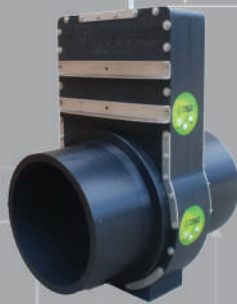


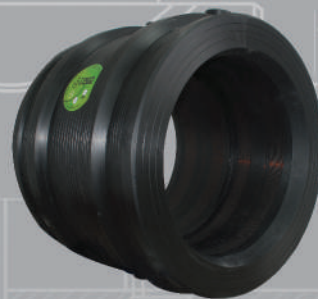


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PRODUCT CATALOG 2017
ÜRÜN KATALOĞU



hakkımızda/about us



TEGA, 25 yılı aşkın süredir plastik borulama ve vana sistemlerinin geliştirilmesinde ve üretiminde lider konumdadır. Geniş PE ve PP ürün gamımız Dünya da 85 ülkede güvenilirliğini kanıtlamıştır. İnovasyon işimizin kilit unsurudur. TEGA müşteri ihtiyaçlarını baz alarak yeni fikirler ve çözümler üretmekte, dizayn sınırlarını zorlamaktadır. TEGA projelerinizin gerçekleşmesi için her zaman yanınızda olacaktır.

For over 25 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 85 countries world wide. 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.





hakkımızda/about us

25 **TEGA**
years



TEGA WORLD



TEGA ÜRÜNLERİ 85 ÜLKEDE GÜVENLE KULLANILMAKTADIR.

*TEGA PRODUCTS ARE BEING USED IN 85 COUNTRIES
OF THE WORLD SUCCESSFULLY*



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 9001:2000 Kalite Yönetim Sistemi
- ISO 14001:2004 Çevre Yönetim Sistemi
- OHSAS 18001 İş Sağlığı ve Güvenliği Yönetim Sistemi

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 9001:2000 Quality Management System Certificate
- ISO 14001:2004 Environment Management System Certificate
- OHSAS 18001 Safety and Health Management System Certificate



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 Uygulaması
USA Sleeve - Coupler Installation



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



Azerbaycan - Bakü Temiz Su Hattı Su Arıtma Tesisinde 3700 adet EF Seme ve 19,500 Manşon 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 Seme 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 Seme Canlı Hat Bağlantısı
 Canada - 28"x18" IPS EF Saddle Hot Tapping Application

EF Kaynakçı Kursları Training



TEGA geliştirdiği teknolojinin ancak iyi eğitilmiş teknik elemanlar vasıtasıyla verimli olarak kullanılabilmesinin 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



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 Plastics Piping Systems for Water Supply – Polyethylene (PE) Part 3 : Fittings
- EN 12201-4 Plastics Piping Systems for Water Supply – Polyethylene (PE) Part 4 : Valves
- EN 1555 -3 Plastics Piping Systems for the Supply of Gaseous Fuels – Polyethylene (PE) Part 3 : Fittings
- EN 1555- 4 Plastics Piping Systems for the Supply of Gaseous Fuels – Polyethylene (PE) Part 4 : Valves
- DVGW GW 335-B2 Plastics Piping for Gas and Water Distribution; Requirements and Testing
- DIN 16963-1 Pipe Joints and Elements for High Density Polyethylene (HDPE) Pressure Pipelines (Pipe Bends of Segmental Constructions for Butt-Welding – Dimensions)
- DIN 16963-2 Pipe Joint Assemblies and Fittings for Types 1 and 2 High Density Polyethylene (HDPE) Pressure Pipes; (Tee and Branches Produced by Segment Inserts for Butt-Welding – Dimensions)
- DIN 16963-3 Pipe Joints and Elements for High Density Polyethylene (HDPE) Pressure Pipelines (Pipe Bends for Butt-Welding – Dimensions)
- DIN 16963- Pipe Joint Assemblies and Fittings for High Density Polyethylene (HDPE) Pressure Pipelines (Adaptors for fusion jointing, flanges and sealing elements – Dimensions)
- DIN 16963-5 Pipe Joints and Elements for High Density Polyethylene (HDPE) Pressure Pipelines (General Quality Requirements, Testing)
- ASTM F-1055 Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene

Ürün/Sistem Belgeleri / Product and System Aproviols

- DVGW Certificate (Size groups 1, 2 and 3 / Electrofusion Fittings / Water and Gas)
- DVGW Certificate (Size groups 1, 2 and 3 / Spigot Fittings / Water and Gas)
- DVGW Certificate (Size group 2 / Gate Valves / Water)
- SVGW Certificate (50 mm -500 mm / Spigot and Electrofusion Fittings)
- IIP Certificate of Conformity – EN 12201-3 (Size group 1 and 2 / Spigot and Electrofusion Fittings)
- IIP Certificate of Conformity – EN 1555-3 (Size group 1 and 2 / Spigot and Electrofusion Fittings)
- Insta-Cert Certificate – EN 12201/Insta SBC 12201 (Size group 1 and 2 / Spigot and Electrofusion Fittings)
- Insta-Cert Certificate – EN 1555/Insta SBC 1555 (Size group 1 and 2 / Spigot and Electrofusion Fittings)
- Watermark Certificate of Conformity – Level 1 - AS/NZS 4129 (Electrofusion and Spigot Fittings)
- FM Approvals Certificate of Compliance – Class 1613
- NSF Approval– NSF/ANSI 61 (Drinking Water System Components)
- WRAS Material Approval
- BulgarKontrola Certificate of Conformity (EN 12201-3 / Spigot and Electrofusion Fittings)
- TSE (Turkish Standards Institute) Certificate (TS EN 1555-3 / Spigot and Electrofusion Fittings)
- TSE (Turkish Standards Institute) Certificate (TS EN 1555-4 / Ball Valves)
- TSE (Turkish Standards Institute) Certificate (TS EN 12201-3 / Spigot and Electrofusion Fittings)
- TSE (Turkish Standards Institute) Certificate (TS EN 12201-4 / Gate Valves)
- ISO 9001 Management System Certificate
- ISO 14001 Environmental Management System Certificate
- OHSAS 18001 Occupational Health and Safety Management System Certificate
- ABS Certificate of Design Assessment

EF-METRİK <i>EF-METRIC</i>	29-100
SPIGOT-METRİK <i>SPIGOT-METRIC</i>	101-164
AKIŞ KONTROL-METRİK <i>FLOW CONTROL-METRIC</i>	165-186
EF-IPS <i>EF-IPS</i>	187-240
AKIŞ KONTROL-IPS <i>FLOW CONTROL-IPS</i>	241-256
MAKİNE-APARATLAR <i>MACHINE-TOOL</i>	257-272
MONTAJ <i>INSTALLATION</i>	273-316
TEKNİK <i>TECHNICAL</i>	317-372





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

30



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

31



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

32



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

33



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

34



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

35



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

37



**EF COUPLER (LONG)
EF MANŞON (UZUN)**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

38



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

39



**EF TAPPING TEE WITH BRASS
OUTLET / EF SERVİS TE
DİŞLİ ÇIKIŞLI**
SDR 11 PE100
WATER / SU : 16 BAR

42



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

43



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

45



**EF TAPPING TEE WITH GAS-STOP
EF SERVİS TE GAZSTOPLU**
SDR 11 PE100
GAS / GAZ : 1-5 BAR

48



**360° ROTATING OUTLET TAPPING TE
360° DÖNER BAŞLIKLİ VANALI
SERVİS TE**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

49



**360° ROTATING OUTLET TAPPING TE
360° DÖNER BAŞLIKLİ SERVİS TE**
SDR 11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

51



53

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



55

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



59

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



61

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



64

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



65

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



66

**EF FLEX SADDLE
EF FLEKS SEMERİ**
SDR11 PE100
GAS / GAZ : 6 BAR
WATER / SU : 16 BAR



68

**BIG SIZE SADDLE
EF SEMER BÜYÜK ÇIKIŞLI**



69

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



70

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



71

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



72

EF REDUCED TE / EF İNEĞAL TE
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



74

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



75

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



76

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



EF-METRIC EF-METRİK



77

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



78

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



78

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



79

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



80

**EF COUPLER FOR PRE-INSULATED
PE PIPING SYSTEM
İZOLASYONLU PE BORU
EF MANŞON**



80

**EF FLEXIBLE PATCH FOR
SLEEVE COUPLERS
SLEEVE MANŞONLAR İÇİN EF KEP**



81

PP EF COUPLER / PP EF MANŞON
SDR26



81

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



82

**TWIN INNER COUPLER PE100
İKİZ İÇ MANŞON PE100**



83

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



84

**EF DUAL CONTAINMENT
FLEX ELBOW**
SDR22,6 PE100
EF ÇİFT CİDARLI FLEKS DİRSEK



85

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



86

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



87

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



88

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



88

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



89

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



89

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



90

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



90

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



91

EF FLEX RESTRAINT PE100



94

**EF FLANGE ADAPTOR PE100
EF FLANŞ ADAPTÖRÜ PE100**



95

**EF INNER FLANGE ADAPTOR PE100
EF İÇ FLANŞ ADAPTÖRÜ PE100**



96

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



97

**HIGH PRESSURE (SANDWICH)
EF COUPLER PE100
YÜKSEK BASINÇLI EF
MANŞON PE100**



98

**BRASS OUTLET EF SADDLE SDR11
PİRİNÇ ÇIKIŞLI EF SEMER SDR11
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR**



100

**WHEEL EF SADDLE
TEKERLEKLİ EF SEMER**



102

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



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



103

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



105

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



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



106

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



108

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



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



112

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



118

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



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



121

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



123

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



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



126

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

104

107

115

122

129



SPIGOT-METRIC SPIGOT-METRİK



132

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



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



134

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



139

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



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



140

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



142

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



143

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



144

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



145

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



146

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



147

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



148

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



149

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



150

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



151

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



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



152

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



154

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



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



155

FLANGE / FLANŞ PN16



157

FLANGE / FLANŞ PN10



FLANGE / FLANŞ PN6



158

**PP COATED FLANGE
PP KAPLI FLANŞ
PN10/16**



160

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



161

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



162

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



162

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



163

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

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



169

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



170

FLANGED PE100 GATE
VALVE-SHORT SPIGOT
FLANŞLI PE100 SÜRGÜLÜ
VANA - KISA SPİGOT



170

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



171

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



171

PE100 GATE VALVE - FLANGED
PE100 SÜRGÜLÜ VANA - FLANŞLI



172

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



174

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



174

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



175

PE100 BALL CHECK VALVE
PE100 KÜRELİ ÇEKVALF



175

PE100 BALL CHECK VALVE -
FLANGED
PE100 KÜRELİ ÇEKVALF -
FLANŞLI



176

PE100 CHECK VALVE WITH
SPRING
PE100 YAYLI ÇEKVALF



176

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



177

PE100 A TYPE IRRIGATION
HYDRANT
PE100 A TİPİ SULAMA
HİDRANTI



177

PE100 D TYPE IRRIGATION
HYDRANT
PE100 D TİPİ SULAMA
HİDRANTI



178

PE100 H TYPE IRRIGATION
HYDRANT
PE100 H TİPİ SULAMA
HİDRANTI

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



PE100 FIRE HYDRANT
PE100 YANGIN HİDRATI

178



PE100 SINGLE BALL AIR
RELEASE VALVE
PE100 TEK KÜRELİ VANTUZ

179



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

179



PE100 NON SLAM DYNAMIC AIR
RELEASE VALVE
PE100 DİNAMİK VANTUZ
DARBESİZ

179



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

180



PE100 DOUBLE BALL
AIR RELEASE VALVE
PE100 ÇİFT KÜRELİ VANTUZ

180



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

180



PE100 KNIFE VALVE/
PE100 BIÇAK VANA

181



PE100 PURGE VALVE
PE100 PURGE VANA

182



EF ACTUATOR BASE
EF AKTÜATÖR ALTLIĞI

183



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

184



EF-IPS EF-IPS



188

**SDR26 ELECTROFUSION COUPLER,
IPS DUAL RATED WATER
NATURAL GAS**



189

**SDR17 ELECTROFUSION COUPLER,
IPS DUAL RATED WATER
NATURAL GAS**



190

**SDR11 ELECTROFUSION COUPLER,
IPS DUAL RATED WATER
NATURAL GAS**



192

**SDR6 ELECTROFUSION
COUPLER, IPS**



193

**SDR9 ELECTROFUSION
COUPLER, IPS**



194

**SDR7.4 ELECTROFUSION
COUPLER, IPS**



195

**SDR26 ELECTROFUSION
COUPLER, DIPS**



196

**SDR17 ELECTROFUSION
COUPLER, DIPS**



197

**SDR11 ELECTROFUSION
COUPLER, DIPS**



199

EF DOST COUPLER



200

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



201

**SDR11 ELECTROFUSION
TAPPING TEES**



205

**SDR11 ELECTROFUSION SMALL
BRANCH SADDLES**



210

**SDR11 ELECTROFUSION VALVE
TAPPING TEES**



213

**SDR11 ELECTROFUSION VALVE
TAPPING TEES (VA TYPE)**



**SDR11 360° ROTATING
TAPPING TEES**

217



**SDR11 360° ROTATING
TAPPING TEES**

219



**SDR11 ELECTROFUSION TAPPING
TEES WITH INNER CAP**

221



**SDR11 ELECTROFUSION FLEX
SADDLES**

223



**SDR11 ELECTROFUSION LARGE
BRANCH SADDLES**

225



**SDR17 ELECTROFUSION LARGE
BRANCH SADDLES**

229



**SDR11 ELECTROFUSION
EQUAL TEES**

232



**SDR11 ELECTROFUSION
REDUCERS**

233



**SDR11 ELECTROFUSION
45 DEGREE ELBOWS**

234



**SDR11 ELECTROFUSION
90 DEGREE ELBOWS**

235



**BRASS THREADED OUTLET
EF SADDLE SDR11**

236



EF FLEX RESTRAINT PE100

238

FLOW CONTROL-IPS AKIŞ KONTROL- IPS



242

**PE100 BALL CHECK VALVE
PE100 KÜRELİ ÇEKVALF**



242

**PE100 BALL CHECK VALVE/FLANGED
PE100 KÜRELİ ÇEKVALF - FLANŞLI**



243

**PE100 CHECK VALVE WITH SPRING
PE100 YAYLI ÇEKVALF**



243

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



244

**PE100 A TYPE IRRIGATION HYDRANT
PE100 A TİPİ SULAMA HİDRANTI**



244

**PE100 D TYPE IRRIGATION HYDRANT
PE100 D TİPİ SULAMA HİDRANTI**



245

**PE100 H TYPE IRRIGATION
HYDRANT
PE100 H TİPİ SULAMA HİDRANTI**



245

**PE100 FIRE HYDRANT
PE100 YANGIN HİDRATI**



247

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



248

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



248

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



248

**PE100 NON SLAM DYNAMIC AIR
RELEASE VALVE
PE100 DİNAMİK VANTUZ
DARBESİZ**



249

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



249

**PE100 DOUBLE BALL
AIR RELEASE VALVE
PE100 ÇİFT KÜRELİ VANTUZ**



249

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

FLOW CONTROL-IPS AKIŞ KONTROL- IPS



**PE100 PURGE VALVE
PE100 PURGE VANA**

250



**PE100 GATE VALVE -
LONG SPIGOT
PE100 SÜRGÜLÜ VANA -
UZUN SPİGOT**

252



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

253



**PE100 GATE VALVE - FLANGED
PE100 SÜRGÜLÜ VANA - FLANŞLI**

253



**PE100 GATE VALVE WITH
EF SADDLE
PE100 SÜRGÜLÜ
VANA - SEMER ÇIKIŞLI**

254



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

255



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

255



258

SS REPAIR SADDLE
PASLANMAZ ÇELİK TAMİR SEMERİ



258

DUCT FOOT BEND
YANGIN HİDRANT ÖKÇESİ



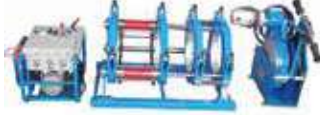
258

SPECIAL DUCT FOOT BEND
PE ÖZEL YANGIN HİDRANT ÖKÇESİ



259

EF WELDING MACHINE
EF KAYNAK MAKİNESİ



262

BUTT WELDING MACHINE
ALIN KAYNAK MAKİNESİ



262

V TYPE ALIGNMENT CLAMP
V TİPİ EKSENLEME KELEPÇESİ



263

RE-ROUNDING TOOL
OVALLIK KELEPÇESİ



263

COUPLER CLAMP
MANŞON KELEPÇESİ



264

HAND SCRAPING TOOLS
BORU KAZIMA APARATLARI



265

SQUEEZING TOOL FOR EF SADDLE
SEMER SIKTIRMA APARATLARI



266

COUPLER PULLING TOOL
MANŞON ÇEKTİRME SETİ



267

**PIPE CUTTER (HAND TYPE)
BORU KESME MAKASI**



267

**TELESCOPIC PIPE CUTTER
TELESKOPIK BORU KESİCİ**



267

**TEGA TELESCOPIC EXTENSIONS
WITH SURFACE BOX FOR PE
GATE VALVE
TEGA PE-SÜRGÜLÜ VANALAR
İÇİN BUŞAKLELİ TELESKOPIK
UZATMA KOLLARI**



269

**TELESCOPIC EXTENSION
FOR GATE VALVE
SÜRGÜLÜ VANA İÇİN
TELESKOPIK UZATMA KOLLARI**



270

**TELESCOPIC EXTENSION
FOR BALL VALVE
KÜRESEL VANA İÇİN
TELESKOPIK UZATMA KOLLARI**



270

**SURFACE BOX
BUŞAKLE KAZANI**



272

**EF SADDLE DRILLING TOOL
PP SEMER DELME APARATI TAKIMI**



272

**EXTERNAL BUTT FUSION PRES-
SURE TEST TOOL
HARİCİ ALIN KAYNAK BASINÇ
TEST APARATI**



4110 Cube
6110
6110-25-100-10-10-10
6110

6110
SMB TYPE 104

EF ÜRÜNLER

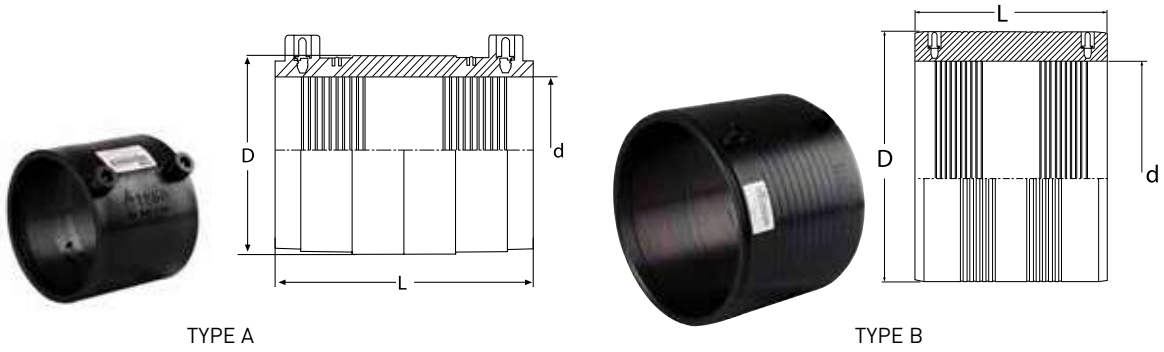
EF PRODUCTS



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
63	1800001	0,12	75	83	30*40*30	30	A
75	1800002	0,13	87	83	60*40*30	36	A
90	1800003	0,25	103	100	30*40*30	18	A
110	1800004	0,34	125	100	60*40*30	24	A
125	1800006	0,38	140	100	30*40*30	16	A
140	1800007	0,67	155	160	60*40*45	12	B
160	1800008	0,80	175	160	60*40*45	12	B
180	1800010	0,93	197	160	60*40*45	12	B
200	1800012	1,15	220	165	60*40*45	8	B
225	1800014	1,25	245	165	60*40*45	7	B
250	1800015	1,65	275	165	60*40*30	4	B
280	1800017	2,00	305	165	60*40*45	3	B
315	1800018	2,50	345	165	60*40*45	3	B
355	1800020	4,00	390	180	60*40*45	3	B
400	1800021	5,50	440	220	60*40*45	2	B
450	1800023	7,00	495	220	60*60*33	1	B
500	1800024	8,70	550	220	**		B
560	1800027	12,20	615	250	**		B
630*	1800028	19,70	690	330	**		B
710*	1800031	26,00	780	330	**		B
800*	1800032	33,50	880	330	**		B
900*	1800033	48,70	990	380	**		B
1000*	1800034	72,20	1110	380	**		B
1200*	1800036	75,40	1300	400	**		B
1400*	1800037	122,00	1530	425	**		B
1600*	1800038	170,40	1750	450	**		B

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

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

EF-METRIC EF-METRİK

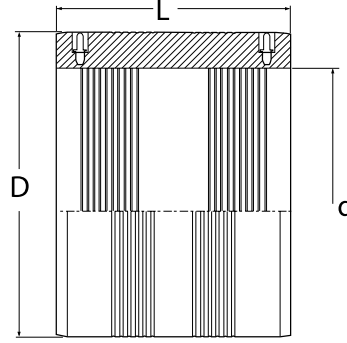


EF COUPLER / EF MANŞON

SDR 17 PE100

GAS / GAZ: 6 BAR

WATER / SU: 10 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box
225	1800067	3,05	265	200	60*40*30	4
250	1800069	4,34	295	210	60*40*30	4
280	1800071	5,00	330	220	60*40*45	2
315	1800072	7,05	365	230	60*40*45	2
355	1800074	10,31	415	255	60*40*45	2
400*	1800075	14,50	470	300	60*60*33	1
450*	1800077	20,75	530	320	60*60*33	1
500*	1800078	27,00	590	365	**	
560*	1800079	36,50	655	400	**	
630*	1800082	50,00	740	420	**	
710*	1800085	66,50	840	445	**	
800*	1800087	86,30	935	470	**	
900*	1800089	114,00	1050	500	**	
1000*	1800090	147,50	1175	500	**	
1200*	1800095	170,50	1371	500	**	
1400*	1800096	255,30	1600	550	**	
1600*	1800387	348,00	1829	575	**	

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

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

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

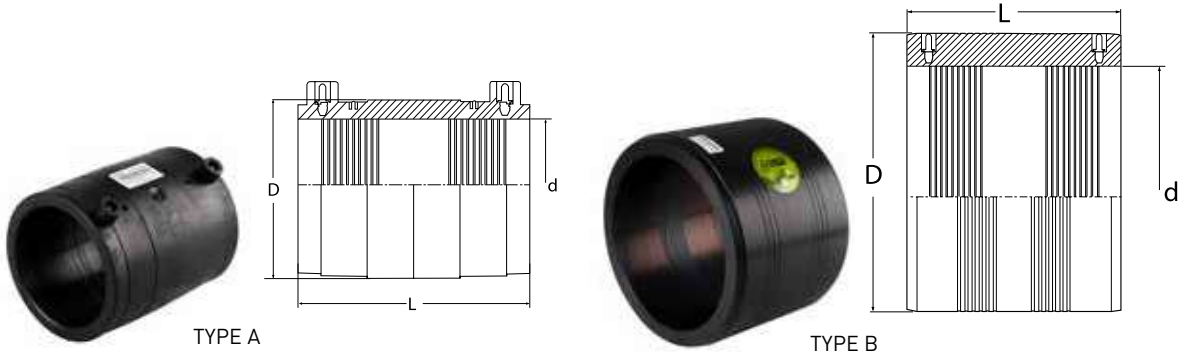
TEKNİK
TECHNICAL

EF COUPLER / EF MANŞON

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
20	1800376	0,03	33	60	30*40*15	125	A
25	1800102	0,04	41	71	30*40*15	100	A
32	1800104	0,07	48	81	30*40*15	50	A
40	1800109	0,09	55	83	30*40*15	40	A
50	1800303	0,13	67	98	30*40*15	20	A
63	1800375	0,18	80	108	30*40*30	30	A
75	1800121	0,25	97	117	30*40*30	24	A
90	1800128	0,40	119	130	60*40*30	30	A
110	1800130	0,67	142	137	60*40*30	22	A
125	1800136	0,85	160	150	60*40*45	16	A
140	1800142	1,06	180	158	60*40*45	12	A
160	1800147	1,30	198	161	60*40*45	12	A
180	1800154	1,69	227	166	60*40*45	8	A
200	1800159	2,50	250	200	60*40*45	4	A
225	1800170	3,80	277	200	60*40*45	4	A
250	1800173	5,40	310	210	60*40*30	2	B
280	1800177	6,55	345	220	60*40*45	2	B
315	1800179	9,60	390	230	60*40*45	2	B
355	1800181	13,50	440	255	60*40*45	1	B
400*	1800184	19,00	495	300	60*60*33	1	B
450*	1800187	25,00	554	320	60*60*33	1	B
500*	1800188	35,00	615	365	**	**	B
560*	1800191	48,50	690	400	**	**	B
630*	1800194	63,80	775	420	**	**	B
710*	1800195	90,00	880	445	**	**	B
800*	1800199	122,70	995	470	**	**	B
900*	1800200	150,00	1100	500	**	**	B
1000*	1800201	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 box is used. Only Euro pallets are being used.)

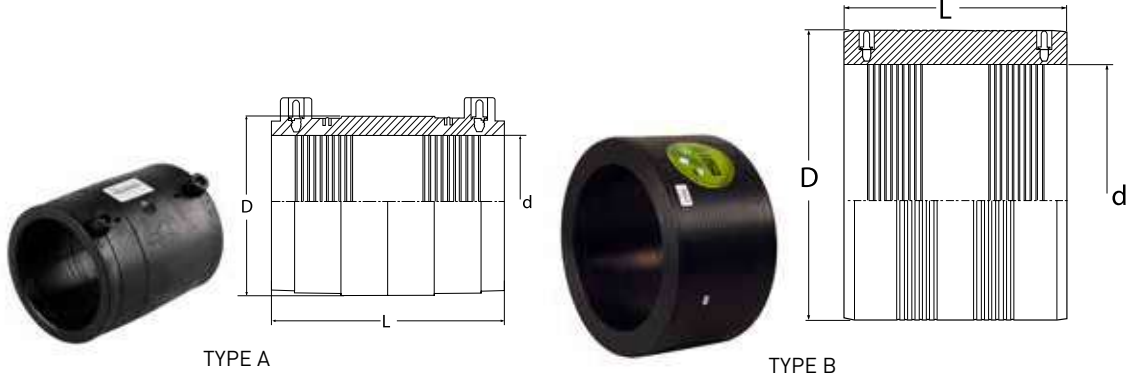
EF-METRIC EF-METRİK



EF COUPLER / EF MANŞON

SDR 9 PE100

WATER / SU : 20 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
63	1800219	0,45	97	118	30*40*30	24	A
75	1800220	0,60	115	150	30*40*30	13	A
90	1800221	1,00	142	167	60*40*30	20	A
110	1800222	1,56	159	170	60*40*30	16	A
125	1800223	2,30	180	170	60*40*45	12	A
140	1800224	3,00	200	185	60*40*45	10	B
160	1800225	3,50	230	190	60*40*45	8	B
180	1800226	3,60	240	190	60*40*45	4	B
200	1800227	5,70	280	200	60*40*30	2	B
225	1800228	6,30	305	200	60*40*30	2	B
250	1800229	7,50	330	220	60*40*45	2	B
280	1800230	9,50	370	220	60*40*45	2	B
315	1800231	12,50	415	230	60*40*45	2	B
355	1800232	17,00	465	255	60*60*33	1	B
400*	1800233	25,70	525	300	60*60*33	1	B
450*	1800388	34,70	590	320	60*60*33	1	B
500*	1800234	50,50	660	365	**	**	B
560*	1800235	69,80	740	400	**	**	B
630*	1800236	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 box is used. (Only Euro pallets are being used.)

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

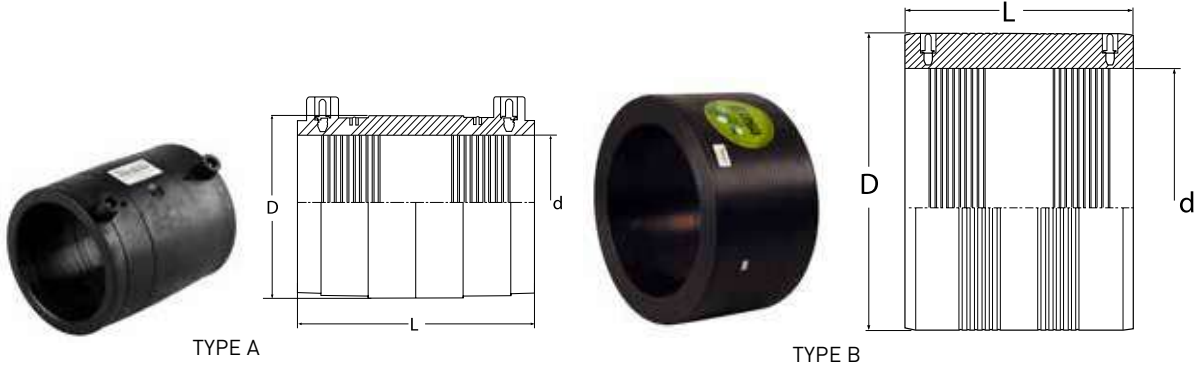
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

EF COUPLER / EF MANŞON

SDR 7,4 PE100

WATER / SU : 25 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	type
63	1800237	0,45	97	118	30*40*30	24	A
75	1800238	0,60	115	150	30*40*30	13	A
90	1800239	1,00	142	167	60*40*30	20	A
110	1800240	1,56	159	172	60*40*45	12	A
125	1800241	2,30	180	171	60*40*45	12	A
140	1800242	3,00	200	185	60*40*45	10	B
160	1800243	3,50	230	190	60*40*45	8	B
180	1800244	4,10	248	190	60*40*45	4	B
200	1800245	5,70	280	200	60*40*30	2	B
225	1800246	6,70	310	200	60*40*30	3	B
250	1800247	9,50	347	220	60*40*30	2	B
280	1800248	12,00	390	220	60*40*45	2	B
315	1800249	16,10	440	230	60*40*45	2	B
355	1800250	21,60	490	255	60*60*33	1	B
400*	1800251	32,60	553	300	60*60*33	1	B
450*	1800252	43,40	620	320	60*60*33	1	B
500*	1800383	61,50	690	365	**	**	B
560*	1800389	87,90	780	400	**	**	B
630*	1800390	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 box is used. (Only Euro pallets are being used.)

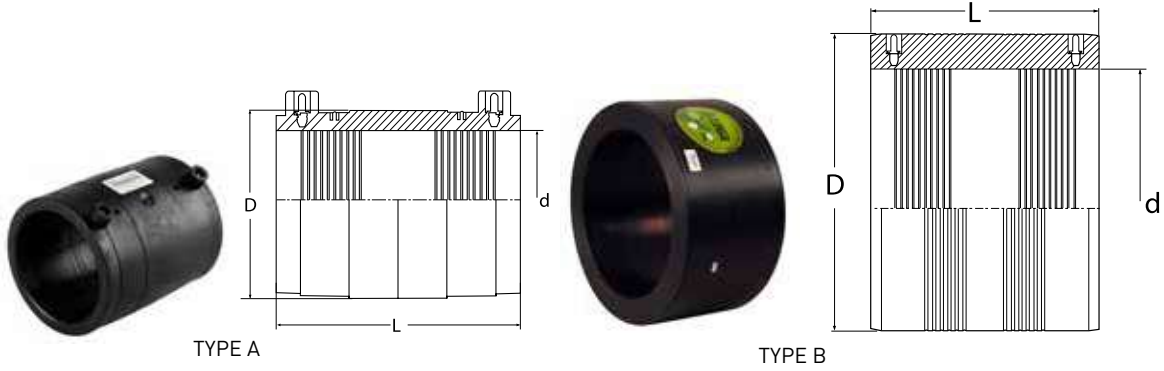
EF-METRIC EF-METRİK



EF COUPLER / EF MANŞON

SDR 6 PE100

WATER / SU : 32 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box	tip
63	1800255	0,48	97	118	30*40*30	24	A
75	1800256	0,85	115	150	30*40*30	13	A
90	1800257	1,50	142	167	60*40*30	20	A
110	1800258	2,60	180	170	60*40*45	12	A
125	1800259	2,70	195	161	60*40*45	12	A
140	1800260	3,60	220	166	60*40*45	10	B
160	1800261	5,30	250	190	60*40*45	8	B
180	1800262	5,80	270	190	60*40*45	4	B
200	1800263	8,00	305	200	60*40*30	2	B
225	1800264	10,30	345	200	60*40*45	3	B
250	1800265	13,60	380	220	60*40*45	3	B
280	1800320	17,70	430	220	60*40*45	2	B
315	1800266	22,75	480	230	60*40*45	2	B
355	1800383	33,00	545	255	60*60*33	1	B
400*	1800391	49,00	615	300	60*60*33	1	B
450*	1800392	64,00	685	320	60*60*33	1	B

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

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

TEGA DOST MANŞON

TEGA DOST COUPLER

Test Point
Test Noktası

4 Welding Zone
4 Ayrı Kaynak Bölgesi



Bevelled
Entrance
Konik Giriş

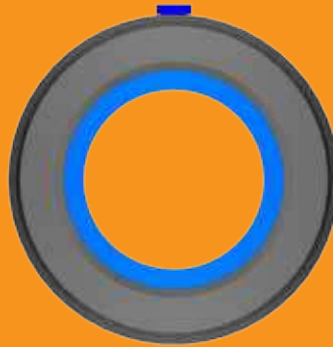
*The Leading
Edge of
Electrofusion
Technology!*

**EF Teknolojisinde
Gelenen Son Nokta !**

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

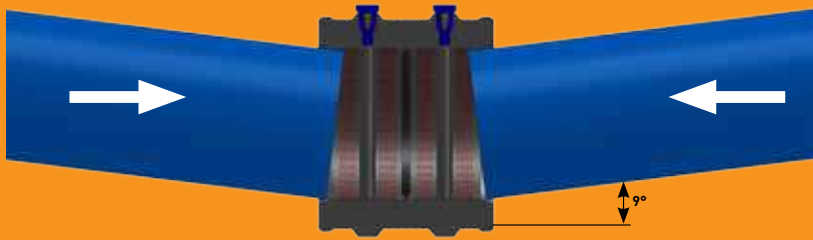


Oval Pipe / Oval Boru



Circular Pipe / Dairesel Boru

Oval Boruların Manşona sokulması zor bir işlemdir. Dost Manşon konik girişi yardımıyla boruda ki ovallik alınır. Manşona borular rahatlıkla sürülür ve borudaki % 10'a kadar ovallik giderilir.



*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



2014 DÜNYA
İNOVASYON ÖDÜLÜ

EF-METRIC EF-METRIK

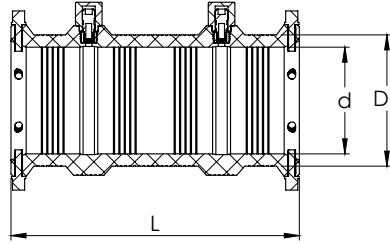
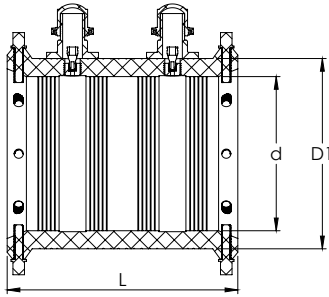


EF DOST COUPLER / EF DOST MANŞON

SDR 11 PE100

GAS / GAZ: 10 BAR

WATER / SU: 16 BAR



TYPE A

TYPE B

d	CODE	Weight (kg)	D1	L	SDR	TYPE
63	1800409	0,9	80	215	11	B
90	1800415	1,6	112	290	11	B
110	1800357	2,2	145	245	11	B
125	1800397	3,3	155	360	11	B
140	1800398	3,8	173	360	11	B
160	1800399	5,5	197	430	11	B
180	1800400	7,0	223	430	11	B
200	1800372	8,3	248	430	11	B
225	1800401	11,3	277	480	11	B
250	1800355	19,6	310	600	11	A
280	1800386	22,3	345	600	11	A
315	1800306	30,2	395	620	11	A
355	1800308	37,9	440	660	11	A
400	1800310	49,6	495	700	11	A
450	1800312	62,8	555	720	11	A
500	1800314	86,3	620	780	11	A
560	1800316	108,6	695	780	11	A
630	1800318	134,1	780	780	11	A
710	1800402	168,4	870	780	11	A
800	1800403	209,1	990	800	11	A
900	1800360	260,6	1100	820	11	A
1000	1800404	247,2	1180	820	17***	A
1200	1800405	278,5	820	820	17***	A
1400	1800406	370	835	820	17***	A
1600	1800407	486,5	835	820	17***	A

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

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

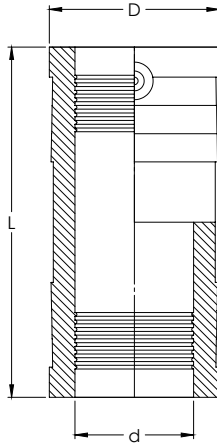
AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-T00L

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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

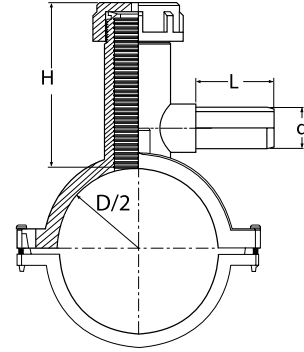


d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box
25	1800288	0,07	34	108	40*30*15	70
32	1800289	0,12	45	128	40*30*15	35
40	1800290	0,15	51	147	40*30*30	50
50	1800291	0,28	67	162	60*40*30	48
63	1800292	0,51	86	186	60*40*30	36
75	1800293	0,78	95	220	60*40*30	24
90	1800294	1,33	117	255	60*40*30	10
110	1800286	1,85	141	257	60*40*30	8
125	1800287	2,39	156	303	60*40*30	8

EF-METRIC EF-METRIK



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



TYPE A



TYPE B



TYPE C



TYPE D



TYPE E

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
40*20	1803117	0,29	105	44	40*30*30	25	A
40*25	1803118	0,30	105	44	40*30*30	25	A
40*32	1803119	0,31	105	47	40*30*30	25	A
50*20	1803125	0,33	105	52	40*30*30	15	A
50*25	1803126	0,34	105	54	40*30*30	15	A
50*32	1803128	0,35	105	85	40*30*30	15	A
63*20	1803132	0,40	105	52	40*30*30	15	A
63*25	1803133	0,42	105	54	40*30*30	15	A
63*32	1803135	0,42	105	85	40*30*30	15	A
63*40	1803137	0,59	105	90	40*30*30	15	A
63*50	1803138	1,10	200	105	40*30*30	7	B
63*63	1803140	1,20	200	105	40*30*30	7	B
75*20	1803141	0,43	105	52	40*30*30	15	A
75*25	1803142	0,44	105	54	40*30*30	15	A
75*32	1803143	0,44	105	85	30*40*30	15	A
75*40	1803144	0,59	105	90	40*30*30	15	A
75*50	1803145	1,10	200	105	40*30*30	7	B
75*63	1803146	1,20	200	105	30*40*30	7	B
90*20	1803148	0,83	135	47	60*40*30	12	A
90*25	1803149	0,84	135	52	60*40*30	12	A
90*32	1803150	0,85	135	64	60*40*30	12	A
90*40	1803152	0,85	135	89	60*40*30	12	A
90*50	1803153	1,65	180	100	60*40*30	10	A
90*63	1803155	1,69	180	110	60*40*30	10	A
110*20	1803017	0,93	135	48	60*40*30	10	A
110*25	1803019	0,94	135	55	60*40*30	10	A

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



EF TAPPING TEE / EF SERVİS TE

SDR 11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

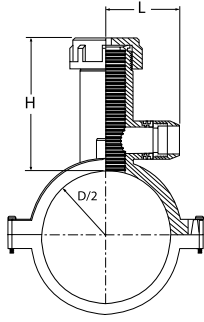
TEKNİK
TECHNICAL

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
110*32	1803021	0,96	135	68	60*40*30	10	A
110*40	1803024	0,98	135	70	60*40*30	10	A
110*50	1803026	1,40	180	75	60*40*30	8	A
110*63	1803027	1,53	180	75	60*40*30	8	A
125*20	1803029	1,32	135	48	60*40*30	10	A
125*25	1803030	1,38	135	55	60*40*30	10	A
125*32	1803033	1,40	135	68	60*40*30	10	A
125*40	1803036	1,45	135	70	60*40*30	10	A
125*50	1803037	1,48	180	75	60*40*30	8	A
125*63	1803039	1,53	180	75	60*40*30	8	A
140*20	1803041	1,30	135	51	60*40*30	10	C
140*25	1803042	1,38	135	48	60*40*30	10	C
140*32	1803043	1,40	135	83	60*40*30	10	C
140*40	1803044	1,45	135	89	60*40*30	8	C
140*50	1803045	1,48	180	103	60*40*30	8	C
140*63	1803046	1,53	180	110	60*40*30	8	C
160*20	1803048	1,30	135	65	60*40*30	10	D
160*25	1803340	1,38	135	64	60*40*30	10	D
160*32	1803054	1,40	137	87	60*40*30	10	D
160*40	1803056	1,45	136	60	60*40*30	10	D
160*50	1803057	1,48	165	109	60*40*30	8	D
160*63	1803058	1,53	165	108	60*40*30	8	D
180*20	1803059	1,30	135	65	60*40*30	10	D
180*25	1803060	1,38	135	64	60*40*30	10	D
180*32	1803063	1,40	137	87	60*40*30	10	D
180*40	1803066	1,45	136	60	60*40*30	8	D
180*50	1803067	1,48	165	109	60*40*30	8	D
180*63	1803069	1,53	165	108	60*40*30	8	D
200*20	1803071	1,32	135	65	60*40*30	10	D
200*25	1803072	1,38	135	64	60*40*30	10	D
200*32	1803073	1,40	137	87	60*40*30	10	D
200*40	1803074	1,45	136	60	60*40*30	8	D
200*50	1803076	1,48	165	109	60*40*30	8	D
200*63	1803077	1,53	165	108	60*40*30	8	D
225*20	1803078	1,32	135	65	60*40*30	10	D
225*25	1803079	1,38	135	64	60*40*30	10	D
225*32	1803080	1,40	137	87	60*40*30	10	D
225*40	1803081	1,45	136	60	60*40*30	8	D
225*50	1803082	1,48	165	109	60*40*30	8	D
225*63	1803083	1,53	165	108	60*40*30	8	D
250*20	1803086	1,30	135	65	60*40*30	12	D
250*25	1803087	1,38	135	64	60*40*30	12	D
250*32	1803088	1,40	137	87	60*40*30	12	D
250*40	1803090	1,45	136	60	60*40*30	12	D
250*50	1803092	1,48	165	109	60*40*30	12	D
250*63	1803094	1,53	165	108	60*40*30	12	D
280*20	1803096	1,30	135	65	60*40*30	12	D
280*25	1803097	1,35	135	64	60*40*30	12	D

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
280*32	1803098	1,38	137	87	60*40*30	12	D
280*40	1803099	1,40	136	60	60*40*30	12	D
280*50	1803100	1,48	165	109	60*40*30	12	D
280*63	1803101	1,53	165	108	60*40*30	12	D
315*20	1803102	1,30	135	65	60*40*30	12	D
315*25	1803103	1,35	135	64	60*40*30	12	D
315*32	1803104	1,38	137	87	60*40*30	12	D
315*40	1803106	1,40	136	60	60*40*30	12	D
315*50	1803107	1,48	165	109	60*40*30	12	D
315*63	1803108	1,53	165	108	60*40*30	12	D
355*20	1803405	1,30	205	70	60*40*30	12	E *
355*25	1803112	1,35	205	80	60*40*30	12	E *
355*32	1803113	1,38	205	85	60*40*30	12	E *
355*40	1803114	1,40	205	95	60*40*30	12	E *
355*50	1803115	1,48	205	105	60*40*30	12	E *
355*63	1803116	1,53	205	115	60*40*30	12	E *

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

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	1803157	2,15	210	117	60*40*30	10
110*20/25/32	1803406	2,07	185	117	60*40*30	8
125*20/25/32	1803407	2,11	185	117	60*40*30	8
140*20/25/32	1803408	2,30	175	117	60*40*30	8
160*20/25/32	1803409	2,32	177	117	60*40*30	8
180*20/25/32	1803410	2,25	172	117	60*40*30	8
200*20/25/32	1803411	2,26	172	117	60*40*30	8
225*20/25/32	1803412	2,26	172	117	60*40*30	8
250*20/25/32	1803413	2,00	172	117	60*40*30	10
280*20/25/32	1803414	2,00	210	117	60*40*30	10
315*20/25/32	1803415	2,00	210	117	60*40*30	10
355* 20/25/32	1803416	2,00	210	117	60*40*30	10

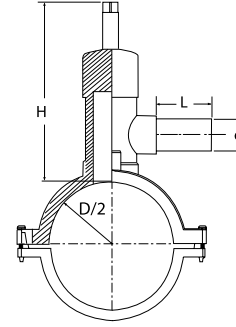
* Sadece SDR17 borularda delme işlemi yapılabilir. (Only SDR17 pipe for drilling)

EF-METRIC EF-METRİK



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	1803160	0,85	160	50	40*30*30	10	A
63*25	1803161	0,85	160	50	40*30*30	10	A
63*32	1803162	0,87	160	75	30*40*30	10	A
63*40	1803163	0,88	160	75	40*30*30	10	A
63*50	1803164	2,25	270	93	30*40*30	6	B
63*63	1803165	2,35	270	93	30*40*30	6	B
75*20	1803166	0,95	160	58	30*40*30	10	A
75*25	1803167	0,95	160	58	30*40*30	10	A
75*32	1803168	1,00	160	58	30*40*30	10	A
75*40	1803169	1,01	160	58	30*40*30	10	A
75*50	1803171	2,27	270	93	30*40*30	6	B
75*63	1803172	2,28	270	93	30*40*30	6	B
90*20	1803173	1,84	215	40	60*40*30	10	A
90*25	1803174	1,70	215	50	60*40*30	10	A
90*32	1803175	1,74	215	75	60*40*30	10	A
90*40	1803176	1,75	215	82	60*40*30	10	A
90*50	1803177	2,68	250	85	60*40*30	8	C
90*63	1803178	2,69	250	85	60*40*30	8	C
110*20	1803179	1,77	215	40	60*40*30	10	A
110*25	1803180	1,78	215	57	60*40*30	10	A
110*32	1803181	1,79	215	71	60*40*30	10	A
110*40	1803182	1,81	215	72	60*40*30	10	A
110*50	1803184	2,70	250	75	60*40*30	8	C
110*63	1803186	2,73	250	75	60*40*30	8	C
125*20	1803190	1,77	215	71	60*40*30	8	A
125*25	1803191	1,78	215	72	60*40*30	8	A
125*32	1803192	1,79	215	71	60*40*30	10	A
125*40	1803193	1,81	215	72	60*40*30	8	A

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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

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



EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
125*50	1803194	2,70	250	77	60*40*30	8	C
125*63	1803195	2,73	250	65	60*40*30	8	C
140*20	1803196	1,96	215	71	60*40*30	8	C
140*25	1803197	1,97	215	72	60*40*30	8	C
140*32	1803198	1,98	215	71	60*40*30	10	C
140*40	1803199	1,99	215	72	60*40*30	10	C
140*50	1803200	2,88	250	75	60*40*30	6	C
140*63	1803201	2,90	250	75	60*40*30	6	C
160*20	1803202	1,99	215	40	60*40*30	8	C
160*25	1803203	2,00	215	50	60*40*30	8	C
160*32	1803204	2,01	215	67	60*40*30	8	C
160*40	1803205	2,02	215	67	60*40*30	8	C
160*50	1803207	2,92	250	75	60*40*30	6	C
160*63	1803209	2,94	250	75	60*40*30	6	C
180*20	1803212	1,99	215	40	60*40*30	8	C
180*25	1803213	2,00	215	50	60*40*30	8	C
180*32	1803214	2,01	215	74	60*40*30	8	C
180*40	1803215	2,02	215	74	60*40*30	8	C
180*50	1803216	2,92	250	74	60*40*30	8	C
180*63	1803217	2,94	250	74	60*40*30	8	C
200*20	1803218	1,92	215	40	60*40*30	8	C
200*25	1803219	1,93	215	50	60*40*30	8	C
200*32	1803220	1,95	215	75	60*40*30	8	C
200*40	1803221	1,97	215	75	60*40*30	8	C
200*50	1803223	2,85	250	75	60*40*30	8	C
200*63	1803225	2,86	250	75	60*40*30	8	C
225*20	1803227	1,93	215	40	60*40*30	8	C
225*25	1803228	1,93	215	50	60*40*30	8	C
225*32	1803229	1,94	215	75	60*40*30	8	C
225*40	1803230	1,95	215	75	60*40*30	8	C
225*50	1803231	2,85	250	75	60*40*30	8	C
225*63	1803232	2,87	250	75	60*40*30	8	C
250*20	1803233	2,48	255	40	60*40*30	8	E
250*25	1803234	2,49	255	50	60*40*30	8	E
250*32	1803235	2,50	255	75	60*40*30	8	E
250*40	1803236	2,51	255	75	60*40*30	8	E
250*50	1803238	2,54	255	75	60*40*30	8	E
250*63	1803240	2,55	255	75	60*40*30	8	E
280*20	1803242	2,48	255	40	60*40*30	8	E
280*25	1803243	2,49	255	50	60*40*30	8	E
280*32	1803244	2,50	255	75	60*40*30	8	E
280*40	1803245	2,51	255	75	60*40*30	8	E
280*50	1803246	2,54	255	75	60*40*30	8	E
280*63	1803247	2,55	255	75	60*40*30	8	E
315*20	1803248	2,48	263	40	60*40*30	8	E
315*25	1803249	2,48	263	50	60*40*30	8	E
315*32	1803250	2,46	263	75	60*40*30	8	E
315*40	1803251	2,54	263	75	60*40*30	8	E
315*50	1803252	2,56	263	75	60*40*30	8	E
315*63	1803253	2,60	263	75	60*40*30	8	E

EF-METRIC EF-METRİK

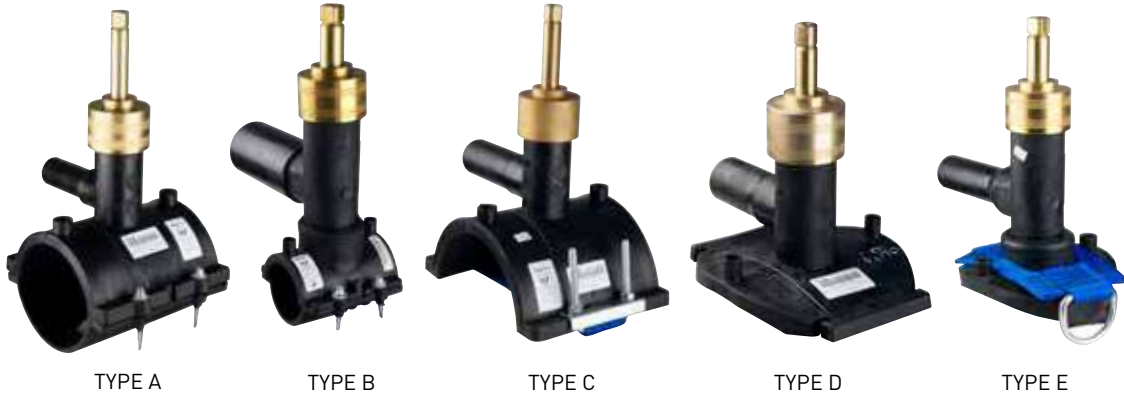
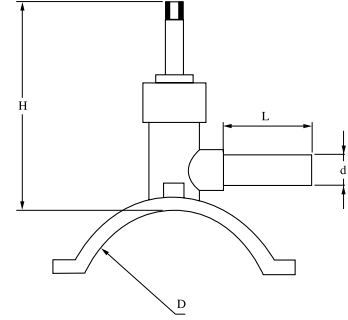


EF VALVE TAPPING TEE (VA TYPE) EF VANALI SERVİS TE (VA TİPİ)

SDR 11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



TYPE A

TYPE B

TYPE C

TYPE D

TYPE E

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
50*20	1803417	1,12	105	52	40*30*30	15	A
50*25	1803418	1,14	105	54	40*30*30	15	A
50*32	1803419	1,15	105	85	40*30*30	15	A
63*20	1803420	1,12	105	52	40*30*30	12	A
63*25	1803339	1,14	105	54	40*30*30	10	A
63*32	1803260	1,15	105	85	40*30*30	10	A
63*40	1803261	1,15	105	90	40*30*30	10	A
63*50	1803421	2,67	200	105	40*30*30	7	B
63*63	1803262	2,77	200	105	40*30*30	7	B
75*20	1803422	1,12	105	52	40*30*30	10	A
75*25	1803423	1,14	105	54	40*30*30	10	A
75*32	1803263	1,15	105	85	40*30*30	10	A
75*40	1803264	1,15	105	90	40*30*30	10	A
75*50	1803265	2,67	200	105	40*30*30	7	B
75*63	1803266	2,77	200	105	40*30*30	7	B
90*20	1803424	1,94	135	47	60*40*30	10	A
90*25	1803267	1,95	135	52	60*40*30	10	A
90*32	1803268	1,96	135	64	60*40*30	10	A
90*40	1803269	1,97	135	89	60*40*30	10	A
90*50	1803270	3,02	180	100	60*40*30	8	A
90*63	1803271	3,06	180	110	60*40*30	8	A
110*20	1803338	1,99	135	48	60*40*30	8	A
110*25	1803326	2,00	135	55	60*40*30	8	A
110*32	1803272	1,85	135	68	60*40*30	8	A
110*40	1803273	1,85	135	70	60*40*30	8	A
110*50	1803274	3,07	180	75	60*40*30	8	A



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

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box	type
110*63	1803275	3,07	180	75	60*40*30	8	A
125*20	1803337	1,99	135	48	60*40*30	8	A
125*25	1803425	2,00	135	55	60*40*30	8	A
125*32	1803276	2,03	135	68	60*40*30	8	A
125*40	1803277	2,04	135	70	60*40*30	8	A
125*50	1803278	3,07	180	75	60*40*30	8	A
125*63	1803354	3,07	180	75	60*40*30	8	A
140*20	1803426	2,28	135	51	60*40*30	8	C
140*25	1803427	2,25	135	48	60*40*30	8	C
140*32	1803279	2,24	135	83	60*40*30	8	C
140*40	1803280	2,27	135	89	60*40*30	8	C
140*50	1803336	3,31	180	103	60*40*30	8	C
140*63	1803335	3,39	180	110	60*40*30	8	C
160*20	1803428	1,74	135	65	60*40*30	8	D
160*25	1803429	1,75	135	64	60*40*30	8	D
160*32	1803281	1,76	137	87	60*40*30	8	D
160*40	1803282	1,77	136	60	60*40*30	8	D
160*50	1803283	2,87	165	109	60*40*30	6	D
160*63	1803284	2,87	165	108	60*40*30	6	D
180*20	1803430	1,74	135	65	60*40*30	8	D
180*25	1803431	1,75	135	64	60*40*30	8	D
180*32	1803285	1,76	137	87	60*40*30	8	D
180*40	1803286	1,77	136	60	60*40*30	8	D
180*50	1803432	2,87	165	109	60*40*30	6	D
180*63	1803345	2,87	165	108	60*40*30	6	D
200*20	1803334	1,74	135	65	60*40*30	8	D
200*25	1803333	1,75	135	64	60*40*30	8	D
200*32	1803287	1,76	137	87	60*40*30	8	D
200*40	1803369	1,77	136	60	60*40*30	8	D
200*50	1803288	2,87	165	109	60*40*30	6	D
200*63	1803289	2,87	165	108	60*40*30	6	D
225*20	1803433	1,74	135	65	60*40*30	8	D
225*25	1803434	1,97	135	64	60*40*30	8	D
225*32	1803290	2,02	137	87	60*40*30	8	D
225*40	1803291	2,01	136	60	60*40*30	8	D
225*50	1803435	2,82	165	109	60*40*30	6	D
225*63	1803292	2,82	165	108	60*40*30	6	D
250*20	1803332	2,26	135	65	60*40*30	10	D
250*25	1803331	2,27	135	64	60*40*30	10	D
250*32	1803293	2,28	137	87	60*40*30	10	D
250*40	1803294	2,42	136	60	60*40*30	10	D
250*50	1803330	2,73	165	109	60*40*30	10	D
250*63	1803295	2,73	165	108	60*40*30	10	D
280*20	1803436	2,26	135	65	60*40*30	10	D
280*25	1803437	2,27	135	64	60*40*30	10	D
280*32	1803296	2,47	137	87	60*40*30	10	D
280*40	1803297	2,48	136	60	60*40*30	10	D
280*50	1803298	2,73	165	109	60*40*30	8	D
280*63	1803299	2,73	165	108	60*40*30	8	D
315*20	1803438	2,26	135	65	60*40*30	10	D

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
315*25	1803439	2,27	135	64	60*40*30	10	D
315*32	1803300	2,29	137	87	60*40*30	10	D
315*40	1803301	2,30	136	60	60*40*30	10	D
315*50	1803440	2,73	165	109	60*40*30	8	D
315*63	1803302	2,73	165	108	60*40*30	8	D
355*20	1803441	2,80	205	70	60*40*30	10	E *
355*25	1803442	2,80	205	80	60*40*30	10	E *
355*32	1803443	2,78	205	85	60*40*30	10	E *
355*40	1803444	2,86	205	95	60*40*30	10	E *
355*50	1803445	2,88	205	105	60*40*30	8	E *
355*63	1803446	2,92	205	115	60*40*30	8	E *

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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

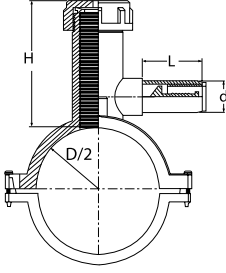
MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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

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



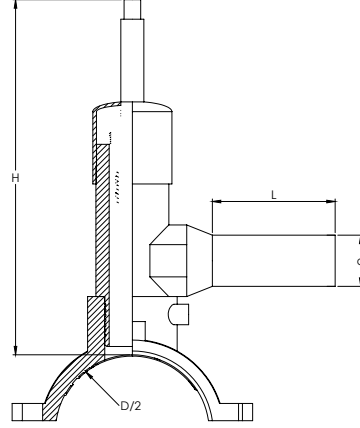
D*d	CODE	Kg.	H (mm)	L (mm)	box sizes	nos/box
40*20	1803447	0,29	105	46	40*30*30	25
40*32	1803448	0,32	105	50	40*30*30	25
50*20	1803449	0,56	105	54	40*30*30	15
50*32	1803313	0,60	105	88	40*30*30	15
63*20	1803314	0,56	105	54	40*30*30	15
63*32	1803315	0,60	105	88	40*30*30	15
75*20	1803450	0,56	105	54	40*30*30	15
75*32	1803451	0,60	105	88	40*30*30	15
90*20	1803317	0,98	135	49	60*40*30	12
90*32	1803318	1,01	135	67	60*40*30	12
110*20	1803452	1,03	135	50	60*40*30	10
110*32	1803319	1,08	135	71	60*40*30	10
125*20	1803320	1,03	135	50	60*40*30	10
125*32	1803321	1,08	135	71	60*40*30	10
140*20	1803323	1,32	135	53	60*40*30	8
140*32	1803453	1,29	135	86	60*40*30	8
160*20	1803454	1,32	135	53	60*40*30	10
160*32	1803455	1,29	135	86	60*40*30	10
180*20	1803456	1,32	135	53	60*40*30	10
180*32	1803457	1,21	135	86	60*40*30	10
200*20	1803458	1,32	135	53	60*40*30	10
200*32	1803459	1,21	135	86	60*40*30	10
225*20	1803460	1,32	135	53	60*40*30	10
225*32	1803461	1,21	135	86	60*40*30	10
250*20	1803462	1,32	198	72	60*40*30	12
250*32	1803463	1,31	198	88	60*40*30	12
280*20	1803464	1,32	198	72	60*40*30	12
280*32	1803465	1,31	198	88	60*40*30	12
315*20	1803466	1,32	205	72	60*40*30	12
315*32	1803467	1,31	205	88	60*40*30	12
355*20	1803468	1,32	205	72	60*40*30	12
355*32	1803469	1,31	205	88	60*40*30	12

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

EF-METRIC EF-METRİK



360° ROTATING OUTLET TAPPING TE
360° DÖNER BAŞLIKLİ 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	1803551	1,43	40	60*40*30	8
90*25	1803552	1,46	50	60*40*30	8
90*32	1803309	1,49	75	60*40*30	8
90*40	1803553	1,52	75	60*40*30	8
90*50	1803554	1,82	75	60*40*30	6
90*63	1803555	1,85	75	60*40*30	6
110*20	1803470	1,53	40	60*40*30	8
110*25	1803471	1,56	50	60*40*30	8
110*32	1803310	1,59	75	60*40*30	8
110*40	1803472	1,62	75	60*40*30	8
110*50	1803473	1,92	75	60*40*30	6
110*63	1803474	1,95	75	60*40*30	6
125*20	1803475	1,53	40	60*40*30	8
125*25	1803476	1,56	50	60*40*30	8
125*32	1803311	1,59	75	60*40*30	8
125*40	1803477	1,62	75	60*40*30	8
125*50	1803478	1,92	75	60*40*30	6
125*63	1803479	1,95	75	60*40*30	6
140*20	1803480	1,95	40	60*40*30	8
140*25	1803481	1,97	50	60*40*30	8
140*32	1803482	2,00	75	60*40*30	8
140*40	1803483	2,03	75	60*40*30	8
140*50	1803484	2,33	75	60*40*30	6
140*63	1803485	2,38	75	60*40*30	6
160*20	1803486	1,95	40	60*40*30	8
160*25	1803487	1,97	50	60*40*30	8
160*32	1803312	2,00	75	60*40*30	8
160*40	1803488	2,03	75	60*40*30	8
160*50	1803489	2,33	75	60*40*30	6

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



360° ROTATING OUTLET TAPPING TE
360° DÖNER BAŞLIKLİ SERVİS TE
SDR11 PE100
GAS / GAZ : 8 BAR
WATER / SU : 16 BAR

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
160*63	1803490	2,38	75	60*40*30	6
180*20	1803491	1,95	40	60*40*30	8
180*25	1803492	1,97	50	60*40*30	8
180*32	1803493	2,00	75	60*40*30	8
180*40	1803494	2,03	75	60*40*30	8
180*50	1803495	2,33	75	60*40*30	6
180*63	1803496	2,38	75	60*40*30	6
200*20	1803497	1,95	40	60*40*30	8
200*25	1803498	1,97	50	60*40*30	8
200*32	1803499	2,00	75	60*40*30	8
200*40	1803500	2,03	75	60*40*30	8
200*50	1803501	2,33	75	60*40*30	6
200*63	1803502	2,38	75	60*40*30	6
225*20	1803503	1,95	40	60*40*30	8
225*25	1803504	1,97	50	60*40*30	8
225*32	1803505	2,00	75	60*40*30	8
225*40	1803506	2,03	75	60*40*30	8
225*50	1803507	2,33	75	60*40*30	6
225*63	1803508	2,38	75	60*40*30	6

EF-METRIC EF-METRİK

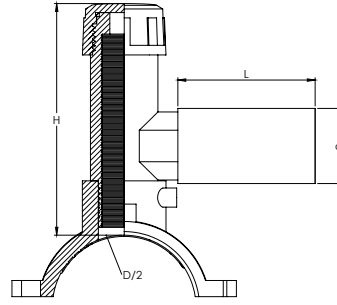


360° ROTATING OUTLET TAPPING TE 360° DÖNER BAŞLIKLİ SERVİS TE

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
90*20	1803599	0,76	70	60*40*30	8
90*25	1803600	0,78	80	60*40*30	8
90*32	1803601	0,8	85	60*40*30	8
90*40	1803602	0,84	95	60*40*30	8
90*50	1803603	0,86	105	60*40*30	6
90*63	1803604	0,88	115	60*40*30	6
110*20	1803509	0,86	70	60*40*30	8
110*25	1803510	0,88	80	60*40*30	8
110*32	1803511	0,90	85	60*40*30	8
110*40	1803512	0,94	95	60*40*30	8
110*50	1803513	0,96	105	60*40*30	6
110*63	1803514	0,98	115	60*40*30	6
125*20	1803515	0,86	70	60*40*30	8
125*25	1803516	0,88	80	60*40*30	8
125*32	1803517	0,90	85	60*40*30	8
125*40	1803518	0,94	95	60*40*30	8
125*50	1803519	0,96	105	60*40*30	6
125*63	1803520	0,98	115	60*40*30	6
140*20	1803521	0,91	70	60*40*30	8
140*25	1803522	0,93	80	60*40*30	8
140*32	1803523	0,95	85	60*40*30	8
140*40	1803524	0,99	95	60*40*30	8
140*50	1803525	1,01	105	60*40*30	6
140*63	1803526	1,03	115	60*40*30	6
160*20	1803527	0,91	70	60*40*30	8
160*25	1803528	0,93	80	60*40*30	8
160*32	1803529	0,95	85	60*40*30	8
160*40	1803530	0,99	95	60*40*30	8
160*50	1803531	1,01	105	60*40*30	6

