süresinde sonra, yerleştirin ve sıkın.
Güvenlik halatı kullanarak yerleştirme yapılmalıdır.



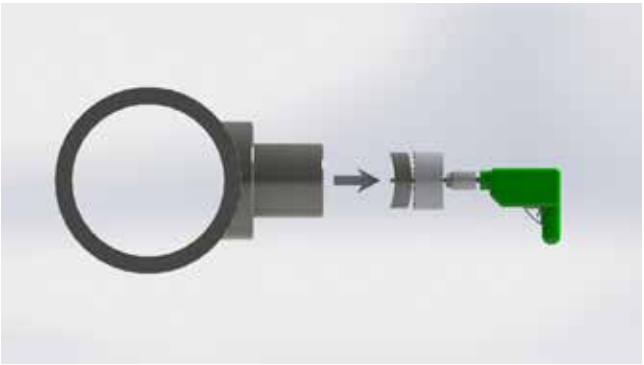
Test the saddle up to 2 bar (30 PSI) by air.
Hava ile 2 bar (30 PSI) basınçla test edilir.



If test is OK, take the plug back.
Test başarılı ise test aparatı çıkarılır.



Drill the pipe.
Boru delinir.



EF COUPLERS FOR PRE-INSULATED PE PIPING SYSTEM
İZOLASYONLU PE BORU MANŞONLARI

1

Long TYPE EF Coupler for insulating pipe
İzolasyonlu borular için uzun tip EF manşon

2

Calculate the touching zone of coupler and mark on the pipe
Boru ile manşonun temas yüzeyini hesaplayın ve boru üzerinde işaretleyin.

3

To remove the oxide layer scrape the pipe surface
Boru üzerindeki oksit tabakasını almak için Boru yüzeyini kazıyın.

4

Clean the area that you was scraped before with an appropriate chemical.
(Trichloroethone or alcohol)
Kazıdığınız bölgeyi uygun bir kimyasalla temizleyiniz. (Trichloroethone veya alkol)

5

Insert the coupler on the one side of the pipe
Manşonu borunun bir ucundan sokun.

6

Weld the steel pipes by using electrical welding
Çelik boruları elektrik kaynağı ile birbirine kaynatın.

7

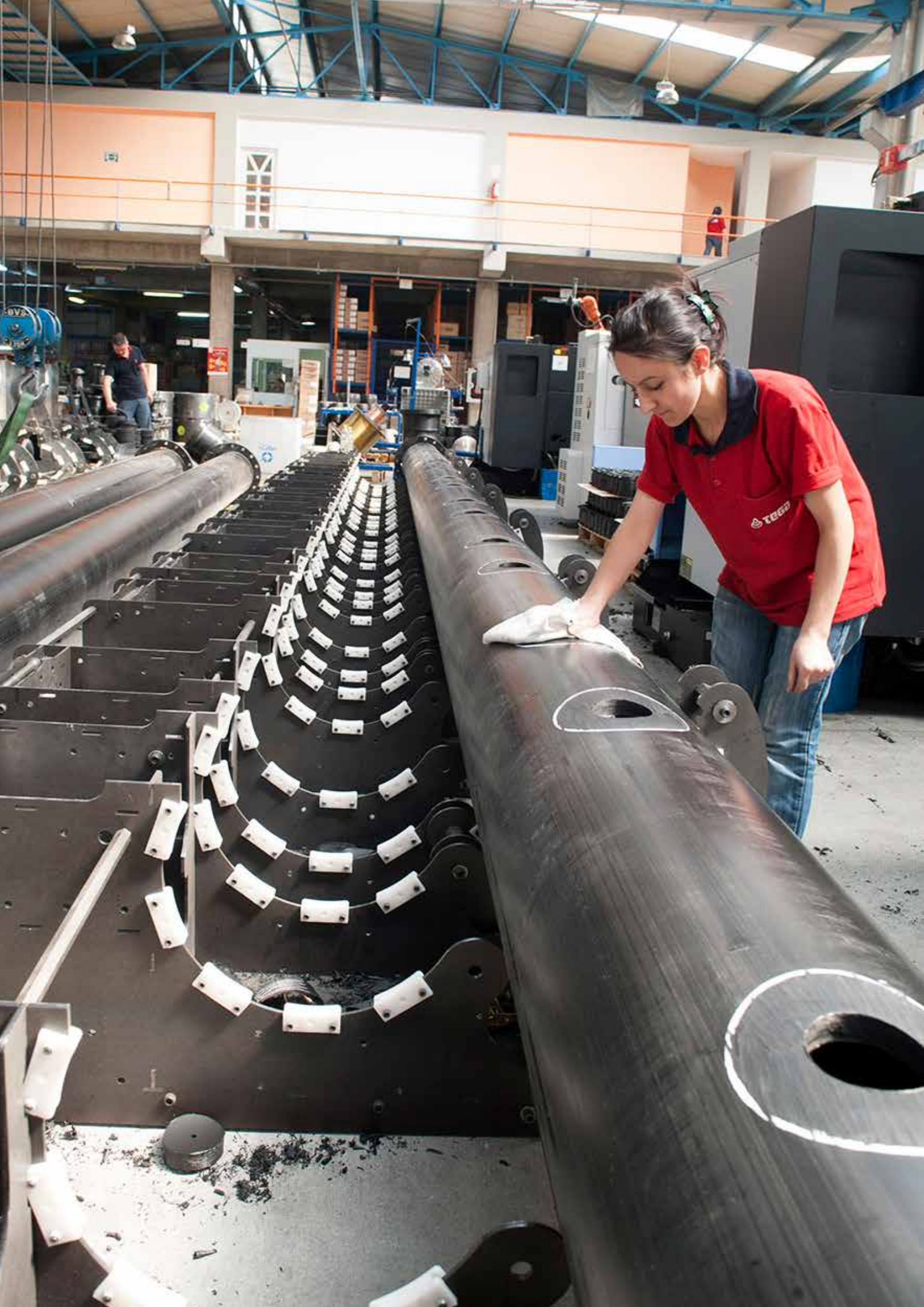
After electrical welding slide the coupler to the other side
Elektrik kaynağından sonra manşonu borunun üzerinde kaydırın.

8

Make the electrofusion welding
Elektrofüzyon kaynak işlemini yapın.

9

Fill the insulating material from the hole of the coupler and fit the cap on the coupler
Manşon üzerindeki delikten İzolasyon malzemesini boru içine doldurun ve deliği tapa ile kapatın.



REPAIR WORKS IF THERE IS RESIDUAL WATER
BORU İÇERİSİNDE SU KALMASI HALİNDE TAMİR İŞLEMİ

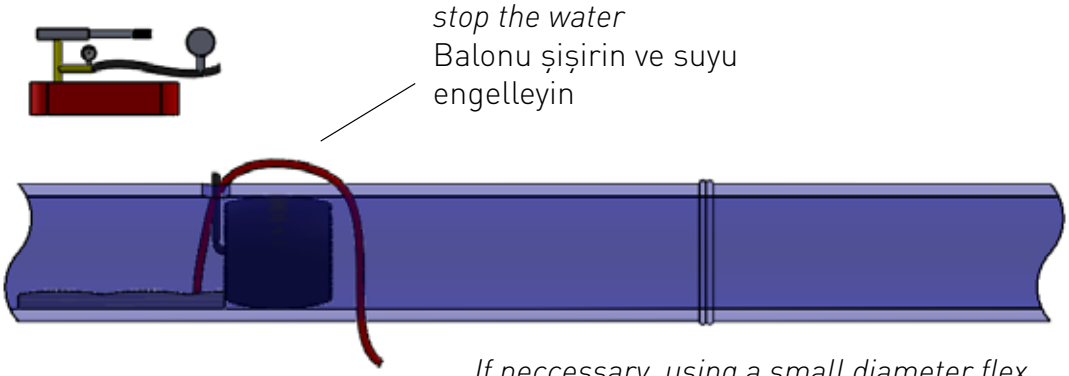
Drill the pipe
d32 - 63 mm
Boruyu d32 - 63 çap aralığında deliniz.

Leaking
Kaçak

Push the balloon down to the pipe.
Balonu boru içine gönderiniz

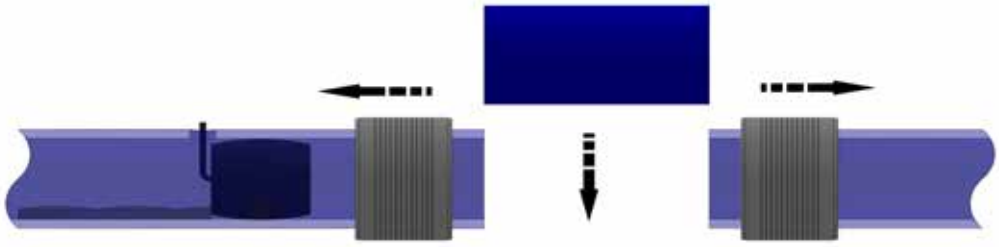
Residual Water
Su

Blow up balloon and stop the water
Balonu şişirin ve suyu engelleyin

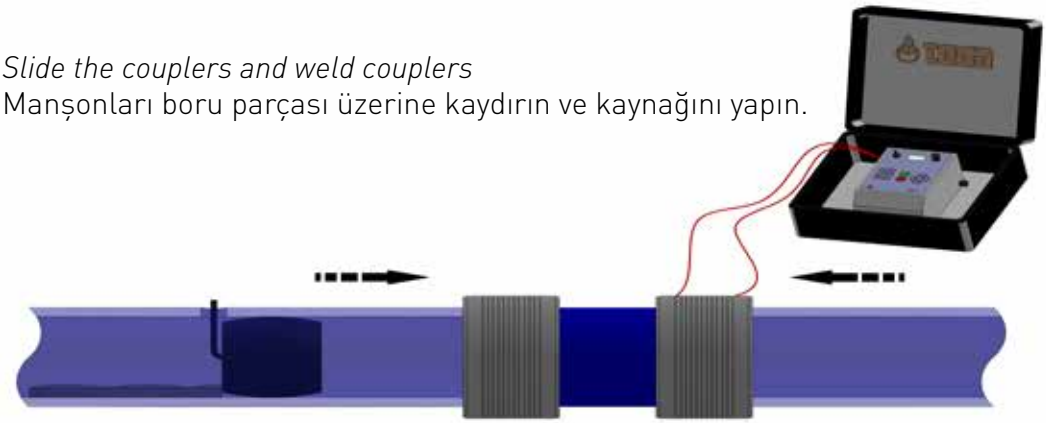


If neccessary, using a small diameter flex hose, take the residual water out by syphon system
Gerekli görüldüğünde ince bir hortumla biriken suyu tahliye edebilirsiniz.

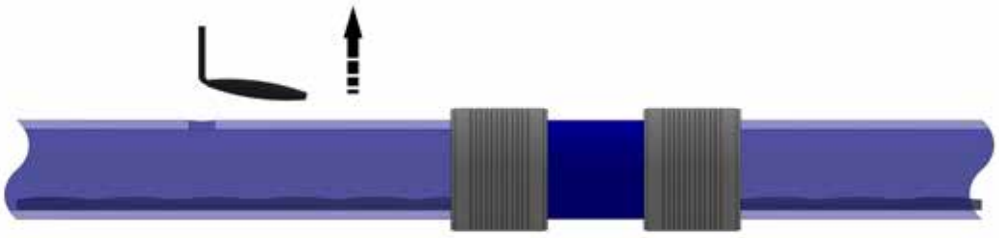
Cut the pipe inserts couplers and insert a piece of pipe
Boruyu kesin, iki manşonu kaydırın ve bir boru parçasını araya yaklaştırın.



Slide the couplers and weld couplers
Manşonları boru parçası üzerine kaydırın ve kaynağını yapın.

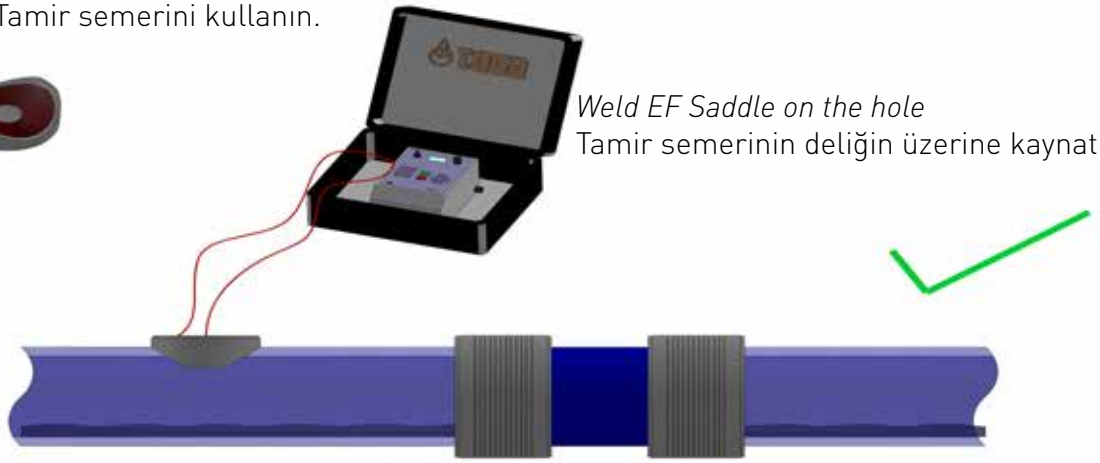


Take the balloon out
Balonu geri alın.



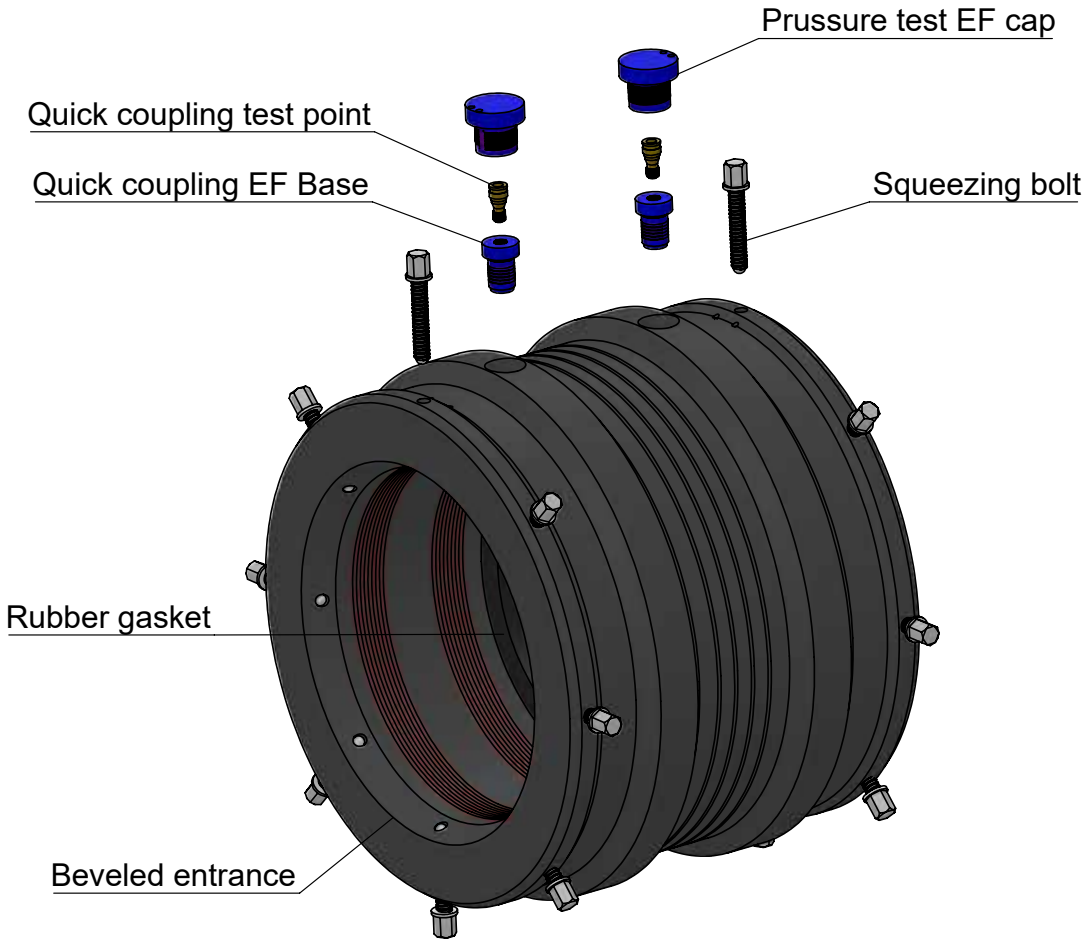
Take a repair saddle
Tamir semerini kullanın.

Weld EF Saddle on the hole
Tamir semerinin deliğin üzerine kaynatın



TEGA DOST COUPLER
INSTALLATION INSTRUCTIONS

Components of Dost Coupler

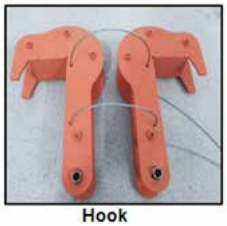


IMPORTANT NOTES

- *Below instructions should are followed strictly step by step.*
- *The fusible pipe series is shown in the SDR labelling on each coupler.*
- *Installation technician must be trained and certified to install Tega large diameter couplers.*
- *Fusion with other pipe materials such as PP, PVC etc. is not possible.*
- *Installation can be done at ambient temperatures between 50°F and +113 °F. If ambient temperatures are not within these limits, using of heated tent for welding.*
- *For general safety reasons, keep a distance of min. 40" to the fusion site during fusion process.*

NECESSARY TOOLS

Pulling tool


Hook


Lever Hoist


Straight base Part 1


Straight base Part 2

1-Scraper

2- Gap gauge and Vernier Caliper

3-Marker

4-EF Welding Machine and Generator

5-Tape meter

6-Ratchet strap

7- Test Jack

8-PE cleaning agent and cloth

9- Welding Tent

10- Circometer

INSTALLATION PROCEDURE

1. Pipe Cutting

For the pipe cutting, a suitable cutter for plastics must be used. The pipes are to be cut in a right angle to the pipe axis square with this cutting tool.

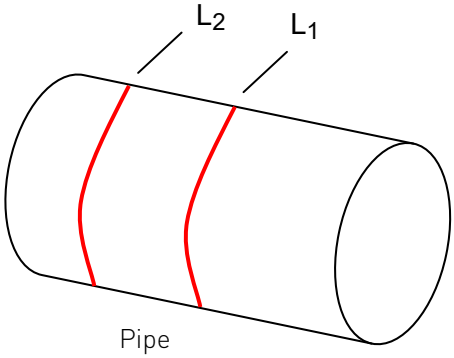
ATTENTION!
If the pipe is not cut at right angles, this result in missing contact between heating coils and the pipe, which cause uncontrolled flow of molten due to overheating.
Pipe toe-in or reduction in diameter should be checked to ensure that the pipe diameter is within tolerance at 1.97" from the end. Severe toe-in may require the removal.

2. Marking the fusion zone

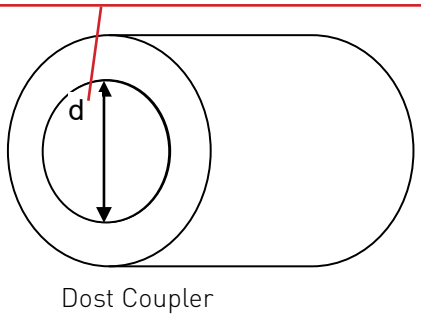
Fusion zone which is the insertion depth of coupler must be marked with a marker on the pipe end or on the spigot end. Measure the total length of coupler and calculate the half length. Mark the coupler half length + 0.4" on pipe surface.

3. Measuring the pipe diameter and pipe ovality:

Pipe circumference must be measured with circumference tape/circometer (or tape measure) at two points (L1 and L2) as shown in below sketch.



The inner diameter (d) of Dost Coupler is given on a label attached on it.



The inner diameter of Dost coupler written on label is the value measured at 68°F. Since job-site ambient temperature may change, inner diameter of Dost coupler also changes.

Use the following table to calculate actual inner diameter (d) of Dost depending on ambient temperature.

Ambient Temperature (°F)	*Multiplier*
41	0.9985
50	0.9990
59	0.9995
68	-
77	1.0005
86	1.0010
95	1.0015
104	1.0020
113	1.0025
113	1.0025

To find the actual inner diameter (d) of coupler;

- *Choose the multiplier from the table according to ambient temperature of site.*
- *Multiply the inner diameter of Dost (given on label) with Multiplier.*
- *Measure and record pipe circumference at two points. (L1 and L2)*

ATTENTION!

First calculate diameters at these two points :

$D_1 = L_1 / 3{,}14$

$D_2 = L_2 / 3{,}14$

Calculate the mean pipe diameter (D):

$$D = \frac{D_1 + D_2}{2}$$

Calculate the difference between coupler inner diameter (d) and mean pipe outer diameter.

0,04'' mm < d-D < 0,07'' mm

Difference should be between 1 mm to 1,8 mm.

D_{min} and D_{max} must be measured at the surface of pipe with a tape measure. Minimum and maximum pipe diameters should be recorded.

ATTENTION!
Write the following information on pipe surface:
Main pipe outer diameter; D
Minimum diameter; Dmin
Maximum diameter; Dmax
Ovality (= Dmax-Dmin)

$$\text{Ovality \%} = \frac{\text{Dmax - Dmin}}{\text{D}} \times 100$$

Ovality must be less than 10%

4. Scraping the pipe surface

In order to remove the oxide layer of the pipe, pipe surface must be scraped carefully by a proper scraper (eg. Rotation scraper). Inspect the entire scraped area to ensure total scraping coverage.

The inner diameter of Dost Coupler is given on a label attached on it.

The difference between coupler inner diameter and pipe outer diameter should be between 1 mm-3 mm. So scraping should be done carefully to not exceed this limit. If necessary, scraping can be done more than one time.

ATTENTION!
In order to remove the oxide layer completely, the pipe must be scraped so that shavings are formed and marking line is removed.

The prepared surface must be protected against unfavorable weather conditions.

5. Fusion of Flex Restraints

In order to create the supports of pulling tool, flex restraints should be fused on both pipes. Two of flex restraints should be fused on each pipes ends with following distances:

1) Couplers between d 12" to 20" size: at a distance half length of coupler + 1.18"
2) Couplers bigger than 20" size: at a distance half length of coupler + 1.57"
3) Number of Flex:
12" - 24": 2 flex (180° between flex)
28" - 36": 3 flex (120° between flex)
40" - 63": 4 flex (90° between flex)

6. Assembly of Straight Bases:

Straight base part 1(which has stopper) should be fixed on first pipe end by using ratchet straps. Straight base part 2 should be fixed on the second pipe end by using ratchet straps. Bases on both pipe ends should stand by flex restraints.

ATTENTION!
Straight base part 1 (with stopper) should be installed on the pipe end where coupler will be installed first.

7. Cleaning the fusion area:

Remove coupler from its package without touching the fusion surface. Make a visual check to ensure coupler is undamaged.

The prepared pipe end and internal face of coupler must be degreased with a suitable cleaning agent and a white absorbent and no fibrous paper/cloth.

As a cleaning agent; isopropyl alcohol can be used (The alcohol content must be more than 96% by volume).

ATTENTION!
Degreased surfaces must be protected against dirt or unfavorable weather conditions

8. Placing the hooks onto coupler

Place the hooks onto coupler as shown in picture.

Attach the lever hoist and operate it to pull coupler.
The hooks and pulling chain must be parallel to the pipe and coupler.
Never create bending force on the coupler.

9. Removing the ovality and insertion of pipe into coupler:

Special design of Tega Dost coupler can tolerate up to 10% ovality. With the help of lever hoist, pull the coupler till it passes the squeezing bolts. Check the gap between pipe and coupler along the whole circumference.

Pull the coupler up to the mark

Prepare the other pipe for installation. The beveled entrance of coupler can accommodate up to 9° deflection/misalignment of pipes.

By using the lever hoist pull the other pipe end up to the mark. Special design of Dost coupler tolerates misalignment and thus pipes can be aligned on the same axis.

ATTENTION!
On both sides at least 236'' pipe length must be free to tolerate the bending of the pipe.

Be careful at cold weather temperatures (<50°F), since the flexibility of pipe decreases.

10. Gap Control and Pre-heating

Check the gap and try to balance it all around the pipe by external clamp or inner clamp.

11. Electrofusion process

- *Before start welding release tension on the chain hoist. Just a strength to hold the coupler. Coupler must be free stress.*
- *Before welding put a test jack on the coupler and open the valve.*
- *In order to prevent heat losses during fusion process, close gap with adhesive tape between pipe and coupler from outside and if possible from inside.*
- *Close open pipe ends to prevent chimney effect.*

Provided that information given in instructions is followed step by step, connect fusion cables to the terminals of the first side of the coupler. Fusion parameters are contained in the main barcode. Fusion data can be transferred to machine by using reader

After reading of barcode, compare data on barcode and data shown on display. Start fusion process. Wait until cooling time has elapsed before moving pipe and coupler. Cooling time is given on barcode and identified by CT.

ATTENTION!
The cooling time on the barcode does not mean starting to pressure test. For pressure test you need to wait 6 hours.

Fuse the other part of coupler. It is possible to fuse both ends of coupler simultaneously by using 2 welding units.

12. Pressure Test

Tega Dost coupler has the ability to do on-site test without filling the pipeline.

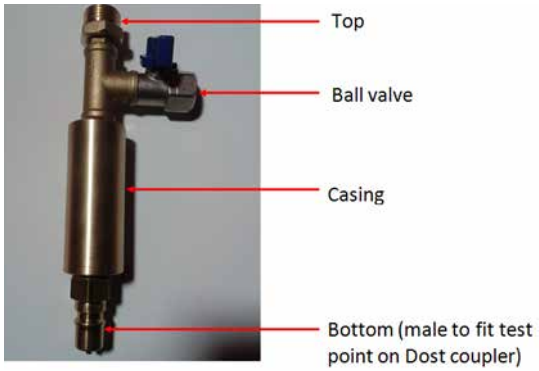
1st test: 10 psi 5 minutes by air

2nd test: 20 psi 5 minutes by air

If any leakage occurs on the air test, before starting water pressure test, you need to make an emergency welding.

Please contact Tega for emergencyy welding parameters.

3rd test: Operation pressure x 1,3 1 hour by water



After 6 hour has elapsed, hydraulic or pneumatic test can be done. Dost coupler is equipped with pressure test point. A test jack is delivered together with coupler.

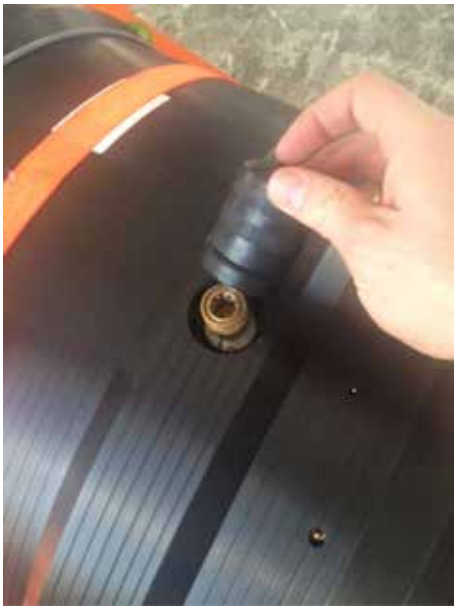
Connect bottom of jack with test point on coupler. It is very important to vent air completely during water filling. This can be achieved by opening and closing of ball valve on test jack.

After ensuring air ventilation; apply a pressure of 1.3 x operating pressure (eg. 20 bar for pipelines with an operating pressure of 16 bar) during 1 hour. Check the fusion areas if there is any leakage.

Remove the test jack by moving the casing downwards.

13. Cap with Gasket:

After completing the pressure test successfully, EF caps can be fused.



EXTERNAL BUTT FUSION PRESSURE TEST PROCEDURE PIPE TEST APPLICATION
HARİCİ ALIN KAYNAK BASINÇ TEST APARATI KULLANIM PROSEDÜRÜ

1. *SCOPE* / KAPSAM:

This procedure describes the tool which is designed for the pre – quality testing for the welding seams on the PE100 and Steel pipes and the main principles about the using of this tool. The testing tool consist of these parts;

Bu prosedür, PE100 ve Çelik borularda, kaynak dikişlerinin ön kalite testi için geliştirilmiş aparat ve bu aparatın kullanılmasında esas olacak prensipleri tarifler. Test aparatı şu parçalardan oluşur:

- *Test clamp with 2 parts and rubber gaskets* / 2 parçalı test kelepçesi ve kauçuk contaları
- *Ball valve for air intake* / Hava alma küresel vanası
- *Test hose and union part* / Test hortumu ve bağlantı rekoru
- *Testing manometer (max : 24 bar (with indicator)* / Test manometresi (maksimum: 24 bar göstergeli)
- *Manual test pump* / Manuel test pompası

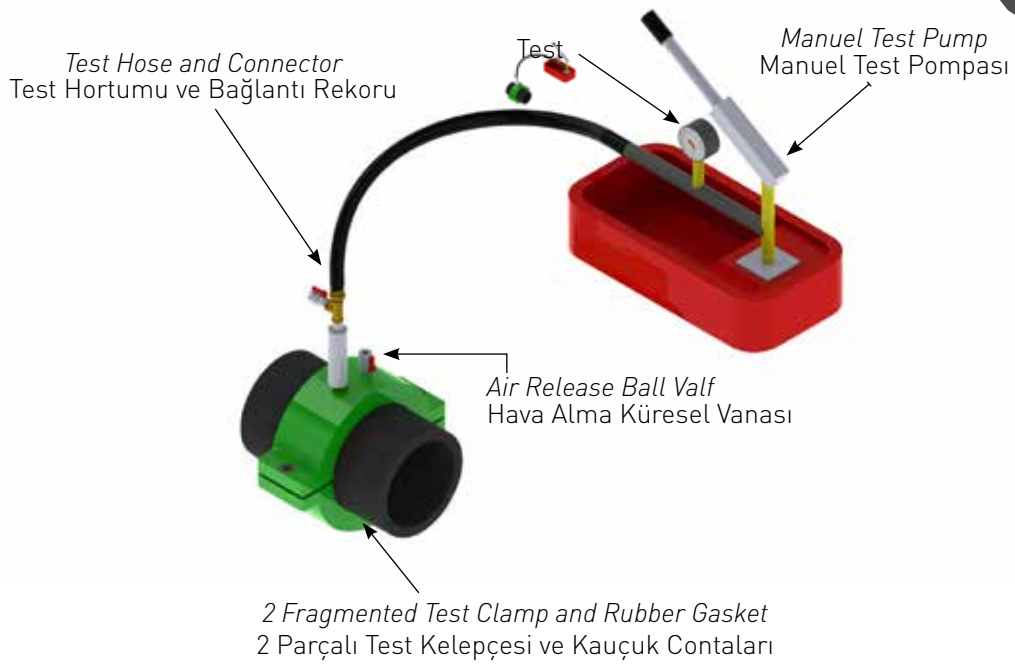
2. *DESCRIPTION OF DEVICE* / APARAT TANIMI:

External welding pressure test tool is used / Harici kaynak basınç test aparatı:

- *To determine the welding quality on PE100 pipes* / PE100 borularda, alın kaynağı kalitesinin tespitinde kullanılanılır.
- *To determine the quality of welding seam made by electrical welding on steel pipes.* / Çelik borularda ise elektrik kaynağıyla yapılan kaynak dikişinin kalitesinin tespiti amacıyla kullanılır.

3. *APPLICATION STEPS* / UYGULAMA ADIMLARI:

- *The type of the testing pipe is determined. (PE100 or Steel)* / Testi yapılacak borunun tipi belirlenir. (PE100 veya Çelik)
- *The diameter of the testing pipe is determined* / Test yapılacak borunun çapı belirlenir.
- *The suitable test tool is chosen compatible with the size* / Bu çapa uygun test aparatı seçilir.
- *The tool with 2 parts is screwed on welding seam.* / 2 parçalı aparat, kaynak dikişinin üzerine gelecek şekilde civatalanır.
- *Test pump is connected to the union of clamp.* / Test pompası kelepçenin bağlantı rekoruna bağlanır.
- *The pressure is applied by pump.* / Pompa ile basınç uygulanır.
- *During the first pressurized, the air inside the tool is discharged by means of ball valve.* / İlk basınçlandırma sırasında, küresel vana yardımı ile aparat içerisindeki hava tahliye edilir.
- *The pressure is amplified until reading the required test pressure in the manometer.* / Manometrede, istenilen test basıncı okununcaya kadar basınç yükseltilir.
- *When the required test pressure is read on the manometer, the pressure is fixed by closing the ball valve on the test pump and manometer is monitored.* / İstenilen test basıncına ulaşılınca, test pompası üzerindeki küresel vana kapatılarak basınç sabitlenir ve manometre izlenir.
- *Test pressure: Pipeline operating pressure X 1,3 / Test basıncı: Boru hattı işletme basıncı X 1,3*
- *Test Period: 15 Minutes.* / Test Süresi: 15 Dakika
- *If no pressure drop is observed in the manometer during this time, the weld seam is considered to have passed the test.* / Bu süre içerisinde manometrede basınç düşüşü gözlenmiyorsa, kaynak dikişi, testi geçmiş sayılır.
- *If the pressure read in the manometer drops but leakage is observed at the part of the tool which is in contact with the pipe, the tool is tightened better and leakage is removed and the test is repeated./* Manometrede okunan basınç düşüyor, ancak aparatın boru ile temas eden kısmında kaçak gözleniyor ise, aparat daha iyi sıkılarak kaçak giderilir ve test tekrarlanır.
- *If there is no leakage in the part of the tool which is in contact with the pipe, but if there is a drop in the manometer, it means that there is leakage in the welding seam.* / Aparatın boru ile temas eden kısmında kaçak gözlenmiyor, ancak manometrede düşüş oluyorsa, kaynak dikişinde kaçak olduğu sonucuna varılır.