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-T00L

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



360° DÖNER BAŞLIKLİ SERVİS TE
360° ROTATING OUTLET TAPPING TE
SDR11 PE100
GAS / GAZ : 8 BAR
WATER / SU : 16 BAR

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

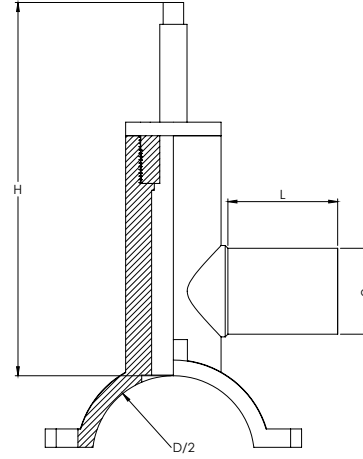
TEKNİK
TECHNICAL

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
160*63	1803532	1,03	115	60*40*30	6
180*20	1803533	0,91	70	60*40*30	8
180*25	1803534	0,93	80	60*40*30	8
180*32	1803535	0,95	85	60*40*30	8
180*40	1803536	0,99	95	60*40*30	8
180*50	1803537	1,01	105	60*40*30	6
180*63	1803538	1,03	115	60*40*30	6
200*20	1803539	0,91	70	60*40*30	8
200*25	1803540	0,93	80	60*40*30	8
200*32	1803541	0,95	85	60*40*30	8
200*40	1803542	0,99	95	60*40*30	8
200*50	1803543	1,01	105	60*40*30	6
200*63	1803544	1,03	115	60*40*30	6
225*20	1803545	0,91	70	60*40*30	8
225*25	1803546	0,93	80	60*40*30	8
225*32	1803547	0,95	85	60*40*30	8
225*40	1803548	0,99	95	60*40*30	8
225*50	1803549	1,01	105	60*40*30	6
225*63	1803550	1,03	115	60*40*30	6

EF-METRIC EF-METRİK



EF VALVE TAPPING TEE WITH INNER CAP
İÇ KAPAKLI VANALI SER TE
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR



D*d	CODE	Kg.	L(mm)	box sizes	nos/box
63*20	1803556	0,75	52	30*40*30	10
63*25	1803557	0,75	54	30*40*30	10
63*32	1803359	0..8	85	30*40*30	10
63*40	1803558	0,80	90	30*40*30	10
75*20	1803559	0,80	52	30*40*30	10
75*25	1803560	0,80	54	30*40*30	10
75*32	1803358	0,85	85	30*40*30	10
75*40	1803561	0,85	90	30*40*30	10
90*20	1803562	0,90	52	60*40*30	8
90*25	1803563	0,90	54	60*40*30	8
90*32	1803564	0,95	85	60*40*30	8
90*40	1803565	0,95	90	60*40*30	8
110*20	1803566	1,05	52	60*40*30	8
110*25	1803567	1,05	54	60*40*30	8
110*32	1803360	1,10	85	60*40*30	8
110*40	1803361	1,10	90	60*40*30	8
125*20	1803568	1,05	52	60*40*30	8
125*25	1803569	1,05	54	60*40*30	8
125*32	1803570	1,10	85	60*40*30	8
125*40	1803571	1,10	90	60*40*30	8
140*20	1803572	1,10	52	60*40*30	8
140*25	1803573	1,10	54	60*40*30	8
140*32	1803574	1,15	85	60*40*30	8
140*40	1803363	1,15	90	60*40*30	8
160*20	1803575	1,10	52	60*40*30	8
160*25	1803576	1,10	54	60*40*30	8

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



EF VALVE TAPPING TEE WITH INNER CAP
İÇ KAPAKLI VANALI SER TE
SDR11 PE100
GAS / GAZ : 10 BAR
WATER / SU : 16 BAR

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

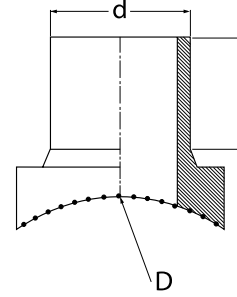
TEKNİK
TECHNICAL

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
160*32	1803577	1,15	85	60*40*30	8
160*40	1803364	1,15	90	60*40*30	8
180*20	1803578	1,10	52	60*40*30	8
180*25	1803579	1,10	54	60*40*30	8
180*32	1803580	1,15	85	60*40*30	8
180*40	1803581	1,15	90	60*40*30	8
200*20	1803582	1,10	52	60*40*30	8
200*25	1803583	1,10	54	60*40*30	8
200*32	1803584	1,15	85	60*40*30	8
200*40	1803585	1,15	90	60*40*30	8
225*20	1803586	1,10	52	60*40*30	8
225*25	1803587	1,10	54	60*40*30	8
225*32	1803588	1,15	85	60*40*30	8
225*40	1803366	1,15	90	60*40*30	8

EF-METRIC EF-METRIK



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	1809045	0,60	120	60*40*30	15
110*90	1809046	0,60	80	60*40*30	15
110*110	1809047	1,05	80	60*40*30	15
125*75	1809054	0,60	80	60*40*30	15
125*90	1809055	0,60	80	60*40*30	15
125*110	1809056	1,05	125	60*40*30	8
125*125	1809057	1,20	125	60*40*30	7
140*75	1809064	0,60	120	60*40*30	15
140*90	1809065	0,60	80	60*40*30	15
140*110	1809066	1,05	125	60*40*30	8
140*125	1809067	1,20	125	60*40*30	7
160*75	1809074	0,60	120	60*40*30	15
160*90	1809075	0,60	80	60*40*30	15
160*110	1809076	1,05	125	60*40*30	8
160*125	1809077	1,20	125	60*40*30	8
160*140	1809078	1,80	140	60*40*30	6
160*160	1809079	2,20	140	60*40*30	5
180*75	1809086	0,60	120	60*40*30	15
180*90	1809087	0,60	80	60*40*30	15
180*110	1809088	1,05	125	60*40*30	8
180*125	1809089	1,20	125	60*40*30	7
180*140	1809090	1,80	140	60*40*30	6
180*160	1809091	2,20	150	60*40*30	5
200*75	1809098	0,60	120	60*40*30	15
200*90	1809099	0,60	80	60*40*30	15
200*110	1809100	1,05	110	60*40*30	8
200*125	1809101	1,20	80	60*40*30	7
200*140	1809102	1,80	110	60*40*30	6
200*160	1809103	2,20	140	60*40*30	5
200*180	1809104	2,30	150	60*40*30	3
225*75	1809111	0,60	120	60*40*30	15
225*90	1809112	0,60	80	60*40*30	15
225*110	1809113	1,05	125	60*40*30	8
225*125	1809114	1,20	125	60*40*30	7
225*140	1809115	1,80	140	60*40*30	6
225*160	1809116	2,20	150	60*40*30	4
225*180	1809117	2,30	150	60*40*30	4
225*200	1809118	4,80	170	60*40*30	2

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIS KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIS KONTROL-IPS
FLOW CONTROL-IPS

MAKINE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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	1809119	4,50	170	60*40*30	2
250*75	1809126	0,60	120	60*40*30	15
250*90	1809127	0,60	80	60*40*30	15
250*110	1809128	1,05	125	60*40*30	8
250*125	1809129	1,36	125	60*40*30	7
250*140	1809130	1,80	140	60*40*30	4
250*160	1809131	2,20	150	60*40*30	4
250*180	1809132	2,30	150	60*40*30	4
250*200	1809133	4,80	170	60*40*30	2
250*225	1809134	4,50	170	60*40*30	2
250*250	1809135	4,80	170	60*40*30	2
280*75	1809141	0,60	120	60*40*30	15
280*90	1809142	0,60	80	60*40*30	15
280*110	1809143	1,05	125	60*40*30	8
280*125	1809144	1,20	125	60*40*30	7
280*140	1809145	1,80	140	60*40*30	6
280*160	1809146	2,20	150	60*40*30	4
280*180	1809147	2,30	150	60*40*30	3
280*200	1809148	4,80	130	60*40*30	2
280*225	1809149	4,50	150	60*40*30	2
280*250	1809150	4,80	170	60*40*30	2
315*75	1809157	0,60	120	60*40*30	15
315*90	1809158	0,60	80	60*40*30	15
315*110	1809159	1,05	125	60*40*30	6
315*125	1809160	1,20	125	60*40*30	6
315*140	1809161	1,80	140	60*40*30	4
315*160	1809162	2,20	150	60*40*30	4
315*180	1809163	2,30	150	60*40*30	3
315*200	1809164	4,80	170	60*40*30	2
315*225	1809165	4,50	170	60*40*30	2
315*250	1809166	8,00	190	60*40*30	2
355*75	1809173	0,60	120	60*40*30	15
355*90	1809174	0,60	80	60*40*30	15
355*110	1809175	1,05	125	60*40*30	6
355*125	1809176	1,20	125	60*40*30	6
355*140	1809177	1,80	140	60*40*30	4
355*160	1809178	2,20	150	60*40*30	4
355*180	1809179	2,30	150	60*40*30	3
355*200	1809180	4,80	170	60*40*30	2
355*225	1809181	4,50	170	60*40*30	2
355*250	1809182	8,00	190	60*40*30	2
400*75	1809189	0,60	120	60*40*30	15
400*90	1809190	0,60	80	60*40*30	15
400*110	1809191	1,05	125	60*40*30	6
400*125	1809192	1,20	125	60*40*30	6
400*140	1809193	1,80	140	60*40*30	4
400*160	1809194	2,20	150	60*40*30	4
400*180	1809195	2,30	150	60*40*30	3
400*200	1809196	4,80	170	60*40*30	2
400*225	1809197	4,50	170	60*40*30	2
400*250	1809198	8,00	190	60*40*30	2
450*75	1809206	0,60	120	60*40*30	15
450*90	1809207	0,60	80	60*40*30	15

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	1809208	1,05	125	60*40*30	8
450*125	1809209	1,20	125	60*40*30	7
450*140	1809210	1,80	140	60*40*30	5
450*160	1809211	2,20	150	60*40*30	4
450*180	1809212	2,30	150	60*40*30	3
450*200	1809213	4,80	170	60*40*30	2
450*225	1809214	4,50	170	60*40*30	2
450*250	1809215	8,00	190	60*40*30	2
500*75	1809223	0,60	120	60*40*30	15
500*90	1809224	0,60	80	60*40*30	15
500*110	1809225	1,05	125	60*40*30	8
500*125	1809226	1,20	125	60*40*30	7
500*140	1809227	1,80	140	60*40*30	4
500*160	1809228	2,20	150	60*40*30	4
500*180	1809229	2,30	150	60*40*30	3
500*200	1809230	4,80	170	60*40*30	2
500*225	1809231	4,50	170	60*40*30	2
500*250	1809232	8,00	190	60*40*30	2
560*75	1809236	0,60	120	60*40*30	15
560*90	1809237	0,60	80	60*40*30	15
560*110	1809238	1,05	125	60*40*30	8
560*125	1809239	1,20	125	60*40*30	7
560*160	1809240	2,20	140	60*40*30	4
560*180	1809241	2,30	150	60*40*30	4
560*200	1809242	4,80	170	60*40*30	2
560*225	1809243	4,50	170	60*40*30	2
560*250	1809244	8,00	190	60*40*30	2
630*75	1809256	0,60	120	60*40*30	15
630*90	1809257	0,60	80	60*40*30	15
630*110	1809258	1,05	125	60*40*30	8
630*125	1809259	1,20	125	60*40*30	7
630*140	1811690	1,80	140	60*40*30	4
630*160	1809260	2,20	150	60*40*30	4
630*180	1809261	2,30	150	60*40*30	3
630*200	1809262	4,80	170	60*40*30	2
630*225	1809263	4,50	170	60*40*30	2
630*250	1809020	8,00	190	60*40*30	2
710*75	1809271	0,60	120	60*40*30	15
710*90	1809272	0,60	80	60*40*30	15
710*110	1809273	1,05	125	60*40*30	8
710*125	1809274	1,20	125	60*40*30	7
710*140	1809275	1,80	140	60*40*30	4
710*160	1809276	2,20	150	60*40*30	4
710*180	1809277	2,30	150	60*40*30	3
710*200	1809278	4,80	170	60*40*30	2
710*225	1809279	4,50	170	60*40*30	2
710*250	1809280	8,00	190	60*40*30	2
800*75	1809283	0,60	120	60*40*30	15
800*90	1809284	0,60	80	60*40*30	15
800*110	1809285	1,05	125	60*40*30	8
800*125	1809286	1,20	125	60*40*30	7
800*140	1811691	1,80	140	60*40*30	4
800*160	1809287	2,20	150	60*40*30	4

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

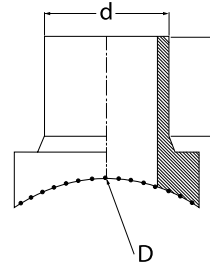
TEKNİK
TECHNICAL

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
800*180	1809288	2,30	150	60*40*30	3
800*200	1809289	4,80	170	60*40*30	2
800*225	1809290	4,50	170	60*40*30	2
800*250	1809291	8,00	190	60*40*30	2
900*75	1809037	0,60	120	60*40*30	15
900*90	1809038	0,60	80	60*40*30	15
900*110	1809296	1,05	125	60*40*30	8
900*125	1809297	1,20	125	60*40*30	7
900*140	1809298	1,80	140	60*40*30	4
900*160	1809299	2,20	150	60*40*30	4
900*180	1809300	2,30	150	60*40*30	3
900*200	1809301	4,80	170	60*40*30	2
900*225	1809302	4,50	170	60*40*30	2
900*250	1809303	8,00	190	60*40*30	2
1000*75	1809307	0,60	120	60*40*30	15
1000*90	1809308	0,60	80	60*40*30	15
1000*110	1809309	1,05	125	60*40*30	8
1000*125	1811692	1,20	125	60*40*30	7
1000*140	1811693	1,80	140	60*40*30	4
1000*160	1809310	2,20	150	60*40*30	4
1000*180	1809311	2,30	150	60*40*30	3
1000*200	1809312	4,80	170	60*40*30	2
1000*225	1809313	4,50	170	60*40*30	2
1000*250	1809314	8,00	190	60*40*30	2
1200*75	1809317	0,60	120	60*40*30	15
1200*90	1809318	0,60	80	60*40*30	15
1200*110	1809319	1,05	125	60*40*30	6
1200*125	1809320	1,20	125	60*40*30	6
1200*140	1811694	1,80	140	60*40*30	4
1200*160	1809321	2,20	150	60*40*30	4
1200*180	1809322	2,30	150	60*40*30	3
1200*200	1809323	4,80	170	60*40*30	2
1200*225	1809324	4,50	170	60*40*30	2
1200*250	1809325	8,00	190	60*40*30	2
1400*75	1809942	0,60	120	60*40*30	15
1400*90	1811695	0,60	80	60*40*30	15
1400*110	1811696	1,05	125	60*40*30	8
1400*125	1811732	1,20	125	60*40*30	7
1400*140	1811733	1,80	140	60*40*30	4
1400*160	1811734	2,20	150	60*40*30	4
1400*180	1809328	2,30	150	60*40*30	3
1400*200	1811735	6,40	170	60*40*30	2
1400*225	1811736	4,80	170	60*40*30	2
1400*250	1809329	6,00	190	60*40*30	2
1600*75	1811737	0,60	120	60*40*30	15
1600*90	1811738	0,60	80	60*40*30	15
1600*110	1811739	1,05	125	60*40*30	8
1600*125	1811740	1,20	125	60*40*30	7
1600*140	1811741	1,80	140	60*40*30	4
1600*160	1811742	2,20	150	60*40*30	4
1600*180	1811743	2,30	150	60*40*30	3
1600*200	1811744	6,40	170	60*40*30	2
1600*225	1811745	4,80	170	60*40*30	2
1600*250	1811746	6,00	190	60*40*30	2

EF-METRIC EF-METRIK



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	1809390	8,50	170	60*60*50	1
355*280	1809401	8,50	170	60*60*50	1
400*280	1809410	8,50	170	60*60*50	1
400*315	1809411	12,80	170	60*60*50	1
400*355	1809412	15,00	170	60*60*50	1
450*280	1809422	8,50	170	60*60*50	1
450*315	1809423	12,80	170	60*60*50	1
500*280	1809431	8,50	170	60*60*50	1
500*315	1809432	12,80	170	60*60*50	1
500*355	1809433	15,00	170	60*60*50	1
560*280	1809439	8,50	170	60*60*50	1
560*315	1809440	12,80	170	60*60*50	1
560*355	1809441	15,00	170	60*60*50	1
560*400	1811712	42,00	215	80*80*50	1
560*450	1811713	42,00	215	80*80*50	1
630*280	1809450	8,50	170	60*60*50	1
630*315	1809451	12,80	170	60*60*50	1
630*355	1809452	15,00	170	60*60*50	1
630*400	1809453	42,00	215	80*80*50	1
630*450	1811714	42,00	215	80*80*50	1
630*500	1811715	42,00	215	80*80*50	1
710*280	1809460	8,50	170	60*60*50	1
710*315	1809461	12,80	170	60*60*50	1
710*355	1809462	15,00	170	60*60*50	1
710*400	1809463	42,00	215	80*80*50	1
710*450	1811716	42,00	215	80*80*50	1
710*500	1811717	42,00	215	80*80*50	1
800*280	1809468	8,50	170	60*60*50	1
800*315	1809469	12,80	170	60*60*50	1
800*355	1809470	15,00	170	60*60*50	1
800*400	1811718	42,00	215	80*80*50	1
800*450	1811719	42,00	215	80*80*50	1

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

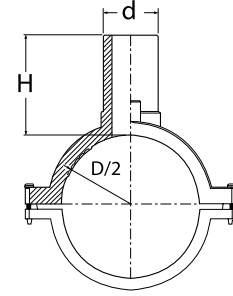
TEKNİK
TECHNICAL

D*d	CODE	Kg.	L(mm)	box sizes	nos/box
800*500	1811720	42,00	215	80*80*50	1
900*280	1809474	8,50	170	60*60*50	1
900*315	1809475	12,80	170	60*60*50	1
900*355	1809476	14,00	170	60*60*50	1
900*400	1811721	42,00	215	80*80*50	1
900*450	1811722	42,00	215	80*80*50	1
900*500	1811723	42,00	215	80*80*50	1
1000*280	1809480	8,50	170	60*60*50	1
1000*315	1809481	12,80	170	60*60*50	1
1000*355	1809482	14,00	170	60*60*50	1
1000*400	1809483	42,00	215	80*80*50	1
1000*450	1811724	42,00	215	80*80*50	1
1000*500	1811725	42,00	215	80*80*50	1
1200*280	1811726	8,50	170	60*60*50	1
1200*315	1811727	12,80	170	60*60*50	1
1200*355	1811728	14,00	170	60*60*50	1
1200*400	1811729	42,00	215	80*80*50	1
1200*450	1811730	42,00	215	80*80*50	1
1200*500	1811731	42,00	215	80*80*50	1
1400*280	1811732	8,50	170	60*60*50	1
1400*315	1811733	12,80	170	60*60*50	1
1400*355	1811734	14,00	170	60*60*50	1
1400*400	1811735	42,00	215	80*80*50	1
1400*450	1811736	42,00	215	80*80*50	1
1400*500	1811737	42,00	215	80*80*50	1
1600*280	1811738	8,50	170	60*60*50	1
1600*315	1811739	12,80	170	60*60*50	1
1600*355	1811740	14,00	170	60*60*50	1
1600*400	1811741	42,00	215	80*80*50	1
1600*450	1811742	42,00	215	80*80*50	1
1600*500	1811743	42,00	215	80*80*50	1

EF-METRIC EF-METRIK



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	1809010	0,18	75	40*30*30	35	A
40*25	1809011	0,19	75	40*30*30	35	A
40*32	1809012	0,20	75	40*30*30	35	A
50*20	1809013	0,34	77	40*30*30	24	A
50*25	1809014	0,35	77	30*40*30	24	A
50*32	1809015	0,38	77	30*40*30	24	A
50*40	1809016	0,39	77	40*30*30	20	A
63*20	1809019	0,35	77	40*30*30	24	A
63*25	1809020	0,36	77	40*30*30	24	A
63*32	1809021	0,39	77	40*30*30	24	A
63*40	1809022	0,40	77	30*40*30	20	A
63*50	1809023	0,75	125	30*40*30	20	A
63*63	1809024	0,80	125	40*30*30	15	A
75*20	1809025	0,36	77	40*30*30	20	A
75*25	1809026	0,37	77	40*30*30	20	A
75*32	1809027	0,39	77	40*30*30	20	A
75*40	1809028	0,41	77	30*40*30	20	A
75*50	1809029	0,45	125	40*30*30	15	A
75*63	1809030	0,49	125	40*30*30	15	A
90*20	1809031	0,66	95	60*40*30	18	A
90*25	1809032	0,68	95	60*40*30	18	A
90*32	1809033	0,69	95	60*40*30	18	A
90*40	1809034	0,70	95	60*40*30	18	A
90*50	1809035	0,71	135	60*40*30	18	B
90*63	1809036	0,72	135	60*40*30	12	B



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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

D*d	CODE	Kg.	H (mm)	box sizes	nos/box	type
110*20	1809037	0,73	95	60*40*30	15	A
110*25	1809038	0,74	95	60*40*30	15	A
110*32	1809039	0,75	95	60*40*30	15	A
110*40	1809040	0,76	95	60*40*30	15	A
110*50	1809041	0,77	110	60*40*30	15	B
110*63	1809042	0,78	110	60*40*30	12	B
125*20	1809043	0,75	95	60*40*30	12	A
125*25	1809044	0,75	95	60*40*30	12	A
125*32	1809045	0,76	95	60*40*30	12	A
125*40	1809046	0,78	95	60*40*30	12	A
125*50	1809052	0,79	110	60*40*30	12	B
125*63	1809053	0,80	110	60*40*30	12	B
140*20	1809058	0,92	95	60*40*30	10	B
140*25	1809059	0,93	95	60*40*30	10	B
140*32	1809060	0,93	95	60*40*30	10	B
140*40	1809061	0,94	95	60*40*30	10	B
140*50	1809062	0,95	110	60*40*30	10	B
140*63	1809063	0,96	110	60*40*30	10	B
160*20	1809068	0,93	95	60*40*30	12	B
160*25	1809069	0,94	95	60*40*30	12	B
160*32	1809070	0,95	95	60*40*30	15	B
160*40	1809071	0,96	95	60*40*30	12	B
160*50	1809072	0,99	110	60*40*30	12	B
160*63	1809073	1,00	110	60*40*30	12	B
180*20	1809080	0,93	95	60*40*30	12	B
180*25	1809081	0,95	95	60*40*30	12	B
180*32	1809082	0,96	95	60*40*30	12	B
180*40	1809083	0,97	95	60*40*30	12	B
180*50	1809084	1,00	110	60*40*30	12	B
180*63	1809085	1,01	110	60*40*30	12	B
200*20	1809092	0,89	95	60*40*30	12	B
200*25	1809093	0,90	95	60*40*30	12	B
200*32	1809094	0,91	95	60*40*30	15	B
200*40	1809095	0,92	95	60*40*30	12	B
200*50	1809096	0,93	110	60*40*30	12	B
200*63	1809097	0,94	110	60*40*30	12	B
225*20	1809105	0,90	95	60*40*30	12	B
225*25	1809106	0,91	95	60*40*30	12	B
225*32	1809107	0,92	95	60*40*30	12	B
225*40	1809108	0,93	95	60*40*30	12	B
225*50	1809109	0,94	110	60*40*30	12	B
225*63	1809110	0,95	110	60*40*30	12	B
250*20	1809120	0,54	100	60*40*30	20	C
250*25	1809121	0,50	100	60*40*30	20	C
250*32	1809122	0,51	130	60*40*30	20	C
250*40	1809123	0,52	110	60*40*30	20	C
250*50	1809124	0,58	130	60*40*30	20	C
250*63	1809125	0,58	125	60*40*30	20	C

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
280*20	1809148	0,49	100	60*40*30	20	C
280*25	1809136	0,50	100	60*40*30	20	C
280*32	1809137	0,51	130	60*40*30	20	C
280*40	1809138	0,52	110	60*40*30	20	C
280*50	1809139	0,58	130	60*40*30	20	C
280*63	1809140	0,58	125	60*40*30	20	C
315*20	1809151	0,51	110	60*40*30	20	C
315*25	1809152	0,47	110	60*40*30	20	C
315*32	1809153	0,48	140	60*40*30	20	C
315*40	1809154	0,49	115	60*40*30	20	C
315*50	1809155	0,55	140	60*40*30	20	C
315*63	1809156	0,55	130	60*40*30	20	C
355*20	1811744	0,46	110	60*40*30	20	C
355*25	1809168	0,47	110	60*40*30	20	C
355*32	1809169	0,48	140	60*40*30	20	C
355*40	1809170	0,49	115	60*40*30	20	C
355*50	1809171	0,55	140	60*40*30	20	C
355*63	1809172	0,55	130	60*40*30	20	C
400*20	1809184	0,48	110	60*40*30	20	C
400*25	1809185	0,44	110	60*40*30	20	C
400*32	1809186	0,45	140	60*40*30	20	C
400*40	1811745	0,46	115	60*40*30	20	C
400*50	1809187	0,52	140	60*40*30	20	C
400*63	1809188	0,52	130	60*40*30	20	C
450*20	1809213	0,43	110	60*40*30	20	C
450*25	1809215	0,44	110	60*40*30	20	C
450*32	1809202	0,45	140	60*40*30	20	C
450*40	1809203	0,46	115	60*40*30	20	C
450*50	1809204	0,52	140	60*40*30	20	C
450*63	1809205	0,52	130	60*40*30	20	C

EF-METRIK
 EF-METRIC

SPIGOT-METRIK
 SPIGOT-METRIC

AKIS KONTROL-METRIK
 FLOW CONTROL-METRIC

EF-IPS
 EF-IPS

AKIS KONTROL-IPS
 FLOW CONTROL-IPS

MAKINE-APARATLAR
 MACHINE-TOOL

MONTAJ
 INSTALLATION

TEKNIK
 TECHNICAL



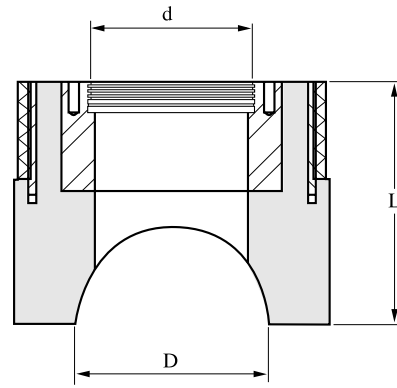
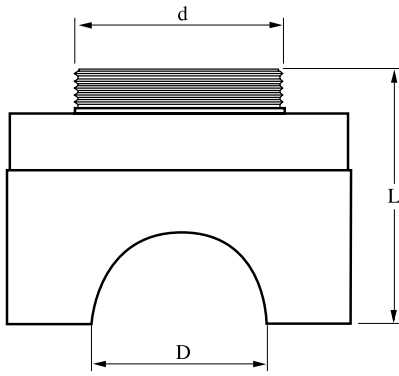
EF SADDLE - STOP SYSTEM

EF SEMER - STOP SİSTEM

SDR11 PE100

GAS / GAZ : 4 BAR

WATER / SU : 10 BAR



TYPE A



TYPE B

D (mm)	CODE	Kg.	L (mm)	d (mm)	TYPE
63	1825007	1,44	92	74,9	A
90	1809000	2,73	120	100	A
110	1809001	3,72	140	112,8	A
125	1809002	4,45	157	125,4	A
160	1809003	17,73	205	130,8	B
180	1809004	17,73	225	146,8	B
200	1809005	25,00	245	164,9	B
225	1809006	25,00	275	184,8	B
250	1809007	36,00	320	203	B
280	1809008	50,00	335	227,5	B
315	1809009	50,00	362	255	B

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

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

EF-METRIC EF-METRIK



EF BALLOON SADDLE

EF BALON SEMER

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR



D	d	CODE	Kg.	L(mm)
2 1/2"	75	2204342	2,25	138
2 1/2"	90	2204343	2,24	138
2 1/2"	110	2204344	2,22	137
2 1/2"	125	2204345	2,22	137
2 1/2"	140	2204346	2,22	137
2 1/2"	160	2204347	2,21	136
2 1/2"	180	2204348	2,21	136
2 1/2"	200	2204349	2,20	135
2 1/2"	225	2204350	2,20	135
2 1/2"	250	2204351	2,19	134
2 1/2"	280	2204352	2,19	134
2 1/2"	315	2204353	2,18	132
2 1/2"	355	2204354	2,18	132
2 1/2"	400	2204355	2,18	132

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

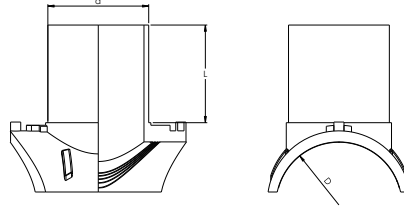
TEKNİK
TECHNICAL

EF FLEX SADDLE / EF FLEKS SEMER

SDR11 PE100

GAS / GAZ : 6 BAR

WATER / SU : 16 BAR



D (mm)	CODE	Kg.	L (mm)	d (mm)	nos/box
110*90	1811944	0,90	121	60x40x30	10
125*90	1811946	0,90	121	60x40x30	10
160*90	1811948	0,90	121	60x40x30	10
160*110	1811949	1,10	122	60x40x30	10
180*90	1811952	0,90	121	60x40x30	10
180*110	1811953	1,10	122	60x40x30	10
200*90	1811957	0,89	121	60x40x30	10
200*110	1811958	1,09	122	60x40x30	10
200*160	1809350	2,00	150	60x40x45	3
225*90	1811963	0,89	121	60x40x30	10
225*110	1811964	1,09	122	60x40x30	1
225*160	1812065	1,24	122	60x40x30	10
250*90	1811970	0,89	121	60x40x30	10
250*110	1811971	1,09	122	60x40x30	1
250*160	1812066	2,00	150	60x40x45	3
280*90	1811978	0,89	121	60x40x30	10
280*110	1811979	1,09	122	60x40x30	10
280*160	1811982	2,00	150	60x40x45	3
280*90	1811978	0,89	121	60x40x30	10
315*90	1811987	0,88	121	60x40x30	10
315*110	1811988	1,08	122	60x40x30	10
315*160	1809352	1,99	150	60x40x45	3
355*90	1812036	0,88	121	60x40x30	10
355*110	1812037	1,08	122	60x40x30	10
355*160	1812039	1,90	122	60x40x30	3
400*90	1811995	0,87	121	60x40x30	10
400*110	1811996	1,07	122	60x40x30	10
400*160	1809353	1,98	150	60x40x45	3
450*90	1812003	0,87	121	60x40x30	10

EF FLEX SADDLE / EF FLEKS SEMER

SDR11 PE100
GAS / GAZ : 6 BAR
WATER / SU : 16 BAR



D (mm)	CODE	Kg.	L (mm)	d (mm)	nos/box
450*110	1812004	1,07	122	60x40x30	10
450*160	1812007	1,98	150	60x40x45	3
500*90	1812012	0,86	121	60x40x30	10
500*110	1812013	1,06	122	60x40x30	10
500*160	1812016	1,97	150	60x40x45	3
560*90	1812021	0,85	121	60x40x30	10
560*110	1812022	1,05	122	60x40x30	10
560*160	1812025	1,96	150	60x40x45	3

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

BIG SIZE SADDLE EF SEMER BÜYÜK ÇIKIŞLI PE100

EF-METRİK
EF-METRİK

SPİGOT-METRİK
SPİGOT-METRİK

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRİK

EF-İPS
EF-İPS

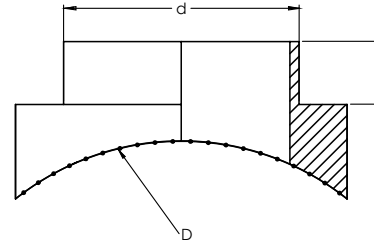
AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

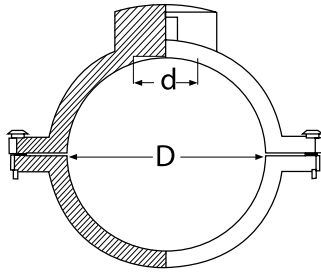
(D) MAIN	(d) OUTLET
630	560
710	560
710	630
800	560
800	630
800	710
900	560
900	630
900	710
900	800
1000	560
1000	630
1000	710
1000	800
1000	900
1200	560
1200	630
1200	710
1200	800
1200	900
1200	1000
1400	560
1400	630
1400	710
1400	800
1400	900
1400	1000
1400	1200
1600	560
1600	630
1600	710
1600	800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



EF-METRIC EF-METRİK



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	1810035	0,38	31	40*30*30	30	A
75	1810036	0,39	31	40*30*30	30	A
90	1810037	0,73	38	60*40*30	24	A
110	1810038	0,73	37	60*40*30	24	A
125	1810040	0,73	37	60*40*30	24	A
140	1810042	0,95	37	60*40*30	18	B
160	1810043	0,96	46	60*40*30	18	B
180	1810044	0,97	46	60*40*30	18	B
200	1810045	0,97	46	60*40*30	18	B
225	1810046	0,97	46	60*40*30	18	B
250	1810047	0,64	44	60*40*30	24	C
280	1810048	0,64	44	60*40*30	24	C
315	1810049	0,65	44	60*40*30	24	C
355	1810051	0,65	44	60*40*30	24	C
400	1810053	0,68	44	60*40*30	24	C
450	1810055	0,68	44	60*40*30	24	C
500	1810057	0,68	44	60*40*30	24	C
560	1810062	0,68	44	60*40*30	24	C
630	1810058	0,68	44	60*40*30	24	C
710	1810060	0,68	44	60*40*30	24	C
800	1810063	0,68	44	60*40*30	24	C
900	1810064	0,68	44	60*40*30	24	C

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

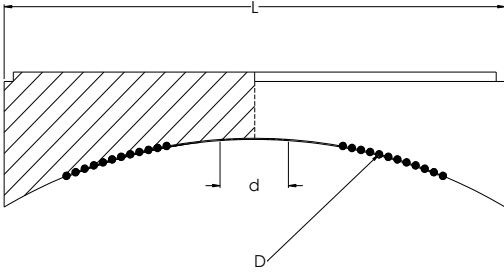
AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	1810039	0,60	80	150	60*40*30	24
125	1810041	0,60	80	180	60*40*30	18
140	1811697	0,60	120	200	60*40*30	12
160	1811698	0,60	120	200	60*40*30	12
180	1811699	0,60	150	255	60*40*30	6
200	1811700	1,80	150	255	60*40*30	6
225	1811701	1,80	190	305	60*40*30	4
250	1811702	1,80	190	305	60*40*30	4
280	1811703	6,40	230	360	60*40*30	4
315	1810050	6,00	230	360	60*40*30	4
355	1810052	5,60	230	360	60*40*30	4
400	1810054	5,70	230	360	60*40*30	4
450	1810056	5,90	230	360	60*40*30	4
500	1811705	5,70	230	360	60*40*30	4
560	1811705	5,50	230	360	60*40*30	4
630	1810059	6,90	230	360	60*40*30	4
710	1810061	7,30	230	360	60*40*30	4
800	1811706	7,40	230	360	60*40*30	4
900	1811707	7,60	230	360	60*40*30	4
1000	1811708	7,50	230	360	60*40*30	4
1200	1811709	7,40	230	360	60*40*30	4
1400	1811710	7,30	230	360	60*40*30	4
1600	1811711	7,30	230	360	60*40*30	4

EF-METRIC EF-METRİK

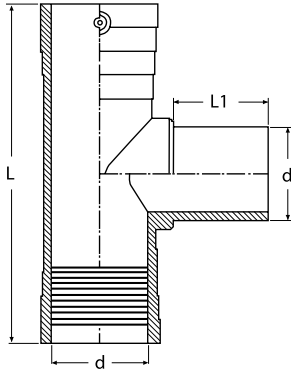


EF EQUAL TE / EF EŞİT TE

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	1816011	0,07	108	37	40*30*15	50	A
32	1816013	0,15	128	41	40*30*15	25	A
40	1816016	0,22	147	49	40*30*30	35	A
50	1816018	0,31	162	49	60*40*30	40	A
63	1816021	0,57	186	61	60*40*30	25	A
75	1816024	0,87	220	63	60*40*30	13	A
90	1816026	1,48	255	74	60*40*30	9	A
110	1816029	2,05	257	79	60*40*30	6	A
125	1816032	2,66	303	78	60*40*30	4	A
160	1816037	5,16	339	125	60*40*30	1	B
180	1816038	8,90	395	130	60*40*30	1	B
200	1816040	10,10	395	130	60*40*30	1	B
225	1816041	17,80	680	110	*	1	C
250	1816042	30,75	810	140	*	1	C
280	1816043	36,40	800	185	*	1	C
315	1816044	45,20	910	270	*	1	C

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

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

EF REDUCED TE / EF INEGAL TE

SDR11 PE100

GAS / GAZ : 10 BAR

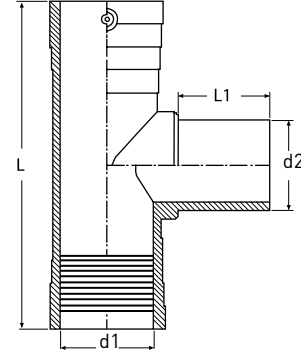
WATER / SU : 16 BAR



TYPE A



TYPE B



d1*d2	CODE	Kg.	L (mm)	L1 (mm)	box sizes	nos/box	Type
32*20	1817027	0,11	128	41	30*40*15	25	A
32*25	1817028	0,11	128	41	30*40*15	25	A
50*32	1817033	0,27	162	49	60*40*30	25	A
63*32	1817037	0,50	186	61	60*40*30	25	A
63*40	1817038	0,52	186	61	60*40*30	25	A
63*50	1817039	0,56	186	61	60*40*30	25	A
75*63	1817043	0,80	220	63	60*40*30	13	A
90*63	1817050	1,30	255	74	60*40*30	10	A
90*75	1817151	1,78	255	74	60*40*30	9	A
110*63	1817129	2,33	257	79	60*40*45	5	A
110*75	1817146	2,71	257	79	60*40*45	8	A
110*90	1817058	1,95	257	79	60*40*30	6	A
125*63	1817123	2,31	303	79	60*40*30	4	A
125*75	1817064	2,41	303	79	60*40*30	4	A
125*90	1817065	2,45	303	79	60*40*30	4	A
125*110	1817066	2,50	303	79	60*40*30	4	A
160*90	1817076	4,09	315	90	60*40*45	3	B
160*110	1817077	4,09	315	90	60*40*45	3	B
160*125	1817147	4,09	315	90	60*40*45	3	B
160*140	1817079	4,10	315	110	60*40*45	3	B
180*90	1817081	5,50	390	130	60*40*45	3	B
180*110	1817082	5,85	390	130	60*40*45	3	B
180*125	1817083	5,95	390	130	60*40*45	3	B
180*140	1817084	6,00	390	130	60*40*45	3	B
180*160	1817127	6,09	390	130	60*40*45	3	B
200*90	1817085	6,11	390	90	60*40*30	1	B
200*110	1817086	6,14	390	110	60*40*30	1	B
200*140	1817088	6,58	390	110	60*40*30	1	B
200*160	1817089	6,87	390	140	60*40*30	1	B
200*180	1817128	6,97	390	150	60*40*30	1	B

EF-METRIC EF-METRİK

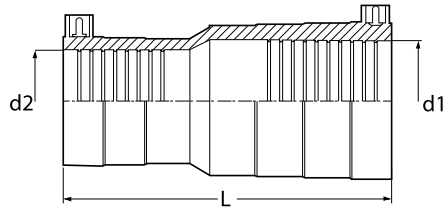


EF REDUCER / EF REDÜKSİYON

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	1818016	0,04	72	40*30*15	100	A
32*20	1818017	0,04	90	40*30*15	60	A
32*25	1818018	0,05	90	40*30*15	60	A
40*32	1818024	0,09	117	40*30*30	70	A
50*32	1818029	0,15	131	40*30*30	45	A
50*40	1818031	0,15	130	40*30*30	45	A
63*32	1818036	0,22	142	40*30*30	35	A
63*40	1818037	0,24	139	40*30*30	35	A
63*50	1818038	0,26	152	40*30*30	30	A
75*63	1818049	0,41	173	60*40*30	35	A
90*63	1818171	0,58	190	60*40*30	30	A
90*75	1818057	0,55	215	60*40*45	24	A
110*63	1818062	0,88	209	60*40*45	25	A
110*75	1818176	0,95	215	60*40*45	24	A
110*90	1818063	1,09	215	60*40*45	24	A
125*63	1818188	1,33	223	60*40*45	15	A
125*90	1818069	1,80	222	60*40*45	15	A
125*110	1818072	1,50	223	60*40*45	15	A
160*90	1818084	2,00	203	60*40*45	6	B
160*110	1818085	2,11	203	60*40*45	6	B
160*125	1818086	2,30	203	60*40*45	6	B
180*125	1818092	2,80	203	60*40*30	3	B
200*110	1818098	2,80	213	60*40*30	3	B
200*160	1818177	3,00	213	60*40*30	3	B
225*200	1818108	6,30	240	60*40*30	2	B
250*200	1818016	8,70	240	60*40*30	2	B
250*225	1818117	7,80	240	60*40*30	2	B
280*200	1818118	12,40	250	60*40*45	1	B
280*225	1818119	12,30	250	60*40*45	1	B
280*250	1818120	10,70	250	60*40*45	1	B
315*225	1818124	18,10	280	60*40*45	1	B

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



EF REDUCER / EF REDÜKSİYON

SDR11 PE100

GAS / GAZ : 10 BAR

WATER / SU : 16 BAR

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

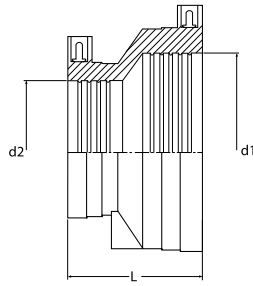
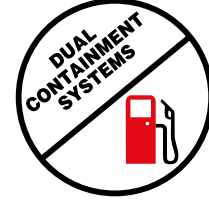
d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box	Type
315*250	1818125	15,80	280	60*40*45	1	B
315*280	1818126	13,90	280	60*40*45	1	B
355*250	1818131	18,40	280	60*40*45	1	B
355*280	1818132	19,60	280	60*40*45	1	B
355*315	1818133	23,10	280	*	*	B
400*280	1818136	27,50	300	*	*	B
400*315	1818137	27,10	310	*	*	B
400*355	1818138	31,30	320	*	*	B
450*315	1818142	37,50	340	*	*	B
450*355	1818143	36,40	340	*	*	B
450*400	1818144	45,20	340	*	*	B
500*355	1818146	48,10	350	*	*	B
500*400	1818147	68,70	380	*	*	B
500*450	1818148	64,40	400	*	*	B
560*450	1818150	74,00	420	*	*	B
560*500	1818151	75,00	430	*	*	B
630*560	1818191	102,60	440	*	*	B
710*630	1818154	152,00	470	*	*	B
800*630	1818155	171,90	470	*	*	B
800*710	1818156	170,00	480	*	*	B
900*710	1818157	232,40	500	*	*	B
900*800	1818158	270,00	500	*	*	B
1000*800	1818192	247,10	520	*	*	B
1000*900	1818193	288,70	520	*	*	B
1200*1000	1818194	271,90	520	*	*	B
1400*1200	1818195	301,80	520	*	*	B

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

EF-METRIC EF-METRİK



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	1818196	0,19	70	40*30*30	48
110*75	1818176	0,39	90	60*40*30	35

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

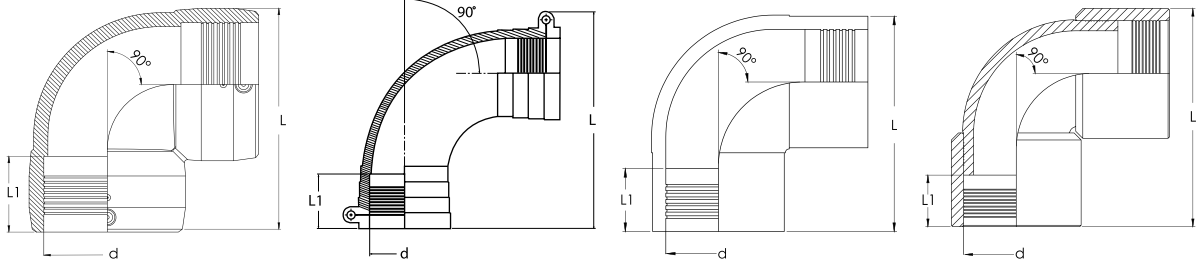
TEKNİK
TECHNICAL

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	1819009	0,08	98	38	30*40*15	60	B
25	1819010	0,05	98	38	30*40*15	50	A
32	1819011	0,09	109	41	30*40*30	60	B
40	1819013	0,18	131	47	30*40*30	35	B
50	1819015	0,27	155	51	30*40*30	20	B
63	1819017	0,50	189	48	60*40*30	25	A
75	1819019	0,74	211	65	60*40*30	15	B
90	1819021	1,16	242	70	60*40*45	15	A
110	1819023	1,29	274	76	60*40*45	10	A
125	1819025	2,86	297	82	60*40*30	4	A
140	1819192	3,00	300	95	60*40*30	4	C
160	1819029	3,63	293	98	60*40*45	4	C
180	1819031	6,50	335	110	60*40*45	2	C
200	1819033	9,30	400	120	60*40*30	1	C
225	1819035	14	460	110	60*33*60	1	D
250	1819037	23	450	130	*	1	C
315	1819039	35	540	115	*	1	D

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

EF-METRIC EF-METRİK

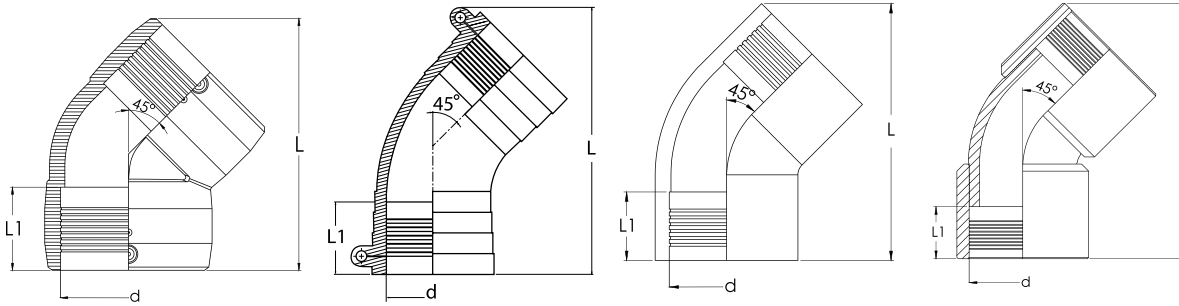


EF ELBOW 45° / EF DİRSEK 45°

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	1819061	0,06	106	38	40*30*15	80	B
32	1819062	0,05	116	41	40*30*30	80	B
40	1819064	0,13	139	47	40*30*30	55	B
50	1819066	0,23	166	51	40*30*30	32	B
63	1819182	0,40	197	58	40*30*30	25	A
75	1819070	0,58	216	66	60*40*30	20	B
90	1819072	0,94	242	72	60*40*30	15	A
110	1819074	1,01	268	76	60*40*45	14	A
125	1819076	2,59	302	82	60*40*30	4	A
140	1819078	2,80	302	75	60*40*30	4	C
160	1819079	3,00	300	70	60*40*45	4	C
180	1819082	4,90	325	80	60*40*45	1	C
200	1819084	8,50	325	80	60*40*30	1	C
225	1819086	11,50	570	110	60*60*33	1	D
250	1819088	21,00	650	110	*		C
315	181990	34,20	750	115	*		D

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

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

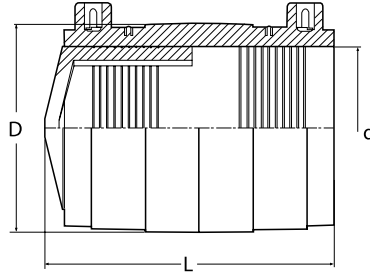
TEKNİK
TECHNICAL

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	1822025	0,05	33	68	30*40*15	100
25	1822026	0,07	41	82	30*40*15	80
32	1822028	0,09	48	89	30*40*30	60
40	1822029	0,12	55	97	30*40*30	50
50	1822032	0,19	67	110	30*40*30	40
63	1822074	0,30	80	134	30*40*30	30
75	1822071	0,49	97	145	30*40*30	24
90	1822037	0,78	115	163	60*40*30	24
110	1822072	1,29	142	198	60*40*30	20
125	1822042	1,39	159	185	60*40*45	16
140	1822044	2,03	180	192	60*40*45	12
160	1822046	2,72	204	210	60*40*45	12
180	1822048	3,71	232	221	60*40*45	8
200	1822051	4,38	247	224	60*40*45	6
225	1822054	6,00	277	270	60*40*30	2
250	1822055	8,20	310	290	60*40*45	2
280	1822056	10,05	345	300	60*40*45	2
315	1822057	19,10	390	290	60*40*45	2
355	1822058	22,00	440	300	*	*
400	1822059	29,36	495	350	*	*
450	1822075	36,51	554	370	*	*
500	1822076	51,66	615	415	*	*
560	1822077	73,36	690	460	*	*
630	1822078	92,90	775	480	*	*
710	1822079	130,70	880	505	*	*

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

EF-METRIC EF-METRİK

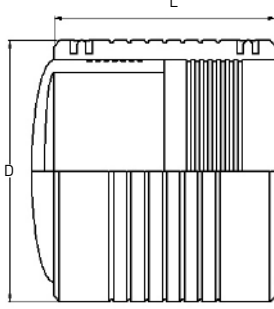


EF END CAP / EF KEP

SDR 17 PE100

GAS / GAZ : 6 BAR

WATER / SU : 10 BAR



d	CODE	Kg.	D(mm)	L(mm)	box sizes	nos/box
200	1822018	4,66	245	220	60*40*45	6
225	1822080	6,24	260	230	60*40*30	2
250	1822019	8,10	285	240	60*40*45	2
280	1822081	11,20	325	240	60*40*45	2
315	1822020	15,05	360	345	60*40*45	2
355	1822021	15,60	440	300	60*40*45	2
400	1822022	21,10	495	350	*	*
450	1822023	29,45	554	370	*	*
500	1822082	38,80	615	415	*	*
560	1822083	54,65	690	460	*	*
630	1822024	73,50	775	480	*	*
710	1822084	101,50	880	505	*	*

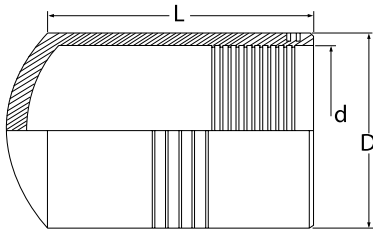
*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. *No box is used. (Only Euro pallets are being used.)*

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	1822039	1,39	140	97	60*40*30	16
160	1822047	2,89	200	115	60*40*30	12
200	1822051	4,85	250	140	60*40*30	4
250	1822055	6,10	315	170	60*40*30	2
315	1822057	10,80	400	220	*	*
400	1822059	16,90	500	230	*	*
500	1822085	32,50	630	280	*	*
560	1822086	42,70	710	270	*	*

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

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

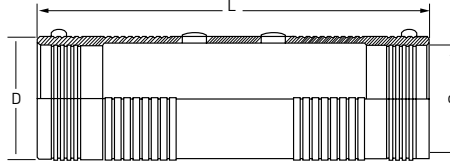
AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

EF COUPLER FOR PRE-INSULATED PE PIPING SYSTEM İZOLASYONLU PE BORU EF MANŞON



d	CODE	Kg.	D (mm)	L(mm)
90	1800267	1,09	100	560
110	1800268	1,41	123	560
125	1800269	1,74	138	560
140	1800270	2,27	153	560
160	1800271	2,87	173	560
180	1800272	3,57	197	560
200	1800273	4,52	220	560
225	1800274	5,54	244	560
250	1800275	6,95	273	560
280	1800276	8,80	300	560
315	1800277	11,19	345	560
355	1800278	14,11	390	560
400	1800279	17,94	435	560
450	1800280	22,13	490	560
500	1800393	27,72	545	560
560	1800394	35,13	610	560
630	1800395	44,55	685	560
710	1800396	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)



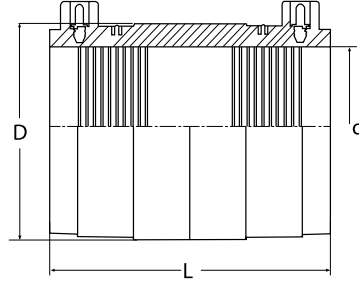
EF-METRIC EF-METRIK



PP EF COUPLER / PP EF MANŞON

SDR 26

WATER / SU : 6 BAR



d	CODE	Kg.	D (mm)	L (mm)	box sizes	nos/box
110	1800005	0,33	128	110	60*40*30	24
160	1800009	0,80	175	160	60*40*45	12
200	1800013	1,16	220	165	60*40*45	8
250	1800016	1,68	275	165	60*40*30	4
315	1800019	2,63	345	165	60*40*45	3
400	1800022	5,80	440	225	60*60*33	1
500	1800025	9,40	555	225	*	*
630	1800029	19,70	690	330	*	*

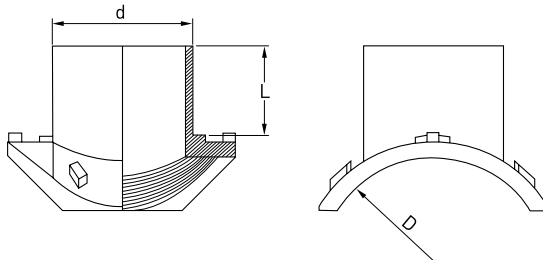
*Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. No box is used. (Only Euro pallets are being used.)



PP EF SADDLE/ PP EF SEMER

SDR 26

WATER / SU : 6 BAR



D/d	CODE	Kg.	L(mm)	box sizes	nos/box
200/160	1809594	1,28	150	60x40x45	3
250/160	1809595	1,45	150	60x40x45	3
280/160	1809954	1,46	150	60x40x45	3
315/160	1809597	1,48	150	60x40x45	3
400/160	1809599	1,53	150	60x40x45	3
500/160	1810028	1,6	150	60x40x45	3

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

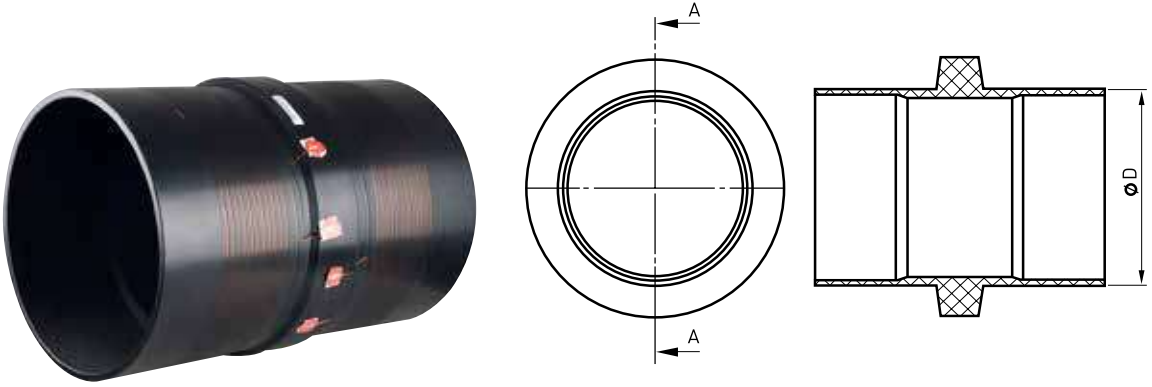
AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

TWIN INNER COUPLER İKİZ İÇ MANŞON PE100



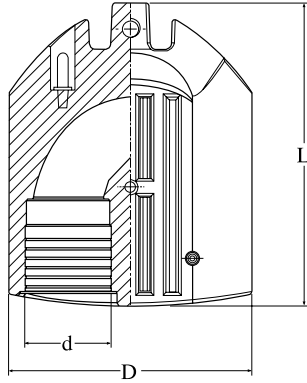
- Talebe bağlı olarak D160 - D1600 aralığında üretilmektedir.
- Available on request all the size from D160 to D1600.



EF-METRIC EF-METRİK



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



d	CODE	D (mm)	L (mm)	box sizes	nos/box
32	1800285	90	110	30*40*15	25

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

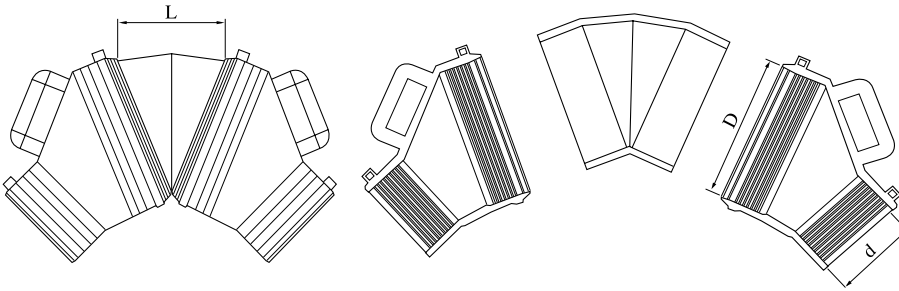
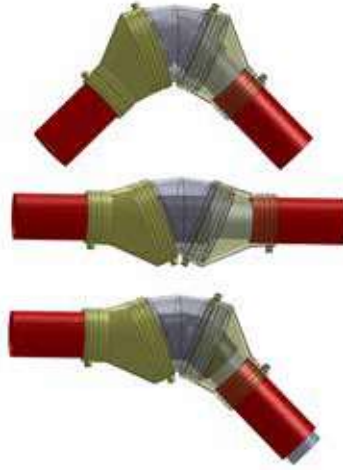
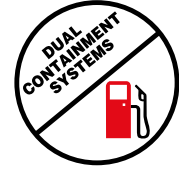
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



EF-METRIC EF-METRIK

**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	1825000	110,7	185,1	178	2,81	60*40*30	2

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

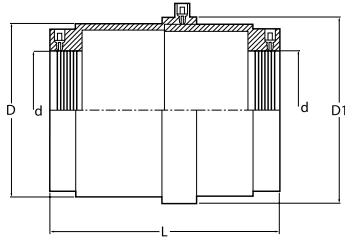
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

EF-METRIC EF-METRİK



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	1800295	For 110x90 dual containment pipe	1,45	160	180	225	60*40*30	6

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

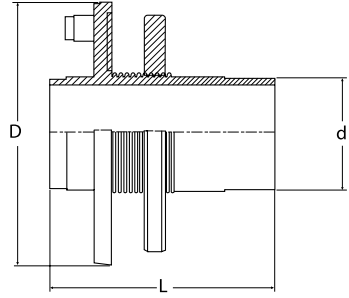
AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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

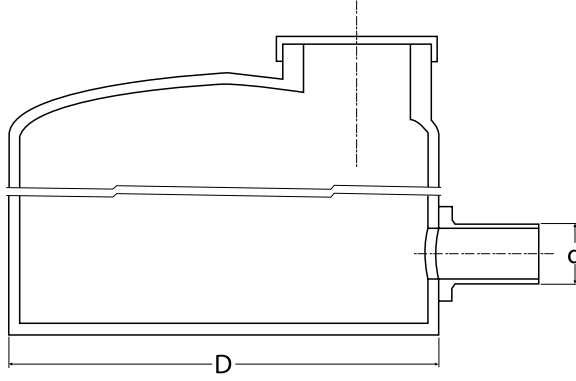


d1	CODE	Kg.	D(mm)	L (mm)	box sizes	nos/box
63	2400032	0,61	163	153	60*40*30	15
75	2400004	0,66	174	153	60*40*30	15
110	2400033	0,79	210	153	60*40*30	12

EF-METRIC EF-METRİK



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



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-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

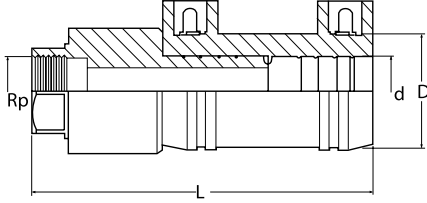
AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

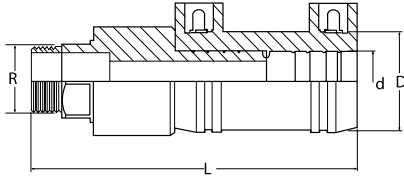
TEKNİK
TECHNICAL

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



d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	1823000	0,12	108	33	40*30*15	75
25-3/4"	1823002	0,17	114	41	40*30*15	50
32 - 1"	1823003	0,26	130	48	40*30*30	60
40 - 1 1/4"	1823006	0,32	140	55	40*30*30	40
50 - 1 1/2"	1823007	0,47	155	67	40*30*30	30
63 - 2"	1823010	0,77	172	80	40*30*30	18

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



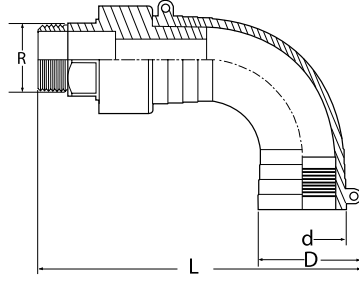
d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	1823014	0,14	122	33	40*30*15	75
20-3/4"	1823076	0,14	122	33	40*30*15	75
25-3/4"	1823015	0,19	128	41	40*30*15	50
32 - 3/4"	1823077	0,32	150	48	40*30*30	60
32 - 1/2"	1823078	0,32	150	48	40*30*30	60
32 - 1"	1823017	0,32	150	48	40*30*30	60
32 - 1 1/4"	1823016	0,32	150	48	40*30*30	60
40 - 1 1/4"	1823018	0,44	160	55	40*30*30	40
50 - 1 1/2"	1823019	0,56	175	67	40*30*30	30
63 - 2"	1823023	0,75	200	80	40*30*30	18
75 - 2 1/2"	1823025	2,48	195	97	40*30*30	16 *
90 - 3"	1823024	1,85	225	115	60*40*30	15
110 - 4"	1823070	2,82	244	132	60*40*30	15

* Steel / Çelik

EF-METRIC EF-METRİK



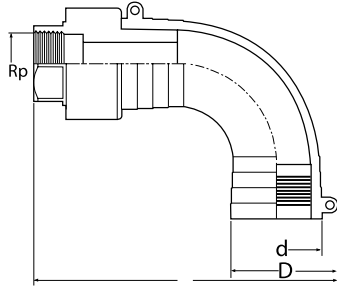
PE-BRASS TRANSITION ELBOW (90°) (MALE) PE-PİRİNÇ GEÇİŞ DİRSEĞİ (90°) (ERKEK) TYPE / TİP: EF



d-R	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	1823027	0,18	155	36	40*30*30	60
20-3/4"	1823089	0,18	155	36	40*30*30	60
25-3/4"	1823028	0,18	155	37	40*30*30	60
32 - 1"	1823029	0,32	180	44	40*30*30	40
32 - 3/4"	1823069	0,32	180	44	40*30*30	40
32 - 1/2"	1823090	0,32	180	44	40*30*30	40
40 - 1 1/4"	1823030	0,53	200	54	40*30*30	24
50 - 1 1/2"	1823031	0,70	230	67	40*30*30	20
63 - 2"	1823032	1,07	270	84	40*30*30	10
75 - 2 1/2"	1823033	2,98	270	100	40*30*30	6 *
90 - 3"	1823034	2,31	295	120	60*40*45	8
110 - 4"	1823091	3,42	307	138	60*40*45	8

* Steel / Çelik

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



d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	1823035	0,16	135	36	40*30*30	60
25-3/4"	1823036	0,18	135	37	40*30*30	60
32 - 1"	1823037	0,28	155	44	40*30*30	40
40 - 1 1/4"	1823039	0,41	180	54	40*30*30	24
50 - 1 1/2"	1823040	0,59	210	67	40*30*30	20
63 - 2"	1823041	1,07	245	84	40*30*30	10

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

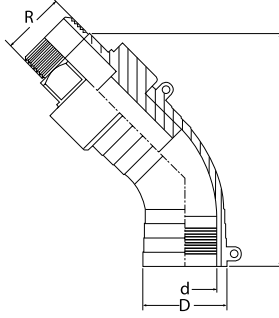
AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

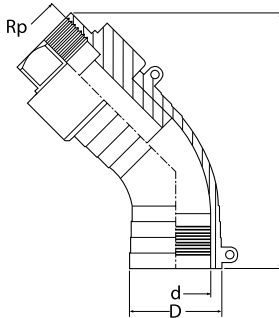
PE-BRASS TRANSITION ELBOW (45°) (MALE)
PE-PİRİNÇ GEÇİŞ DİRSEĞİ (45°) ERKEK)
TYPE / TİP: EF



d-R	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20 - 1/2"	1823093	0,19	140	37	40*30*30	60
20-3/4"	1823081	0,19	140	37	40*30*30	60
25-3/4"	1823044	0,19	140	37	40*30*30	60
32 - 1"	1823045	0,32	185	43	40*30*30	40
32 - 3/4"	1823082	0,32	185	43	40*30*30	40
32 - 1/2"	1823083	0,32	185	43	40*30*30	40
40 - 1 1/4"	1823046	0,48	205	53	40*30*30	30
50 - 1 1/2"	1823047	0,66	240	66	40*30*30	20
63 - 2"	1823048	0,97	295	83	40*30*30	10
75 - 2 1/2"	1823049	2,77	270	100	40*30*30	8 *
90 - 3"	1823050	2,14	300	120	60*40*30	8
110- 4"	1823092	3,65	281	138	60*40*30	8

* Steel / Çelik

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

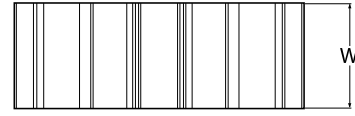
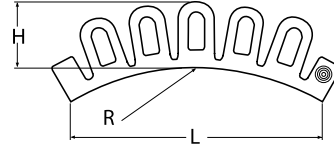


d-Rp	CODE	Kg.	L(mm)	D (mm)	box sizes	nos/box
20-1/2"	1823084	0,14	155	37	40*30*30	60
25-3/4"	1823085	0,17	155	37	40*30*30	60
32 - 1"	1823043	0,26	160	43	40*30*30	40
40 - 1 1/4"	1823086	0,36	190	53	40*30*30	30
50 - 1 1/2"	1823087	0,55	220	66	40*30*30	20
63 - 2"	1823088	0,97	275	83	40*30*30	10

EF-METRIC EF-METRİK



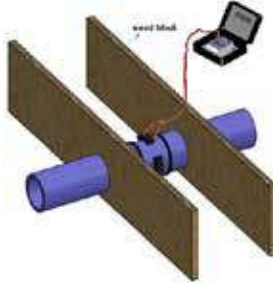
EF FLEX RESTRAINT PE100



Main Pipe size/ Boru çapı (R)	CODE	L	H	W
160-1600	1825008	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

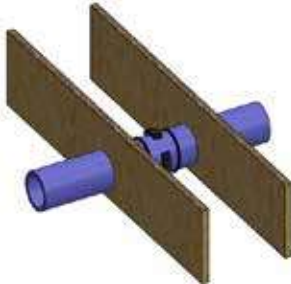


- Isıl genişmeden dolayı, PE boru hareket eder ve boru - beton arasında boşluk oluşur.
- Because of the thermal expansion, PE pipe moves each side and a gap occurs between pipe and concrete.

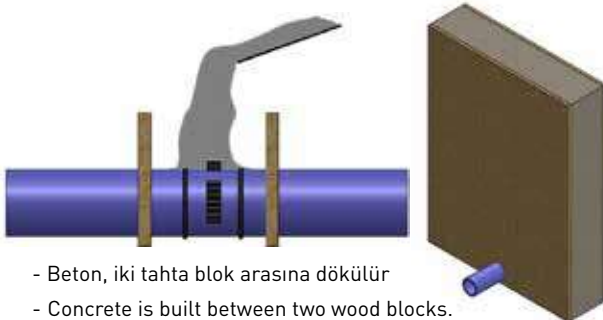
EF FLEX RESTRAINT'ler boruya kaynatılır.
EF FLEX RESTRAINTs are welded to the pipe.



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 ayrılır.
- 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-METRİK
EF-METRİK

SPİGOT-METRİK
SPİGOT-METRİK

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRİK

EF-İPS
EF-İPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

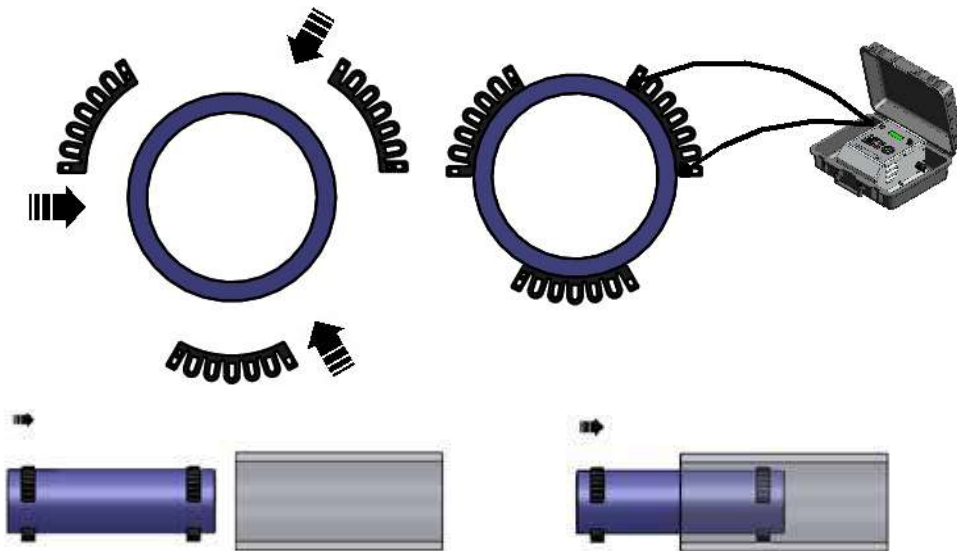
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

- Beton duvar geçişlerinde kritik kuvvet, borudaki ısıl genişlemenin neden olduğu aksel yüküdür.
- Tega Flex parçalarının herbiri 42,3 kN'a kadar aksel (yanal) 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 Restrain 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



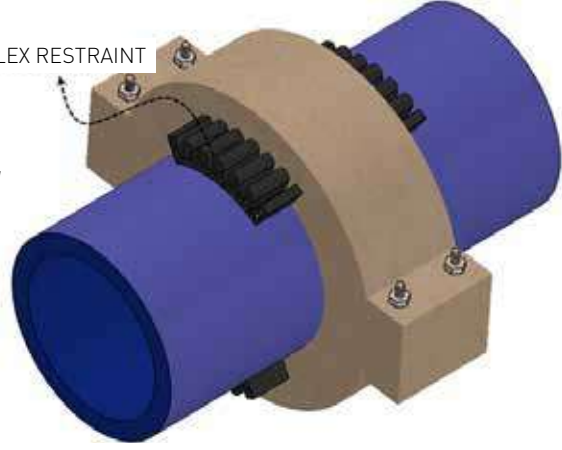
Flex parçalar, aynı zamanda birbirinin içerisine sokularak boruların merkezlenmesi içinde kullanılabilirler.
Flex restraints also can be used for centering and easy sliding of a PE pipe in another pipe.



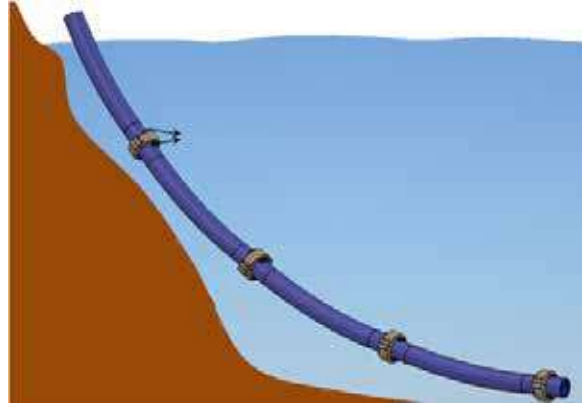
Kaymayı önlemek için, bloklar boruya sabitlenmelidir.
To prevent slipping, blocks must be fixed to the pipe.

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

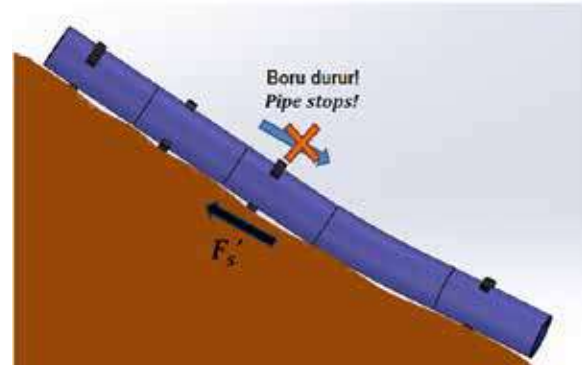
EF FLEX RESTRAINT



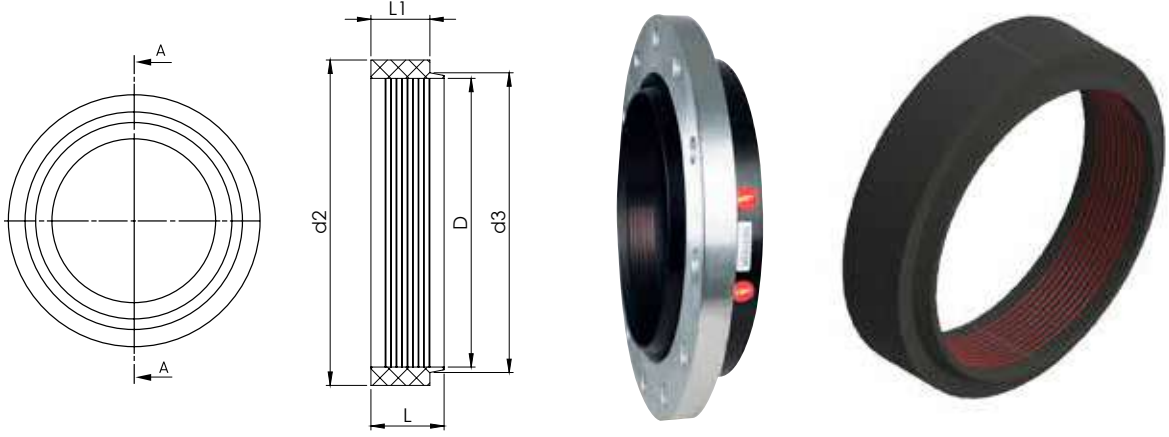
Kurşun veya baskı blokları artık kayma yapmaz
Sinkers or thrust blocks do not slip anymore



Boru kaymasını önleme
Prevents slipping pipes



EF FLANGE ADAPTOR PE100 EF FLANŞ ADAPTÖRÜ PE100



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



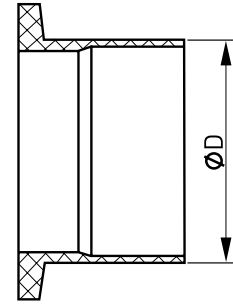
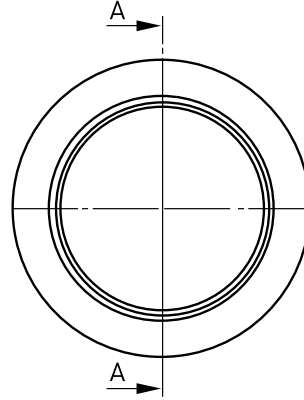
CODE	D	d2	d3	L1	L
1824027	110	158	125	77	102
1804028	125	158	132	77	102
1784029	140	188	155	85	110
1764030	160	212	175	85	110
1824046	180	212	185	85	110
1764031	200	268	232	85	120
1764032	225	268	235	95	120
1764033	250	320	285	95	120
1764034	280	320	291	95	120
1764035	315	370	335	95	135
1764036	355	430	373	110	150
1764037	400	482	427	120	160
1764038	450	585	514	130	170
1764040	500	585	530	140	180
1824047	560	685	615	145	180
1824048	630	685	642	145	180
1824049	710	800	737	145	180
1824050	800	905	840	145	180
1824051	900	1005	944	145	180
1824052	1000	1110	1047	145	180
1824053	1200	1330	1245	145	180



EF-METRIC EF-METRİK



EF INNER FLANGE ADAPTOR PE100 EF İÇ FLANŞ ADAPTÖRÜ PE100



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



EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

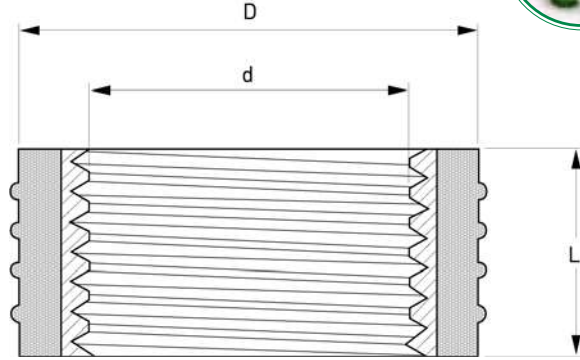
MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

EF-METRIC EF-METRİK

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

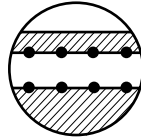
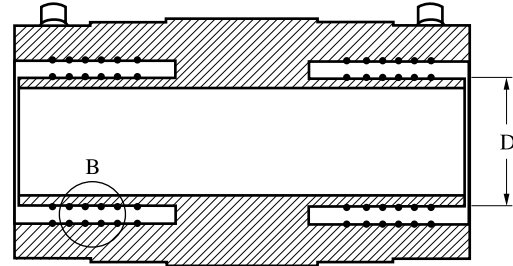
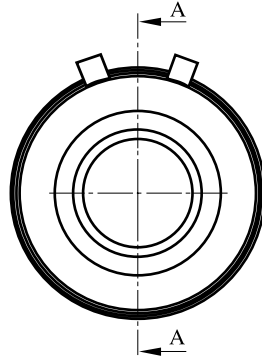


part of PE	Threaded Size
Available on request	1"
Available on request	2"
Available on request	3"
Available on request	4"
Available on request	6"

EF-METRIC EF-METRİK



HIGH PRESSURE (SANDWICH) EF COUPLER PE100 YÜKSEK BASINÇLI EF MANŞON PE100 UP TO 100 BAR



DETAY B

- Tega yüksek basınçlı manşon üretme teknolojisine sahiptir.
- 100 bar (1450 psi) basınç testleri kendi laboratuvarlarında yapılmıştır.
- Tega has the technological ability to produce High Pressure couplers for PE pipes which has composit layer in it.
- Pressure tests up to 100 bar (1450 psi) has been completed succesfully.

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

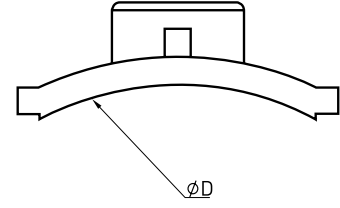
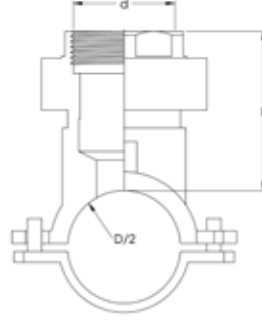
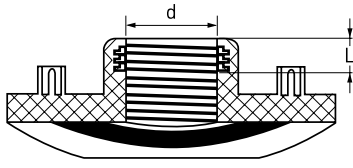
TEKNİK
TECHNICAL

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"	1811781	12	0.50	30*40*30	12	B
63	3/4"	1811782	12	0.73	30*40*30	12	B
75	3/4"	1811783	12	0.69	30*40*30	12	B
90	3/4"	1811784	12	0.65	30*40*30	12	A
110	3/4"	1811785	12	0.71	30*40*30	12	A
125	3/4"	1811786	12	0.71	30*40*30	12	A
140	3/4"	1811787	12	0.93	30*40*30	12	A
160	3/4"	1811788	12	0.93	30*40*30	12	A
180	3/4"	1811789	12	0.93	30*40*30	12	A
200	3/4"	1811790	12	0.93	30*40*30	12	A
225	3/4"	1811791	12	0.93	30*40*30	12	A
250	3/4"	1811792	12	0.63	30*40*30	12	C
280	3/4"	1811793	12	0.63	30*40*30	12	C
315	3/4"	1811794	12	0.62	30*40*30	12	C
355	3/4"	1811795	12	0.62	30*40*30	12	C
400	3/4"	1811796	12	0.62	30*40*30	12	C
450	3/4"	1811797	12	0.61	30*40*30	12	C
500	3/4"	1811798	12	0.61	30*40*30	12	C
560	3/4"	1811799	12	0.61	30*40*30	12	C
630	3/4"	1811800	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"	1811801	12	0.60	30*40*30	12	C
63	1"	1811802	12	0.75	30*40*30	12	B
75	1"	1811803	12	0.71	30*40*30	12	B
90	1"	1811804	12	0.67	30*40*30	12	A
110	1"	1811805	12	0.73	30*40*30	12	A
125	1"	1811806	12	0.73	30*40*30	12	A
140	1"	1811807	12	0.95	30*40*30	12	A
160	1"	1811808	12	0.95	30*40*30	12	A
180	1"	1811809	12	0.95	30*40*30	12	A
200	1"	1811810	12	0.95	30*40*30	12	A
225	1"	1811811	12	0.95	30*40*30	12	A
250	1"	1811812	12	0.64	30*40*30	12	C
280	1"	1811813	12	0.64	30*40*30	12	C
315	1"	1811814	12	0.63	30*40*30	12	C
355	1"	1811815	12	0.63	30*40*30	12	C
400	1"	1811816	12	0.63	30*40*30	12	C
450	1"	1811817	12	0.62	30*40*30	12	C
500	1"	1811818	12	0.62	30*40*30	12	C
560	1"	1811819	12	0.62	30*40*30	12	C
630	1"	1811820	12	0.61	30*40*30	12	C
710	1"	1811821	12	0.61	30*40*30	12	C
63	2"	1811712	20	1.12	30*40*30	12	B
75	2"	1811713	20	1.08	30*40*30	12	B
90	2"	1811714	20	1.04	30*40*30	12	B
110	2"	1811715	20	1.1	30*40*30	12	B
125	2"	1811716	20	1.1	30*40*30	12	B
140	2"	1811717	20	1.32	30*40*30	12	B
160	2"	1811718	20	1.32	30*40*30	12	B
180	2"	1811719	20	1.32	30*40*30	12	B
200	2"	1811720	20	1.32	30*40*30	12	B
225	2"	1811721	20	1.32	30*40*30	12	B
250	2"	1811722	20	0.77	30*40*30	12	C
280	2"	1811723	20	0.77	30*40*30	12	C
315	2"	1811724	20	0.76	30*40*30	12	C
355	2"	1811725	20	0.76	30*40*30	12	C
400	2"	1811726	20	0.76	30*40*30	12	C
450	2"	1811727	20	0.75	30*40*30	12	C
500	2"	1811728	20	0.75	30*40*30	12	C
560	2"	1811729	20	0.75	30*40*30	12	C
630	2"	1811730	20	0.74	30*40*30	12	C
710	2"	1811731	20	0.74	30*40*30	12	C

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-T00L

MONTAJ
INSTALLATION

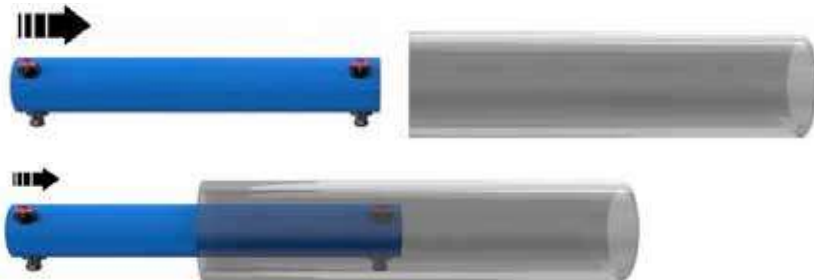
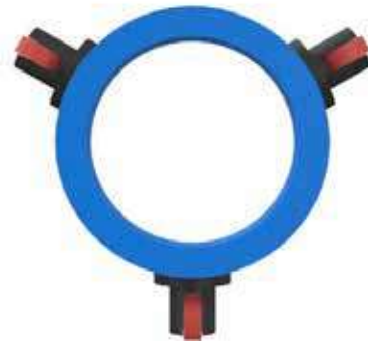
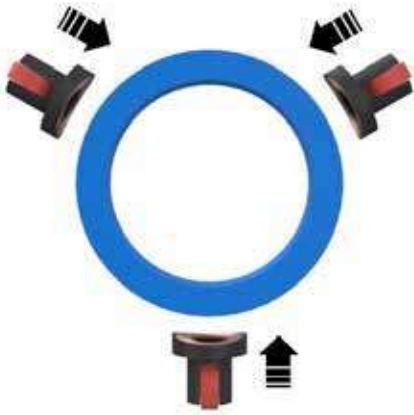
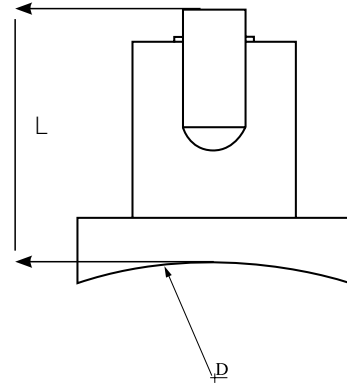
TEKNİK
TECHNICAL

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 change on demand.

SPIGOT-GEÇİŞ ÜRÜNLERİ

SPIGOT-TRANSITION PRODUCTS



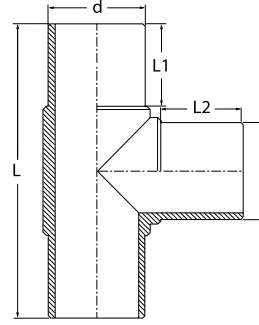
EQUAL TEE / EŞİT TE

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	2000012	0,32	218	64	40*30*30	16
75	2000013	0,80	275	76	60*40*30	16
90	2000014	0,70	275	76	60*40*30	15
110	2000015	1,30	340	85	60*40*45	12
125	2000018	1,45	360	90	60*40*30	4
140	2000019	2,10	396	100	60*40*30	4
160	2000020	3,75	560	107	60*40*30	4
180	2000022	5,60	565	127	60*40*45	2
200	2000023	5,40	500	120	60*40*45	2
225	2000025	7,40	540	130	60*40*30	1
250	2000026	11,80	602	140	60*60*33	1
280	2000028	18,80	630	185	**	
315	2000029	23,00	760	160	**	

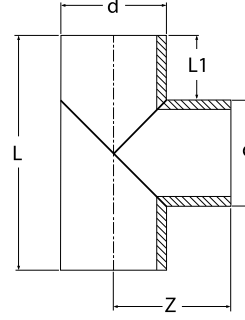
[**] : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. No box is used. (Only Euro pallets are being used.)

SPIGOT-METRIC SPIGOT-METRİK



EQUAL TEE SEGMENTED EŞİT TE KONFEKSİYON

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



d	CODE	Kg.	L (mm)	L1 (mm)	Z (mm)	nos/box
355	2000138	32	960	300	480	**
400	2000139	42	1000	300	500	**
450	2000140	56	1050	300	525	**
500	2000141	79	1200	350	600	**
560	2000142	104	1260	350	630	**
630	2000143	139	1330	350	665	**
710	2000144	194	1410	350	705	**
800	2000145	252	1500	350	750	**
900	2000146	352	1800	450	900	**
1000	2000147	437	2000	480	980	**

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



SPIGOT-METRIC SPIGOT-METRİK

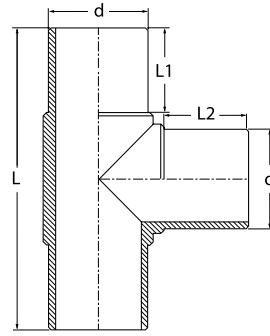
EQUAL TEE (SHORT) / EŞİT TE (KISA)

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	2000035	1,0	320	80	60*40*45	12
125	2000036	1,2	335	80	60*40*30	6
140	2000044	1,9	350	80	60*40*30	4
160	2000037	3,5	370	80	60*40*45	3
180	2000038	5,0	390	80	60*40*45	2
200	2000039	5,1	410	80	60*40*45	2
225	2000040	6,9	435	80	60*40*30	1
250	2000041	11,1	460	80	60*40*30	1
280	2000042	21,1	600	150	*	*
315	2000043	24,4	710	160	*	*

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

SPIGOT-METRIC SPIGOT-METRİK



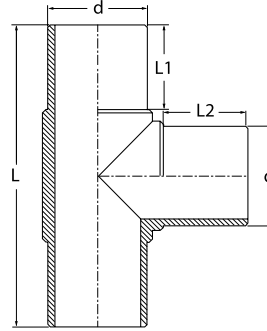
EQUAL TEE / EŞİT TE

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	2000056	0,22	178	58	40*30*30	50
40	2000057	0,22	178	58	40*30*30	50
50	2000058	0,22	188	60	40*30*30	30
63	2000060	0,39	218	64	40*30*30	16
75	2000063	1,01	275	76	60*40*30	16
90	2000064	0,89	275	76	60*40*30	15
110	2000067	1,80	340	85	60*40*45	12
125	2000069	2,17	360	90	60*40*30	4
140	2000072	3,01	396	100	60*40*30	4
160	2000073	4,99	560	107	60*40*45	3
180	2000076	7,00	565	127	60*40*45	2
200	2000078	7,60	500	120	60*40*45	2
225	2000080	10,00	540	130	60*40*30	1
250	2000082	14,20	602	140	60*60*33	1
280	2000084	23,00	630	185	**	1
315	2000086	27,00	670	270	**	1

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

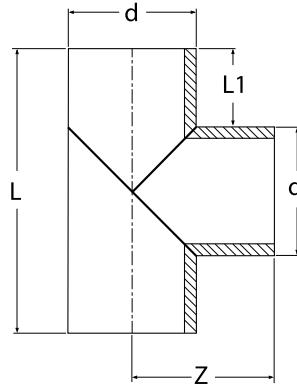
MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	2000158	47	960	300	480
400	2000159	62	1000	300	500
450	2000160	83	1050	300	525
500	2000161	116	1200	350	600
560	2000162	153	1260	350	630
630	2000163	204	1330	350	665
710	2000164	286	1410	350	705
800	2000165	305	1500	350	750

SPIGOT-METRIC SPIGOT-METRİK



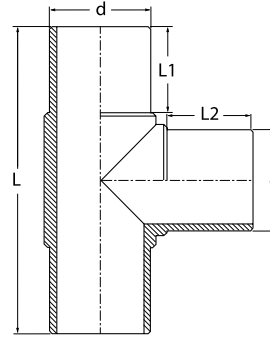
EQUAL TEE (SHORT) / EŞİT TE (KISA)

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	2000092	1,60	320	80	60*40*45	12
125	2000197	1,90	335	80	60*40*30	6
140	2000093	2,70	350	80	60*40*30	4
160	2000094	4,00	370	80	60*40*45	3
180	2000095	5,80	390	80	60*40*45	2
200	2000096	7,00	410	80	60*40*45	2
225	2000097	9,20	435	80	60*40*30	1
250	2000098	13,70	460	80	60*40*30	1
280	2000198	24,25	600	150	*	*
315	2000099	26,65	710	160	*	*

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

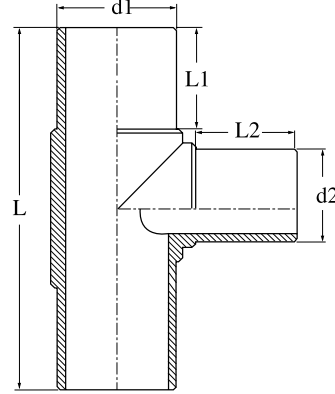
REDUCED TEE / İNEĞAL TE

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	2001091	1,23	340	95	65	60*40*45	12	*
110*90	2001093	1,30	340	95	75	60*40*45	12	*
125*90	2001097	1,60	360	95	85	60*40*45	9	*
125*110	2001098	1,75	360	95	90	60*40*45	9	*
140*90	2001103	2,25	400	100	95	60*40*30	4	*
140*110	2001104	2,00	400	100	100	60*40*30	4	*
140*125	2001099	2,45	400	120	90	60*40*30	4	*
160*90	2001111	3,75	560	150	90	60*40*30	2	*
160*110	2001112	3,60	560	150	95	60*40*30	2	*
160*125	2001105	3,95	560	150	95	60*40*30	2	*
160*140	2001107	3,60	415	100	110	60*40*30	2	**
180*90	2001119	5,00	560	145	90	60*40*30	2	*
180*110	2001120	5,00	560	145	80	60*40*30	2	*
180*125	2001113	5,30	560	145	90	60*40*30	2	*
180*140	2001114	4,10	430	105	110	60*40*30	2	**
180*160	2001116	5,80	470	105	140	60*40*30	2	**
200*90	2001128	4,58	500	120	90	60*40*45	3	*
200*110	2001129	4,65	500	120	90	60*40*45	3	*
200*125	2001121	5,10	430	115	90	60*40*30	2	**
200*140	2001122	5,95	470	140	110	60*40*30	2	*
200*160	2001124	5,40	515	140	140	60*40*30	2	*
200*180	2001127	7,40	485	115	140	60*40*30	2	**
225*90	2001140	6,95	540	130	85	60*40*45	2	*
225*110	2001141	7,18	540	130	90	60*40*45	2	*
225*125	2001130	7,30	540	130	95	60*40*45	2	*
225*140	2001133	6,30	460	120	110	60*40*45	2	**
225*160	2001136	7,45	540	130	110	60*40*45	2	*
225*180	2001139	7,65	530	130	115	60*40*45	2	*
250*90	2001151	10,00	600	140	100	60*40*30	1	*
250*110	2001152	5,78	460	155	110	60*40*30	1	*
250*125	2001143	7,30	470	130	90	60*40*30	1	**
250*140	2001145	10,40	510	140	110	60*40*30	1	*

REDUCED TEE / INEGAL TE
 SDR17 PE100
 GAS/GAZ: 6 BAR
 WATER/SU: 10 BAR
 TYPE/TIP: SPIGOT



d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box	
250*160	2001147	9,40	520	130	140	60*40*30	1	**
250*180	2001150	9,70	525	130	150	60*40*45	1	**
250*200	2001154	10,80	600	140	130	60*40*45	1	*
250*225	2001144	10,60	575	130	150	60*40*45	1	**
280*63	2001144	5,90	430	140	85	60*40*45	1	**
280*90	2001163	7,10	440	140	90	60*40*30	1	**
280*110	2001164	8,80	490	140	110	60*40*30	1	**
280*125	2001155	8,90	490	140	90	60*40*30	1	**
280*140	2001157	9,20	505	140	110	60*60*33	1	**
280*160	2001159	11,20	545	140	140	***		**
280*180	2001162	11,40	545	140	150	***		**
280*200	2001165	12,70	595	140	130	***		**
280*225	2001156	12,50	595	140	150	***		**
315*90	2001176	9,20	465	150	90	***		**
315*110	2001177	10,90	510	150	110	***		**
315*125	2001166	11,00	510	150	90	***		**
315*140	2001168	15,50	525	150	110	***		*
315*160	2001171	13,50	565	150	140	***		**
315*180	2001174	13,90	570	150	150	***		**
315*200	2001178	14,80	615	150	130	***		*
315*225	2001167	15,00	615	150	150	***		**
315*250	2001169	18,30	655	150	145	***		*
315*280	2001175	20,60	740	150	185	***		**
355*90	2001188	12,00	495	165	90	***		**
355*110	2001189	14,00	540	165	110	***		**
355*125	2001179	14,10	540	165	90	***		**
355*140	2001181	14,50	555	165	110	***		**
355*160	2001184	16,90	595	165	140	***		**
355*180	2001186	17,10	595	165	150	***		**
355*200	2001190	18,80	645	165	130	***		**
355*225	2001180	18,60	645	165	150	***		**
355*250	2001182	22,10	685	165	145	***		**
355*280	2001187	24,80	770	165	185	***		**
355*315	2001191	46,70	820	165	165	***		**
400*90	2001200	15,80	525	180	90	***		**
400*110	2001201	18,00	570	180	110	***		**
400*125	2001192	18,10	570	180	90	***		**
400*140	2001194	18,60	585	180	110	***		**
400*160	2001197	21,20	625	180	140	***		**
400*180	2001198	21,50	625	180	150	***		**
400*200	2001202	23,50	675	180	130	***		**
400*225	2001193	23,30	675	180	150	***		**
400*250	2001195	27,00	715	180	145	***		**
400*280	2001199	30,20	800	180	185	***		**
400*315	2001203	52,40	850	180	165	***		**
400*355	2001947	-	-	-	-	***		**
450*90	2001196	20,80	555	195	90	***		**
450*110	2001214	23,40	600	195	110	***		**
450*125	2001204	23,50	600	195	90	***		**
450*140	2001206	24,10	615	195	110	***		**
450*160	2001210	27,00	655	195	140	***		**

EF-METRIK

SPIGOT-METRIK

AKIS KONTROL-METRIK

EF-IPS

AKIS KONTROL-IPS

MAKINE-APARATLAR

MONTAJ

TEKNİK



SPIGOT-METRIC SPIGOT-METRİK

d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box
450*180	2001211	27,20	655	195	150	***	**
450*200	2001215	29,60	705	195	130	***	**
450*225	2001205	29,40	705	195	150	***	**
450*250	2001207	33,40	745	195	145	***	**
450*280	2001212	37,20	830	195	185	***	**
450*315	2001216	59,80	880	195	165	***	**
450*355	2001950	-	-	-	-	***	**
450*400	2001951	-	-	-	-	***	**
500*90	2001227	27,20	595	215	90	***	**
500*110	2001228	30,10	640	215	110	***	**
500*125	2001218	30,20	640	215	90	***	**
500*140	2001220	31,00	655	215	110	***	**
500*160	2001224	34,20	695	215	140	***	**
500*180	2001225	34,50	695	215	150	***	**
500*200	2001229	37,30	745	215	130	***	**
500*225	2001219	37,10	745	215	150	***	**
500*250	2001221	41,40	785	215	145	***	**
500*280	2001226	46,00	870	215	185	***	**
500*315	2001230	-	-	-	-	***	**
500*355	2002345	-	-	-	-	***	**
500*400	2001957	-	-	-	-	***	**
500*450	2002346	-	-	-	-	***	**
560*90	2001241	36,00	635	235	90	***	**
560*110	2001242	39,40	680	235	110	***	**
560*125	2001232	39,50	680	235	90	***	**
560*140	2001234	40,50	695	235	110	***	**
560*160	2001238	44,10	735	235	140	***	**
560*180	2001239	44,40	735	235	150	***	**
560*200	2001243	47,70	785	235	130	***	**
560*225	2001233	47,50	785	235	150	***	**
560*250	2001235	52,30	825	235	145	***	**
560*280	2001240	57,80	910	235	188	***	**
560*315	2001244	81,30	960	235	165	***	**
560*355	2001960	-	-	-	-	***	**
560*400	2001961	-	-	-	-	***	**
560*450	2001962	-	-	-	-	***	**
560*500	2002347	-	-	-	-	***	**
630*90	2001258	48,10	675	255	90	***	**
630*110	2001259	52,20	720	255	110	***	**
630*125	2001247	52,30	720	255	90	***	**
630*140	2001249	53,50	735	255	110	***	**
630*160	2001253	57,70	775	255	140	***	**

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

REDUCED TEE / INEGAL TE
SDR17 PE 100
GAS/GAZ : 6 BAR
WATER/SU : 10 BAR
TYPE/TIP : SPIGOT



d1*d2	CODE	Kg.	L (mm)	L1 (mm)	L2(mm)	box sizes	nos/box
630*180	2001256	58,00	775	255	150	***	**
630*200	2001260	62,00	825	255	130	***	**
630*225	2001248	61,80	825	255	150	***	**
630*250	2001250	67,20	865	255	145	***	**
630*280	2001257	73,90	950	255	185	***	**
630*315	2001261	98,20	1000	255	165	***	**
630*355	2001966	-	-	-	-	***	**
630*400	2001967	-	-	-	-	***	**
630*450	2001968	-	-	-	-	***	**
630*500	2001969	-	-	-	-	***	**
630*560	2001970	-	-	-	-	***	**

Büyük çaplar isteğe bağlı olarak üretilmektedir. (Bigger sizes are available upon request.)

(*) : Enjeksiyon baskılı(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.)

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

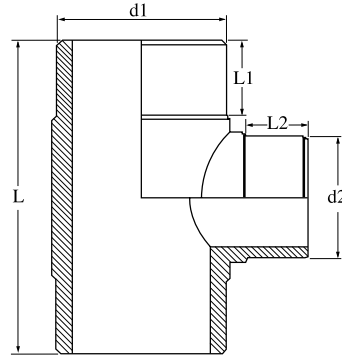
REDUCED TEE (SHORT) / İNEĞAL TE (KISA)

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	2001612	1,40	275	60	75	60*40*45	4	**
160*90	2001613	1,50	275	60	95	60*40*45	3	*
160*140	2002348	2,30	335	60	110	60*40*45	2	*
180*75	2001617	1,80	275	60	75	60*40*45	2	**
180*110	2001619	2,30	320	60	105	60*40*45	2	*
180*125	2001620	2,50	320	60	110	60*40*45	2	*
180*140	2001621	2,70	335	60	110	60*40*45	2	**
180*160	2001622	3,40	375	60	120	60*40*45	2	**
200*75	2001623	2,20	275	60	75	60*40*45	2	**
200*90	2001624	2,30	275	60	90	60*40*45	2	*
200*125	2001626	2,90	320	60	110	60*40*45	2	**
200*140	2001627	3,20	335	60	10	60*40*45	2	*
200*160	2001628	3,90	375	60	120	60*40*45	2	**
200*180	2002349	4,30	375	60	125	60*40*45	2	*
225*75	2001629	3,60	375	60	75	60*40*45	2	**
225*90	2002350	2,80	275	60	90	60*40*45	2	*
225*110	2001630	3,40	320	60	105	60*40*45	2	*
225*125	2001631	3,50	320	60	110	60*40*45	2	**
225*140	2002351	3,90	335	60	110	60*40*45	2	**
225*160	2001632	4,60	375	60	120	60*40*45	2	*
225*180	2002352	5,00	375	60	125	60*40*45	2	**
225*200	2001633	6,00	425	60	130	60*40*30	2	**
250*75	2001634	3,20	275	60	75	60*40*45	2	**
250*90	2001635	3,30	275	60	90	60*40*45	2	*
250*110	2001636	4,00	320	60	105	60*40*30	1	*
250*125	2001637	4,10	320	60	110	60*40*30	1	*
250*140	2001638	4,60	335	60	110	60*40*30	1	**
250*160	2001639	5,40	375	60	120	60*40*30	1	*
250*180	2001640	5,80	375	60	125	60*40*45	1	*
250*200	2001641	6,80	425	60	130	60*40*45	1	*

REDUCED TEE (SHORT) / INEGAL TE (KISA)

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



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
250*225	2001642	7,10	425	60	130	60*40*45	1	**
280*75	2001643	4,00	275	60	75	60*40*30	1	**
280*90	2001644	4,10	275	60	90	60*40*30	1	**
280*110	2001645	4,90	320	60	105	60*40*30	1	**
280*125	2001646	5,00	320	60	110	60*40*30	1	**
280*140	2001647	5,50	335	60	110	60*40*30	1	**
280*160	2001648	6,40	375	60	120	60*40*30	1	**
280*180	2001649	6,80	375	60	125	***		**
280*200	2001650	7,90	425	60	130	***		**
280*225	2001651	8,30	425	60	130	***		**
280*250	2001652	10,40	465	60	145	***		**
315*90	2001654	5,10	275	60	90	***		**
315*110	2001655	6,10	320	60	105	***		**
315*125	2001656	6,20	320	60	110	***		**
315*140	2001657	6,70	335	60	110	***		**
315*160	2001658	7,80	375	60	120	***		**
315*180	2001659	8,20	375	60	125	***		**
315*200	2001660	9,50	425	60	130	***		**
315*225	2001661	9,90	425	60	130	***		**
315*250	2001662	12,10	465	60	145	***		**
315*280	2001663	14,00	560	60	150	***		**
355*90	2001666	7,70	335	90	90	***		**
355*110	2001667	9,00	380	90	105	***		**
355*125	2001668	9,10	380	90	110	***		**
355*140	2001669	9,60	395	90	110	***		**
355*160	2001670	10,80	435	90	120	***		**
355*180	2001671	11,30	435	90	125	***		**
355*200	2001672	12,80	485	90	130	***		**
355*225	2001673	13,10	485	90	130	***		**
355*250	2001674	15,60	525	90	145	***		**
355*280	2001675	11,10	620	90	150	***		**
400*90	2002353	9,70	335	90	90	***		**
400*110	2001678	11,10	380	90	105	***		**
400*125	2001679	11,30	380	90	110	***		**
400*140	2001680	12,00	395	90	110	***		**
400*160	2001681	13,40	435	90	120	***		**
400*180	2001682	13,90	435	90	125	***		**
400*200	2001683	15,70	485	90	130	***		**
400*225	2001684	16,00	485	90	130	***		**
400*250	2001685	18,70	525	90	145	***		**
400*280	2001686	21,60	620	90	150	***		**
400*315	2001687	23,70	670	90	155	***		**
450*90	2001688	12,30	335	90	90	***		**
450*110	2001691	14,00	380	90	105	***		**
450*125	2001692	14,10	380	90	110	***		**
450*140	2001693	15,00	395	90	110	***		**
450*160	2001694	16,70	435	90	120	***		**
450*180	2001695	17,20	435	90	125	***		**

EF-METRIK

SPIGOT-METRIK

AKIS KONTROL-METRIK

EF-IPS

AKIS KONTROL-IPS

MAKINE-APARATLAR

MONTAJ

TEKNİK



SPIGOT-METRIC SPIGOT-METRİK

REDUCED TEE (SHORT) / INEGAL TE (KISA)

SDR17 PE100

GAS/GAZ : 6 BAR

WATER/SU : 10 BAR

TYPE/TIP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
450*200	2001696	19,40	485	90	130	***	**
450*225	2001697	19,70	485	90	130	***	**
450*250	2001698	22,70	525	90	145	***	**
450*280	2001699	26,30	620	90	150	***	**
450*315	2001700	28,70	670	90	155	***	**
500*90	2002354	15,00	335	90	90	***	**
500*110	2001703	17,20	380	90	105	***	**
500*125	2001704	17,30	380	90	110	***	**
500*140	2001705	18,20	395	90	110	***	**
500*160	2001706	20,30	435	90	120	***	**
500*180	2001707	20,70	435	90	125	***	**
500*200	2001708	23,40	485	90	130	***	**
500*225	2001709	23,80	485	90	130	***	**
500*250	2001710	27,10	525	90	145	***	**
500*280	2001711	31,50	620	90	150	***	**
560*90	2001715	19,90	335	90	90	***	**
560*110	2001716	22,50	380	90	105	***	**
560*125	2001717	22,70	380	90	110	***	**
560*140	2001718	23,70	395	90	110	***	**
560*160	2001719	26,30	435	90	120	***	**
560*180	2001720	26,70	435	90	125	***	**
560*200	2001721	30,00	485	90	130	***	**
560*225	2001722	30,30	485	90	130	***	**
560*250	2001723	34,00	525	90	145	***	**
560*280	2001724	39,50	620	90	150	***	**
630*90	2001727	25,10	335	90	90	***	**
630*110	2001728	28,40	400	100	105	***	**
630*125	2001729	28,50	400	100	110	***	**
630*140	2001730	29,80	415	100	110	***	**
630*160	2001731	33,00	455	100	120	***	**
630*180	2001732	33,40	455	100	125	***	**
630*200	2001733	37,40	505	100	130	***	**
630*225	2001734	37,70	505	100	130	***	**
630*250	2001735	42,00	545	100	145	***	**
630*280	2001736	48,90	640	100	150	***	**
630*315	2001737	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.)

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

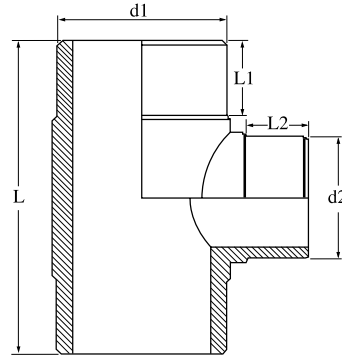
TEKNİK
TECHNICAL

SPIGOT-METRIC SPIGOT-METRIK



REDUCED TEE (SHORT) / INEGAL 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	2001798	2,10	275	60	75	60*40*45	4	**
160*90	2001799	2,20	275	60	95	60*40*45	3	*
160*140	2001800	3,40	335	60	110	60*40*45	2	*
180*75	2001801	2,60	275	60	75	60*40*45	2	**
180*110	2001802	3,40	320	60	105	60*40*45	2	*
180*125	2001803	3,60	320	60	110	60*40*45	2	*
180*140	2001804	4,00	335	60	110	60*40*45	2	**
180*160	2001805	4,90	375	60	120	60*40*45	2	**
200*75	2001806	3,20	275	60	75	60*40*45	2	**
200*90	2001807	3,25	275	60	90	60*40*45	2	*
200*125	2001808	4,20	320	60	110	60*40*45	2	**
200*140	2001809	4,70	335	60	110	60*40*45	2	*
200*160	2001810	5,60	375	60	120	60*40*45	2	**
200*180	2001811	6,20	375	60	125	60*40*45	2	*
225*75	2001812	5,20	375	60	75	60*40*45	2	**
225*90	2001813	4,00	275	60	90	60*40*45	2	*
225*110	2001814	4,90	320	60	105	60*40*45	2	*
225*125	2001815	5,00	320	60	110	60*40*45	2	**
225*140	2001816	5,60	335	60	110	60*40*45	2	**
225*160	2001817	6,60	375	60	120	60*40*45	2	*
225*180	2001818	7,30	375	60	125	60*40*45	2	**
225*200	2001819	8,60	425	60	130	60*40*30	2	**
250*75	2001820	4,70	275	60	75	60*40*45	2	**
250*90	2001821	4,80	275	60	90	60*40*45	2	*
250*110	2001822	5,90	320	60	105	60*40*30	1	*
250*125	2001823	6,00	320	60	110	60*40*30	1	*

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



REDUCED TEE (SHORT) / INEGAL TE (KISA)

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

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
250*140	2001824	6,60	335	60	110	60*40*30	1 **
250*160	2001825	7,80	375	60	120	60*40*30	1 *
250*180	2001826	8,40	375	60	125	60*40*45	1 *
250*200	2001827	9,80	425	60	130	60*40*45	1 *
250*225	2001828	10,30	425	60	130	60*40*45	1 **
280*75	2001830	5,80	275	60	75	60*40*30	1 **
280*90	2001831	5,90	275	60	90	60*40*30	1 **
280*110	2001832	7,10	320	60	105	60*40*30	1 **
280*125	2001833	7,30	320	60	110	60*40*30	1 **
280*140	2001834	7,90	335	60	110	60*40*30	1 **
280*160	2001835	9,30	375	60	120	60*40*30	1 **
280*180	2001836	9,90	375	60	125	***	**
280*200	2001837	11,50	425	60	130	***	**
280*225	2001838	12,00	425	60	130	***	**
280*250	2001839	15,10	465	60	145	***	**
315*90	2001841	7,40	275	60	90	***	**
315*110	2001842	8,90	320	60	105	***	**
315*125	2001843	9,00	320	60	110	***	**
315*140	2001844	9,70	335	60	110	***	**
315*160	2001845	11,30	375	60	120	***	**
315*180	2001846	11,90	375	60	125	***	**
315*200	2001847	13,80	425	60	130	***	**
315*225	2001848	14,30	425	60	130	***	**
315*250	2001849	17,60	465	60	145	***	**
355*90	2001853	11,10	335	90	90	***	**
355*110	2001854	13,00	380	90	105	***	**
355*125	2001855	13,10	380	90	110	***	**
355*140	2001856	13,90	395	90	110	***	**
355*160	2001857	15,80	435	90	120	***	**
355*180	2001858	16,40	435	90	125	***	**
355*200	2001859	18,60	485	90	130	***	**
355*225	2001860	19,10	485	90	130	***	**
355*250	2001861	22,70	525	90	145	***	**
400*90	2001864	14,10	335	90	90	***	**
400*110	2001865	16,30	380	90	105	***	**
400*125	2001866	16,40	380	90	110	***	**
400*140	2001867	17,40	395	90	110	***	**
400*160	2001868	19,50	435	90	120	***	**
400*180	2001869	20,10	435	90	125	***	**
400*200	2001870	22,80	485	90	130	***	**
400*225	2001871	23,30	485	90	130	***	**
400*250	2001872	27,20	525	90	145	***	**
450*90	2002356	17,80	335	90	90	***	**
450*110	2001877	20,40	380	90	105	***	**
450*125	2001878	20,50	380	90	110	***	**
450*140	2001879	21,70	395	90	110	***	**
450*160	2001880	24,30	435	90	120	***	**
450*180	2001881	24,90	435	90	125	***	**
450*200	2001882	28,10	485	90	130	***	**

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

REDUCED TEE (SHORT) / INEGAL TE (KISA)

SDR11 PE100
GAS/GAZ : 10 BAR
WATER/ŞU : 16 BAR
TYPE/TIP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
450*225	2001883	28,60	485	90	130	***	**
450*250	2001884	32,90	525	90	145	***	**
500*90	2001888	21,80	335	90	90	***	**
500*110	2001889	25,00	380	90	105	***	**
500*125	2001890	25,10	380	90	110	***	**
500*140	2001891	26,40	395	90	110	***	**
500*160	2001892	29,50	435	90	120	***	**
500*180	2001893	30,10	435	90	125	***	**
500*200	2001894	34,00	485	90	130	***	**
500*225	2001895	34,50	485	90	130	***	**
500*250	2001896	39,30	525	90	145	***	**
560*90	2001899	28,80	335	90	90	***	**
560*110	2001900	32,70	380	90	105	***	**
560*125	2001901	32,90	380	90	110	***	**
560*140	2001902	34,40	395	90	110	***	**
560*160	2001903	38,20	435	90	120	***	**
560*180	2001904	38,80	435	90	125	***	**
560*200	2001905	43,40	485	90	130	***	**
560*225	2001906	43,90	485	90	130	***	**
560*250	2001907	49,30	525	90	145	***	**
630*90	2001911	36,40	335	90	90	***	**
630*110	2001912	41,20	400	100	105	***	**
630*125	2001913	41,40	400	100	110	***	**
630*140	2001914	43,30	415	100	110	***	**
630*160	2001915	47,90	455	100	120	***	**
630*180	2001916	48,50	455	100	125	***	**
630*200	2001917	54,20	505	100	130	***	**
630*225	2001918	54,70	505	100	130	***	**
630*250	2001919	61,00	545	100	145	***	**

Büyük çaplar isteğe bağlı olarak üretilmektedir. (Bigger sizes are available upon request.)

(*) : Enjeksiyon baskılı(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.)

EF-METRIK

SPIGOT-METRIK

AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

MONTAJ

TEKNİK

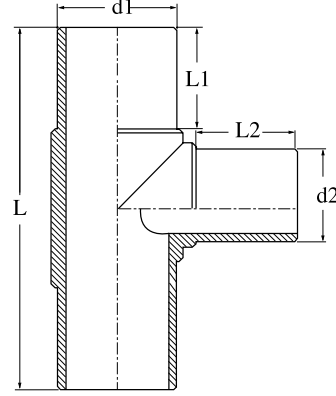
REDUCED TEE / INEGAL TE

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	2001309	0,20	190	60	65	40*30*30	30	*
50*40	2001483	0,20	196	60	60	40*30*30	30	*
63*32	2001313	0,33	220	64	75	40*30*30	20	*
63*40	2001314	0,34	220	64	58	40*30*30	20	*
63*50	2001315	0,35	220	64	62	40*30*30	16	*
75*32	2001318	0,90	277	76	60	60*40*30	16	*
75*40	2001319	0,92	277	79	60	60*40*30	16	*
75*63	2001321	0,95	277	77	85	60*40*30	16	*
90*50	2001325	0,90	305	85	85	60*40*30	15	*
90*63	2001326	0,90	305	85	85	60*40*30	15	*
90*75	2001327	0,90	305	85	85	60*40*30	15	*
110*90	2001336	1,52	340	95	75	60*40*45	12	*
110*32	2001330	1,40	340	95	80	60*40*45	12	*
110*50	2001332	1,45	340	95	85	60*40*45	12	*
110*63	2001333	1,45	340	95	65	60*40*45	12	*
110*90	2001336	1,52	340	95	75	60*40*45	12	*
125*90	2001343	1,92	360	95	85	60*40*45	9	*
125*110	2001344	2,07	360	95	90	60*40*45	9	*
140*90	2001349	2,68	400	100	95	60*40*30	4	*
140*110	2001350	2,79	400	100	100	60*40*30	4	*
140*125	2001345	3,20	400	120	90	60*40*30	4	*
160*90	2001357	4,45	560	150	90	60*40*30	4	*
160*110	2001358	4,60	560	150	95	60*40*30	3	*
160*125	2001351	4,65	560	150	95	60*40*30	3	*
160*140	2001352	5,00	415	100	140	60*40*30	2	**
180*90	2001366	6,00	560	145	90	60*40*30	2	*
180*110	2001367	6,00	560	145	80	60*40*30	2	*

REDUCED TEE / INEGAL TE

SDR11 PE100

GAS/GAZ : 10 BAR

WATER/SU : 16 BAR

TYPE/TIP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	
180*125	2001360	6,20	560	145	90	60*40*30	2	*
180*140	2001361	5,82	430	105	140	60*40*30	2	**
180*160	2001363	7,60	470	105	150	60*40*30	2	**
200*90	2001376	6,10	500	120	90	60*40*30	2	*
200*110	2001377	6,20	500	120	90	60*40*30	2	*
200*125	2001368	6,60	430	115	125	60*40*30	2	**
200*140	2001369	7,00	470	140	110	60*40*30	2	*
200*160	2001372	7,30	490	140	140	60*40*45	2	*
200*180	2001375	9,00	485	115	150	60*40*45	2	**
225*90	2001387	8,20	540	130	85	60*40*45	2	*
225*110	2001388	8,45	540	130	90	60*40*45	2	*
225*125	2001378	8,60	540	130	95	60*40*45	2	*
225*140	2001380	8,30	460	120	110	60*40*45	2	**
225*160	2001383	8,80	540	130	110	60*40*45	2	*
225*180	2001386	9,00	540	130	115	60*40*45	2	*
225*200	2001390	11,80	560	120	130	60*40*45	2	**
250*90	2001400	7,89	450	155	90	60*40*30	1	*
250*110	2001401	8,50	460	155	110	60*40*30	1	*
250*125	2001391	9,70	470	130	125	60*40*30	1	**
250*140	2001393	10,00	485	130	140	60*40*30	1	**
250*160	2001396	10,79	530	160	140	60*40*30	1	*
250*180	2001399	12,50	525	130	150	60*40*45	1	**
250*200	2001403	14,80	610	145	130	60*40*45	1	*
250*225	2001392	16,62	575	130	170	60*40*45	1	**
280*90	2001412	10,00	440	140	80	***	1	**
280*110	2001413	11,95	490	140	110	***	1	**
280*125	2001404	12,00	490	140	90	***	1	**
280*140	2001406	12,50	505	140	110	***	1	**
280*160	2001408	14,70	545	140	140	***	1	**
280*180	2001411	15,00	545	140	150	***	1	**
280*200	2001414	16,60	595	140	130	***	1	**
280*225	2001405	16,40	595	140	150	***	1	**
280*250	2001407	19,80	635	140	145	***	1	**
315*90	2001426	13,00	465	150	90	***		**
315*110	2001427	15,10	510	150	110	***		**
315*125	2001415	15,20	510	150	90	***		**
315*140	2001417	15,70	525	150	110	***		**
315*160	2001421	18,20	565	150	140	***		**
315*180	2001424	18,60	570	150	150	***		**
315*200	2001428	20,30	615	150	130	***		**
315*225	2001416	20,10	615	150	150	***		**
315*250	2001418	23,70	655	150	145	***		**
355*90	2001436	17,20	495	165	90	***		**
355*110	2001437	19,60	540	165	110	***		**
355*125	2001429	19,70	540	165	90	***		**
355*140	2001431	20,30	555	165	110	***		**
355*160	2001433	23,00	595	165	140	***		**
355*180	2001434	23,30	595	165	150	***		**
355*200	2001438	25,50	645	165	130	***		**
355*225	2001430	25,30	645	165	150	***		**
355*250	2001432	29,20	685	165	145	***		**

EF-METRIK

SPIGOT-METRIK

AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

MONTAJ

TEKNİK



SPIGOT-METRIC SPIGOT-METRİK

d1*d2	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
400*110	2001451	25,60	570	180	110	***	**
400*125	2001441	25,70	570	180	90	***	**
400*140	2001443	26,40	585	180	110	***	**
400*160	2001446	29,50	625	180	140	***	**
400*180	2001448	29,80	625	180	150	***	**
400*200	2001452	32,50	675	180	130	***	**
400*225	2001442	32,30	675	180	150	***	**
400*250	2001444	36,50	715	180	145	***	**
450*90	2001445	30,10	555	195	90	***	**
450*110	2001465	33,40	600	195	110	***	**
450*125	2001455	33,50	600	195	90	***	**
450*140	2001457	34,40	615	195	110	***	**
450*160	2001460	38,00	655	195	140	***	**
450*180	2001462	38,20	655	195	150	***	**
450*200	2001466	41,40	705	195	130	***	**
450*225	2001456	41,20	705	195	150	***	**
450*250	2002355	46,00	745	195	145	***	**
500*90	2001479	39,60	595	215	90	***	**
500*110	2001480	43,40	640	215	110	***	**
500*125	2001469	43,60	640	215	90	***	**
500*140	2001471	44,60	655	215	110	***	**
500*160	2001475	48,70	695	215	140	***	**
500*180	2001477	49,00	695	215	150	***	**
500*200	2001481	52,80	745	215	130	***	**
500*225	2001470	52,60	745	215	150	***	**
500*250	2001472	58,00	785	215	145	***	**
560*90	2001491	52,70	635	235	90	***	**
560*110	2001492	57,30	680	235	110	***	**
560*125	2001484	57,40	680	235	90	***	**
560*140	2001486	58,80	695	235	110	***	**
560*160	2001488	63,50	735	235	140	***	**
560*180	2001489	63,80	735	235	150	***	**
560*200	2001493	68,40	785	235	130	***	**
560*225	2001485	68,20	785	235	150	***	**
560*250	2001487	74,00	825	235	145	***	**
630*90	2001503	70,00	675	255	90	***	**
630*110	2001504	75,40	720	255	110	***	**
630*125	2001495	75,50	720	255	90	***	**
630*140	2001497	77,20	735	255	110	***	**
630*160	2001500	82,70	775	255	140	***	**
630*180	2001501	83,00	775	255	150	***	**
630*200	2001311	88,70	825	255	130	***	**
630*225	2001496	88,50	825	255	150	***	**
630*250	2001498	95,00	865	255	145	***	**

Büyük çaplar isteğe bağlı olarak üretilmektedir. (Bigger sizes are available upon request.)

(*) : Enjeksiyon baskı (Injected)

(**) : Sadece 10 Bar için Ef semer kullanılarak üretilmektedir. (Produced by EF saddle and Only used 10 Bar)

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

SPIGOT-METRIC SPIGOT-METRİK



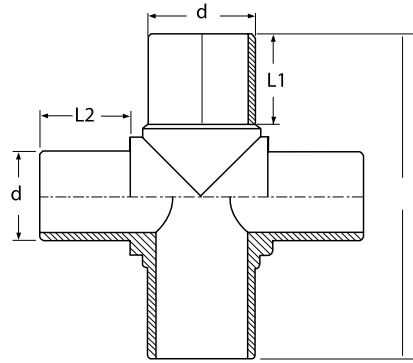
CROSS TEE / KROS TE

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	2004016	1,68	370	105	105	60*40*45	12
110	2004017	2,80	370	105	105	60*40*45	9
125	2004018	3,50	360	100	90	60*40*45	9 *
140	2004019	5,00	390	100	110	60*40*30	4 *
160	2004019	6,50	420	105	140	60*40*30	2 *
180	2004021	7,60	450	120	150	60*40*30	2 *
200	2004022	13,50	520	125	130	60*40*30	2 *
225	2004023	14,40	540	135	150	60*40*45	2 *
250	2004024	22,50	560	120	145	60*40*45	1 *

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

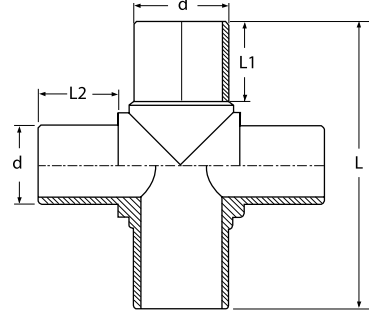
CROSS TEE / KROS TE

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
125	2004002	3,10	360	100	90	60*40*45	9 *
140	2004003	4,50	390	100	110	60*40*30	4 *
160	2004003	5,80	420	105	140	60*40*30	2 *
180	2004005	6,50	450	120	150	60*40*30	2 *
200	2004006	12,00	520	125	130	60*40*30	2 *
225	2004007	13,00	540	135	150	60*40*45	2 *
250	2004008	20,00	560	120	145	60*40*45	1 *
280	2004009	23,00	570	125	185	**	* *
315	2004010	28,00	650	130	165	**	* *

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

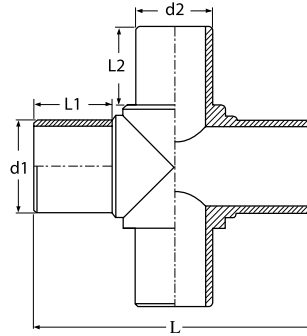
(**): Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. No box is used. (Only Euro pallets are being used.)