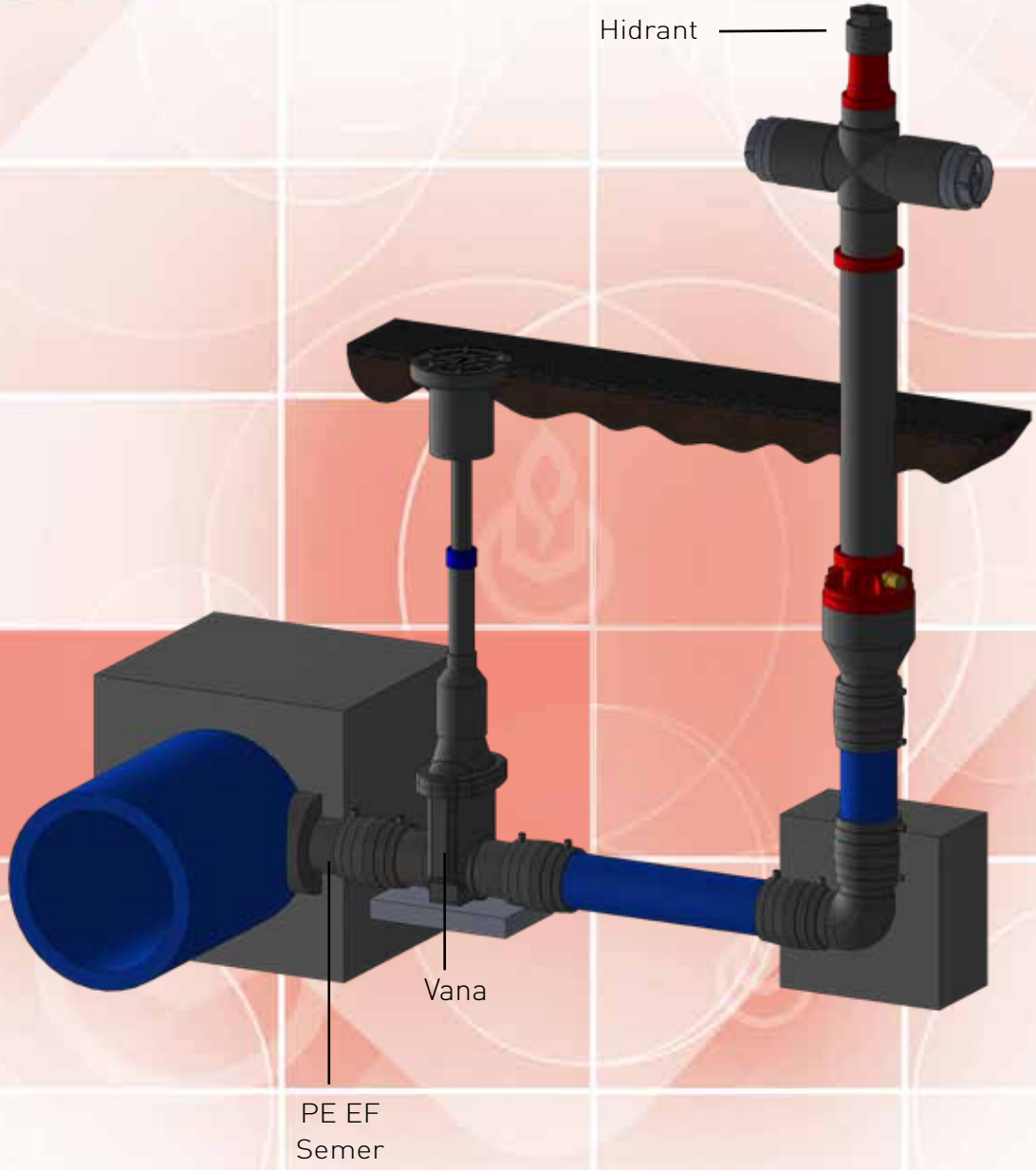
The test tool is placed to the welded pipe line.
Kaynak yapılan boru hattına test aparatı yerleştirilir.

The tool is fixed appropriately.
Yerleştirilen aparatın sabitlemesi yapılır.

The test is realized by applying 24 bar test pressure on butt welded zone by a manual pump.
Manuel pompa ile alın kaynak yapılan alana 24 basınç verilerek test gerçekleştirilir.


tega
tega
4000-S

TEKNİK
TECHNICAL



1- MALZEMELER / *MATERIALS*

1.1- Tanım ve özellikler

Polietilen (PE), daha önceleri yoğunluğuna göre sınıflandırılırken, günümüzde mukavemet sınıflarına göre tanımlanmaktadır (PE 80, PE 100). PE 100, PE 80'e göre daha gelişmiş bir polimerizasyon işlemi görmüş olduğundan; yoğunluğu, sertliği ve mekanik dayanıklılığı daha yüksektir. Ayrıca, akma gerilimi ve çatlak ilerlemesi dayanımı da daha yüksektir.

Dolayısı ile, bu malzeme, PE 80'e göre aynı basınç sınıfına göre daha az et kalınlığı ile kullanılabilmektedir.

PE, diğer termoplastiklere göre daha üstün vasıflar göstermektedir. Bunlardan başlıcaları;

* Yağ, alkali ve zararlı hava şartlarına direnç
* Yüksek yırtılma dayanımı
* Yüksek basınç dayanımı
* Gerilim çatlamasına karşı çok iyi direnç
* Geniş kullanım sıcaklık aralığı (-30 ila +60 oC)
* Korozyona karşı dayanım
* Çok iyi kaynaklanabilirlik, kolay ve güvenli montaj
* Metal borulara göre daha düşük sürtünme kayıpları
* Diğer malzemelere göre daha düşük akış gürültüsü
* PVC den daha düşük yoğunluk
* Yüksek aşınma ve yaşlanma direnci
* Tam elektriksel yalıtkanlık ve çok iyi ısıl yalıtım
* Fizyolojik olarak zehirsiz
* Radyoaktif atıklar için uygunluk - PE radyoaktivite kapmaz.

1.1- Description and Properties

Polyethylene (PE) used to be classified by its density, however, now is classified by its strength classes; namely, PE 80, PE 100. The PE 100 type is a further development of the PE 80 material which results in a modified polymerization process an amended mol mass distribution. Therefore PE 100 types have mostly a higher density and by this, also improved mechanical properties such as increased stiffness and hardness. In addition creep pressure as well as resistance against crack propagation is improved.

Consequently, this material is suitable e.g. for the production of pressure pipes with larger diameters as in comparison to usual pressure pipes out of PE 80 the corresponding pressure rating will be achieved with less wall thickness.

These materials show many superior properties to other thermoplastics. Some of the numerous advantages are;

* *Excellent resistance to oils, acids, alkalis and aggressive ambient air*
* *High rupture strength*
* *High pressure resistance*
* *Very good resistance due to stress cracking*
* *Wide usage temperature range (-30 to +60oC)*
* *Resistant to corrosion*
* *Very good weldability, easy and safe installation*
* *Lower frictional losses compared to metal pipes*
* *Lower generated flow noise compared to other materials*
* *Lower density than PVC*
* *High abrasion and weathering resistance*
* *No electrical conductivity and very good thermal insulation*
* *Physiologically non-toxic*
* *Suitable for drainage of radioactive sewage water, PE does not become radioactive.*

PE 100 - ÖZELLİKLER

ÖZELLİK		STANDART	BİRİM	DEĞER
	Yoğunluk	ISO 1183	gr/cm3	0,95
	Erime Akış Oranı (MFR) 190/5	T 003	gr/10 min.	0,2 – 0,4
	Erime Akış Oranı (MFR) 190/5	T 005	gr/10 min	0,4 – 0,7
	Erime Akış Oranı (MFR) 190/5	T 010	gr/10 min	0,7 – 1,3
Mekanik Özellikler	Çekme Gerilimi (akma)	ISO 527	Kg/cm2	255
	Uzama (sünme)	ISO 527	%	9
	Uzama (kopma)	ISO 527	%	→ 600
	Elastisite Modülü	ISO 527	Kg/cm2	11216
Isıl Özellikler	Yumuşama Sıcaklığı	ISO 306	°C	77
	Şekil Değiştirme Sıcaklığı.	ISO 75	°C	75
	Isıl Genleşme Katsayısı	DIN 53732	1 / °C	0,00018
	Isıl İletkenlik (20 oC)	DIN 52612	W / m °C	0,4
	Alevlenebilirlik	DIN 4102	--	B2
Elektriksel Özellikler	Özgül Hacim Direnci	VDE 0303	Ohm.cm	→ 1016
	Özgül Yüzey Direnci	VDE 0303	Ohm	→ 1013
	Dielektrik Katsayısı	VDE 0303	kV / mm	70

SPECIFIC PROPERTIES OF PE100

PROPERTY		*STANDARD*	*UNIT*	*VALUE*
	Density	*ISO 1183*	*gr/cm3*	*0,95*
	Melt Flow Rate (MFR) 190/5	*T 003*	*gr/10 min.*	*0,2 – 0,4*
	Melt Flow Rate (MFR) 190/5	*T 005*	*gr/10 min*	*0,4 – 0,7*
	Melt Flow Rate (MFR) 190/5	*T 010*	*gr/10 min*	*0,7 – 1,3*
Mechanical Properties	*Tensile Stress (yield)*	*ISO 527*	*Kg/cm2*	*255*
	Elongation (yield)	*ISO 527*	*%*	*9*
	Elongation (break)	*ISO 527*	*%*	*> 600*
	Modulus of Elasticity	*ISO 527*	*Kg/cm2*	*11216*
Thermal Properties	*Softening Point*	*ISO 306*	*°C*	*77*
	Heat Deflection Temp.	*ISO 75*	*°C*	*75*
	Coeff. Of Thermal Expansion	*DIN 53732*	*1 / °C*	*0,00018*
	Thermal Conductivity (20 oC)	*DIN 52612*	*W / m °C*	*0,4*
	Flammability	*DIN 4102*	*--*	*B2*
Electrical Properties	*Specific Volume Resistance*	*VDE 0303*	*Ohm.cm*	*> 1016*
	Specific Surface Resistance	*VDE 0303*	*Ohm*	*> 1013*
	Dielectric Strength	*VDE 0303*	*kV / mm*	*70*

ULTRAVİYOLE (GÜNEŞ IŞIĞI) DİRENCİ

Fiziksel ve kimyasal olarak korunma olmadığı takdirde; PE, ultraviyole (UV) ışını ile zayıflama gösterir. Malzemeye % 2 ila 3 arasında karbon siyahı eklenmesi durumunda, UV girişi kesilerek zayıflama engellenir. Dolayısıyla, siyah renkli PE açık havada kullanılabilmekte, ancak diğer tiplerin yer altında veya koruma kaplaması ile açıkta kullanılmaları gerekmektedir.

ULTRAVIOLET (SUNLIGHT) RESISTANCE

PE is degraded by UV light, if chemical or physical protection is not provided. Addition of 2 to 3% carbon black in PE blocks the UV penetration and thus prevents degrading. Black colored PE can be used in open air, but others are intended for protected use underground or as shielded in the open.

ÇEŞİTLİ MADDELERE KARŞI KİMYASAL DİRENÇ

SEMBOL	ANLAMI
aq	Sulu
Sat	Oda sıcaklığında doymuş
+	Dayanıklı
/	Sınırlı Dayanıklı
-	Dayanıksız

MATERIAL	%conc.	23°C	60°C
A			
Acetic acid	100	+	+
Acetic acid	50	+	+
Acetic acid	10	+	+
Acetic anhydride	100	+	
Acetone	100	+	+
Accumulator acid	38	+	+
Alum	Sat	+	+
Aluminum salt. aq.	Sat	+	+
Ammonia. aq.	Sat	+	+
Ammonium salts. aq.	Sat	+	+
Amyl alcohol	100	+	+
Aniline	100	+	+
Antifreeze glycol	50	+	+
Asphalt	100	+	/
B			
Barium salts, aq.	Sat	+	+
Benzaldehyde	100	+	+
Benzene	100	/	/
Benzine	100	+	/
Benzine, normal	100	+	/
Benzine, super	100	/	-
Benzoic acid, aq.	sat	+	+
12.5 % active chlorine	30	/	-
Bone oil	100	+	+
Borax, aq.	Sat	+	+
Boric acid, aq.	Sat	+	+
Brake fluid	100	+	+
Bromine	100	-	
Bromine *WATER*	Sat	-	-
Butane, liquid	100	+	
Butyl acetate	100	+	
Butyl alcohol	100	+	+
C			
Calcium salts, aq.	Sat	+	+
Carbon disulphide	100	/	
Carbon tetrachloride	100	/	-

* Tabloda verilen değerler hammadde ile ilgilidir. Ürün üretildikten sonra basınç ve sıcaklık faktörleri ile birlikte farklı sonuçlar ortaya çıkabilir, sorumluluk kabul edilmez.

CHEMICAL RESISTANCE TO VARIOUS MATERIALS

SYMBOL	*MEANING*
aq	*Aqueous*
Sat	*Saturated at room temp.*
+	*Resistant*
/	*Limited resistance*
-	*Not resistant*

MALZEME	*%conc.*	*23°C*	*60°C*
A			
Acetic acid	*100*	*+*	*+*
Acetic acid	*50*	*+*	*+*
Acetic acid	*10*	*+*	*+*
Acetic anhydride	*100*	*+*	
Acetone	*100*	*+*	*+*
Accumulator acid	*38*	*+*	*+*
Alum	*Sat*	*+*	*+*
Aluminum salt. aq.	*Sat*	*+*	*+*
Ammonia. aq.	*Sat*	*+*	*+*
Ammonium salts. aq.	*Sat*	*+*	*+*
Amyl alcohol	*100*	*+*	*+*
Aniline	*100*	*+*	*+*
Antifreeze glycol	*50*	*+*	*+*
Asphalt	*100*	*+*	*/*
B			
Barium salts, aq.	*Sat*	*+*	*+*
Benzaldehyde	*100*	*+*	*+*
Benzene	*100*	*/*	*/*
Benzine	*100*	*+*	*/*
Benzine, normal	*100*	*+*	*/*
Benzine, super	*100*	*/*	*-*
Benzoic acid, aq.	*sat*	*+*	*+*
12.5 % active chlorine	*30*	*/*	*-*
Bone oil	*100*	*+*	*+*
Borax, aq.	*Sat*	*+*	*+*
Boric acid, aq.	*Sat*	*+*	*+*
Brake fluid	*100*	*+*	*+*
Bromine	*100*	*-*	
Bromine water	*Sat*	*-*	*-*
Butane, liquid	*100*	*+*	
Butyl acetate	*100*	*+*	
Butyl alcohol	*100*	*+*	*+*
C			
Calcium salts, aq.	*Sat*	*+*	*+*
Carbon disulphide	*100*	*/*	
Carbon tetrachloride	*100*	*/*	*-*

Values given in the table are related with raw materials. After its production, products exposed to prassure and tempature may perform differently. No responsibility is takes.

MATERIAL	%conc.	23°C	60°C
Carbonic acid, aq.	Sat	+	+
Caustic potash solution	50	+	+
Chlorobenzene	100	/	-
Chloride of lime		+	+
Chlorine *WATER*	Sat	/	-
Chlorine, liquid	100	-	
Chloroform	100	/	-
Chlorosulfonic acid	100	-	-
Chromic acid	20	+	+
Chromic/sulphuric acid	Conc.	-	-
Chromium salts, aq.	Sat	+	+
Chromiumtrioxide, aq.	Sat	+	-
Copper (II)-salts,aq.	Sat	+	+
Cresol, aq.	Sat	+	/
Cumolhydroperoxide	70	+	
Cyciohexane	100	+	+
Cyclohexanole	100	+	+
Cyclohexanone	100	+	/
D			
Decahydronaphthalene	100	/	-
Detergents, aq.	10	+	+
Dibutylphthalate	100	+	/
Dibutylsebacate	100	+	/
Diesel oil	100	+	/
Diethylether	100	+	
Dihexylphthalate	100	+	+
Diisononyl Phthalate	100	+	+
Dimethylformamide	100	+	+
Dinonyladipate	100	+	
Dioctyladipate	100	+	
Dioctylphthalate	100	+	+
Dioxane, -1,4	100	+	+
Dixa solution	5	+	+
E			
Ethanol	96	+	+
Ethanol amine	100	+	+
Ethyl hexanol, -2	100	+	+
Ethyl-2-hexane acid	100	+	
Ethyl-2-hexane Acid chloride	100	+	
Ethyl-2-hexyl chloroformiat	100	+	
Ethylacetate	100	+	/
Ethylbenzene	100	/	-
Ethylchloride	100	/	
Ethylene chlorhydrin	100	+	+
Ethylene chloride	100	/	/
Ethylene diamine tetraacetic acid, aq.	Sat	+	+
Ethylglykolacetate	100	+	

MALZEME	*%conc.*	*23°C*	*60°C*
Carbonic acid, aq.	*Sat*	+	+
Caustic potash solution	*50*	+	+
Chlorobenzene	*100*	/	-
Chloride of lime		+	+
Chlorine water	*Sat*	/	-
Chlorine, liquid	*100*	-	
Chloroform	*100*	/	-
Chlorosulfonic acid	*100*	-	-
Chromic acid	*20*	+	+
Chromic/sulphuric acid	*Conc.*	-	-
Chromium salts, aq.	*Sat*	+	+
Chromiumtrioxide, aq.	*Sat*	+	-
Copper (II)-salts,aq.	*Sat*	+	+
Cresol, aq.	*Sat*	+	/
Cumolhydroperoxide	*70*	+	
Cyciohexane	*100*	+	+
Cyclohexanole	*100*	+	+
Cyclohexanone	*100*	+	/
D			
Decahydronaphthalene	*100*	/	-
Detergents, aq.	*10*	+	+
Dibutylphthalate	*100*	+	/
Dibutylsebacate	*100*	+	/
Diesel oil	*100*	+	/
Diethylether	*100*	+	
Dihexylphthalate	*100*	+	+
Diisononyl Phthalate	*100*	+	+
Dimethylformamide	*100*	+	+
Dinonyladipate	*100*	+	
Dioctyladipate	*100*	+	
Dioctylphthalate	*100*	+	+
Dioxane, -1,4	*100*	+	+
Dixa solution	*5*	+	+
E			
Ethanol	*96*	+	+
Ethanol amine	*100*	+	+
Ethyl hexanol, -2	*100*	+	+
Ethyl-2-hexane acid	*100*	+	
Ethyl-2-hexane Acid chloride	*100*	+	
Ethyl-2-hexyl chloroformiat	*100*	+	
Ethylacetate	*100*	+	/
Ethylbenzene	*100*	/	-
Ethylchloride	*100*	/	
Ethylene chlorhydrin	*100*	+	+
Ethylene chloride	*100*	/	/
Ethylene diamine tetraacetic acid, aq.	*Sat*	+	+
Ethylglykolacetate	*100*	+	

MATERIAL	%conc.	23°C	60°C
F			
Fatty acids → C6	100	+	/
Ferrous salt, aq.	Sat	+	+
Fixing salt, aq.	10	+	+
Floor polish	100	+	/
Fluoride, aq.	Sat	+	
Fluosilicic acid	32	+	+
Formaldehyde, aq.	40	+	+
Formalin		+	+
Formic acid	98	+	+
Formic acid	50	+	+
Formic acid	10	+	+
Frigen 11	100	/	
Fuel oil	100	+	/
Furfuryl alcohol	100	+	/
G			
Glycerine	100	+	+
Glycerine, aq.	10	+	+
Glycol	100	+	+
Glycol acid	70	+	+
Glycol, aq.	50	+	+
H			
Heptane	100	+	/
Hexafluosilicic acid, aq.	Sat	+	+
Hexane	100	+	+
Humic acids, aq.	100	+	+
Hydrazine, aq.	1	+	+
Hydriodic acid, aq	Sat	+	
Hydrochinone, aq.	Sat	+	
Hydrochloric acid	38	+	+
Hydrochloric acid	10	+	+
Hydrofluoric acid	40	+	+
Hydrofluoric acid	70	+	/
Hydrogen peroxide	30	+	+
Hydrogen peroxide	3	+	+
Hydrogen sulphide	Low	+	+
Hydrosylammoniumsulphate	Sat	+	+
Hydroxyacetone	100	+	+
I			
Iodine tincture DAB 6			
Isononan acid	100	+	/
Isononan acid chloride	100	+	
Isooctane	100	+	/
Isopropanol	100	+	+
L			
Lactic acid, aq.	90	+	+
Lactic acid, aq.	10	+	+

MALZEME	*%conc.*	*23°C*	*60°C*
F			
Fatty acids > C6	*100*	+	/
Ferrous salt, aq.	*Sat*	+	+
Fixing salt, aq.	*10*	+	+
Floor polish	*100*	+	/
Fluoride, aq.	*Sat*	+	
Fluosilicic acid	*32*	+	+
Formaldehyde, aq.	*40*	+	+
Formalin		+	+
Formic acid	*98*	+	+
Formic acid	*50*	+	+
Formic acid	*10*	+	+
Frigen 11	*100*	/	
Fuel oil	*100*	+	/
Furfuryl alcohol	*100*	+	/
G			
Glycerine	*100*	+	+
Glycerine, aq.	*10*	+	+
Glycol	*100*	+	+
Glycol acid	*70*	+	+
Glycol, aq.	*50*	+	+
H			
Heptane	*100*	+	/
Hexafluosilicic acid, aq.	*Sat*	+	+
Hexane	*100*	+	+
Humic acids, aq.	*100*	+	+
Hydrazine, aq.	*1*	+	+
Hydriodic acid, aq	*Sat*	+	
Hydrochinone, aq.	*Sat*	+	
Hydrochloric acid	*38*	+	+
Hydrochloric acid	*10*	+	+
Hydrofluoric acid	*40*	+	+
Hydrofluoric acid	*70*	+	/
Hydrogen peroxide	*30*	+	+
Hydrogen peroxide	*3*	+	+
Hydrogen sulphide	*Low*	+	+
Hydrosylammoniumsulphate	*Sat*	+	+
Hydroxyacetone	*100*	+	+
I			
Iodine tincture DAB 6			
Isononan acid	*100*	+	/
Isononan acid chloride	*100*	+	
Isooctane	*100*	+	/
Isopropanol	*100*	+	+
L			
Lactic acid, aq.	*90*	+	+
Lactic acid, aq.	*10*	+	+

MATERIAL	%conc.	23°C	60°C
Lauric acid chloride	100	+	
Lithium salts	sat	+	+
Lysol		+	/
M			
Magnesium salts, aq.	Sat	+	+
Menthol	100	+	
Mercuric salts, aq.	Sat	+	+
Mercury	100	+	+
Methan sulphoic acid	50	+	
Methanol	100	+	+
Methoxyl butanol	100	+	/
Methoxyl butyl acetate	100	+	/
Methyl cyclohexane	100	+	/
Methyl ethyl ketone	100	+	+
Methyl glycol	100	+	+
Methyl isobutyl ketone	100	+	/
Methyl sulphuric acid	50	+	/
Methyl-4-pentanol-2	100	+	+
Methylacetate	100	+	+
Methyene chloride	100	/	
Mineral oil	100	+	/
Monochloracetic acid ethyl ester	100	+	+
Monochloracetic acid methyl ester	100	+	+
Morpholine	100	+	+
Motor oil	100	+	/
N			
Na-dodecyl benz. Sulphon.	100	+	+
Nail polish remover	100	+	/
Neodecane acid	100	+	
Neodecane acid chloride	100	+	
Nickel salts, aq.	Sat	+	+
Nitric acid	50	/	/
Nitric acid	25	+	+
Nitrobenzene	100	+	/
Nitrohydrochloric acid	3:1	+	-
Nitromethane	100	+	
O			
Oils, etherial		+	
Oils, vegetable	100	+	+
Oleic acid	100	+	/
Oleum	→100	-	-
Oxalic acid, aq.	Sat	+	+
P			
Paraffin oil	100	+	/
Paraldehyde	100	+	
PCB	100	/	
Pectin	Sat	+	+
Perchlorethylene	100	/	-
Perchloric acid	20	+	+

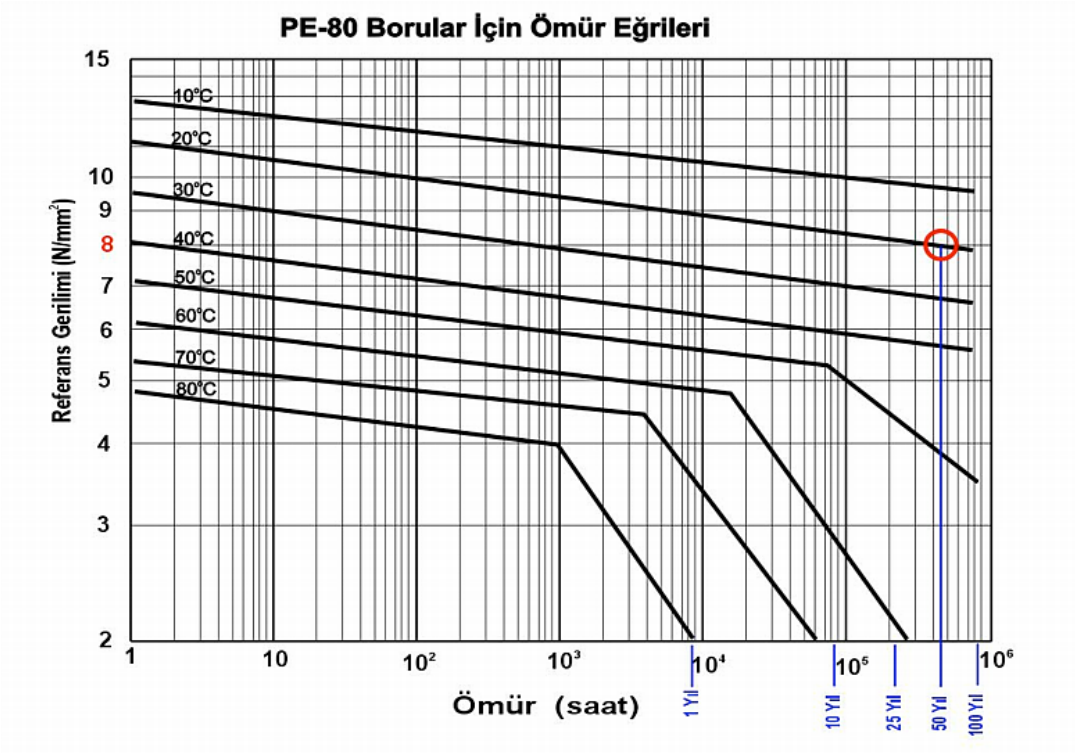
MALZEME	*%conc.*	*23°C*	*60°C*
Lauric acid chloride	*100*	+	
Lithium salts	*sat*	+	+
Lysol		+	/
M			
Magnesium salts, aq.	*Sat*	+	+
Menthol	*100*	+	
Mercuric salts, aq.	*Sat*	+	+
Mercury	*100*	+	+
Methan sulphoic acid	*50*	+	
Methanol	*100*	+	+
Methoxyl butanol	*100*	+	/
Methoxyl butyl acetate	*100*	+	/
Methyl cyclohexane	*100*	+	/
Methyl ethyl ketone	*100*	+	+
Methyl glycol	*100*	+	+
Methyl isobutyl ketone	*100*	+	/
Methyl sulphuric acid	*50*	+	/
Methyl-4-pentanol-2	*100*	+	+
Methylacetate	*100*	+	+
Methyene chloride	*100*	/	
Mineral oil	*100*	+	/
Monochloracetic acid ethyl ester	*100*	+	+
Monochloracetic acid methyl ester	*100*	+	+
Morpholine	*100*	+	+
Motor oil	*100*	+	/
N			
Na-dodecyl benz. Sulphon.	*100*	+	+
Nail polish remover	*100*	+	/
Neodecane acid	*100*	+	
Neodecane acid chloride	*100*	+	
Nickel salts, aq.	*Sat*	+	+
Nitric acid	*50*	/	/
Nitric acid	*25*	+	+
Nitrobenzene	*100*	+	/
Nitrohydrochloric acid	*3:1*	+	-
Nitromethane	*100*	+	
O			
Oils, etherial		+	
Oils, vegetable	*100*	+	+
Oleic acid	*100*	+	/
Oleum	*>100*	-	-
Oxalic acid, aq.	*Sat*	+	+
P			
Paraffin oil	*100*	+	/
Paraldehyde	*100*	+	
PCB	*100*	/	
Pectin	*Sat*	+	+
Perchlorethylene	*100*	/	-
Perchloric acid	*20*	+	+

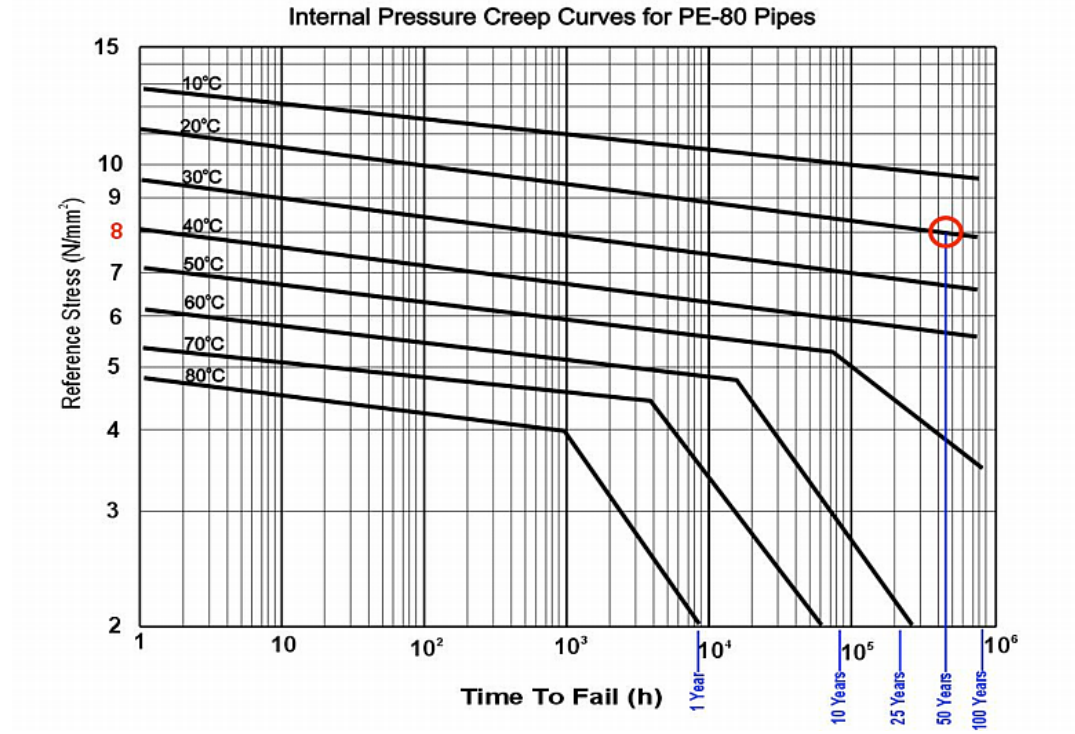
MATERIAL	%conc.	23°C	60°C
Perchloric acid	50	+	/
Perchloric acid	70	+	-
Petroleum	100	+	/
Petroleum ether	100	+	/
Phenol, aq.	Sat	+	+
Phenylchloroform	100	/	
Phosphates, aq.	Sat	+	+
Phosphoric acid	85	+	/
Phosphoric acid	50	+	+
Photographic developers		+	+
Potassium permanganate, aq.	Sat	+	+
Potassium persulphate aq.	Sat	+	+
Potassium salt, aq.	Sat	+	+
Potassium soap	100	+	+
Propane, liquid	100	+	+
Pyridine	100	+	/
S			
Salad oil	100	+	+
Salted *WATER*	Sat	+	+
Sea *WATER*		+	+
Shoe polish	100	+	/
Silicone oil	100	+	+
Silver salts. aq.	Sat	+	+
Soap solution	Sat	+	+
Soap solution	10	+	+
Soda lye	60	+	+
Sodium chlorate, aq.	25	+	+
Sodium chlorite, aq.	5	+	+
Sodium hypochlorite, aq.	5	+	+
Sodium hypochlorite, aq.	30	/	/
Sodium hypochlorite, aq.	20	+	+
Sodium salts, aq.	Sat	+	+
Succinic acid, aq.	Sat	+	+
Sulphur dioxide, aq.	Low	+	+
Sulphuric acid	96	-	-
Sulphuric acid	50	+	+
Sulphuric acid	10	+	+
T			
Tannic acid	10	+	+
Tar	100	+	/
Tartaric acid, aq.	Sat	+	+
Test fuel, aliphatic	100	+	/
Tetrachlorethane	100	/	-
Tetrachlorethylene	100	/	-
Tetrahydro naphthalene	100	+	-
Tetrahydrofuran	100	/	-
Thiophene	100	/	/
Tin-II-chloride, aq.	Sat	+	+
Toluene	100	/	-