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
110*90	2004078	2,24	330	95	90	60*40*45	12
125*90	2004079	2,55	330	95	90	60*40*45	9 *
125*110	2004080	3,53	350	95	110	60*40*45	9 *
140*90	2004081	3,09	370	110	90	60*40*30	4 *
140*110	2004082	4,04	380	110	110	60*40*30	4 *
140*125	2004083	4,34	380	120	90	60*40*30	4 *
160*90	2004084	3,87	400	120	90	60*40*30	2 *
160*110	2004085	4,83	410	120	110	60*40*30	2 *
160*125	2004086	5,20	420	120	90	60*40*30	2 *
160*140	2004087	6,60	450	120	110	60*40*30	2 *
180*90	2004088	4,65	410	125	90	60*40*30	2 *
180*110	2004089	5,64	420	125	110	60*40*30	2 *
180*125	2004090	6,02	430	125	90	60*40*30	2 *
180*140	2004091	7,47	460	125	110	60*40*30	2 *
180*160	2004092	8,44	480	125	140	60*40*30	2 *
200*90	2004093	5,57	420	130	90	60*40*30	2 *
200*110	2004094	6,57	430	130	110	60*40*30	2 *
200*125	2004095	6,98	440	130	90	60*40*30	2 *
200*140	2004096	8,38	460	130	110	60*40*30	2 *
200*160	2004097	9,39	480	130	140	60*40*30	2 *
200*180	2004098	9,59	480	130	150	60*40*30	2 *
225*90	2004099	6,96	440	140	90	60*40*45	2 *

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

d1*d2	CODE	Kg.	L[mm]	L1[mm]	L2 (mm)	box sizes	nos/box	*
225*110	2004100	8,00	450	140	110	60*40*45	2	*
225*125	2004101	8,43	460	140	90	60*40*45	2	*
225*140	2004102	10,02	490	140	110	60*40*45	2	*
225*160	2004103	11,08	510	140	140	60*40*45	2	*
225*180	2004104	11,28	510	140	150	60*40*45	2	*
250*90	2004105	8,65	460	150	90	60*40*45	1	*
250*110	2004106	9,71	470	150	110	**		*
250*125	2004107	10,18	480	150	90	**		*
250*140	2004108	11,86	510	150	110	**		*
250*160	2004109	12,99	530	150	140	**		*
250*180	2004110	13,19	530	150	150	**		*
250*200	2004111	18,50	560	150	130	**		*
250*225	2004112	18,00	560	150	150	**		*
280*90	2004113	10,74	470	160	90	**		*
280*110	2004114	12,05	490	160	110	**		*
280*125	2004115	12,55	500	160	90	**		*
280*140	2004116	14,36	530	160	110	**		*
280*160	2004117	15,57	550	160	140	**		*
280*180	2004118	15,77	550	160	150	**		*
280*200	2004119	21,10	570	160	130	**		*
280*225	2004120	20,55	570	160	150	**		*
315*90	2004121	14,05	500	170	90	**		*
315*110	2004122	15,21	510	170	110	**		*
315*125	2004123	15,76	520	170	90	**		*
315*140	2004124	17,74	550	170	110	**		*
315*160	2004125	19,05	570	170	140	**		*
315*180	2004126	19,25	570	170	150	**		*
315*200	2004127	24,00	570	170	130	**		*
315*225	2004128	23,80	580	170	150	**		*
315*250	2004129	32,00	630	170	145	**		*
355*90	2004130	18,48	530	185	90	**		*
355*110	2004131	19,70	540	185	110	**		*
355*125	2004132	20,33	550	185	90	**		*
355*140	2004133	22,51	580	185	110	**		*
355*160	2004134	23,98	600	185	140	**		*
355*180	2004135	24,16	600	185	150	**		*
355*200	2004136	29,00	600	185	130	**		*
355*225	2004137	28,50	600	185	150	**		*
355*250	2004138	37,00	650	185	145	**		*
400*90	2004139	23,97	550	200	90	**		*
400*110	2004140	25,70	570	200	110	**		*
400*125	2004141	26,41	580	200	90	**		*
400*140	2004142	28,85	610	200	110	**		*
400*160	2004143	30,48	630	200	140	**		*
400*180	2004144	30,68	630	200	150	**		*

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*200	2004145	36,00	640	200	130	**	*
400*225	2004146	35,50	640	200	150	**	*
400*250	2004147	45,00	700	200	145	**	*
450*90	2004148	31,60	580	215	90	**	*
450*110	2004149	33,50	600	215	110	**	*
450*125	2004150	34,30	610	215	90	**	*
450*140	2004151	37,10	640	215	110	**	*
450*160	2004152	39,00	660	215	140	**	*
450*180	2004153	39,10	660	215	150	**	*
450*200	2004154	44,00	660	215	130	**	*
450*225	2004155	43,60	660	215	150	**	*
450*250	2004156	53,00	710	215	145	**	*
500*90	2004157	41,40	620	235	90	**	*
500*110	2004158	43,00	630	235	110	**	*
500*125	2004159	43,90	640	235	90	**	*
500*140	2004160	47,00	670	235	110	**	*
500*160	2004161	49,15	690	235	140	**	*
500*180	2004162	#REF!	690	235	150	**	*
500*200	2004163	55,50	710	235	130	**	*
500*225	2004164	55,00	710	235	150	**	*
500*250	2004165	65,20	760	235	145	**	*
560*90	2004166	55,00	660	255	90	**	*
560*110	2004167	57,50	680	255	110	**	*
560*125	2004168	58,60	690	255	90	**	*
560*140	2004169	62,25	720	255	110	**	*
560*160	2004170	64,68	740	255	140	**	*
560*180	2004171	64,80	740	255	150	**	*
560*200	2004172	70,70	750	255	130	**	*
560*225	2004173	70,10	750	255	150	**	*
560*250	2004174	81,10	800	255	145	**	*
630*90	2004175	73,10	700	275	90	**	*
630*110	2004176	76,10	720	275	110	**	*
630*125	2004177	77,40	730	275	90	**	*
630*140	2004178	81,70	760	275	110	**	*
630*160	2004179	84,50	780	275	140	**	*
630*180	2004180	84,70	780	275	150	**	*
630*200	2004181	89,78	780	275	130	**	*
630*225	2004182	89,10	780	275	150	**	*
630*250	2004183	100,30	820	275	145	**	*

(*): 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.)

EF-METRIK

SPİGOT-METRIK

AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

MONTAJ

TEKNİK



SPIGOT-METRIC SPIGOT-METRİK

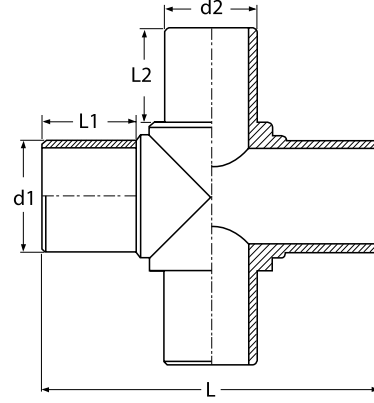
REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR17 PE100

GAS/GAZ : 6 BAR

WATER/SU : 10 BAR

TYPE/TİP : SPIGOT



D*d	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	*
110*90	2004184	1,70	330	95	90	60*40*45	12	*
125*90	2004185	1,90	330	95	90	60*40*45	9	*
125*110	2004186	2,80	350	95	110	60*40*45	9	*
140*90	2004187	2,25	370	110	90	60*40*30	4	*
140*110	2004188	3,10	380	110	110	60*40*30	4	*
140*125	2004189	3,40	380	120	90	60*40*30	4	*
160*90	2004190	2,70	400	120	90	60*40*30	2	*
160*110	2004191	3,60	410	120	110	60*40*30	2	*
160*125	2004192	3,92	420	120	90	60*40*30	2	*
160*140	2004193	5,10	450	120	110	60*40*30	2	*
180*90	2004194	3,20	410	125	90	60*40*30	2	*
180*110	2004195	4,10	420	125	110	60*40*30	2	*
180*125	2004196	4,40	430	125	90	60*40*30	2	*
180*140	2004197	5,60	460	125	110	60*40*30	2	*
180*160	2004198	6,50	480	125	140	60*40*30	2	*
200*90	2004199	3,80	420	130	90	60*40*30	2	*
200*110	2004200	4,68	430	130	110	60*40*30	2	*
200*125	2004201	5,00	440	130	90	60*40*30	2	*
200*140	2004202	6,20	460	130	110	60*40*30	2	*
200*160	2004203	7,10	480	130	140	60*40*30	2	*
200*180	2004204	7,30	480	130	150	60*40*30	2	*
225*90	2004205	4,70	440	140	90	60*40*45	2	*
225*110	2004206	5,60	450	140	110	60*40*45	2	*
225*125	2004207	5,90	460	140	90	60*40*45	2	*
225*140	2004208	7,60	460	140	90	60*40*45	2	*

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

REDUCING CROSS TEE / REDÜKSİYON KROS TE

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



D*d	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box	*
225*160	2004209	8,10	510	140	140	60*40*45	2	*
225*180	2004210	8,30	510	140	150	60*40*45	2	*
250*90	2004211	5,70	460	150	90	60*40*45	1	*
250*110	2004212	6,60	470	150	110	**		*
250*125	2004213	7,00	480	150	90	**		*
250*140	2004214	8,40	510	150	110	**		*
250*160	2004215	9,30	530	150	140	**		*
250*180	2004216	9,50	530	150	150	**		*
250*200	2004217	14,30	560	150	130	**		*
250*225	2004218	13,80	560	150	150	**		*
280*90	2004219	7,00	470	160	90	**		*
280*110	2004220	8,00	490	160	110	**		*
280*125	2004221	8,45	500	160	90	**		*
280*140	2004222	9,90	530	160	110	**		*
280*160	2004223	10,90	550	160	140	**		*
280*180	2004224	11,10	550	160	150	**		*
280*200	2004225	15,90	570	160	130	**		*
280*225	2004226	15,30	570	160	150	**		*
315*90	2004227	9,00	500	170	90	**		*
315*110	2004228	10,00	510	170	110	**		*
315*125	2004229	10,40	520	170	90	**		*
315*140	2004230	12,00	550	170	110	**		*
315*160	2004231	13,00	570	170	140	**		*
315*180	2004232	13,20	570	170	150	**		*
315*200	2004233	17,80	570	170	130	**		*
315*225	2004234	17,40	580	170	150	**		*
315*250	2004235	24,50	630	170	145	**		*
315*280	2004236	25,50	630	170	185	**		*
355*90	2004237	11,80	530	185	90	**		*
355*110	2004238	12,80	540	185	110	**		*
355*125	2004239	13,30	550	185	90	**		*
355*140	2004240	15,00	580	185	110	**		*
355*160	2004241	16,10	600	185	140	**		*
355*180	2004242	16,30	600	185	150	**		*
355*200	2004243	20,80	600	185	130	**		*
355*225	2004244	20,30	600	185	150	**		*
355*250	2004245	27,70	650	185	145	**		*
355*280	2004246	28,60	650	185	185	**		*
355*315	2004247	30,90	720	185	165	**		*
400*90	2004248	15,10	550	200	90	**		*
400*110	2004249	16,50	570	200	110	**		*
400*125	2004250	17,00	580	200	90	**		*
400*140	2004251	18,80	610	200	110	**		*
400*160	2004252	20,10	630	200	140	**		*
400*180	2004253	20,30	630	200	150	**		*
400*200	2004254	25,10	640	200	130	**		*
400*225	2004255	24,50	640	200	150	**		*
400*250	2004256	32,40	700	200	145	**		*
400*280	2004257	33,30	700	200	185	**		*
400*315	2004258	36,00	770	200	165	**		*
450*90	2004259	19,90	580	215	90	**		*
450*110	2004260	21,30	600	215	110	**		*

EF-METRIK

SPIGOT-METRIK

AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

MONTAJ

TEKNİK



REDUCING CROSS TEE / REDÜKSİYON KROS TE

SDR17 PE100

GAS/GAZ : 6 BAR

WATER/SU : 10 BAR

TYPE/TIP : SPIGOT

D*d	CODE	Kg.	L(mm)	L1(mm)	L2 (mm)	box sizes	nos/box
450*125	2004261	22,00	610	215	90	**	*
450*140	2004262	23,00	640	215	110	**	*
450*160	2004263	25,40	660	215	140	**	*
450*180	2004264	25,50	660	215	150	**	*
450*200	2004265	30,10	660	215	130	**	*
450*225	2004266	29,50	660	215	150	**	*
450*250	2004267	37,50	710	215	145	**	*
450*280	2004268	38,40	710	215	185	**	*
450*315	2004269	42,00	790	215	165	**	*
500*90	2004270	25,90	620	235	90	**	*
500*110	2004271	27,10	630	235	110	**	*
500*125	2004272	27,70	640	235	90	**	*
500*140	2004273	30,00	670	235	110	**	*
500*160	2004274	31,60	690	235	140	**	*
500*180	2004275	31,80	690	235	150	**	*
500*200	2004276	37,10	710	235	130	**	*
500*225	2004277	36,60	710	235	150	**	*
500*250	2004278	45,00	760	235	145	**	*
500*280	2004279	45,80	760	235	185	**	*
500*315	2004280	49,50	830	235	165	**	*
560*90	2004281	34,10	660	255	90	**	*
560*110	2004282	35,90	680	255	110	**	*
560*125	2004283	36,70	690	255	90	**	*
560*140	2004284	39,30	720	255	110	**	*
560*160	2004285	41,00	740	255	140	**	*
560*180	2004286	41,20	740	255	150	**	*
560*200	2004287	46,25	750	255	130	**	*
560*225	2004288	45,70	750	255	150	**	*
560*250	2004289	54,60	800	255	145	**	*
560*280	2004290	55,50	800	255	185	**	*
560*315	2004291	60,00	870	255	165	**	*
630*90	2004292	45,50	700	275	90	**	*
630*110	2004293	47,50	720	275	110	**	*
630*125	2004294	48,50	730	275	90	**	*
630*140	2004295	51,40	760	275	110	**	*
630*160	2004296	53,40	780	275	140	**	*
630*180	2004297	53,60	780	275	150	**	*
630*200	2004298	58,10	780	275	130	**	*
630*225	2004299	57,60	780	275	150	**	*
630*250	2004300	66,50	820	275	145	**	*
630*280	2004301	67,40	820	275	185	**	*
630*315	2004302	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.)

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

SPIGOT-METRIC SPIGOT-METRİK



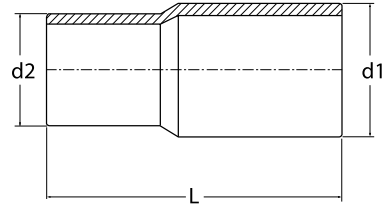
REDUCER / REDÜKSİYON

SDR17 PE100

GAS/GAZ : 6 BAR

WATER/SU : 10 BAR

TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
75*63	2005129	0,20	166	40*30*30	25
90*63	2005131	0,25	180	60*40*30	36
90*75	2005132	0,30	180	60*40*30	36
110*63	2005133	0,40	198	60*40*45	40
110*75	2005134	0,42	183	60*40*45	40
110*90	2005135	0,49	205	60*40*30	30
125*63	2005138	0,55	210	60*40*30	18
125*75	2005139	0,54	200	60*40*30	18
125*90	2005140	0,60	205	60*40*30	18
125*110	2005136	0,65	205	60*40*45	25
140*90	2005142	0,75	225	60*40*45	20
140*110	2005143	0,82	225	60*40*45	20
140*125	2005144	0,85	225	60*40*45	20
160*90	2005145	0,88	230	60*40*45	18
160*110	2005146	0,91	230	60*40*45	15
160*125	2005147	1,00	230	60*40*45	15
160*140	2005148	1,20	235	60*40*45	13
180*90	2005149	1,40	300	60*40*45	6
180*110	2005150	1,56	300	60*40*45	6
180*125	2005151	1,70	300	60*40*45	6
180*140	2005152	1,80	300	60*40*45	6
180*160	2005153	1,90	300	60*40*45	6
200*110	2005156	1,95	320	60*40*45	6
200*125	2005157	2,10	320	60*40*45	6
200*140	2005158	2,20	310	60*40*45	6
200*160	2005159	2,25	320	60*40*45	6

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-T00L

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

d1*d2	CODE	Kg.	L (mm)	box sizes	nos/box
200*180	2005160	2,30	310	60*40*45	6
225*110	2005162	2,00	315	60*40*45	5
225*125	2005163	2,15	315	60*40*45	5
225*140	2005164	2,25	300	60*40*45	4
225*160	2005165	2,30	315	60*40*45	4
225*180	2005166	2,60	310	60*40*45	4
225*200	2005167	3,10	315	60*40*45	3
250*110	2005169	3,10	335	60*40*45	3
250*125	2005170	3,20	335	60*40*45	3
250*140	2005171	3,30	335	60*40*45	3
250*160	2005172	3,40	315	60*40*45	3
250*180	2005173	3,74	340	60*40*45	3
250*200	2005174	3,15	340	60*40*45	3
250*225	2005175	4,50	360	60*40*45	2
280*125	2005178	4,60	345	60*40*45	2
280*140	2005179	4,70	345	60*40*45	2
280*160	2005180	4,80	345	60*40*45	2
280*180	2005181	4,90	345	60*40*45	2
280*200	2005182	5,10	365	60*40*45	2
280*225	2005183	5,30	370	60*40*45	2
280*250	2005184	6,70	385	60*40*45	2
315*180	2005191	8,00	345	*	
315*200	2005192	9,30	365	*	
315*225	2005193	9,80	370	*	
315*250	2005194	10,50	385	*	
315*280	2005195	8,80	385	*	
355*180	2005201	12,10	345	*	
355*200	2005202	13,00	365	*	
355*225	2005203	13,80	370	*	
355*250	2005204	14,20	370	*	
355*280	2005205	12,40	370	*	
355*315	2005206	11,00	380	*	
400*250	2005213	23,80	390	*	
400*280	2005214	21,50	400	*	
400*315	2005215	16,00	400	*	
400*355	2005216	14,60	410	*	
450*250	2005223	26,80	440	*	
450*280	2005224	25,30	440	*	
450*315	2005225	25,00	440	*	
450*355	2005226	20,10	440	*	
450*400	2005227	23,10	450	*	
500*315	2005236	29,20	460	*	
500*355	2005237	25,60	460	*	
500*400	2005238	27,20	470	*	
500*450	2005239	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	2005247	37,00	500	*	
560*400	2005250	33,20	500	*	
560*450	2005251	35,50	500	*	
560*500	2005252	37,40	500	*	
630*500	2005263	47,60	530	*	
630*560	2005264	51,00	540	*	
710*560	2005274	63,00	550	*	
710*630	2005275	66,20	550	*	
800*630	2005280	83,00	570	*	
800*710	2005281	85,00	570	*	
900*710	2005284	130,00	620	*	
900*800	2005285	127,50	620	*	
1000*900	2006218	135,00	620	*	
1200*1000	2006219	200,00	620	*	
1400*1200	2006220	250,00	620	*	
1600*1200	2006221	435,00	620	*	

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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

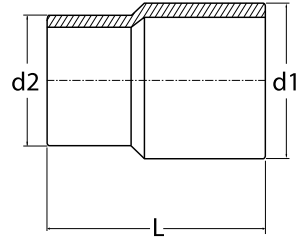
REDUCER (SHORT) / REDÜKSİYON (KISA)

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	2005332	6,00	250	60*40*45	2
315*180	2005336	6,50	250	60*40*45	2
315*200	2005337	6,70	250	60*40*45	2
315*225	2005338	7,80	250	60*40*45	2
315*250	2005339	6,50	250	60*40*45	2
315*280	2005340	6,90	250	60*40*45	1
355*180	2005345	10,00	280	60*40*45	1
355*200	2005346	11,00	280	60*40*45	1
355*225	2005347	11,30	280	60*40*45	1
355*250	2005348	12,00	270	60*40*45	1
355*280	2005349	10,50	270	60*40*45	1
355*315	2005350	8,00	260	60*40*45	1
400*250	2005355	19,80	300	60*40*45	1
400*280	2005356	18,50	290	60*40*45	1
400*315	2005357	14,00	280	60*40*45	1
400*355	2005358	10,80	270	60*40*45	1
450*250	2005363	22,40	320	*	
450*280	2005364	22,10	310	*	
450*315	2005365	23,00	300	*	
450*355	2005366	18,20	290	*	
450*400	2005367	21,80	280	*	
500*315	2005373	27,30	310	*	
500*355	2005374	23,80	300	*	
500*400	2005375	25,70	290	*	
500*450	2005376	25,90	280	*	
560*355	2005381	34,00	320	*	
560*400	2005382	31,20	320	*	
560*450	2005383	32,80	300	*	
560*500	2005384	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	2005388	42,60	320	*	
630*560	2005389	46,20	300	*	
710*560	2005394	54,10	320	*	
710*630	2005395	58,70	300	*	
800*630	2005398	73,00	360	*	
800*710	2005399	75,60	340	*	
900*710	2005401	97,80	370	*	
900*800	2005402	78,60	350	*	
1000*900	2006222	80,00	370	*	
1200*1000	2006223	165,00	380	*	
1400*1200	2006224	202,70	470	*	
1600*1200	2006225	355,20	470	*	

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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

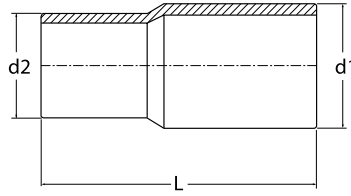
REDUCER / REDÜKSİYON

SDR11 PE100

GAS/GAZ : 10BAR

WATER/SU : 16 BAR

TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
32*20	2005410	0,02	90	40*30*15	100
32*25	2005411	0,03	99	40*30*15	100
40*20	2005536	0,04	108	40*30*30	100
40*25	2005538	0,04	108	40*30*30	100
40*32	2005414	0,04	108	40*30*30	100
50*20	2005415	0,19	245	40*30*30	60
50*25	2005416	0,19	245	40*30*30	60
50*32	2005417	0,08	130	40*30*30	50
50*40	2005418	0,09	130	40*30*30	50
63*32	2005421	0,12	145	40*30*30	50
63*40	2005421	0,12	145	40*30*30	50
63*50	2005423	0,13	145	40*30*30	45
75*63	2005428	0,24	166	40*30*30	25
90*63	2005433	0,32	180	60*40*30	36
90*75	2005434	0,38	180	60*40*30	36
110*63	2005438	0,49	198	60*40*45	40
110*75	2005439	0,50	183	60*40*45	40
110*90	2005441	0,60	205	60*40*45	30
125*63	2005445	0,66	190	60*40*45	30
125*75	2005446	0,70	200	60*40*45	25
125*90	2005447	0,73	205	60*40*45	25
125*110	2005442	0,79	205	60*40*45	25
140*90	2005451	0,98	225	60*40*45	20
140*110	2005452	1,03	225	60*40*45	20
140*125	2005453	1,14	225	60*40*45	20
160*90	2005460	1,19	230	60*40*45	18

REDUCER / REDÜKSİYON

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



d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
160*110	2005461	1,27	230	60*40*45	15
160*125	2005462	1,38	230	60*40*45	15
160*140	2005463	1,49	235	60*40*45	13
180*90	2005466	1,90	300	60*40*30	7
180*110	2005467	1,95	300	60*40*30	7
180*125	2005468	2,13	300	60*40*30	6
180*140	2005469	2,24	300	60*40*30	6
180*160	2005470	2,47	300	60*40*30	6
200*110	2005474	2,61	320	60*40*45	6
200*125	2005475	2,83	320	60*40*45	6
200*140	2005476	2,88	320	60*40*45	6
200*160	2005477	3,00	320	60*40*45	6
200*180	2005478	3,20	320	60*40*45	6
225*110	2005482	3,02	315	60*40*45	6
225*125	2005483	3,12	315	60*40*45	6
225*140	2005484	3,04	300	60*40*45	4
225*160	2005485	3,10	315	60*40*45	4
225*180	2005486	3,26	315	60*40*45	4
225*200	2005487	3,62	315	60*40*45	3
250*110	2005491	4,12	335	40*40*45	3
250*125	2005492	4,20	335	60*40*45	3
250*140	2005493	4,23	335	60*40*45	3
250*160	2005494	4,27	315	60*40*45	3
250*180	2005495	4,68	340	60*40*45	3
250*200	2005496	4,84	340	60*40*45	3
250*225	2005497	6,20	365	60*40*45	2
280*125	2005502	5,60	345	60*40*45	2
280*140	2005503	5,60	345	60*40*45	2
280*160	2005504	5,80	345	60*40*45	2
280*180	2005505	5,60	345	60*40*45	2
280*200	2005506	6,80	365	60*40*45	2
280*225	2005507	7,20	365	60*40*45	2
280*250	2005508	8,00	385	60*40*45	2
315*180	2005515	10,20	380	60*40*45	2
315*200	2005516	10,60	380	60*40*45	2
315*225	2005517	10,70	370	60*40*45	2
315*250	2005518	11,60	380	60*40*45	2
315*280	2005519	11,80	380	60*40*45	2
355*180	2005526	13,20	370	60*40*45	1
355*200	2005527	13,70	370	60*40*45	1
355*225	2005528	15,30	370	60*40*45	1
355*250	2005529	17,00	370	60*40*45	1
355*280	2005530	13,00	370	60*40*45	1
355*315	2005531	13,20	380	60*40*45	1
400*250	2005538	20,10	390	60*40*45	1
400*280	2005539	21,00	400	60*40*45	1
400*315	2005540	18,50	400	60*40*45	1
400*355	2005541	19,30	410	60*40*45	1
450*250	2005545	26,00	440	*	
450*280	2005546	26,20	440	*	

EF-METRIK
EF-METRICSPIGOT-METRIK
SPIGOT-METRICAKIŞ KONTROL-METRIK
FLOW CONTROL-METRICEF-IPS
EF-IPSAKIŞ KONTROL-IPS
FLOW CONTROL-IPSMAKİNE-APARATLAR
MACHINE-TOOLMONTAJ
INSTALLATIONTEKNİK
TECHNICAL



REDUCER / REDÜKSİYON

SDR11 PE100

GAS/GAZ : 10BAR

WATER/SU : 16 BAR

TYPE/TİP : SPIGOT

d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
450*315	2005547	25,50	440	*	
450*355	2005548	25,60	440	*	
450*400	2005549	27,70	450	*	
500*315	2005556	35,00	460	*	
500*355	2006226	33,90	460	*	
500*400	2005557	32,00	470	*	
500*450	2005558	32,00	470	*	
560*355	2005560	45,00	500	*	
560*400	2005561	43,80	500	*	
560*450	2005562	42,00	500	*	
560*500	2005563	44,00	500	*	
630*500	2005423	56,00	530	*	
630*560	2005569	60,00	540	*	
710*560	2005573	74,00	550	*	
710*630	2005573	78,00	550	*	
800*630	2006227	98,00	570	*	
800*710	2005574	100,00	570	*	
900*710	2006228	154,00	620	*	
900*800	2006229	150,00	620	*	

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

SPIGOT-METRIC SPIGOT-METRİK



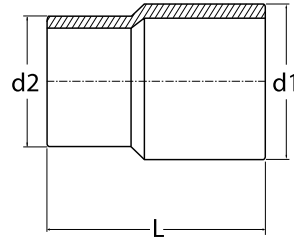
REDUCER (SHORT) / REDÜKSİYON (KISA)

SDR11 PE100

GAS/GAZ : 10BAR

WATER/SU : 16 BAR

TYPE/TİP : SPIGOT



d1*d2	CODE	Kg.	L(mm)	box sizes	nos/box
280*250	2006230	7,20	250	60*40*45	2
315*180	2006231	9,20	250	60*40*45	2
315*200	2006232	9,40	250	60*40*45	2
315*225	2006233	9,50	250	60*40*45	2
315*250	2006234	8,70	250	60*40*45	2
315*280	2006235	8,80	250	60*40*45	1
355*180	2006236	12,00	280	60*40*45	1
355*200	2006237	12,50	280	60*40*45	1
355*225	2006238	14,10	280	60*40*45	1
355*250	2006239	15,80	270	60*40*45	1
355*280	2006240	11,50	270	60*40*45	1
355*315	2006241	11,60	260	60*40*45	1
400*250	2006242	17,00	300	60*40*45	1
400*280	2006243	18,00	290	60*40*45	1
400*315	2006244	15,50	280	60*40*45	1
400*355	2006245	16,30	270	60*40*45	1
450*250	2006246	22,00	320	*	
450*280	2006247	22,20	310	*	
450*315	2006248	23,10	300	*	
450*355	2006249	23,60	290	*	
450*400	2006250	23,80	280	*	
500*315	2006251	30,00	310	*	
500*355	2006252	28,90	300	*	
500*400	2006253	25,20	290	*	
500*450	2006254	24,30	280	*	
560*355	2006255	39,10	320	*	
560*400	2006256	37,70	320	*	
560*450	2006257	38,00	300	*	

EF-METRIC
EF-METRIC

SPIGOT-METRIC
SPIGOT-METRIC

AKIŞ KONTROL-METRIC
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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	2006258	40,00	290	*	
630*500	2006259	48,30	320	*	
630*560	2006260	51,70	300	*	
710*560	2006261	63,20	320	*	
710*630	2006262	64,50	300	*	
800*630	2006263	89,30	360	*	
800*710	2006264	90,70	340	*	
900*710	2006265	140,30	370	*	
900*800	2006266	144,80	350	*	

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

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

SPIGOT-METRIC SPIGOT-METRİK



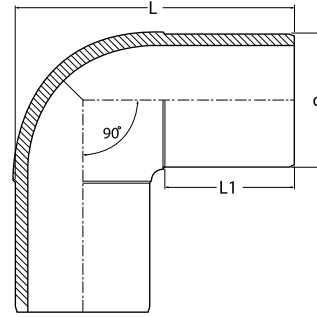
ELBOW (90°) / DİRSEK (90°)

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	2007527	0,26	167	63	30*40*30	24
75	2007528	0,58	184	88	60*40*30	24
90	2007529	0,59	187	90	60*40*30	24
110	2007530	0,80	225	90	60*40*30	10
125	2007531	1,20	240	108	60*40*30	10
140	2007532	1,50	240	100	60*40*45	10
160	2007533	2,30	288	112	60*40*45	6
180	2007534	4,10	335	135	60*40*45	4
200	2007535	4,40	335	121	60*40*45	4
225	2007537	6,80	370	140	60*40*30	2
250	2007539	6,60	410	150	60*40*45	2
280	2007708	14,50	460	150	60*40*45	2
315	2007542	20,70	485	150	60*40*33	1

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

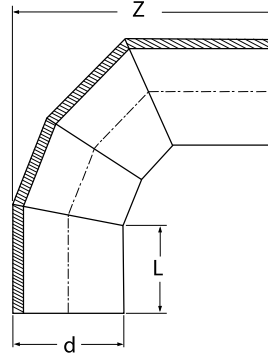
MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	2007743	0,64	110	264	1
110	2007744	1,06	115	293	1
125	2007725	1,42	120	305	1
140	2007546	1,93	125	330	1
160	2007547	2,64	130	345	1
180	2007548	3,55	135	368	1
200	2007549	5,40	145	463	1
225	2007550	7,10	150	481	1
250	2007551	9,45	160	518	1
280	2007552	12,43	170	542	1
315	2007553	16,41	180	562	1
355	2007554	22,65	195	611	1
400	2007555	30,60	210	649	1
450	2007556	41,22	225	689	1
500	2007557	57,04	245	775	1
560	2007558	97,15	305	1.070	1
630	2007559	126,96	305	1.105	1
710	2007560	167,03	305	1.145	1
800	2007561	223,54	320	1.205	1
900	2007562	302,84	350	1.285	1
1000	2007563	387,96	350	1.335	1

SPIGOT-METRIC SPIGOT-METRİK



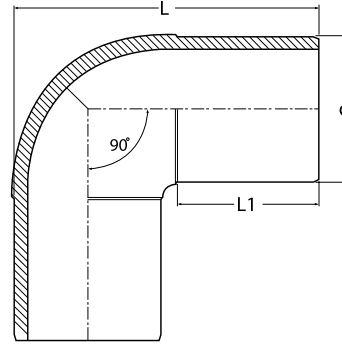
ELBOW (90°) / DİRSEK (90°)

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	2007565	0,02	36	60	30*40*15	100
25	2007566	0,03	43	80	30*40*15	100
32	2007567	0,05	50	90	30*40*30	60
40	2007568	0,08	53	100	30*40*30	40
50	2007569	0,31	57	163	30*40*30	40
63	2007570	0,30	63	167	30*40*30	24
75	2007571	0,66	88	184	60*40*30	24
90	2007572	0,64	90	187	60*40*30	24
110	2007574	1,06	90	225	60*40*30	10
125	2007575	1,44	108	240	60*40*30	10
140	2007576	1,74	100	240	60*40*45	10
160	2007578	2,80	112	288	60*40*45	6
180	2007580	5,00	135	335	60*40*45	4
200	2007581	5,00	121	335	60*40*45	4
225	2007583	7,80	140	370	60*40*30	1
250	2007585	10,70	160	410	60*40*45	1
280	2007587	13,20	150	460	60*40*45	1
315	2007589	24,20	150	485	**	

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

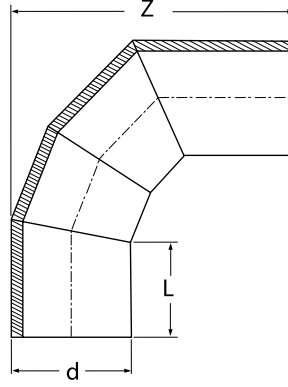
MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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

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



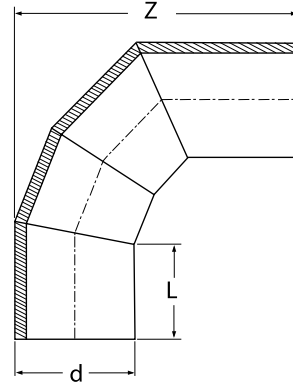
d	CODE	Kg.	L (mm)	Z (mm)
90	2007766	0,95	110	264
110	2007767	1,55	115	293
125	2007600	2,10	120	305
140	2007601	2,85	125	330
160	2007602	3,88	130	345
180	2007603	5,22	135	368
200	2007604	7,95	145	463
225	2007605	10,45	150	481
250	2007606	13,90	160	518
280	2007607	18,29	170	542
315	2007608	24,12	180	562
355	2007609	33,30	195	611
400	2007610	45,00	210	649
450	2007611	60,63	225	689
500	2007612	83,88	245	775
560	2007613	143,06	305	1.070
630	2007714	186,82	305	1.105
710	2007615	245,63	305	1.145
800	2007616	328,73	320	1.205
900	2007617	445,35	350	1.285
1000	2007768	570,53	350	1.335

SPIGOT-METRIC SPIGOT-METRİK



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	2007747	1,27	90	275	1
140	2007748	1,69	91	297	1
160	2007749	2,31	93	309	1
180	2007750	3,15	100	333	1
200	2007751	4,98	115	433	1
225	2007752	6,34	107	438	1
250	2007753	8,36	110	468	1
280	2007754	10,95	115	487	1
315	2007755	14,32	120	502	1
355	2007756	19,86	132	548	1
400	2007757	27,52	155	594	1
450	2007758	36,97	165	629	1
500	2007759	52,66	195	725	1
560	2007760	97,15	305	1.070	1
630	2007761	126,96	305	1.105	1
710	2007762	167,03	305	1.145	1
800	2007763	220,17	305	1.190	1
900	2007764	290,06	305	1.240	1
1000	2007765	372,19	305	1.290	1

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

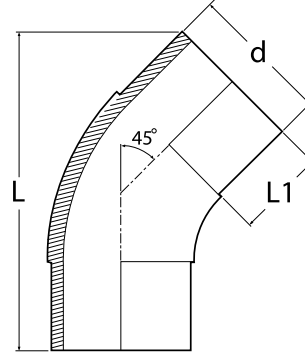
ELBOW (45°) / DİRSEK (45°)

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	2007225	0,16	160	65	40*30*30	30
75	2007226	0,38	210	88	60*40*30	30
90	2007227	0,39	215	90	60*40*30	25
110	2007228	0,69	250	92	60*40*30	15
125	2007229	1,00	285	100	60*40*30	10
140	2007230	2,10	315	115	60*40*45	10
160	2007231	2,00	320	115	60*40*45	6
180	2007232	3,20	360	120	60*40*45	4
200	2007233	3,60	360	120	60*40*45	4
225	2007234	5,40	450	140	60*40*45	2
250	2007235	6,00	450	140	60*40*30	1
280	2007236	9,40	450	140	**	1
315	2007238	16,20	500	150	**	1

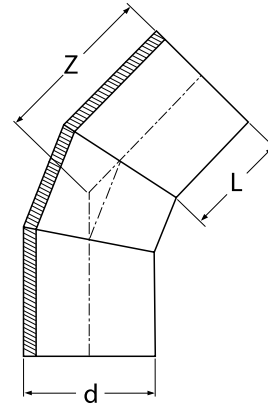
(**) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. No box is used. (Only Euro pallets are being used.)

SPIGOT-METRIC SPIGOT-METRİK



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	2007796	0,87	90	164
140	2007797	1,16	91	174
160	2007727	1,57	93	180
180	2007352	2,14	100	194
200	2007353	3,30	115	243
225	2007354	4,12	107	240
250	2007355	5,25	110	248
280	2007356	6,89	115	259
315	2007357	9,13	120	271
355	2007358	12,60	132	294
400	2007359	17,78	155	327
450	2007360	24,10	165	350
500	2007361	34,56	195	406
560	2007728	65,27	305	613
630	2007729	84,55	305	627
710	2007730	110,20	305	644
800	2007731	143,93	305	662
900	2007732	187,80	305	683
1000	2007733	238,80	305	704

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

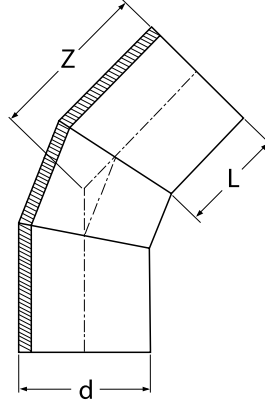
AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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



d	CODE	Kg.	L(mm)	Z (mm)
125	2007792	1,04	120	194
140	2007793	1,40	125	208
160	2007290	1,90	130	217
180	2007291	2,54	135	229
200	2007292	3,71	145	273
225	2007293	4,88	150	283
250	2007294	6,35	160	298
280	2007295	8,40	170	314
315	2007296	11,22	180	331
355	2007297	15,38	195	357
400	2007298	20,86	210	382
450	2007299	28,35	225	410
500	2007300	38,95	245	456
560	2007301	65,28	305	613
630	2007734	84,55	305	627
710	2007303	110,20	305	644
800	2007304	147,29	320	677
900	2007305	200,58	350	728
1000	2007306	254,60	350	749

SPIGOT-METRIC SPIGOT-METRİK



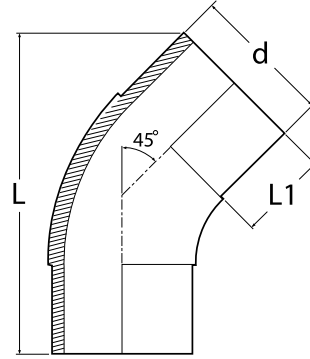
ELBOW (45°) / DİRSEK (45°)

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	2007245	0,02	36	80	40*30*15	150
25	2007246	0,03	43	100	40*30*15	150
32	2007247	0,04	50	115	40*30*30	100
40	2007248	0,07	53	130	40*30*30	80
50	2007249	0,11	57	140	40*30*30	50
63	2007250	0,19	65	160	40*30*30	30
75	2007251	0,44	88	210	60*40*30	30
90	2007253	0,49	90	215	60*40*30	25
110	2007255	0,88	92	250	60*40*30	15
125	2007257	1,20	100	285	60*40*30	10
140	2007258	2,60	115	315	60*40*45	10
160	2007260	2,47	115	320	60*40*45	6
180	2007261	3,80	120	360	60*40*45	5
200	2007262	4,24	120	360	60*40*45	4
225	2007263	6,50	140	450	60*40*45	2
250	2007265	7,20	140	450	60*40*30	1
280	2007266	17,40	140	450	**	1
315	2007268	17,20	150	500	**	1

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

EF-METRIC
EF-METRIC

SPIGOT-METRIC
SPIGOT-METRIC

AKIŞ KONTROL-METRIC
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

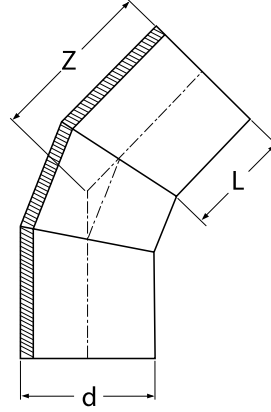
AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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



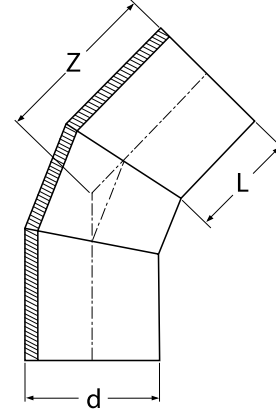
d	CODE	Kg.	L(mm)	Z (mm)
90	2007798	0,70	110	171
110	2007799	1,13	115	186
125	2007800	1,53	120	194
140	2007801	2,05	125	208
160	2007310	2,80	130	217
180	2007311	3,73	135	229
200	2007312	5,46	145	273
225	2007313	7,17	150	283
250	2007314	9,33	160	298
280	2007315	12,35	170	314
315	2007316	16,50	180	331
355	2007317	22,61	195	357
400	2007318	30,68	210	382
450	2007319	41,70	225	410
500	2007320	57,27	245	456
560	2007321	96,00	305	613
630	2007735	124,34	305	627
710	2007323	162,06	305	644
800	2007324	216,60	320	677
900	2007325	294,96	350	728
1000	2007802	374,41	350	749

SPIGOT-METRIC SPIGOT-METRİK



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	2007802	0,57	80	141
110	2007803	0,98	90	161
125	2007804	1,29	90	164
140	2007805	1,71	91	174
160	2007736	2,31	93	180
180	2007737	3,15	100	194
200	2007379	4,84	115	243
225	2007382	6,05	107	240
250	2007383	7,72	110	248
280	2007362	10,13	115	259
315	2007363	13,43	120	271
355	2007364	18,52	132	294
400	2007365	26,15	155	327
450	2007366	35,44	165	350
500	2007367	50,83	195	406
560	2007738	96,00	305	613
630	2007739	124,34	305	627
710	2007740	162,06	305	644
800	2007741	211,65	305	662
900	2007742	276,18	305	683
1000	2007806	351,21	305	704

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

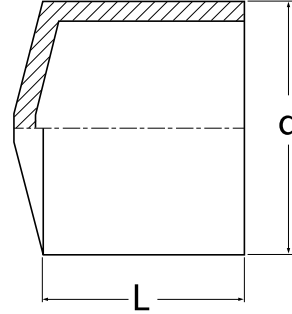
END CAP / KEP

SDR17 PE100

GAS/GAZ : 6 BAR

WATER/SU : 10 BAR

TYPE/TİP : SPIGOT



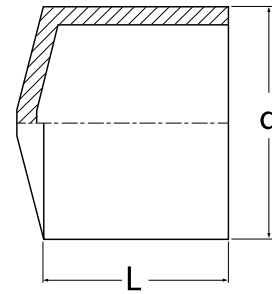
d	CODE	Kg.	L (mm)	box sizes	nos/box
63	2010008	0,08	70	40*30*30	50
75	2010009	0,14	77	40*30*30	50
90	2010010	0,19	72	40*30*30	36
110	2010011	0,30	88	60*40*30	48
125	2010012	0,43	87	60*40*30	40
140	2010013	0,60	98	60*40*30	16
160	2010014	0,72	93	60*40*30	14
180	2010015	1,16	116	60*40*30	12
200	2010016	1,41	115	60*40*30	12
225	2010017	1,95	130	60*40*30	7
250	2010018	3,22	140	60*40*30	4
280	2010019	3,86	157	60*40*30	4
315	2010020	4,92	170	60*40*30	2
355	2010021	5,90	170	60*40*45	1
400	2010022	7,06	200	*	*
450	2010023	11,10	200	*	*
500	2010024	12,20	230	*	*
560	2010077	18,15	270	*	*
630	2010025	22,30	270	*	*
710	2010078	30,00	270	*	*

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

SPIGOT-METRIC SPIGOT-METRİK



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



d	CODE	Kg.	L (mm)	box sizes	nos/box
20	2010026	0,01	29	40*30*15	300
25	2010027	0,01	35	40*30*15	250
32	2010028	0,01	38	40*30*15	150
40	2010029	0,03	47	40*30*15	100
50	2010030	0,04	56	40*30*15	75
63	2010031	0,09	70	40*30*15	50
75	2010032	0,17	77	40*30*30	50
90	2010033	0,22	72	40*30*30	36
110	2010034	0,36	88	60*40*30	48
125	2010035	0,52	87	60*40*30	40
140	2010036	0,72	98	60*40*30	16
160	2010037	0,87	93	60*40*30	14
180	2010038	1,39	116	60*40*30	12
200	2010039	1,70	115	60*40*30	12
225	2010040	2,34	130	60*40*30	7
250	2010041	3,86	140	60*40*30	4
280	2010042	4,63	157	60*40*30	4
315	2010043	5,90	170	60*40*30	2
355	2010044	9,30	170	60*40*45	1
400	2010045	10,36	200	*	*
450	2010079	11,51	200	*	*
500	2010046	16,66	230	*	*
560	2010047	24,86	270	*	*
630	2010080	29,90	270	*	*
710	2010081	40,10	270	*	*

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

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

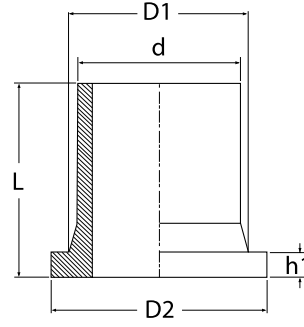
FLANGE ADAPTOR / FLANŞ ADAPTÖR

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	2011034	0,20	115	72	102	14	30*40*30	30
75	2011035	0,32	125	86	122	16	30*40*30	20
90	2011037	0,38	130	100	138	16	60*40*30	30
110	2011039	0,50	140	125	158	18	60*40*30	24
125	2011040	0,75	175	125	158	25	60*40*45	24
140	2011041	0,95	165	150	188	25	60*40*45	12
160	2011043	1,38	190	170	212	25	60*40*45	12
180	2011045	1,51	180	180	212	30	60*40*45	12
200	2011046	2,47	200	225	268	32	60*40*45	6
225	2011047	2,51	205	230	268	32	60*40*45	4
250	2011048	3,94	225	280	320	36	60*40*30	2
280	2011049	4,38	250	286	320	36	60*40*30	2
315	2011050	6,00	260	335	370	36	60*40*45	2
355	2011052	8,50	260	370	430	40	60*40*45	2
400	2011053	11,20	280	425	482	46	60*40*45	1
450-A	2011055	16,50	325	510	585	60	60*60*33	1
450-B	2011350	16,50	325	458	585	60	60*60*33	1
500	2011056	22,60	335	525	585	60	*	
560	2011057	31,00	360	610	685	60	*	
630	2011059	35,40	360	640	685	60	*	
710	2011061	43,00	370	730	800	60	*	
800	2011062	48,40	380	840	905	60	*	
900	2011064	74,00	390	944	1005	60	*	
1000	2011065	105,00	420	1047	1110	60	*	
1200	2011066	157,60	450	1245	1330	60	*	
1400	2011067	201,00	-	-	-	-	*	
1600	2011068	282,20	-	-	-	-	*	

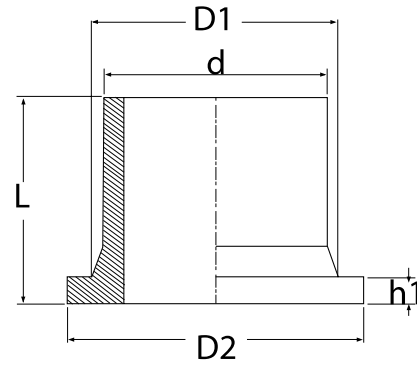
(*) : Karton kutu kullanılmaz.Sadece Euro paletler kullanılmaktadır. *No box is used. (Only Euro pallets are being used.)*

SPIGOT-METRIC SPIGOT-METRİK



FLANGE ADAPTOR (SHORT) FLANŞ ADAPTÖR (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	2011072	0,95	134	150	188	26	60x40x30	12
160	2011073	1,10	134	170	210	25	60x40x30	12
200	2011075	2,20	142	225	268	32	60x40x45	6
355	2011080	3,96	180	370	430	40	60x40x45	1
400	2011081	5,89	191	425	482	46	60x40x45	1
450-A	2011082	13,80	220	510	560	60	60x60x33	1
450-B	2011387	13,80	220	458	560	60	60x60x33	1
500	2011083	16,85	210	525	585	60	*	
560	2011084	21,90	240	610	685	60	*	
630	2011085	23,50	220	640	685	60	*	
710	2011086	32,00	230	730	800	60	*	
800	2011087	34,60	230	840	905	60	*	
900	2011088	46,20	270	940	1005	60	*	
1000	2011089	53,00	290	1047	1110	60	*	
1200	2011090	68,80	310	1245	1330	60	*	
1400	2011091	-	-	-	-	-	*	
1600	2011092	-	-	-	-	-	*	

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

EF-METRIC
EF-METRIC

SPIGOT-METRIC
SPIGOT-METRIC

AKIŞ KONTROL-METRIC
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

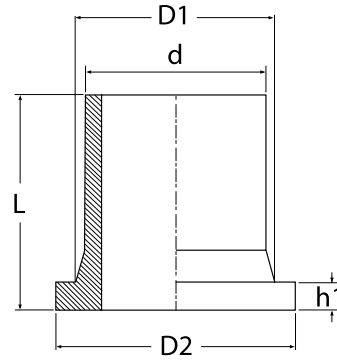
FLANGE ADAPTOR / FLANŞ ADAPTÖR

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	2011103	0,03	75	25	45	7	30*40*15	90
25	2011104	0,06	85	33	58	9	30*40*15	85
32	2011105	0,07	75	40	66	9	30*40*15	75
40	2011106	0,09	95	50	78	11	30*40*30	70
50	2011107	0,13	98	60	88	12	30*40*30	70
63	2011108	0,18	115	72	102	14	30*40*30	30
75	2011109	0,33	125	86	122	16	30*40*30	20
90	2011111	0,48	130	100	138	16	60*40*30	30
110	2011113	0,68	140	125	158	18	60*40*30	24
125	2011115	0,99	175	125	160	25	60*40*45	24
140	2011116	1,25	165	150	188	26	60*40*45	12
160	2011118	1,85	190	170	210	25	60*40*45	12
180	2011119	1,95	180	180	210	30	60*40*45	12
200	2011120	3,20	200	225	268	32	60*40*45	6
225	2011121	3,44	205	230	268	32	60*40*45	4
250	2011122	5,26	225	280	320	36	60*40*30	2
280	2011123	6,12	250	286	320	36	60*40*30	2
315	2011124	8,35	260	335	370	36	60*40*45	2
355	2011125	10,40	260	370	430	40	60*40*45	1
400	2011126	15,40	280	425	482	46	60*40*45	1
450-A	2011128	26,80	325	510	585	60	60*60*33	1
450-B	2011384	25,10	325	458	550	60	60*60*33	1
500	2011129	32,20	335	525	585	60	*	
560	2011130	47,80	360	610	685	60	*	
630	2011131	51,50	360	640	685	60	*	
710	2011132	69,50	370	730	800	60	*	
800	2011133	84,10	380	840	905	60	*	
900	2011134	107,80	400	944	1005	60	*	

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

SPIGOT-METRIC SPIGOT-METRİK



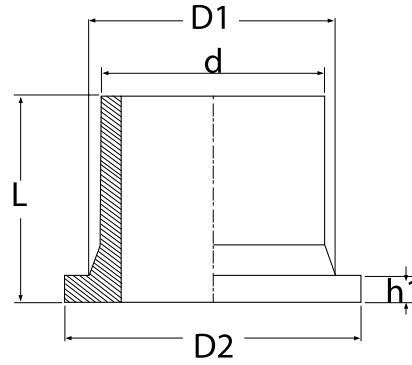
FLANGE ADAPTOR (SHORT) FLANŞ ADAPTÖR (KISA)

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	2011143	1,20	134	150	188	26	60x40x30	12
160	2011144	1,45	134	170	210	25	60x40x30	12
200	2011146	2,75	142	225	268	32	60x40x45	6
355	2011151	6,17	180	370	430	40	60x40x45	1
400	2011152	11,50	191	425	482	46	60x40x45	1
450-A	2011153	20,10	220	510	560	60	60x60x33	1
450-B	2011383	20,10	220	458	560	60	60x60x33	1
500	2011154	22,60	210	525	585	60	*	1
560	2011155	31,10	240	610	685	60	*	*
630	2011156	32,40	220	640	685	60	*	*
710	2011157	39,30	230	730	800	60	*	*
800	2011158	53,20	230	840	905	60	*	*
900	2011159	71,00	240	944	1000	60	*	*

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

EF-METRIC
EF-METRIC

SPIGOT-METRIC
SPIGOT-METRIC

AKIŞ KONTROL-METRIC
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

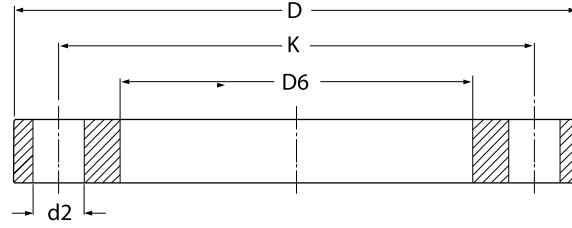
AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-T00L

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLANGE/FLANŞ PN16 ELECTROGALVANIZED STEEL GALVANİZ KAPLAMA ÇELİK

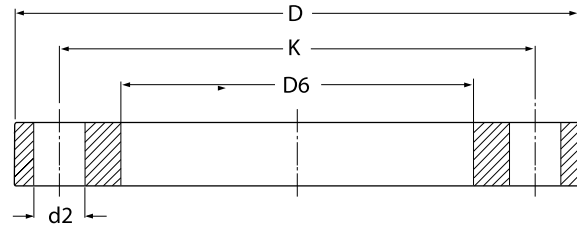


Steel Nominal DN	PE Equivalent d	D6(mm)	K(mm)	D(mm)	D2(mm)	n ad	kg
15	20	28	65	95	14	4	0,6
20	25	34	75	105	14	4	1,0
25	32	42	85	115	14	4	1,1
32	40	51	100	140	18	4	1,6
40	50	62	110	150	18	4	1,7
50	63	78	125	165	18	4	2,2
65	75	92	145	185	18	4	2,8
80	90	108	160	200	18	8	3,2
100	110	128	180	220	18	8	3,6
100	125	135	180	220	18	8	3,4
125	140	158	210	250	18	8	4,6
150	160	178	240	285	23	8	6,4
150	180	188	240	285	23	8	5,8
200	200	235	295	340	23	12	8,0
200	225	238	295	340	23	12	7,8
250	250	288	355	405	27	12	11,8
250	280	294	355	405	27	12	11,2
300	315	338	410	465	27	12	16,2
350	355	376	470	520	27	16	22,8
400	400	430	525	580	30	16	28,4
450	450	462	585	640	30	20	45,1
500	450	517	650	715	33	20	49,4
500	500	533	650	715	33	20	43,6
600	560	618	770	840	36	20	66,2
600	630	645	770	840	36	20	58,4
700	710	740	840	910	39	24	56,6
800	800	843	950	1025	39	24	59,0
900	900	947	1050	1125	39	28	84,5
1000	1000	1050	1170	1255	42	28	115,0
1200	1200	1260	1390	1485	48	32	172,0
1400	1400	1436	1590	1685	48	36	240,0
1600	1600	1640	1820	1930	56	40	343,0

SPIGOT-METRIC SPIGOT-METRİK

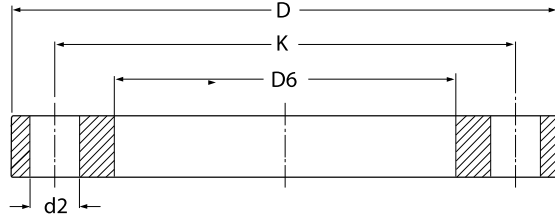


FLANGE/FLANŞ PN10 ELECTROGALVANIZED STEEL GALVANİZ KAPLAMA ÇELİK



Steel Nominal DN	PE Equivalent d	D6(mm)	K(mm)	D(mm)	D2(mm)	n ad	kg
15	20	28	65	95	14	4	0,6
20	25	34	75	105	14	4	1,0
25	32	42	85	115	14	4	1,1
32	40	51	100	140	18	4	1,6
40	50	62	110	150	18	4	1,7
50	63	78	125	165	18	4	2,2
65	75	92	145	185	18	4	2,8
80	90	108	160	200	18	8	3,2
100	110	128	180	220	18	8	3,6
100	125	135	180	220	18	8	3,4
125	140	158	210	250	18	8	4,6
150	160	178	240	285	23	8	6,4
150	180	188	240	285	23	8	5,8
200	200	235	295	340	23	8	8,4
200	225	238	295	340	23	8	8,2
250	250	288	350	390	23	12	11,6
250	280	294	350	395	23	12	10,4
300	315	338	400	445	23	12	13,0
350	355	376	460	505	30	16	17,8
400	400	430	515	565	30	16	20,8
450-A	450	470	565	615	30	20	25,3
450-B	450	517	620	670	30	20	30,0
500	500	533	620	670	30	20	26,8
600	560	618	725	780	30	20	36,4
600	630	645	725	780	30	20	30,4
700	710	740	840	895	30	24	44,6
800	800	843	950	1015	33	24	60,0
900	900	947	1050	1115	33	28	65,5
1000	1000	1050	1160	1230	36	28	80,6
1200	1200	1260	1380	1455	39	32	136,0
1400	1400	1436	1590	1675	42	36	194,0
1600	1600	1640	1890	1915	48	40	282,0

FLANGE/FLANŞ PN6 ELECTROGALVANIZED STEEL GALVANİZ KAPLAMA ÇELİK

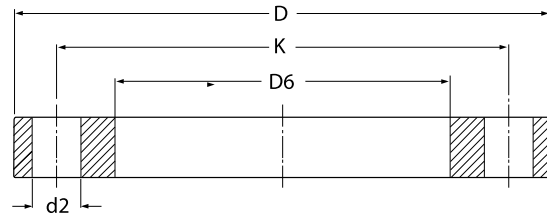


Steel Nominal DN	PE Equivalent d	D6(mm)	K(mm)	D(mm)	D2(mm)	n ad	kg
15	20	28	55	80	11	4	0,2
20	25	34	65	90	11	4	0,4
25	32	42	75	100	11	4	0,5
32	40	51	90	120	14	4	0,7
40	50	62	100	130	14	4	0,9
50	63	78	110	140	14	4	1,0
65	75	92	130	160	14	4	1,5
80	90	108	150	190	18	4	2,0
100	110	128	170	210	18	4	2,3
100	125	135	170	210	18	8	2,1
125	140	158	200	240	18	8	3,3
150	160	178	225	285	18	8	4,0
150	180	188	225	265	18	8	3,6
200	200	235	225	320	18	8	5,9
200	225	238	280	320	18	12	5,7
250	250	288	335	275	18	12	8,6
250	280	294	335	375	18	12	8,1
300	315	338	395	440	22	12	11,6
350	355	376	445	490	22	12	15,5
400	400	430	495	540	22	16	18,0
450	450	517	495	645	22	20	33,1
500	500	533	600	645	22	20	30,5
600	560	618	705	755	26	20	44,7
600	630	645	705	755	26	20	39,4
700	710	740	810	860	26	24	37,0
800	800	843	920	975	30	24	46,2
900	900	947	1020	1075	30	24	55,0
1000	1000	1050	1120	1175	30	28	71,2
1200	1200	1260	1340	1405	33	32	100,3
1400	1400	1436	1560	1630	36	36	138,0
1600	1600	1640	1760	1830	36	40	196,3

SPIGOT-METRIC SPIGOT-METRİK



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
80	90	2013074	108	160	200	18	8	3,2
100	110	2013075	128	180	220	18	8	3,6
100	125	2013076	135	180	220	18	8	3,4
150	160	2013077	178	240	285	23	8	6,4
150	180	2013078	188	240	285	23	8	5,8

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

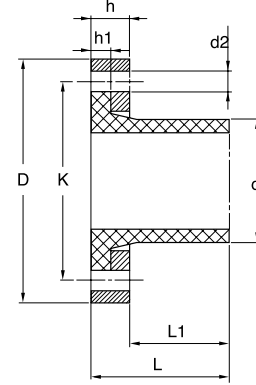
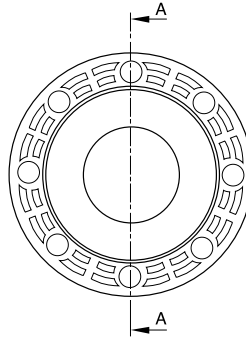
AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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



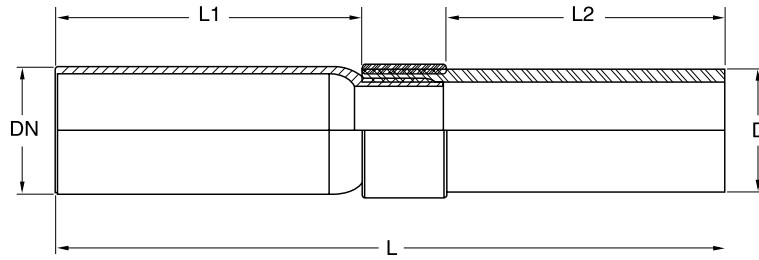
d	CODE	d2	D	K	L	L1	h	h1	n
90	2011339	18	198	157	121	82	34	16	8
110	2011341	19	112	179	129	94	31	18	8
125	2011343	19	1125	179	147	109	31	25	8
160	2013620	22	285	240	152	96	50	25	8
180	2013621	22	285	240	164	115	50	30	8

SPIGOT-METRIC SPIGOT-METRİK



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

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



D-DN	CODE	Kg.	L	L1	L2	TYPE
20-1/2"	2012000	0,5	217	46	137	B
25-3/4 "	2012002	0,7	217	50	137	A
32-1"	2012004	1,0	455	275	90	A
40-1 1/4"	2012009	0,7	243	85	111	B
50-1 1/2"	2012011	0,85	243	85	111	B
63 - 2"	2012015	2,4	530	295	145	A
90 - 3"	2012017	4,5	590	215	195	A
110-4"	2012019	10,2	755	320	265	B
125-4"	2012021	11,0	740	300	265	B
160-6"	2012027	27,8	725	275	240	B
180-6"	2012029	28,2	770	300	275	B
200-8"	2012031	57,6	790	300	275	B
225-8"	2012144	50,0	810	300	275	B
250-10"	2012145	60,0	750	365	285	B
280-10"	2012146	69,8	780	380	300	B
315-12"	2012147	70,4	810	395	310	B
355-14"	2012038	127,4	860	405	350	B
400-16"	2012148	190,3	950	415	410	B
450-18"	2012149	210,8	995	430	430	B
500-20"	2012150	282,9	1040	445	445	B

EF-METRIC
EF-METRIC

SPIGOT-METRIC
SPIGOT-METRIC

AKIŞ KONTROL-METRIC
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

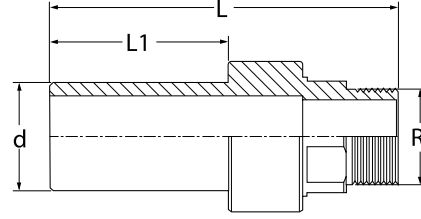
TEKNİK
TECHNICAL

PE-BRASS TRANSITION FITTING MALE (THREADED)

PE-PIRİNÇ GEÇİŞ FITİNGİ ERKEK (DİŞLİ)

WATER/SU : 16 BAR

TYPE/TİP : SPIGOT



d-R	CODE	Kg.	L	L1
20 - 1/2 "	2012071	0,10	90	45
20 - 3/4 "	2012070	0,13	90	45
25 - 3/4 "	2012073	0,13	90	45
32 - 1 "	2012077	0,24	110	48
32 - 3/4 "	2012074	0,24	110	48
32 - 1/2 "	2012075	0,24	110	48
40 - 1 1/4 "	2012079	0,35	115	55
50 - 1 1/2 "	2012082	0,43	125	65
63 - 2 "	2012087	0,57	140	72
75 - 2 1/2 "	2012053	2,2	134	70 *
90 - 3 "	2012090	1,46	180	80
100 - 4 "	2012091	2,45	220	93

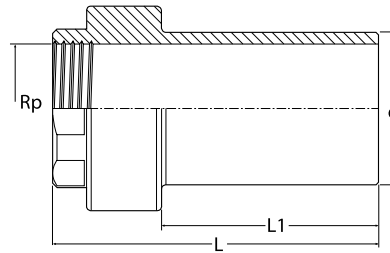
* Steel/ Çelik

PE-BRASS TRANSITION FITTING FEMALE (THREADED)

PE-PIRİNÇ GEÇİŞ FITİNGİ DİŞİ (DİŞLİ)

WATER/SU : 16 BAR

TYPE/TİP : SPIGOT



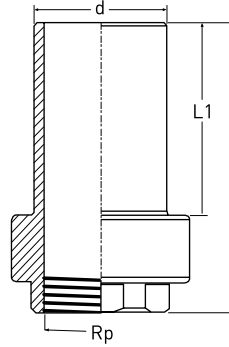
d-Rp	CODE	Kg.	L	L1
20-1/2"	2012098	0,08	78	45
25-3/4"	2012099	0,11	78	45
32 - 1"	2012100	0,18	90	48
40 - 1 1/4"	2012103	0,23	95	55
50 - 1 1/2"	2012105	0,32	105	65
63 - 2"	2012106	0,58	115	73

SPIGOT-METRIC SPIGOT-METRİK



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"	2012130	0,04	70	40
32 - 1"	2012116	0,05	80	45
50 - 1 1/2"	2012117	0,10	114	67
63 - 2"	2012118	0,15	124	74

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



AKIŞ KONTROL-METRİK

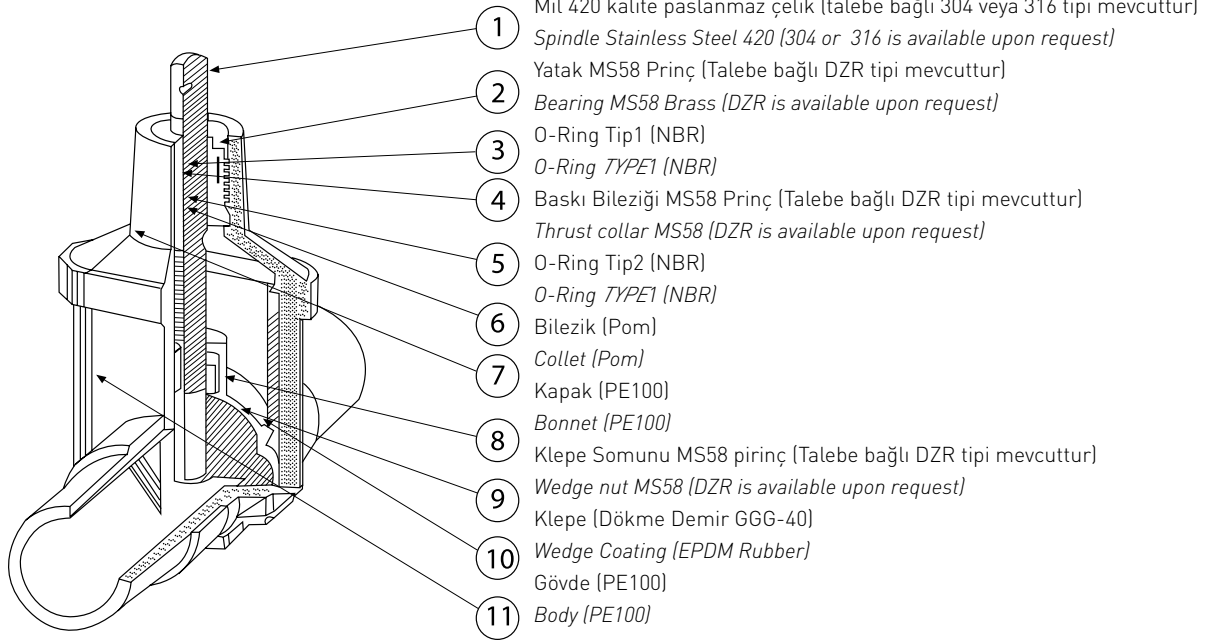
FLOW CONTROL-METRIC



FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



MALZEME LİSTESİ / MATERIAL LIST



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 altına ölçüler / *Face to face dimension*

Flanş için Delik Ebatı / *Drilling Dimension for Flange*

ISO 7005-2 [EN 1092-2]



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



SÜRGÜLÜ VANALAR GATE VALVES



PE SÜRGÜLÜ VANA BİR HAYAL MI?