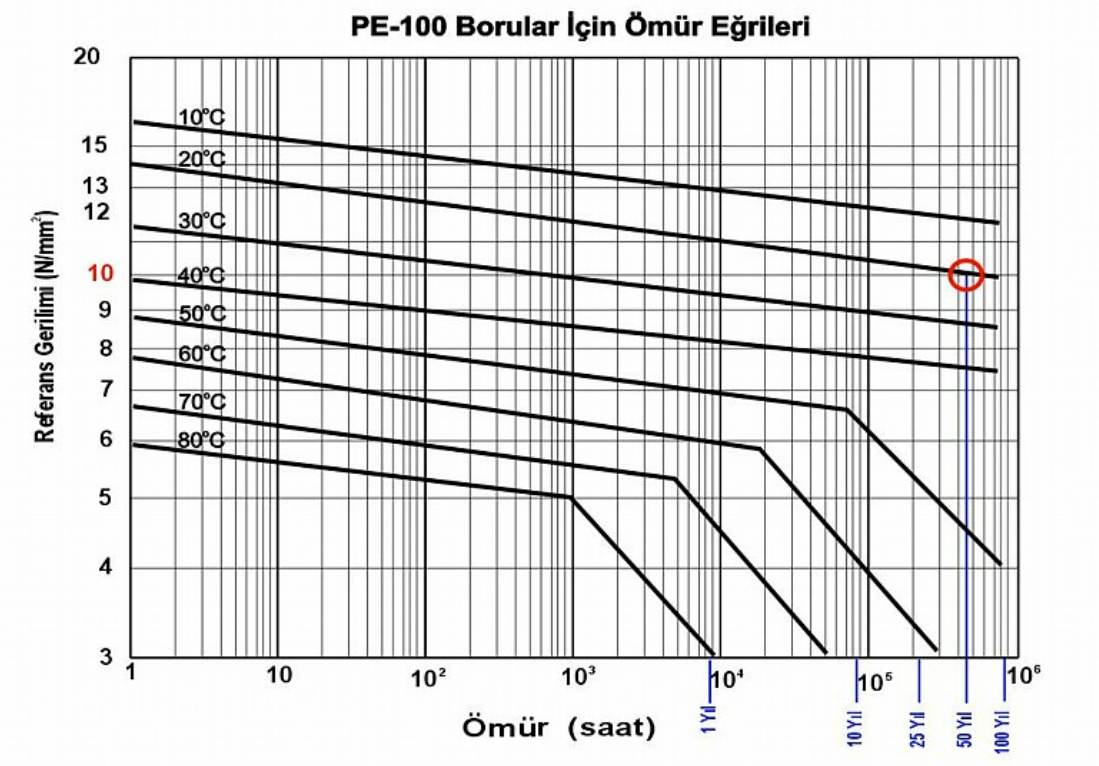
MALZEME	*%conc.*	*23°C*	*60°C*
Perchloric acid	*50*	+	/
Perchloric acid	*70*	+	-
Petroleum	*100*	+	/
Petroleum ether	*100*	+	/
Phenol, aq.	*Sat*	+	+
Phenylchloroform	*100*	/	
Phosphates, aq.	*Sat*	+	+
Phosphoric acid	*85*	+	/
Phosphoric acid	*50*	+	+
Photographic developers		+	+
Potassium permanganate, aq.	*Sat*	+	+
Potassium persulphate aq.	*Sat*	+	+
Potassium salt, aq.	*Sat*	+	+
Potassium soap	*100*	+	+
Propane, liquid	*100*	+	+
Pyridine	*100*	+	/
S			
Salad oil	*100*	+	+
Salted water	*Sat*	+	+
Sea water		+	+
Shoe polish	*100*	+	/
Silicone oil	*100*	+	+
Silver salts. aq.	*Sat*	+	+
Soap solution	*Sat*	+	+
Soap solution	*10*	+	+
Soda lye	*60*	+	+
Sodium chlorate, aq.	*25*	+	+
Sodium chlorite, aq.	*5*	+	+
Sodium hypochlorite, aq.	*5*	+	+
Sodium hypochlorite, aq.	*30*	/	/
Sodium hypochlorite, aq.	*20*	+	+
Sodium salts, aq.	*Sat*	+	+
Succinic acid, aq.	*Sat*	+	+
Sulphur dioxide, aq.	*Low*	+	+
Sulphuric acid	*96*	-	-
Sulphuric acid	*50*	+	+
Sulphuric acid	*10*	+	+
T			
Tannic acid	*10*	+	+
Tar	*100*	+	/
Tartaric acid, aq.	*Sat*	+	+
Test fuel, aliphatic	*100*	+	/
Tetrachlorethane	*100*	/	-
Tetrachlorethylene	*100*	/	-
Tetrahydro naphthalene	*100*	+	-
Tetrahydrofuran	*100*	/	-
Thiophene	*100*	/	/
Tin-II-chloride, aq.	*Sat*	+	+
Toluene	*100*	/	-

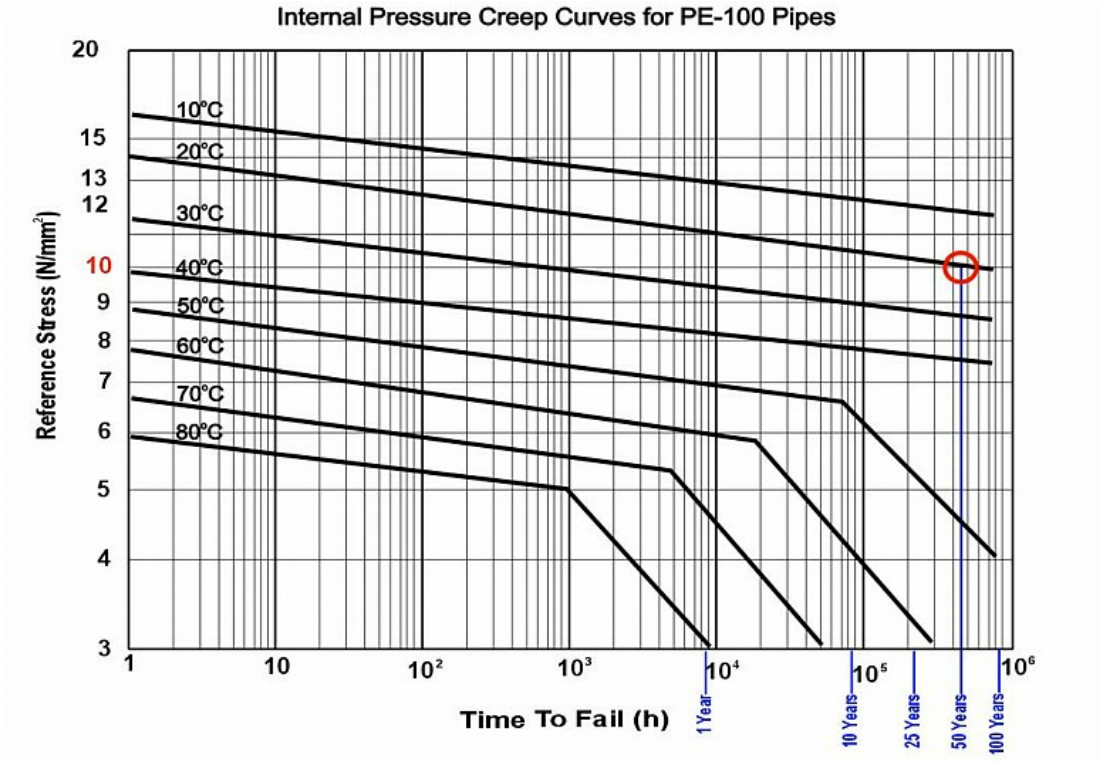
MATERIAL	%conc.	23°C	60°C
Transformer oil	100	+	/
Trichlorethylene	100	/	-
Tricresyl phosphate	100	+	+
Trioctyl phosphate	100	+	/
Two-stroke oil	100	+	/
U			
Urea, aq.	Sat	+	+
Uric acid	Sat	+	+
Urine		+	+
W			
Washing-up liquid, fluid	5	+	+
WATER glass	100	+	+
Wetting agent	100	+	/
X			
Xylene	100	/	-
Z			
Zinc salts, aq.	Sat	+	+

MALZEME	*%conc.*	*23°C*	*60°C*
Transformer oil	*100*	+	/
Trichlorethylene	*100*	/	-
Tricresyl phosphate	*100*	+	+
Trioctyl phosphate	*100*	+	/
Two-stroke oil	*100*	+	/
U			
Urea, aq.	*Sat*	+	+
Uric acid	*Sat*	+	+
Urine		+	+
W			
Washing-up liquid, fluid	*5*	+	+
Water glass	*100*	+	+
Wetting agent	*100*	+	/
X			
Xylene	*100*	/	-
Z			
Zinc salts, aq.	*Sat*	+	+


PE-80 Borular İçin Ömür Eğrileri
Referans Gerilimi (N/mm²)
15
10
9
8
7
6
5
4
3
2
10°C
20°C
30°C
40°C
50°C
60°C
70°C
80°C
1
10
10²
10³
10⁴
10⁵
10⁶
Ömür (saat)
1 Yıl
10 Yıl
25 Yıl
50 Yıl
100 Yıl


Internal Pressure Creep Curves for PE-80 Pipes
Reference Stress (N/mm²)
15
10
9
8
7
6
5
4
3
2
10°C
20°C
30°C
40°C
50°C
60°C
70°C
80°C
1
10
10²
10³
10⁴
10⁵
10⁶
Time To Fail (h)
1 Year
10 Years
25 Years
50 Years
100 Years


PE-100 Borular İçin Ömür Eğrileri
Referans Gerilimi (N/mm²)
20
15
13
12
10
9
8
7
6
5
4
3
10°C
20°C
30°C
40°C
50°C
60°C
70°C
80°C
1
10
10²
10³
10⁴
10⁵
10⁶
Ömür (saat)
1 Yıl
10 Yıl
25 Yıl
50 Yıl
100 Yıl


Internal Pressure Creep Curves for PE-100 Pipes
Reference Stress (N/mm²)
20
15
13
12
10
9
8
7
6
5
4
3
10°C
20°C
30°C
40°C
50°C
60°C
70°C
80°C
1
10
10²
10³
10⁴
10⁵
10⁶
Time To Fail (h)
1 Year
10 Years
25 Years
50 Years
100 Years

2- Saha Montajı

2.1- Depolama ve Taşıma

2.1.1- Depolama

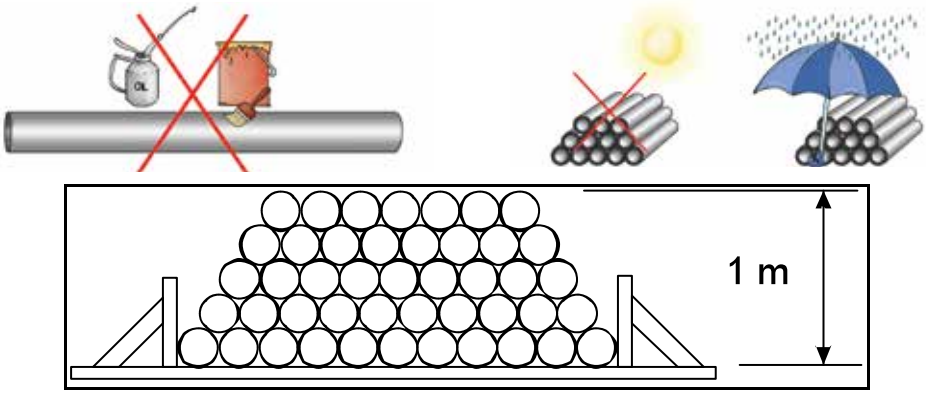
PE ürünleri depolarken bazı önlemler alınmak zorundadır.
* Önerilen en fazla yükseklik 1 m olup, yığılmış borular için dağılmaya karşı önlem alınmalıdır.
* Kangal borular en iyi silo olarak depolanabilirler. Kangallar bu silolardan birer birer, dengeyi bozmadan alınabilir.
* Düz borular sıralar halinde üst üste depolanabilirler. Borular birbirleriyle açı yapmamalı, alt sıra ise yanal harekete karşı sabitlenmelidir. Yan dikme destekler, boruların ucundan 600 mm kadar sonra başlamalı, en az 100 mm eninde olmalı ve 1.5 m den fazla aralıklı olmamalıdır.

2- Field Applications

2.1- Storage and Handling

2.1.1- Storage

Some precautions have to be taken when storing PE products.
** Maximum recommended storage height is 1 m, and the pipes should be secured to prevent bundles splitting open.*
** Coiled pipes are best stored in silo packs. Individual coils can be taken from the silo pack without disturbing the stability.*
** Straight pipes can be stacked in rows, laid straight and not crossed or entangled with another. The base row must be secured by blocking any possibility for sideways movement.*
The side support blocks must begin at about 600 mm from each end, be at least 100 mm wide and be spaced no more than 1.5 meters.



Boruların üstüste depolanması

Stacking of pipes

* Borular yatay bir düzlemde depolanmalı ve keskin objelerle temas etmemelidir.
* PE fitingler kapalı bir alanda, naylon ambalajlar içinde depolanmalıdır.
* Boru ve fitinglerin toprak, pislik, atık su veya solventler ile teması önlenmelidir.

** The pipes must be stored on a level floor and not be in contact with sharp objects.*
** PE fittings must be stored in a closed place and within nylon bags on site.*
** Precautions against contamination of pipes and fittings, by soil, dirt, waste water or solvents should be taken.*

2.1.2- Taşıma

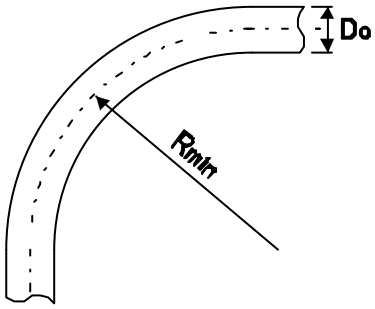
* Donma noktası civarı ve daha düşük sıcaklıklarda, PE sertleşerek darbe ve gerilimlere karşı daha dirençsiz olur. Bundan dolayı, borular yere düşürülmemeli, alet veya diğer malzemelerle darbe görmemeli, yüksek hızda yerde sürüklenmemelidir.
* El testeresi ile keserken, boru iki tarafından da desteklenmelidir. Düşük sıcaklıklarda keserken gerilime maruz kaldığı takdirde borular kırılabilir.
* PE boruların bükme yarıçapı (Rmin), boru çapına ve ortam sıcaklığına göre farklılık gösterir.

2.1.2- Handling

** At temperatures near and below freezing point, PE becomes stiffer and more vulnerable to impacts and stresses. So, care should be taken not to drop pipe, make impacts on it with tools or other objects, or not to drag at speeds where bouncing can harm the pipe.*
** Pipes should be supported at both sides when cutting with a handsaw. At low temperatures, the pipes may fracture if bending stress is present while cutting.*
** Bending radius of PE pipes (Rmin) vary with their diameter and ambient temperature.*

Sıcaklık	20oC	10oC	5oC
Boru ekseninde Minimum Bükme Yarıçapı (Do= dış çap)	20xDo	35xDo	50xDo

Temperature	*20oC*	*10oC*	*5oC*
Minimum Bending Radius at Pipe Axis (Do= outer diameter)	*20xDo*	*35xDo*	*50xDo*



* Boruların taşınacağı vasıtaların kasaları, tam boyu alacak kadar uzun olmalıdır.
* Vasıta üzerinden borular alınırken, geniş kayışlarla vinç veya forklift kullanılmalıdır. Birim alana daha fazla yük bineceğinden dolayı kaldırmak için halat veya zincir kullanılmamalıdır. Hiçbir şekilde, borular ve fitingler vasıta üstünden yere atılmamalıdır.

2.2- Mesnetleme

2.2.1- Açıkta (havada) mesnetlenmiş döşeme

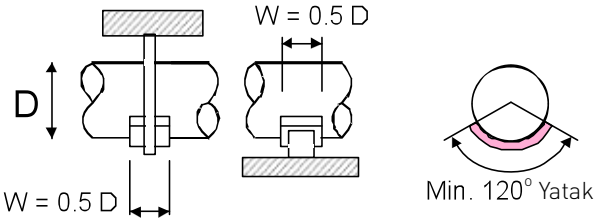
Mesnetleme aralıkları, borunun ebadına, özelliklerine, akışkan yoğunluğuna, ortam sıcaklığına ve serim hattına bağlıdır.
Genellikle aralıklı mesnetler kullanılmasına rağmen, küçük çaplar için (ör. 20-40 mm) kesintisiz mesnetler gerekebilir.
Mesnet semerleri, borunun alt yüzeyinde en az 120 derece yataklama yapmalı ve en az boru çapının yarısı kadar geniş olmalıdır. Mesnet kenarları boruyu korumak için keskin kenarlı olmamalıdır. Bu kriterler ışığında, örneğin, U-cıvatalar PE boru tespiti için uygun değildir.

** Vehicles for transportation should have beds that are long enough to support the whole length of pipes.*
** When unloading the vehicle on site, silo packs and palletized items should be taken off the vehicle by wide web slings or by a forklift. Wire ropes and chains should not be used as they can damage the pipes. In no cases should the pipes and fittings be rolled or pushed off the vehicle to the ground.*

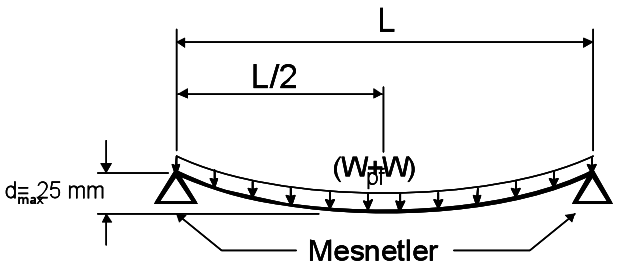
2.2- Supporting

2.2.1- Above Grade Supporting

The support distances depend on the physical properties of laid pipe, the pipe size, the density of the flow media, operating temperature and piping layout.
Applications usually involve non-continuous supports, but for small diameters (e.g. 20-40 mm) continuous supports may be necessary.
Supports for pipes must cradle at least 120 degrees of the lower part of the pipes, and have a width of minimum 0.5 pipe diameter. The support edges must be rounded, free of sharp edges to prevent cutting into pipes. In the light of these criteria, for example, U-bolts are not suitable for PE pipe supporting.



PE borunun mesnetlenmesi / *Supporting of PE pipes*



Mesnet aralığı için şekil / *Figure for support spacing*

Mesnet aralıkları, mesnetler arası izin verilen çökmeye, boru malzemesine ve boyutlarına, içerideki akışkana ve sıcaklığa bağlıdır. Mesnet aralıkları aşağıdaki formülden hesaplanabilir:

L = [(3840xExIxd / (5(Wp+Wf))1/4] / 100

Açıklamalar;
L: Mesnet aralığı (m)
E: Elastisite modülü (MPa)
I: Borunun atalet momenti (cm4)
d: izin verilen çökme (cm)
Wp: Borunun birim ağırlığı (kg/cm)
Wf: Akışkanın birim ağırlığı (kg/cm)

The effective spans are related to allowed collapse value between the effective spans, the material and size of the pipe , the inner fluid and the temperature. The values of the effective spans can be calculated with the below formula:

L = [(3840xExIxd / (5(Wp+Wf))1/4] / 100

The explanations;
L: The effective span (m)
E: The elasticity modüle (MPa)
I: The inertial momentum of the pipe
d: The allowed collapse value
Wp: The unit weight of the pipe
Wf: The unit weight of the fluid

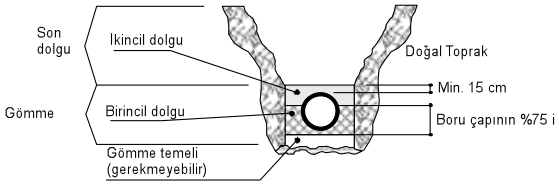
Uzun süreli kullanımlar için, PE100 boruların tipik E değerleri tablosu:
For long-term usage, typical E values for PE100 pipes are shown in the table below:

Sıcaklık/Temp. (°C)	-29	-18	4	16	23	38	49	60
E (Mpa)	476	413	270	206	194	159	103	79

2.2.2- Toprağa gömerek döşeme

Toprağa boru döşemek; kaz, boru döşe, üstünü kapat türü bir yaklaşımdan çok daha ciddi ve zor bir iştir. Bu işlem ciddi mühendislik yaklaşımları gerektirir. Burada detayına inmeğe çalışmak çok anlamsız olacaktır; ancak, temel kavramlardan söz edilecektir. Burada söz edilen konular temel bir rehber niteliğinde olup, gerçek işlemler uzman mühendisler tarafından, her işin gerektirdiği farklı uygulama yöntemlerine karar verilerek yapılmalıdır.

Boru Gömmeye Dair Malzeme ve İşlem Terminolojisi
Terminolojide, malzemelerin bulunduğu yere veya işlevlerine göre terimler yer almaktadır.



Boru Gömme Terminolojisine Dair Şekil

2.2.2- As Buried in Soil

Burying pipes in soil is in no ways simple as it looks – dig, lay the pipes, then cover with soil. Serious engineering concepts are involved with the process. It will be meaningless here, to introduce these concepts with detail; however, basics in considerations will be given. Please remember that these topics given here are for guide purposes only; and burying pipes in soil should be carried out by professional engineers.

Terminology of Pipe Embedment Materials
The materials enveloping a buried pipe are generally identified, as shown by their function or location (see Figure below).

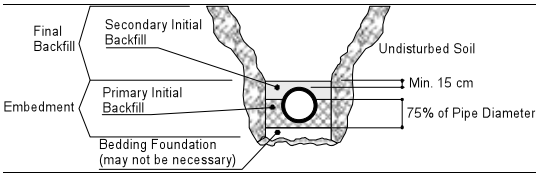


Figure for Terminology of Pipe Embedment Materials

Gömme Temeli – Kazılan hendek dibi yeterli sağlamlıkta bir zemin oluşturmuyor ise gereklidir.

Birincil ve İkincil Dolgular – Hendek dibinden itibaren, borunun en az 15 cm üstüne çıkacak şekilde yapılan toprak dolgudur. Borunun yüklere dayanımı ve oynamaya karşı direncini bu dolgunun kalitesi belirler.

Yataklama – Hendek zeminini istenen düz seviyede yapma işlemidir.

Birincil Dolgu – Borunun alt bölümünü çevreleyen ve boru çapının %75 ine kadar yükselen dolgudur. Bu malzemenin kalitesi ve uygulama tekniği, dolgulama işleminin en önemli aşamasıdır.

İkincil Dolgu – Bu dolgunun temel amacı, üstten gelen yüklerin dağıtılması ve son dolguda olabilecek oynamalara karşı boruyu korumasıdır. Yeraltı sularının boru seviyesinin üstüne çıkabileceği durumlarda, ikincil dolgu birincil dolgunun evsaf olarak devamı olmak durumundadır. Minimum hendek genişliği, çalışma bölgesi şartları ve gömme malzemelerinin evsafına bağlıdır.

Son Dolgu – Son dolgu işlev itibarı ile bir gömme malzemesi olmadığından, yapısı ve basılmasının boruya olan etkisi fazla değildir. Ancak, sert bir son dolgu da boruya binecek olan üst yükleri azaltacaktır. Boruya gelebilecek hasarları önlemek açısından, son dolgu malzemesinde iri kayalar, organik malzemeler ve molozlar bulunmamalıdır. Son dolgunun malzeme ve sıkıştırma işlemleri yol, kaldırım, vb. yapım kurallarına uyumlu olmalıdır.

PE Boru İçin Montaj Yönergeleri

İlgili mühendis, çalışma yeri ve yüzey altı şartlarını ve uygulama hedeflerini gözönünde bulundurarak borunun ihtiyacı olan takviye derecesini saptamak durumundadır. Uygulama derinliğinin fazla olması, toprağın tutuculuğunun yetersiz olması, yüzey veya yol yüklerinin fazla olması, boru et kalınlığının ince olması gibi durumlarda özel montaj yönergesinin hazırlanması gereklidir. Aslında çoğu zaman aşağıda belirtilen genel uygulama yöntemlerinin de yeterli olduğu bir gerçektir. Bu uygulamalar, tipik olarak, fazla derine döşenmedğinden üstünde aşırı toprak yükü olmayan, yeterince dayanıklı basınçlı boruların olduğu hallerdedir. Bu uygulamaların yol kestiği bazı kısımlarında özel mühendislik dikkati isteyen durumlar olabilmektedir.

Basınçlı Borular İçin Basitleştirilmiş Uygulama Yöntemleri

(Küçük çaplı borular çoğu zaman yüzeye yakın döşenip yeterli dayanıklıkta olduklarından, özel bir çökme incelemesi gerektirmemektedirler).

Foundation - *A foundation is required only when the native trench bottom does not provide a firm working platform for placement of the pipe bedding material.*

Initial Backfill - *This is the critical zone of embedment soil surrounding the pipe from the foundation to at least 15 cm over the pipe. The pipe's ability to support loads and resist deflection is determined by the quality of the embedment material and the quality of its placement. The bedding, haunching, primary, and secondary zones are within the initial backfill zone.*

Bedding - *In addition to bringing trench bottom to required level, the bedding levels out any irregularities and ensures uniform support along the length of the pipe.*

Haunching - *The backfill under the lower half of the pipe distributes the combined loadings. The nature of the haunching material and its placement are the most important factors in limiting the deformation of PE pipe.*

Primary Initial Backfill - *This zone of backfill provides the support against lateral pipe deformation. To ensure such support is available, this zone should extend from trench level up to at least 75 percent of the pipe diameter. Under some conditions, such as when the pipe will be permanently below the ground water table, the primary initial backfill should extend to at least 15 cm over the pipe.*

Secondary Initial Backfill - *The basic function of the material in this zone is to distribute overhead loads and to protect the pipe from any adverse effects of the placement of the final backfill. When groundwater levels are expected to reach above the pipe, the secondary initial backfill should be a continuation of the primary initial backfill in order to provide optimum pipe support. Minimum trench width will depend on site conditions and embedment materials.*

Final Backfill - *As the final backfill is not an embedment material, its nature and quality of compaction has a less effect on the flexible pipe. However, arching and thus a load reduction on the pipe is promoted by a stiff backfill. To preclude the possibility of impact or concentrated loadings on the pipe, both during and after backfilling, the final backfill should be free of large rocks, organic material, and debris. The material and compaction requirements for the final backfill should reflect good construction applications and satisfy local ordinances and sidewalk, road building, or other applicable regulations.*

Installation Guidelines for PE Pipe

The engineer must evaluate the site conditions, the subsurface conditions, and the application objectives to determine the extent of support the pipe may need from the surrounding soil. Where the pipe burial depth is relatively deep, where subsurface soil conditions are not supportive of pipe, or where surface loads or live loads are present, or where the pipe DR is high, it is of importance that the engineer prepares a specific installation specification. On the other hand, there are many applications that meet the criterion below for using Simplified Installation Guidelines. Typically these lines contain pressure pipes installed at

Çoğu zaman, aşağıda belirtilen basit adımlar başarılı bir uygulama için yeterlidir. Bu adımlar, şu şartların sağlanması halinde geçerlidir:
1. Boru çapı 600 mm veya daha az
2. SDR (Standard Dimension Ratio - Dış çapın et kalınlığına oranı) 26 veya daha az
3. Dolgu yüksekliği 0.75 m ve 5 m arasında
4. Yeraltı suyu yüksekliği her zaman yüzeyden 60 cm den daha aşağıda
5. Boru döşenmesi oynamayan toprakta.

Oynamayan topraktan kasıt, toprağın dik veya dike yakın derecede kesilmesi halinde toprağın akmadan durabilmesi halidir. Toprağın yüksek taşıma dayanımına da sahip olması gereklidir.
Aşağıdaki uygulamalar, genel anlamda olup işin erbabı bir mühendisin yaptığı uygulamaları kontrol amacı ile kullanılmamalıdır.

Basitleştirilmiş Montaj Aşamaları
Hendek Kazma
Hendek çökmelerinin her toprakta olabilme ve çalışanların sağlık veya hayatına tehlike oluşturma durumu vardır. Takviyelendirilmemiş kazılarda, hendek kenarları güvenli bir açıda tutulmalı ve yerel iş güvenliği kurallarına uyulmalıdır. Tüm desteklemeler boru seviyesinin üstünde yer almalıdır. Kazılan hendek bölümlerinin uzunlukları hesaplanırken, boru aşağı sarkıtılırken önerilen asgari bükme yarıçapından daha keskin bükümler olmayacak boyda kazılmasına dikkat edilmelidir. Hendek genişliği 600 mm çaptan daha küçük borular için boru çapı + 300 mm; daha büyük çaplar için boru çapı + 600 mm kadar olmalıdır.
Boru çapı ve döşeme derinliğine göre önerilen hendek boyları arkadaki tabloda verilmektedir:

shallow depths which are sufficiently stiff to resist the minimal earth load. In some cases a pipeline may contain sections that require specific engineering such as a section that crosses a road.

Simplified Installation Guidelines for Pressure Pipe
(Small diameter pressure pipes usually have adequate stiffness and are usually installed in such shallow depths that it is unnecessary to make an internal inspection of the pipe for deflection.)
A quality job can be achieved for most installations following the simple steps that are listed below. These guidelines apply where the following conditions are met:
1. Pipe Diameter of 600 mm or less
2. SDR (Std. Dimension Ratio) equal to or less than 26
3. Depth of Cover between 0.75 m and 5 m.
4. Groundwater elevation never higher than 60 cm below the surface
5. The route of the pipeline is through stable soil

Stable soil is an arbitrary definition referring to soil that can be cut vertically or nearly vertically without significant sloughing, or soil that is granular but dry (or de-watered) that can stand vertical to at least the height of the pipe. These soils must also possess good bearing strength. Examples of soils that normally do not possess adequate stability for this method are mucky, organic, or loose and wet soils.
Where the above conditions are met, installation specifications from the following steps can be written. It should be made sure that all state and local safety regulations are met.

The following are general guidelines for the installation of PE pipe. Other satisfactory methods or specifications may be available. The information below should not be substituted for the judgment of a professional engineer in achieving specific requirements.

Simplified Step-by-Step Installation
Trenching
Trench collapses can occur in any soil and are dangerous for worker health, or lives. In unsupported excavations, proper attention should be paid to sloping the trench wall to a safe angle; local codes should be consulted. All trench shoring and bracing must be kept above the pipe. (If this is not possible, consult the more detailed installation recommendations.) The length of open trench required for fused pipe sections should be such that bending and lowering the pipe into the ditch does not exceed the manufacturer's minimum recommended bend radius. The trench width at pipe grade should be equal to the pipe outer diameter (OD) plus 300 mm for pipes with OD 600 mm or less; and OD plus 600 mm for pipes with OD greater than 600 mm.

Table for suggested trench lengths with regard to Pipe OD and trench depth:

Hendek Derinliği (m)/ *Depth of Trench (m)*

Asgari Hendek Boyu (m) / *Min. Length of Trench (m)*	Boru Çapı (mm) / Nom. Pipe Size (mm)	1	1.5	2.1	2.8	3.4	4
	15 - 80	4.6	6.1	7.6	9.1	10.7	12.2
	100 - 200	7.6	9.1	10.7	12.2	13.7	15.2
	250 - 350	10.7	12.2	13.7	15.2	16.8	18.3
	400 - 550	13.7	15.2	16.8	18.3	19.8	21.3
	600 - 1050	0	18.3	19.8	21.3	22.9	24.4
	1200	0	0	24.4	27.4	30.5	33.5

Sudan korumak

Güvenli ve uygun yapım için, hendekteki suyun borunun ağız altı seviyesinden daha aşağıda tutulması ve boruya su girmemesi gereklidir. Bu, suyun toplanacağı derin kuyular kazmak veya pompa ile suyu devamlı boşaltmak şeklinde olabilir.

Yataklama

Hendek zemini problemsiz olarak açılıp düzleştirilebiliyorsa, basınçlı borular doğrudan hendek zeminine yerleştirilebilir. Hendek zemini hafif dalgalı olabilir; ancak, boru zemine tam oturmalı, boşluk veya tümsek üstünde kalmamalıdır. Toprağın kayasız veya kazı sırasında güzelce ufalandığı durumlarda, kazı toprağı zeminde yataklamak için de kullanılabilir. Hendek dibi kayalıksa, taban üstüne 10-15 cm kadar dolgu yapılabilir. Dolgu malzemesi serbestçe akabilen çakıl, kum, çamurlu veya killi kum olabilir. Ancak, bu malzemelerin içindeki taşlar 1 cm den daha küçük olmalıdır.
Bu malzemelerden 15 cm kadar yükseklikte sıkıştırılmış zemin, boruya güzel bir yatak oluşturur.

Boruyu Hendeğe Yerleştirmek

200 mm çapa ve kabaca 9 kg/m ağırlığa kadar olan borular, hendeğe el ile döşenebilir. Daha büyük borular için mutlaka uygun taşıma ve kaldırıp indirme ekipmanına gerek vardır. Borular hiçbir şekilde hendeğe yuvarlanmamalı, itilmemeli ve atılmamalıdır. Hendek çevresinde insanlar olduğu zaman mutlaka gerekli güvenlik önlemleri alınmalıdır.
Güneşte ısınıp genleşmiş bir boru hendeğe koyulduğunda soğuyup büzülecektir. Bu soğuma çekmesi, boruların mekanik birleşme bağlantılarından çıkmasına sebep olabilir. Bundan dolayı, borular hendeğe indirildikten sonra soğuması için beklenmeli, sonra mekanik bağlantılar yapılmalıdır.

Boruyu Kavisli Döşemek

Flanş ve fitingli bağlantılar borudan daha sert olduğu için, kavis içinde böyle bir bağlantı varsa, bu bağlantının hem öncesi hem sonrasında 5 boru çapına kadar olan mesafede asgari büküm yarıçapı boru çapının 100 katı olmalıdır.
Boruyu kavisli hendek içine yerleştirirken ve birincil dolgu yapılırken, boru kavisini korumak için geçici destekler kullanılması gerekebilir. Son dolgudan önce bu destekler kaldırılmalı, oluşan boşluklara yine birincil dolgu malzemesinden dolgu yapılmalıdır.

De-watering

For safe and proper construction the groundwater level in the trench should be kept below the pipe invert. This can be done by deep wells, well points or sump pumps placed in the trench.

Bedding

Pressure pipes may be installed directly on the prepared trench bottom if the trench bottom soil can be cut and graded without difficulty. For pressure pipe, the trench bottom may undulate, but must support the pipe smoothly and be free of ridges, hollows, and lumps. In other situations, bedding may be prepared from the excavated material if it is rock free and well broken up during excavation. The trench bottom should be relatively smooth and free of rock. When rocks or large stones are met which may cause point loading on the pipe, they should be removed and the trench bottom padded with 10-15 cm of bedding material. Bedding should consist of free-flowing material such as gravel, sand, silty sand, or clayey sand that is free of stones or hard particles larger than 1 cm.
A mat of at least 15 cm of compacted embedment material will provide satisfactory bedding.

Placing Pipe in Trench

PE pressure pipe up to about 200 mm diameter and weighing roughly 9 kg/m or less can usually be hand-placed in the trench. Heavier, larger diameter pipe will require equipment to lift, move, and lower the pipe into the trench. Pipe must not be dumped, dropped, pushed, or rolled into the trench. Proper safety precautions must be taken whenever people are in or near the trench.
Placing pipe that has been in direct sunlight in a cooler trench will result in thermal contraction of the pipe's length. This contraction can generate forces which could result in pull-out of couplings. Pipe should be allowed to cool before making connections to an anchored joint, flange, or a fitting that requires protection against excessive pull-out forces.

Installation of Pipe in Curves

Since fittings and flange connections are rigid compared to the pipe; when a fitting or flange connection is present in the bend, the minimum bend radius should be 100 times the pipe's outside diameter (OD). The bend radius should be limited to 100 x OD for a distance of about 5 times the pipe diameter on either side of the fitting location.
Field bending involves excavating the trench to the desired bend radius, then sweeping or pulling the pipe string into the required bend and placing it in the trench. Temporary restraints may be required to bend the pipe, and to maintain the bend while placing the pipe in the trench and placing initial backfill. Temporary blocks or restraints must be removed before installing final backfill, and any voids must be filled with compacted initial backfill material. Caution: Considerable force may be required to field bend the pipe, and the pipe may spring back forcibly if the restraints slip or are inadvertently released while bending. Related safety precautions should be applied during field bending.

Dikkat: Boruyu kavislendirmek için yüksek güç gerekebilir, geçici desteklerden borunun kurtulması halinde tehlikeli geri yaylanma olabilir. Böyle durumlarda mutlaka ilgili güvenlik önlemleri alınmalıdır.

Birincil Dolgu

Birincil dolgu malzemesi, döşenmiş boruyu yerinden oynatmayacak şekilde yerine konmalı ve sıkıştırılmalıdır. Bu sırada, malzemenin borunun altına tamamen girdiği ve borunun alt kısmını güzelce sarmaladığı kontrol edilmelidir. Bu işlem için titreşimli kompaktörler, darbeli kompaktörlerden daha uygundur.

PE Borudan Farklı Malzemeden Boru Veya Fitinge Contalı Geçiş

PE boru kaynakla birleştirildiği zaman pratikte eksiz bir boru niteliğinde olmaktadır. Boru basınçlandırıldığında, iki farklı iç kuvvet altında kalır.

1- Büküm veya boru sonlarındaki itme kuvveti boruya eksenel çekme gerilimi olarak yansır,

2- İç basınçtan dolayı çevresel gerilim oluşur.

Eksenel gerilim, borunun boyunu uzatmaya, çevresel gerilim de çapı genişletmeye, genişletirken de Poisson Oranı'na göre boyu kısaltmaya çalışır. Tamamen PE olan bir sistemde bu etkenler birbirlerini hemen hemen yok ederler. Sonuç olarak, gömülmüş bir PE sistem kendi kendini tutar ve itmeye karşı önlem almak gerekmez.

Ancak; PE boru, başka bir malzemeye, sabitlenmemiş contalı elemanlarla bağlandığı zaman farklı bir durum oluşur. Eksenel kuvvet oluşmayabilir. Bu durumda, genleşen çap boydan kısalmaya yol açabilir ve boru ek yerinden kurtulabilir.

Genellikle, böyle bir geçişin olduğu hallerde PE borunun uçlarını sabitlemek gerekir. Şayet contalı eleman sabitlenmişse, boruyu ayrıca sabitlemeye gerek yoktur.

PE Fitinglerin Gömülmesi

Kaynaklanmış PE boru ve fitings, tek parça olma özelliğindedir. Dolayısı ile basınç itmesine karşı ayrıca sabitlemek gerekmez. Muflu bağlantılarda ise ek yeri mutlaka ayrılmaya karşı sabitlenmelidir.

Elastik şekil değişimi, ısıl genleşme/büzülmeler vs. dolayı olan hareketler PE boruya zararlı değildir; ancak, vana veya benzeri armatürlerin eklenmesinden dolayı olacak hareketler boruya aşırı yükler getirebilir. Çoğu zaman, uygun dolgulama aşırı yükleri engeller.

Genel fitings, dirsek ve Te ayrımlar için boru ile aynı dolgu malzemesi yeterlidir. Servis bağlantıları da PE malzemeden yapılırsa özel sıkıştırma gerekmez. Servis bağlantları taşıt yolu altında yapılmışsa, buralarda %95 Standart Proctor yoğunluğunda sıkıştırma gereklidir.

Su ve yangından koruma sistemlerinde, ana hattan vana ve hidrantlara ayrımlarda redüksiyonlu Te bağlantılar sıkça kullanılmaktadır. Aşağıdaki şekilde, böyle uygulamalar için çeşitli sabitleme yöntemleri gösterilmektedir. Te ve dirseklerde çevresel sıkıştırma yapmak yerine çimentolu kum ile sağlamlaştırmak çok daha kolaydır.

Haunching

Haunching material must be carefully placed and compacted so as not to disturb the pipe from its line and grade while ensuring that it is in firm and intimate contact with the entire bottom surface of the pipe. Usually a vibratory compactor has less tendency to disturb the pipe than an impact tamper.

Transition from PE Pressure Pipe to Gasket Jointed Pipe

The heat fusion joint used for PE pipe creates an essentially continuous length of pipe. When the pipe is pressurized two significant internal forces are present in the pipe.

1- End thrust from bends or end caps is transmitted through the pipe as a longitudinal force.

2- Circumferential stress occurs due to the internal pressure.

The longitudinal force tends to grow the pipe length while the circumferential thrust expands the diameter and tends to contract the pipe's length in proportion to Poisson's Ratio. In an all PE pipe system, the length effects from these two forces tend to cancel each other out. As a result, buried PE pipes are self-restrained and require no blocking against thrust.

However, a different situation occurs when PE pipe transitions to a different type of pipe material that is joined by non-restrained gasket joints. The longitudinal force may no longer be present. The result is that circumferential expansion is now unbalanced and will cause contraction of the PE pipe. This contraction can result in pulling apart of gasket joints in line with the PE pipe.

Generally, it is necessary to anchor the ends of a PE pipeline that makes a transition into an unrestrained gasket jointed pipe system. If the gasket joints are restrained, anchoring is unnecessary.

Proper Burial of Fabricated PE Fittings

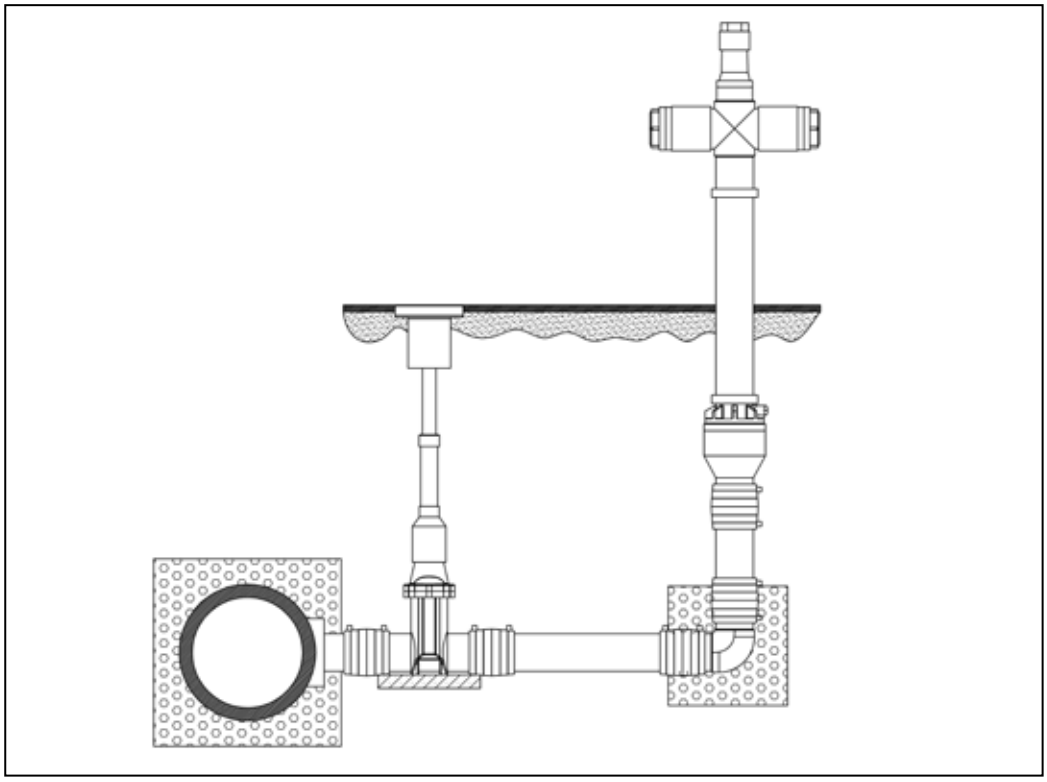
Heat fused PE pipe and fittings are monolithic structures, which do not require thrust blocks to restrain the longitudinal loads resulting from pipe pressurization.

Since fittings are part of the monolithic structure no thrust blocks are needed to keep the fittings from separating from the PE pipe. However; bell and spigot piping systems must have thrust blocks or restrained joints to prevent separation of pipe from fittings when there is a change of direction.

Pipe movement due to elastic deformation, thermal expansion/ contraction, etc. is not harmful to PE pipe, but pipe movement or the addition of valves or other elements used with PE pipe systems can cause excessive loads. In most cases, proper backfill prevents excessive loads.

Common fittings, elbows and equal tees normally require the same backfill as the pipe. When service connections are made from PE water mains, no special compaction is required. When service connections are made under an active roadway, 95% Standard Proctor density is normally required around the pipe and the service connection.

In water systems and fire protection piping systems, reducing tees are frequently used to connect from the main to valves and hydrants. Figure below shows the use of concrete support pads, thrust blocks on hydrants, self restrained PE mechanical joint adapters and sand stabilized with cement around the bend and reducing tee. While no true thrust blocks are on the PE pipe or fittings in this arrangement, the sand stabilized with cement provides proper support for the reducing tee. Stabilizing sand with cement or flowable filling material is easier than trying to compact around the fittings.



PE fitinglerin gömülmesine dair çeşitli örnekler

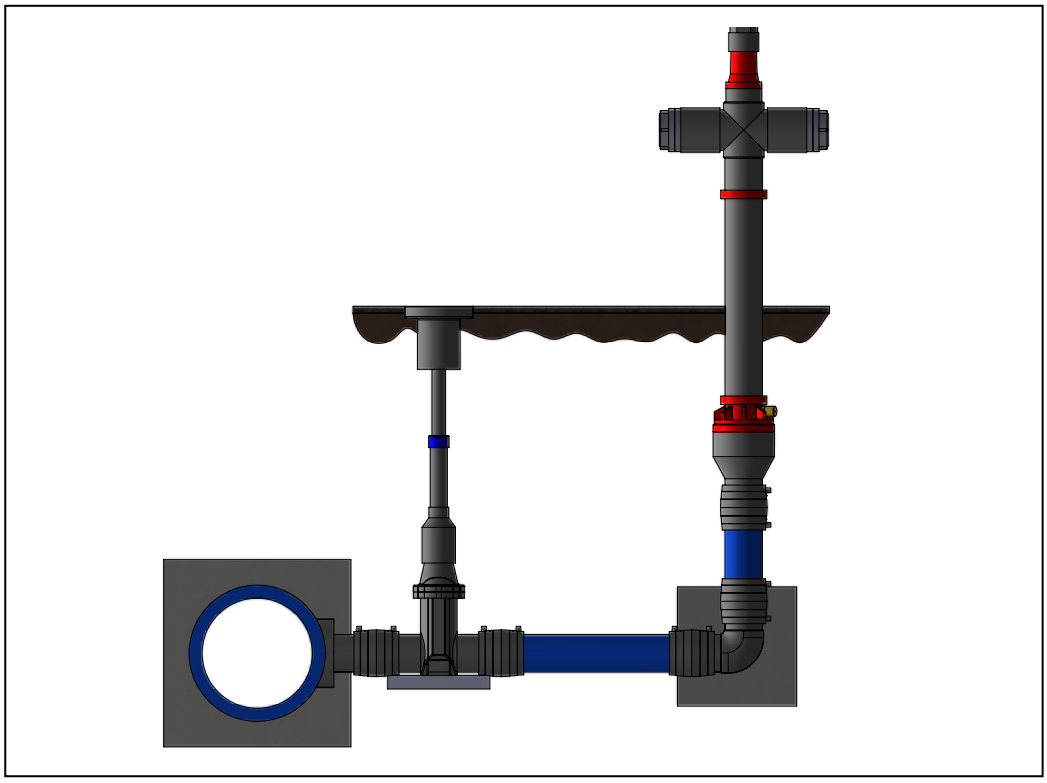


Figure for samples of PE fittings burial

Boru Gömme

Gömme malzemesi çakıl, kum, veya kaba parçacıklar içeren çamurlu / killi kum olabilir. Parça büyüklüğü 50-100 mm borular için 10 mm, 150-200 mm borular için 20 mm, daha büyükler için 25 mm den küçük olmalıdır.
Gömme malzemesi 15 cm den az katlar halinde yapılmalı, mekanik bir sıkıştırıcı ile sıkıştırıldıktan sonra bir üst kata geçilmelidir.

Kaçak Testi

Kaçak testleri gerekiyorsa, Bölüm 2.6 da açıklanan şekilde gerçekleştirilmelidir.

Hendek Son Dolgusu

Son dolguda kazıdan çıkan malzeme kullanılabilir, ama uygun olmayan malzemelerin ayıklanması gereklidir (iri kil parçaları, organik malzemeler, 20 cm den büyük kayalar gibi).
Borunun taşıt yolu altından geçtiği hallerde, son dolgu da kademeli olarak, her kademe %95 Standart Proctor yoğunluğunda sıkıştırılarak yapılmalıdır.
Son dolgu boru montajı bittikten hemen sonra yapılmalıdır. Böylece boru, olası darbelerden, su basması sebebi ile borunun yerinden oynamasından veya soğuk havalarda dolgu malzemesinin donmasından korunmuş olacaktır.

2.2.3- Su altında döşeme

Su altı uygulamaları için PE boru son derece uygun bir malzemedir. Ana sebebi korozyona karşı dayanıklılık olsa bile, aşağıda sayılan diğer avantajları da çok önemlidir:

* PE Hafiftir – Belli bir çap ve performans şartlarında, kullanılacak olan PE boru beton borudan %10, çelik borudan %50 daha hafif olduğundan taşıma ve montajda kolaylık sağlar.
* PE Yüzer – PE yoğunluğu tatlı suyun %96sı, deniz suyunun ise %94ü kadar olduğundan, içi su dolu olsa bile su üstünde kalmaktadır. Uzun boylar kıyıda birleştirilip hedefe kadar su üstünde yüzdürülerek taşınabilir, yerinde ağırlık eklenerek dibe indirilebilir.
* Kaynaklı Birleşimler – Alın kaynağı metodu ile mekanik bağlantılara gerek kalmadan PE boruları boy boy birbirine eklenebilir. Kaynatılan yerler borunun kendisi kadar sağlamdır ve mekanik bağlantılarda olan sızdırma riski bulunmamaktadır.
* PE Esnektir – PE boruyu suya yavaş yavaş indirerek taban yüzeyine uyum göstererek oturması mümkündür.
* PE Yumuşaktır – Yüksek şekil değiştirme özelliğinden dolayı, su altı dalga ve akıntılarının yarattığı değişken yüklere başarı ile karşı koyar, aynı sebeplerden dolayı olan dip yüzey değişikliklerine borunun uyumlu olmasını sağlar.

PE borular su dolu olduğu halde yüzdüklerinden, karada veya bir yüzer platform üzerinde iken ağırlıklar eklenmelidir. Boru hattı yüzdürülerek gerekli yere çekilir ve batırılır. Tipik ağırlık tasarımında, boru hava ile doluyken (uçları kapatılmış) ağırlıklarla yüzebilmeli, su doldurulunca da batabilmelidir. Ağırlıkların fazla yapılması gerektiği hallerde, yüzdürmek için geçici bağlanmış varillerden faydalanılabilir.
Kıyıda iken, ağırlıkların boruya bağlandığı yer bir rampa

Pipe Embedment

The embedment material should be a coarse grained soil, such as gravel or sand, or a coarse grained soil containing fines, such as a silty sand or clayey sand. The particle size should not exceed 10 mm for 50-100 mm pipe, 20 mm for 150-200 mm pipe and 25 mm for all other sizes. Where the embedment is angular, crushed stone may be placed around the pipe by dumping and slicing with a shovel.
Where the embedment is naturally occurring gravels, sands and mixtures with fines, the embedment should be placed in lifts, less than 15 cm in thickness, and then tamped. Tamping should be accomplished by using a mechanical tamper (600 kN-m/m3).

Leak Testing

If a leak test is required, it should be conducted in accordance with the procedure in Section 2.6 after the embedment material is placed.

Trench Backfill

The final backfill may consist of the excavated material, but it must be free from unsuitable matter such as large lumps of clay, organic material or Stones larger than 20 cm, or construction debris. Where the pipe is located beneath a road, the final backfill should be done in lifts and be compacted to 95 percent Standard Proctor Density.
Backfilling should be done as soon as possible after pipe placement and assembly. This prevents the pipe from being dislocated by cave-ins, protects the pipe from external damage, eliminates pipe lifting due to flooding of open trench and in very cold weather, reduces the possibility of backfill material becoming frozen.
In most cases, compaction will be required for all material placed in the trench from 15 cm below the pipe to at least 15 cm above it.

2.2.3- Underwater Application

Polyethylene (PE) piping is very beneficial to be used for various underwater applications. Immunity to corrosion is the major reason for choosing PE. However, other beneficial features, listed below, also contribute to the usage of PE in underwater applications:

** PE Has Low weight – For a given pipe diameter and equivalent performance requirements, the weight of PE pipe is around 10% of the weight of concrete pipe and less than 50% of iron. So handling is easier.*
** PE is buoyant – Because PE's density is about 96% of fresh water, and about 94% of that for sea water, PE pipe floats even if it is filled with water. Long lengths can be assembled on shore and then be floated to its target location, and then ballasted to keep it anchored at its final submerged location.*
** Welded joints – Using butt fusion method, continuous lengths of PE pipe can be welded without using mechanical joining elements. The welded joints are as strong as the pipe, and they eliminate the risk of leakages from mechanical joints.*
** PE is Flexible – It is possible to sink the PE pipe gradually and to adapt to the natural contours of underwater surfaces. This means that the flexible pipeline can normally be placed directly on the natural bottom without any trenching or other form of preparation of continuous level support.*
** PE is Ductile – Because of its high deformation capacity, PE piping can safely compensate for variable external forces due to waves and currents. PE piping can also safely shift or bend to adjust itself to altered bedding that can result by the strong waves and currents.*

Since the PE pipes will float even when filled with water, ballast weights must be installed, either on shore or on barges over water. The pipeline is then floated into location and sunk into its position. Typical ballast weight design allows an air-filled

ile suya kavuşabilir. Bu sayede, ağırlıklı borular suya kaydırılabilir. Su üstünde de, yüzer platform vinçleri ağırlıklı boruyu nakletme ve yerleştirmede kullanılabilirler.
Boru hattı bir tekne ile veya halatlarla çekilerek yerine götürülür. Batırma sırasında pozisyonu bozulmasın diye geçici olarak sabitlemek mümkündür. Kıyı tarafından boruya su verilip diğer tarafındaki ucundan hava kontrollü bir şekilde tahliye edilerek borunun yavaşça suya batması sağlanır. Bu işlem sırasında her iki ucun da su seviyesinden yüksekte tutulması gereklidir. Hava tahliye hızı, suyun boruya dolma hızını kontrol eder.
Suyun dolma hızının kontrolü, borunun aniden dolarak kırılmaya yol açacak bir büküme uğramasına engel olmak açısından çok önemlidir.
Şayet boru su altında da toprağa gömülecekse, tüm hendek açma işlemi batırma işinden önce yapılmalıdır. Sualtı dolgusu küçük boyuta ufalanmış kayalardan oluşmalı, ek koruma gerekiyorsa bu dolgunun üstüne kaya veya beton parçaları yerleştirilmelidir.

Sualtı Uygulamaları İçin Temel Dizayn ve Montaj Aşamaları:
Hemen tüm sualtı uygulamalarında, aşağıda belirtilen aşamalar geçerlidir:
1. Uygun boru çapı belirlenmesi
Akışkan cinsi, debi ve boru hattının uzunluğu esas alınarak hidrolik hesaplar yapılmalı ve
asgari boru iç çapı belirlenmelidir.

2. Montaj ve çalışma şartları gözönünde bulundurularak uygun Boyut Oranı (DR-Dimension Ratio) hesaplanması
Bu işlem, borunun öngörülen sıcaklık ve basınç şartlarında güvenli hizmet vermesi açısından önemli ve gereklidir. Bu konuda bilgi Bölüm 3.1 de verilmiştir. Ayrı bir "emniyet katsayısı" olarak, çalışma sıcaklığını borunun iç veya dış ortamından hangisi yüksekse o değeri almak önerilir.
Seçilen borunun basınç değerinin, çalışmada olabilecek koç darbelerini de karşıladığı kontrol edilmelidir. Koç darbeleri pompaya yol verme veya durdurma sırasında olabilmektedir. Bu konudan da Bölüm 3.2 de bahsedilmiştir.

3. Boruyu batırmak için gerekli ağırlık ve montaj aralıklarının hesaplanması
3.1. Boruyu hedefe "ne yüzerek, ne batarak" durumda taşımak için gerekli ağırlık belirlenir. Suyun içindeki bir borudaki kaldırma kuvveti, boru ve içindekinin ağırlığı ile borunun taşırdığı suyun ağırlığı arasındaki fark kadardır. Bu bağlantı şu şekilde ifade edilebilir:

F = [Wboru + Wmadde] – Wtaşma

F = birim metredeki kaldırma kuvveti, kg/m boru
Wboru = borunun birim ağırlığı, kg/m boru
Wmadde = boru içindeki maddenin birim ağırlığı, kg/m boru

pipeline to float with ballast weights attached, if both ends of the pipeline are capped. Temporary floats such as barrels attached to the pipeline may be required to control sinking; if the line is designed with heavy ballast weights.
On shore, ballast weight installation can be eased with a sliding ramp to slide ballasted pipe into the water. Over water, barge mounted cranes may be used to handle pipe with ballast weights. Once ballasted, the pipeline is moved into position with marine craft or pulled into position with cables. Temporary anchoring may be necessary to maintain position during sinking. Water is introduced from the shore end, and air is vented slowly from the other end. Water must not be allowed to run the full length of the pipe. The shore end should be raised slightly to create a u-bend of water that moves down the line as the line sinks. The floating air bleed end should also be above the water level to prevent water entry. Bleeding rate of air from the floating end controls the water entry rate.
It is essential that sinking rate must be under control, so the pipe does not bend too tightly and kink.
If the pipeline is to be buried inside the water bedding, all trench work must be done before sinking. Underwater backfill should be coarse soil such as crushed rock. If additional erosion protection is necessary, large stones or broken concrete may be placed over the initial backfill.

Basic Design and Installation Steps for Underwater Applications:
In almost all underwater applications, the design and installation of PE piping requires the following basic steps:

1. Selection of proper pipe diameter
Pipe minimum inside diameter should be calculated by employing hydraulic calculations, dependent on the required flow rate and the pipe length.

2. Determination of proper pipe DR (Dimension Ratio - proper wall thickness) considering the installation and operating conditions
This is necessary for the pipe to operate safely at the maximum design net internal pressure at the maximum proposed operating temperature. Information for determining the appropriate pipe DR is presented in Section 3.1. As an extra "safety factor", it is of good practice to pressure rate the pipe for the maximum anticipated operating temperature of either the internal or external environment, whichever is higher.
A check should also be made to make sure that the selected pipe pressure rating is also sufficient to resist any momentary pressure surges above normal operating pressure. Pressure surges can occur during pump start-ups or shut-downs. Guidance for selecting a PE pipe with sufficient surge pressure strength is also presented in Section 3.2.

3. Designing the weight and pitch of the ballast weights' spacing that will be used to sink and then hold the pipe in position
3.1. The necessary weighting that is required to "neither sink nor float" condition (for transporting to the intended place before sinking) is determined. The buoyant force on a submerged PE pipe is equal to the sum of the weight of the pipe and its contents minus the weight of the water that the pipe displaces. This relationship can be expressed as:

F = [Wpipe + Wcont] – Wdispl

F = buoyant force, kg/m of pipe
Wpipe = weight of pipe, kg/m of pipe
Wcont = weight of pipe contents, kg/m of pipe
Wdispl = weight of water displaced by pipe, kg/m of pipe

Wtaşma = borunun taşırdığı suyun birim ağırlığı, kg/m boru

3.2. Batırılmış borunun tam tespiti için gerekli ağırlık hesaplanır.

Çoğu durumda, (boru dipte su ile dolu halde iken) taşırdığı su ağırlığının %25 ila %50 si arasında bir ağırlık eklenmesi, borunun dipte tam tespiti için yeterlidir. Bu yüzdelerin düşük değerleri göl gibi sakin sularda yeterli iken akıntılı yerlerdeki haller için yüksek değerlere geçilmektedir.

Dalga hareketinin en etkin olduğu kıyıya yakın yerlerde, boruyu gömmek sıkça yapılan bir uygulamadır. Hatırlanması gereken bir nokta; su altında yapılan bir dolgu ince parçacıklı kum veya toprak olduğu taktirde, dalga hareketlerinin dolguyu gevşek ve akışkan hale getirmesinden dolayı borunun yerinden çıkabileceğidir. Boruyu taşırdığı su ağırlığının en az %40 I kadar bir ağırlıkla desteklemek, bu duruma engel olabilir.

Borular aşağıdaki farklı şekillerde batırılabilir:

Gerekli ağırlıklar iki aşamada bağlanabilir: Batırılacağı yere kadar yüzmesine yetecek kadar ağırlık bağlanır, batırıldıktan sonra yerinde ek ağırlıklar eklenir.

İkinci bir metod, tam ağırlıklar konulup batırılacağı yere kadar geçici dubalara bağlanarak yüzdürülür ve yerinde duba bağlantıları çözülerek boru batırılır.

Üçüncü bir metod da, ağırlıkların boruya su üstündeki bir yüzen platformda bağlanarak (aşırı bükülmeden olabilecek kırılmalara dikkat ederek) suya bırakılması ve ilerlerken bu işlemin devam etmesidir.

3.3. İstenmeyen yüzme etkisi yaratmaması için boruda hava cebi kalmadığından emin olunmalıdır.

3.4. Boruya bağlanacak ağırlık miktarları ve bağlama aralıkları belirlenir.

Ağırlıklar arası mesafenin hesabındaki kriterler, boruyu havada mesnetleme ile hemen hemen aynıdır. Her iki durumda da boru, yayılmış yük altındadır; su içinde buna ek olarak akıntı ve dalga etkilerine maruzdur. Esas amaç, borunun bu bileşik kuvvetler altında maruz kalacağı bükme gerilimleri ve şekil değiştirmenin güvenli sınırlar içinde kalmasıdır.

Aşağıdaki tabloda, genelde uygulanan ağırlık aralıkları gösterilmektedir. Hava cebi kalması riskine karşı önlem olarak, havada mesnetlenme aralıklarından daha az aralıklarla ağırlıklar konulmaktadır.

3.2. Minimum weighting for the anchoring of a submerged pipe in its final position is determined.

In most cases a weighting of 25 to 50% of the pipe displacement is enough to maintain a properly anchored submerged PE pipe after it has been filled with water. The lower values of weight have been found satisfactory in cases (like in lake crossings), where current and wave action are relatively mild, while the larger values of weight are used in sea installations where sea actions are stronger. Closer to the shore, where wave action is at its strongest, it is a common practice to protect the pipe by trenching. It should be noted that, when a trench is refilled with fine-grained soil, the buried pipe can sometimes float from the trench, resulting from the fluidization of the fill by strong wave action. This situation can be avoided by weighting the pipe to at least 40% of its displacement.

Pipes can be submerged in different ways, such as;

The attachment of the required ballast weights can be done in two steps: primary weighting is conducted so as to still allow the pipe to be floated into position, and then the additional required weights are added where required after the completion of the submerging of the pipe.

Another way is to temporarily increase the pipe's buoyancy by employing empty tanks, or large blocks of rigid plastic foamed material that are then released, as the pipe is being submerged.

A third method is to attach the required ballast weights onto the pipe from a barge from which the pipe is slid to the bottom by means of a sled that is designed to ensure that the bending of the pipe is below the buckling limit.

3.3. It should be made sure that no air is trapped in the pipes to facilitate unwanted buoyancy. A surge basin can be used in the system design, at a point before the pipe enters the water. Care should be taken that no high points are present in the pipe layout, where air pockets can occur.

3.4. Weights and spacing of the ballasts that are attached to the pipe is determined.

The principles for determining the spacing between ballasts are almost the same as those for the support spacing criteria for above-ground suspended pipelines. In both cases the pipes are subject to a distributed loading – in the case of submerged pipelines, by the combined effect of current, lift and wave actions. The objective of the design is to limit resultant pipe deflection so that the maximum bending stresses and strains are within safe limits.

Listed in Table below, are commonly used ballast spacing. To satisfy the aim for preventing air entrapment, the spans in this table are somewhat shorter than for pipes that are suspended above ground.

Nominal Boru Çapı (mm) Nominal Pipe Diameter (mm)	Takribi Aralık (m) Approximate Spacing (m)
← 300	1.5 – 3.0
→300 - ←600	2.2 – 4.5
→600 - 1600	3.0 – 6.0

3.5. Ağırlıkların tasarım ve yapımı; ağırlıklar tipik olarak betonarme olarak yapılır. Farklı şekillerde olabilirler, ancak, batırma sırasında burulmaya yol açmaması açısından daire, kare, altıgen gibi simetrik kesitler tercih edilir. Batırılmış boru belirgin akıntılar içinde kalacaksa, burulma hareketine önlem olarak tabanı düz olan ağırlık şekilleri tercih edilir.
Ağırlıklar üst ve alt parçalardan oluşmalı ve birbirine tam bağlandığı zaman boru ile arasında ufak bir açıklık kalmalıdır. Bu açıklık, yumuşak boru ve sert ağırlık arasında boru güvenliği açısından araya konacak tampon malzemesi içindir. Tampon malzemesinin diğer bir işlevi de, sürtünme tabakası oluşturarak ağırlığın (özellikle batırma sırasında) boru üstünde kaymasını önlemektir. Tampon malzemeleri üstüste sarılmış 3 mm kalınlıkta lastik veya 6 mm kalınlıkta neopren levha gibi malzemeler olabilir.
Tecrübeler göstermiştir ki, gelgit veya akıntıların çok olduğu deniz uygulamalarında, alt kısmı üst kısmından daha ağır olan ağırlıkl blokları daha avantajlı olmaktadır. Bu blokların üst ve alt kısımlarında korozyona dayanıklı (ör. paslanmaz çelik) kaldırma kulakları, cıvata-somun bulunmalıdır.

3.5. Design and construction of ballast weights; ballasts are typically made of reinforced concrete. Ballasts can be made in different shapes, although a symmetrical design such as round, square, or hexagonal is preferred to avoid twisting during submersion. Flat-bottomed ballasts are preferred if the submerged piping will be subjected to significant currents, tides or wave forces; because they help prevent torsional movement of the pipe.
The ballasts should have a top and bottom section that; when mated, the resultant inside diameter is slightly larger than the outside diameter of the pipe. This slightly larger inside diameter is to allow the placement of a cushioning material to protect the softer PE pipe from being damaged by the hard ballast material. Another function of the cushioning is to provide frictional resistance that will help prevent the ballasts from sliding along the pipe during the submersion process. Some suggested cushioning materials can be several wraps of approximately 3 mm thick rubber sheet or approximately 6 mm thick neoprene sponge sheet.
Additionally, experience has shown that in certain marine applications where tidal or current activities may be significant, an asymmetric ballast design in which the bottom portion of the ballast is heavier than the upper portion of the ballast is recommended. Suitable lifting lugs should be included in the top and bottom sections of the ballasts. The lugs and the tightening elements should be corrosion resistant (e.g. stainless steel).

Ağırlık bloklarının tipik ağırlıkları aşağıdaki tabloda verilmiştir:

Typical properties of ballast weights are shown in the table below:

Boru Dış Çapı (mm) *Outside Diameter of Pipe (mm)*	Borudaki % Hava Miktarına Karşı Koymak Üzere Ağırlık Bloklarının Aralıkları *Spacing of Ballast Weights To Overcome % Air (m)*			Betonarme Blokların Takribi Ağırlıkları (kg) *Approximate Weight of Concrete Block (kg)*	
	10%	15%	20%	Havada *In Air*	Tatlı Suda *In Fresh Water*
90	3	2	1,5	6	4
110	3	2	1,5	9	5
140	3	2	1,5	14	8
160	3	2	1,5	16	9
180	3	2	1,5	21	12
225	3	2	1,5	25	15
280	3	2	1,5	43	25
315	3	2	1,5	57	33
355	4,5	3	2	102	59
400	4,5	3	2	114	66
450	4,5	3	2	165	96
500	4,5	3	2	182	106
560	4,5	3	2	245	142
630	4,5	4	2	280	162
710	6	4	3	410	238
800	6	4	3	520	302
900	6	4	3	650	377
1000	6	4	3	810	470
1200	6	4	3	1135	658
1400	6	4	3	1540	893
1600	6	4	3	2020	1172

Borunun ağırlık içindeki durumunu gösteren örnek resim
Sample picture showing pipe in ballast weight

4. Boruları birleştirmek ve suya indirmek için uygun bir yer seçilmelidir.
Bu yerin borunun daldırılacağı suyun kenarında olması ve kara taşıtlarıyla ulaşılabilmesi ilk istenen şeydir. Borunun suya doğru çekileceği zemin boruya hasar vermeyecek yapıda, kayalık ve molozlardan arınmış olmalıdır. Ağırlıklar bağlı olarak borunun suya çekilebilmesi için kıyıda uygun bir rampa yapılmalıdır.