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 HAYALI GERÇEKLEŞTİRİYOR

2005 yılından itibaren TEGA AR-GE grubu bu hayali gerçekleştirmek için yoğun bir çaba içerisinde girmiş ve sayısız hesaplama, analiz, deneme yapmıştır.

6 yıllık bu sürecin sonunda istenen teknik kriterlere ulaşılmış 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.

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



PE SÜRGÜLÜ VANANIN AVANTAJLARI

Dayanıklılık

- Gövde ve çıkışların tamamı PE
- Korozyon ve kimyasallara karşı yüksek dayanım
- Kınımlara 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

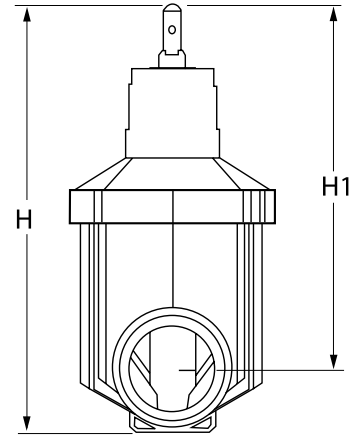
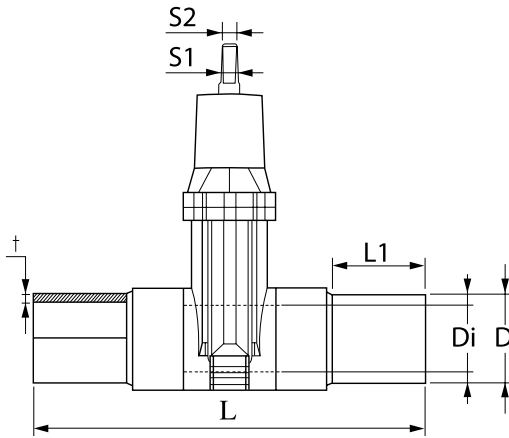
- Advanced design of engineering
- Processing of Sensitive Procurement
- High Quality Criteria
- 100% Quality Control



FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



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



Metrik (mm) / Metric size (mm)

ÜRÜN KODU PRODUCT CODE (420 SS+MS 58)	ÜRÜN KODU PRODUCT CODE (304 SS+DZR)	ÜRÜN KODU PRODUCT CODE (316 SS+DZR)	D	Di	L	L1	H	H1	t	S1	S2
2300111	2300115	2300119	32	25	254	88	224	200	3,4	15	12
2300112	2300116	2300120	40	31	276	93	238	214	4,2	15	12
2300113	2300117	2300121	50	40	320	103	260	225	5,2	17	14
2300008	2300055	2300056	63	51	370	115	300	255	6,5	17	14
2300009	2300004	2300057	75	61	380	125	345	300	7,6	20,5	17
2300010	2300005	2300002	90	73	430	160	400	335	9	20,5	17
2300011	2300006	2300003	110	90	640	160	430	365	11	23	19
2300013	2300058	2300059	125	90	640	160	430	365	11	23	19
2300114	2300118	2300122	140	130	805	215	570	480	14	23	19
2300015	2300007	2300060	160	130	805	215	570	480	16	23	19
2300016	2300061	2300062	180	130	805	215	570	480	16	23	19
2300017	2300063	2300064	200	130	805	235	570	480	18	23	19
2300018	2300065	2300065	225	130	805	235	570	480	20	23	19

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

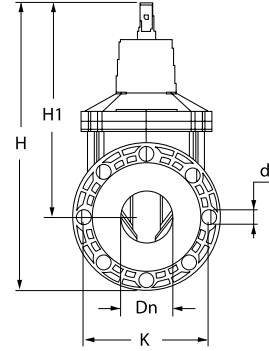
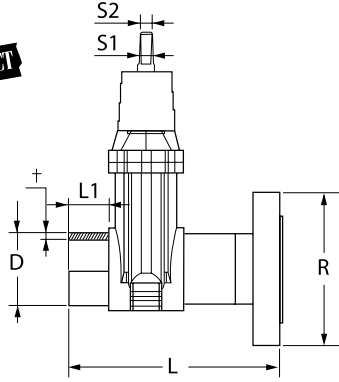
AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

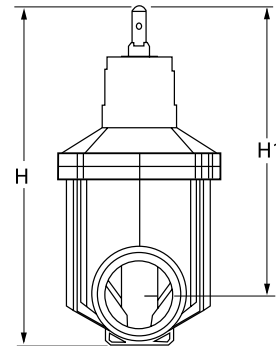
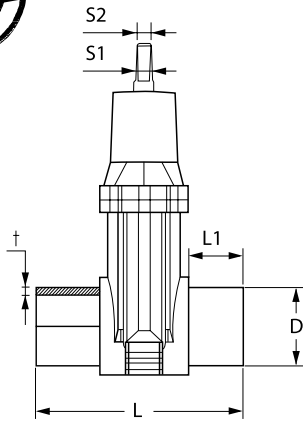
FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



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

Metrik (mm) / Metric size (mm)

ÜRÜN KODU PRODUCT CODE (420 SS+MS 58)	ÜRÜN KODU PRODUCT CODE (304 SS+DZR)	ÜRÜN KODU PRODUCT CODE (316 SS+DZR)	D	Dn	L	L1	H	H1	t	S1	S2
2300047	2300097	2300106	90	80	355	160	335	400	9	20,5	17
2300029	2300028	2300107	110	100	386	160	365	430	11	23	19
2300048	2300100	2300108	160	150	420	215	480	570	16	23	19



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

ÜRÜN KODU PRODUCT CODE (420 SS+MS 58)	ÜRÜN KODU PRODUCT CODE (304 SS+DZR)	ÜRÜN KODU PRODUCT CODE (316 SS+DZR)	D	L	L1	H	H1	t	S1	S2
2300050	2300080	2300084	90	265	80	365	310	9	20,5	17
2300023	2300022	2300021	110	293	90	430	375	11	23	19
2300024	2300040	2300051	160	340	95	540	460	16	23	19

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

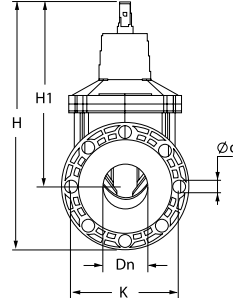
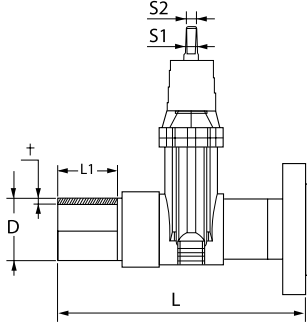
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



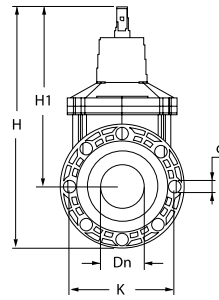
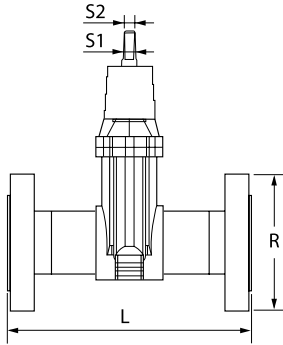
GATE VALVE - LONG SPIGOT / FLANGED SÜRGÜLÜ VANA - UZUN SPIGOT/FLANŞLI WATER / SU : PN16 PE100



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

ÜRÜN KODU PRODUCT CODE (420 SS+MS 58)	ÜRÜN KODU PRODUCT CODE (304 SS+DZR)	ÜRÜN KODU PRODUCT CODE (316 SS+DZR)	D	Dn	L	L1	H	H1	t	S1	S2	K	R	d/Qty
2300026	2300123	2300126	90	80	510	160	365	310	9	20,5	17	160	200	18/8
2300027	2300025	2300127	110	100	545	150	430	375	11	23	19	180	220	18/8
2300052	2300124	2300128	125	100	555	150	430	375	13	23	19	180	220	18/8
2300053	2300125	2300129	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

ÜRÜN KODU PRODUCT CODE (420 SS+MS 58)	ÜRÜN KODU PRODUCT CODE (304 SS+DZR)	ÜRÜN KODU PRODUCT CODE (316 SS+DZR)	Dn	PE'ye göre	L	R	H	H1	K	S1	S2	d/Qty
2300030	2300130	2300133	80	90	203	200	365	310	160	20,5	17	18/8
2300031	2300032	2300134	110	110	229	220	430	375	180	23	19	18/8
2300054	2300131	2300135	125	125	229	220	430	375	180	23	19	18/8
2300034	2300132	2300136	160	160	267	285	540	460	240	23	19	23/8

EF-METRİK
EF-METRIC

SPIGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



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



D	L1	R	H1	S1	S2
63	115	75...710	300	17	14
75	125	90...710	345	20,5	17
90	160	110...1600	400	20,5	17
110	160	125...1600	430	23	19
125	160	140..1600	430	23	19
140	215	160...1600	570	23	19
160	215	180...1600	570	23	19
180	215	200...1600	570	23	19
200	235	225...1600	570	23	19
225	235	250...1600	570	23	19

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

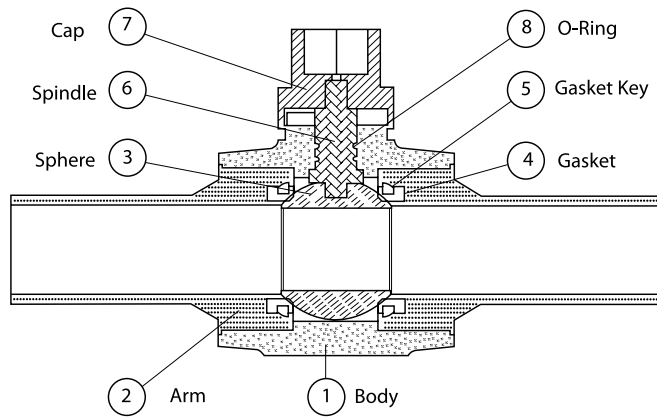
AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

COMPONENT LIST
MALZEME LİSTESİ



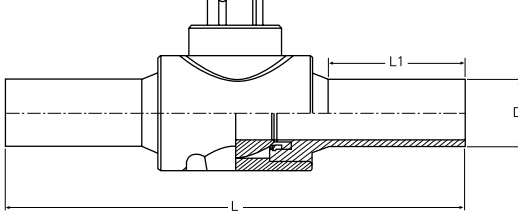
Parça No/Part No	Parça Adı/Part Name	Malzeme/Material
1	Gövde / Body	PE100
2	Kol / Arm	PE100
3	Küre / Sphere	POM/PE 100
4	Conta / GASKet	EPDM
5	Conta Kilidi / GASKet Key	PE 100
6	Mil / Spindle	POM
7	Kapak / Cap	POM
8	O-ring / O-ring	EPDM/NBR

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



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

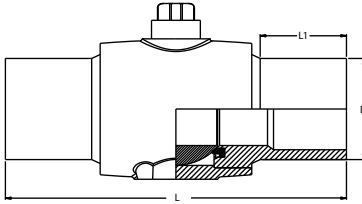
GAS/GAZ : 10 BAR
WATER/SU : 16 BAR PE100



D	CODE	L (mm)	L1 (mm)
20	2302024	280	70
25	2302025	250	60
32	2302026	270	65
40	2302027	360	100
50	2302028	360	100
63	2302029	370	110
75	2302030	420	125
90	2302031	510	115
110	2302032	520	125
125	2302033	530	130
140	2302034	610	155
160	2302035	620	160
180	2302103	745	210
200	2302104	780	210
225	2302105	865	230
250	2302106	865	230

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

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



D	CODE	L (mm)	L1 (mm)
180	2302045	620	160
200	2302047	620	160
225	2302048	620	160
280	2302101	865	230
315	2302102	885	240

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

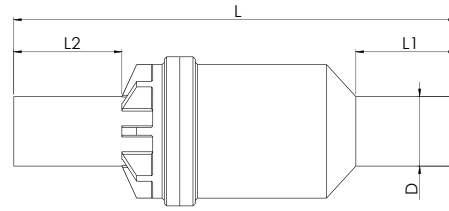
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

PE 100 CHECK VALVE

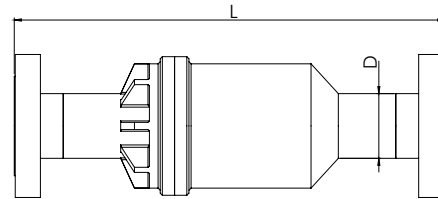


BALL CHECK VALVE KÜRELİ ÇEKVALF SDR11 PE100



CODE	D	L	L1	L2	AĞIRLIK
2303088	90	570	130	140	3,5
2303085	110	580	140	140	3,7

BALL CHECK VALVE - FLANGED KÜRELİ ÇEKVALF - FLANŞLI SDR11 PE100



CODE	D	L	AĞIRLIK
2303137	90	560	4,7
2303138	110	560	4,8

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

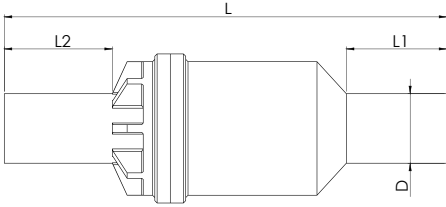
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK

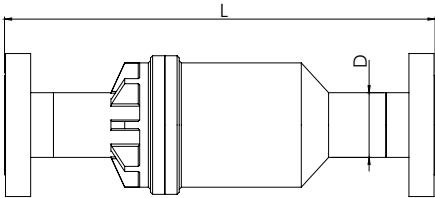


CHECK VALVE WITH SPRING YAYLI ÇEKVALF SDR11 PE100



CODE	D	L	L1	L2	AĞIRLIK
2303139	90	570	130	140	3,6
2303140	110	580	140	140	3,8

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



CODE	D	L	AĞIRLIK
2303141	90	560	4,8
2303142	110	560	5

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

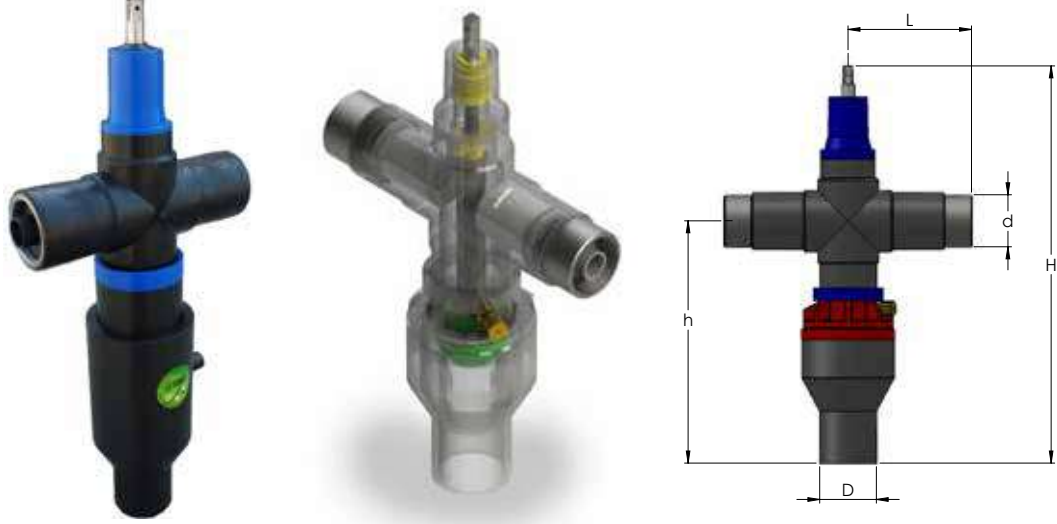
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

HYDRANT-HİDRANT

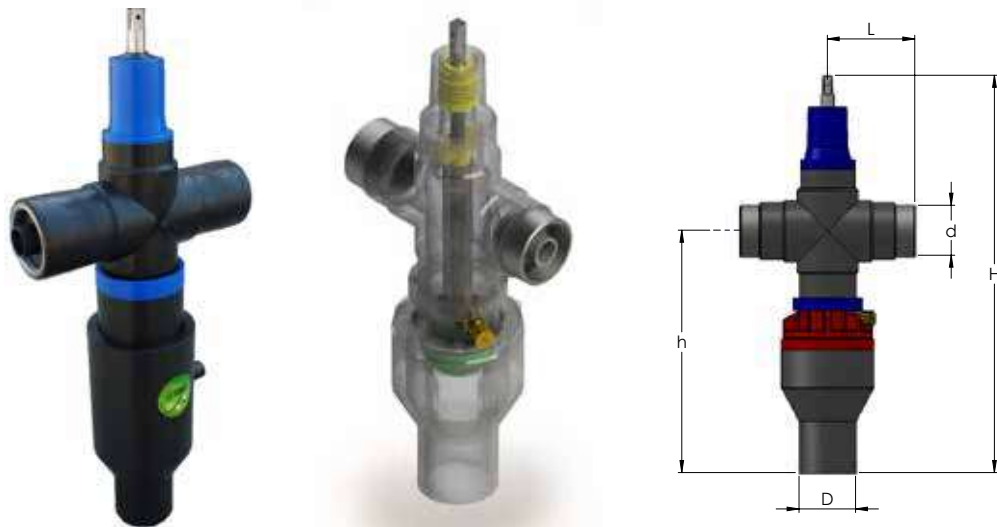


A TYPE IRRIGATION HYDRANT A TİPİ SULAMA HİDRANTI SDR11 PE100



CODE	Tip	D	d	H	h	L
2303075	A	110 (PE100)	65/80 (Dişli)	760	460	240
2303143	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
2303144	D	110 (PE100)	65/80 (Dişli)	760	460	170
2303145	D	160 (PE100)	100 (Dişli)	910	600	180

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

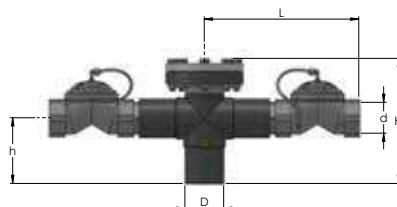
TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



H TYPE IRRIGATION HYDRANT H TİPİ SULAMA HİDRANTI

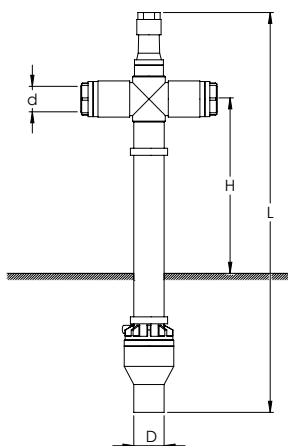
SDR11 PE100



CODE	Tip	D	d	H	h	L
2303132	H	110 (PE100)	80 (Dişli)	355	185	440

FIRE HYDRANT YANGIN HİDRANTI

SDR11 PE100



CODE	Tip	D	d	H	L
2303133	YANGIN	110 (PE100)	2 1/2	630	1435
2303134	HİDRANTI	110 (PE100)	2 1/2	630	1750
2303135		110 (PE100)	2 1/2	630	2150

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

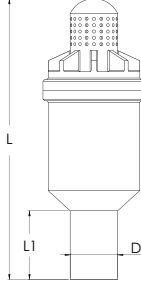
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

VANTUZ-AIR RELEASE

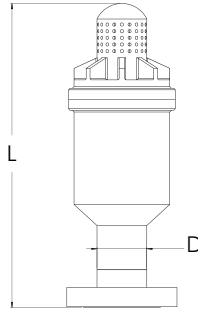


PE100 SINGLE BALL AIR RELEASE VALVE PE100 TEK KÜRELİ VANTUZ SDR11 PE100



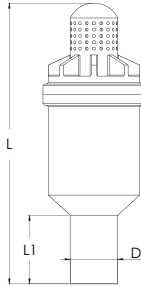
CODE	D	L	L1	AĞIRLIK
2303087	90	530	130	3,4
2303074	110	540	140	3,7

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



CODE	D	L	AĞIRLIK
2303146	90	530	4
2303147	110	530	4,3

NON SLAM DYNAMIC AIR RELEASE VALVE DİNAMİK VANTUZ DARBESİZ SDR11 PE100



CODE	D	L	L1	AĞIRLIK
2303086	90	530	130	4,1
2303073	110	540	140	4,4

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

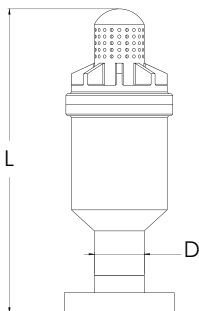
AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

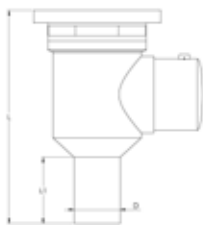
TEKNİK
TECHNICAL

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



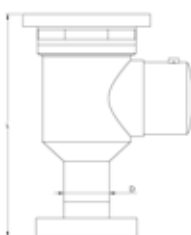
CODE	D	L	AĞIRLIK
2303148	90	530	4,7
2303149	110	530	5

DOUBLE BALL AIR RELEASE VALVE ÇİFT KÜRELİ VANTUZ SDR11 PE100



CODE	D	L	L1	AĞIRLIK
2303152	90	420	130	5,6
2303153	110	430	140	5,8

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



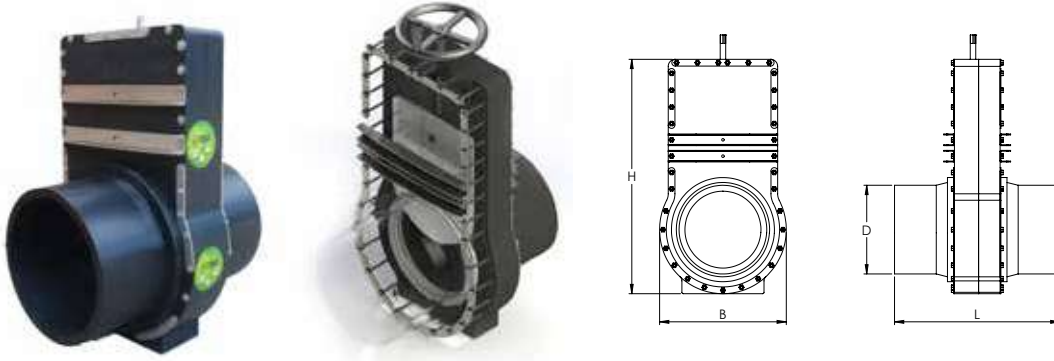
CODE	D	L	AĞIRLIK
2303150	90	420	6,2
2303151	110	420	6,3

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



KNIFE VALVE BIÇAK VANA PE100 SDR17-26

- No Groove
- Composit Blade
- Spigot Outlet
- PN 2-6 BAR



ÜRÜN KODU	D	H	B	L	BAR	SDR
2303097	110	451	139	420	6	SDR17
2303118	160	565	320	500	6	SDR17
2303098	160	565	320	500	6	SDR26
2303099	200	632	355	545	6	SDR26
2303105	225	678	377	545	6	SDR26
2303100	250	719	398	555	6	SDR26
2303103	280	767	425	555	6	SDR26
2303101	315	832	455	595	6	SDR26
2303104	355	912	495	630	6	SDR26
2303076	400	992	535	685	6	SDR26
2303113	450	1400	610	810	2	SDR26
2303114	500	1500	750	824	2	SDR26
2303115	560	1600	810	890	2	SDR26
2303116	630	1700	900	890	2	SDR26
2303117	710	1800	950	960	2	SDR26
2303118	800	2000	1000	960	2	SDR26

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

*d 355 - d 800 PN 2 BAR

EF-METRİK
EF-METRIC
SPIGOT-METRIC
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS
AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

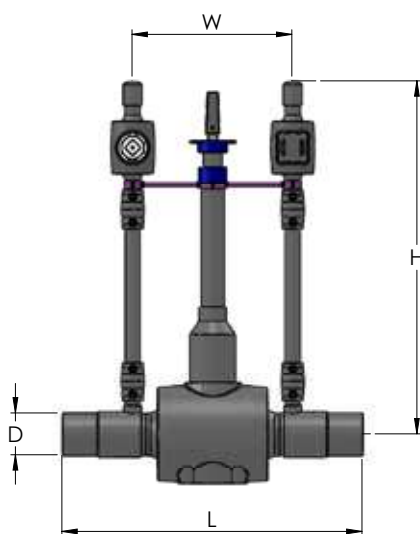
FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



PURGE VALVE

PURGE VANA

SDR11 PE100



CODE	D	L	H	W
2302082	63	480	730	240
2302086	90	650	760	345
2302087	110	655	760	345
2302088	125	715	810	355
2302089	160	730	810	380
2302090	200	835	950	470
2302091	250	930	950	490
2302092	315	1015	950	505

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

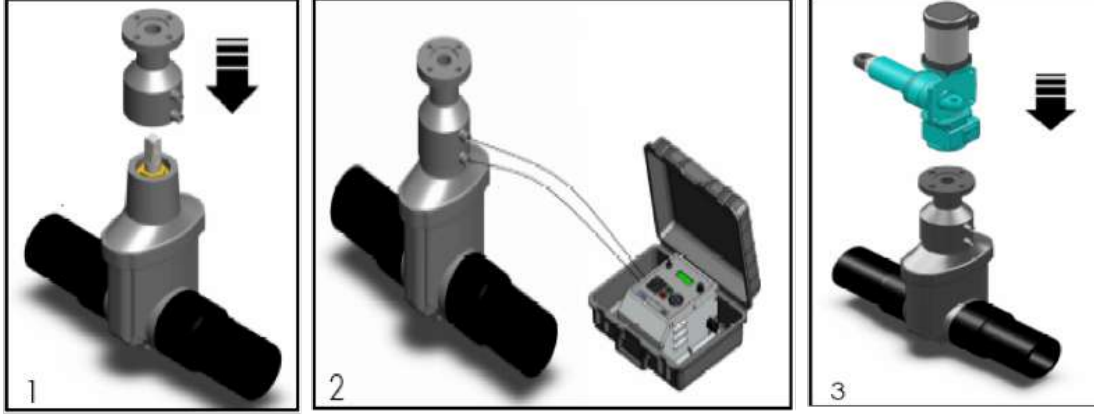
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



EF ACTUATOR BASE EF AKTÜATÖR ALTLIĞI

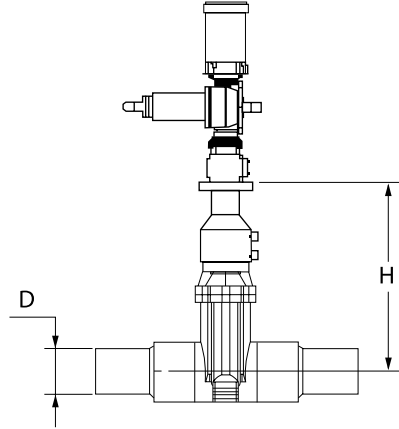


Tega, PE-EF Aktüatör altlıklarını kullanarak, sürgülü vanaınızı aktüatör monte edecek şekilde getirebilirsiniz. Vana dünyasındaki en pratik sistemdir.

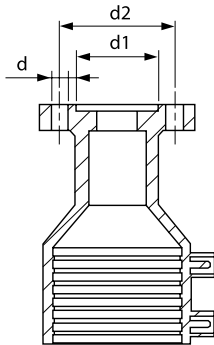
Do your "gate valve with actuator" on job site yourself by using TEGA EF actuator base! Most practical system on the world.



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



d/Qty	d1	d2
04.Eki	56	70

ÜRÜN KODU / PRODUCT CODE	D	H1
1825015	63	250
1825016	90 - 110	323 - 386
1825017	125	386
1825018	160	425
1825019	180	425



EF Aktüatör Altlığı / EF Actuator Base

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPIGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

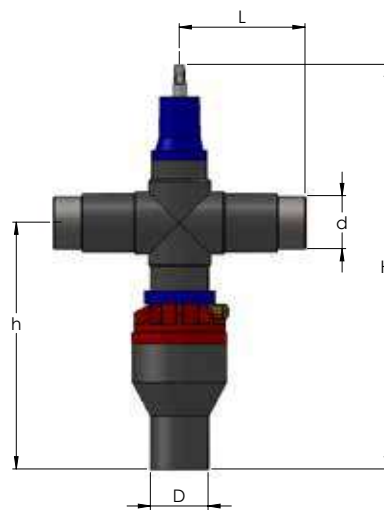
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-METRIC AKIŞ KONTROL- METRİK



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



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

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



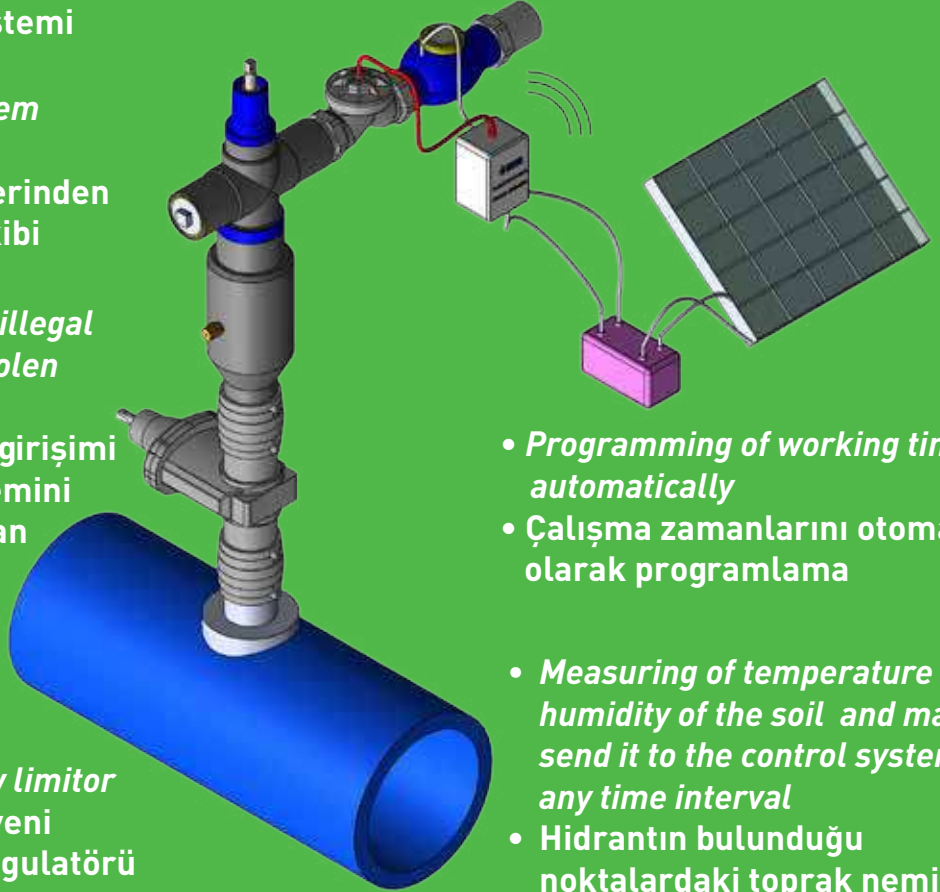
- *Digital metering of the water consumption*
- Dijital sayaç

- *Remote controlled on-off system*
- Uzaktan kontrol 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 limiter*
- Yeni geliştirilen yeni jenerasyon su regülâtörü 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 Sürgülü Vana

PE 100 Gate Valve

- **World Wide Patent**
Dünya Çapında Patentli
- **7 years in development**
7 yıl da geliştirilen

- **Proven through extensive testing**
Kapsamlı testler ile başarısı kanıtlanan

The future VALVE

Geleceğin VANASI

The missing link for the 'jointless' pipeline system
BORU SİSTEMLERİNDE İHTİYAÇ OLAN ARA BAĞLANTI PARÇASI

- Reduced mechanical jointing
- 100% leak tight
- 100% recyclable
- 100% corrosion resistant
- Azaltılmış mekanik birleşme
- %100 sızdırmaz
- %100 geri dönüşümlü
- %100 korozyona dayanıklı
- Light weight for ease of handling and installation. Upto 1/3 of the weight of traditional Gate Valves
- Taşınma ve kurulum kolaylığı döküm sürgülü vanadan % 60 oranında hafiftir.

- DN32 - DN225
- PE100 SDR11
- PN 16



Successfully tested in freezing temperatures down to -20°C

-20°C altında ki hava koşullarında başarı ile test edildi.

**FIRST
IN THE
WORLD**

Tested successfully to temperatures → 50°C in desert environments

50°C üstü sıcaklıklar da başarı ile test edildi.

**Dünyada
İlk**

EF INCH SIZE

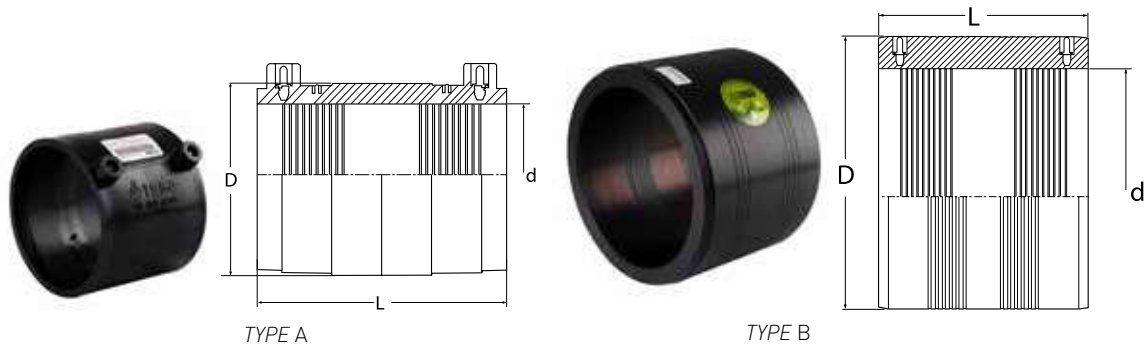


SDR26 ELECTROFUSION COUPLER, IPS DUAL RATED WATER/NATURAL GAS

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



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	2200008
4"	4,500	4,92	3,94	0,43	A	2200009
5"	5,563	6,10	6,30	1,08	B	2200180
6"	6,625	7,36	6,69	1,88	B	2200010
7"	7,125	7,75	6,69	1,62	B	2200181
8"	8,625	9,57	6,69	3,12	B	2200011
10"	10,750	12,01	6,69	5,22	B	2200012
12"	12,750	14,56	7,09	5,90	B	2200013
14"	14,000	15,28	7,09	7,20	B	2200014
16"	16,000	17,64	8,66	12,99	B	2200015
18"	18,000	19,88	9,06	17,57	B	2200016
20"	20,000	22,64	9,06	27,73	B	2200017
22" (1)	22,000	24,21	9,84	27,40	B	2200018
24" (1)	24,000	26,38	13,78	44,94	B	2200019
26" (1)	26,000	28,90	13,78	59,68	B	2200020
28" (1)	28,000	30,71	13,78	59,66	B	2200021
30" (1)	30,000	33,07	13,78	72,66	B	2200022
32" (1)	32,000	35,04	13,78	76,44	B	2200023
34" (1)	34,000	37,40	14,96	98,93	B	2200024
36" (1)	36,000	40,55	14,96	141,98	B	2200025
40" (1)	40,000	44,49	14,96	154,45	B	2200027
42" (1)	42,000	46,46	19,69	211,28	B	2200028
48" (1)	48,000	53,15	19,69	279,16	B	2200030
54" (1)	54,000	59,06	19,69	306,29	B	2200171
63" (1)	63,000	68,50	19,69	387,90	B	2200031

(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

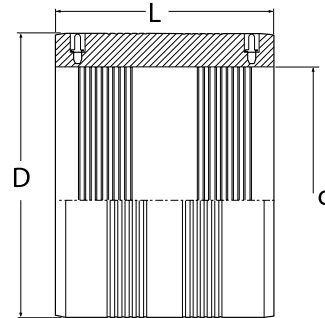
Operating Pressure

- 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



Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	Item Code
6"	6,625	7,76	7,48	3,31	2200182
7"	7,125	8,27	7,48	3,58	2200183
8"	8,625	10,31	8,03	7,00	2200034
10"	10,750	12,60	8,66	10,18	2200036
12"	12,750	14,96	9,06	15,10	2200037
14"	14,000	16,34	10,00	19,32	2200038
16" (1)	16,000	18,50	11,81	27,78	2200039
18" (1)	18,000	20,87	12,60	38,21	2200040
20" (1)	20,000	23,23	14,41	54,75	2200041
22" (1)	22,000	25,79	15,75	77,60	2200042
24" (1)	24,000	27,95	15,75	88,05	2200043
26" (1)	26,000	30,51	16,54	114,78	2200044
28" (1)	28,000	33,07	17,52	147,71	2200045
30" (1)	30,000	35,43	17,52	169,57	2200046
32" (1)	32,000	37,20	18,50	181,46	2200047
34" (1)	34,000	40,16	18,90	234,93	2200048
36" (1)	36,000	41,73	19,69	238,80	2200049
40" (1)	40,000	46,85	19,69	318,86	2200184
42" (1)	42,000	49,21	19,69	352,58	2200050
48" (1)	48,000	55,12	20,67	413,04	2200051
54" (1)	54,000	62,20	21,65	562,07	2200052

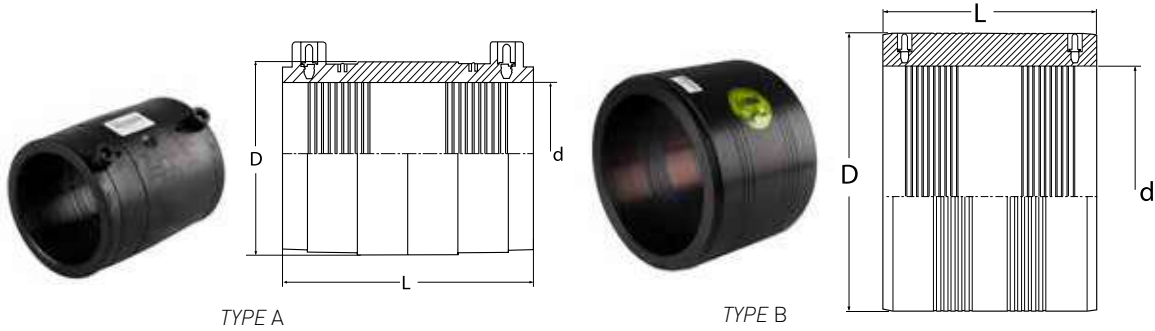
(1) Separate fusion zones

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



Nominal IPS Pipe Size	ID [Nominal] d	D	L	Unit Weight in lbs.	TYPE	Item
3/4"	1,050	1,61	2,80	0,11	A	2200085
1"	1,315	1,89	3,23	0,16	A	2200087
1 1/4"	1,660	2,17	3,39	0,18	A	2200089
1 1/2"	1,900	2,64	3,86	0,35	A	2200090
2"	2,375	3,15	4,21	0,49	A	2200092
3"	3,500	4,53	5,91	0,89	A	2200094
4"	4,500	5,59	6,69	1,40	A	2200095
5"	5,563	7,09	6,73	3,53	A	2200103
6"	6,625	8,41	7,56	4,75	A	2200185
7"	7,125	9,06	7,48	5,65	B	2200186
8"	8,625	10,75	7,87	8,81	B	2200073
10"	10,750	13,39	8,66	14,99	B	2200114 *
12"	12,750	15,35	9,06	18,03	B	2200058
14"	14,000	17,32	10,00	28,34	B	2200119 **
16" (1)	16,000	19,29	11,81	37,35	B	2200060
18" (1)	18,000	21,57	12,60	48,52	B	2200062 **
20" (1)	20,000	24,21	14,41	73,07	B	2200065 **
22" (1)	22,000	27,17	15,75	108,88	B	2200187 **
24" (1)	24,000	29,72	15,75	131,86	B	2200133
26" (1)	26,000	32,28	16,54	164,87	B	2200079
28" (1)	28,000	34,65	17,52	198,58	B	2200188 *

**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
30" (1)	30,000	37,01	17,52	223,98	B	2200137
32" (1)	32,000	38,98	18,50	249,45	B	2200068
34" (1)	34,000	42,13	18,90	318,26	B	2200189 **
36" (1)	36,000	44,09	19,69	347,46	B	2200139
40" (1)	40,000	47,24	19,69	338,71	B	2200070
42" (1)	42,000	51,18	19,69	456,00	B	2200140 **

(1) Separate fusion zones

* 220 PSI

** 200 PSI

EF-METRIK
SPIGOT-METRIK
AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

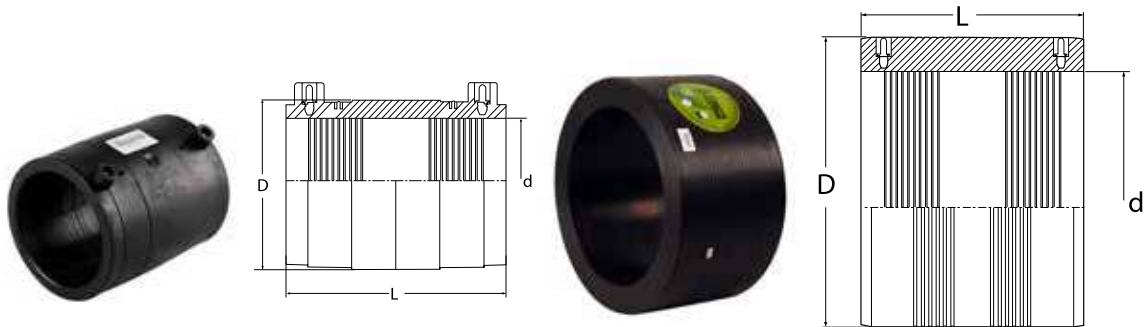
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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 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



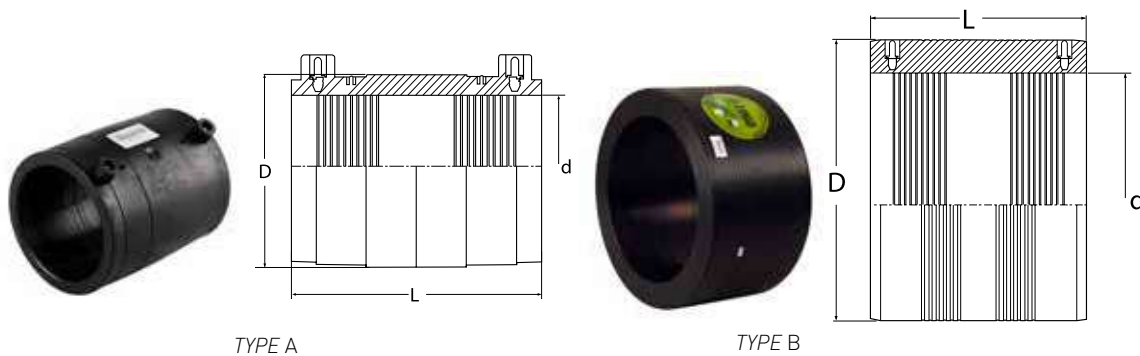
Nominal IPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	TYPE	Item Code
2"	2,375	3,80	6,65	0,45	A	2200190
3"	3,500	5,60	6,57	1,00	A	2200191
4"	4,500	7,87	7,28	3,00	A	2200192
6"	6,625	10,23	7,56	5,70	A	2200193
8"	8,625	13,38	7,87	10,20	B	2200194
10"	10,750	16,50	8,66	16,90	B	2200160
12"	12,750	19,29	9,06	23,40	B	2200195
14"	14,000	21,65	10,00	33,60	B	2200161
16" (1)	16,000	24,40	11,81	49,60	B	2200196
18" (1)	18,000	27,55	12,60	67,60	B	2200162

(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



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	2200197
3"	3,500	5,59	6,57	3,40	A	2200198
4"	4,500	6,26	6,69	3,45	A	2200141
5"	5,563	7,87	7,28	6,16	A	2200199
6"	6,625	9,06	7,48	7,76	A	2200200
7"	7,125	9,65	8,66	9,97	B	2200201
8"	8,625	12,01	7,87	14,96	B	2200143
10"	10,750	14,57	8,66	22,79	B	2200144
12"	12,750	16,73	9,06	28,94	B	2200202
14"	14,000	18,31	10,04	38,03	B	2200145
16" (1)	16,000	20,87	11,81	57,69	B	2200146
18" (1)	18,000	23,62	12,60	80,26	B	2200203
20" (1)	20,000	25,98	14,37	107,66	B	2200204
22" (1)	22,000	29,13	15,75	156,40	B	2200205
24" (1)	24,000	32,68	16,54	221,40	B	2200206

(1) Separate fusion zones

EF-IPS EF-IPS

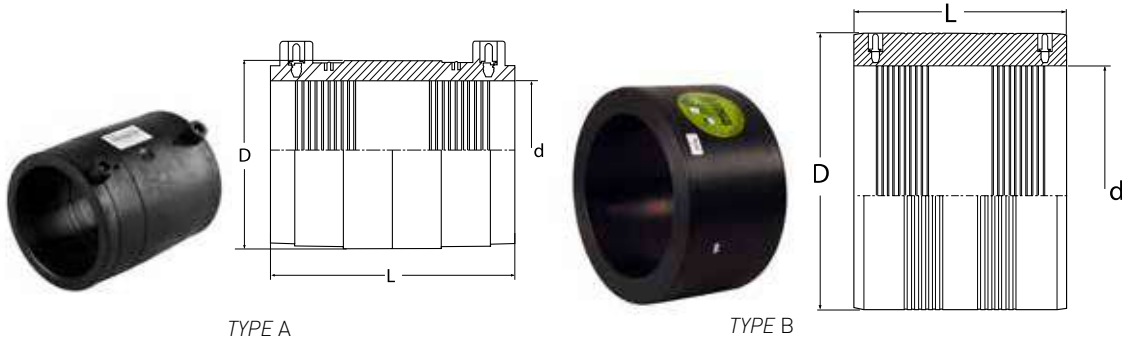


SDR7,4 ELECTROFUSION COUPLER IPS

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



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	2200149
3"	3,500	5,59	6,57	3,40	A	2200150
4"	4,500	6,26	6,77	3,49	A	2200151
5"	5,563	8,03	7,28	6,65	A	2200207
6"	6,625	9,45	7,48	9,24	A	2200152
7"	7,125	9,76	7,48	9,08	B	2200208 *
8"	8,625	12,20	7,87	15,98	B	2200153
10"	10,750	15,35	8,66	28,34	B	2200154
12"	12,750	17,32	9,06	33,90	B	2200156 *
14"	14,000	19,29	10,04	48,15	B	2200155 *
16" (1)	16,000	21,77	11,81	70,10	B	2200157 *
18" (1)	18,000	24,41	12,60	93,23	B	2200158 *
20" (1)	20,000	27,17	14,37	132,22	B	2200159 *
22" (1)	22,000	30,71	15,75	196,80	B	2200209

(1) Separate fusion zones

* 350 PSI

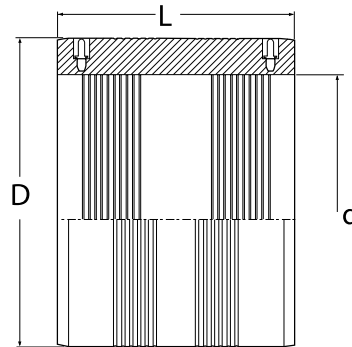
EF-IPS EF-IPS



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	2200210
6"	6,900	7,67	6,30	1,87	2200211
10"	11,100	12,20	6,50	4,50	2200212
12"	13,200	14,75	7,08	8,30	2200213
14"	15,300	17,10	8,66	13,80	2200214
16"	17,400	19,25	8,66	16,20	2200215
18"	19,500	21,50	8,66	20,60	2200216
20"	21,600	24,20	9,84	29,20	2200217
24" (1)	25,800	28,40	12,90	48,20	2200218
30" (1)	32,000	35,40	13,70	75,50	2200219
36" (1)	38,300	42,10	15,00	124,00	2200026

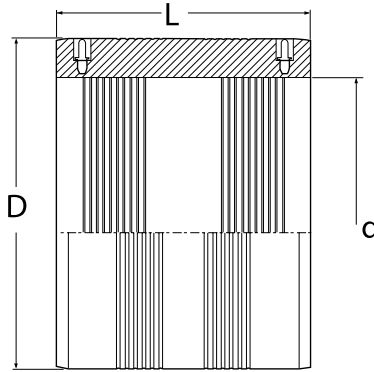
(1) Separate fusion zones

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"	6,90	8,10	7,50	3,50	2200220
8"	9,05	10,60	7,80	5,70	2200035
10"	11,10	13,00	8,60	10,60	2200221
12"	13,20	15,35	9,50	16,00	2200222
14" (1)	15,30	18,30	11,80	29,80	2200223
16" (1)	17,40	20,86	12,60	45,10	2200224
18" (1)	19,50	23,20	14,40	54,60	2200225
20" (1)	21,60	26,50	15,70	88,50	2200226
24" (1)	25,80	30,50	16,50	112,70	2200227
30" (1)	32,00	37,40	18,50	179,50	2200228

(1) Separate fusion zones

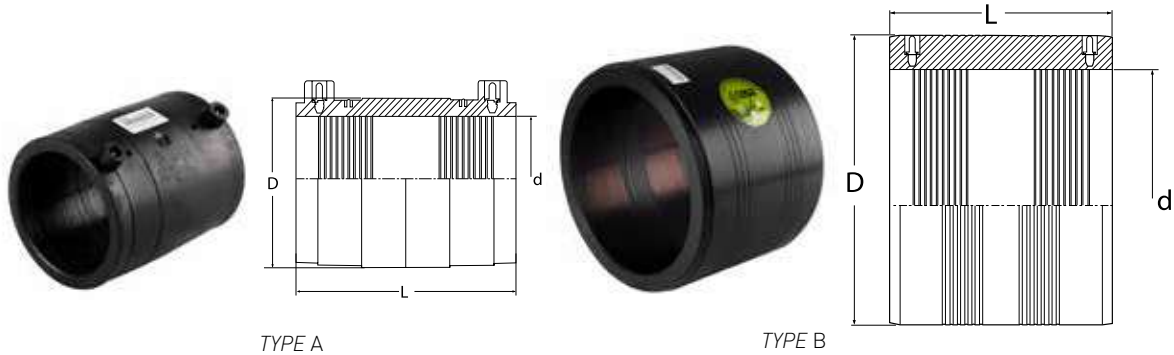
EF-IPS EF-IPS



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



Nominal DIPS Pipe Size	ID (Nominal) d	D	L	Unit Weight in lbs.	TYPE	Item Code
4"	4,80	6,30	6,60	3,00	A	2200229
6"	6,90	8,40	7,50	4,70	B	2200230
8"	9,05	10,60	8,00	6,70	B	2200231
10"	11,10	13,00	8,60	13,80	B	2200075
12"	13,20	15,35	9,50	24,00	B	2200232
14" (1)	15,30	18,30	11,80	41,50	B	2200076
16" (1)	17,40	20,86	12,60	56,30	B	2200077
18" (1)	19,50	23,20	14,40	68,50	B	2200078
20" (1)	21,60	26,50	15,70	115,00	B	2200233
24" (1)	25,80	31,50	16,50	156,50	B	2200234
30" (1)	32,00	38,50	18,50	246,60	B	2200235

(1) Separate fusion zones

** 220 psi

*** 200 psi

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

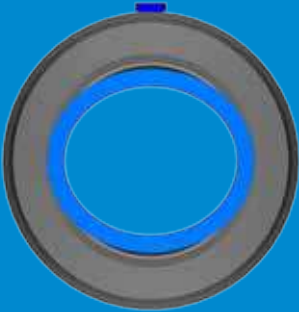
TEKNİK
TECHNICAL

TEGA DOST COUPLER



The Leading Edge Of Electrofusion Technology!

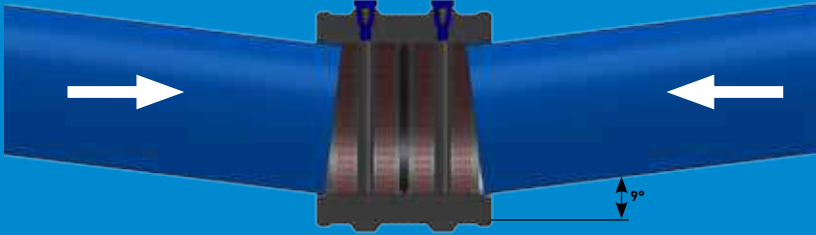
Deflection can cause ovality. The ovality of the pipe can be solved by using conical entrance of the coupler. Dost coupler can tolerate up to 10% ovality of the pipe



Oval Pipe

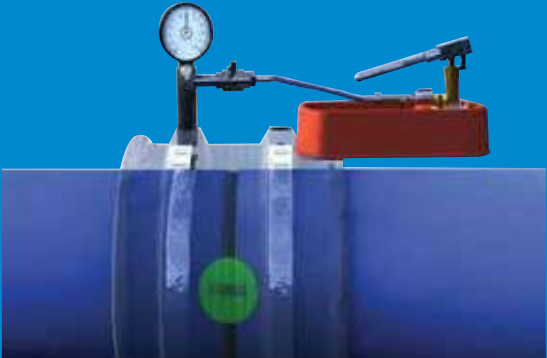


Circular Pipe



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



EF-IPS EF-IPS



EF DOST COUPLER / EF DOST MANŞON

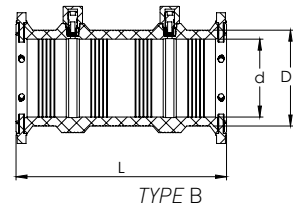
Water - 240 PSI at 73 Deg F Sustainable Maximum

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



d	CODE	Weight(kg)	ID (Nominal) d	D1	L	SDR	TYPE
2"	2200274	0,8	2,375	3,15	8,46	11	B
3"	2200275	1,6	3,500	4,41	11,42	11	B
4"	2200244	2,90	4,500	5,70	13,38	11	B
5"	2200276	2,90	5,563	5,51	14,17	11	B
6"	2200245	6,90	6,625	8,46	16,93	11	B
8"	2200246	11,50	8,625	10,83	18,9	11	B
10"	2200247	23,50	10,750	13,58	23,62	11	B
12"	2200248	31,60	12,750	15,55	24,30	11	B
14"	2200249	43,50	14,000	17,52	25,80	11	B
16"	2200250	55,50	16,000	19,49	27,56	11	B
18"	2200251	67,00	18,000	21,85	28,35	11	B
20"	2200252	92,50	20,000	24,41	30,07	11	B
22"	2200253	116,70	22,000	27,36	30,07	11	B
24"	2200254	144,90	24,000	29,92	30,07	11	B
26"	2200255	155,70	26,000	32,48	30,07	11	B
28"	2200256	186,40	28,000	34,45	33,07	11	B
30"	2200257	208,00	30,000	37,00	33,07	11	B
32"	2200258	220,40	32,000	38,98	33,07	11	B
36"	2200259	306,60	36,000	44,09	33,07	11	B
40"	2200260	283,10	40,000	47,64	33,07	17*	B
42"	2200261	269,00	42,000	48,82	33,07	17*	B
48"	2200262	314,10	48,000	55,12	33,07	17*	B
54"	2200178	396,20	54,000	62,21	33,07	17*	B
63"	2200263	552,30	63,000	72,05	33,07	17*	B

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

EF-METRIK
EF-METRIC
SPİGOT-METRIK
SPİGOT-METRIC
AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

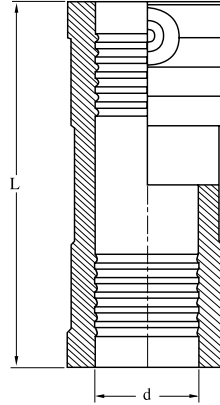
TEKNİK
TECHNICAL

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



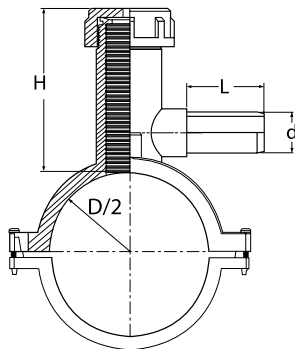
Nominal Pipe Size (d)	Base Norm	L	Unit Weight in lbs.	Item Code
3/4" IPS	IPS	4,25	1,43	2200236
1" CTS	CTS	5,04	0,26	2200237
1" IPS	IPS	5,04	0,26	2200238
1 1/4" IPS	IPS	6,38	0,33	2200239
1 1/2" IPS	IPS	6,38	0,61	2200240
2" IPS	IPS	7,32	1,13	2200241
3" IPS	IPS	10,04	2,94	2200242
4" IPS	IPS	11,93	5,28	2200243

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	2202000
1 1/4"	IPS	1/2"	IPS	4,13	1,73	0,66	A	2202068
1 1/4"	IPS	3/4"	CTS	4,13	1,73	0,66	A	2202069
1 1/4"	IPS	3/4"	IPS	4,13	1,73	0,66	A	2202001
1 1/4"	IPS	1"	CTS	4,13	1,73	0,68	A	2202070
1 1/4"	IPS	1"	IPS	4,13	1,85	0,68	A	2202002
1 1/2"	IPS	1/2"	CTS	4,13	2,05	1,06	A	2202071
1 1/2"	IPS	1/2"	IPS	4,13	2,05	1,12	A	2202072
1 1/2"	IPS	3/4"	CTS	4,13	2,05	1,15	A	2202073
1 1/2"	IPS	3/4"	IPS	4,13	2,13	1,26	A	2202074
1 1/2"	IPS	1"	CTS	4,13	2,13	1,28	A	2202004
1 1/2"	IPS	1"	IPS	4,13	3,35	1,30	A	2202005
1 1/2"	IPS	1 1/4"	CTS	4,13	3,35	1,30	A	2202075
2"	IPS	1/2"	CTS	4,13	2,05	1,19	A	2202006
2"	IPS	1/2"	IPS	4,13	2,05	1,23	A	2202007
2"	IPS	3/4"	CTS	4,13	2,05	1,23	A	2202008
2"	IPS	3/4"	IPS	4,13	2,13	1,28	A	2202009
2"	IPS	1"	CTS	4,13	2,13	1,28	A	2202010
2"	IPS	1"	IPS	4,13	3,35	1,30	A	2202011
2"	IPS	1 1/4"	IPS	4,13	3,54	1,30	A	2202012

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
2"	IPS	1 1/4"	CTS	4,13	3,35	1,30	A	2202076
2"	IPS	1 1/2"	IPS	7,87	4,53	2,43	B	2202077
2"	IPS	2"	IPS	7,87	4,53	2,65	B	2202013
3"	IPS	1/2"	CTS	5,31	1,85	2,14	A	2202014
3"	IPS	1/2"	IPS	5,31	1,85	2,16	A	2202015
3"	IPS	3/4"	CTS	5,31	1,85	2,16	A	2202016
3"	IPS	3/4"	IPS	5,31	2,05	2,18	A	2202017
3"	IPS	1"	CTS	5,31	2,05	2,18	A	2202018
3"	IPS	1"	IPS	5,31	2,52	2,21	A	2202019
3"	IPS	1 1/4"	IPS	5,31	3,50	2,23	A	2202020
3"	IPS	1 1/4"	CTS	5,31	2,52	2,21	A	2202078
3"	IPS	1 1/2"	IPS	7,09	3,94	3,20	C	2202079
3"	IPS	2"	IPS	7,09	4,33	3,29	C	2202021
4"	IPS	1/2"	CTS	5,31	1,89	2,25	A	2202022
4"	IPS	1/2"	IPS	5,31	1,89	2,27	A	2202023
4"	IPS	3/4"	CTS	5,31	1,89	2,27	A	2202024
4"	IPS	3/4"	IPS	5,31	2,17	2,29	A	2202025
4"	IPS	1"	CTS	5,31	2,17	2,34	A	2202026
4"	IPS	1"	IPS	5,31	2,68	2,36	A	2202027
4"	IPS	1 1/4"	IPS	5,31	2,76	2,38	A	2202028
4"	IPS	1 1/4"	CTS	5,31	2,68	2,36	A	2202627
4"	IPS	1 1/2"	IPS	7,09	2,95	2,38	C	2202029
4"	IPS	2"	IPS	7,09	2,95	3,31	C	2202030
5"	IPS	1/2"	CTS	5,31	2,01	2,91	C	2202080
5"	IPS	1/2"	IPS	5,31	2,01	2,91	C	2202081
5"	IPS	3/4"	CTS	5,31	2,01	2,93	C	2202082
5"	IPS	3/4"	IPS	5,31	1,89	2,93	C	2202083
5"	IPS	1"	CTS	5,31	1,89	2,93	C	2202084
5"	IPS	1"	IPS	5,31	3,27	2,95	C	2202085
5"	IPS	1 1/4"	IPS	5,31	3,50	2,98	C	2202086
5"	IPS	1 1/4"	CTS	5,31	3,27	2,95	C	2202087
5"	IPS	1 1/2"	IPS	7,09	4,06	3,84	C	2202088
5"	IPS	2"	IPS	7,09	4,33	4,01	C	2202089
6"	IPS	1/2"	CTS	5,31	2,01	1,72	C	2202036
6"	IPS	1/2"	IPS	5,31	2,01	1,72	C	2202037
6"	IPS	3/4"	CTS	5,31	2,01	1,72	C	2202038
6"	IPS	3/4"	IPS	5,31	1,89	1,74	C	2202039
6"	IPS	1"	CTS	5,31	1,89	1,74	C	2202040
6"	IPS	1"	IPS	5,31	3,27	1,76	C	2202041
6"	IPS	1 1/4"	IPS	5,31	3,50	1,79	C	2202043
6"	IPS	1 1/4"	CTS	5,31	3,27	1,76	C	2202090
6"	IPS	1 1/2"	IPS	7,09	4,06	2,87	C	2202091
6"	IPS	2"	IPS	7,09	4,33	2,87	C	2202045
7"	IPS	1/2"	CTS	5,31	2,01	1,70	C	2202092
7"	IPS	1/2"	IPS	5,31	2,01	1,72	C	2202093
7"	IPS	3/4"	CTS	5,31	2,01	1,72	C	2202094
7"	IPS	3/4"	IPS	5,31	1,89	1,74	C	2202095
7"	IPS	1"	CTS	5,31	1,89	1,74	C	2202096
7"	IPS	1"	IPS	5,31	3,27	1,76	C	2202097
7"	IPS	1 1/4"	IPS	5,31	3,50	1,79	C	2202098

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	2202099
7"	IPS	1 1/2"	IPS	7,09	3,39	2,87	C	2202100
7"	IPS	2"	IPS	7,09	3,39	2,87	C	2202101
8"	IPS	1/2"	CTS	5,31	2,01	1,72	C	2202052
8"	IPS	1/2"	IPS	5,31	2,01	1,72	C	2202053
8"	IPS	3/4"	CTS	5,31	2,01	1,74	C	2202054
8"	IPS	3/4"	IPS	5,31	1,89	1,76	C	2202055
8"	IPS	1"	CTS	5,31	1,89	1,76	C	2202056
8"	IPS	1"	IPS	5,31	3,27	1,79	C	2202057
8"	IPS	1 1/4"	IPS	5,31	3,50	1,81	C	2202065
8"	IPS	1 1/4"	CTS	5,31	3,27	1,79	C	2202102
8"	IPS	1 1/2"	IPS	7,09	3,39	2,76	C	2202103
8"	IPS	2"	IPS	7,09	4,45	2,76	C	2202058
10"	IPS	1/2"	CTS	5,31	2,01	1,72	D	2202104
10"	IPS	1/2"	IPS	5,31	2,01	1,72	D	2202105
10"	IPS	3/4"	CTS	5,31	2,01	1,72	D	2202106
10"	IPS	3/4"	IPS	5,31	1,89	1,74	D	2202107
10"	IPS	1"	CTS	5,31	1,89	1,74	D	2202108
10"	IPS	1"	IPS	5,31	3,27	1,76	D	2202109
10"	IPS	1 1/4"	IPS	5,31	3,50	1,79	D	2202110
10"	IPS	1 1/4"	CTS	5,31	3,27	1,76	D	2202111
10"	IPS	1 1/2"	IPS	7,09	3,39	2,76	D	2202112
10"	IPS	2"	IPS	7,09	4,45	2,76	D	2202063
3"	DIPS	1/2"	CTS	5,31	1,89	2,21	A	2202112
3"	DIPS	1/2"	IPS	5,31	1,89	2,25	A	2202113
3"	DIPS	3/4"	CTS	5,31	1,89	2,25	A	2202114
3"	DIPS	3/4"	IPS	5,31	2,17	2,29	A	2202115
3"	DIPS	1"	CTS	5,31	2,17	2,29	A	2202116
3"	DIPS	1"	IPS	5,31	2,68	2,36	A	2202117
3"	DIPS	1 1/4"	IPS	5,31	2,76	2,38	A	2202118
3"	DIPS	1 1/4"	CTS	5,31	2,68	2,36	A	2202119
3"	DIPS	1 1/2"	IPS	7,09	2,95	3,31	C	2202120
3"	DIPS	2"	IPS	7,09	2,95	3,31	C	2202121
4"	DIPS	1/2"	CTS	5,31	1,89	2,27	A	2202122
4"	DIPS	1/2"	IPS	5,31	1,89	2,29	A	2202123
4"	DIPS	3/4"	CTS	5,31	1,89	2,29	A	2202031
4"	DIPS	3/4"	IPS	5,31	2,17	2,32	A	2202032
4"	DIPS	1"	CTS	5,31	2,17	2,32	A	2202033
4"	DIPS	1"	IPS	5,31	2,68	2,36	A	2202034
4"	DIPS	1 1/4"	IPS	5,31	2,76	2,38	A	2202124
4"	DIPS	1 1/4"	CTS	5,31	2,68	2,36	A	2202125
4"	DIPS	1 1/2"	IPS	7,09	2,95	3,31	C	2202126
4"	DIPS	2"	IPS	7,09	2,95	3,31	C	2202127
6"	DIPS	1/2"	CTS	5,31	2,01	1,72	D	2202046
6"	DIPS	1/2"	IPS	5,31	2,01	1,72	D	2202128
6"	DIPS	3/4"	CTS	5,31	2,01	1,72	D	2202047
6"	DIPS	3/4"	IPS	5,31	1,89	1,74	D	2202048
6"	DIPS	1"	CTS	5,31	1,89	1,76	D	2202049
6"	DIPS	1"	IPS	5,31	3,27	1,76	D	2202050

EF-METRIK
SPIGOT-METRIK
AKIS KONTROL-METRIK
FLOW CONTROL-METRIK
EF-IPS
AKIS KONTROL-IPS
FLOW CONTROL-IPS
MAKINE-APARATLAR
MACHINE-TOOL
MONTAJ
INSTALLATION
TEKNİK
TECHNICAL

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	2202129
6"	DIPS	1 1/4"	CTS	5,31	3,27	1,76	D	2202130
6"	DIPS	1 1/2"	IPS	7,09	3,39	2,87	D	2202131
6"	DIPS	2"	IPS	7,09	3,39	2,87	D	2202051
8"	DIPS	1/2"	CTS	5,31	2,01	1,72	D	2202132
8"	DIPS	1/2"	IPS	5,31	2,01	1,74	D	2202133
8"	DIPS	3/4"	CTS	5,31	2,01	1,74	D	2202059
8"	DIPS	3/4"	IPS	5,31	1,89	1,74	D	2202060
8"	DIPS	1"	CTS	5,31	1,89	1,76	D	2202061
8"	DIPS	1"	IPS	5,31	3,27	1,79	D	2202134
8"	DIPS	1 1/4"	IPS	5,31	3,50	1,81	D	2202135
8"	DIPS	1 1/4"	CTS	5,31	3,27	1,79	D	2202136
8"	DIPS	1 1/2"	IPS	7,09	3,39	2,76	D	2202137
8"	DIPS	2"	IPS	7,09	4,45	2,76	D	2202138
10"	DIPS	1/2"	CTS	5,31	2,01	1,72	D	2202139
10"	DIPS	1/2"	IPS	5,31	2,01	1,72	D	2202140
10"	DIPS	3/4"	CTS	5,31	2,01	1,74	D	2202141
10"	DIPS	3/4"	IPS	5,31	1,89	1,74	D	2202142
10"	DIPS	1"	CTS	5,31	1,89	1,74	D	2202143
10"	DIPS	1"	IPS	5,31	3,27	1,76	D	2202144
10"	DIPS	1 1/4"	IPS	5,31	3,50	1,81	D	2202145
10"	DIPS	1 1/4"	CTS	5,31	3,27	1,76	D	2202146
10"	DIPS	1 1/2"	IPS	7,09	3,39	2,76	D	2202147
10"	DIPS	2"	IPS	7,09	4,45	2,76	D	2202148

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

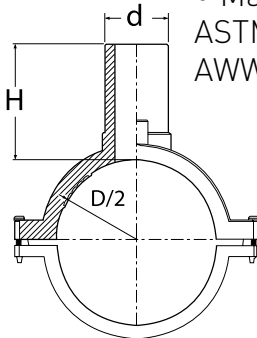
TEKNİK
TECHNICAL

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	2204554
1 1/4"	IPS	1/2"	IPS	2,95	0,33	A	2204555
1 1/4"	IPS	3/4"	CTS	2,95	0,33	A	2204556
1 1/4"	IPS	3/4"	IPS	2,95	0,36	A	2204051
1 1/4"	IPS	1"	CTS	2,95	0,39	A	2204557
1 1/4"	IPS	1"	IPS	2,95	0,40	A	2204325
1 1/2"	IPS	1/2"	CTS	2,95	0,33	A	2204558
1 1/2"	IPS	1/2"	IPS	2,95	0,35	A	2204052
1 1/2"	IPS	3/4"	CTS	2,95	0,36	A	2204559
1 1/2"	IPS	3/4"	IPS	2,95	0,37	A	2204560
1 1/2"	IPS	1"	CTS	2,95	0,37	A	2204053
1 1/2"	IPS	1"	IPS	2,95	0,41	A	2204054
1 1/2"	IPS	1 1/4"	CTS	2,95	0,41	A	2204561
2"	IPS	1/2"	CTS	3,03	0,77	A	2204562
2"	IPS	1/2"	IPS	3,03	0,77	A	2204056
2"	IPS	3/4"	CTS	3,03	0,77	A	2204563
2"	IPS	3/4"	IPS	3,03	0,79	A	2204057
2"	IPS	1"	CTS	3,03	0,79	A	2204564
2"	IPS	1"	IPS	3,03	0,86	A	2204058
2"	IPS	1 1/4"	IPS	3,03	0,88	A	2204050

**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	2204565
2"	IPS	1 1/2"	IPS	4,92	1,65	A	2204059
2"	IPS	2"	IPS	4,92	1,76	A	2204060
3"	IPS	1/2"	CTS	3,74	1,46	A	2204566
3"	IPS	1/2"	IPS	3,74	1,46	A	2204062
3"	IPS	3/4"	CTS	3,74	1,46	A	2204567
3"	IPS	3/4"	IPS	3,74	1,50	A	2204063
3"	IPS	1"	CTS	3,74	1,50	A	2204568
3"	IPS	1"	IPS	3,74	1,52	A	2204064
3"	IPS	1 1/4"	IPS	3,74	1,54	A	2204065
3"	IPS	1 1/4"	CTS	3,74	1,52	A	2204569
3"	IPS	1 1/2"	IPS	5,31	1,57	A	2204066
3"	IPS	2"	IPS	5,31	1,59	A	2204067
4"	IPS	1/2"	CTS	3,74	1,61	A	2204570
4"	IPS	1/2"	IPS	3,74	1,61	A	2204571
4"	IPS	3/4"	CTS	3,74	1,61	A	2204572
4"	IPS	3/4"	IPS	3,74	1,63	A	2204573
4"	IPS	1"	CTS	3,74	1,63	A	2204574
4"	IPS	1"	IPS	3,74	1,65	A	2204071
4"	IPS	1 1/4"	IPS	3,74	1,68	A	2204072
4"	IPS	1 1/4"	CTS	3,74	1,65	A	2204575
4"	IPS	1 1/2"	IPS	5,31	1,70	A	2204073
4"	IPS	2"	IPS	5,31	1,72	A	2204074
6"	IPS	1/2"	CTS	3,74	2,05	B	2204576
6"	IPS	1/2"	IPS	3,74	2,05	B	2204082
6"	IPS	3/4"	CTS	3,74	2,05	B	2204577
6"	IPS	3/4"	IPS	3,74	2,09	B	2204578
6"	IPS	1"	CTS	3,74	2,09	B	2204579
6"	IPS	1"	IPS	3,74	2,12	B	2204083
6"	IPS	1 1/4"	IPS	3,74	2,14	B	2204084
6"	IPS	1 1/4"	CTS	3,74	2,12	B	2204580
6"	IPS	1 1/2"	IPS	5,31	2,20	B	2204085
6"	IPS	2"	IPS	5,31	2,23	B	2204086
7"	IPS	1/2"	CTS	3,74	2,05	B	2204581
7"	IPS	1/2"	IPS	3,74	2,05	B	2204582
7"	IPS	3/4"	CTS	3,74	2,05	B	2204583
7"	IPS	3/4"	IPS	3,74	2,09	B	2204584
7"	IPS	1"	CTS	3,74	2,09	B	2204585
7"	IPS	1"	IPS	3,74	2,12	B	2204586
7"	IPS	1 1/4"	IPS	3,74	2,14	B	2204587
7"	IPS	1 1/4"	CTS	3,74	2,12	B	2204588
7"	IPS	1 1/2"	IPS	5,31	2,20	B	2204589
7"	IPS	2"	IPS	5,31	2,23	B	2204590
8"	IPS	1/2"	CTS	3,74	1,98	B	2204591
8"	IPS	1/2"	IPS	3,74	1,98	B	2204109
8"	IPS	3/4"	CTS	3,74	1,98	B	2204592
8"	IPS	3/4"	IPS	3,74	2,01	B	2204593
8"	IPS	1"	CTS	3,74	2,01	B	2204097
8"	IPS	1"	IPS	3,74	2,03	B	2204098
8"	IPS	1 1/4"	IPS	3,74	2,05	B	2204099

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

**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	2204594
8"	IPS	1 1/2"	IPS	5,31	2,07	B	2204100
8"	IPS	2"	IPS	5,31	2,09	B	2204101
10"	IPS	1/2"	CTS	3,94	1,46	C	2204595
10"	IPS	1/2"	IPS	3,94	1,46	C	2204128
10"	IPS	3/4"	CTS	3,94	1,46	C	2204596
10"	IPS	3/4"	IPS	3,94	1,46	C	2204597
10"	IPS	1"	CTS	3,94	1,46	C	2204119
10"	IPS	1"	IPS	5,12	1,48	C	2204120
10"	IPS	1 1/4"	IPS	4,13	1,50	C	2204121
10"	IPS	1 1/4"	CTS	5,12	1,48	C	2204598
10"	IPS	1 1/2"	IPS	5,12	1,50	C	2204122
10"	IPS	2"	IPS	4,92	1,50	C	2204123
12"	IPS	1/2"	CTS	3,94	1,48	C	2204599
12"	IPS	1/2"	IPS	3,94	1,48	C	2204144
12"	IPS	3/4"	CTS	3,94	1,48	C	2204600
12"	IPS	3/4"	IPS	3,94	1,50	C	2204601
12"	IPS	1"	CTS	3,94	1,50	C	2204602
12"	IPS	1"	IPS	5,12	1,52	C	2204135
12"	IPS	1 1/4"	IPS	4,13	1,54	C	2204136
12"	IPS	1 1/4"	CTS	5,12	1,52	C	2204603
12"	IPS	1 1/2"	IPS	5,12	1,54	C	2204137
12"	IPS	2"	IPS	4,92	1,54	C	2204138
14"	IPS	1/2"	CTS	3,94	1,68	C	2204604
14"	IPS	1/2"	IPS	3,94	1,68	C	2204158
14"	IPS	3/4"	CTS	3,94	1,68	C	2204605
14"	IPS	3/4"	IPS	3,94	1,70	C	2204606
14"	IPS	1"	CTS	3,94	1,70	C	2204607
14"	IPS	1"	IPS	5,12	1,72	C	2204153
14"	IPS	1 1/4"	IPS	4,13	1,68	C	2204607
14"	IPS	1 1/4"	CTS	5,12	1,72	C	2204608
14"	IPS	1 1/2"	IPS	5,12	1,70	C	2204609
14"	IPS	2"	IPS	4,92	1,72	C	2204154
16"	IPS	1/2"	CTS	3,94	0,95	C	2204610
16"	IPS	1/2"	IPS	3,94	0,95	C	2204171
16"	IPS	3/4"	CTS	3,94	0,95	C	2204611
16"	IPS	3/4"	IPS	3,94	0,97	C	2204612
16"	IPS	1"	CTS	3,94	0,97	C	2204613
16"	IPS	1"	IPS	5,12	0,99	C	2204166
16"	IPS	1 1/4"	IPS	4,13	1,01	C	2204614
16"	IPS	1 1/4"	CTS	5,12	0,99	C	2204615
16"	IPS	1 1/2"	IPS	5,12	1,15	C	2204616
16"	IPS	2"	IPS	4,92	1,15	C	2204167
18"	IPS	1/2"	CTS	3,94	0,95	C	2204617
18"	IPS	1/2"	IPS	3,94	0,95	C	2204182
18"	IPS	3/4"	CTS	3,94	0,95	C	2204618
18"	IPS	3/4"	IPS	3,94	0,97	C	2204619
18"	IPS	1"	CTS	3,94	0,97	C	2204620
18"	IPS	1"	IPS	5,12	0,99	C	2204177
18"	IPS	1 1/4"	IPS	4,13	1,01	C	2204621

EF-METRIK
SPIGOT-METRIK
AKIS KONTROL-METRIK
FLOW CONTROL-METRIK
EF-IPS
AKIS KONTROL-IPS
FLOW CONTROL-IPS
MAKINE-APARATLAR
MONTAJ
TEKNİK

**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	2204622
18"	IPS	1 1/2"	IPS	5,12	1,15	C	2204623
18"	IPS	2"	IPS	4,92	1,15	C	2204178
3"	DIPS	1/2"	CTS	3,74	1,61	A	2204624
3"	DIPS	1/2"	IPS	3,74	1,61	A	2204625
3"	DIPS	3/4"	CTS	3,74	1,61	A	2204626
3"	DIPS	3/4"	IPS	3,74	1,63	A	2204627
3"	DIPS	1"	CTS	3,74	1,63	A	2204628
3"	DIPS	1"	IPS	3,74	1,65	A	2204629
3"	DIPS	1 1/4"	IPS	3,74	1,68	A	2204630
3"	DIPS	1 1/4"	CTS	3,74	1,65	A	2204631
3"	DIPS	1 1/2"	IPS	5,31	1,70	A	2204632
3"	DIPS	2"	IPS	5,31	1,72	A	2204633
4"	DIPS	1/2"	CTS	3,74	1,65	B	2204634
4"	DIPS	1/2"	IPS	3,74	1,65	B	2204635
4"	DIPS	3/4"	CTS	3,74	1,65	B	2204636
4"	DIPS	3/4"	IPS	3,74	1,65	B	2204637
4"	DIPS	1"	CTS	3,74	1,65	B	2204638
4"	DIPS	1"	IPS	3,74	1,68	B	2204077
4"	DIPS	1 1/4"	IPS	3,74	1,72	B	2204639
4"	DIPS	1 1/4"	CTS	3,74	1,68	B	2204640
4"	DIPS	1 1/2"	IPS	5,31	1,74	B	2204641
4"	DIPS	2"	IPS	5,31	1,76	B	2204078
6"	DIPS	1/2"	CTS	3,74	2,05	B	2204642
6"	DIPS	1/2"	IPS	3,74	2,05	B	2204643
6"	DIPS	3/4"	CTS	3,74	2,05	B	2204644
6"	DIPS	3/4"	IPS	3,74	2,09	B	2204645
6"	DIPS	1"	CTS	3,74	2,09	B	2204646
6"	DIPS	1"	IPS	3,74	2,12	B	2204091
6"	DIPS	1 1/4"	IPS	3,74	2,14	B	2204647
6"	DIPS	1 1/4"	CTS	3,74	2,12	B	2204648
6"	DIPS	1 1/2"	IPS	5,31	2,20	B	2204649
6"	DIPS	2"	IPS	5,31	2,23	B	2204092
8"	DIPS	1/2"	CTS	3,94	1,98	B	2204650
8"	DIPS	1/2"	IPS	3,94	1,98	B	2204651
8"	DIPS	3/4"	CTS	3,94	1,98	B	2204652
8"	DIPS	3/4"	IPS	3,94	2,01	B	2204110
8"	DIPS	1"	CTS	3,94	2,01	B	2204653
8"	DIPS	1"	IPS	5,12	2,03	B	2204111
8"	DIPS	1 1/4"	IPS	4,13	2,05	B	2204654
8"	DIPS	1 1/4"	CTS	5,12	2,03	B	2204655
8"	DIPS	1 1/2"	IPS	5,12	2,07	B	2204656
8"	DIPS	2"	IPS	4,92	2,09	B	2204112
10"	DIPS	1/2"	CTS	3,94	1,46	C	2204657
10"	DIPS	1/2"	IPS	3,94	1,46	C	2204658
10"	DIPS	3/4"	CTS	3,94	1,46	C	2204659
10"	DIPS	3/4"	IPS	3,94	1,46	C	2204660
10"	DIPS	1"	CTS	3,94	1,46	C	2204661
10"	DIPS	1"	IPS	5,12	1,48	C	2204129
10"	DIPS	1 1/4"	IPS	4,13	1,50	C	2204662

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

**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



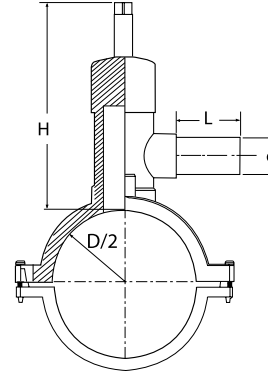
BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	H	Unit Weight in lbs	TYPE	Item Code
10"	DIPS	1 1/4"	CTS	5,12	1,48	C	2204663
10"	DIPS	1 1/2"	IPS	5,12	1,50	C	2204664
10"	DIPS	2"	IPS	4,92	1,50	C	2204130
12"	DIPS	1/2"	CTS	3,94	1,68	C	2204665
12"	DIPS	1/2"	IPS	3,94	1,68	C	2204151
12"	DIPS	3/4"	CTS	3,94	1,68	C	2204666
12"	DIPS	3/4"	IPS	3,94	1,70	C	2204667
12"	DIPS	1"	CTS	3,94	1,70	C	2204668
12"	DIPS	1"	IPS	5,12	1,72	C	2204146
12"	DIPS	1 1/4"	IPS	4,13	1,68	C	2204669
12"	DIPS	1 1/4"	CTS	5,12	1,72	C	2204670
12"	DIPS	1 1/2"	IPS	5,12	1,70	C	2204671
12"	DIPS	2"	IPS	4,92	1,72	C	2204147
14"	DIPS	1/2"	CTS	3,94	0,95	C	2204672
14"	DIPS	1/2"	IPS	3,94	0,95	C	2204673
14"	DIPS	3/4"	CTS	3,94	0,95	C	2204674
14"	DIPS	3/4"	IPS	3,94	0,97	C	2204675
14"	DIPS	1"	CTS	3,94	0,97	C	2204676
14"	DIPS	1"	IPS	5,12	0,99	C	2204160
14"	DIPS	1 1/4"	IPS	4,13	1,01	C	2204677
14"	DIPS	1 1/4"	CTS	5,12	0,99	C	2204678
14"	DIPS	1 1/2"	IPS	5,12	1,15	C	2204679
14"	DIPS	2"	IPS	4,92	1,15	C	2204161
16"	DIPS	1/2"	CTS	3,94	0,95	C	2204680
16"	DIPS	1/2"	IPS	3,94	0,95	C	2204681
16"	DIPS	3/4"	CTS	3,94	0,95	C	2204682
16"	DIPS	3/4"	IPS	3,94	0,97	C	2204683
16"	DIPS	1"	CTS	3,94	0,97	C	2204684
16"	DIPS	1"	IPS	5,12	0,99	C	2204175
16"	DIPS	1 1/4"	IPS	4,13	1,01	C	2204685
16"	DIPS	1 1/4"	CTS	5,12	0,99	C	2204686
16"	DIPS	1 1/2"	IPS	5,12	1,15	C	2204687
16"	DIPS	2"	IPS	4,92	1,15	C	2204172

EF-METRIK
SPIGOT-METRIK
AKIS KONTROL-METRIK
FLOW CONTROL-METRIK
EF-IPS
AKIS KONTROL-IPS
FLOW CONTROL-IPS
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MONTAJ
INSTALATION
TEKNİK
TEKNİKAL

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	2202149
2"	IPS	1/2"	IPS	6,30	1,97	1,87	A	2202150
2"	IPS	3/4"	CTS	6,30	1,97	1,87	A	2202151
2"	IPS	3/4"	IPS	6,30	1,97	1,90	A	2202152
2"	IPS	1"	CTS	6,30	1,97	1,90	A	2202153
2"	IPS	1"	IPS	6,30	2,95	1,92	A	2202154
2"	IPS	1 1/4"	IPS	6,30	2,95	1,94	B	2202155
2"	IPS	1 1/4"	CTS	6,30	2,95	1,92	A	2202156
2"	IPS	1 1/2"	IPS	10,63	3,66	4,63	B	2202157
2"	IPS	2"	IPS	10,63	3,66	4,74	B	2202158
3"	IPS	1/2"	CTS	8,46	1,57	3,75	A	2202159
3"	IPS	1/2"	IPS	8,46	1,57	3,79	A	2202160
3"	IPS	3/4"	CTS	8,46	1,57	3,79	A	2202161
3"	IPS	3/4"	IPS	8,46	1,97	3,81	A	2202162
3"	IPS	1"	CTS	8,46	1,97	3,81	A	2202163
3"	IPS	1"	IPS	8,46	2,95	3,84	A	2202164
3"	IPS	1 1/4"	IPS	8,46	3,23	3,86	A	2202165
3"	IPS	1 1/4"	CTS	8,46	2,95	3,84	A	2202166
3"	IPS	1 1/2"	IPS	9,84	3,35	5,91	C	2202167
3"	IPS	2"	IPS	9,84	3,35	5,93	C	2202168

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	2202169
4"	IPS	1/2"	IPS	8,46	1,57	3,90	A	2202170
4"	IPS	3/4"	CTS	8,46	1,57	3,90	A	2202171
4"	IPS	3/4"	IPS	8,46	2,24	3,92	A	2202172
4"	IPS	1"	CTS	8,46	2,24	3,92	A	2202173
4"	IPS	1"	IPS	8,46	2,80	3,95	A	2202174
4"	IPS	1 1/4"	IPS	8,46	2,83	3,99	A	2202175
4"	IPS	1 1/4"	CTS	8,46	2,80	3,95	A	2202176
4"	IPS	1 1/2"	IPS	9,84	2,95	5,95	C	2202177
4"	IPS	2"	IPS	9,84	2,95	6,02	C	2202178
6"	IPS	1/2"	CTS	8,46	1,57	4,32	C	2202179
6"	IPS	1/2"	IPS	8,46	1,57	4,39	C	2202180
6"	IPS	3/4"	CTS	8,46	1,57	4,39	C	2202181
6"	IPS	3/4"	IPS	8,46	1,97	4,41	C	2202182
6"	IPS	1"	CTS	8,46	1,97	4,41	C	2202183
6"	IPS	1"	IPS	8,46	2,64	4,43	C	2202184
6"	IPS	1 1/4"	IPS	8,46	2,64	4,45	C	2202185
6"	IPS	1 1/4"	CTS	8,46	2,64	4,43	C	2202186
6"	IPS	1 1/2"	IPS	9,84	2,95	6,44	C	2202187
6"	IPS	2"	IPS	9,84	2,95	6,48	C	2202188
7"	IPS	1/2"	CTS	8,46	1,57	4,32	C	2202189
7"	IPS	1/2"	IPS	8,46	1,57	4,39	C	2202190
7"	IPS	3/4"	CTS	8,46	1,57	4,39	C	2202191
7"	IPS	3/4"	IPS	8,46	1,97	4,41	C	2202192
7"	IPS	1"	CTS	8,46	1,97	4,41	C	2202193
7"	IPS	1"	IPS	8,46	2,91	4,43	C	2202194
7"	IPS	1 1/4"	IPS	8,46	2,91	4,45	C	2202195
7"	IPS	1 1/4"	CTS	8,46	2,91	4,43	C	2202196
7"	IPS	1 1/2"	IPS	9,84	2,91	6,44	C	2202197
7"	IPS	2"	IPS	9,84	2,91	6,48	C	2202198
8"	IPS	1/2"	CTS	8,46	1,57	4,19	C	2202199
8"	IPS	1/2"	IPS	8,46	1,57	4,26	C	2202200
8"	IPS	3/4"	CTS	8,46	1,57	4,26	C	2202201
8"	IPS	3/4"	IPS	8,46	1,97	4,26	C	2202202
8"	IPS	1"	CTS	8,46	1,97	4,26	C	2202203
8"	IPS	1"	IPS	8,46	2,95	4,28	C	2202204
8"	IPS	1 1/4"	IPS	8,46	2,95	4,30	C	2202205
8"	IPS	1 1/4"	CTS	8,46	2,95	4,28	C	2202206
8"	IPS	1 1/2"	IPS	9,84	2,95	6,28	C	2202207
8"	IPS	2"	IPS	9,84	2,95	6,33	C	2202208
10"	IPS	1/2"	CTS	10,04	1,57	5,40	D	2202209
10"	IPS	1/2"	IPS	10,04	1,57	5,47	D	2202210
10"	IPS	3/4"	CTS	10,04	1,57	5,49	D	2202211
10"	IPS	3/4"	IPS	10,04	1,97	5,49	D	2202212
10"	IPS	1"	CTS	10,04	1,97	5,49	D	2202213
10"	IPS	1"	IPS	10,04	2,95	5,51	D	2202214
10"	IPS	1 1/4"	IPS	10,04	2,95	5,53	D	2202215
10"	IPS	1 1/4"	CTS	10,04	2,95	5,51	D	2202216
10"	IPS	1 1/2"	IPS	10,04	2,95	5,60	D	2202217
10"	IPS	2"	IPS	10,04	2,95	5,62	D	2202218

EF-METRIK
 SPİGOT-METRIK
 AKIŞ KONTROL-METRIK
 AKIŞ KONTROL-IPS
 MAKİNE-APARATLAR
 MONTAJ
 TEKNİK

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	2202219
3"	DIPS	1/2"	IPS	8,46	1,57	3,90	A	2202220
3"	DIPS	3/4"	CTS	8,46	1,57	3,90	A	2202221
3"	DIPS	3/4"	IPS	8,46	2,24	3,92	A	2202222
3"	DIPS	1"	CTS	8,46	2,24	3,92	A	2202223
3"	DIPS	1"	IPS	8,46	2,80	3,95	A	2202224
3"	DIPS	1 1/4"	IPS	8,46	2,83	3,99	A	2202225
3"	DIPS	1 1/4"	CTS	8,46	2,80	3,95	A	2202226
3"	DIPS	1 1/2"	IPS	9,84	2,95	5,95	C	2202227
3"	DIPS	2"	IPS	9,84	2,95	6,02	C	2202228
4"	DIPS	1/2"	CTS	8,46	2,80	3,86	A	2202229
4"	DIPS	1/2"	IPS	8,46	2,80	3,90	A	2202230
4"	DIPS	3/4"	CTS	8,46	2,80	3,90	A	2202231
4"	DIPS	3/4"	IPS	8,46	2,83	3,92	A	2202232
4"	DIPS	1"	CTS	8,46	2,83	3,92	A	2202233
4"	DIPS	1"	IPS	8,46	2,80	3,95	A	2202234
4"	DIPS	1 1/4"	IPS	8,46	2,83	3,99	A	2202235
4"	DIPS	1 1/4"	CTS	8,46	2,80	3,95	A	2202236
4"	DIPS	1 1/2"	IPS	9,84	3,03	5,95	C	2202237
4"	DIPS	2"	IPS	9,84	2,56	6,02	C	2202238
6"	DIPS	1/2"	CTS	8,46	1,57	4,34	C	2202239
6"	DIPS	1/2"	IPS	8,46	1,57	4,39	C	2202240
6"	DIPS	3/4"	CTS	8,46	1,57	4,39	C	2202241
6"	DIPS	3/4"	IPS	8,46	1,97	4,41	C	2202242
6"	DIPS	1"	CTS	8,46	1,97	4,41	C	2202243
6"	DIPS	1"	IPS	8,46	2,91	4,43	C	2202244
6"	DIPS	1 1/4"	IPS	8,46	2,91	4,45	C	2202245
6"	DIPS	1 1/4"	CTS	8,46	2,91	4,43	C	2202246
6"	DIPS	1 1/2"	IPS	9,84	2,91	6,44	C	2202247
6"	DIPS	2"	IPS	9,84	2,91	6,48	C	2202248
8"	DIPS	1/2"	CTS	10,04	1,57	4,21	C	2202249
8"	DIPS	1/2"	IPS	10,04	1,57	4,26	C	2202250
8"	DIPS	3/4"	CTS	10,04	1,57	4,26	C	2202251
8"	DIPS	3/4"	IPS	10,04	1,97	4,26	C	2202252
8"	DIPS	1"	CTS	10,04	1,97	4,26	C	2202253
8"	DIPS	1"	IPS	10,04	2,95	4,28	C	2202254
8"	DIPS	1 1/4"	IPS	10,04	2,95	4,30	C	2202255
8"	DIPS	1 1/4"	CTS	10,04	2,95	4,28	C	2202256
8"	DIPS	1 1/2"	IPS	10,04	2,95	6,28	C	2202257
8"	DIPS	2"	IPS	10,04	2,95	6,33	C	2202258
10"	DIPS	1/2"	CTS	10,04	1,57	5,40	D	2202259
10"	DIPS	1/2"	IPS	10,04	1,57	5,47	D	2202260
10"	DIPS	3/4"	CTS	10,04	1,57	5,47	D	2202261
10"	DIPS	3/4"	IPS	10,04	1,97	5,49	D	2202262
10"	DIPS	1"	CTS	10,04	1,97	5,49	D	2202263
10"	DIPS	1"	IPS	10,04	2,95	5,51	D	2202264
10"	DIPS	1 1/4"	IPS	10,04	2,95	5,53	D	2202265
10"	DIPS	1 1/4"	CTS	10,04	2,95	5,51	D	2202266
10"	DIPS	1 1/2"	IPS	10,04	2,95	5,60	D	2202267
10"	DIPS	2"	IPS	10,04	2,95	5,62	D	2202268

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

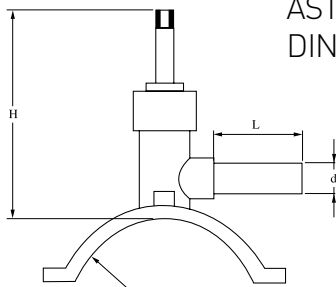
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	2202269
2"	IPS	1/2"	IPS	4,13	2,05	2,47	A	2202270
2"	IPS	3/4"	CTS	4,13	2,05	2,47	A	2202271
2"	IPS	3/4"	IPS	4,13	2,13	2,51	A	2202272
2"	IPS	1"	CTS	4,13	2,13	2,51	A	2202273
2"	IPS	1"	IPS	4,13	3,35	2,54	A	2202274
2"	IPS	1 1/4"	IPS	4,13	3,54	2,54	B	2202275
2"	IPS	1 1/4"	CTS	4,13	3,35	2,54	A	2202276
2"	IPS	1 1/2"	IPS	7,87	4,53	3,66	B	2202277
2"	IPS	2"	IPS	7,87	4,53	3,88	B	2202278
3"	IPS	1/2"	CTS	5,31	1,85	4,26	A	2202279
3"	IPS	1/2"	IPS	5,31	1,85	4,28	A	2202280
3"	IPS	3/4"	CTS	5,31	1,85	4,28	A	2202281
3"	IPS	3/4"	IPS	5,31	2,05	4,30	A	2202282
3"	IPS	1"	CTS	5,31	2,05	4,30	A	2202283
3"	IPS	1"	IPS	5,31	2,52	4,32	A	2202284
3"	IPS	1 1/4"	IPS	5,31	3,50	4,34	A	2202285
3"	IPS	1 1/4"	CTS	5,31	2,52	4,32	A	2202286
3"	IPS	1 1/2"	IPS	7,09	3,94	6,66	C	2202287
3"	IPS	2"	IPS	7,09	4,33	6,75	C	2202288

**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	2202289
4"	IPS	1/2"	IPS	5,31	1,89	4,39	A	2202290
4"	IPS	3/4"	CTS	5,31	1,89	4,39	A	2202291
4"	IPS	3/4"	IPS	5,31	2,17	4,41	A	2202292
4"	IPS	1"	CTS	5,31	2,17	4,45	A	2202293
4"	IPS	1"	IPS	5,31	2,68	4,48	A	2202294
4"	IPS	1 1/4"	IPS	5,31	2,76	4,50	A	2202295
4"	IPS	1 1/4"	CTS	5,31	2,68	4,48	A	2202296
4"	IPS	1 1/2"	IPS	7,09	2,95	5,84	C	2202297
4"	IPS	2"	IPS	7,09	2,95	6,77	C	2202298
5"	IPS	1/2"	CTS	5,31	2,01	5,03	C	2202299
5"	IPS	1/2"	IPS	5,31	2,01	5,03	C	2202300
5"	IPS	3/4"	CTS	5,31	2,01	5,05	C	2202301
5"	IPS	3/4"	IPS	5,31	1,89	5,05	C	2202302
5"	IPS	1"	CTS	5,31	1,89	5,05	C	2202303
5"	IPS	1"	IPS	5,31	3,27	5,07	C	2202304
5"	IPS	1 1/4"	IPS	5,31	3,50	5,09	C	2202305
5"	IPS	1 1/4"	CTS	5,31	3,27	5,07	C	2202306
5"	IPS	1 1/2"	IPS	7,09	4,06	7,30	C	2202307
5"	IPS	2"	IPS	7,09	4,33	7,47	C	2202308
6"	IPS	1/2"	CTS	5,31	2,01	3,84	D	2202309
6"	IPS	1/2"	IPS	5,31	2,01	3,84	D	2202310
6"	IPS	3/4"	CTS	5,31	2,01	3,84	D	2202311
6"	IPS	3/4"	IPS	5,31	1,89	3,86	D	2202312
6"	IPS	1"	CTS	5,31	1,89	3,86	D	2202313
6"	IPS	1"	IPS	5,31	3,27	3,88	D	2202314
6"	IPS	1 1/4"	IPS	5,31	3,50	3,90	D	2202315
6"	IPS	1 1/4"	CTS	5,31	3,27	3,88	D	2202316
6"	IPS	1 1/2"	IPS	7,09	4,06	6,33	D	2202317
6"	IPS	2"	IPS	7,09	4,33	6,33	D	2202318
7"	IPS	1/2"	CTS	5,31	2,01	3,81	D	2202319
7"	IPS	1/2"	IPS	5,31	2,01	3,84	D	2202320
7"	IPS	3/4"	CTS	5,31	2,01	3,84	D	2202321
7"	IPS	3/4"	IPS	5,31	1,89	3,86	D	2202322
7"	IPS	1"	CTS	5,31	1,89	3,86	D	2202323
7"	IPS	1"	IPS	5,31	3,27	3,88	D	2202324
7"	IPS	1 1/4"	IPS	5,31	3,50	3,90	D	2202325
7"	IPS	1 1/4"	CTS	5,31	3,27	3,88	D	2202326
7"	IPS	1 1/2"	IPS	7,09	3,39	6,33	D	2202327
7"	IPS	2"	IPS	7,09	3,39	6,33	D	2202328
8"	IPS	1/2"	CTS	5,31	2,01	3,84	D	2202329
8"	IPS	1/2"	IPS	5,31	2,01	3,84	D	2202330
8"	IPS	3/4"	CTS	5,31	2,01	3,86	D	2202331
8"	IPS	3/4"	IPS	5,31	1,89	3,88	D	2202332
8"	IPS	1"	CTS	5,31	1,89	3,88	D	2202333
8"	IPS	1"	IPS	5,31	3,27	3,90	D	2202334
8"	IPS	1 1/4"	IPS	5,31	3,50	3,92	D	2202335
8"	IPS	1 1/4"	CTS	5,31	3,27	3,90	D	2202336
8"	IPS	1 1/2"	IPS	7,09	3,39	6,22	D	2202337
8"	IPS	2"	IPS	7,09	4,45	6,22	D	2202338

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

**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	2202339
10"	IPS	1/2"	IPS	5,31	2,01	4,98	D	2202340
10"	IPS	3/4"	CTS	5,31	2,01	4,98	D	2202341
10"	IPS	3/4"	IPS	5,31	1,89	5,01	D	2202342
10"	IPS	1"	CTS	5,31	1,89	5,01	D	2202343
10"	IPS	1"	IPS	5,31	3,27	5,03	D	2202344
10"	IPS	1 1/4"	IPS	5,31	3,50	5,05	D	2202345
10"	IPS	1 1/4"	CTS	5,31	3,27	5,03	D	2202346
10"	IPS	1 1/2"	IPS	7,09	3,39	6,02	D	2202347
10"	IPS	2"	IPS	7,09	4,45	6,02	D	2202348
3"	DIPS	1/2"	CTS	5,31	1,89	4,32	A	2202349
3"	DIPS	1/2"	IPS	5,31	1,89	4,37	A	2202350
3"	DIPS	3/4"	CTS	5,31	1,89	4,37	A	2202351
3"	DIPS	3/4"	IPS	5,31	2,17	4,41	A	2202352
3"	DIPS	1"	CTS	5,31	2,17	4,41	A	2202353
3"	DIPS	1"	IPS	5,31	2,68	4,48	A	2202354
3"	DIPS	1 1/4"	IPS	5,31	2,76	4,50	A	2202355
3"	DIPS	1 1/4"	CTS	5,31	2,68	4,48	A	2202356
3"	DIPS	1 1/2"	IPS	7,09	2,95	6,77	C	2202357
3"	DIPS	2"	IPS	7,09	2,95	6,77	C	2202358
4"	DIPS	1/2"	CTS	5,31	1,89	4,39	A	2202359
4"	DIPS	1/2"	IPS	5,31	1,89	4,41	A	2202360
4"	DIPS	3/4"	CTS	5,31	1,89	4,41	A	2202361
4"	DIPS	3/4"	IPS	5,31	2,17	4,43	A	2202362
4"	DIPS	1"	CTS	5,31	2,17	4,43	A	2202363
4"	DIPS	1"	IPS	5,31	2,68	4,48	A	2202364
4"	DIPS	1 1/4"	IPS	5,31	2,76	4,50	A	2202365
4"	DIPS	1 1/4"	CTS	5,31	2,68	4,48	A	2202366
4"	DIPS	1 1/2"	IPS	7,09	2,95	6,77	C	2202367
4"	DIPS	2"	IPS	7,09	2,95	6,77	C	2202368
6"	DIPS	1/2"	CTS	5,31	2,01	3,84	D	2202369
6"	DIPS	1/2"	IPS	5,31	2,01	3,84	D	2202370
6"	DIPS	3/4"	CTS	5,31	2,01	3,84	D	2202371
6"	DIPS	3/4"	IPS	5,31	1,89	3,86	D	2202372
6"	DIPS	1"	CTS	5,31	1,89	3,88	D	2202373
6"	DIPS	1"	IPS	5,31	3,27	3,88	D	2202374
6"	DIPS	1 1/4"	IPS	5,31	3,50	3,90	D	2202375
6"	DIPS	1 1/4"	CTS	5,31	3,27	3,88	D	2202376
6"	DIPS	1 1/2"	IPS	7,09	3,39	6,33	D	2202377
6"	DIPS	2"	IPS	7,09	3,39	6,33	D	2202378
8"	DIPS	1/2"	CTS	5,31	2,01	3,84	D	2202379
8"	DIPS	1/2"	IPS	5,31	2,01	3,86	D	2202380
8"	DIPS	3/4"	CTS	5,31	2,01	3,86	D	2202381
8"	DIPS	3/4"	IPS	5,31	1,89	3,86	D	2202382
8"	DIPS	1"	CTS	5,31	1,89	3,88	D	2202383
8"	DIPS	1"	IPS	5,31	3,27	3,90	D	2202384
8"	DIPS	1 1/4"	IPS	5,31	3,50	3,92	D	2202385
8"	DIPS	1 1/4"	CTS	5,31	3,27	3,90	D	2202386
8"	DIPS	1 1/2"	IPS	7,09	3,39	6,22	D	2202387
8"	DIPS	2"	IPS	7,09	4,45	6,22	D	2202388

EF-METRIK / SPIGOT-METRIK / AKIS KONTROL-METRIK / EF-IPS / AKIS KONTROL-IPS / MAKINE-APARATLAR / MONTAJ / TEKNİK

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	2202389
10"	DIPS	1/2"	IPS	5,31	2,01	4,98	D	2202390
10"	DIPS	3/4"	CTS	5,31	2,01	5,01	D	2202391
10"	DIPS	3/4"	IPS	5,31	1,89	5,01	D	2202392
10"	DIPS	1"	CTS	5,31	1,89	5,01	D	2202393
10"	DIPS	1"	IPS	5,31	3,27	5,03	D	2202394
10"	DIPS	1 1/4"	IPS	5,31	3,50	5,07	D	2202395
10"	DIPS	1 1/4"	CTS	5,31	3,27	5,03	D	2202396
10"	DIPS	1 1/2"	IPS	7,09	3,39	6,02	D	2202397
10"	DIPS	2"	IPS	7,09	4,45	6,02	D	2202398

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

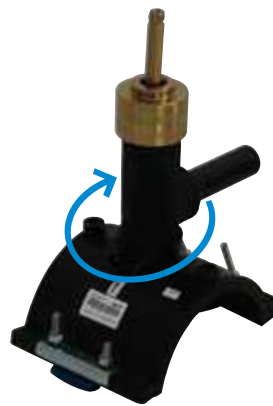
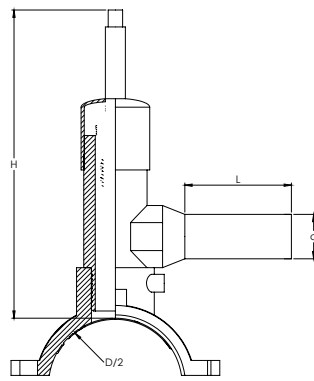
TEKNİK
TECHNICAL

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	1,57	1,43	2202399
3	IPS	1/2"	IPS	1,57	1,43	2202400
3	IPS	3/4"	CTS	1,57	1,43	2202401
3	IPS	3/4"	IPS	1,97	1,46	2202402
3	IPS	1"	CTS	1,97	1,46	2202403
3	IPS	1"	IPS	2,95	1,49	2202404
3	IPS	1 1/4"	IPS	2,95	1,52	2202405
3	IPS	1 1/4"	CTS	2,95	1,52	2202406
3	IPS	1 1/2"	IPS	2,95	1,82	2202407
3	IPS	2"	IPS	2,95	1,83	2202408
4	IPS	1/2"	CTS	2,76	1,53	2202409
4	IPS	1/2"	IPS	2,76	1,53	2202410
4	IPS	3/4"	CTS	2,76	1,53	2202411
4	IPS	3/4"	IPS	3,15	1,56	2202412
4	IPS	1"	CTS	3,35	1,56	2202413
4	IPS	1"	IPS	3,35	1,59	2202414
4	IPS	1 1/4"	IPS	3,74	1,62	2202415
4	IPS	1 1/4"	CTS	2,86	1,62	2202416
4	IPS	1 1/2"	IPS	4,13	1,92	2202417
4	IPS	2"	IPS	4,53	1,95	2202418
6	IPS	1/2"	CTS	2,76	1,95	2202419
6	IPS	1/2"	IPS	2,76	1,95	2202420
6	IPS	3/4"	CTS	2,76	1,95	2202421
6	IPS	3/4"	IPS	3,15	1,56	2202422
6	IPS	1"	CTS	3,35	1,97	2202423
6	IPS	1"	IPS	3,35	2,00	2202424
6	IPS	1 1/4"	IPS	3,74	2,03	2202425
6	IPS	1 1/4"	CTS	2,86	2,00	2202426

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
6	IPS	1 1/2"	IPS	4,13	2,33	2202427
6	IPS	2"	IPS	4,53	2,38	2202428
8	IPS	1/2"	CTS	2,76	1,95	2202429
8	IPS	1/2"	IPS	2,76	1,95	2202430
8	IPS	3/4"	CTS	2,76	1,95	2202431
8	IPS	3/4"	IPS	3,15	1,56	2202432
8	IPS	1"	CTS	3,35	1,97	2202433
8	IPS	1"	IPS	3,35	2,00	2202434
8	IPS	1 1/4"	IPS	3,74	2,03	2202435
8	IPS	1 1/4"	CTS	2,86	2,00	2202436
8	IPS	1 1/2"	IPS	4,13	2,33	2202437
8	IPS	2"	IPS	4,53	2,38	2202438
3	DIPS	1/2"	CTS	2,76	1,53	2202439
3	DIPS	1/2"	IPS	2,76	1,53	2202440
3	DIPS	3/4"	CTS	2,76	1,53	2202441
3	DIPS	3/4"	IPS	3,15	1,56	2202442
3	DIPS	1"	CTS	3,35	1,56	2202443
3	DIPS	1"	IPS	3,35	1,59	2202444
3	DIPS	1 1/4"	IPS	3,74	1,62	2202445
3	DIPS	1 1/4"	CTS	2,86	1,62	2202446
3	DIPS	1 1/2"	IPS	4,13	1,92	2202447
3	DIPS	2"	IPS	4,53	1,95	2202448
4	DIPS	1/2"	CTS	2,76	1,53	2202449
4	DIPS	1/2"	IPS	2,76	1,53	2202450
4	DIPS	3/4"	CTS	2,76	1,53	2202451
4	DIPS	3/4"	IPS	3,15	1,56	2202452
4	DIPS	1"	CTS	3,35	1,56	2202453
4	DIPS	1"	IPS	3,35	1,59	2202454
4	DIPS	1 1/4"	IPS	3,74	1,62	2202455
4	DIPS	1 1/4"	CTS	2,86	1,62	2202456
4	DIPS	1 1/2"	IPS	4,13	1,92	2202457
4	DIPS	2"	IPS	4,53	1,95	2202458
6	DIPS	1/2"	CTS	2,76	1,95	2202459
6	DIPS	1/2"	IPS	2,76	1,95	2202460
6	DIPS	3/4"	CTS	2,76	1,95	2202461
6	DIPS	3/4"	IPS	3,15	1,97	2202462
6	DIPS	1"	CTS	3,35	1,97	2202463
6	DIPS	1"	IPS	3,35	2,00	2202464
6	DIPS	1 1/4"	IPS	3,74	2,03	2202465
6	DIPS	1 1/4"	CTS	2,86	2,00	2202466
6	DIPS	1 1/2"	IPS	4,13	2,33	2202467
6	DIPS	2"	IPS	4,53	2,38	2202468
8	DIPS	1/2"	CTS	2,76	1,95	2202469
8	DIPS	1/2"	IPS	2,76	1,95	2202470
8	DIPS	3/4"	CTS	2,76	1,95	2202471
8	DIPS	3/4"	IPS	3,15	1,97	2202472
8	DIPS	1"	CTS	3,35	1,97	2202473
8	DIPS	1"	IPS	3,35	2,00	2202474
8	DIPS	1 1/4"	IPS	3,74	2,03	2202475
8	DIPS	1 1/4"	CTS	2,86	2,00	2202476
8	DIPS	1 1/2"	IPS	4,13	2,33	2202477
8	DIPS	2"	IPS	4,53	2,38	2202478

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

SDR11 360° ROTATING TAPPING TEES

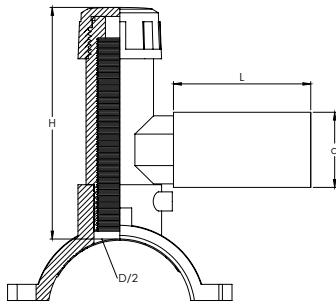
Water - 240 PSI at 73 Deg F Sustainable Maximum Operating Pressure

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	2202479
3	IPS	1/2"	IPS	2,76	0,76	2202480
3	IPS	3/4"	CTS	2,76	0,76	2202481
3	IPS	3/4"	IPS	3,15	0,78	2202482
3	IPS	1"	CTS	3,35	0,78	2202483
3	IPS	1"	IPS	3,35	0,80	2202484
3	IPS	1 1/4"	IPS	3,74	0,84	2202485
3	IPS	1 1/4"	CTS	2,86	0,84	2202486
3	IPS	1 1/2"	IPS	4,13	0,86	2202487
3	IPS	2"	IPS	4,53	0,88	2202488
4	IPS	1/2"	CTS	2,76	0,86	2202489
4	IPS	1/2"	IPS	2,76	0,86	2202490
4	IPS	3/4"	CTS	2,76	0,86	2202491
4	IPS	3/4"	IPS	3,15	0,88	2202492
4	IPS	1"	CTS	3,35	0,88	2202493
4	IPS	1"	IPS	3,35	0,90	2202494
4	IPS	1 1/4"	IPS	3,74	0,94	2202495
4	IPS	1 1/4"	CTS	2,86	0,94	2202496
4	IPS	1 1/2"	IPS	4,13	0,96	2202497
4	IPS	2"	IPS	4,53	0,98	2202498
6	IPS	1/2"	CTS	2,76	0,91	2202499
6	IPS	1/2"	IPS	2,76	0,91	2202500
6	IPS	3/4"	CTS	2,76	0,91	2202501
6	IPS	3/4"	IPS	3,15	0,93	2202502
6	IPS	1"	CTS	3,35	0,93	2202503
6	IPS	1"	IPS	3,35	0,95	2202504
6	IPS	1 1/4"	IPS	3,74	0,99	2202505
6	IPS	1 1/4"	CTS	2,86	0,99	2202506
6	IPS	1 1/2"	IPS	4,13	1,01	2202507

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
6	IPS	2"	IPS	4,53	1,03	2202508
8	IPS	1/2"	CTS	2,76	0,91	2202509
8	IPS	1/2"	IPS	2,76	0,91	2202510
8	IPS	3/4"	CTS	2,76	0,91	2202511
8	IPS	3/4"	IPS	3,15	0,93	2202512
8	IPS	1"	CTS	3,35	0,93	2202513
8	IPS	1"	IPS	3,35	0,95	2202514
8	IPS	1 1/4"	IPS	3,74	0,99	2202515
8	IPS	1 1/4"	CTS	2,86	0,99	2202516
8	IPS	1 1/2"	IPS	4,13	1,01	2202517
8	IPS	2"	IPS	4,53	1,03	2202518
3	DIPS	1/2"	CTS	2,76	0,86	2202519
3	DIPS	1/2"	IPS	2,76	0,86	2202520
3	DIPS	3/4"	CTS	2,76	0,86	2202521
3	DIPS	3/4"	IPS	3,15	0,88	2202522
3	DIPS	1"	CTS	3,35	0,88	2202523
3	DIPS	1"	IPS	3,35	0,90	2202524
3	DIPS	1 1/4"	IPS	3,74	0,94	2202525
3	DIPS	1 1/4"	CTS	2,86	0,94	2202526
3	DIPS	1 1/2"	IPS	4,13	0,96	2202527
3	DIPS	2"	IPS	4,53	0,98	2202528
4	DIPS	1/2"	CTS	2,76	0,86	2202529
4	DIPS	1/2"	IPS	2,76	0,86	2202530
4	DIPS	3/4"	CTS	2,76	0,86	2202531
4	DIPS	3/4"	IPS	3,15	0,88	2202532
4	DIPS	1"	CTS	3,35	0,88	2202533
4	DIPS	1"	IPS	3,35	0,90	2202534
4	DIPS	1 1/4"	IPS	3,74	0,94	2202535
4	DIPS	1 1/4"	CTS	2,86	0,94	2202536
4	DIPS	1 1/2"	IPS	4,13	1,01	2202537
4	DIPS	2"	IPS	4,53	1,03	2202538
6	DIPS	1/2"	CTS	2,76	0,91	2202539
6	DIPS	1/2"	IPS	2,76	0,91	2202540
6	DIPS	3/4"	CTS	2,76	0,91	2202541
6	DIPS	3/4"	IPS	3,15	0,93	2202542
6	DIPS	1"	CTS	3,35	0,93	2202543
6	DIPS	1"	IPS	3,35	0,95	2202544
6	DIPS	1 1/4"	IPS	3,74	0,99	2202545
6	DIPS	1 1/4"	CTS	2,86	0,99	2202546
6	DIPS	1 1/2"	IPS	4,13	1,01	2202547
6	DIPS	2"	IPS	4,53	1,03	2202548
8	DIPS	1/2"	CTS	2,76	0,91	2202549
8	DIPS	1/2"	IPS	2,76	0,91	2202550
8	DIPS	3/4"	CTS	2,76	0,91	2202551
8	DIPS	3/4"	IPS	3,15	0,93	2202552
8	DIPS	1"	CTS	3,35	0,93	2202553
8	DIPS	1"	IPS	3,35	0,95	2202554
8	DIPS	1 1/4"	IPS	3,74	0,99	2202555
8	DIPS	1 1/4"	CTS	2,86	0,99	2202556
8	DIPS	1 1/2"	IPS	4,13	1,01	2202557
8	DIPS	2"	IPS	4,53	1,03	2202558

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

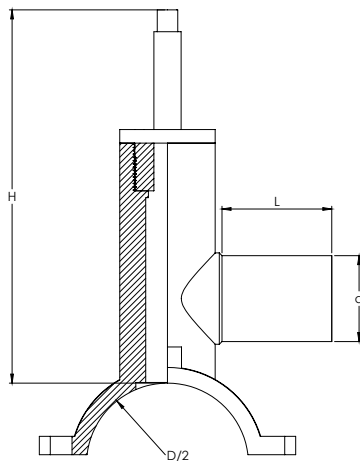
TEKNİK
TECHNICAL

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	2202559
2	IPS	1/2"	IPS	2,05	0,75	2202560
2	IPS	3/4"	CTS	2,05	0,75	2202561
2	IPS	3/4"	IPS	2,13	0,75	2202562
2	IPS	1"	CTS	2,13	0,75	2202563
2	IPS	1"	IPS	3,35	0,80	2202564
2	IPS	1 1/4"	IPS	3,54	0,80	2202565
2	IPS	1 1/4"	CTS	3,35	0,80	2202566
3	IPS	1/2"	CTS	1,85	0,90	2202567
3	IPS	1/2"	IPS	1,85	0,90	2202568
3	IPS	3/4"	CTS	1,85	0,90	2202569
3	IPS	3/4"	IPS	2,05	0,90	2202570
3	IPS	1"	CTS	2,05	0,90	2202571
3	IPS	1"	IPS	2,52	0,95	2202572
3	IPS	1 1/4"	IPS	3,50	0,95	2202573
3	IPS	1 1/4"	CTS	2,52	0,95	2202574
4	IPS	1/2"	CTS	1,89	1,05	2202575
4	IPS	1/2"	IPS	1,89	1,05	2202576
4	IPS	3/4"	CTS	1,89	1,05	2202577
4	IPS	3/4"	IPS	2,17	1,05	2202578
4	IPS	1"	CTS	2,17	1,05	2202579
4	IPS	1"	IPS	2,68	1,10	2202580
4	IPS	1 1/4"	IPS	2,76	1,10	2202581
4	IPS	1 1/4"	CTS	2,68	1,10	2202582



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	2202583
6	IPS	1/2"	IPS	1,89	1,10	2202584
6	IPS	3/4"	CTS	1,89	1,10	2202585
6	IPS	3/4"	IPS	2,17	1,10	2202586
6	IPS	1"	CTS	2,17	1,10	2202587
6	IPS	1"	IPS	2,68	1,15	2202588
6	IPS	1 1/4"	IPS	2,76	1,15	2202589
6	IPS	1 1/4"	CTS	2,68	1,15	2202590
8	IPS	1/2"	CTS	1,89	1,10	2202591
8	IPS	1/2"	IPS	1,89	1,10	2202592
8	IPS	3/4"	CTS	1,89	1,10	2202593
8	IPS	3/4"	IPS	2,17	1,10	2202594
8	IPS	1"	CTS	2,17	1,10	2202595
8	IPS	1"	IPS	2,68	1,15	2202596
8	IPS	1 1/4"	IPS	2,76	1,15	2202597
8	IPS	1 1/4"	CTS	2,68	1,15	2202598
3	DIPS	1/2"	CTS	1,89	1,05	2202599
3	DIPS	1/2"	IPS	1,89	1,05	2202600
3	DIPS	3/4"	CTS	1,89	1,05	2202601
3	DIPS	3/4"	IPS	2,17	1,05	2202602
3	DIPS	1"	CTS	2,17	1,05	2202603
3	DIPS	1"	IPS	2,68	1,10	2202604
3	DIPS	1 1/4"	IPS	2,76	1,10	2202605
3	DIPS	1 1/4"	CTS	2,68	1,10	2202606
4	DIPS	1/2"	CTS	2,05	1,05	2202607
4	DIPS	1/2"	IPS	2,52	1,05	2202608
4	DIPS	3/4"	CTS	3,50	1,05	2202609
4	DIPS	3/4"	IPS	2,52	1,05	2202610
4	DIPS	1"	CTS	3,94	1,05	2202611
4	DIPS	1"	IPS	1,85	1,10	2202612
4	DIPS	1 1/4"	IPS	1,85	1,10	2202613
4	DIPS	1 1/4"	CTS	1,85	1,10	2202614
6	DIPS	1/2"	CTS	2,52	1,10	2202615
6	DIPS	1/2"	IPS	3,50	1,10	2202616
6	DIPS	3/4"	CTS	2,52	1,10	2202617
6	DIPS	3/4"	IPS	3,94	1,10	2202618
6	DIPS	1"	CTS	3,35	1,10	2202619
6	DIPS	1"	IPS	3,35	1,15	2202620
6	DIPS	1 1/4"	IPS	3,74	1,15	2202621
6	DIPS	1 1/4"	CTS	2,86	1,15	2202622
8	DIPS	1/2"	CTS	2,76	1,10	2202623
8	DIPS	1/2"	IPS	2,76	1,10	2202624
8	DIPS	3/4"	CTS	2,76	1,10	2202625
8	DIPS	3/4"	IPS	3,15	1,10	2202626
8	DIPS	1"	CTS	3,35	1,10	2202627
8	DIPS	1"	IPS	3,35	1,15	2202628
8	DIPS	1 1/4"	IPS	3,74	1,15	2202629
8	DIPS	1 1/4"	CTS	2,86	1,15	2202630

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

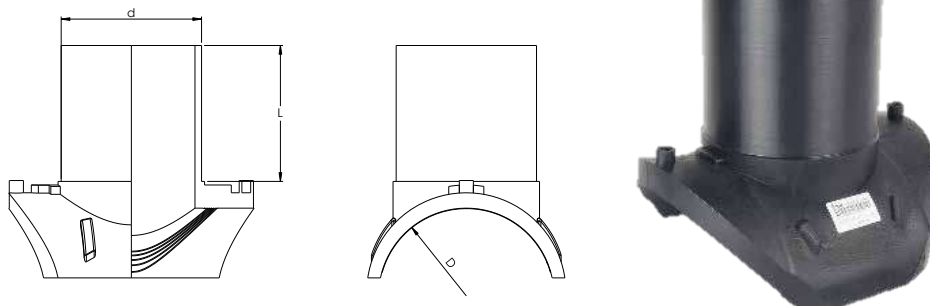
TEKNİK
TECHNICAL

SDR11 ELECTROFUSION FLEX 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
4"	IPS	3"	IPS	4,76	1,98	2204743
6"	IPS	3"	IPS	4,76	1,98	2204744
6"	IPS	4"	IPS	4,80	2,43	2204745
8"	IPS	3"	IPS	4,76	1,96	2204746
8"	IPS	4"	IPS	4,80	2,40	2204747
8"	IPS	6"	IPS	5,91	4,41	2204748
10"	IPS	3"	IPS	4,76	1,96	2204749
10"	IPS	4"	IPS	4,80	2,40	2204750
10"	IPS	6"	IPS	5,91	4,41	2204751
12"	IPS	3"	IPS	4,76	1,94	2204753
12"	IPS	4"	IPS	4,80	2,38	2204754
12"	IPS	6"	IPS	5,91	4,39	2204755
14"	IPS	3"	IPS	4,76	1,94	2204757
14"	IPS	4"	IPS	4,80	2,38	2204758
14"	IPS	6"	IPS	5,91	4,39	2204759
16"	IPS	3"	IPS	4,76	1,92	2204761
16"	IPS	4"	IPS	4,80	2,36	2204762
16"	IPS	6"	IPS	5,91	4,37	2204763
18"	IPS	3"	IPS	4,76	1,92	2204765
18"	IPS	4"	IPS	4,80	2,36	2204766

SDR11 ELECTROFUSION FLEX SADDLES

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

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

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- 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
8"	IPS	6"	IPS	5,91	4,37	2204767
20"	IPS	3"	IPS	4,76	1,90	2204769
20"	IPS	4"	IPS	4,80	2,34	2204770
20"	IPS	6"	IPS	5,91	4,34	2204771
24"	IPS	3"	IPS	4,76	1,87	2204773
24"	IPS	4"	IPS	4,80	2,32	2204774
24"	IPS	6"	IPS	5,91	4,32	2204775
8"	IPS	6"	DIPS	6,10	4,63	2204777
10"	IPS	6"	DIPS	6,10	4,63	2204778
12"	IPS	6"	DIPS	6,10	4,59	2204779
14"	IPS	6"	DIPS	6,10	4,59	2204780
16"	IPS	6"	DIPS	6,10	4,56	2204781
18"	IPS	6"	DIPS	6,10	4,56	2204782
20"	IPS	6"	DIPS	6,10	4,54	2204783
24"	IPS	6"	DIPS	6,10	4,52	2204784