5. Karadan suya geçiş bölgesini ve gerekiyorsa sualtı yataklamasını hazırlamak
Daldırma işlemi başlamadan önce, kıyıdan suya geçiş bölgesinde, borunun su içinde ek koruma olmadan durabileceği yere kadar bir hendek kazmak gerekebilir.
Bu hendek, boruyu gelgit ve dalga hareketlerinden, akıntılardan, sürüklenen buz parçalarından ve tekne trafiğinden koruyacak kadar derinlik ve uzunlukta olmalıdır. Bu bölgedeki gömme, denizin hırçınlaştığı zamanlarda dahi bozulmadan durabilecek yapıda olmalıdır.
Boru koruma ve sabitleme, dolgu üstüne kaya parçaları 30-60 cm yükseklikte döşenerek de takviye edilebilir.
Genel olarak, boruyu yerleştirmek için dip taramasına gerek yoktur, zira ağırlık blokları boruyu zeminden biraz yüksekte tutmaktadır. Yine de, borunun altına değebilecek irilikteki taşlar var ise bunların borunun her tarafından 3 çap uzaklığa kadar temizlenmesi gereklidir.

6. Parça boruların kaynatılarak tek parça boru yapılması
Borular kaynatılarak peşpeşe eklendikçe, boru ön tarafından çekilerek suya daha çok sokulur. Ağırlıklar, boru suya değmeden bağlanmalıdır. Eğer şartlar daha uygun oluyorsa, ağırlıklar suda yüzen bir platformda da bağlanıp boru ondan sonra suya indirilebilir.

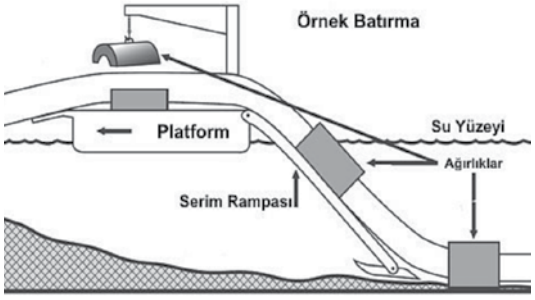
7. Ağırlık bloklarının bağlanması
Ağırlık bloklarının depolanma alanından boruya montaj yerine getirilmesi, borunun kaldırılarak blok alt parçasının borunun altına sürülmesi, blok üst parçasının üste konularak sıkıştırılması işlemleri için yeterli ve uygun sayıda kaldırma ve taşıma ekipmanı gerekmektedir. Bu

4. Choosing a suitable place for staging, joining and launching the pipe
The site for staging, joining and launching the pipe should preferably be on land adjacent to
the water in which the pipeline is to be submerged. The site should be accessible by land
vehicles.
The ground or other surface, over which the pipe will be moved to the water should be
relatively smooth and free of rocks, debris or other material that may damage the pipe or
interfere with its proper launching. When launching a pipe with ballast weights already
attached, provision should be made for a ramp or a rail skidway arrangement to allow the
ballasts to move easily into the water.

5. Preparing the land-to-water transition zone and, if necessary, the underwater bedding
At some point in time before the start of the submersion procedure, usually before the pipe
is launched, a trench needs to be prepared in which to place the pipe between the point
where it leaves the shore and the first underwater location beyond which the pipe is
completely submerged without the need for external protection.
The trench needs to be deep and long enough to protect the pipe from wave action, tidal scour, drifting ice and boat traffic. Special care should be employed in the design and construction of the land-to-water transition in ocean outfalls where occasional rough seas can result in very strong waves and in the scouring of the material below and around the pipe. Unless weighted to a relatively high extent, say to at least 40% of the pipe displacement, a pipe lying in a land-to-water transition trench that has been filled with fine silt or sand could float up when that zone is subjected to strong wave action. Protection and stabilization of the pipe installation may be further enhanced by the placement of a 30 to 60 cm cover of blast rock over the completed installation.
With regard to the preparation of the underwater support generally, no dredging of filling needs to be carried out because the ballasts act to keep the pipe above the bottom

ekipman boruları kaldırıp suya çekmekte de kullanılabilir. Ağırlık bağlanmış boruyu suya indirmek için uygun ve en az sürüklenme direnci yaratacak olan bir rampanın da yapılması gereklidir.
Ağırlıklar suyun üzerine bağlanmak istenirse, kaldırma ekipmanını da taşıyabilecek bir yüzer platformun kullanılması gereklidir. Bu yöntemde, platform yüzen borunun yanına getirilir, boru sudan kaldırılarak ağırlıklar bağlanır ve boru suya indirilerek platform bir sonraki ağırlık bağlama noktasına ilerletilir. Her durumda, boruyu en az miktarda kaldırabilmek için platformun yüzeyi suya mümkün olduğunca yakın olmalıdır.

8. Eklenmiş borunun suya indirilmesi (bu aşama bir önceki aşama ile aynı anda yapılabilir)
Ağırlık eklenmiş boru, bir rampa aracılığı ile suya kolay indirme için kullanılabilir. Rampa, suyun içine doğru o şekilde uzatılmalıdır ki, boru suya indiği zaman ağırlığı tamamen tutabilsin. Boruyu kaldırmak için enli bantlar kullanılmalı, nokta teması yapabilecek halat, zincir gibi malzemelerden kaçınılmalıdır.
Nehir geçişlerinde karşı kıyıya bağlanacak yönlendirme halatları ile boru çekilirken akıntıya karşı koyulabilir.



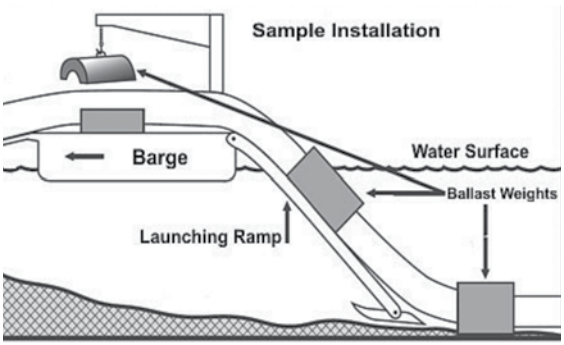
9. Belirlenen noktaya borunun batırılması
Boruyu batırmaya hazırlamak için, öncelikle boru belirlenen hattın üstüne çekilir. Batırma işlemi, basit olarak karadan boru içine su verilirken diğer ucundan havayı kontrollü olarak boşaltma şeklinde yapılır. Batırma işlemi borunun kara tarafında suya dalması ile başlayıp ileri doğru devam etmelidir. Bunu sağlamak için, borunun kara tarafında bir hava cebi olacak şekilde boru yukarı kaldırılır.
Batırma sırasında borunun aşırı bükülerek katlanma riski olmadan işlem yapılmalıdır.
Su, boruya kontrollü bir şekilde verildiği zaman, borunun uygun şekilde dibe oturması sağlanabilir. Tecrübeler göstermiştir ki, saatte 250 ila 450 m boru batırma hızı çoğu uygulamalar için yeterli olmaktadır.
Batırma sırasında bir problem olursa, havanın boşaltıldığı vanadan geriye basınçlı hava basılıp su borunun gerisinden dışarı atılarak boru tekrar yüzdürülebilir. Ancak, basınçlı havanın içerdiği tehlike potansiyelinden dolayı borunun su için olan basınç değerinin %50 sinden

material. The main idea is that the pipe should not rest or come in contact with large stones. To this end, larger stones that project above the bottom and that could come in contact with the pipe should be removed, as well as those that lie within about 3 pipe diameters on either side of the pipe.

6. Assembling the individual lengths of pipe to form a continuous length of pipe
Upon the completion of the heat fusing of an added length to the pipeline, the resultant longer pipe string is further moved into the water. Ballast weights can be mounted before the pipe string reaches the water. If circumstances make it more practical, the ballasts can also be attached on the floating pipe from a floating barge.

7. Fixing the ballast weights
Enough number of lift equipment needs to be on hand to move the ballasts from the stockpile to the pipe location and to lift the pipe to allow the ballasts to be positioned under it. This equipment can also be used to lift and pull the pipe into the water. A suitable ramp or skidway should be provided to move weighted pipe into the water with a minimum of drag. For mounting ballasts on the floating pipe it is necessary to have low-profile equipment such as a barge or raft that is of sufficient size to accommodate the required lifting equipment and to carry sufficient ballasts. In this method the barge is brought alongside the floating pipe, the pipe is lifted to install one or more ballasts, and after their installation the pipe is returned to the water and a new section is moved onto the barge or the barge is advanced along the floating string of pipe. In either case, the working surface or platform of the barge should be as close as possible to the water to reduce the need for a high lifting of the weighted pipe.

8. Launching the joined pipe into the water (the previous step may be done simultaneously with this step)
Pipe with attached ballast weights should be moved into the water by means of a ramp arrangement that allows the ballasts to move easily into the water. The ramp must extend sufficiently into the water ensuring that when the pipe leaves the ramp, the ballast weight is fully supported by the floating pipe. The pipe should be moved using suitable equipment and it should only be lifted using wide-band nylon slings, or any other means that prevents a concentrated point loading.
In the case of river crossings, a system of guide cables that are anchored on the opposite shore can serve to control the position of the pipeline, particularly when the pipeline is subject to strong river flow.



9. Submersion of the pipeline into the specified location
To prepare the pipe for submersion, it is first accurately positioned over its intended location.

fazla basınçta hava kullanılmamalıdır.
10. Karadan suya geçişin tamamlanması
Borunun batırılma işi bittikten sonra, karadan suya olan geçişte yapılmış olan hendek doldurularak üstten gereken koruma önlemleri alınmalıdır.
Montaj bitiminde, tüm hattın uzman dalgıçlar tarafından aşağıdaki maddeler açısından kontrol edilmesinde fayda vardır:
• Boru belirlenen hatta doğru olarak yerleşmiştir.
• Ağırlık blokları tabana güzel olarak oturmaktadır.
• Boru, hasara yol açabilecek sivri kaya, moloz veya diğer malzemelere temas etmemektedir.
• Tüm geçici olarak konulan elemanlar (hortum, halat, duba, vs) sökülmüştür
• Gereken yerlerde uygun şekilde dolgu yapılmıştır.
• Şayet varsa, projeci tarafından öngörülen özel uygulama şekilleri uygulanmıştır.

2.3- Isıl Genleşme

PE boruyu metal borudan ayıran önemli bir özellik de genleşme katsayısının metale göre 10 kat civarında büyük olmasıdır. Bu, tespit edilmemiş bir PE boruda daha fazla genleşme ve büzülme demektir. Diğer tarafta, başka bir özellik de çok daha düşük elastisite modülü değeridir. Bağlanmış bir boru durumunda, bu özellik çok daha düşük eksenel gerilim anlamına gelir, bu da boru sabitleme işleminin gerektirdiklerini kolaylaştırır.
Basınçlı borularda, uzun süreli kullanımı limitleyen faktör sıcaklıktır, bu da genellikle 60°C tır. Çeşitli sıcaklıklar için kullanım basıncı kapasite çarpanları aşağıdaki tabloda verilmektedir. Daha yüksek sıcaklıklar söz konusu ise, mutlaka imalatçı ile görüşülmelidir.

The sinking operation basically consists of the controlled addition of water from the on-shore end of the pipe and the release of the entrapped air from the opposite end. The sinking is conducted so that it starts at the shore where the pipe enters the body of water and then gradually progresses into deeper waters. To achieve this, an air pocket is induced by lifting the floating pipe close to the shore.
It is very important that during submersion the bending of the pipeline be limited to an extent that will not risk the formation of a localized kink.
The water must be introduced into the pipe at a controlled rate. This allows the pipe to settle properly on the bottom. Experience has shown that submerging the pipe at a rate in the range of about 250 to 450 meters per hour has been found to be adequate for most cases.
As water is being added at the shore-end of the pipe, air must be allowed to escape from the opposite end, in a controlled manner.
If a problem is encountered during the sinking, the availability of a valve outlet on the outboard end of the pipeline allows the sinking procedure to be reversed. Compressed air can be pumped into the submerged line to push the water out and thus allow the line to be raised. Because compressed air packs a lot of potential energy, the rule of thumb is to limit air pressure to max. 50 % of the pipe's pressure rating for water.

10. Completion of the land-to-water transition
After the pipeline has been submerged, the portion of the pipeline that has been lowered into a land-to-water transition trench should be backfilled with specified material and to the required depth of cover.
Upon completion of the installation of a submerged pipeline, it is advisable to have the complete line surveyed by a specialist diver to ensure that:
• The pipeline is located within the prescribed path
• The ballasts holding the pipeline are all properly sitting on the bottom contour and that the line is not bridging any changes in elevation
• The pipe is not resting on any rocks, debris or material that could cause damage
• Any auxiliary lines, such as hoses, ropes, buoyancy blocks or any other equipment used during the installation has been removed
• Where required, the pipe has been backfilled and the backfilling was done properly
• If present, all other installation requirements established by the designer for the subject application have been complied with.

2.3- Thermal Expansion

A property that differs PE pipe from metallic pipe is its coefficient of thermal expansion is about 10 times larger. This means a larger thermal expansion/contraction in the case of unconstrained pipe. However, another distinguishing feature is a much lower modulus of elasticity. In the case of constrained pipe this leads to a much lower value of thermally induced longitudinal stresses, which greatly simplifies requirements for supporting and anchoring.
In the case of pressure pipe the highest operating temperature is limited by the practical consideration of retaining sufficient long-term strength or maintaining the pressure rating that is sufficient for the intended application. That maximum temperature is generally 60°C. De-rating factors for up to 60°C are presented in the Table below. If higher temperatures are being considered, the pipe supplier should be consulted for additional information.

Max. Daimi Sıcaklık. (oC) *Max. Sustained Temp. (oC)*	Çarpım Faktörü *Multiplication Factor*	Max. Daimi Sıcaklık. (oC) *Max. Sustained Temp. (oC)*	Çarpım Faktörü *Multiplication Factor*	Max. Daimi Sıcaklık. (oC) *Max. Sustained Temp. (oC)*	Çarpım Faktörü *Multiplication Factor*
-29	2.54	4	1.49	38	0.73
-23	2.36	10	1.32	43	0.64
-18	2.18	16	1.18	49	0.58
-12	2.00	23	1.00	54	0.50
-7	1.81	27	0.93	60	0.43
-1	1.65	32	0.82		

Basınçsız ve gömülmüş durumdaki borularda, boruya topraktan destek geldiğinden dolayı çalışma sıcaklığı 82°C ye kadar çıkabilmektedir.
PE borunun faydalı bir özelliği de düşük sıcaklıklarda bile dayanıklılığını koruyabilmesidir. Donma derecesinin altında bile güvenle kullanılabilir. Boru içinde buz oluşması akışı engelleyip durdurabilir, ama boru patlamadan sağlam olarak kalır. Donma derecesi altlarında PE boru kendi içinde daha kırılgan olsa bile, diğer malzemelere göre yırtılma açısından daha sağlamdır.

Isıl Genleşme / Büzülme Etkileri
Boru ve kaynaklı ek yerleri, sıcaklık değişiminden dolayı olan gerilimleri rahatça karşılayabilir. Genellikle, tamamen PE olan bir sistemde genleşme sınırlama veya kompansatör kullanmak için gerek olmaz. Ancak, PE borunun diğer bir malzemeye geçiş yerlerinde, veya muflu bağlantılarda, hareket sınırlayıcı önlemlere gerek vardır.
PE genleşme katsayısı diğer malzemelere göre yüksek olduğundan, aşağıdaki hususları göz önünde bulundurmak gereklidir:

- Sıcak iken montajı yapılan borular soğuyunca büzülüp çekme gerilimi oluştururlar. Bundan dolayı borular çalışma sıcaklığına yakın sıcaklıklara indikten sonra montajlanmalıdır.
- Mekanik bir bağlantıdaki boru, bağlantıdan kurtulacak kadar çekme yapabilir. Bu sebeple, böyle bağlantı olan yerler oynamaya karşı bağlanmalıdır. Bu konuda Bölüm 2.5 te açıklamalar bulunmaktadır.
- Belirgin sıcaklık değişimlerine maruz kalan boru, genleşip büzülecek, yana doğru yılanlaşma hareketi yapacak veya sabitleme noktalarına basma veya çekme gerilimleri uygulayacaktır.

Hafifletici olarak, PE malzemenin düşük elastisite modülü genleşme / büzülmeden dolayı olan gerilimlerin yarattığı kuvvetin önemli ölçüde azalmasını sağlar. Bu gerilimlerin kaynaklanmış yerlerde herhangi bir etkisi bulunmamaktadır.

In the case of buried applications of non-pressure pipe, in which the embedment material provides a significant support against pipe deformation, the highest operating temperature can be sometimes as high as 82°C.
A beneficial feature of PE pipe is that it retains much of its toughness even at low temperatures. It can be safely handled, installed and operated even in sub-freezing conditions. The formation of ice in the pipe will restrict or, stop flow but not cause pipe breakage. Although under sub-freezing conditions PE pipe is somewhat less tough it is still much tougher that most other pipe materials.

Thermal Expansion/Contraction Effects
The PE pipe and the fused joints can easily accommodate the stress induced by changes in temperature. In general thrust restraints and mechanical expansion joints are not required in a fully fused PE piping system. However, thrust restraint may be necessary where PE pipe is connection to other 'bell and spigot' end pipe.
Since the coefficient of thermal expansion for PE is significantly larger than that of non-plastics, considerations relating to the potential effects of thermal expansion/contraction may include:

- *Piping that is installed when it is warm may cool after installation to generate significant tensile forces. Therefore, it is advised that the final connection be made after the pipe has settled to its operating temperature.*
- *Unrestrained pipe may shrink enough so that it pulls out from a mechanical joint that does not provide sufficient pull-out resistance. Methods used to connect PE pipe should provide restraint against pull-out that is either inherent to the joint design or additional mechanical restraint. More about this topic is in Section 2.5.*
- *Unrestrained pipe that is exposed to significant temperature changes will expand and contract, deflect laterally, or apply compressive or tensile loads to constraints or supports.*

A mitigating factor is PE's relatively low modulus of elasticity, which greatly reduces the thrust that is generated by a restrained expansion/contraction. This thrust imposes no problem on thermal fusion connections.

Sabitlenmemiş bir borudaki uzama veya kısalma şu denklem ile hesaplanır: $\Delta L = \alpha (T2 - T1) L$

Açıklama;
ΔL = Teorik boy değişimi (m.)
$\Delta L \rightarrow 0$ uzama
$\Delta L \leftarrow 0$ kısalma
α = Sıcaklık genleşme katsayısı, PE 100 için 1.8x10-4 m/m.°C
T1 = İlk sıcaklık (°C)
T2 = Son sıcaklık (°C)
L = Borunun ilk sıcaklıktaki (T1) boyu (m.)

Esnek PE boru baskı kuvvetini tam olarak iletmez. Sıcaklık artarken, boru da mesnetlerine tam kuvvet vermeden önce genellikle yana doğru yılankavi bir hareket yapar. Yanal yer değiştirme şu denklem ile yaklaşık olarak hesaplanabilir:

$Y = L\sqrt{(\alpha \Delta T) / 2}$

Açıklama;
Y = yanal yer değiştirme, m
L = mesnetler arası mesafe, m
α = Sıcaklık genleşme katsayısı, PE 100 için 1.8x10-4 m/m.°C
ΔT = Sıcaklık değişimi, °C

Mesnet yüklerini en aza indirmek veya genleşmede hareketi borunun belli bir tarafına vermek için montajda bir tarafa doğru hafif bir esneme yapılabilir. Bu aynı zamanda borunun büzüldüğü zaman düz bir hatta gerilemesini de engeller. Ayrıca, daha önceden yılankavi hareket verilmiş olan bir boru, genleşme sırasında mesnetlere daha az yük bindirecektir. Montaj sırasında, mevcut sıcaklık ve öngörülen en az sıcaklık arasındaki değer ile mesnetler arası uzaklık göz önünde bulundurularak yanal esneme miktarı hesaplanmalıdır. Bulunan değere, projeci tarafından öngörülen asgari yanal öteleme değeri de eklenerek boru bulunan toplam değer kadar yanal öteleme ile montajlanmalıdır.
Borunun öngörülen asgari sıcaklığa düştüğü zaman kısalarak aşırı gerilimde kalmaması için, montaj sırasındaki sıcaklıkta mesnetlerin boru üzerinde denk geleceği noktalar şu şekilde hesaplanmalıdır:
Mevcut ile asgari sıcaklık arasındaki oluşacak boy farkı ΔL bulunur, buna %10 emniyet katsayısı eklenir, bu da mesnetler arası uzunluğa (L) eklenir.

$Lp = L + 1.1\ \Delta L$

Açıklama;
Lp = genleşmiş boru boyu, m.
Yani, L aralığında yerleştirilmiş mesnetler, boru üzerinde Lp aralığına denk gelen noktalarda sıkılacak şekilde boru yana doğru esnetilerek bağlanmalıdır.

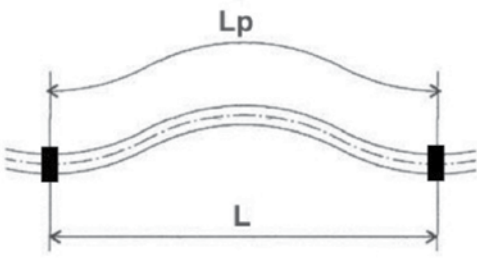
The expansion or contraction for an unrestrained PE pipe can be calculated by using the equation: $\Delta L = \alpha (T2 - T1) L$
Where
ΔL *= Theoretical length change (m.)*
$\Delta L > 0$ *is expansion*
$\Delta L < 0$ *is contraction*
α *= Coefficient of linear expansion, 1.8x10-4 m/m.°C for PE 100*
T1 = Initial temperature (°C)
T2 = Final temperature (°C)
L = Length of pipe (m.) at initial temperature, T1

Flexible polyethylene pipe does not transmit compressive force very well. During temperature increase, the pipe usually will deflect laterally (snake sideways) before developing significant compressive force on structural restraints. Lateral deflection may be approximated by
$Y = L\sqrt{(\alpha \Delta T) / 2}$

Where,
Y = lateral deflection, m
L = distance between end points, m
α *= thermal expansion coefficient, m/m.°C*
ΔT *= temperature change, °C*

To minimize thrust loads on restraints or to control which side of the centerline the pipe snakes, an initial deflection can be provided so the pipe does not contract to a straight line at minimum expected temperature. Likewise, during thermal expansion, pipe that is pre-snaked requires less force than predicted to continue snaking. At the time of installation, the anticipated temperature change from installation temperature to minimum temperature should be determined. Using this temperature change and the distance between points, lateral deflection should be determined, and the pipe be installed with this lateral deflection plus the minimum lateral deflection specified by the designer.
Additional pipe length should be provided so contraction at low temperature will not completely straighten out the pipe.
Determine the length change, ΔL*, for the change from ambient temperature at the time of installation, to the minimum expected temperature, add approximately 10% as a safety factor; then add this length to the anchor point distance, L.*

The length of the expanded pipe may be determined from:
$Lp = L + 1.1\ \Delta L$
Where
Lp = expanded pipe length, m.



Genleşmiş borunun mesnetler arasındaki yanal ötelenmesi
Lateral deflection of elongated pipe between supports

Genleşme halinde Bölüm 2.1.2 deki tabloda belirtilenden daha dar kavislerin oluşmayacağından emin olunmalıdır.

Örnek Çözüm:
T1 = 20°C
T2 = 50°C
L = 10m.
Δ L= 1.8x10-4 (50-20) 10 = 0,054 m bulunur.
Yanal öteleme verilmek istenirse;
Lp = 10 + 1.1 x 0,054 = 10,06 m
Yani, 10m aralığında yerleştirilmiş mesnetler, boru üzerinde 10,06m uzunluğa denk gelen noktalarda sıkılacak şekilde boru yana doğru esnetilerek bağlanmalıdır.

Genleşme Bağlantıları (Kompansatörler)
Genel olarak, PE hatlarda, özellikle basınçlı sistemlerde, kompansatörlerin kullanımına gerek olmaz. Şayet kullanmak gerekirse, kompansatörlerin PE için özel olarak yapılmış, çok düşük kuvvetlerde esneyebilen tipte olması ve geniş hareketlere izin vermesi gereklidir. Yine de, farklı nedenlerden dolayı kompansatörlerin PE hatlarda kullanımı önerilmemektedir. Örneğin;

(1) Genleşme zonu PE için yetersizdir.
(2) Kompansatörü hareket ettirmek için gereken kuvvet, PE borunun bükülme direncinden fazla olabilir.
(3) Kompansatörlerde, esnedikleri zaman PE boruya uç yükü uygulayacak elemanlar bulunabilir. PE boru ise kompansatörü esnetmek yerine, yana doğru ötlenme eğiliminde olacaktır. Uygulama yapmadan önce kompansatör imalatçısına mutlaka danışılmalıdır.

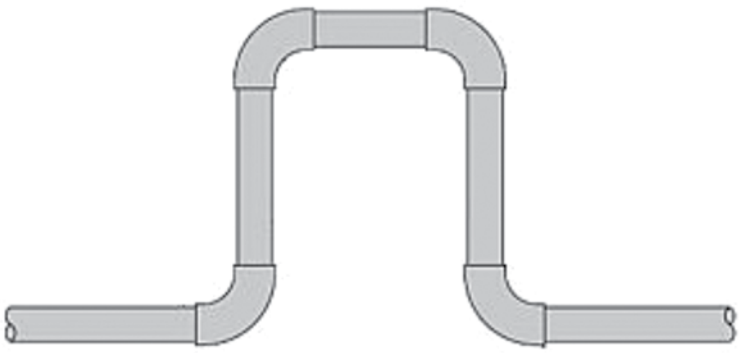
Genleşme telafisi için Omega bükümler

Care should be taken to ensure that thermal expansion deflection does not result in tight bends. Thermal expansion deflection bending should not result in a bend that is tighter than the minimum long-term cold field-bending radius tabulated in section 2.1.2.
Sample Problem:
T1 = 20°C
T2 = 50°C
L = 10m.
Δ L= 1.8x10-4 (50-20) 10 = 0.054 m

If some lateral deflection is to be given to the pipe;
Lp = 10 + 1.1 x 0.054 = 10.06 m
This means, with supports spaced at 10m distance, a length of 10.06m marked on the pipe will be installed between the 10m apart supports, the supports being coincident with the markings on the pipe, thus a lateral deflection be given.

Expansion Joints
In general, expansion joints are not recommended for use with PE pipe, especially in pressure service. If used, expansion joints must be specifically intended for use with PE pipe to activate at very low longitudinal forces and permit large movements. Expansion joints intended for use with other piping materials are not recommended for several reasons; such as:
(1) Expansion allowance is frequently insufficient for PE.
(2) The force required to activate the joint may exceed the column buckling strength of the PE pipe.
(3) Expansion joints for pressure service may include internal components that when pressurized, will place an end load on the pipe. PE pipe has low resistance to end loads, and likely will deflect sideways rather than compress the expansion joint. The expansion joint manufacturer should be contacted before application.

Omega bends for compensation



Tipik omega bükümü
Typical omega bend

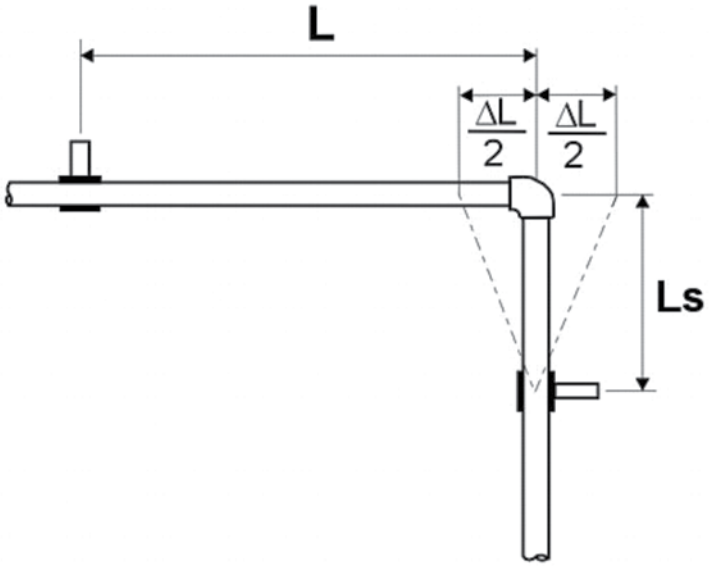
Omega bağlantısı yaparken asgari düz boyda sabitlenerek öngerilimli olarak yapılması önerilir, çünkü genleştiği zaman görsel etkisi azalacaktır. Öngerilimli yapmaktan kasıt, genleşeceği öngörülen boyun yarısı kadar (ΔL/2) ters tarafa kasıntılı olarak montaj yapılmalıdır. Böylece, boru genleştiği zaman omeganın uçları arasında öngörülenin yarısı kadar kapanma olacak ve gözü normalde yapacağı kadar rahatsız etmeyecektir.
Asgari düz boyun hesabı şu formülle yapılabilir:

Ls=26√(Do.ΔL/2)

Açıklama;
Ls : Asgari düz boy, mm
Do: Boru dış çapı, mm
ΔL: Hesaplanan uzama miktarı, mm

It is advisable to make prestressed connection so that minimum straight length can be reduced and visual effect of expansion is hardly visible.
The value of minimum straight length can be found by the formula:

Ls=26√(Do.ΔL/2)
Where
Ls : Min. Straight length, mm
Do: Outer diameter of pipe, mm
ΔL: Calculated change in length, mm



Asgari düz boy hesabı terminolojisi
Terminology for minimum straight length

Örnek Çözüm:
Do: 63 mm
T1 = 20°C
T2 = 50°C
L = 2m.
Δ L= 1.8x10-4 (50-20) 2 = 0,011 m = 11 mm bulunur.

Ls=26√(63 x 11/2) = 484 mm olarak hesaplanır.

2.4- Mekanik İşleme
Kesme, frezeleme ve delme işlemleri PE malzemede problemsiz olarak yapılabilir.

Sample Problem:
Do: 63 mm
T1 = 20°C
T2 = 50°C
L = 2m.
Δ L= 1.8x10-4 (50-20) 2 = 0.011 m = 11 mm

Ls=26√(63 x 11/2) = 484 mm

2.4- Machining
Cutting, turning, milling and drilling operations can easily be performed with PE.

	KESME		TORNALAMA	FREZE	DELME
	Şerit Testere	Daire Testere			
Boşluk açısı α (o)	30-40	10-15	5-15	5-15	12-16
Üst eğim açısı γ (o)	0-5	0-15	0-15	← 10	3-5
Adım P (mm)	3-5	3-5	----	----	----
Kesme hızı (m/min)	← 3000	← 3000	200-500	← 1000	50-100
Kalem açısı λ (o)	----	----	45-60	----	----
İlerleme (mm/devir)	----	----	0.1-0.5	0.2-0.5	0.1-0.3
Kesme derinliği (mm)	----	----	← 8	----	----
Uç açısı □ (o)	----	----	----	----	100

	CUTTING		*TURNING*	*MILLING*	*DRILLING*
	Band-Saw	*Circular Saw*			
Clearance angle α (o)	30-40	10-15	5-15	5-15	12-16
Rake angle γ (o)	0-5	0-15	0-15	← 10	3-5
Pitch P (mm)	3-5	3-5	----	----	----
Cutting Speed (m/min)	← 3000	← 3000	200-500	← 1000	50-100
Tool Angle λ (o)	----	----	45-60	----	----
Feed (mm/rot)	----	----	0.1-0.5	0.2-0.5	0.1-0.3
Cutting Depth (mm)	----	----	← 8	----	----
Tool Tip Angle □ (o)	----	----	----	----	100

2.5- Birleştirme İşlemleri

PE boru ve/veya fitingler birbirlerine eriterek kaynatma (füzyon) veya mekanik fitingler ile bağlanırlar. PE borular, diğer malzemelerden olan borulara dıştan sıkmalı fitingler, flanşlar veya amaca uygun yapılmış diğer geçiş adaptörleri ile bağlanabilirler. Bağlantı fitingleri çok geniş bir yelpazede üretilirler; herbirinin kullanılacak yere göre kolaylıkları ve sınırları vardır.

Halen füzyon yolu ile kaynak için üç metod kullanılmaktadır: Soket, Elektrofüzyon (EF) ve Alın kaynağı.

Füzyonun temelinde, iki yüzeyi belirli bir sıcaklığa gelene kadar ısıtmak ve sonrasında bu parçaları birbirine bastırarak malzemeleri birbirine yedirmek işlemi yatar. Üretici talimatı doğrultusunda bu işlem yapıldığında ek yapılan bölge malzemenin kendisi kadar sağlam ve sızdırmaz olur. Ek yeri ortam sıcaklığına soğuduğu zaman, kullanılabilir haldedir. Aşağıdaki bölümlerde bu üç farklı metod için genel uygulama yöntemleri işlenecektir.

2.5.1- Soket Kaynak

Bu teknikte, boru dış yüzeyi ile fitingin iç yüzeyi füzyon sıcaklığına gelene kadar ısıtılır. Boru fitinge sokularak soğuyana kadar yerinde kımıldatmadan tutulur.

63 mm den büyük çaplar için, parçaları gerekli baskı kuvveti ile yerinde tutabilmek açısından mekanik ekipmana gerek vardır.

2.5- Joining Procedures

PE pipe and/or fittings are joined by heat fusion or with mechanical fittings. PE pipe may be joined to other pipe materials by means of compression fittings, flanges, or other suitable types of manufactured transition fittings. There are many types and styles of fittings; offering their particular advantages and limitations for various joining cases.

There are three types of conventional heat fusion joints currently used in the industry; Socket, Electrofusion (EF) and Butt welding.

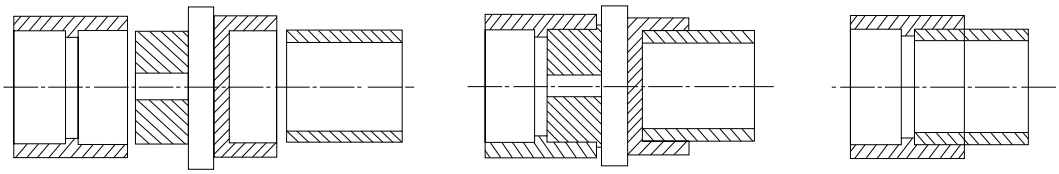
The principle of heat fusion is to heat two surfaces to a designated temperature, then fuse them together by application of a sufficient force. This force causes the melted materials to flow and mix, thereby resulting in fusion. When fused according to the pipe and/or fitting manufacturers' procedures, the joint area becomes as strong as the pipe itself in both tensile and pressure properties and properly fused joints are absolutely leak proof. As soon as the joint cools close to ambient temperature, it is ready for handling. The following sections provide a general procedural guideline for each of these heat fusion methods.

2.5.1- Socket Welding

This technique consists of simultaneously heating both the external surface of the pipe end and the internal surface of the socket fitting until the material reaches the recommended fusion temperature, inspecting the melt pattern, inserting the pipe end into the socket, and holding it in place until the joint cools.

Mechanical equipment is required to hold both the pipe and the fitting for sizes larger than 63 mm to help attain the required force and to provide good alignment. It is a good practice to follow pipe manufacturers' application procedures.

Soket Kaynak İçin Şematik resim
Schematic Sketch For Socket Welding



KAYNAĞA HAZIRLIK
RESOURCES PREPAREDNESS

AYARLAMA VE ISITMA
SETTING AND HEATING

BİRLEŞTİRME VE SOĞUTMA
JOINING AND COOLING

Soket kaynağı yapmak için aşağıdaki adımlar uygulanmalıdır:

1. Boru ucu dik olarak kesilmelidir.
2. Ucun ve fitingin kaynatılacak bölümü iyice temizlenmelidir .
3. Parçalar ısıtılmalıdır.
4. Parçalar birleştirilmelidir.
5. Soğumaya bırakılmalıdır.

1, 2. Boru ucunun dik olarak kesilerek kaynayacak parçaların uç temizliklerinin yapılması
Boru ucu eksene dik olarak kesilmeli, 40 mm ve daha büyük çaptaki boruların ağızlarında pah kırılmalıdır. Eklenecek yüzeylerdeki talaş, traşlama artıkları, yağ, pislik vb tamamen temizlenmelidir.

3. Isıtma
Isıtıcı sıcaklığı kontrol edilmelidir (250-270oC). Isıtıcının yüzeyleri, boru ve fitingin kaynatılacak yüzeylerine geçirilmeli ve imalatçının önerileri doğrultusunda ısıtılmalıdır. Genel olarak uygulanan değerler aşağıdaki tabloda verilmiştir.

Follow these general steps when performing socket fusion:

1. Square and prepare the pipe end
2. Thoroughly clean the end of the pipe and the matching inside surface of the fitting
3. Heat the parts
4. Join the parts
5. Allow to cool

1, 2. Square and Prepare Pipe and clean the pipe and fitting
The pipe ends have to be cut square, and the end be chamfered for sizes 40 mm outer diameter and larger. Scraps, burrs, shavings, oil, and/or dirt have to be removed from the surfaces to be joined.

3. Heating
The heater temperature should be checked (250-270oC). The proper surface temperature should be verified periodically, using a pyrometer or other surface temperature measuring device. The hot clean tool faces should be brought into contact with the outside surface of the end of the pipe and with the inside surface of the socket fitting, in accordance with pipe and fitting manufacturers' instructions.

Boru dış çapı (mm) *Pipe Outside Diameter (mm)*	Ön ısıtma süresi (sn) *Pre-heating Time (sec)*		Ayarlama süresi (sn) *Adjusting Time (sec)*	Soğutma süresi *Cooling Time*	
	SDR 17.6	SDR→11		Sabit (sn) *Fixed (sec)*	Toplam (dk) *Overall (min)*
20	*	5	4	6	2
25	*	7	4	10	2
32	*	8	6	10	4
40	*	12	6	20	4
50	*	18	6	20	4
63	*	24	8	30	6
75	15	30	8	30	6
90	22	40	8	40	6
110	30	50	10	50	8

* Düşük et kalınlığından dolayı önerilmez. *Not recommended due to low thickness*

4. Birleştirme
Boru, ütünün erkek tarafına ve fiting ise dişi tarafında durana kadar (veya işaretli kısımlar tamamen girecek şekilde) hızlı bir şekilde itilmelidir.
Yukarıdaki tablodaki değerlere göre ön ısıtma işlemi yapılmalıdır. Ön ısıtma bittikten sonra fiting ve boru ütüden çıkarılmalı ve hızlı bir şekilde dudakları birleşene kadar çevirmeden birbirlerine geçirilmelidir.
Kaynak yerinin soğumasını beklenmeli, daha sonra kelepçe çıkarılmalıdır.

4. Joining
The fitting and pipe should be pushed in axial direction onto the heating spigot or into the heating socket until the end stop (or marking); and preheated according to table (above) values.
After the pre-heating time, fitting and pipe should be quickly pulled off the heating element and immediately be fitted into each other without twisting them until both welding beads meet.
The joint should be let to cool down, and then clamps be removed.

5. Soğutma

Boru soğurken oynamayacak bir şekilde sabit tutulup soğuması beklenir. Önerilen tipik soğuma süreleri yukarıdaki tabloda verilmiştir.

Basınç testi yapılmadan önce tüm kaynak yerleri soğutulmalıdır. Basınç testi geçerli standart kurallarına göre (ör, DVS 2210 Kısım-1, DVGW - W 210) yapılmalıdır.

Maksimum test basıncı 1,5xPN dir. (max. PN+5). Boru hattı hava sıcaklığındaki değişimlere karşı korunmalıdır (UV-radyasyon).

5. Cooling

Hold or block the pipe in place so that the pipe cannot come out of the joint while the mating surfaces are cooling. These cooling times are listed in the table above.

Before performing the pressure test, all welding joints have to be completely cooled down. The pressure test has to be performed according to the relevant standard regulations (e.g. DVS 2210 Part 1, DVGW working sheet W210).

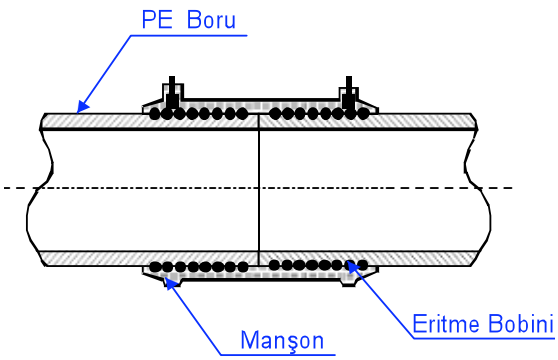
The maximum test pressure is 1,5xPN (max. PN+5). The piping system has to be protected against changes in ambient temperature (UV-radiation).

2.5.2- EF (Elektrofüzyon) Kaynak

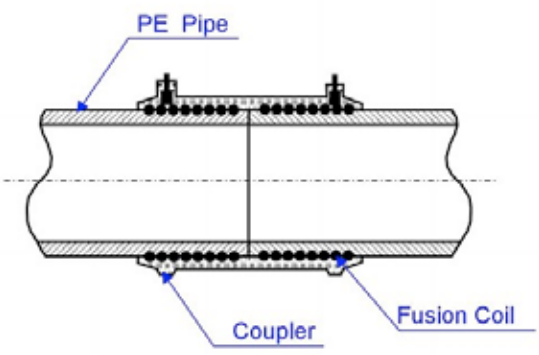
2.5.2- EF (Electrofusion) Welding

Bu füzyon tekniği, Bölüm 2.5.1 de belirtilen teknikten farklılıklar gösterir. İkisi arasındaki temel fark, ısının uygulanma metodundadır. Konvansiyonel füzyonda, boru ve fiting yüzeylerini ısıtmak için bir ısıtıcı ekipman kullanılmaktadır. Elektrofüzyon (EF) tekniğinde ise, fitingin içine yerleştirilmiş bir direnceelektrik verilerek ısınması ve malzemeyi eriterek birbirlerine kaynatması sağlanmaktadır. Alttaki resim tipik bir EF bağlantısını göstermektedir. PE boruları birbirine kaynatmak için EF manşonlar kullanılmalıdır.

This technique of heat fusion joining is different from the conventional fusion joining (socket welding) described in 2.5.1. The main difference between conventional heat fusion and electrofusion is the method by which the heat is applied. In conventional heat fusion joining, a heating tool is used to heat the pipe and fitting surfaces. The electrofusion joint is heated internally, by a conductor at the interface of the joint. Heat is created as an electric current is applied to the conductive material in the fitting. Figure below illustrates a typical electrofusion joint. PE pipe to pipe connections made using the electrofusion process require the use of electrofusion couplings.



Tipik bir EF kaynak bağlantısı



Typical EF pipe joint

Bağlantı Şekillerinin Uygunluk Karşılaştırması

	Bağlantı Çeşidi		Boyutlar [mm]	
	20/63	75/90	110/225	250/1000
Elektrofüzyon Kaynak	X	X	X	X
Alın Kaynağı			X	X
Soket Kaynak	X*	X*		
Flanşlı Bağlantı	X*	X*	X*	X*

* : Gaz taşıyan hatlar için önerilmez.

Application Suitabilities For Various Jointings

	Joint *TYPE*		Dimensions [mm]	
	20/63	75/90	110/225	250/1000
Electrofusion-welding	X	X	X	X
Butt welding			X	X
Socket welding	X*	X*		
Flanged connections	X*	X*	X*	X*

* : Not recommended for *GAS* systems

EF bağlantı yapılırken izlenmesi gereken aşamalar:
1. Borunun kazınıp temizlenerek hazırlanması
2. Borunun işaretlenmesi
3. Boru ve fitingin birbirine geçirilip ayarlanarak sabitlenmesi
4. Elektrik uygulanması
5. Soğutulma ve sabitlemelerin sökülmesi
6. İşlemin dökümanlanması

2.5.2.1 Manşon Kaynağı

Boru Hazırlığı (Temizlik ve sıyırma)

Boru uçları eksene dik olarak kesilmelidir. Kaynatılacak alanlar her türlü kir ve yağdan arınmış olmalıdır. Temizlik için trikloroetan veya %90 isopropil alkol kullanılabilir. Borunun manşona girecek olan ucu da çepeçevre traşlanarak temiz malzeme açığa çıkartılmalı, sonre üstünde kalan talaş vb temizlenerek kaynağa hazır hale getirilmelidir. Traşlama için özel yapım el aletleri kullanılmalıdır.

Borunun düzgün bir şekilde kesilmemesi, fitingdeki metal sargıların belli bölgelerde boruya temas etmemesine neden olur. Bu ise aşırı ısınmaya ve erimiş malzemenin kontrolsüz bir şekilde akmasına yol açabilir. (aşağıdaki şekilde gösterilmiştir)

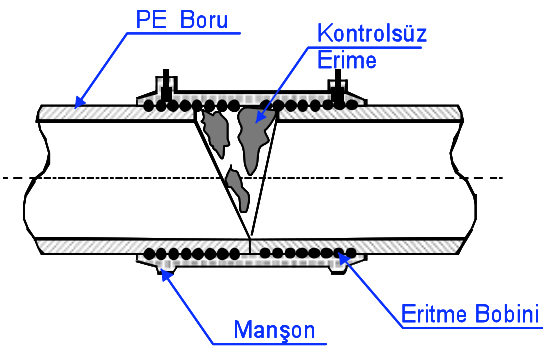
General steps to be followed when performing electrofusion joining are:
1. Prepare the pipe (scrape, clean)
2. Mark the pipe
3. Align and restrain pipe and fitting per manufacturer's recommendations
4. Apply the electric current
5. Cool and remove the clamps
6. Document the fusion process

2.5.2.1 Welding Couplers

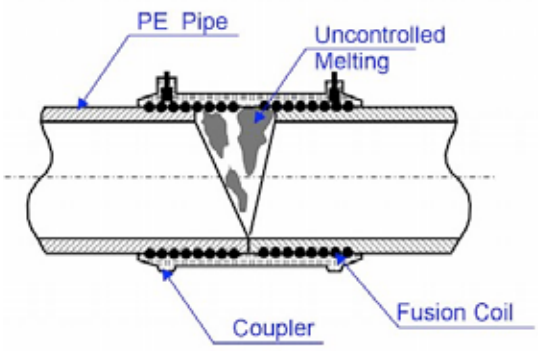
Prepare the Pipe (Clean and Scrape)

The pipe ends are cut square when joining using electrofusion couplings. The fusion area must be clean from dirt or contaminants. This may require the use of trichloroethane or 90% isopropyl alcohol. Next, the pipe surface in the fusion must be scraped, that is material must be removed to expose clean material. This may be achieved by various special purpose tools available from the fitting manufacturer.

If the pipe is not cut at right angles, this results in contact between heating coils and the pipe, which causes uncontrolled flow of molten due to overheating. (illustrated in Figure below)



Düzgün kesilmeyen boru uçlarının kaynağa olumsuz etkisi



Unwanted result of welding improperly cut pipe ends

Borunun İşaretlenmesi
Kaynak alanı, borunun fiting içine gireceği derinlik olarak tanımlanabilir (fitingin ucundan orta noktasına kadar olan mesafe). Kaynak alanı petrol türevi olmayan bir kalem ile boru üzerinde işaretlenir.
Orta kısmında stoper bulunan TEGA Manşonlarının kaynak alanını boru üzerinde işaretlemek oldukça kolaydır.

Boru ve Fitingin Üreticinin Önerilerine Göre Ayarlanıp Tespit Edilmesi
Boruyu fitingin içine sokarken fitingin kontak terminallerinin üstte kalmasına dikkat edilmelidir. Boru fiting içerisine yerleştirildikden sonra rahatlıkla döndürülebilmelidir. Borular eğilme gerilimine maruz kalmamalı ve fiting içerisinde kendi ağırlıklarını rahatlıkla taşıyabilmelidir. Borunun serbest uçlarına destek konulabilir.
Boru, fitingin içine geçirildikten sonra eksenel doğruluk ayarı kontrol edilerek sabitlenir. Büyük çaplı boruların kaynak öncesinde ovalliğinin giderilmesi gerekebilir. İzin verilen ovallik dış çapın %1.5 i kadardır. Ovallik giderilmesi için boru kelepçesi kullanılabilir.

Elektrik Akımı Verilerek Kaynağın Yapılması
Montaj talimatları adım adım izlenmiş ve herhangi bir problem yok ise kaynak işlemi universal bir EF kaynak makinesi kullanılarak yapılabilir. Bunun için, kaynak bilgilerinin manuel olarak veya bir barkod okuyucu yardımıyla kaynak makinesine girilmesi gerekmektedir. Şayet veri girmede bir problem olursa, enerji verme ve soğutma süreleri gerekli tablolardan bakılarak el ile uygulanabilir.
Elektrofüzyon manşonların üzerinde kaynak indikatörleri (meme) bulunmaktadır. Kaynak işlemi başladıktan sonra dışarı çıkan bu memeler kaynak işleminin tamamlandığını gösterir.
Kaynak işlemi esnasında herhangi bir hata oluşur ise eriyen PE malzeme etrafa sıçrayabilir. Bu nedenle güvenlik açısından, kaynak işlemi esnasında en az 1 m uzakta durmaya dikkat edilmelidir.

Kaynak işlemi herhangi bir nedenle (enerji kesintisi, vb.) kesintiye uğrar ise kaynaklı parçanın soğuması için yeteri kadar beklendikden sonra kaynak işlemine devam edilebilir. TEGA Fitinglerinin soğuma süreleri barkod etiketleri üzerinde verilmiştir.

Soğutma ve Kelepçelerin Sökülmesi
Yapılan kaynak, öngörülen süre kadar beklenip soğuması sağlanmalıdır. Şayet kelepçe ile bağlanmışsa, tam soğumadan kelepçenin sökülmesi ve ek yerininoynaması kaynağın performansını olumsuz olarak etkiler.

Kaynağın Dökümanlanması
Kaynak makinası, kaynatma için gerilim uygulamanın yanısıra, zaman, sıcaklık, basınç gibi parametreleri de kontrol etmektedir. Yapılan her kaynak makinanın hafızasında depolanır, gerektiği hallerde bilgisayara aktarılabilir.

Mark the Pipe
The pipe is marked for stab depth of couplings or the proper fusion location of saddles. Caution should be taken to assure that a non-petroleum marker is used. TEGA couplers have their own stoppers at the center so that the insertion depth can be determined easily.

Align and Restrain Pipe or Fitting According to the Manufacturer's Recommendations
The fitting is aligned and restrained to pipe according to the manufacturer's recommendations. The pipe(s) and fitting are placed in the clamping fixture to prevent movement of the pipe(s) or fitting. Special attention has to be paid for proper positioning of the fitting on the prepared pipe surfaces. Large pipe diameters may need re-rounding prior to the electrofusion process. The allowable ovality is 1.5% of outer diameter.

Welding by Applying Electric Current
The contact terminals of the coupler must be easily accessible. The electrofusion control box is connected to the fitting and to the power source. Electric current is applied to the fitting as specified in the manufacturer's instructions. Read the barcode which is supplied with the electrofusion fitting. If the control does not do so automatically, turn off the current when the proper time has elapsed to heat the joint properly.
During Fusion operation, fusion indicators which show the completion of process must be observed. There may be less or more melt in the indicators. This is because of the gap formed between the coupler and pipe end or spigot end. As a safety precaution, it is advised that people stay at least 1 m away from the fusion area.
If the fusion process is interrupted for any reason (e.g. due to power failure) the fusion process can be repeated after the joint cooled adequately. The cooling times can be found on TEGA Couplers' barcode labels.

Cool Joint and Remove Clamps
Allow the joint to cool for the recommended time. If using clamps, premature removal from the clamps and any strain on a joint that has not fully cooled can be detrimental to joint performance.

Documenting fusion
The Electrofusion control box that applies current to the fitting also controls and monitors the critical parameters of fusion, (time, temperature, & pressure). The control box is a micro- processor capable of storing the specific fusion data for each joint. This information can be downloaded to a computer for documentation and inspection of the days work.

2.5.2.2 Welding Tapping Fittings (Branch TEE)

Prepare the Pipe
Different from the couplers, in Tapping Fittings, Fusion Zone is the area where the resistance wire exists and which

2.5.2.2 TE- Servis Te Kaynatılması

Borunun hazırlanması

Manşonlardan farklı olarak, Te-branşmanlardaki füzyon alanı, Te'nin üst kısmında tel sargının bulunduğu bölgedir. Traşlamaya başlamadan önce, füzyon bölgesi işaretlenmelidir .

is located to the upper side of the fitting. Before scraping, fusion zone must be marked with a marker on the pipe.

Füzyon bölgesi işaretlenmesi/ *Marking of the fusion zone*

Borunun Traşlanması

Oksitli tabakanın özel işlem bıçağı ile traşlanması gereklidir (alttaki resim). Oksitli tabaka parçalarının tam temizlenememesi halinde, kaynak yerinden sızıntılar olabilir. Hazırlanan yüzey hemen kaynak yapılacak olsa bile, kötü hava şartlarına ve tekrar kirlenmeye karşı korunmalıdır. Kaynak işlemine başlamadan önce, fitingin iç, borunun dış yüzeyi trikloroetan veya alkol kullanılarak temizlenmelidir. (Alkol içeriği hacimce % 96'dan az olmamalıdır). Temizleme maddesi beyaz ve emici özelliğe sahip bir kağıt veya parçacık bırakmayan bir bez üzerine dökülerek kullanılmalıdır.

Scrape the Pipe

In order to remove the oxide layer, scrape carefully the whole circumference of the fusion zone using a hand scraper (Fig. below). This scraping operation must be carried out just before jointing. The prepared surface must be protected against unfavorable weather. The prepared pipe and internal face of fitting must be degreased with trichloroethane or alcohol (alcohol content must be at least 96% by volume), with a white absorbent and nonfibrous cloth.

Oksitli tabakanın traşlanması/ *Scraping the oxidated layer*

Boru ve fitingin ayarlanması ve kaynak öncesi sıkılması

Boru üzerinde doğru konumlama yapıldıktan sonra, Te-branşman parçası cıvataları anahtarla sıkılarak boru üzerinde sıkılır.

Align and Restrain Pipe or Fitting According to the Manufacturer's Recommendations

After correct positioning is done on the prepared pipe, fitting is closed and fully tightened with both two bolts uniformly by using a suitable wrench

Te-branşmanın kaynak öncesi boru üstünde sıkılması/
Tightening of Tee-branch on the pipe

Elektrik Akımı Verilerek Kaynağın Yapılması

Montaj talimatları adım adım izlenmiş ve herhangi bir problem yok ise kaynak işlemi universal bir EF kaynak makinesi kullanılarak yapılabilir. Bunun için, kaynak bilgilerinin manuel olarak veya bir barkod okuyucu yardımıyla kaynak makinesine girilmesi gerekmektedir. Şayet veri girmede bir problem olursa, enerji verme ve soğutma süreleri gerekli tablolardan bakılarak el ile uygulanabilir.

Kaynak işlemi esnasında herhangi bir hata oluşur ise eriyen PE malzeme etrafa sıçrayabilir. Bu nedenle güvenlik açısından, kaynak işlemi esnasında en az 1 m uzakta durmaya dikkat edilmelidir.

Kaynak işlemi herhangi bir nedenle (enerji kesintisi, vb.) kesintiye uğrar ise kaynaklı parçanın soğuması için yeteri kadar beklendikden sonra kaynak işlemine devam edilebilir. TEGA Fitinglerinin soğuma süreleri barkod etiketleri üzerinde verilmiştir.

Soğutma ve Kelepçelerin Sökülmesi

Yapılan kaynak, öngörülen süre kadar beklenip soğuması sağlanmalıdır. Tam soğumadan kelepçenin sökülmesi ve ek yerininoynaması kaynağın performansını olumsuz olarak etkiler.

Kaynağın Dökümanlanması

Kaynak makinası, kaynatma için gerilim uygulamanın yanısıra, zaman, sıcaklık, basınç gibi parametreleri de kontrol etmektedir. Yapılan her kaynak makinanın hafızasında depolanır, gerektiği hallerde bilgisayara aktarılabilir.

Branşmanın Delinmesi

Kaynak işlemi tamamlandıktan ve soğuma süresi beklendikten sonra branşman kapağı çıkartılır ve dikkatli bir şekilde kirlenmeyecek bir yere koyulur. Daha sonra alyan anahtarı yardımıyla branşman içindeki delici çevrilerek delik delinir. Delme işlemi tamamlandıktan sonra delici yukarı çekilerek ilk pozisyonuna getirilir, sonra da kapağı sıkıca kapatılır.

Welding by Applying Electric Current

The contact terminals of the coupler must be easily accessible. The electrofusion control box is connected to the fitting and to the power source. Electric current is applied to the fitting as specified in the manufacturer's instructions. Read the barcode which is supplied with the electrofusion fitting. If the control does not do so automatically, turn off the current when the proper time has elapsed to heat the joint properly.

As a safety precaution, it is advised that people stay at least 1 m away from the fusion area.

If the fusion process is interrupted for any reason (e.g. due to power failure) the fusion process can be repeated after the joint cooled adequately. The cooling times can be found on TEGA fittings' barcode labels.

Cool Joint and Remove Clamps

Allow the joint to cool for the recommended time.

Documenting fusion

The Electrofusion control box that applies current to the fitting also controls and monitors the critical parameters of fusion, (time, temperature, & pressure). The control box is a micro- processor capable of storing the specific fusion data for each joint. This information can be downloaded to a computer for documentation and inspection of the days work.

Carrying out the tapping operation:

The cap on the tapping fitting is first unscrewed and put somewhere it cannot become soiled. After that, by means of a suitable hexagon wrench, the integral cutter is screwed down. After drilling is finished, the cutter is removed and the Tee is re-capped.

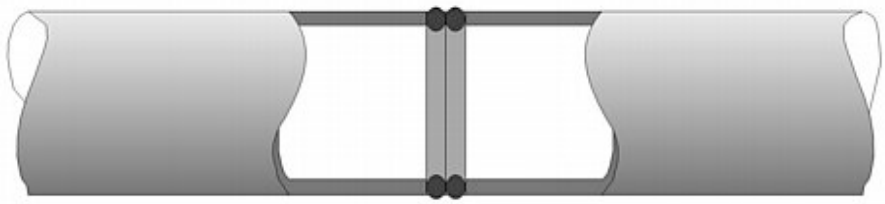
Branşmanın delinmesi/
Tapping process

2.5.3- Alın Kaynak

PE boruları peşpeşe bağlamak için kullanılan, boruların birbirine eklenecek alın kesitleri eritilerek birleştirme şeklinde uygulanan en yaygın yöntemdir (alttaki şekil)

2.5.3- Butt Welding

The most widely used method for joining individual lengths of PE pipe and pipe to PE fittings is by heat fusion of the pipe butt ends as in the figure below.



Tipik bir alın kaynak kesitii/ *Typical butt-welding sectional view*

Alın Kaynak Makinası/ *Butt-welding Machine*

Bu yöntem, sabit, ekonomik ve akışa engel olmayan bir bağlantı oluşturur. Alın kaynak makinası şu özellikleri sağlayabilmelidir:
- Boru uçlarını ayarlama
- Boruları sabitleme
- Alın kesitlerini birbirine paralel ve eksene dik olarak konumlandırabilme
- Boru uçlarını ısıtma
- Gerekli füzyon baskı kuvvetini uygulayabilme

Alın kaynağı yaparken uygulanacak 6 aşama vardır:
1. Boru uçlarının temizlenmesi ve ayarlanması
2. Boru uçlarının birbirine paralel ve eksene dik olarak

This technique produces a permanent, economical and flow-efficient connection. The butt fusion machine should be capable of:
- *Aligning the pipe ends*
- *Clamping the pipes*
- *Facing the pipe ends parallel and square to the centerline*
- *Heating the pipe ends*
- *Applying the proper fusion force*

The six steps involved in making a butt fused joint are:
1. Cleaning, clamping and aligning the pipe ends to be joined

konumlandırılması
3. Boru uçlarının ayarlanması
4. Boru uçlarının eritilmesi
5. Uygun baskı kuvveti altında boru uçlarındaki erimiş malzemenin birbirine yedirilerek kaynağın oluşturulması
6. Soğuyana kadar basınç altında tutulması.

Bazı boru sistemlerinde, kaynakta oluşan iç ve/veya dış dudakların yok edilmesi istenebilir. Dış dudaklar çevresel traşlayıcılar kullanılarak yok edilebilir, ancak bu yapılırken çentik oluşturmamaya dikkat edilmelidir. Elektrikli makinalar da kullanılabilir, ama boru dış çapından daha içeri girmemeye çok dikkat edilmelidir.
İç dudakları traşlamak gereksiz bir işlemdir, çünkü akışa olumsuz bir etkileri olmayıp gereksizce fazla işlem zamanı harcanır.

2. Facing the pipe ends to establish clean, parallel surfaces, perpendicular to the center line
3. Aligning the pipe ends
4. Melting the pipe interfaces
5. Joining the two pipe ends together by applying the proper fusion force
6. Holding under pressure until the joint cools down.

In some pipe systems, it may be requested to remove the inner or outer bead of the joint. External beads are removed with run-around planning tools, which are forced into the bead, then drawn around the pipe. Power planers may also be used, but care must be taken not to cut into the pipe's outside surface.
It is practically unnecessary to remove internal beads, as they have little or almost no effect on flow, and removal is time-consuming. Internal beads may be removed from pipes after each fusion with a cutter fitted to a long stem. Since the fused joint must be completely cooled before bead removal, assembly time is slightly increased.

Kaynatma Parametreleri *Welding Parameters*

Et Kalınlığı *Wall Thickness* mm	Dudak Yüksekliği *Bead Height* mm	Ön Isıtma Süresi *Preheating Time* sn	Ayar Süresi *Adjusting Timei* sn	Birleştirme Basıncı *Join Pressure Time* sn	Soğutma Süresi *Cooling Time* dak
	P= 0.15 N/mm2	P= 0.20 N/mm2		P= 0.15 N/mm2	
2 - 4.5	0.5	45	5	5	6
4.5 - 7	1	45 - 70	5 - 6	5 - 6	6 - 10
12	1.5	70 - 120	6 - 8	6 - 8	10 - 16
19 - 26	2	120 - 190	8 - 10	8 - 11	16 - 24
26 - 37	2.5	190 - 260	10 - 12	11 - 14	24 - 32
37 - 50	3	260 - 370	12 - 16	14 - 19	32 - 45
50 - 70	4	500 - 700	20 - 25	25 - 35	60 - 80

2.5.3.1- Alın Kaynağı Yapım Aşamaları:

Kaynak Yerinin Hazırlanması
Kaynak alet ve makinaları hazırlanmalı, çalışmaları kontrol edilmelidir. İş arazide ise kaynak çadırı veya benzeri bir koruma hazırlanmalıdır.
Kaynatılacak Kısımların Hazırlanması
Kaynatılacak uçlar birbirine paralel ve eksene dik olarak konumlandırılıp tespit edilmelidir.
Kaynak bölgesindeki uçların dış ve iç yüzeyleri PE-temizleyici ile temizlenmeli, kaynak yapılacak her iki parçanın uçları kazınmalıdır. Kaynak alanındaki talaş parçaları fırça, kağıt, vb ile temizlenmelidir.
Hava akımından dolayı borunun iç kısmında sıcaklığın düşmesini önlemek için, borunun diğer ucunu kapatmak gereklidir. Her bir kaynak işleminden önce kaynak sıcaklığı kontrol edilmelidir (kaynak işlemine, ütü uygun sıcaklığa geldikten 5 dakika sonra başlanmalıdır).
Gerekli kaynak parametreleri belirlenip ayarlanmalıdır.
Kaynak yapılacak parçaların hareket ettirme basıncı (Pw) ölçülmeli ve bu değer, eşitleme ve birleşme basıncına eklenmelidir. Pw basıncı parçaların yavaşça hareket

2.5.3.1- Steps in making a butt-weld:

Preparation of welding place
Assemble welding equipment (prepare tools and machinery), control welding devices. Install welding tent or similar.
Preparation of welding seam
Pipes or fittings should be clamped and adjusted - the surfaces to be welded should be square to each other. Parts to be welded should be secured by taking appropriate measures (e.g, adjustable dollies).
Both ends of the pipes to be welded should be machined (planning) and shavings from the welding area be removed (with brush, paper, etc.).
Outside and inside surfaces (near welding seams) of the parts to be welded should be cleaned with PE-cleaner (or similar).
In order to avoid cooling down of the pipe inside temperature by strong currents of air, it is necessary to seal the pipe end being opposite to the pipe end being welded. Welding temperature should be controlled before each welding process (welding process be started 5 min. after the heating element has reached proper temperature at the earliest).
Determine and adjust the required welding parameters.

ettirilmesi sırasında ölçülür fakat hizalama (alignment) basıncını geçmemelidir.
Kirlenme veya oluşabilecek hasarları önlemek için ütüyü her bir kaynak işleminden önce ve sonra koruyucu bir alet içerisinde tutmak gereklidir. Kaynak işlemine başlamadan önce, ütü temiz, parça bırakmayan bir kağıt ile temizlenmelidir.

2.5.3.2- Kaynak İşleminin Yapılması
Ütü yerleştirildikten sonra gerekli olan hizalama basıncını elde edilmelidir. Birleşecek yüzler ütü üzerinde tam olarak aynı hizaya gelene kadar hizalama basıncını vermeye devam edilmeli, bu arada kaynak yapılacak her iki parçanın tüm çevresini kaplayan dudak oluşturulmalıdır (bkz. Kaynatma Parametreleri Tablosu). Ayar basıncı p = 0,01 N/mm2 değerine düşürülerek Kaynatma Parametreleri Tablosundaki ön-ısıtma süresi beklenmelidir. Ütü kaldırılarak kaynak yapılacak yüzeyler (ayar süresi olabildiğince kısa olarak) birleştirilmelidir.

Birleşme işlemi boyunca istenen değere ulaşana kadar ayar basıncını sürekli arttırılarak, oluşan dudaklar soğuyana kadar ayar basıncı sabit tutulmalıdır. Soğutucu maddeler kullanarak ani soğutma yapılmamalıdır. Gerekli soğuma süresi beklendikten sonra kelepçeler çıkarılmalıdır.

2.5.4- Mekanik (dişli, flanşlı) bağlantılar
Mekanik bağlantılar, PE parçaları birbirlerine veya diğer malzemelerden olan parçalara bağlamak için kullanılırlar.

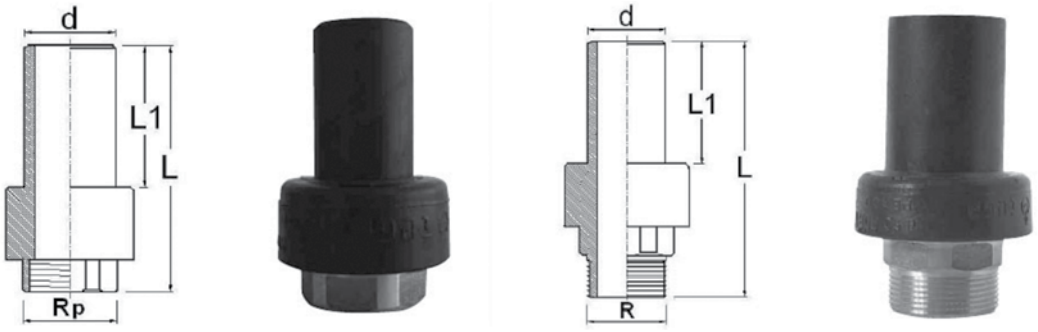
2.5.4.1 – Dişli Bağlantılar
Mekanik veya flanşlı bağlantılarda kullanılmak üzere, ucuna metalden diş açılmış, erkek veya dişi adaptör parça PE boruya kaynatılır; adaptörün dişli ucu da karşı parçaya bağlanır.
Aşağıdaki resimlerde dişi ve erkek adaptörler görülmektedir.