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

EF-IPS EF-IPS

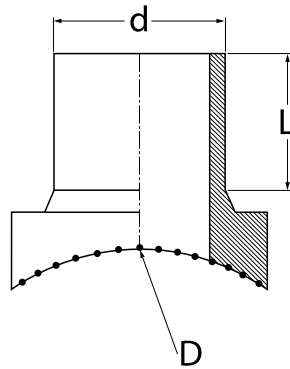


SDR11 ELECTROFUSION LARGE BRANCH SADDLES

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	2204068
4"	IPS	3"	IPS	3,54	1,32	2204075
4"	IPS	4"	IPS	3,54	2,65	2204076
5"	IPS	3"	IPS	3,54	1,32	2204080
5"	IPS	4"	IPS	3,54	2,65	2204254
6"	IPS	3"	IPS	3,54	1,32	2204087
6"	IPS	4"	IPS	3,54	2,65	2204088
6"	IPS	5"	IPS	4,33	3,97	2204448
6"	IPS	6"	IPS	5,91	4,20	2204090
7"	IPS	3"	IPS	3,54	1,32	2204094
7"	IPS	4"	IPS	3,54	2,65	2204449
7"	IPS	5"	IPS	4,33	3,97	2204095
7"	IPS	6"	IPS	5,91	5,07	2204450
8"	IPS	3"	IPS	3,54	1,32	2204102
8"	IPS	4"	IPS	3,54	2,65	2204103
8"	IPS	5"	IPS	4,33	3,97	2204106
8"	IPS	6"	IPS	5,91	5,07	2204107
8"	IPS	7"	IPS	5,91	5,07	2204451
8"	IPS	8"	IPS	5,91	5,07	2204109
10"	IPS	3"	IPS	3,54	1,32	2204124
10"	IPS	4"	IPS	3,54	2,65	2204125
10"	IPS	5"	IPS	4,33	3,97	2204048
10"	IPS	6"	IPS	5,91	5,07	2204127
10"	IPS	7"	IPS	5,91	5,07	2204452

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	2204128
12"	IPS	3"	IPS	3,54	1,32	2204139
12"	IPS	4"	IPS	3,54	2,65	2204140
12"	IPS	5"	IPS	4,33	3,97	2204453
12"	IPS	6"	IPS	5,91	5,07	2204142
12"	IPS	7"	IPS	5,91	5,07	2204454
12"	IPS	8"	IPS	5,91	9,92	2204144
14"	IPS	3"	IPS	3,54	1,32	2204155
14"	IPS	4"	IPS	3,54	2,65	2204156
14"	IPS	5"	IPS	4,33	3,97	2204455
14"	IPS	6"	IPS	5,91	5,07	2204157
14"	IPS	7"	IPS	5,91	5,07	2204456
14"	IPS	8"	IPS	5,91	9,92	2204158
16"	IPS	3"	IPS	3,54	1,32	2204168
16"	IPS	4"	IPS	3,54	2,65	2204169
16"	IPS	5"	IPS	4,33	3,97	2204457
16"	IPS	6"	IPS	5,91	5,07	2204170
16"	IPS	7"	IPS	5,91	5,07	2204458
16"	IPS	8"	IPS	5,91	9,92	2204171
18"	IPS	3"	IPS	3,54	1,32	2204179
18"	IPS	4"	IPS	3,54	2,65	2204180
18"	IPS	5"	IPS	4,33	3,97	2204459
18"	IPS	6"	IPS	5,91	5,07	2204181
18"	IPS	7"	IPS	5,91	5,07	2204460
18"	IPS	8"	IPS	5,91	9,92	2204182
20"	IPS	3"	IPS	3,54	1,32	2204189
20"	IPS	4"	IPS	3,54	2,65	2204190
20"	IPS	5"	IPS	4,33	3,97	2204461
20"	IPS	6"	IPS	5,91	5,07	2204192
20"	IPS	7"	IPS	5,91	5,07	2204462
20"	IPS	8"	IPS	5,91	9,92	2204193
22"	IPS	3"	IPS	3,54	1,32	2204200
22"	IPS	4"	IPS	3,54	2,65	2204201
22"	IPS	5"	IPS	4,33	3,97	2204463
22"	IPS	6"	IPS	5,91	5,07	2204291
22"	IPS	7"	IPS	5,91	5,07	2204464
22"	IPS	8"	IPS	5,91	9,92	2204202
24"	IPS	3"	IPS	3,54	1,32	2204465
24"	IPS	4"	IPS	3,54	2,65	2204206
24"	IPS	5"	IPS	4,33	3,97	2204466
24"	IPS	6"	IPS	5,91	5,07	2204208
24"	IPS	7"	IPS	5,91	5,07	2204467
24"	IPS	8"	IPS	5,91	9,92	2204056
30"	IPS	3"	IPS	3,54	1,32	2204225
30"	IPS	4"	IPS	3,54	2,65	2204226
30"	IPS	5"	IPS	4,33	3,97	2204468
30"	IPS	6"	IPS	5,91	5,07	2204227
30"	IPS	7"	IPS	5,91	5,07	2204469
30"	IPS	8"	IPS	5,91	9,92	2204228
32"	IPS	3"	IPS	3,54	1,32	2204230

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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	2204231
32"	IPS	5"	IPS	4,33	3,97	2204470
32"	IPS	6"	IPS	5,91	5,07	2204233
32"	IPS	7"	IPS	5,91	5,07	2204471
32"	IPS	8"	IPS	5,91	9,92	2204234
36"	IPS	3"	IPS	3,54	1,32	2204238
36"	IPS	4"	IPS	3,54	2,65	2204239
36"	IPS	5"	IPS	4,33	3,97	2204472
36"	IPS	6"	IPS	5,91	5,07	2204240
36"	IPS	7"	IPS	5,91	5,07	2204473
36"	IPS	8"	IPS	5,91	9,92	2204241
1000 mm.	IPS	3"	IPS	3,54	1,32	2204246
1000 mm.	IPS	4"	IPS	3,54	2,65	2204474
1000 mm.	IPS	5"	IPS	4,33	3,97	2204475
1000 mm.	IPS	6"	IPS	5,91	5,07	2204247
1000 mm.	IPS	7"	IPS	5,91	5,07	2204476
1000 mm.	IPS	8"	IPS	5,91	9,92	2204248
42"	IPS	3"	IPS	3,54	1,32	2204477
42"	IPS	4"	IPS	3,54	2,65	2204478
42"	IPS	5"	IPS	4,33	3,97	2204479
42"	IPS	6"	IPS	5,91	5,07	2204480
42"	IPS	7"	IPS	5,91	5,07	2204481
42"	IPS	8"	IPS	5,91	9,92	2204482
48"	IPS	3"	IPS	3,54	1,32	2204483
48"	IPS	4"	IPS	3,54	2,65	2204484
48"	IPS	5"	IPS	4,33	3,97	2204485
48"	IPS	6"	IPS	5,91	5,07	2204486
48"	IPS	7"	IPS	5,91	5,07	2204487
48"	IPS	8"	IPS	5,91	9,92	2204488
54"	IPS	3"	IPS	3,54	1,32	2204489
54"	IPS	4"	IPS	3,54	2,65	2204490
54"	IPS	5"	IPS	4,33	3,97	2204491
54"	IPS	6"	IPS	5,91	5,07	2204492
54"	IPS	7"	IPS	5,91	5,07	2204493
54"	IPS	8"	IPS	5,91	9,92	2204494
63"	IPS	3"	IPS	3,54	1,32	2204495
63"	IPS	4"	IPS	3,54	2,65	2204256
63"	IPS	5"	IPS	4,33	3,97	2204496
63"	IPS	6"	IPS	5,91	5,07	2204497
63"	IPS	7"	IPS	5,91	5,07	2204498
63"	IPS	8"	IPS	5,91	9,92	2204499
6"	DIPS	4"	DIPS	3,54	2,65	2204500
8"	DIPS	4"	DIPS	3,54	2,65	2204501
8"	DIPS	6"	DIPS	5,91	5,07	2204502
10"	DIPS	4"	DIPS	3,54	2,65	2204503
10"	DIPS	6"	DIPS	5,91	5,07	2204504
10"	DIPS	8"	DIPS	5,71	19,84	2204505
12"	DIPS	4"	DIPS	3,54	2,65	2204506
12"	DIPS	6"	DIPS	5,91	5,07	2204507
12"	DIPS	8"	DIPS	5,71	18,74	2204507
14"	DIPS	4"	DIPS	3,54	2,65	2204509

EF-METRIK
 SPİGOT-METRIK
 AKIŞ KONTROL-METRIK
 FLOW CONTROL-METRIK
 EF-IPS
 AKIŞ KONTROL-IPS
 FLOW CONTROL-IPS
 MAKİNE-APARATLAR
 MACHINE-TOOL
 MONTAJ
 INSTALLATION
 TEKNİK
 TECHNICAL

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	2204510
14"	DIPS	8"	DIPS	5,71	18,74	2204510
16"	DIPS	4"	DIPS	3,54	2,65	2204512
16"	DIPS	6"	DIPS	5,91	5,07	2204512
16"	DIPS	8"	DIPS	5,71	18,74	2204513
18"	DIPS	4"	DIPS	3,54	2,65	2204514
18"	DIPS	6"	DIPS	5,91	5,07	2204515
18"	DIPS	8"	DIPS	5,71	18,74	2204516
20"	DIPS	4"	DIPS	3,54	2,65	2204517
20"	DIPS	6"	DIPS	5,91	5,07	2204518
20"	DIPS	8"	DIPS	5,71	18,74	2204519
24"	DIPS	4"	DIPS	3,54	2,65	2204520
24"	DIPS	6"	DIPS	5,91	5,07	2204521
24"	DIPS	8"	DIPS	5,71	18,74	2204521
30"	DIPS	4"	DIPS	3,54	2,65	2204523
30"	DIPS	6"	DIPS	5,91	5,07	2204524
30"	DIPS	8"	DIPS	5,71	18,74	2204524
36"	DIPS	4"	DIPS	3,54	2,65	2204526
36"	DIPS	6"	DIPS	5,91	5,07	2204526
36"	DIPS	8"	DIPS	5,71	18,74	2204527
42"	DIPS	4"	DIPS	3,54	2,65	2204528
42"	DIPS	6"	DIPS	5,91	5,07	2204529
42"	DIPS	8"	DIPS	5,71	18,74	2204530
48"	DIPS	4"	DIPS	3,54	2,65	2204531
48"	DIPS	6"	DIPS	5,91	5,07	2204532
48"	DIPS	8"	DIPS	5,71	18,74	2204533

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

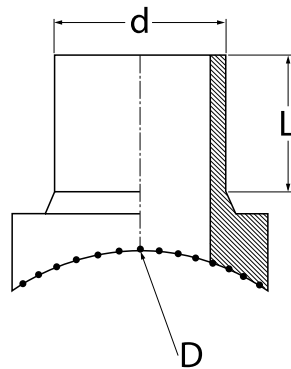
TEKNİK
TECHNICAL

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	2204145
14"	IPS	10"	IPS	6,70	18,74	2204159
14"	IPS	12"	IPS	6,70	33,07	2204364
16"	IPS	10"	IPS	6,70	18,74	2204017
16"	IPS	12"	IPS	6,70	33,07	2204019
18"	IPS	10"	IPS	6,70	18,74	2204024
18"	IPS	12"	IPS	6,70	33,07	2204026
18"	IPS	14"	IPS	6,70	33,07	2204365
20"	IPS	10"	IPS	6,70	18,74	2204027
20"	IPS	12"	IPS	6,70	33,07	2204028
20"	IPS	14"	IPS	6,70	33,07	2204366
20"	IPS	16"	IPS	8,46	92,60	2204367
22"	IPS	10"	IPS	6,70	18,74	2204368
22"	IPS	12"	IPS	6,70	33,07	2204031
22"	IPS	14"	IPS	6,70	33,07	2204369
22"	IPS	16"	IPS	8,46	92,60	2204370
22"	IPS	16"	IPS	8,46	92,60	2204371
22"	IPS	18"	IPS	8,46	92,60	2204372
24"	IPS	10"	IPS	6,70	18,74	2204373
24"	IPS	12"	IPS	6,70	33,07	2204374

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



EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

BASE (D)	BASE NORM	OUTLET (d)	OUTLET NORM	L	Unit Weight in lbs	Item
24"	IPS	14"	IPS	6,70	33,07	2204375
24"	IPS	16"	IPS	8,46	92,60	2204005
24"	IPS	18"	IPS	8,46	92,60	2204376
30"	IPS	10"	IPS	6,70	18,74	2204037
30"	IPS	12"	IPS	6,70	33,07	2204038
30"	IPS	14"	IPS	6,70	33,07	2204377
30"	IPS	16"	IPS	8,46	92,60	2204378
30"	IPS	18"	IPS	8,46	92,60	2204379
30"	IPS	20"	IPS	8,46	92,60	2204380
32"	IPS	10"	IPS	6,70	18,74	2204381
32"	IPS	12"	IPS	6,70	33,07	2204382
32"	IPS	14"	IPS	6,70	33,07	2204383
32"	IPS	16"	IPS	8,46	92,60	2204384
32"	IPS	18"	IPS	8,46	92,60	2204385
32"	IPS	20"	IPS	8,46	92,60	2204386
36"	IPS	10"	IPS	6,70	18,74	2204387
36"	IPS	12"	IPS	6,70	33,07	2204388
36"	IPS	14"	IPS	6,70	33,07	2204389
36"	IPS	16"	IPS	8,46	92,60	2204390
36"	IPS	18"	IPS	8,46	92,60	2204391
36"	IPS	20"	IPS	8,46	92,60	2204392
42"	IPS	10"	IPS	6,70	18,74	2204393
42"	IPS	12"	IPS	6,70	33,07	2204394
42"	IPS	14"	IPS	6,70	33,07	2204395
42"	IPS	16"	IPS	8,46	92,60	2204396
42"	IPS	18"	IPS	8,46	92,60	2204397
42"	IPS	20"	IPS	8,46	92,60	2204398
48"	IPS	10"	IPS	6,70	18,74	2204399
48"	IPS	12"	IPS	6,70	33,07	2204400
48"	IPS	14"	IPS	6,70	33,07	2204401
48"	IPS	16"	IPS	8,46	92,60	2204402
48"	IPS	18"	IPS	8,46	92,60	2204403
48"	IPS	20"	IPS	8,46	92,60	2204404
54"	IPS	10"	IPS	6,70	18,74	2204405
54"	IPS	12"	IPS	6,70	33,07	2204406
54"	IPS	14"	IPS	6,70	33,07	2204407
54"	IPS	16"	IPS	8,46	92,60	2204408
54"	IPS	18"	IPS	8,46	92,60	2204409
54"	IPS	20"	IPS	8,46	92,60	2204410
63"	IPS	10"	IPS	6,70	18,74	2204411
63"	IPS	12"	IPS	6,70	33,07	2204412
63"	IPS	14"	IPS	6,70	33,07	2204413
63"	IPS	16"	IPS	8,46	92,60	2204414
63"	IPS	18"	IPS	8,46	92,60	2204415
63"	IPS	20"	IPS	8,46	92,60	2204416
12"	DIPS	10"	DIPS	6,70	18,74	2204417
14"	DIPS	10"	DIPS	6,70	18,74	2204016
14"	DIPS	12"	DIPS	6,70	33,07	2204418
16"	DIPS	10"	DIPS	6,70	18,74	2204023

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	2204021
18"	DIPS	10"	DIPS	6,70	18,74	2204419
18"	DIPS	12"	DIPS	6,70	33,07	2204420
20"	DIPS	10"	DIPS	6,70	18,74	2204421
20"	DIPS	12"	DIPS	6,70	33,07	2204030
20"	DIPS	14"	DIPS	8,46	92,60	2204422
20"	DIPS	16"	DIPS	8,46	92,60	2204423
24"	DIPS	10"	DIPS	6,70	18,74	2204424
24"	DIPS	12"	DIPS	6,70	33,07	2204034
24"	DIPS	14"	DIPS	8,46	92,60	2204425
24"	DIPS	16"	DIPS	8,46	92,60	2204426
24"	DIPS	18"	DIPS	8,46	92,60	2204427
30"	DIPS	10"	DIPS	6,70	18,74	2204428
30"	DIPS	12"	DIPS	6,70	33,07	2204429
30"	DIPS	14"	DIPS	8,46	92,60	2204430
30"	DIPS	16"	DIPS	8,46	92,60	2204431
30"	DIPS	18"	DIPS	8,46	92,60	2204432
36"	DIPS	10"	DIPS	6,70	18,74	2204433
36"	DIPS	12"	DIPS	6,70	33,07	2204434
36"	DIPS	14"	DIPS	8,46	92,60	2204435
36"	DIPS	16"	DIPS	8,46	92,60	2204436
36"	DIPS	18"	DIPS	8,46	92,60	2204437
42"	DIPS	10"	DIPS	6,70	18,74	2204438
42"	DIPS	12"	DIPS	6,70	33,07	2204439
42"	DIPS	14"	DIPS	8,46	92,60	2204440
42"	DIPS	16"	DIPS	8,46	92,60	2204441
42"	DIPS	18"	DIPS	8,46	92,60	2204442
48"	DIPS	10"	DIPS	6,70	18,74	2204443
48"	DIPS	12"	DIPS	6,70	33,07	2204444
48"	DIPS	14"	DIPS	8,46	92,60	2204445
48"	DIPS	16"	DIPS	8,46	92,60	2204446
48"	DIPS	18"	DIPS	8,46	92,60	2204447

EF-METRIK / SPIGOT-METRIK / AKIS KONTROL-METRIK / EF-IPS / AKIS KONTROL-IPS / MAKINE-APARATLAR / MONTAJ / TEKNİK

EF-METRIC / SPIGOT-METRIC / FLOW CONTROL-METRIC / EF-IPS / FLOW CONTROL-IPS / MACHINE-TOOL / INSTALLATION / TECHNICAL

SDR11 ELECTROFUSION EQUAL TEES

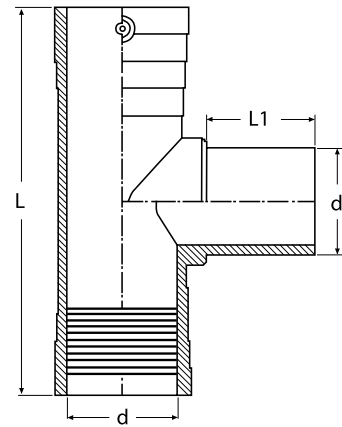
Water - 240 PSI at 73 Deg F Sustainable Maximum

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

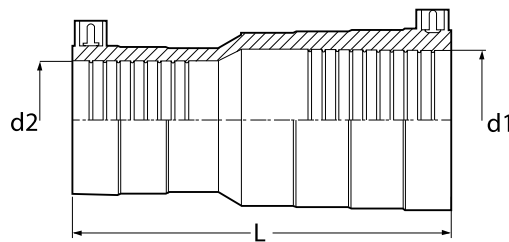
Nominal Pipe Size d	Base Norm	L	L1	Unit Weight in lbs.	Item Code	TYPE
3/4" IPS	IPS	4,25	1,46	1,59	2207004	A
1" CTS	CTS	5,04	1,61	0,29	2207005	A
1" IPS	IPS	5,04	1,61	0,29	2207006	A
1 1/4" IPS	IPS	6,38	1,93	0,37	2207007	A
1 1/2" IPS	IPS	6,38	1,93	0,68	2207008	A
2" IPS	IPS	7,32	2,40	1,26	2207010	A
3" IPS	IPS	10,04	2,91	3,26	2207011	A
4" IPS	IPS	11,93	3,11	5,86	2207013	A
6" IPS	IPS	19,00	4,75	11,46	2207016	B
8" IPS	IPS	19,00	5,20	36,15	2207017	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



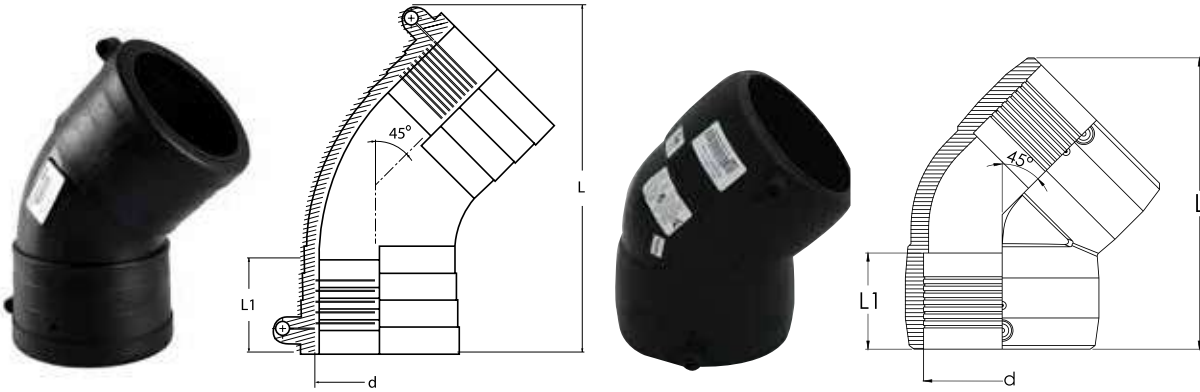
Nominal Pipe Size	L	Unit Weight in lbs.	Item Code
1" IPS X 1/2" IPS	3,54	0,09	2208008
1" IPS X 3/4" CTS	3,54	0,11	2208035
1" IPS X 3/4" IPS	3,54	0,09	2208010
1 1/4" IPS X 1" IPS	4,61	0,20	2208012
1 1/2" IPS X 1" IPS	5,16	0,33	2208014
2" IPS X 1" IPS	5,59	0,49	2208019
2" IPS X 1 1/4" IPS	5,47	0,53	2208020
2" IPS X 1 1/2" IPS	5,98	0,57	2208021
3" IPS X 2" IPS	7,48	1,28	2208023
4" IPS X 2" IPS	8,23	1,94	2208024
4" IPS X 3" IPS	8,46	2,40	2208025

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



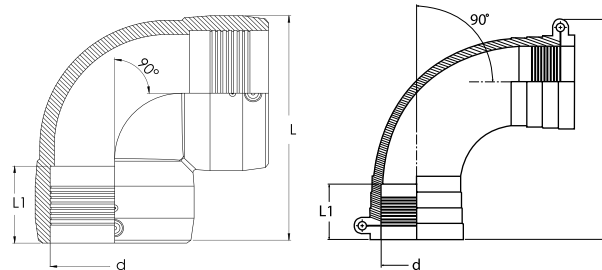
Nominal Pipe Size d	Base Norm	L	L1	Unit Weight in lbs.	Item Code	TYPE
3/4"	IPS	4,17	1,50	0,13	2209011	A
1"	CTS	4,57	1,61	0,18	2209012	A
1"	IPS	4,57	1,61	0,18	2209013	A
1 1/4"	IPS	5,47	1,85	0,29	2209014	A
1 1/2"	IPS	6,54	2,01	0,51	2209015	A
2"	IPS	7,76	2,28	0,88	2209016	A
3"	IPS	9,53	2,83	2,07	2209017	A
4"	IPS	11,89	3,23	5,71	2209018	A
6"	IPS	17,14	4,75	4,00	2209020	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

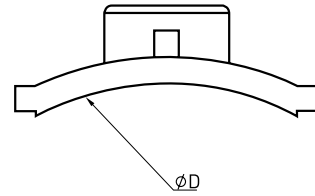
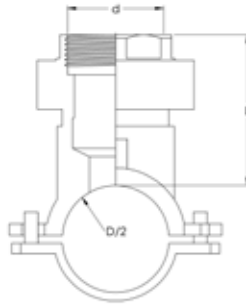
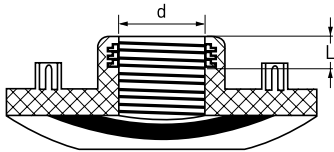
Nominal Pipe Size d	Base Norm	L	L1	Unit Weight	Item Code	TYPE
				in lbs.		
3/4"	IPS	3,86	1,50	0,15	2209001	A
1"	CTS	4,29	1,61	0,31	2209002	A
1"	IPS	4,29	1,61	0,22	2209003	A
1 1/4"	IPS	5,16	1,85	0,37	2209004	A
1 1/2"	IPS	6,10	2,01	0,62	2209005	A
2"	IPS	7,44	1,89	1,15	2209006	A
3"	IPS	9,53	2,76	2,45	2209007	A
4"	IPS	11,69	3,23	6,61	2209008	A
6"	IPS	17,14	4,75	5,50	2209009	B

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"	2204364	12	0.73	30*40*30	12	B
3"	3/4"	2204365	12	0.65	30*40*30	12	A
4"	3/4"	2204366	12	0.71	30*40*30	12	A
6"	3/4"	2204367	12	0.93	30*40*30	12	A
8"	3/4"	2204368	12	0.93	30*40*30	12	A
10"	3/4"	2204369	12	0.63	30*40*30	12	C
12"	3/4"	2204370	12	0.62	30*40*30	12	C
14"	3/4"	2204371	12	0.62	30*40*30	12	C
16"	3/4"	2204372	12	0.62	30*40*30	12	C
18"	3/4"	2204373	12	0.61	30*40*30	12	C
20"	3/4"	2204374	12	0.61	30*40*30	12	C
22"	3/4"	2204375	12	0.61	30*40*30	12	C
24"	3/4"	2204376	12	0.60	30*40*30	12	C
26"	3/4"	2204377	12	0.60	30*40*30	12	C
28"	3/4"	2204378	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"	2204379	12	0.75	30*40*30	12	B
3"	1"	2204380	12	0.67	30*40*30	12	A
4"	1"	2204381	12	0.73	30*40*30	12	A
6"	1"	2204382	12	0.95	30*40*30	12	A
8"	1"	2204383	12	0.95	30*40*30	12	A
10"	1"	2204384	12	0.64	30*40*30	12	C
12"	1"	2204385	12	0.63	30*40*30	12	C
14"	1"	2204386	12	0.63	30*40*30	12	C
16"	1"	2204387	12	0.63	30*40*30	12	C
18"	1"	2204388	12	0.62	30*40*30	12	C
20"	1"	2204389	12	0.62	30*40*30	12	C
22"	1"	2204390	12	0.62	30*40*30	12	C
24"	1"	2204391	12	0.61	30*40*30	12	C
26"	1"	2204392	12	0.61	30*40*30	12	C
28"	1"	2204393	12	0.61	30*40*30	12	C
2"	2"	2204394	20	1.12	30*40*30	12	B
3"	2"	2204395	20	1.04	30*40*30	12	A
4"	2"	2204396	20	1.1	30*40*30	12	A
6"	2"	2204397	20	1.32	30*40*30	12	A
8"	2"	2204398	20	1.32	30*40*30	12	C
10"	2"	2204399	20	0.77	30*40*30	12	C
12"	2"	2204400	20	0.76	30*40*30	12	C
14"	2"	2204401	20	0.76	30*40*30	12	C
16"	2"	2204402	20	0.76	30*40*30	12	C
18"	2"	2204403	20	0.75	30*40*30	12	C
20"	2"	2204404	20	0.75	30*40*30	12	C
22"	2"	2204405	20	0.75	30*40*30	12	C
24"	2"	2204406	20	0.74	30*40*30	12	C
26"	2"	2204407	20	0.74	30*40*30	12	C
28"	2"	2204408	20	0.74	30*40*30	12	C

EF-METRIK

SPIGOT-METRIK

AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

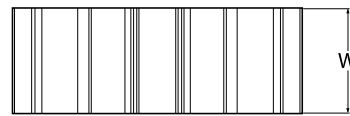
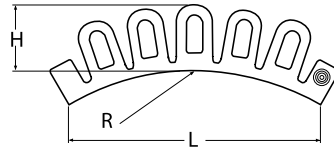
MONTAJ

TEKNİK

EF-IPS EF-IPS



EF FLEX RESTRAINT PE100

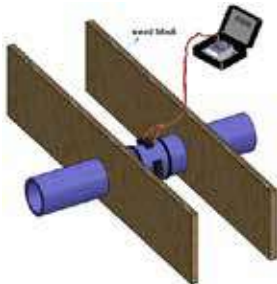


Main Pipe size	CODE	L	H	W
6"-54"	1825008	152	40	63

Max permissible axial force 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.

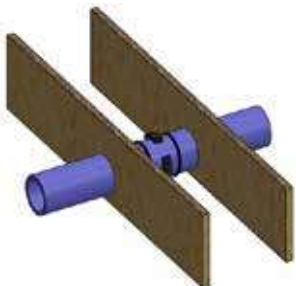


EF FLEX RESTRAINTs are welded to the pipe.



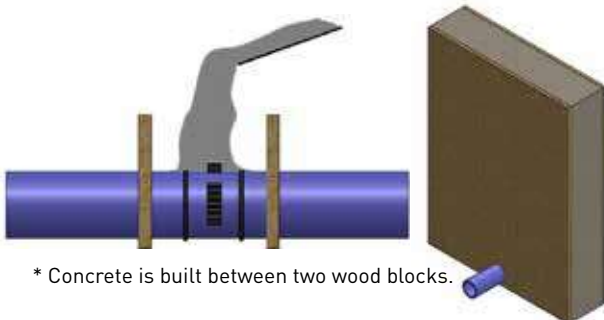
SOLUTION

* To prevent movement of pipe and gap, EF FLEX RESTRAINTs are fixed to the pipe by welding.



* Two wood blocks are separated from concrete.

* Only concrete block stands and EF Flex Restraints keep pipe stable.



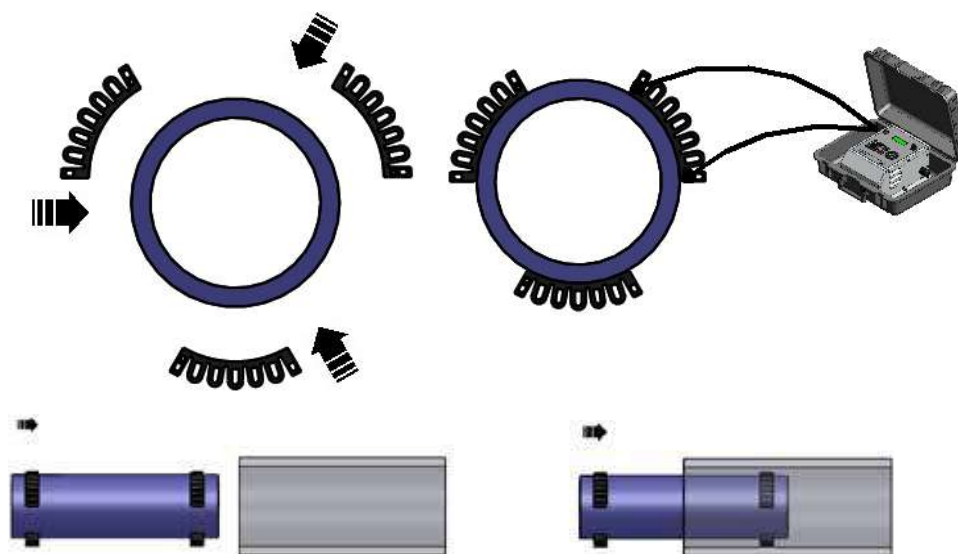
* Concrete is built between two wood blocks.

EF-IPS EF-IPS



- For wall transition the only critical force on the pipe is thermal expansion of the pipe system
- Tega EF Flex Restrain 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
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



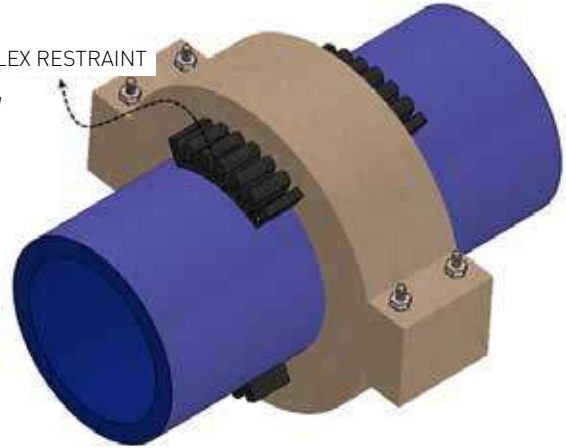
Flex restraints also can be used for centering and easy sliding of a PE pipe in another pipe.



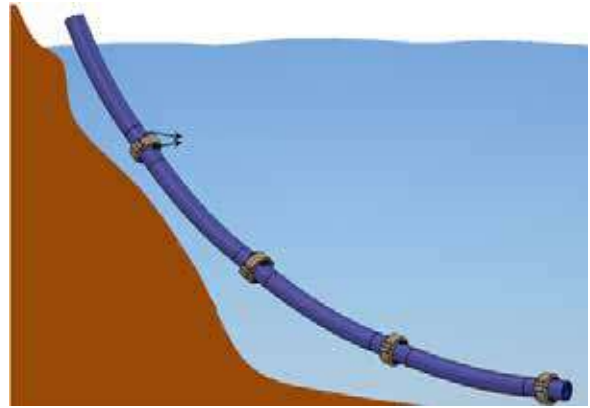
To prevent slipping, blocks must be fixed to the pipe.

EF FLEX RESTRAINTs are welded to the pipe and prevents blocks to slip.

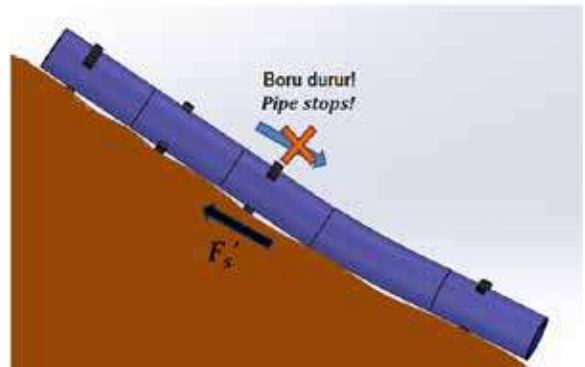
EF FLEX RESTRAINT



Sinkers or thrust blocks do not slip anymore



Prevents slipping pipes



AKIŞ KONTROL-IPS

FLOW CONTROL-IPS



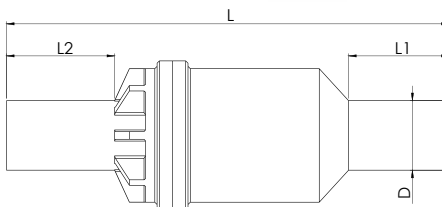
FLOW CONTROL-IPS AKIŞ KONTROL- IPS



PE 100 CHECK VALVE

BALL CHECK VALVE

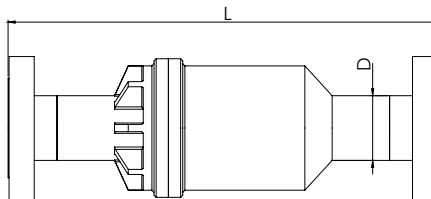
SDR11 PE100



CODE	D	L	L1	L2	WEIGHT
2212040	3" IPS	22,44	5,12	5,51	3,45
2212041	4" IPS	21,65	5,51	5,51	3,8

BALL CHECK VALVE - FLANGED

SDR11 PE100



CODE	D	L	WEIGHT
2212042	3" IPS	22,05	4,65
2212043	4" IPS	22,05	4,9

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

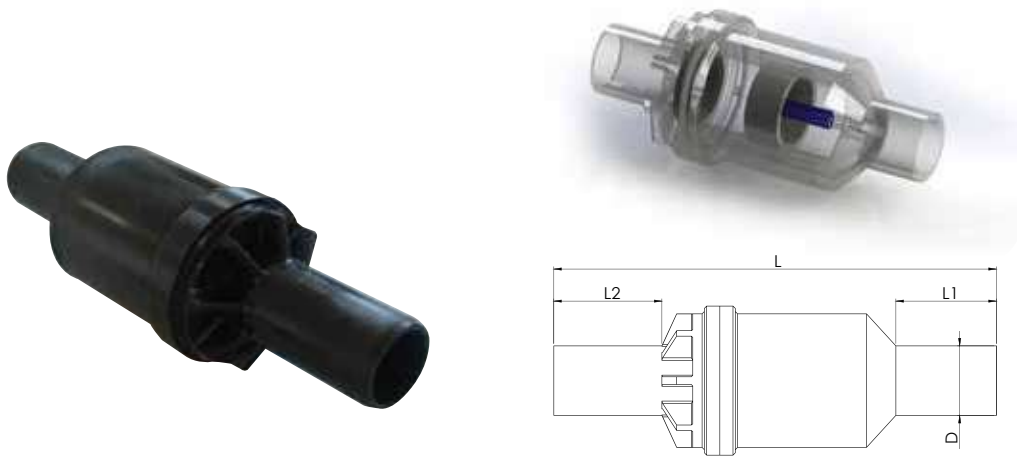
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-IPS AKIŞ KONTROL- IPS

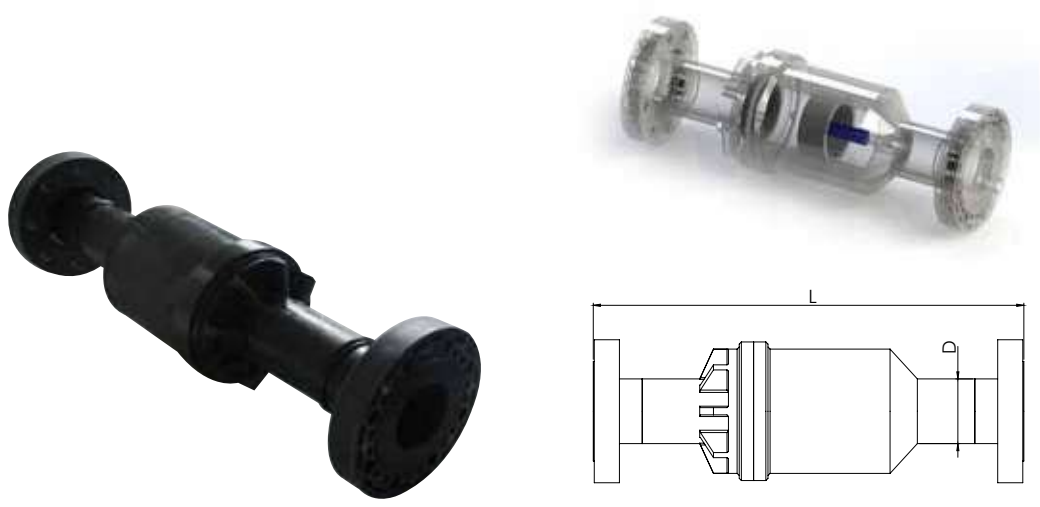


PE100 CHECK VALVE WITH SPRING SDR11 PE100



CODE	D	L	L1	L2	WEIGHT
2212044	3" IPS	22,44	5,12	5,51	3,55
2212045	4" IPS	22,83	5,51	5,51	3,9

CHECK VALVE WITH SPRING-FLANGED SDR11 PE100



CODE	D	L	WEIGHT
2212046	3" IPS	22,05	4,75
2212047	4" IPS	22,05	5,1

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

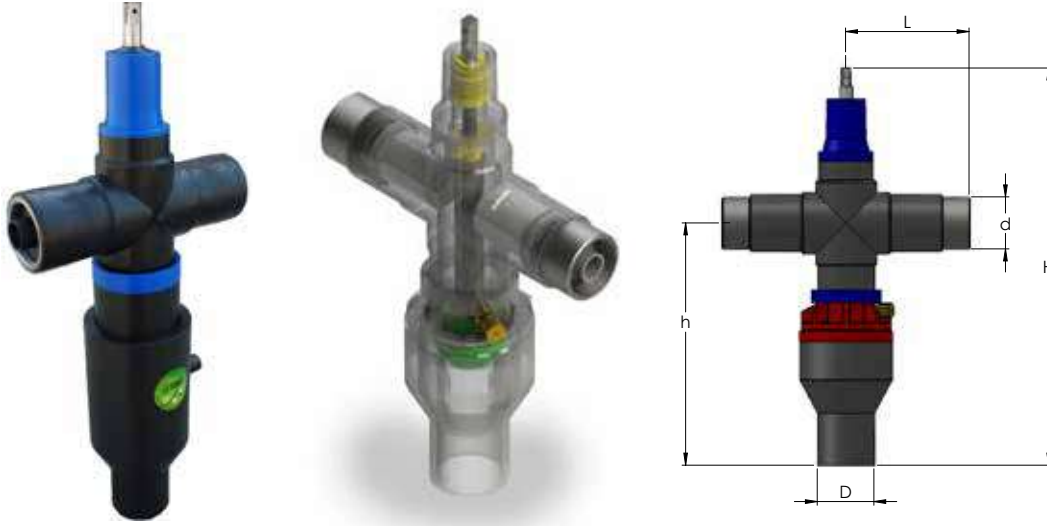
FLOW CONTROL-IPS AKIŞ KONTROL- IPS



HYDRANT-HİDRANT

A TYPE IRRIGATION HYDRANT

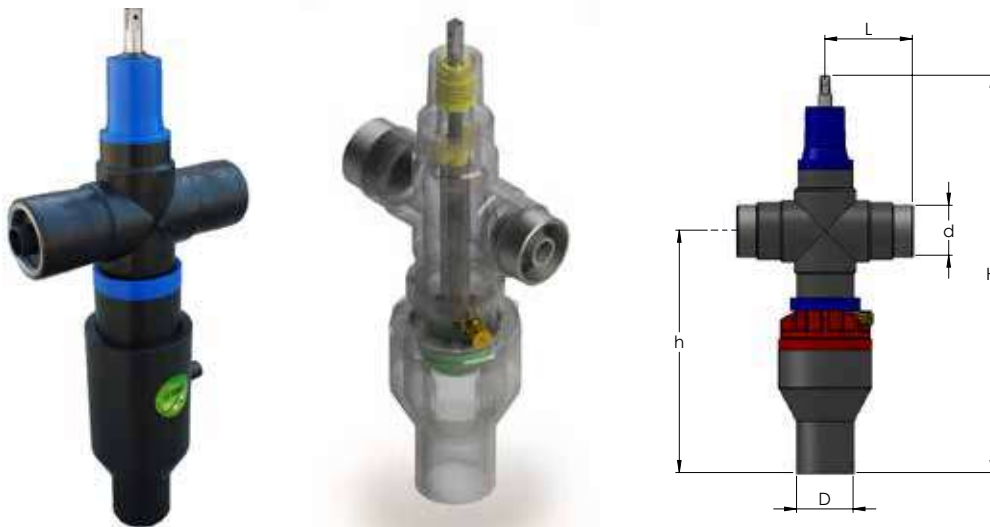
SDR11 PE100



CODE	Tip	D	d	H	h	L
2212048	A	4" IPS	2 1/2" - 3"	29,92	18,11	9,45
2212049	A	6" IPS	4"	35,83	23,62	12,6

D TYPE IRRIGATION HYDRANT

SDR11 PE100



CODE	Tip	D	d	H	h	L
2212050	D	4" IPS	2 1/2" - 3"	29,92	18,11	6,69
2212051	D	6" IPS	4"	35,83	23,62	7,09

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

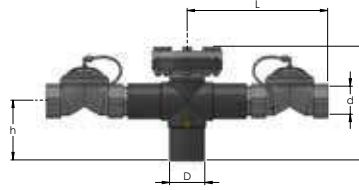
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-IPS AKIŞ KONTROL- IPS

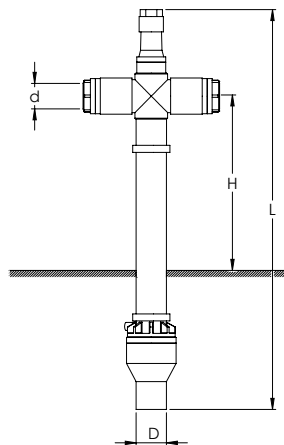


H TYPE IRRIGATION HYDRANT SDR11 PE100



CODE	Tip	D	d	H	h	L
2212052	H	4" IPS	3"	13,97	7,28	17,32

FIRE HYDRANT SDR11 PE100



CODE	Tip	D	d	H	L
2212053	FIRE HYDRANT	4" IPS	2 1/2	24,8	56,5
2212054		4" IPS	2 1/2	24,8	68,9
2212055		4" IPS	2 1/2	24,8	84,65

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

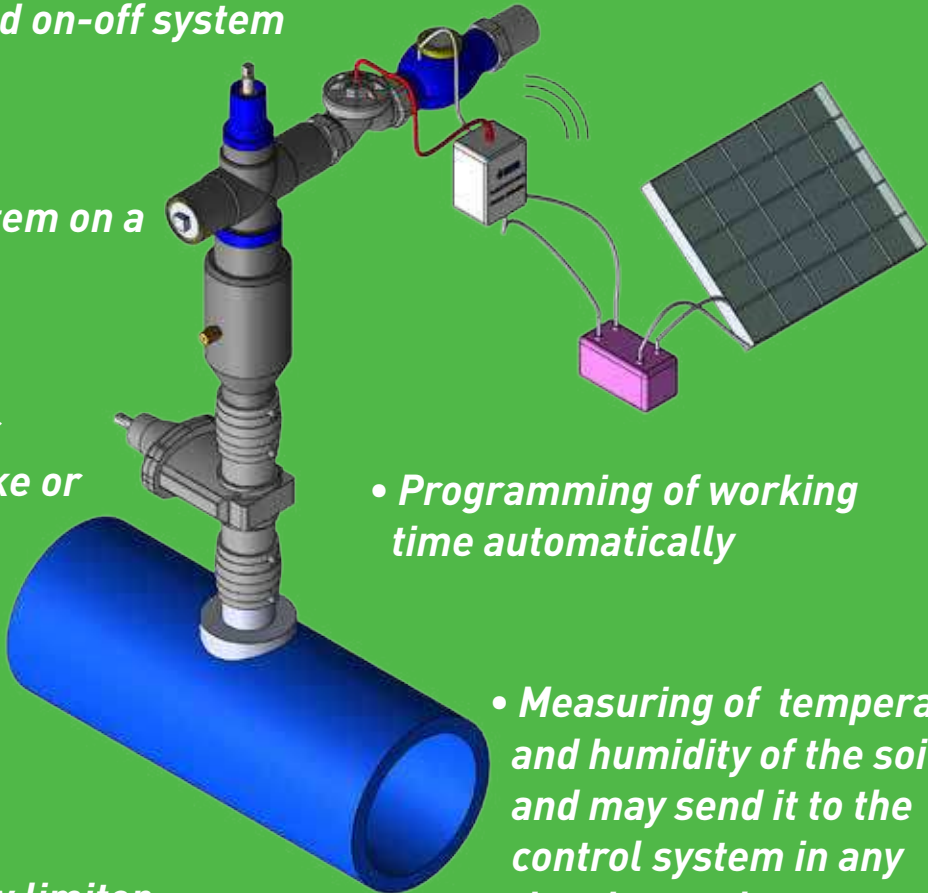
AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



- *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*
 - *Innovative-New generation water regulator and flow limiter*
 - *Measuring of temperature and humidity of the soil and may send it to the control system in any time interval*
- 

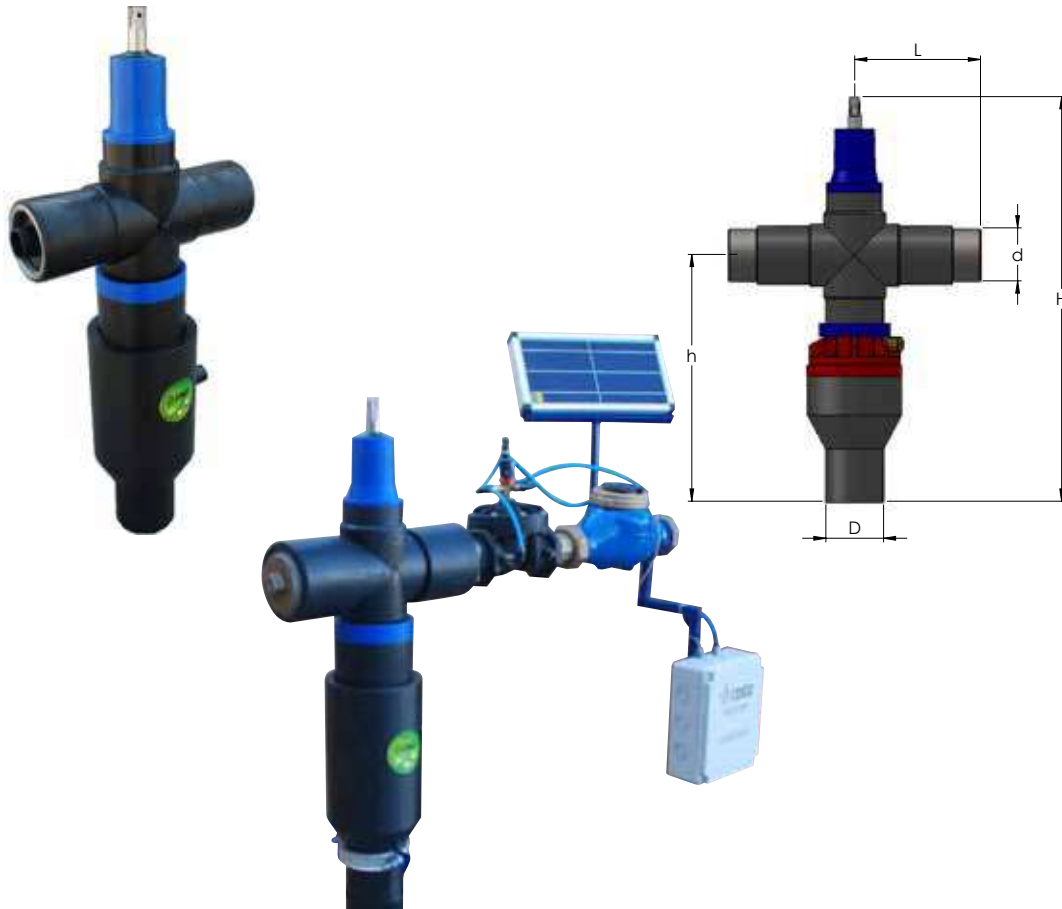
PE 100 IRRIGATION HYDRANT

- **REMOTE CONTROLLED**
- **SOLAR ENERGY SUPPLY**
- **DIGITAL WATER METERING**

FLOW CONTROL-IPS



**IRRIGATION HYDRANT
REMOTE CONTROLLED ON-OFF SYSTEM
SDR11 PE100**



D	d	H	h	L	TYPE
4"	2 1/2" - 3"	29,920"	18,11"	9,450"	A
4"	2 1/2" - 3"	29,920"	18,11"	6,690"	D
6"	4"	35,830"	23,620"	7,080"	D

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIS KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

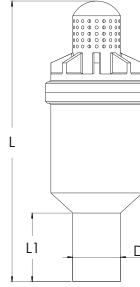
AKIS KONTROL-IPS
FLOW CONTROL-IPS

MAKINE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

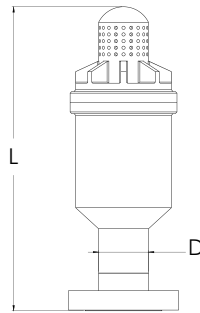
TEKNİK
TECHNICAL

SINGLE BALL AIR RELEASE VALVE SDR11 PE100



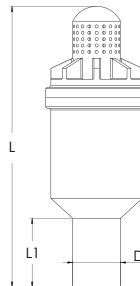
CODE	D	L	L1	WEIGHT
22012056	3" IPS	20,87	5,12	3,35
22012057	4" IPS	21,26	5,51	3,8

SINGLE BALL AIR RELEASE VALVE- FLANGED SDR11 PE100



CODE	D	L	WEIGHT
22012058	3" IPS	20,87	4,05
22012059	4" IPS	20,87	4,4

NON SLAM DYNAMIC AIR RELEASE VALVE SDR11 PE100

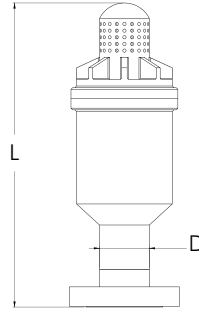


CODE	D	L	L1	WEIGHT
22012060	3" IPS	20,87	5,12	4,15
22012061	4" IPS	21,26	5,51	4,35

FLOW CONTROL-IPS AKIŞ KONTROL- IPS

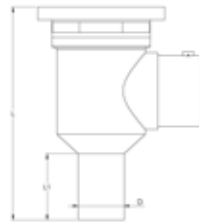


NON SLAM DYNAMIC AIR RELEASE VALVE-FLANGED SDR11 PE100



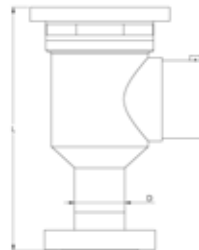
CODE	D	L	WEIGHT
22012062	3" IPS	20,87	4,65
22012063	4" IPS	20,87	5,1

DOUBLE BALL AIR RELEASE VALVE SDR11 PE100



CODE	D	L	L1	WEIGHT
22012066	3" IPS	16,54	5,12	5,55
22012067	4" IPS	16,93	5,51	5,9

PE100 DOUBLE BALL AIR RELEASE VALVE-FLANGED PE100



CODE	D	L	WEIGHT
22012064	3" IPS	16,54	6,15
22012065	4" IPS	16,54	6,4

EF-METRIK

SPIGOT-METRIK

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

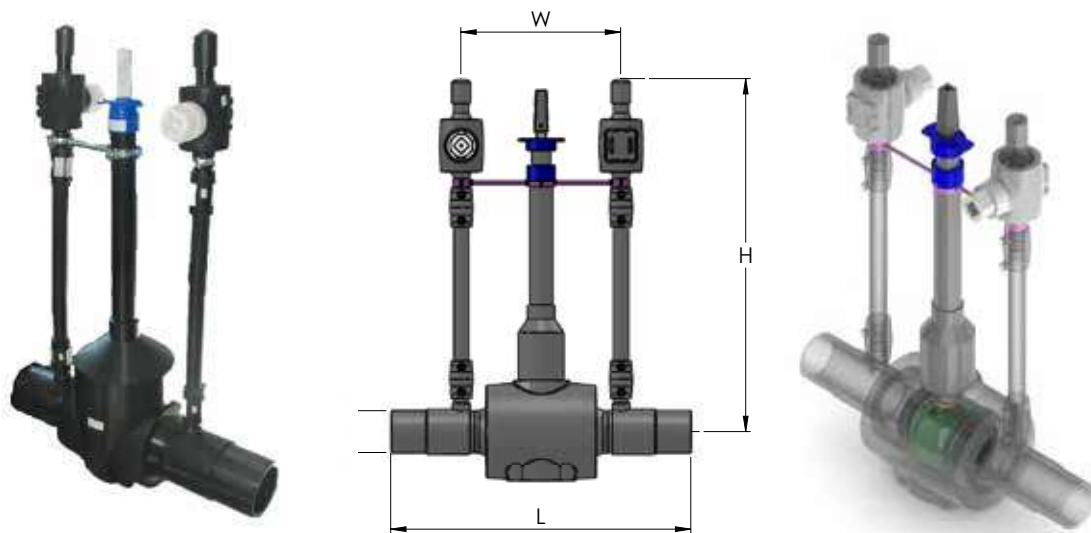
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-IPS AKIŞ KONTROL- IPS



PURGE VALVE SDR11 PE100



CODE	D	L	H	W
2212019	2 IPS	18,88 "	16,93 "	9,45 "
2212020	3 IPS	25,79 "	29,92 "	13,58 "
2212021	4 IPS	25,79 "	29,92 "	13,58 "
2212022	6 IPS	28,74 "	31,89 "	14,96 "
2212023	8 IPS	32,87 "	37,4 "	18,5 "
2212024	10 IPS	36,61 "	37,4 "	19,29 "
2212025	12 IPS	39,96 "	37,4 "	19,88 "

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

PE 100 Gate Valve

- World Wide Patent
- 7 years in development
- Proven through extensive testing

The future VALVE

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 successfully to temperatures → 50°C in desert environments

Successfully tested in freezing temperatures down to -20°C

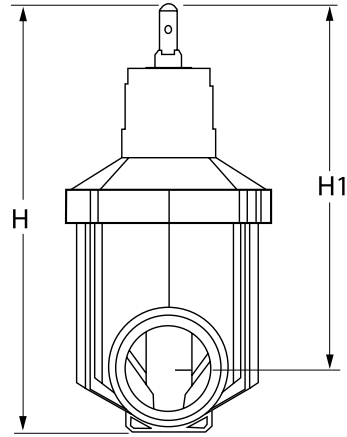
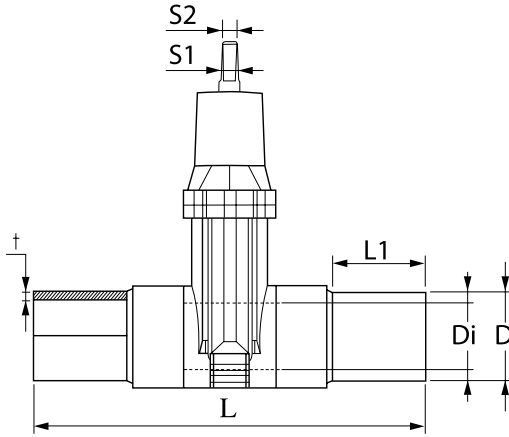


**FIRST
IN THE
WORLD**

FLOW CONTROL-IPS AKIŞ KONTROL- IPS



PE100 GATE VALVE – LONG SPIGOT
WATER / SU : PN16



İnç / Inch siz

PRODUCT CODE (420 SS+MS 58)	PRODUCT CODE (304 SS+DZR)	PRODUCT CODE (316 SS+DZR)	D	L	L1	H	H1	t	S1	S2
2212050	2212049	2212048	1" IPS	9,00	3,46	8,82	7,87	0,13	0,59	0,47
2212051	2212052	2212053	1 1/4" IPS	10,87	3,66	9,37	8,43	0,17	0,59	0,47
2212008	2212032	2212033	3" IPS	16,92"	6.300"	15,75"	13,188"	0,35"	0,81"	0,67"
2212036	2212035	2212034	4" IPS	25,19"	6.300"	16,93"	14,37"	0,45"	0,91"	0,75"
2212037	2212038	2212039	6" IPS	31,700"	8,460"	22,44"	18,897"	0,670"	0,91"	0,75"
2212054	2212055	2212056	8" IPS	31,700"	8,460"	22,44"	18,897"	0,880"	0,91"	0,75"

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATILAR
MACHINE-TOOL

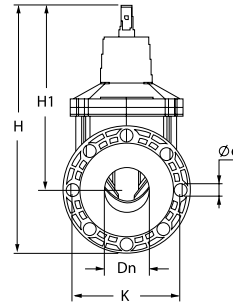
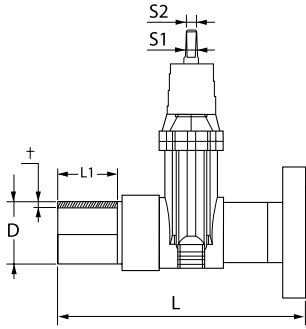
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-IPS AKIŞ KONTROL- IPS



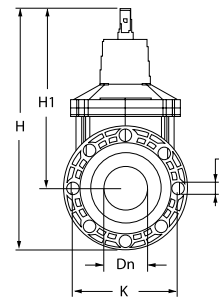
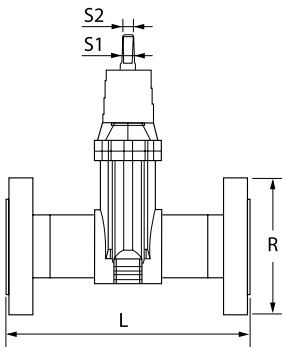
PE100 GATE VALVE - LONG SPIGOT / FLANGED WATER / SU : PN16



İnç - Flanş ölçüsü: ASME B 16.1 / Inch - Drilling dimensions for flange: ASME B 16.1

PRODUCT CODE (420 SS+MS 58)	PRODUCT CODE (304 SS+DZR)	PRODUCT CODE (316 SS+DZR)	Dn	L	L1	H	H1	t	S1	S2	K	R	d/Qty
2212026	2212057	2212058	3"IPS	20.078"	2.56"	11.22"	9.84"	0.26"	0.75"	0.63"	6.625"	8.25"	0.875"/8
2212027	2212059	2212060	4"IPS	21.456"	3.35"	16.93"	14.76"	0.44"	0.75"	0.63"	7.875"	10.00"	0.875"/8
2212028	2212061	2212062	6"IPS	23.543"	3.94"	21.26"	18.11"	0.71"	0.75"	0.63"	10.625"	12.50"	0.875"/12

PE100 GATE VALVE - FLANGED WATER / SU : 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 (304 SS+DZR)	PRODUCT CODE (316 SS+DZR)	Dn	R	H	H1	K	S1	S2	d/Q-ty
2212029	2212063	2212064	3"IPS	8.25"	11.22"	9.84"	6.625"	0.75"	0.63"	0.875"/8
2212030	2212065	2212066	4"IPS	10.00"	16.93"	14.76"	7.785"	0.75"	0.63"	0.875"/8
2212031	2212067	2212068	6"IPS	12.50"	21.26"	18.11"	10.625"	0.75"	0.63"	0.875"/12

EF-METRIK

SPİGOT-METRIK

AKIŞ KONTROL-METRIK

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

INSTALASYON

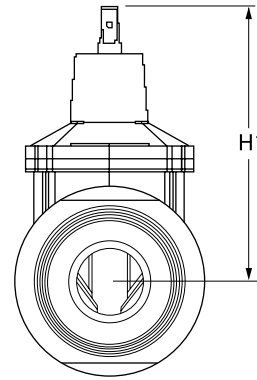
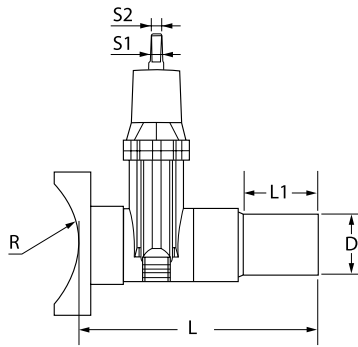
TEKNİK

TEKNİK

FLOW CONTROL-IPS AKIŞ KONTROL- IPS



PE100 GATE VALVE with EF SADDLE
WATER / SU : PN16



Dn	R	L	L1	H1	S1	S2
3"IPS	4" ... 63"	19,880"	6.300"	13,188"	0,81"	0,67"
4"IPS	6" ... 63"	21,100"	6.300"	14,37"	0,91"	0,75"
6"IPS	8" ... 63"	23,700"	8,460"	18,897"	0,91"	0,75"
8"IPS	10" ... 63"	23,700"	8,460"	18,897"	0,91"	0,75"

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

FLOW CONTROL-IPS AKIŞ KONTROL- IPS

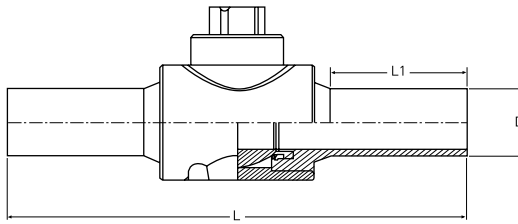


PE BALL VALVE (FULL BORE)

SDR11 PE100

GAS/GAZ : 10 BAR

WATER/SU : 16 BAR



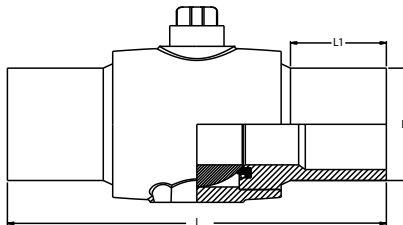
IPS	CODE	L (mm)	L1 (mm)
2" IPS	2302077	14,567"	4,331"
3" IPS	2302079	20,079"	4,528"
4" IPS	2302080	20,472"	4,921"
6" IPS	2302081	24,409"	6,299"

PE BALL VALVE (REDUCED BORE)

SDR11 PE100

GAS/GAZ : 10 BAR

WATER/SU : 16 BAR



IPS	CODE	L (mm)	L1 (mm)
2" IPS	2212069	13,780"	4,331"
3" IPS	2212070	16,457"	4,528"
4" IPS	2212071	16,732"	4,921"
6" IPS	2212072	23,031"	6,299"
8" IPS	2212073	24,409"	6,299"
12" IPS	2212074	34,843"	9,449"

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



PC-100 ELEKTRO SCHWEISSFITTING SYSTEM
POLYETHYLEN (PE) ELEKTROFUSION FITTING SYSTEM
TEGA

WÄRMEGÜTE
WÄRMEGÜTE

MAKİNE VE APARATLAR

MACHINES & TOOLS



MACHINE-TOOL MAKİNE- APARATLAR



SS REPAIR SADDLE PASLANMAZ ÇELİK TAMİR SEMERİ



Pipe diameter	CODE
63	1700001
75	1700002
90	1700003
110	1700004
125	1700005
140	1700316
160	1700006
180	1700317
200	1700007
225	1700008
250	1700009
280	1700010
315	1700011
355	1700012
400	1700013
450	1700318
500	1700319
560	1700320
630	1700321

DUCT FOOT BEND YANGIN HİDRANT ÖKÇESİ



PE Pipe - D	HYDRANT - d	CODE
d 90	d 80	1700184
d 110	d 100	1700188

SPECIAL DUCT FOOT BEND PE ÖZEL YANGIN HİDRANT ÖKÇESİ



PE Pipe - D	HYDRANT - d	CODE
d 110	80	2303102

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

MACHINE-TOOL MAKİNE- APARATLAR



EF WELDING MACHINES EF KAYNAK MAKİNESİ



Teknik Özellikler		Technical Features
Çıkış voltajı	8-48 V	Output voltage
Nominal Voltaj	230 V	Nominal Voltage
Frekans	50/60 Hz	Frequency
Güç	2800 VA (80% duty cy.)	Power
Max. akım	120 A	Max. output current
Çalışma sıcaklığı	-20 + 60°C	Ambient Temperature
Hafıza	1800 kayıt (records)	Memory
Koruma Sınıfı	IP54	Protection class
Boyutlar	545x435x230	Dimensions
Ağırlık	22 kg	Weight
Kaynak kablosu uzunluğu	4 mt	Length of welding cable
Çalışma modu	Barcode/Manuel	Operation mode

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

MACHINE-TOOL MAKİNE- APARATLAR



TEGA GPS MAP Job Site Tracking System

TEGA JOB SITE TRACKING SOFTWARE for SMART PHONES

- TEGA GPS tracking software allows the user to input all welding job data into their smarthone.
- It is also simple to track job site progress from your PC in real time.