The workpiece movement pressure Pw should be measured at the welding area and added to the equalizing pressure and the joining pressure. The workpiece movement pressure is measured during slow displacement of the parts to be welded. It must, however, not exceed the alignment pressure. To prevent contamination or damage, it is necessary to keep the heating element in a protective device before and after each welding process. Before starting each welding process, heating element should be cleaned with clean, fluffless paper.

2.5.3.2- Performing the welding process
Insert heating element between the ends and apply required alignment pressure. The alignment pressure is maintained until the joining faces completely align onto the heating element. By this moment, a bead must be created (see Welding Parameters table above) surrounding the whole circumference of both parts to be welded. Adjusting pressure should be reduced to p = 0,01 N/mm² for the preheating time according to Welding Parameters table above. The heating element should then be removed and the surfaces to be welded be joined; taking care that adjusting time is as short as possible. Adjusting pressure should be increased during the joining process until the required value is reached. Adjusting pressure should be maintained until the welding seam has cooled down (sudden cooling with the help of cooling agents is not permitted). Then clamps should be removed after the required cooling time.

2.5.4- Threaded and Flanged Connections
Mechanical connections are used to connect PE components to themselves or to other pipe materials or components.

2.5.4.1 – Threaded Connections
For mechanical joint and flanged connections, a male or female threaded adapter is welded to PE pipe; then the adapter is connected to the mating component. Figure below shows female and male threaded adapters.
Other mechanical connectors connect directly to plain-end PE pipe. Compression couplings work on the general principle of compressing an elastomeric gasket around each pipe end to be joined, to form a seal.



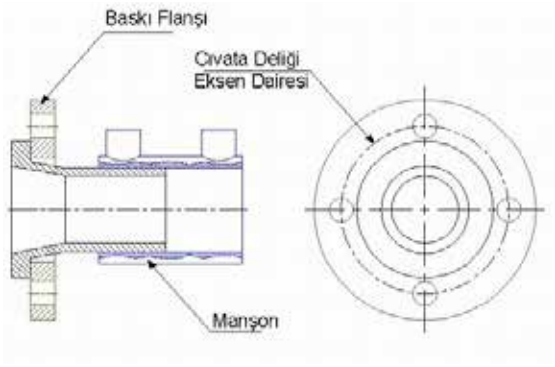
Dişi ve erkek adaptör resimleri/ *Pictures for female and male threaded adapters*

Diğer mekanik bağlantılar doğruca PE borunun üstünden bağlanırlar. Boru üstünden sıkma rakorlu bağlantılar, elastomerik bir contayı kendi gövde içi ve boru dışı arasında sıkıştırarak sızdırmazlığı sağlama prensibi ile çalışırlar. Bu tür bağlantılar, çekerek yerinden kurtulma riskine karşı boru içine konulan metal bir takviye bileziğine gerek duyarlar.

2.5.4.2 – Flanşlı Bağlantılar

Flanşlı bağlantılar, boruya kaynatılmış bir adaptör kullanırlar. PE malzemeden olan esas flanş, arka taraftan mutlaka bir baskı flanşı ile beslenmelidir. Aksi taktirde, PE flanş cıvataların arasından sızdırma yapacaktır. PE flanşın her tarafından eşit kuvvet uygulanmalıdır.

Baskı flanşları demir, çelik, astarlanmış çelik, plastik kaplanmış çelik veya paslanmaz çelikten olabilir. Yeraltı uygulamalarında, kaplama ve katodik koruma gerekebilir. Flanş cıvataları cıvata deliğinden kabaca 3 mm daha düşük çaptadır. Somun ve baskı flanşı arasında mutlaka yassı pul kullanılmalıdır. Flanş cıvataları, cıvata dişleri somundan en az 2-3 diş dışarıda kalacak uzunlukta olmalıdır.



Tipik flanş bağlantı detayı

Flanş Montajı

Sıkıştırmadan önce, karşılıklı flanşlar tam eksende ve yüzeyleri paralel olmalıdır. Ayarsız flanşları sıkmak, kaçaklara sebep olabilir.

Montaja başlamadan önce cıvata, somun ve pulların gres yağı ile yağlanmasında fayda vardır. Conta ve flanş yüzeyleri temiz ve çentiksiz olmalıdır.

Flanşlar önce gevşek olarak birbirine bağlanmalıdır. Sonra el ile sıkılarak denklik ayarı kontrol edilmeli ve gerekirse düzeltilmelidir.

Cıvatalar, 4-lü indeksleme sırasında, öngörülen tork değerinde, somun döndürülerek sıkılmalıdır.

The gasket, when compressed against the outside of the pipe by tightening the bolts, produces a pressure seal. These couplings require a stiffener in the pipe ID for pullout resistance. Examples to such couplings are;

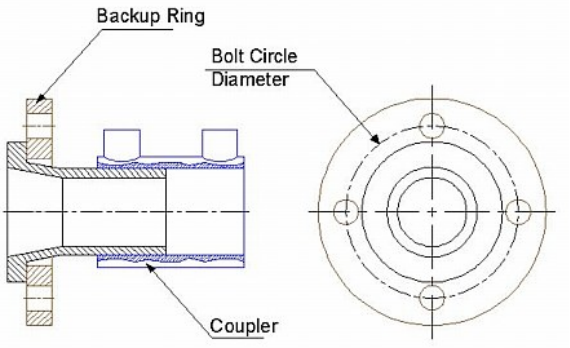
Mechanical Compression Couplings for Small Diameter Pipes
Mechanical Bolt Type Couplings

2.5.4.2 - Flanged Connections

Flanged joints are made using an adapter that is welded to pipe. A back-up ring is fitted behind the flange adapter sealing surface flange and bolted to the mating flange. An all-PE flange without a back-up ring is not recommended because PE flanges require uniform pressure over the entire sealing surface. Without a back-up ring, a PE flange will leak between the bolts.

Back-up rings are made of ductile iron, steel, primer-coated steel; epoxy coated steel, or stainless steel. In underground service, coatings and cathodic protection may be needed to protect metal back-up rings from corrosion. One edge of the back-up ring bore must be radiused or chamfered. This edge fits against the back of the sealing surface flange. Flange bolts are sized about 3 mm smaller than the bolthole diameter. Flat washers should be

used between the nut and the back-up ring. Flange bolts must be long enough to span the entire width of the flange joint, and provide sufficient thread length to fully engage the nut.



Typicak flanged connection detail

Flange Assembly

Before tightening, mating flanges must be centered to each other and sealing surfaces must be vertically and horizontally parallel. Tightening misaligned flanges can cause leakage or flange failure.

Before fitting, flange bolt threads, washers, and nuts should be lubricated with a lubricant grease. Gasket and flange sealing surfaces must be clean and free of significant cuts or scrapings. The flange components should first be fitted together loosely.

All bolts must be tightened by hand and alignment be rechecked, and readjusted if necessary.

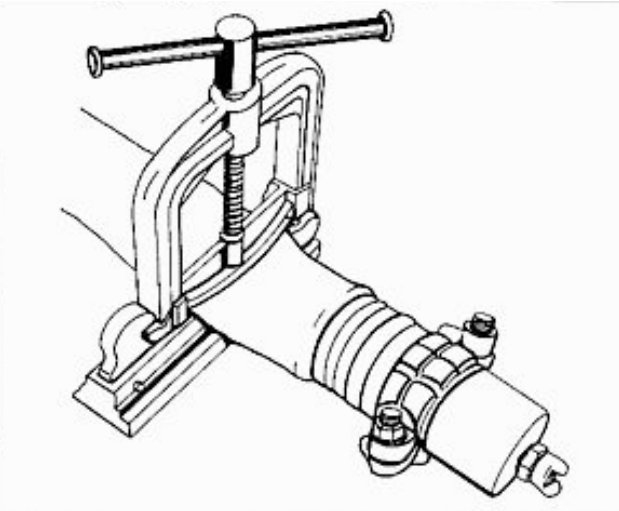
4-lü İndeksleme Sıkma Sırası:
1) Üst konumda bir cıvata seçilip sıkılır;
2) Bunun 180° karşısındaki cıvata sıkılır;
3) İkinci sıkılan cıvatanın 90° saat yönündeki bir sonraki cıvata sıkılır;
4) Üçüncü cıvatanın 180° karşısındaki son cıvata da sıkılır.
5) İlk başlanılan cıvatadan saat yönüne doğru bir sonraki cıvata sıkılır ve yukarıdaki göreceli sıkma sırası ikinci grup cıvata için de uygulanır.
6) Tüm cıvatalar gerekli ilk tork değerinde sıkılana kadar işlem devam eder.
7) Sıkma tork değeri son değere çıkarılarak tüm cıvatalar ayni şablon uyarınca sıkılır.
8) PE ve conta, sıkışarak bir miktar plastik deformasyona uğrayacağından dolayı bir saat kadar sonra tüm cıvatalar tekrar son tork değerinde sıkılmalıdır. Sıkma işlemi için tork anahtarı kullanılmalıdır.

2.5.5 PE Boruların Onarılması
Hasarlı PE boruların onarılma metodu, hasarın derecesine bağlıdır. Küçük hasarlar, hasarlı bölgenin üstüne bir semeri EF yöntemi ile kaynatarak veya kelepçe ile sıkarak onarılabilir. Böyle bir yöntem, boruda gaz veya yanıcı madde varken uygun olmayabilir. Yakın zamanlarda, hasarlı bölgeyi bir kapsül içine alma yöntemleri de geliştirilmiştir. Bu konu için boru üreticilerine başvurulmalıdır.
Daha büyük hasarlar, hasarlı boru parçasının çıkarılarak araya yeni bir parçanın konması şeklinde onarılabilir. Bu işlem genelde basit bir uygulamadır. Borunun hasarlı bölümü sıkma aparatlarıyla izole edilir, hasarlı kısım kesilir ve aynı evsafta yeni parça EF metodu ile araya konulabilir.
Aşağıda, tipik bir onarım için aşamaları gösteren şekiller ve sonrasında açıklamalar bulunmaktadır:

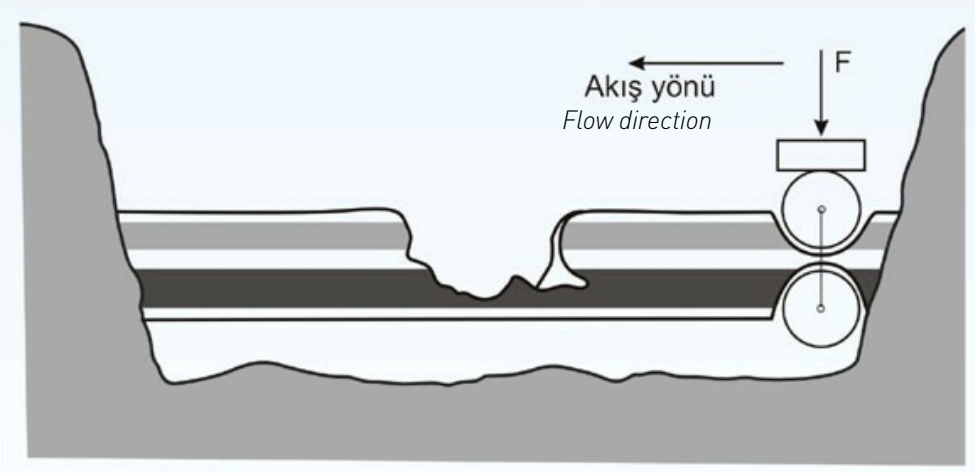
Flange bolts are tightened uniformly in a 4-bolt index pattern to the appropriate torque value by turning the nut.

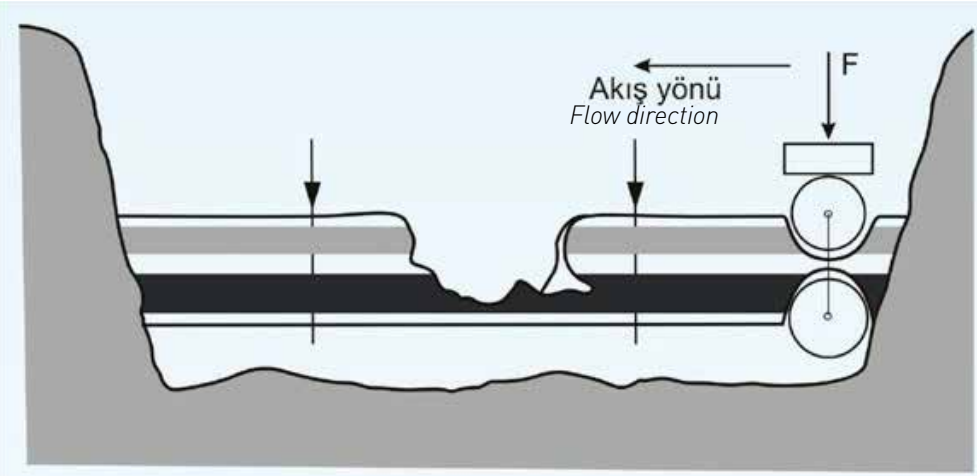
4-Bolt Index Pattern Tightening Sequence:
1) Select and tighten a top bolt;
2) tighten the bolt 180° opposite the first bolt;
3) tighten the bolt 90° clockwise from the second bolt;
4) tighten the bolt 180° opposite the third bolt.
5) Index the pattern one bolt clockwise and repeat the 4-bolt pattern.
6) Continue tightening in a 4-bolt index pattern until all bolts are tightened to the specified torque level.
7) Increase the tightening torque to the next level and repeat the entire 4-bolt index pattern for all flange bolts.
8) PE and the gasket will undergo some compression set. Therefore, retightening is recommended about an hour or so, after torqueing to the final torque value the first time.
A torque wrench is recommended for tightening.

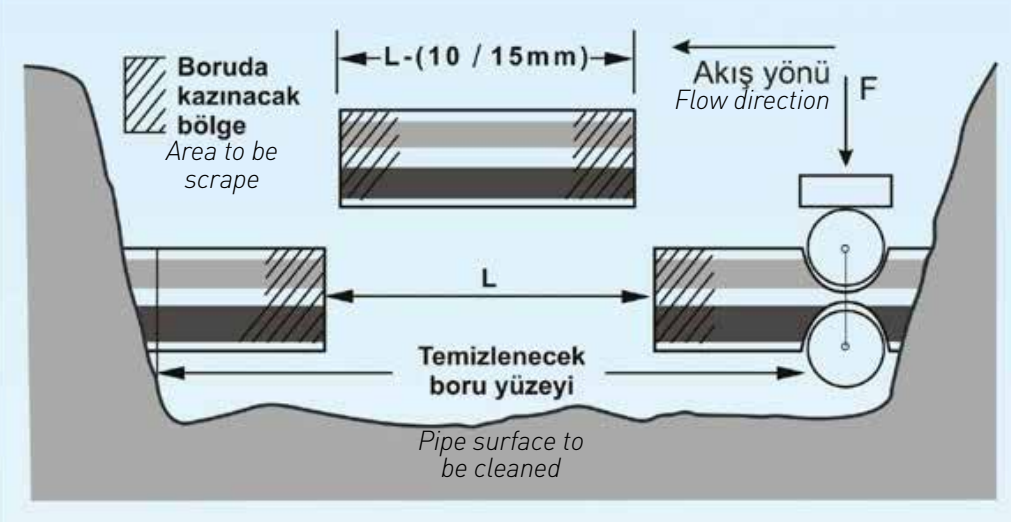
2.5.5 Repairing of PE Pipes
The method of repairing damaged PE pipe depends upon the degree of damage sustained. Localised damage may be repaired by use of an electrofusion saddle or clamp fixed around the damaged area. Such a repair may not be suitable where gas or other flammable fluid is present in the pipe, due to the heat generated in the fusion process. PE encapsulation techniques have recently been developed and may be suitable for localised repairs. Information on these techniques can be obtained from the pipe manufacturers.
More extensive damage will require the section of pipe to be cut out and replaced. This is a relatively simple process, firstly isolating the damaged section by the use of squeeze-off tools, cutting out the section and replacing with new pipe using electrofusion couplers to tie-in the sections. It is important that the replacement section is of suitable diameter and pressure rating to maintain the integrity of the pipeline.
In all cases reference should be made to local or national codes of practice and all health and safety procedures should be closely followed.
Below are figures for a typical sequence of repair steps, and explaining follow after:

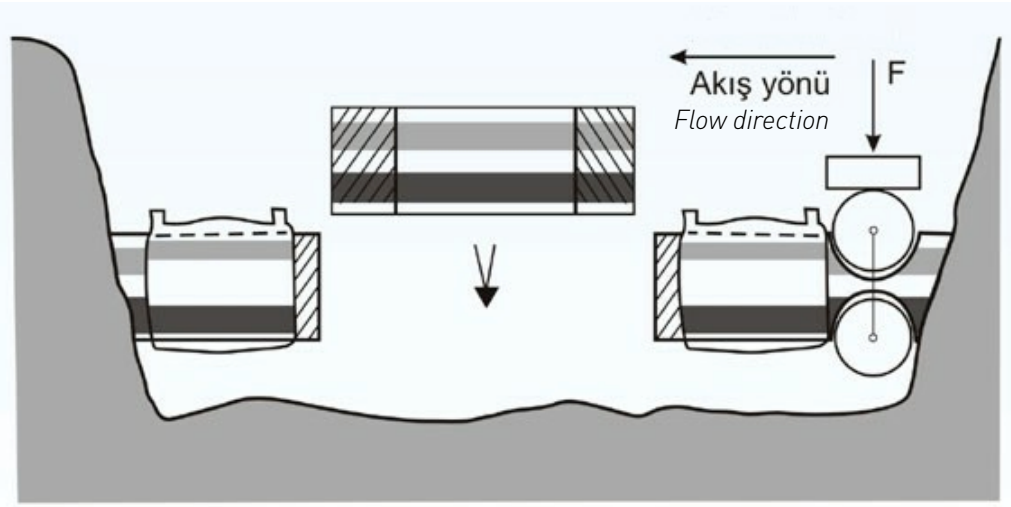


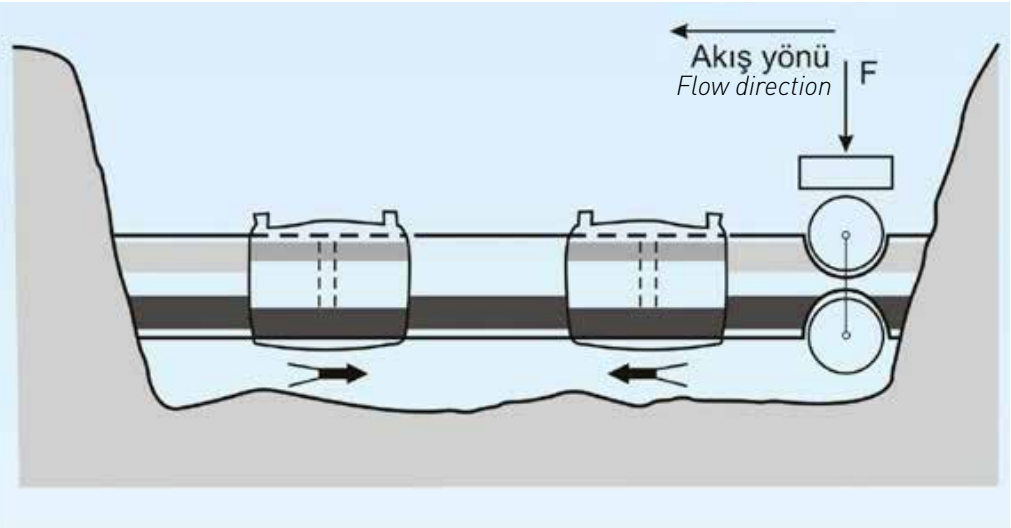
PE boruyu sıkarak büzme/ *Squeezing PE pipe with a clamping device*

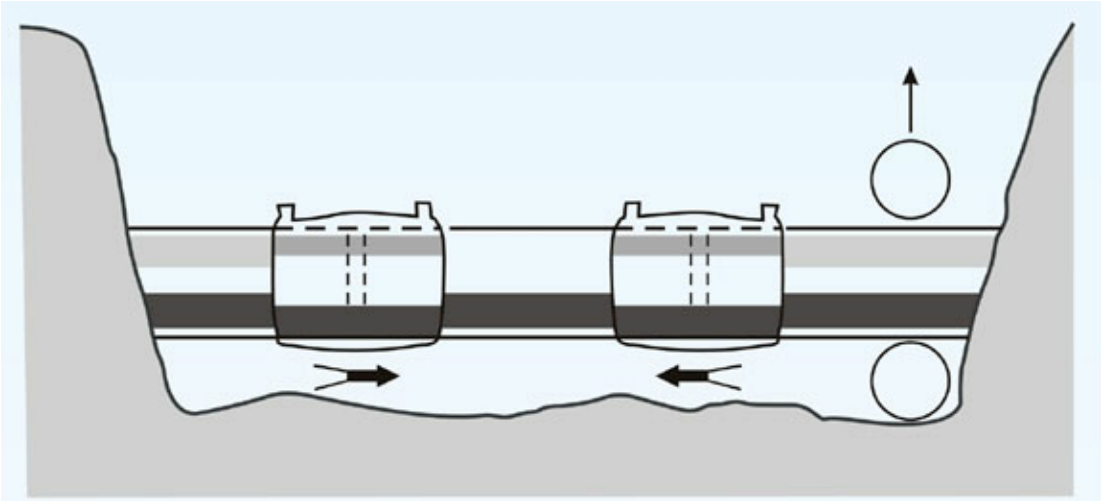





Boruda kazınacak bölge
Area to be scrape
L-(10 / 15mm)
Akış yönü
Flow direction
F
L
Temizlenecek boru yüzeyi
Pipe surface to be cleaned


Akış yönü
Flow direction
F


Akış yönü
Flow direction
F



1. Hasarlı bölüm öncesinde boru bir sıkıştırma aparatı ile tamamen büzülür. Aparatın hasarlı bölgeden uygun bir mesafede olması lazımdır.
2. Borunun hasarlı bölgesi kesilir. Kesimin boru eksenine tam dik açıda olması lazımdır.
3. Kesilen parçanın yerinde kalan boşluk ölçülür, bundan 10-15 mm daha kısa bir yeni boru parçası hazırlanır..
4. Boru uçları kazınarak oksit tabakası temizlenir.
5. EF manşonun içindeki stoperler kopartılır. Bunun için manşon boru üstüne geçirilip stoperlere dayanır, sonra manşonu diğer tarafından sertçe darbe uygulanarak stoperler kopartılır.
6. Borunun EF manşon içinde kalacak alanı bir kalemle işaretlenir.
7. Kaynayacak bölümlerin temiz ve kuru olması sağlanır.
8. EF manşonlar ana boru uçlarına geçirilerek dışa doğru itilir, araya yeni boru getirilir.
9. Yeni boru yerine hizalandıktan sonra manşonlar içe doğru sürülerek yeni borunun da manşonlar içinde kalması sağlanır.
10. Durum sabitlendikten sonra EF kaynak işlemi uygulanır.
11. Soğuduktan sonra sıkıştırma aparatı sökülür ve boru hattı tekrar hizmete alınır.

2.6- Basınç / Kaçak Testleri

2.6.1 – Test Öncesi Notlar:

Kaçak testleri yeni yapılmış veya onarımı tamamlanmış bir hatta kaçak olup olmadığını görmek için yapılır. Kaçak testleri, borunun basınç sınıfını veya uzun süreli kullanım performansını onaylamak için bir kriter değildir. Bu özellikleri belirleyen kriterler, sistem tasarımı ve kullanılan malzemelerin basınç sınıflarıdır.

Basınçlı boru tesisatının kaçak testleri, sistemi sıvı ile (genellikle su) doldurup statik basınç uygulamak şeklindedir. Hava ile testler tavsiye olunmaz.

1. Put a clamping device before the damaged part of the pipe. Clamping device must be suitable distance from damaged point.
2. Cut the damaged part of the piping line. Cutting angle must be square with the pipe axis.
3. Measure the cut length (L) of the damaged pipe and prepare a new pipe with a length 10-15 mm less than the length of the damaged pipe.
4. Scrape the pipe ends.
5. Break the stoppers in the EF coupling part using a piece of pipe. To accomplish this, inserting the pipe in the coupler, then hit the free part of the coupler to the hard face of the pipe.
6. Mark on the pipe the inserting part of EF coupler with a pencil.
7. Pay attention for welding regions (e.g. pipe ends, inside of the coupler) to be clean and dry.
8. Insert EF coupler to the ends of PE pipes and move the couplers on the pipe so that it is possible to place the new pipe between the cut pipe ends.
9. After placing the new pipe in the space, pull the coupler over the new pipe as shown in the figure.
10. After finishing the positioning, EF welding process can be started.
11. After finishing welding process and cooling time elapsed, the clamping device can be removed and water or gas could be supplied to the pipe line.

2.6- Pressure / Leak Testing

2.6.1 – Pre-Test Considerations

Leak testing may be used to find leaks in a newly constructed or newly modified piping system, or in an established system where an apparent loss of integrity has been experienced. Leak testing does not verify pressure rating or potential long-term performance. The system design and the pressure ratings of the installed components are the determining parameters of system pressure rating and long-term performance.

Leak testing of pressure piping systems is done by filling with a liquid and applying a pressure. Pneumatic (air) testing of pressure piping systems is not recommended.

Güvenlik

Güvenlik, her işin başı, en önemli unsurdur. Kaçak testleri ek yerlerine yüksek basınç uygulamaktadır. Testler sırasında oluşacak bir hasar, parçaların aniden sağa-sola savrulması ve çevreye de hasar vermesine yol açabilir.
Ciddi yaralanma ve ölüm riski olduğundan, basınç testleri sırasında güvenli bir uzaklıkta durulmalıdır.
Test edilen kısımlar, tüm test süresince denetim altında olmalıdır.
Tam olarak bağlanmamış bir tesisatta basınç testleri uygulanmamalıdır. Bir yırtılma olması durumunda boruların veya parçaların etrafa savrulmaması açısından sistemin sağlam olarak tespit edilmesi gereklidir. Bir yardeki kaçak o bölgenin ani yırtılmasına yol açabilir. Sistem basınç altında iken hiç bir surette görülen bir kaçak onarılmaya çalışılmamalıdır. Onarımdan önce mutlaka basınç sıfırlanmalıdır.

* Test öncesi tüm kaynaklar tam olarak soğumuş olmalıdır.
* Tüm mekanik bağlantılar bağlanmış ve talimata göre sıkılmış olmalıdır
* Dolgu içinde kalan ek yerleri gözlemleme için açıkta kalmalıdır.
* Kullanılan tüm tapa vs kapatma elemanları uygulanacak basınca uygun sınıfta olmalıdır
* Sisteme bağlı ama daha düşük basınçta kalan kısımlar varsa, buraların bağlantısı test sırasında kesilmeli, test basıncı uygulanmamalıdır.

Test Bölümü

Testler tüm sitemde aynı anda veya bölümler halinde yapılabilir. Test bölümünün uzunluğu, test ekipmanının kapasitesi ile sınırlıdır. Düşük kapasiteli doldurma ve basınçlandırma ekipmanı, testi öngörülen sürede bitiremiyebilir. Böyle bir durumda ya bölümler halinde testler yapılmalı, ya da daha yüksek kapasiteli test ekipmanı kullanılmalıdır.
Test basıncı uygulamadan önce, test bölümü ve test akışkanının ortak bir sıcaklığa gelmeleri beklenmeli, sonra teste başlanmalıdır.

Test Basıncı

PE boru ve fitinglerden oluşan basınçlı ssistemlerde:
* Azami test basıncı, test yapılan bölümün en düşük kotundan ölçülmelidir.
* Azami test basıncı, sistemde kullanılan elemanların en düşük basınç sınıfı kadar olabilir.

PE borunun kaçak testleri için; azami test basıncı sistemdeki çalışma basıncının 1.5 katıdır. Ancak, PE boruların basınç dayanımı artan sıcaklık ile azaldığından, test ortamındaki sıcaklığa göre uygulanacak basıncı düşürmek gerekebilir. Böyle bir durumda, uygulanması gereken test basıncı aşağıdaki tablodaki katsayılarla çarpılarak çıkan basınç uygulanmalıdır.

Safety

Safety is of utmost importance. Leak tests can apply high stress to joints and parts in the system. Failure can occur by leaking or by catastrophic rupture that can cause sudden, violent movement. In some cases, leakage may immediately precede catastrophic rupture.
Death or serious injury and property damage can result from failure at a joint or connection during pressure leak testing. All persons must be at a safe distance away during testing.
The test section is to be supervised throughout the test.
Ensure that all piping is restrained against possible movement from catastrophic failure at a joint or connection. When pressurized, faulty joints or connections may separate suddenly; causing violent and dangerous movement of piping or parts. Leakage at a joint or connection may immediately precede catastrophic failure. Never approach or attempt to repair or stop leaks while the test section is pressurized. Always depressurize the test section before making repairs.
Before applying pressure, all piping and all components in the test section must be restrained. This means that if piping or parts move or separate during the test, it will not result in damage or injury. Never conduct leak tests on unrestrained piping.
** Heat fusion joints must be properly cooled before testing.*
** Mechanical connections must be completely installed and tightened per manufacturer's instructions.*
** If backfill provides restraint, it must be properly placed and compacted. Joints and connections may be exposed for inspection.*
** End closures must be suitable for pressure service and pressure-rated for the test pressure.*
** Ensure that all connections to test equipment are secure. Disconnect or isolate all low pressure filling lines and all other parts that are not to be subjected to test pressure. Restrain, isolate or remove expansion joints before leak testing.*

Test Section

Testing may be conducted on the full system or in sections. Test section length is determined by the capacity of the testing equipment. Lower capacity pressurizing or filling equipment may not be capable of completing the test within permissible time limits. If so, either a higher capacity test equipment should be used or a shorter test section be selected.
Before applying test pressure, time should be allowed for the test fluid and the test section to equalize to a common temperature.

Test Pressure

For pressure piping systems that include polyethylene pipe or fittings:
** The maximum permissible test pressure is measured at the lowest elevation in the test section.*
** The maximum permissible test pressure is the lowest pressure rated component in the test section.*
For leak testing purposes, the maximum allowable test pressure in polyethylene pipe is 150% of the pipe's design pressure rating for the application and the application service temperature.
All PE pipes have reduced strength at increased temperatures. Test pressure must be reduced when the test section is at a higher temperature either from service conditions or from environmental conditions such as being warmed by the sun. Multiply the test pressure by the multiplier (Table below), to determine the allowable higher temperature test pressure.

Sıcaklıklara Göre Test Basıncı Katsayıları *Higher Temperature Multiplying Factors*

Test Bölümü Sıcaklığı (°C) *Test Section Temp.(°C)*	↖ 27	↖ 32	↖ 38	↖ 43	↖ 49	↖ 54	↖ 60
Katsayı *Factor*	1,00	0,90	0,80	0,75	0,65	0,60	0,50

Test Süresi

Bir sistemi dizayn basıncının 1.5 katında test ederken, test süresi 8 saat ile sınırlandırılmıştır. Bu süreye basınçlandırma süresi, genleşme için geçen süre, bekleme süresi ve basınç düşürülme süresi dahildir. Şayet bir kaçak veya başka bir sebeple test tamamlanamazsa, sistemin basıncı sıfırlanmalı, tekrar basınçlandırmak için en az 8 saat beklenmelidir.

Testin yapılma zamanı, tüm test boyunca devamlı denetlenebilecek saatlerde olmalıdır.

Test Akışkanı

Hidrostatik Test

Test akışkanının çevreye ve test ekipmanına zarar vermeyen, problemsiz olarak atık hattına verilebilecek bir akışkan olması gereklidir. Testler için önerilen akışkan sudur.

Pnömatik Test

Hidrostatik teste göre kaçak ve patlaklarda çok daha tehlikeli olduğundan, basınçlı hava ile test yapılmamalıdır.

2.6.2 – Hidrostatik Kaçak Testi Aşamaları

Test aşamaları doldurma, genleşme fazı, test fazı ve boşaltma aşamalarından oluşur.

Test fazı için 2 seçenek vardır.

2.6.2.1- Test Fazı – 1. Seçenek

Test bölümü tamamen doldurulmalı, içeride hiç hava kalmadığından emin olunmalıdır. Aksi taktirde bir patlama ile hayati tehlike bile oluşabilir. Sistemin yüksek noktalarına konulacak pürjörler ile hava dışarı atılmalıdır. Genleşme fazından hemen sonra, test basıncı 0.7 bar kadar düşürülür ve su eklemeye son verilir. Şayet test basıncı 1 saat boyunca hedef basıncın %5 inden daha az sapma gösterirse kaçak olmadığına hükmedilir.

2.6.2.2- Test Fazı – 2. Seçenek

Test bölümü yavaş yavaş basınçlandırılmalı ve 3 saat basınç altında tutulmalıdır. Genleşme fazında, PE boru bir miktar genleşecek ve su eklemek gerekecektir. Genleşme fazında eklenen su miktarını ölçmeye gerek yoktur.

Bu seçenek, test basıncı işletme basıncının 1.5 katı olduğu hallerde geçerlidir. Genleşme fazından hemen sonra, test basıncını sıra ile 1, 2 ve 3 saat boyunca sabit tutmak için gereken takviye su miktarı ölçülür. Şayet eklene su miktarları aşağıdaki tablonun ilgili bölümündeki değerden fazla değilse kaçak olmadığına hükmedilir.

Test Duration

When testing at pressures above system design pressure up to 150% of the system design pressure, the maximum test duration is eight (8) hours including time to pressurize, time for initial expansion, time at test pressure, and time to depressurize the test section. If the test is not completed due to leakage, equipment failure, or for any other reason, depressurize the test section completely, and allow it to relax for at least eight (8) hours before re-pressurizing the test section.

When testing at system design pressure or less, test duration including time to pressurize, time for initial expansion, time at test pressure and time to depressurize should be limited to a practical time period given that the test section is not to be left unsupervised at any time during leak testing.

Test Fluid

Hydrostatic Testing

The test liquid should meet appropriate industry standards for safety and quality so that the environment, system, test equipment and disposal (if necessary) are not adversely affected. The recommended test liquid is water.

Pneumatic Testing

Compared to hydrostatic testing, pneumatic testing can be more dangerous because failure during pneumatic testing releases more energy. For safety reasons, pneumatic testing is not recommended.

2.6.2 – Hydrostatic Leak Testing Procedures

This hydrostatic leak test procedure consists of filling, an initial expansion phase, a test phase, and depressurizing. There are two alternatives for the test phase.

2.6.2.1- Test Phase – Alternate 1

Fill the restrained test section completely with test liquid. Ensure that there is no air trapped in the test section. Failure with entrapped air can result in explosive release and result in death or serious bodily injury. Use equipment vents at high points to remove air.

Immediately following the initial expansion phase, reduce test pressure by 0.7 bar, and stop adding test liquid. If test pressure remains steady (within 5% of the target value) for one hour, no leakage is indicated.

2.6.2.2- Test Phase – Alternate 2

Gradually pressurize the test section to test pressure, and maintain test pressure for three hours. During the initial expansion phase, polyethylene pipe will expand slightly. Additional test liquid will be required to maintain pressure. It is not necessary to monitor the amount of water added during the initial expansion phase.

This alternative is applicable when the test pressure is 150% of the system design pressure.

Immediately following the initial expansion phase, monitor the amount of make-up water required to maintain test pressure for one, two or three hours. If the amount of make-up water needed to maintain test pressure does not exceed the amount in Table below, no leakage is indicated.

İzin verilen takviye su miktarları tablosu *Table for permitted amounts of make-up water*

Takviye Edilen Su, Lt/100m boru *Make-up Water Allowance, Lt/100m of Pipe*				Takviye Edilen Su, Lt/100m boru *Make-up Water Allowance, Lt/100m of Pipe*			
Boru Dış Çapı (mm) *Pipe O.D. (mm)*	1-saat test *1-hr test*	2- saat test *2-hr test*	3- saat test *3-hr test*	Boru Dış Çapı (mm) *Pipe O.D. (mm)*	1-saat test *1-hr test*	2- saat test *2-hr test*	3- saat test *3-hr test*
32	0,7	1,2	2,0	315	13,6	28,5	42,2
40	0,9	1,2	2,1	355	17,4	34,7	52,1
50	0,9	1,4	2,4	400	21,1	40,9	62,0
63	1,1	1,7	2,7	450	24,8	53,3	80,6
75	1,2	1,9	3,1	500	34,7	68,2	99,2
90	1,6	3,1	5,0	560	43,4	86,8	130,2
110	2,4	4,7	7,2	630	55,8	110,4	164,9
125	2,6	5,1	7,7	710	68,2	137,7	208,3
140	3,7	7,4	11,2	800	86,8	177,3	266,6
180	5,0	8,7	12,4	900	111,6	223,2	334,8
200	6,2	12,4	18,6	1000	148,8	286,5	437,8
250	10,0	16,1	26,0	1200	186,0	334,8	533,3

3- Akış ve Hesaplamalar

3.1- Boru çapını belirleme

SDR – Standart Boyut Oranı (Standard Dimension Ratio)
Bir borulama sisteminin tasarımı SDR değeri üzerinden yapılır. Bu değer, dış çapın et kalınlığına olan oranıdır.

SDR = Do / t

Çalışma Basıncı Hesabı
Emniyet faktörü ve izin verilebilir çalışma basıncını hesaplayabilmek için, malzemenin uzun vadedeki çatlama gerilimini bilmek gerekir. Aşağıda PE için verilen ömür eğrileri, buna ilişkin bir grafiktir. Bu grafik, hedeflenen çalışma basınç ve sıcaklığında uzun dönem çatlama gerilimini (K) göstermektedir.

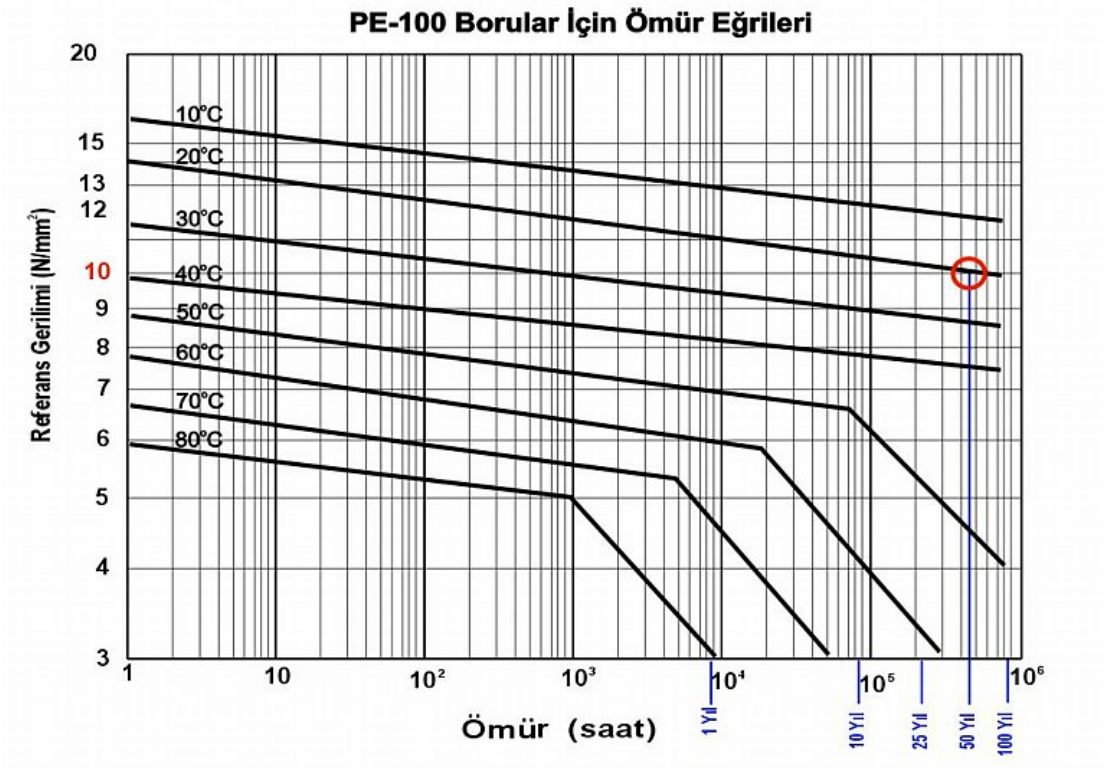
3- Flow and Calculations

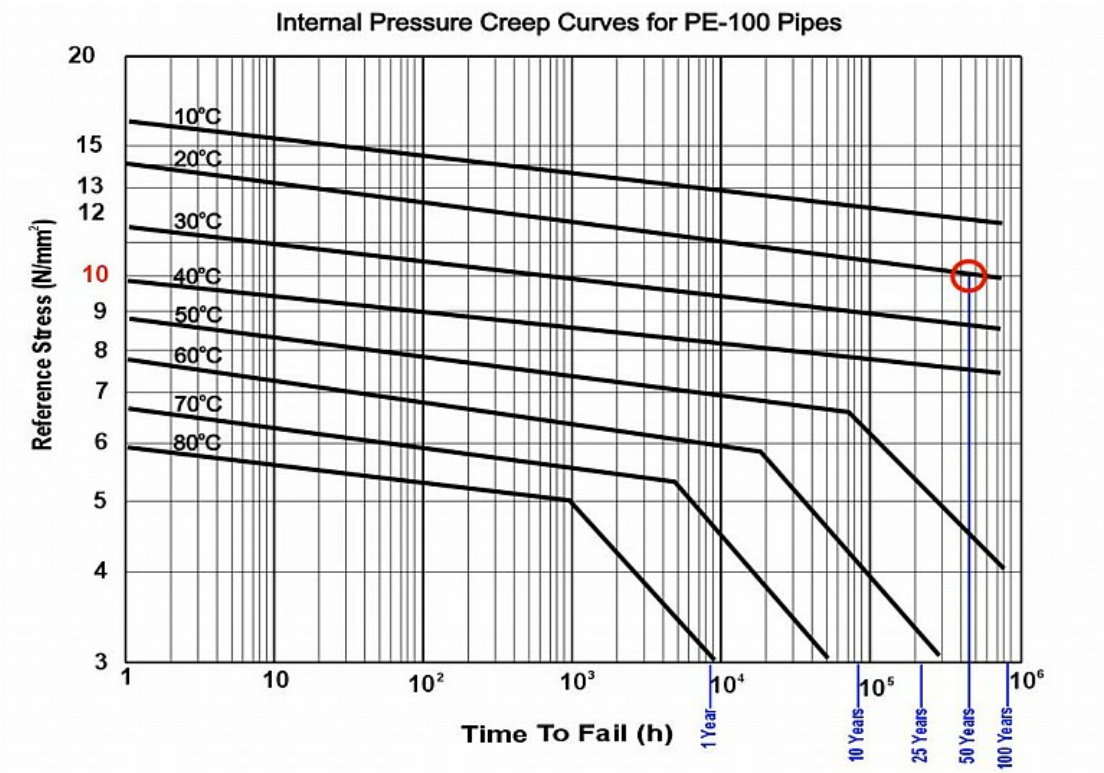
3.1- Determining Pipe Sizes

Standard Dimension Ratio
The design of a piping system is based on the SDR value (Standard Dimension Ratio). It is the ratio of the pipes (or fittings) outside diameter to its minimum wall thickness.

SDR = Do / t

Working Pressure Calculation
To calculate the safety factor and permissible operating pressure it is necessary to know the long term rupture stress of a material. Creep Curve below, is such diagram for PE. This diagram allows the long term rupture stress K to be read depending on the desired operating life and working temperature.


PE-100 Borular İçin Ömür Eğrileri
Referans Gerilimi (N/mm²)
20
15
13
12
10
9
8
7
6
5
4
3
10°C
20°C
30°C
40°C
50°C
60°C
70°C
80°C
1
10
10²
10³
10⁴
10⁵
10⁶
Ömür (saat)
1 Yıl
10 Yıl
25 Yıl
50 Yıl
100 Yıl


Internal Pressure Creep Curves for PE-100 Pipes
Reference Stress (N/mm²)
20
15
13
12
10
9
8
7
6
5
4
3
10°C
20°C
30°C
40°C
50°C
60°C
70°C
80°C
1
10
10²
10³
10⁴
10⁵
10⁶
Time To Fail (h)
1 Year
10 Years
25 Years
50 Years
100 Years

Efektif emniyet faktörü şu formül ile bulunur:

C = 20 · (K· t) / P · (Do – t)

Açıklama,
K = uzun dönem çatlama gerilimi (N/mm²) (K yukarıdaki grafikten okunacaktır)
t = boru et kalınlığı (mm)
Do = boru dış çapı (mm)
P = çalışma basıncı (bar)

PE borular için asgari emniyet faktörü (C):
1.25 (su için)
1.60 (gaz için)

PE borunun azami çalışma basıncı şu formülle hesaplanır:
Pmax = (20 · K) / (C · (SDR - 1)) (bar)

Özet olarak; çalışma hesapları için 2 seçenek vardır:
1- Boru özellikleri bilinirse;
Pmax = (20 · MRS) / (C · (SDR-1)) (bar)

2- Çalışma şartları bilinirse;
SDR = 1 + ((20 · MRS) / (C · Pmax))

Açıklama; (MRS : Minimum Required Strength – Asgari Gerekli Dayanım),
MRS = 8 Mpa PE80 için
MRS = 10 Mpa PE100 için

Elemanların izin verilebilen çalışma basınçları
Aşağıdaki tabloda (ISO 4065 and DIN 8074 ile uyumlu), boruların farklı işletme koşullarında (sıcaklık ve zaman) izin verilebilen çalışma basınçları gösterilmektedir. (C = 1,25)

The effective safety factor is given by the following formula :

C = 20 · (K· t) / P · (Do – t)

Where,
K = long term reference stress (N/mm²) (K should be looked from the creep curve depending on the operating temperature and expected service life)
t = wall thickness of pipe(mm)
Do = outside diameter of pipe (mm)
P = operating pressure (bar)

The minimum safety factor (C) to be taken for PE pipes:
1.25 (for water)
1.60 (for gas)

The maximum operating pressure of a PE pipe can be calculated by the formula
Pmax = (20 · K) / (C · (SDR - 1)) (bar)

As a summary; two alternatives for operational calculations are:
1- When the pipe geometry is known;
Pmax = (20 · MRS) / (C · (SDR-1)) (bar)

2- When the operating conditions are known;
SDR = 1 + ((20 · MRS) / (C · Pmax))

Where (MRS : Minimum Required Strength),
MRS = 8 Mpa for PE80
MRS = 10 Mpa for PE100

Permissible operating pressures of components
The table below (in compliance with ISO 4065 and DIN 8074) may help to evaluate the respective permissible operating pressures of components under different operating conditions (temperature and time).

PE-100 için (C = 1,25) izin verilen çalışma basınçları (bar)/ *Permissible operating pressure for PE-100 (C = 1,25) (bar)*

Boru İçindeki Akışkan Sıcaklığı *Temperature of fluid in pipe*	Çalışma Süresi *Operating Period*	SDR *SDR*		
[°C]	[yıl]/ *[year]*	17	11	7,4
10	5	12,6	20,2	31,5
	10	12,4	19,8	31,0
	25	12,1	19,3	30,2
	50	11,9	19,0	29,7
	100	11,6	18,7	29,2
20	5	10,6	16,9	26,5
	10	10,4	16,6	26,0
	25	10,1	16,2	25,4
	50	10,0	16,0	25,0
	100	9,8	15,7	24,5
30	5	9,0	14,4	22,5
	10	8,8	14,1	22,1
	25	8,6	13,8	21,6
	50	8,4	13,5	21,2
40	5	7,7	12,3	19,3
	10	7,6	12,1	19,0
	25	7,4	11,8	18,5
	50	7,2	11,6	18,2
50	5	6,7	10,7	16,7
	10	6,5	10,4	16,2
	15	5,9	9,5	14,8
60	5	4,8	7,7	12,1
70	2	3,9	6,2	9,8

Gaz uygulamaları için, su ve gaz emniyet katsayıları arasındaki orandan gaz çalışma basınçları için de hesap yapılabilir ancak öncelikle yerel ve ulusal güvenlik normlarına uyulması gereklidir.
Boru üzerinde diğer çevresel faktörlerin de etkin olabileceği durumlarda (ör. Toprak yükleri, askıda olmaktan dolayı eğim gerilmeleri vs) ikinci bir emniyet faktörü de alınması önerilir.
Alın kaynak yöntemi için kullanılan uzun süreli kaynak faktörüne (fs=0,8) eşit bir azaltma faktörü kullanılması tavsiye edilir.

Örnek Çözümler:
a- Boru özelliklerinin belirli olması durumu:
PE-100 boru, MRS=10
Do = 63 mm
SDR=17; t = 3,7 mm
Akışkan: Su, C=1,25
Pmax = (20 · MRS) / (C · (SDR-1)) = (20 x 10) / (1,25 x (17-1)) = 10 bar
Alın kaynak emniyet faktörü de hesaba katılırsa, Pmax = 10 x 0,8 = 8 bar olur.

b- Çalışma şartlarının bilinmesi durumu:
PE-100 boru, MRS=10
Akışkan: Su, C=1,25
Pmax = 12 bar
SDR = 1 + ((20 · MRS) / (C · Pmax)) = 1 + ((20 x 10) / (1,25 x 12)) = 14,33
yani SDR=11 olan bir boru seçilmelidir.
Alın kaynak emniyet faktörü de hesaba katılırsa, SDR = 14,33 x 0,8 = 11,46 bulunur, bu durumda da SDR=11 olan bir boru uygundur.

Boru çapının hesaplanması:
Akış izlemlerinin hesaplanması kütlelerin eşitliği denkleminden yararlanılarak yapılır. Sabit hacimli akışkanlar için denklem aşağıdaki gibidir:

$$Q = 0.0036 \cdot A \cdot V$$

Q ... debi (m³/h)
A ... boru net kesit alanı (mm²)
V ... akış hızı (m/s)

Gaz ve buharlar için, malzeme akışı sürekli sabittir.
Bu sebeple denklem aşağıdaki gibidir:
$m = 0.0036 \cdot A \cdot v \cdot \rho$
m ... kütle akışı (kg/h)
ρ ... akışkanın basınç ve sıcaklığa bağlı yoğunluğu (kg/m³)

Kısaca, aşağıdaki formüllerle gerekli akış kesit alanı hesaplanabilir.

$Di = 18,8 \cdot \sqrt{(Q/V)}$ (Q.... m3/h)
$Di = 35,7 \cdot \sqrt{(Q/V)}$ (Q....lt/s)

Açıklama,
Di ... boru iç çapı (mm)
Q ... debi (m3/h),(lt/s)
V ... akış hızı (m/s)

For gas applications the given system operating pressures may be converted in accordance with the respective safety factor for gas. However, regional and national guidelines have to be adhered to.
Considering an overall piping system, where not only internal pressure loads, but also additional loads become effective (e.g. soil loads, bending stresses at above-ground piping systems. etc.) there is still another safety factor that has to be taken into account.
It is recommended to apply a reduction factor, equivalent to the long-term welding factor for heating element butt welds (fs=0,8).

Sample Problems:
a- If pipe geometry is known:
PE-100 pipe, MRS=10
Do = 63 mm
SDR=17; t = 3.7 mm
Fluid: Water, C=1.25
Pmax = (20 · MRS) / (C · (SDR-1)) = (20 x 10) / (1.25 x (17-1)) = 10 bar
Considering butt-welding safety factor, Pmax = 10 x 0,8 = 8 bar

b- If operating conditions are known:
PE-100 pipe, MRS=10
Fluid: Water, C=1.25
Pmax = 12 bar
SDR = 1 + ((20 · MRS) / (C · Pmax)) = 1 + ((20 x 10) / (1.25 x 12)) = 14.33
So a pipe with SDR=11 should be chosen.
Considering butt-welding safety factor, SDR = 14.33 x 0.8 = 11.46 so a pipe with SDR=11 is still suitable.

Determination of the pipe cross section:
Flowing processes are calculated by means of the continuity equation. For fluids with constant volume flow, the equation is:

$$Q = 0.0036 \cdot A \cdot V$$

Q ... volume flow (m³/h)
A ... free pipe cross section (mm²)
V ... flow velocity (m/s)

For gases and vapors, the material flow remains constant. Therefore following equation results:
$m = 0.0036 \cdot A \cdot v \cdot \rho$
m ... material flow (kg/h)
ρ ... density of medium depending on pressure and temperature (kg/m³)

The formulas below are used in practice for the calculation of the required pipe cross section.

$Di = 18,8 \cdot \sqrt{(Q/V)}$ (Q.... m3/h)
$Di = 35,7 \cdot \sqrt{(Q/V)}$ (Q....lt/s)

Where,
Di ... internal diameter of pipe (mm)
Q ... volume flow rate (m3/h),(lt/s)
V ... flow velocity (m/s)

Reference values for the calculation of flow velocities may be for fluids:
V ~ 0,5 / 1,0 m/s (suction side)

Akış hızının hesaplanmasında sıvılar için aşağıdaki değerler referans olarak kullanılabilir:
V ~ 0,5 / 1,0 m/s (emiş tarafı)
V ~ 1,0 / 3,0 m/s (basma tarafı)
Akış hızının hesaplanmasında gazlar için aşağıdaki değerler referans olarak kullanılabilir:
V ~ 10 / 30 m/s

Hidrolik basınç kayıplarının hesaplanması:
Boru içindeki akışkan basınç kayıplarının oluşmasına neden olur ve bu sebeple sistem içerisinde enerji kayıpları ortaya çıkar.
Basınç kayıpları için önemli parametreler:

- Boru tesisatının uzunluğu
- Borunun çapı
- Boru iç yüzeyinin pürüzlülüğü
- Fiting ve birleşimlerin kalitesi
- Akışkanın viskozitesi ve yoğunluğu
- Akışın türü (laminer veya türbülanslı)

Toplam basınç kaybı, bağımsız kayıpların toplamıdır:

ΔP = ΔPp + ΔPf (bar)

Açıklama,
ΔPp ..... Düz borulardaki basınç kaybı

ΔPp = (f · L · ρ · V2) / (Di · 2 ·102) (bar)

f .....boru sürtünme katsayısı (genellikle f = 0,02)
L.....boruların toplam düz boyu (m)
Di....boru iç çapı (mm)
ρ ... akışkan yoğunluğu (kg/m³)
V ... akış hızı (m/s)

ΔPf ..... Vana ve fitinglerdeki basınç kaybı

ΔPf = (f · Leff · ρ · V2) / (Di · 2 ·102) (bar)

Leff ..... Fitinglerdeki basınç kaybını belirlemek için eşdeğer düz boru boyu;
Leff = R · Di / 1000

Açıklama,
Leff ... efektif boru uzunluğu (m)
Di ..... boru iç çapı (mm)
R aşağıdaki tablodan alınır:

V ~ 1,0 / 3,0 m/s (pressure side)
Reference values for the calculation of flow velocities may be for gases.
V ~ 10 / 30 m/s

Determination of the hydraulic pressure losses:
Flowing media in pipes cause pressure losses and consequently energy losses within the conveying system.
Important parameters for pressure losses are:

- *Length of the piping system*
- *Size of pipe*
- *Roughness of pipe inner surface*
- *Quality of fittings and joints*
- *Viscosity and density of the flowing medium.*
- *Type of flow (laminar or turbulent)*

The total pressure loss is the sum of individual losses:

ΔP = ΔPp + ΔPf (bar)

Where,
ΔPp ..... Pressure loss in straight pipes

ΔPp = (f · L · ρ · V2) / (Di · 2 ·102) (bar)

f .....pipe frictional index (in most cases f = 0,02)
L.....length of piping system (m)
Di....inside diameter of pipe (mm)
ρ ... medium density (kg/m³)
V ... flow velocity (m/s)

ΔPf ..... Presure loss in valves and fittings

ΔPf = (f · Leff · ρ · V2) / (Di · 2 ·102) (bar)

Leff ..... The equivalent length of pipe to be used to estimate the friction loss due to fittings;
Leff = R · Di / 1000
Where,
Leff ... effective Pipeline length (m)
Di ..... pipe internal diameter (mm)
R is taken from Table below.

Eleman Cinsi	R	Eleman Cinsi	R
90° Döküm Dirsek	40	30° Parçalı Dirsek (2 veya fazlası parça)	8
45° Döküm Dirsek	21	30° Parçalı Dirsek (1 parça)	8
15° Döküm Dirsek	6	15° Parçalı Dirsek (1 parça)	6
90° Parçalı Dirsek (3 veya fazlası parça)	24	TE, Anahat/Ayrılma	60
90° Parçalı Dirsek (2 parça)	30	TE, Anahat/Anahat	20
90° Parçalı Dirsek (1 parça)	60	Glob Vana, Tam açık	340
60° Parçalı Dirsek (2 veya fazlası parça)	25	Köşe Vana, Tam açık	145
60° Parçalı Dirsek (1 parça)	16	Kelebek Vana, →200 mm, Tam açık	40
45° Parçalı Dirsek (2 veya fazlası parça)	15	Çek valf, çalparalı	135
45° Parçalı Dirsek (1 parça)	12		

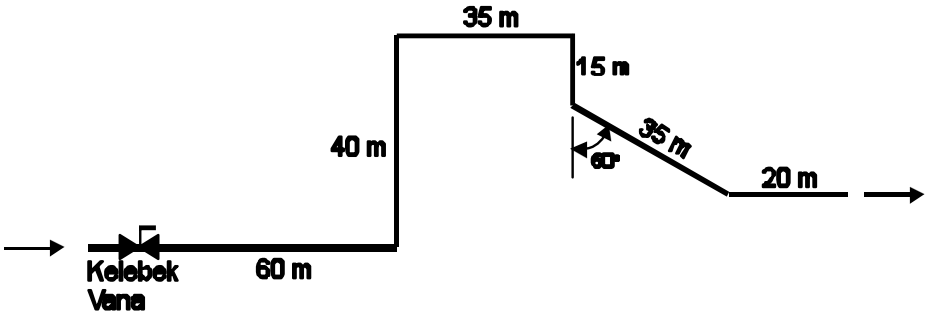
Piping Component	R	Piping Component	R
90° Molded Elbow	40	30° Fabricated Elbow (2 or more miters)	8
45° Molded elbow	21	30° Fabricated Elbow (1 miter)	8
15° Molded Elbow	6	15° Fabricated Elbow (1 miter)	6
90° Fabricated Elbow (3 or more miters)	24	Equal Outlet Tee, Run/Branch	60
90° Fabricated Elbow (2 miters)	30	Equal Outlet Tee, Run/Run	20
90° Fabricated Elbow (1 miter)	60	Globe Valve, Fully Open	340
60° Fabricated Elbow (2 or more miters)	25	Angle Valve, Fully Open	145
60° Fabricated Elbow (1 miter)	16	Butterfly Valve, →200mm,Fully Open	40
45° Fabricated Elbow (2 or more miters)	15	Check Valve, Conventional Swing	135
45° Fabricated Elbow (1 miter)	12		

Örnek Problem:

Toplam 205 m uzunlukta bir PE-100 boru hattından 350 m3/h debide su pompalanacaktır. Borunun serim hattı aşağıdaki şemada görüldüğü gibidir. Borudaki su hızı 2,5 m/s civarında olacak şekilde uygun boru çapını ve boru kayıplarını hesaplayınız.

Sample Problem:

350 m3/h water is to be pumped through a PE-100 pipe, 205 m of total length. The layout of piping is as shown in the figure below. It is required that the water velocity in the pipe is about 2.5 m/s. Calculate the suitable pipe size and the pipe total pressure loss.



Boru iç çapı hesabı:
Di = 18,8 · √(Q/V) = 18,8 x √(350 / 2,5) = 222 mm
SDR=17 ve Do=250 mm borunun Di = 220,6 mm gelir, bu boru uygundur.
Bu çapta borudaki su hızı 2,54 m/s bulunur.

Düz borulardaki basınç kaybı:
ΔPp = (f · L · ρ · V2) / (Di · 2 ·102)
ΔPp = (0,02 x 205 x 999 x (2,54)2) / (220,6 x 2 x 100) = 0,6 bar

Vana ve fitinglerdeki basınç kaybı:
ΔPf = (f · Leff · ρ · V2) / (Di · 2 ·102)
Kelebek Vana ΔPp = (0,02 x 40 x 999 x (2,54)2) / (220,6 x 2 x 100) = 0,12 bar x 1 adet = 0,12 bar
90° Döküm Dirsek ΔPp = (0,02 x 40 x 999 x (2,54)2) / (220,6 x 2 x 100) = 0,12 bar x 3 adet = 0,36 bar
60° Parçalı Dirsek ΔPp = (0,02 x 25 x 999 x (2,54)2) / (220,6 x 2 x 100) = 0,12 bar x 1 adet = 0,08 bar
30° Parçalı Dirsek ΔPp = (0,02 x 8 x 999 x (2,54)2) / (220,6 x 2 x 100) = 0,12 bar x 1 adet = 0,02 bar
Vana ve fitinglerdeki basınç kayıpları toplamı: 0,58 bar

Düz borular ile fitinglerin toplam kaybı: 0,6 + 0,58 = 1,18 bar olarak bulunur.

Calculation of pipe inside diameter:
Di = 18.8 · √(Q/V) = 18.8 x √(350 / 2.5) = 222 mm
For SDR=17 and Do=250 mm, Di = 220.6 mm, this pipe is suitable.
The water velocity in this pipe is calculated as 2.54 m/s.

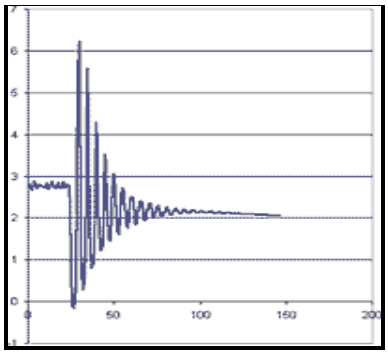
Pressure loss in straight pipesı:
ΔPp = (f · L · ρ · V2) / (Di · 2 ·102)
ΔPp = (0.02 x 205 x 999 x (2.54)2) / (220.6 x 2 x 100) = 0.6 bar

Pressure loss in valve and fittings:
ΔPf = (f · Leff · ρ · V2) / (Di · 2 ·102)
Butterfly Valve ΔPp = (0.02 x 40 x 999 x (2.54)2) / (220.6 x 2 x 100) = 0.12 bar x 1 item = 0.12 bar
90° Molded Elbow ΔPp = (0.02 x 40 x 999 x (2.54)2) / (220.6 x 2 x 100)= 0,12 bar x 3 items= 0.36 bar
60° Fabr. Elbow ΔPp = (0.02 x 25 x 999 x (2.54)2) / (220.6 x 2 x 100) = 0,12 bar x 1 item = 0.08 bar
30° Fabr. Elbow ΔPp = (0.02 x 8 x 999 x (2.54)2) / (220.6 x 2 x 100) = 0,12 bar x 1 item = 0.02 bar
Total pressure loss in valve and fittings: 0.58 bar

Total pressure loss in straight pipes and valve and fittings: 0.6 + 0.58 = 1.18 bar.

3.2- Koç Darbesi

3.2- Pressure Surge



Koç darbesi basınç dalgalanması/ *Shock waves in pressure surge*

Boru hatlarında koç darbesi ve buna bağlı olarak yorulmalar normal çalışma şartlarında olagelen şeylerdir (ör. Pompaların çalışma ve durması, ani vana kapanması vb). Koç darbesi, sistem bsıncının kısa süreli olarak normal çalışma basıncının üstüne çıkması demektir. Deneyler, PE100 boruların aşağıdaki koç darbesi basınçlarında emniyetle kullanılabileceğini göstermiştir:

Surge and fatigue occur in pipelines due to the normal operations of, for example, pumps shutting down or valves being operated quickly. Due to the incompressible nature of liquids the phenomenon is usually associated with water distribution mains and pumped sewer mains.
Surge can be described as short term pressure rises above the static operating pressure. This is generally as a result of water hammer where the sudden changes in fluid velocity within the pipeline, as pumps and valves are operated, are converted to increases in fluid pressure. As the velocity stabilizes the fluid pressure reverts to its static operating pressure. Tests have shown that PE100 pipe can be used in the following surge conditions;

Asgari Emniyet Faktörü C	Uygulama	Normal çalışma basıncı (Pmax) üstüne gelebilecek koç darbesi basıncı
1.25	Su	50 %
1.60	Gaz	100 %
Min. Safety Factor C	Application	Surge pressure above Pmax
1.25	*WATER*	50 %
1.60	*GAS*	100 %

Yorulma, uzun vadede tekrarlanan pompa-vana açıp kapamalarının döngüsel değişen basınçlar haline gelmesi ile oluşur. Yorulmada kritik parametreler darbenin genliği ile sıklığıdır.
Ancak, yüksek dayanımlı PE100 için yorulma bir sorun oluşturmamaktadır. Pmax değerinin bir hayli üstündeki darbe basınçları hasarsız olarak karşılanabilmektedir.

Koç darbesinin oluşturduğu basınç aşağıdaki formül ile hesaplanabilir:

$$Ps = 101 \cdot [(BM \cdot E) / ((w/g) \cdot (E + BM \cdot SDR)]1/2 \cdot w \cdot Vc / (10210 \cdot g)$$

Açıklama;
BM..... Sıvının Bulk Modülü (su için 20684)
E.....Elastisite Modülü (PE ~ 6895) [bar]
SDR..... .Standart boyut oranı (Do/t)
w..... Sıvı yoğunluğu (su için 999 kg/m³)
g.....Yerçekimi ivmesi (9.81m/s²)
Ps.....Basınçtaki değişim (bar)
Vc.....Sıvının hız değişimi (m/s) (kapatmadan önceki akışkan hızına eşittir)

Fatigue is associated with the repeated operation of the pumps and valves over a long period causing cyclic pressure variation. Critical parameters in fatigue are the frequency and the amplitude of the surge events. Under these conditions the theory of linear fatigue damage accumulation applies.
However, fatigue is not a concern with high toughness PE100, and surge pressure well in excess of Pmax can be sustained without damage.
A 'Water Hammer' in a piping system is a pressure surge due to a sudden change of velocity in a noncompressible fluid media. The change in velocity could be caused by a sudden opening or closing of a valve, starting and stopping of pumps, pump failure or other dynamic event.

The magnitude of the pressure surge (Ps) can be calculated by the following equation: $Ps = 101 \cdot [(BM \cdot E) / ((w/g) \cdot (E + BM \cdot SDR)]1/2 \cdot w \cdot Vc / (10210 \cdot g)$

Where,
BM..... .Bulk Modulus of the liquid 20684 for water)
E.....Modulus of elasticity (PE ~ 6895) [bar]
SDR..... .Standard dimension ratio
w..... Fluid weight (999 kg/m³ for water)
g.....Acceleration due to gravity (9.81m/s²)
Ps.....Change in pressure (bar)
Vc.....Change in velocity of fluid (m/s) (equals velocity of fluid before sudden shutdown)

NOTLAR/NOTES