HOW IT WORKS

AT THE JOB SITE



Open the tracking software using your smart phone browser.



All welding data is entered online.



The weld location is now accessible on the map.



A photo of the welding point is taken and sent by e-mail.

OFFICE

- All collected data from the job site can be tracked from anywhere
- Statistical analysis can be done quickly and accurately



Can be used for all piping connection work (PE, DI, Steel, Cement, and so on)

MACHINE-TOOL MAKİNE- APARATLAR



TEGA GPS MAP

Şantiye Saha Takip Programı

AKILLI TELEFONLARLA ŞANTIYE TAKİP SİSTEMİ

- TEGA GPS Map sistemi şantiye sahasındaki tüm bilgi ve fotoğrafları anında istenilen bilgisayara iletir.
- Bu bilgilere kaynak yapılan noktanın harita ve koordinat bilgileri de dahildir.

NASIL ÇALIŞIR?

ŞANTIYE SAHASINDA



Akıllı telefon kullanarak telefon üzerinde internet browser uygulaması açılır



Bütün kaynak verileri online olarak programa girilir



Kaynağın yapıldığı konuma harita üzerinde erişilir



Kaynakla ilgili bir fotoğraf da alınarak e-posta ile istenilen yere gönderilir

OFİS

- Sahadan toplanan bütün veriler herhangi bir yerden ve Google Map üzerinden izlenebilir
- Yapılan işle ilgili istatistiksel analizler kolay ve doğru bir biçimde yapılır



Bütün boru bağlantı tiplerinde kullanılabilir (PE, DI, Çelik, Beton vb.)

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

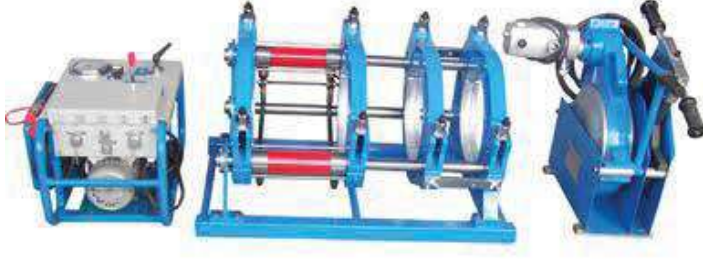
AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

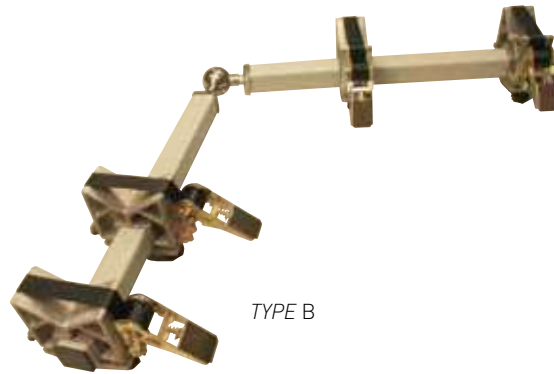
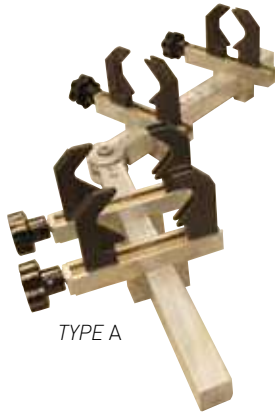
TEKNİK
TECHNICAL

BUTT WELDING MACHINE ALIN KAYNAK MAKİNESİ



PE PIPE DIMENSION INTERVAL - D	CODE
d 40 - 160	1700209
d 63 - 160	1700210
d 75 - 250	1700211
d 90 - 315	1700212
d 180 - 500	1700213
d 200 - 450	1700214
d 315 - 630	1700215
d 500 - 800	1700216
d 710 - 1000	1700217
d 710 - 1200	1700218

V TYPE ALIGNMENT CLAMP V TİPİ EKSENLEME KELEPÇESİ



DIAMETER / ÇAP	CODE	TYPE
20-63	1700180	A
63-125	1700181	B

RE-ROUNDING TOOL OVALLIK KELEPÇESİ



DIAMETER / ÇAP	CODE
63	1700052
90	1700053
110	1700054
125	1700055
140	1700056
160	1700057
180	1700058
200	1700059
225	1700060
250	1700061
280	1700062
315	1700063
355	1700297
400	1700296
450	1700289

COUPLER CLAMP MANŞON KELEPÇESİ

DIAMETER / ÇAP	CODE
63	1700036
90	1700038
110	1700039
125	1700040
140	1700041
160	1700042
180	1700043
200	1700044
225	1700045
250	1700046
280	1700047
315	1700048
355	1700049
400	1700050
450	1700051



MACHINE-TOOL MAKİNE- APARATLAR



PIPE SCRAPING TOOLS BORU KAZIMA APARATLARI

Hand Scraper / Kazıma Bıçağı



DIAMETER / ÇAP	CODE
75-200	1700022



DIAMETER / ÇAP	CODE
75-315	1700322



DIAMETER / ÇAP	CODE
355-710	1700323

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

MACHINE-TOOL MAKİNE- APARATLAR



SQUEEZING TOOLS FOR EF SADDLE SEMER SIKTIIRMA APARATLARI

Spider Squeezing Tool Type A Semer Sıkıştırma Aparatı TİP A

DIAMETER / ÇAP	CODE
225 - 630 mm	1700294



4 Piece Inner Squeezing Tool for EF Saddle Type B Semer Sıkıştırma Aparatı TİP B

DIAMETER / ÇAP	CODE
225 - 630 mm	1700324



TEGA Vacum Squeezing Tool Type C Semer Sıkıştırma Aparatı TİP C

DIAMETER / ÇAP	CODE
225 - 630 mm	1700325



EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

COUPLER PULLING TOOL MANŞON ÇEKTİRME SETİ



DIAMETER / ÇAP

D 315 - 900

CODE

1700290

PIPE CUTTERS BORU KESME APARATLARI

Telescopic Pipe Cutter / Teleskopik Boru Kesici



DIAMETER / ÇAP	CODE
40-125	1700192
110-160	1700191

Pipe Cutter (hand type) / Boru Kesme Makası

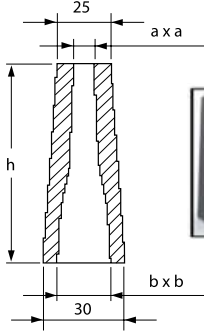


DIAMETER / ÇAP	CODE
20-40	1700195
20-63	1700196

MACHINE-TOOL MAKİNE- APARATLAR



Anahtar adaptörü/
Key Adaptor



axa	bxb	h
10x10	14x14	95

TEGA PE-SÜRGÜLÜ VANALAR İÇİN BUŞAKLELİ TELESKOPIK UZATMA KOLLARI

Tega buşakle kazanları özel kompozit 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.

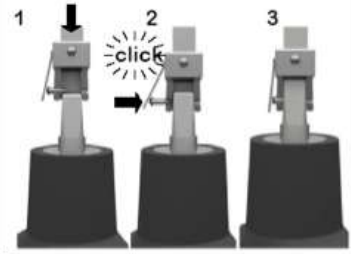
TEGA TELESCOPIC EXTENSIONS (TELESKOPIK UZATMA KOLLARI)

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

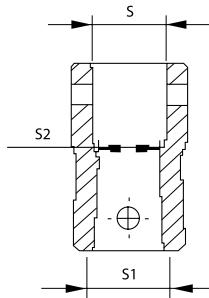
Manuel Pin System



Self Click System



Vana mili adaptörü / Spindle Adaptor



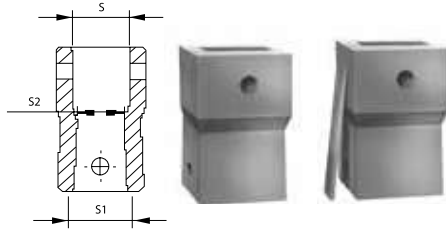
d	SXS	S2	S1
32-63	20x20	14,5	17,5
75-90	25x25	18,8	21,5
110-125	25x25	20,8	23,5
140-225	25x25	20,8	23,5

MACHINE-TOOL MAKİNE- APARATLAR



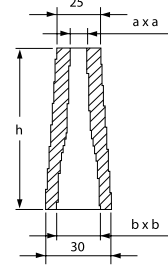
TELESCOBIC EXTENSION FOR GATE VALVE / SÜRGÜLÜ VANA İÇİN

Telescopic 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

Telescopic 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) - SIZE A (0,45mt - 0,70mt) (D75-90 GATE VALVE)
2303001	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SIZE B (0,60mt - 1,00mt) (D75-90 GATE VALVE)
2303002	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SIZE C (1,00mt - 1,50mt) (D75-90 GATE VALVE)
2303003	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SIZE D (1,20mt - 2,00mt) (D75-90 GATE VALVE)
2303014	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:21.5 - S2:18.8) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE A (0,45mt - 0,70mt) (D32-63 GATE VALVE)
2303019	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:17.5 - S2:14.5) - SIZE B (0,6mt - 1,00mt) (D32-63 GATE VALVE)
2303020	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:17.5 - S2:14.5) - SIZE C (1,0mt - 1,50mt) (D32-63 GATE VALVE)
2303021	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:17.5 - S2:14.5) - SIZE D (1,2mt - 2,00mt) (D32-63 GATE VALVE)
2303022	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:17.5 - S2:14.5) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE A (0,45mt - 0,70mt) (D110-125 GATE VALVE)
2303027	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE B (0,60mt - 1,00mt) (D110-125 GATE VALVE)
2303079	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE C (1,00mt - 1,50mt) (D110-125 GATE VALVE)
2303080	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE D (1,20mt - 2,00mt) (D110-125 GATE VALVE)
2303081	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE A (0,45mt - 0,70mt) (D140-180 GATE VALVE)
2303121	0,60mt-1,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE B (0,60mt - 1,00mt) (D140-180 GATE VALVE)
2303122	1,0mt-1,5mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE C (1,00mt - 1,50mt) (D140-180 GATE VALVE)
2303123	1,2mt-2,0mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE D (1,20mt - 2,00mt) (D140-180 GATE VALVE)
2303124	0,45mt-0,70 mt	TELESCOBIC EXTENSION (S1:23.5 - S2:20.8) - SIZE 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) - SIZE 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) - SIZE 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) - SIZE D (1,20mt-2,00mt) (D140-180 GATE VALVE) WITH CLICK SYSTEM

EF-METRIK
SPİGOT-METRIK
AKİS KONTROL-METRIK
FLOW CONTROL-METRIK
EF-İPS
AKİS KONTROL-İPS
MAKİNE-APARATLAR
MONTAJ
TEKNİK

MACHINE-TOOL MAKİNE- APARATLAR

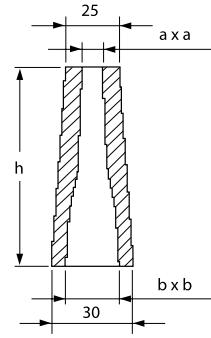
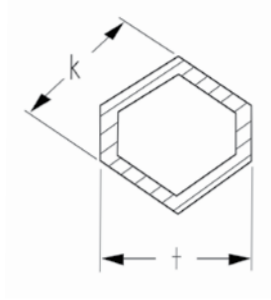


TELESCOPIC EXTENSION FOR BALL VALVE / KÜRESEL VANA İÇİN



Telescopic Bottom Side
Vana Spindle Adaptor

Telescopic Top Side
Key Adaptor

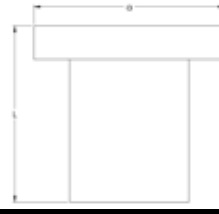


t	k
30	30
50	50

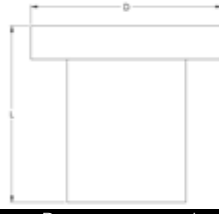
a x a	b x b	h
10 x 10	14 x 14	95

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



175 x 175 | 185



195 | 185

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

MACHINE-TOOL MAKİNE- APARATLAR



**YESTERDAY
DÜN**



**TODAY AND TOMORROW
BUGÜN VE YARIN**

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

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TECHNICAL

MACHINE-TOOL MAKİNE- APARATLAR



EF SADDLE DRILLING TOOL PP SEMER DELME APARAT TAKIMI



DIAMETER / ÇAP

90-315 mm

CODE

1700073

BUTT WELDING TEST TOOL ALIN KAYNAK TEST APARATI



DIAMETER / ÇAP

160-630 mm

CODE

1700338

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-İPS

MAKİNE-APARATLAR
MACHINE-TOOL

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INSTALLATION



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 Kalem/Marker



Boşluk Mastarı ve Kumpas/
Gap gauge and Vernier Caliper



EF Kaynak Makinası

-Ovallık kelepçesi/
Re-rounding clamp

-Pe temizleme solüsyonu
ve bez/
PE cleaning agent
and cloth

-Kaynak çadırı/Welding tent

1. Borunun Kesilmesi:

Boru kendi eksenine 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)

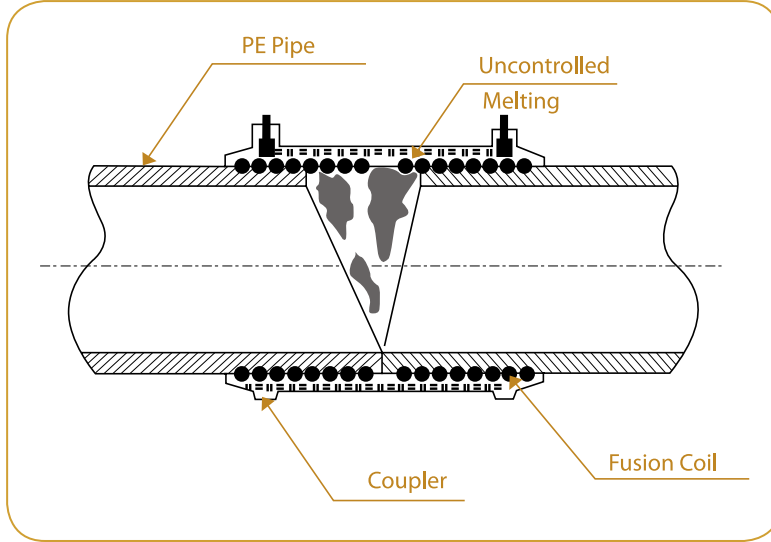
1. Pipe Cutting:

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 ovallık mutlaka kontrol edilmelidir. Bu kontrolü Fig. 4 ve 5'te gösterildiği gibi borunun birkaç noktasından yapın.

3. Controlling ovality

PE pipes may lose their roundness during storage. For this purpose measure pipe ovality as illustrated in Fig. 4 and 5.



(Fig. 4)



(Fig. 5)

Eğer boruda ovallık varsa ovallık 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)

Ovallık 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 re-rounding clamp (Fig. 7 and 8).



(Fig. 7)



(Fig. 8)

4. Boru Yüzeyinin Kazınması

Kaynak işlemine başlamadan önce 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).

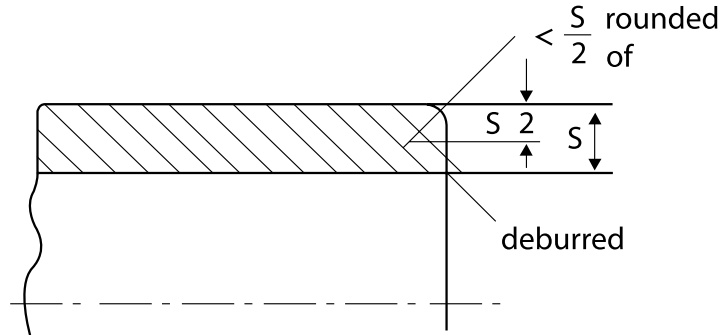


Attention

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 kirliliği 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).

INSTALLATION MONTAJ



[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 paper [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).



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).



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 ovaliği dağıtın ve tüm boru çevresi boyunca boşlukların eşit olmasını sağlayın (Fig. 15). Boşlukları ölçün. Boşluk 2 mm'den küçükse Elektrofüzyon Kaynak işlemine geçin. Boşluk 2-3 mm arasında ise önce "Ön Isıtma Prosedürü"nü uygulayın, sonra 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. If it is between 2-3mm first apply "Preheating Procedure" and then pass to 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 transferred 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.

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ÖN ISITMA PROSEDÜRÜ

- Manşon ve boru arasındaki boşluğun tüm çevre boyunca eşit olduğundan emin olun.
- Ön ısıtma esnasındaki ısı kayıplarını önlemek için manşon ağzını bantlayın.
- Boru uçlarını kapatın.
- Ön ısıtma parametrelerini EF kaynak makinesine girin.
- Ön ısıtma işlemini yapın.
- Boşlukları kontrol edin. Boşluklar hala 2 mm'den küçük değilse ön ısıtma işlemini tekrarlayın. Boşluklar 2 mm'den küçükse elektrofüzyon kaynak işlemini yapın (kaynak bilgileri barkod etiketi üzerindedir)

PRE-HEATING PROCEDURE

- Ensure that coupler is centralized on the pipe so that gap on whole circumference is as equal as possible.
- In order to prevent heat losses during pre-heating process, close gap with adhesive tape.
- Close open pipe ends.
- Introduce pre-heating parameters (on pre-heating barcode) to EF machine.
- Start pre-heating process.
- Check gaps; if it is still not less than 2 mm, repeat pre-heating second time. If gap is ok, start fusion process (fusion parameters are on fusion barcode)

EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

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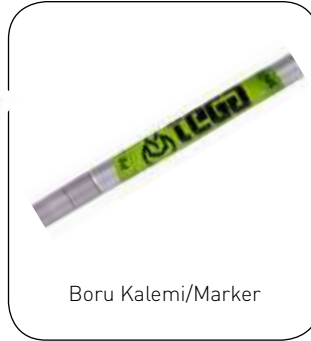
ELECTROFUSION WELDING INSTRUCTION FOR SMALL SIZE PE100 EF COUPLERS KÜÇÜK ÇAPLI PE100 EF MANŞONLAR İÇİN ELEKTROFÜZYON KAYNAK UYGULAMASI 20 < d ≤ 355

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 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



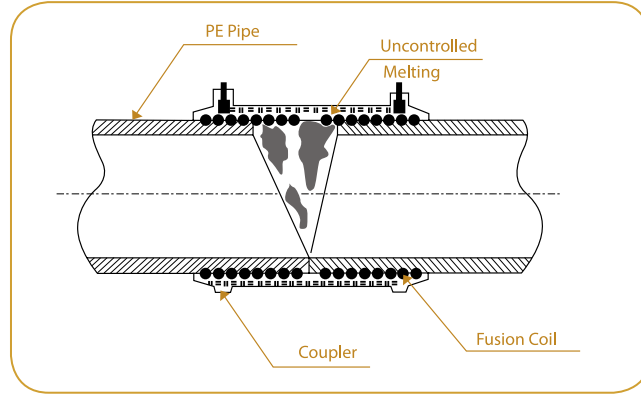
- Ovallık kelepçesi / Re-rounding clamp
- Pe temizleme solüsyonu ve bez
PE cleaning agent and cloth
- Kaynak çadırı/Welding tent

1. Borunun kesilmesi:

Boru, kendi eksenine 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, fittingteki 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)

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(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).

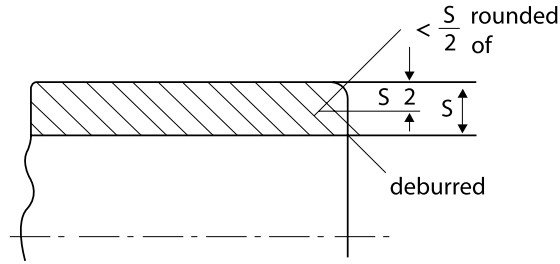


Attention

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, reround 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 fitting yüzeyleri temiz olmalı, yüzey üzerinde yağ, kir vs. olmamalıdır. Kaynak işlemine başlamadan önce, fittingin 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 fitting 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 paper. (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 fitting içine yerleştirilmesi:

Birleştirme esnasında boru ile fittingi birbirine göre kesinlikle eğik tutmayın. Borunun işaretlenmiş bölgesi fitting 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 others (Fig. 7-8-9-10)



(Fig. 7)



(Fig. 8)

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(Fig. 9)



(Fig. 10)



Dikkat

Boruyu fittingin içine sokarken fittingin kontak terminallerinin üstte kalmasına dikkat edilmelidir. Boru fitting içerisine yerleştirildikten sonra rahatlıkla döndürülebilmelidir. Borular eğilme gerilimine maruz kalmamalı ve fitting içerisinde kendi ağırlıklarını rahatlıkla taşıyabilmelidir. Borunun serbest uçlarına destek konulabilir.



Attention

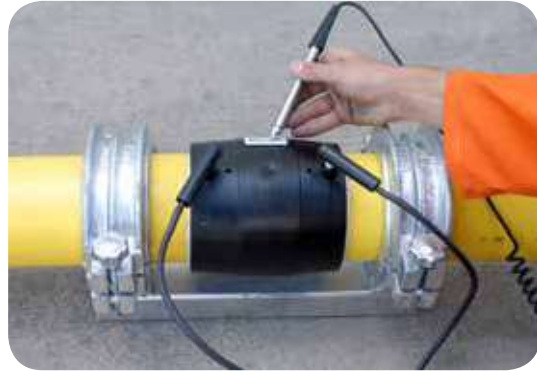
The contact terminals of the coupler must be easily accessible.

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)

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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-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
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MONTAJ
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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)



(Fig. 1)

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.



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.

2. Temizleme: Kaynak yapılacak boru ve fittingin yüzeyleri temiz olmalı, yüzey üzerinde yağ, kir, vs. olmamalıdır.

Kaynak işlemine başlamadan önce, fittingin 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)

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. 2)

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.



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. 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 paper. (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 nedentle 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 anahtarını 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)

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,

- Ovallık ve
- Kasıntıyı iki ayrı problemdir.

Kasıntıyı almak için "V clamp"; ovalliği almak için ise "ovallık 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.



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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 prosedürlerini 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 succesfully. Very limited unseccesfull 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 desderesiyle, açılan delikten başlayarak, iç çemberi izleyerek, boruyu deliniz.

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

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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 scroped before with an appropriate chemical. (Isopropyl alcohol)
Kazıdığınız bölgeyi uygun bir kimyasalla temizleyiniz. (İzopropil alkol)



8

If it is necessary, EF Saddle must be cleaned with an appropriate chemical before welding.
Gerek görürseniz kaynak öncesinde EF semeri de aynı kimyasalla temizleyiniz.

EF-METRİK
EF-METRIC

SPİGOT-METRİK
SPİGOT-METRIC

AKIŞ KONTROL-METRİK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

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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 işlemi
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, mutlaka soğuma süresi
kadar kayış sistemini çıkartmayınız. Bu süre
zarfında kaynak makinenizi başka bir kaynak işlemi
için kullanabilirsiniz.*



12

*Take off the straps after cooling.
Soğuma işleminden sonra kayışları sökünüz.*

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

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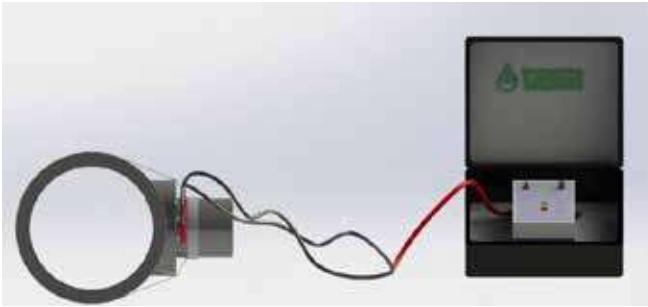
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HIGH SAFETY TEST STEPS FOR EF SADDLE ELEKTRO FÜZYON SEMER İÇİN YÜKSEK GÜVENLİK ADIMLARI

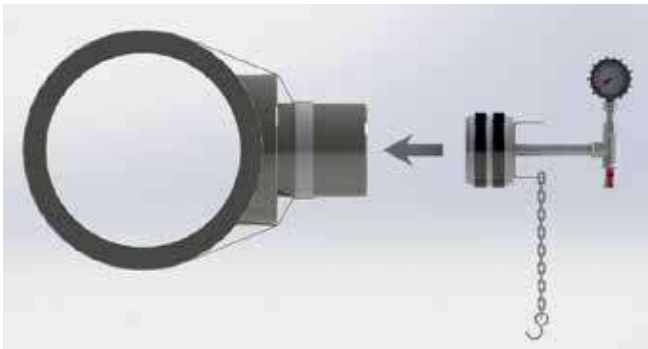
(TEGA recommends these test procedure for EF Saddle)
(TEGA'nın tavsiye ettiği elektro füzyon semer test prosedürleri)



Scrape the pipe.
Boruyu kazıyın.

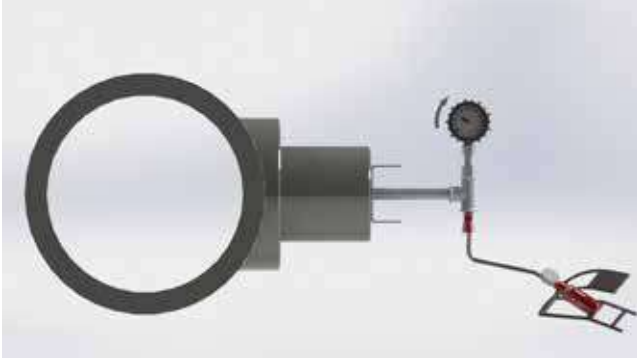


Squeeze EF Saddle and weld it.
Semeri sabitleyin ve kaynatın.

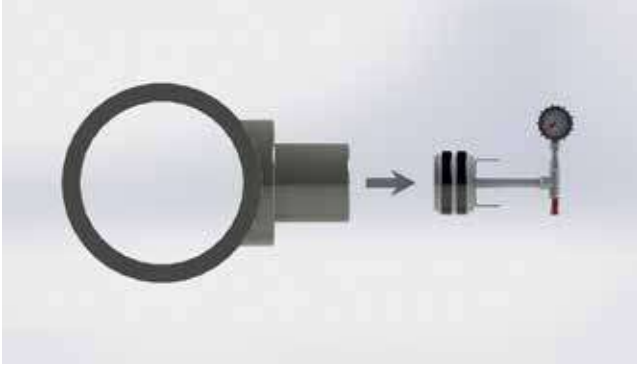


After cooling time, push the test plug
and tight it.
Connect the plug to the saddle outlet by a
rope for safety.
Soğuma süresinde sonra, yerleştirin ve
sıkın.
Güvenlik halatı kullanarak yerleştirme
yapılmalıdır.

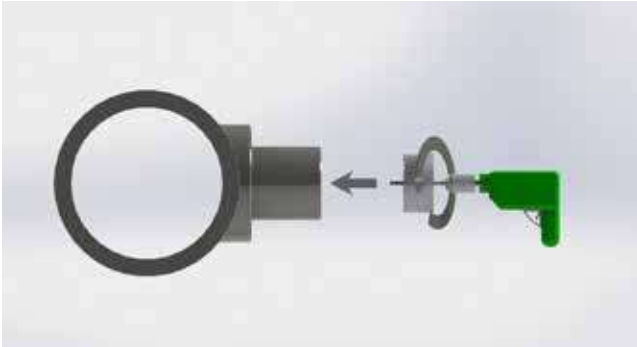
INSTALLATION MONTAJ



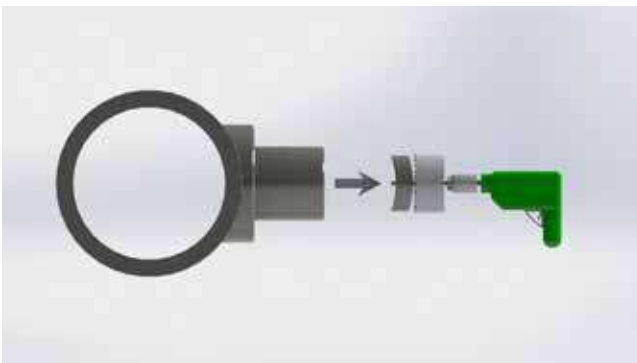
Test the saddle up to 2 bar (30 PSI) by air.
Hava ile 2 bar (30 PSI) basınçla test edilir.



If test is OK, take the plug back.
Test başarılı ise test aparatı çıkarılır.



Drill the pipe.
Boru delinir.



EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

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)

INSTALLATION MONTAJ



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.

EF-METRIK
EF-METRIC

SPIGOT-METRIK
SPIGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

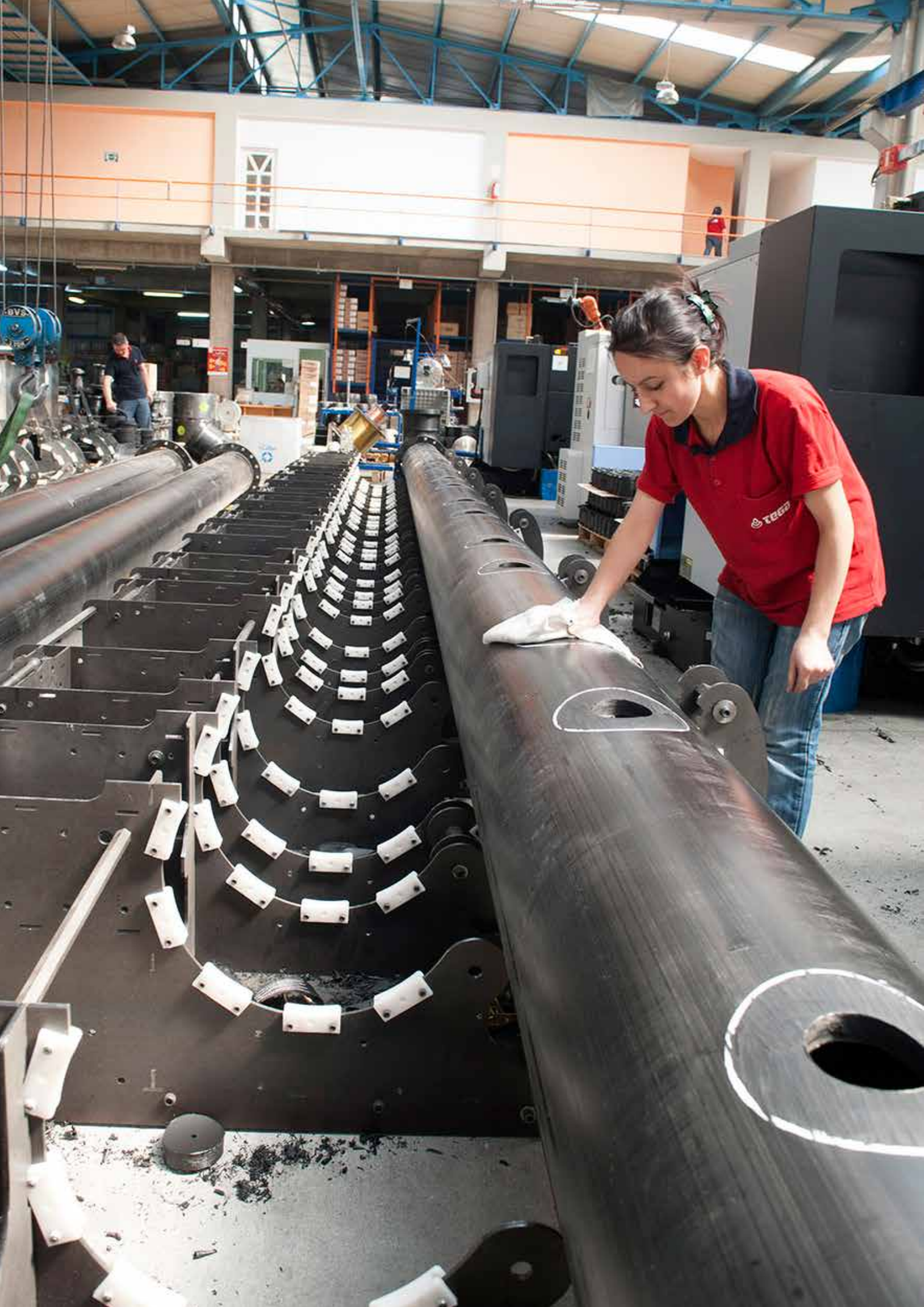
EF-IPS
EF-IPS

AKIŞ KONTROL-IPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



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

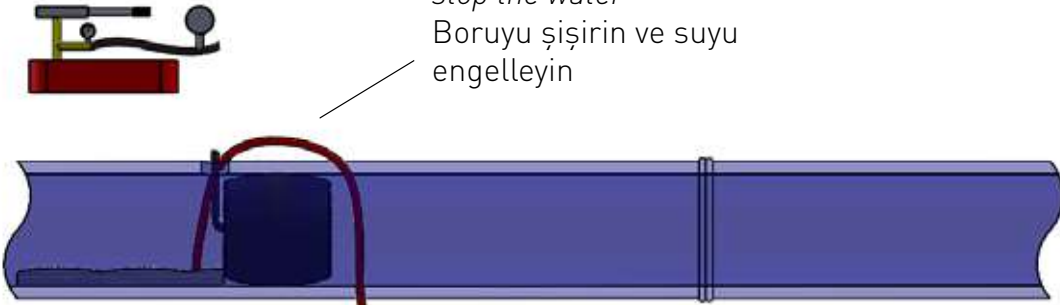


Push the balloon down to the pipe.
Balonu boru içine gönderiniz



Residual Water
Su

Blow up balloon and
stop the water
Boruyu şişirin ve suyu
engelleyin

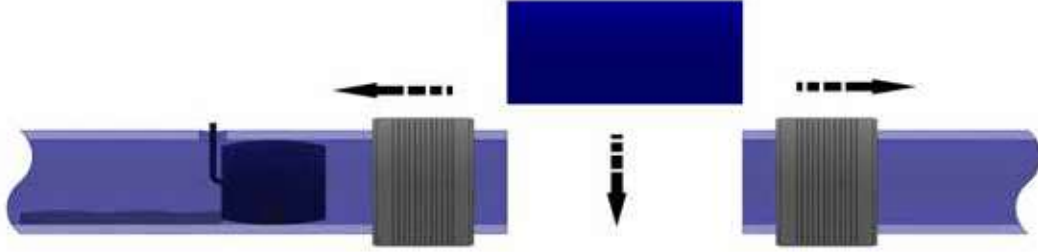


If necessary it using a small diameter flex
house, take the residual water out by syphon
system
Gerekli görüldüğünde ince bir hortumla
biriken suyu tahliye edebilirsiniz.

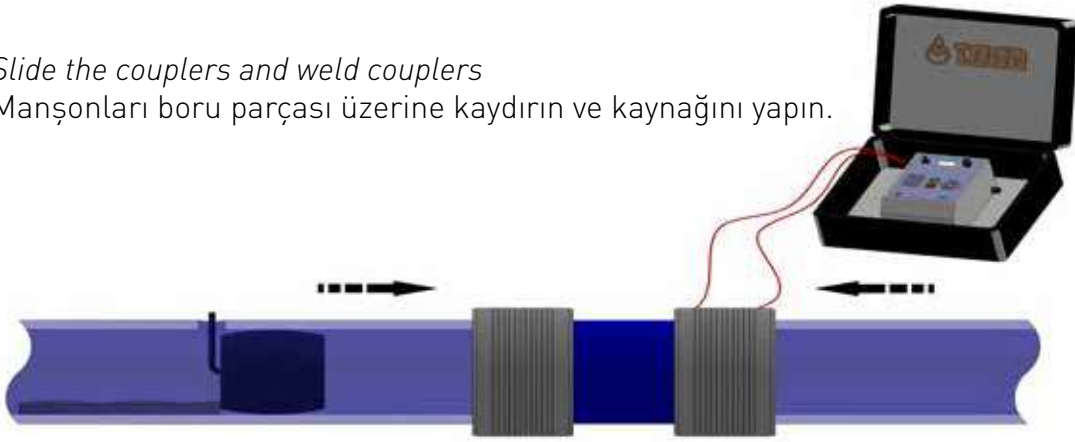
INSTALLATION MONTAJ



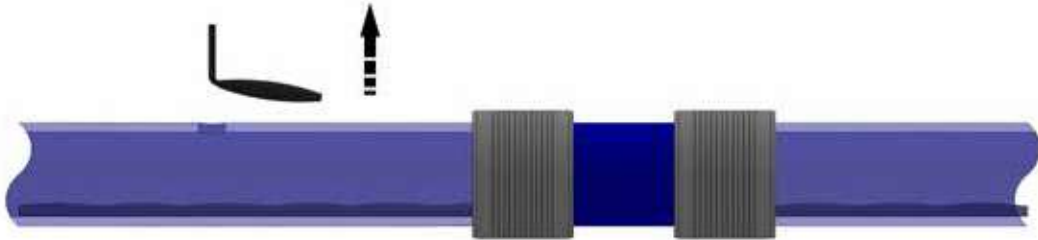
Cut the pipe inserts couplers and insert a piece of pipe
Boruyu kesin, iki manşonu kaydırın ve bir boru parçasını araya yaklaştırın.



Slide the couplers and weld couplers
Manşonları boru parçası üzerine kaydırın ve kaynağını yapın.



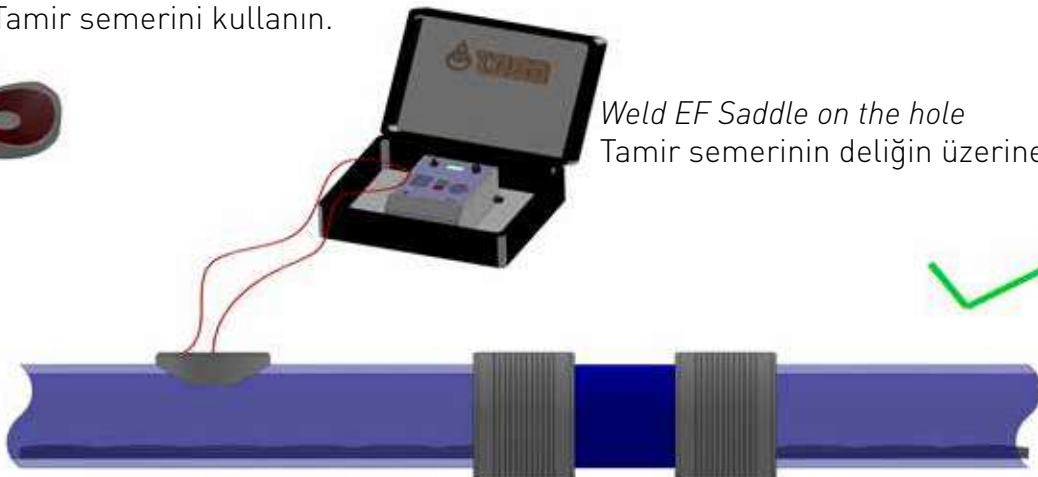
Take the balloon out
Balonu geri alın.



Take a repair saddle
Tamir semerini kullanın.

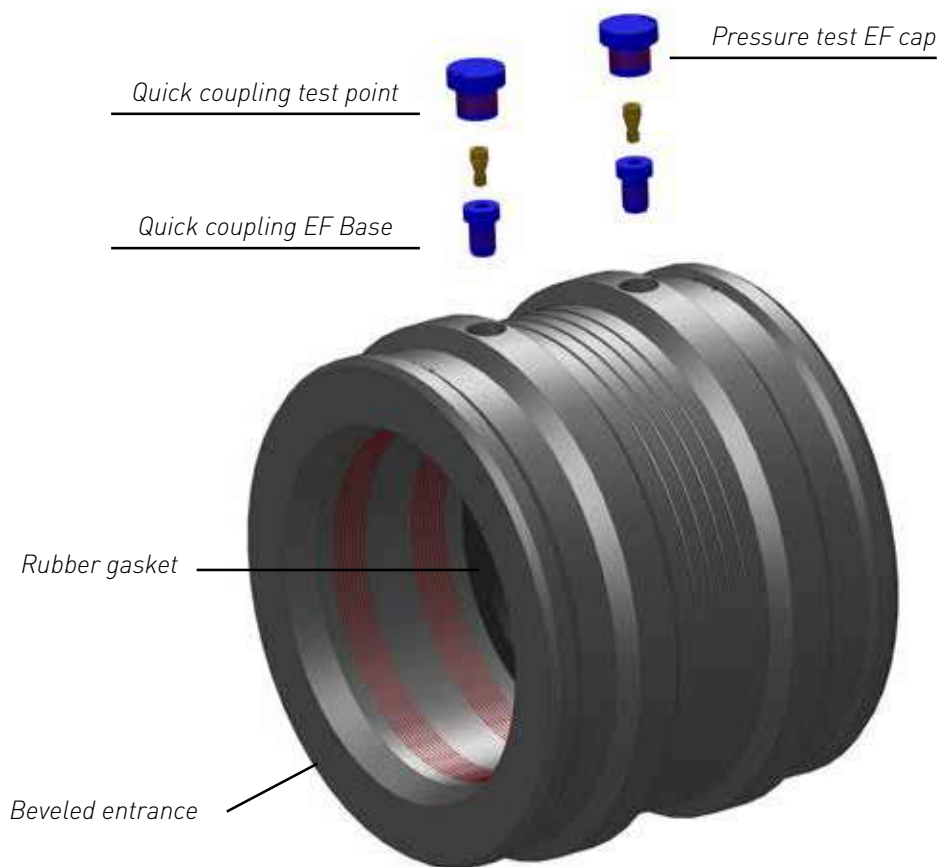


Weld EF Saddle on the hole
Tamir semerinin deliğın üzerine kaynatın



TEGA DOST COUPLER INSTALLATION INSTRUCTIONS

Components of Dost Coupler



IMPORTANT NOTES

- Below instructions should be 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



6-Ratchet strap



5-Tape meter



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.

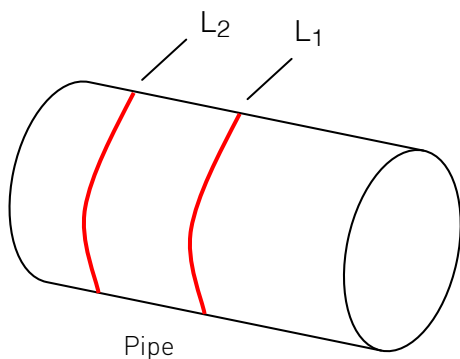
2. Marking the fusion zone

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.



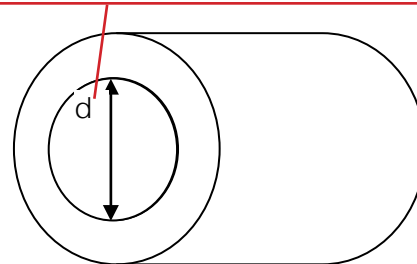
3. Measuring the pipe diameter and pipe ovality:

Pipe circumference must be measured with circumference tape/circometer (or tape measure) at two points (L1 and L2) as shown in below sketch.



Pipe

The inner diameter (d) of Dost Coupler is given on a label attached on it.



Dost Coupler

INSTALLATION MONTAJ



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.

$$0,04'' \text{ mm} < d-D < 0,07'' \text{ mm}$$

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)

$$\text{Ovality \%} = \frac{D_{\text{max}} - D_{\text{min}}}{D} \times 100$$

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!

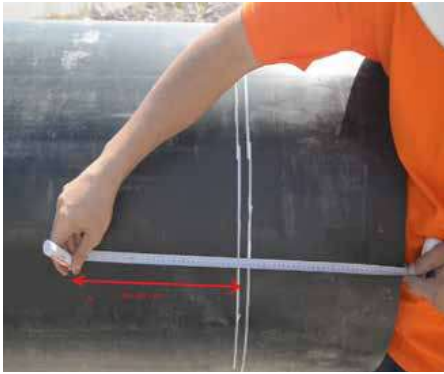
In order to remove the oxide layer completely, the pipe must be scraped so that shavings are formed and marking line is removed.

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.

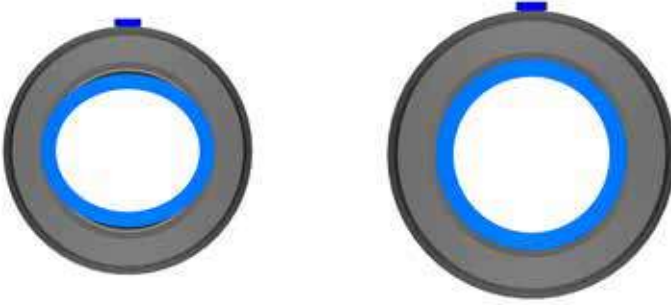
Never create bending force on the coupler.





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.



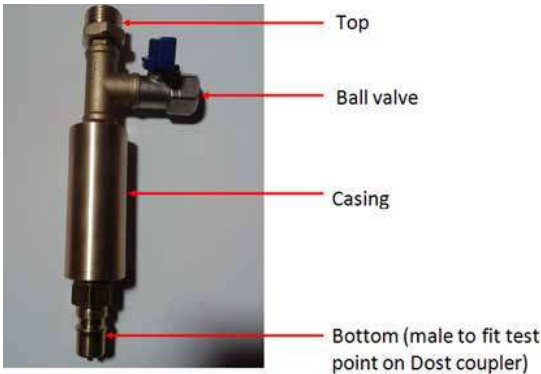
1st test: 10 psi 5 minutes by air

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 emergency 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 procedur 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:

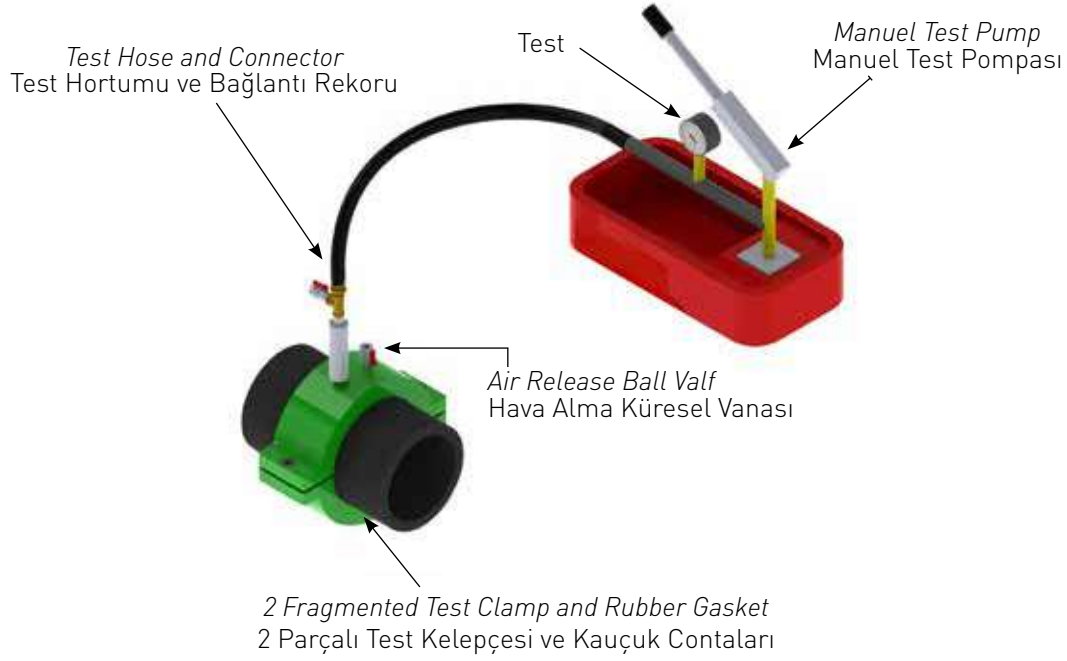
External welding pressure test tool is used / Harici kaynak basınç test aparatı:

- To determine the welding quality on PE100 pipes / PE100 borularda, alın kaynağı kalitesinin tespitinde kullanılır.
- 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 de termined. (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 civatlanır.
- 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 ulaşıncaya, 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.

INSTALLATION MONTAJ



*The test tool is placed to the welded pipe line.
Kaynak yapılan boru hattına test aparatı yerleştirilir.*



*The test tool is placed to the welded pipe line.
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.*

EF-METRIC

SPIGOT-METRIC

AKIŞ KONTROL-METRIC

EF-IPS

AKIŞ KONTROL-IPS

MAKİNE-APARATLAR

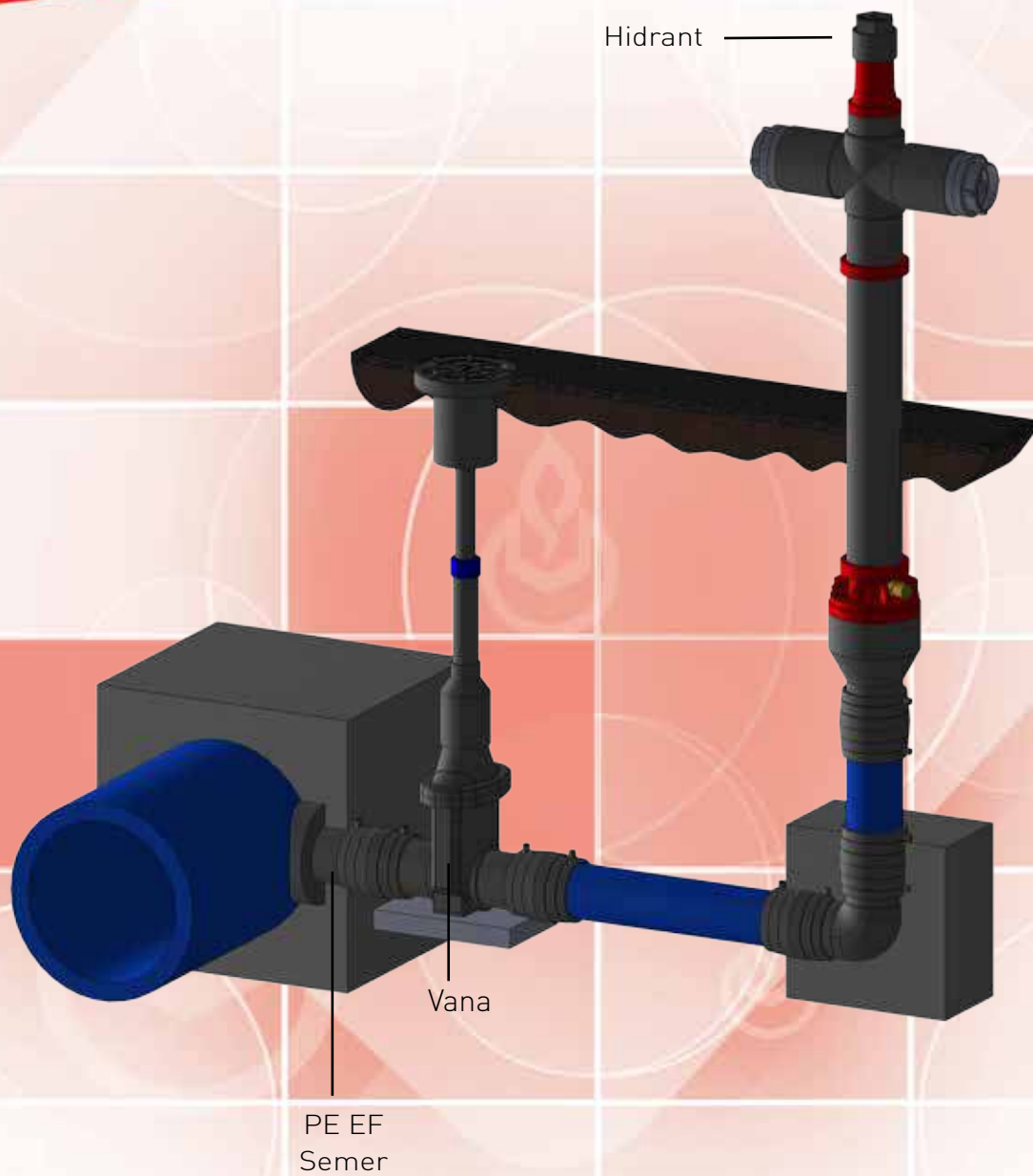
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL



TEKNIK

TECHNICAL





1- Malzemeler

1.1- Tanım ve Özellikler

2- Saha Montajı

2.1- Depolama ve Taşıma

2.1.1- Depolama

2.1.2- Taşıma

2.2- Mesnetleme

2.2.1- Açıkta (havada) mesnetlenmiş döşeme

2.2.2- Toprağa gömerek döşeme

2.2.3- Su altında döşeme

2.3- Isıl Genleşme

2.4- Mekanik İşleme

2.5- Birleştirme İşlemleri

2.5.1- Soket kaynak

2.5.2- EF kaynak

2.5.3- Alın kaynak

2.5.4- Mekanik (dişli, flanşlı) bağlantılar

2.5.5- PE Boruların Onarılması

2.6- Basınç / Kaçak Testleri

2.6.1- Test Öncesi Notlar

2.6.2- Hidrostatik Kaçak Testi Aşamaları

3- Akış ve Hesaplamalar

3.1- Boru çapını belirleme

3.2- Koç Darbesi

YASAL UYARI:

Bu katalogdaki yazılar, teknik bilgiler ve önerilerin güncel olarak doğru olduğuna inanılmaktadır. Gerçek uygulamalardaki şartlar ve burada belirtilen ürünlerin uygulamaları kontrolümüz dışında olduğundan; ayrıca, ürünlerin ve ürünlerin kullanıldığı sistemlerin montajı her ayrı duruma özel mühendislik bakışı ve bilgisi gerektirdiğinden, TEGA bu katalogdaki bilgiler kullanılarak yapılan bir uygulamada doğabilecek; doğrudan, dolaylı veya bir şeyin sonucunda meydana gelen hasar veya kayıplardan, TEGA hiçbir şartta sorumlu değildir. Açıkça belirtilmiş veya ima edilmiş dahi olsa; TEGA bu katalogta bulunabilecek tipografi veya basım hataları, bilginin bütünlüğü ve/veya uygunluğu konularındaki hatalardan olduğu öne sürülen zarar veya kayıplardan sorumlu tutulamaz.

Bu katalogdaki tüm kelimeler, veriler, şekiller ve tablolar dikkatle düzenlenmiş olup, sehven yapılan hatalar müstesnadır. Bu katalog, teknik bilgi ve becerisi bulunan kişilere ürün seçimi ve uygulamalar konularında rehber olması amacı ile düzenlenmiştir. Ürünlerin herhangi bir uygulamaya uygunluğu; veya uygulama yöntemleri konusunda proje veya yüklenici firma mühendisleri karar vermelidir.

TEGA; bu katalogdaki her türlü bilgiyi veya ürünlerine ait tasarım, yapım, malzeme, işlem veya diğer özelliklerini önceden haber vermeksizin değiştirmek; üretim ve satışını yaptığı malzemeleri miktar olarak azaltmak veya sonlandırmak haklarını saklı tutar.

1- Materials

1.1- Description and Properties

2- Field Applications

2.1- Storage and Handling

2.1.1- Storage

2.1.2- Handling

2.2- Supporting

2.2.1- Abovegrade Supporting

2.2.2- As Buried In Soil

2.2.3- Underwater Application

2.3- Thermal Expansion

2.4- Machining

2.5- Joining Procedures

2.5.1- Socket Welding

2.5.2- EF Welding

2.5.3- Butt Welding

2.5.4- Threaded and Flanged Connections

2.5.5- Repairing of PE Pipes

2.6- Pressure / Leak Testing

2.6.1- Pre-test Considerations

2.6.2- Hydrostatic Leak Testing Procedures

3- Flow and Calculations

3.1- Determining Pipe Sizes

3.2- Pressure Surge

DISCLAIMER:

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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 kullanılabilir. 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 yalıtımlık ve çok iyi ısıt 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/cm ³	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/cm ²	255
	Uzama (sünme)	ISO 527	%	9
	Uzama (kopma)	ISO 527	%	→ 600
	Elastisite Modülü	ISO 527	Kg/cm ²	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
Elektriksel Özellikler	Alevlenebilirlik	DIN 4102	--	B2
	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/cm ³	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/cm ²	255
	Elongation (yield)	ISO 527	%	9
	Elongation (break)	ISO 527	%	> 600
	Modulus of Elasticity	ISO 527	Kg/cm ²	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
Electrical Properties	Flammability	DIN 4102	--	B2
	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 kullanılabilir, 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
-	Dayanısız

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	/	/
Benzene	100	+	/
Benzene, normal	100	+	/
Benzene, 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	/	-

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	/	/
Benzene	100	+	/
Benzene, normal	100	+	/
Benzene, 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	/	-



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 (III)-salts,aq.	Sat	+	+
Cresol, aq.	Sat	+	/
Cumolhydroperoxide	70	+	
Cyclohexane	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	+	
Diocyladipate	100	+	
Diocylphthalate	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 (III)-salts,aq.	Sat	+	+
Cresol, aq.	Sat	+	/
Cumolhydroperoxide	70	+	
Cyclohexane	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	+	
Diocyladipate	100	+	
Diocylphthalate	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	+	+
Methylene chloride	100	/	
Mineral oil	100	+	/
Monochloroacetic acid ethyl ester	100	+	+
Monochloroacetic 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	+	+
Perchloroethylene	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	+	+
Methylene chloride	100	/	
Mineral oil	100	+	/
Monochloroacetic acid ethyl ester	100	+	+
Monochloroacetic 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	+	+
Perchloroethylene	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	/	-



EF-METRIK
EF-METRIC

SPİGOT-METRIK
SPİGOT-METRIC

AKIŞ KONTROL-METRIK
FLOW CONTROL-METRIC

EF-İPS
EF-IPS

AKIŞ KONTROL-İPS
FLOW CONTROL-IPS

MAKİNE-APARATLAR
MACHINE-TOOL

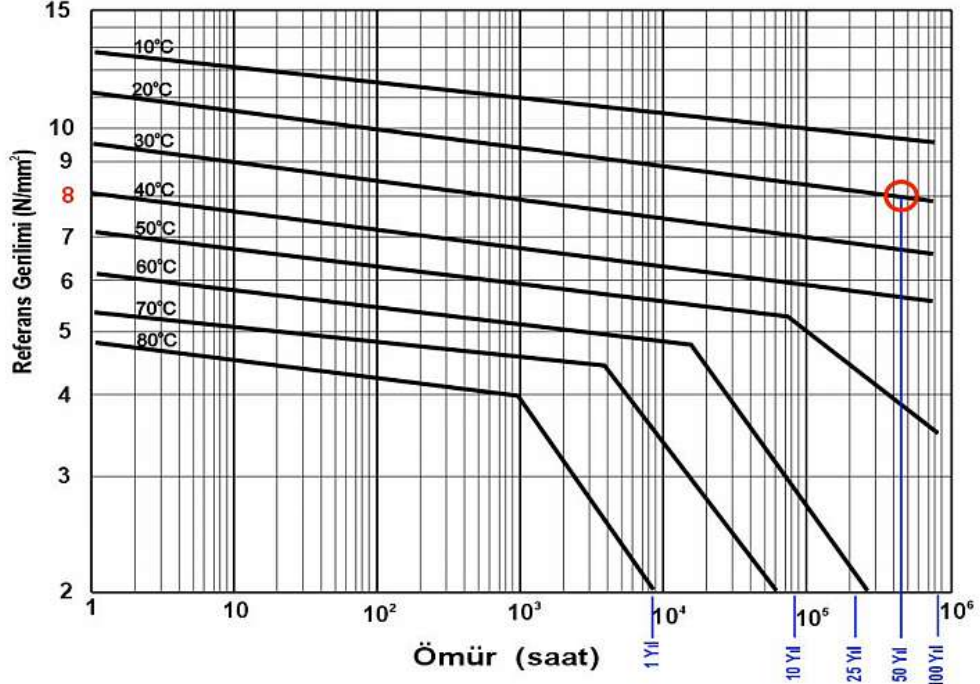
MONTAJ
INSTALLATION

TEKNİK
TECHNICAL

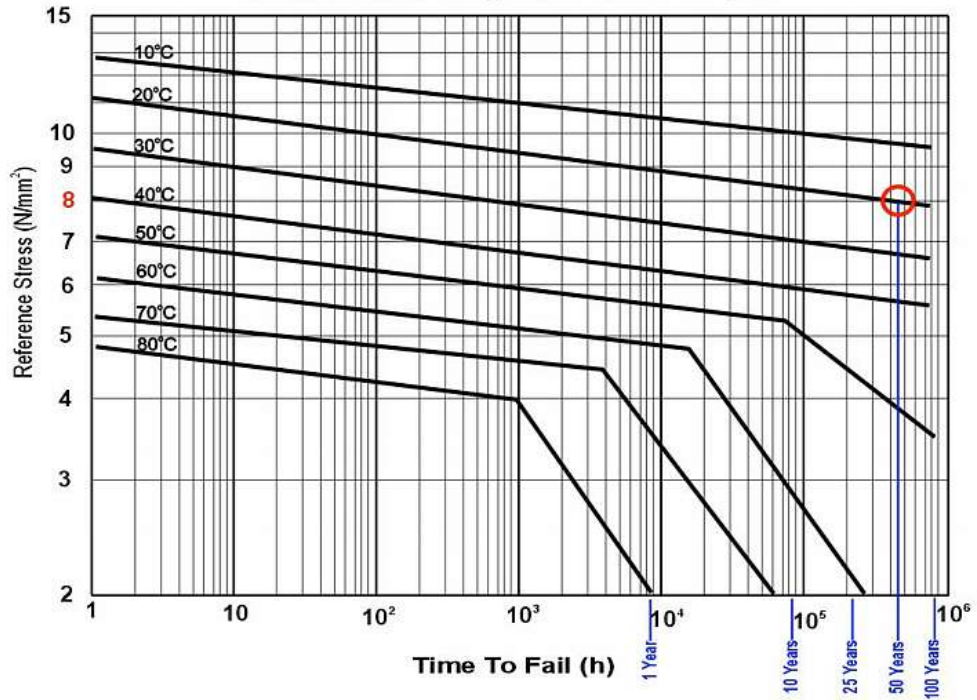
MATERIAL	%conc.	23°C	60°C
Transformer oil	100	+	/
Trichlorethylene	100	/	-
Tricresyl phosphate	100	+	+
Trioctyl phosphate	100	+	/
Two-stroke oil	100	+	/
U			
Urea, aq.	Sat	+	+
Uric acid	Sat	+	+
Urine		+	+
W			
Washing-up liquid, fluid	5	+	+
WATER glass	100	+	+
Wetting agent	100	+	/
X			
Xylene	100	/	-
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

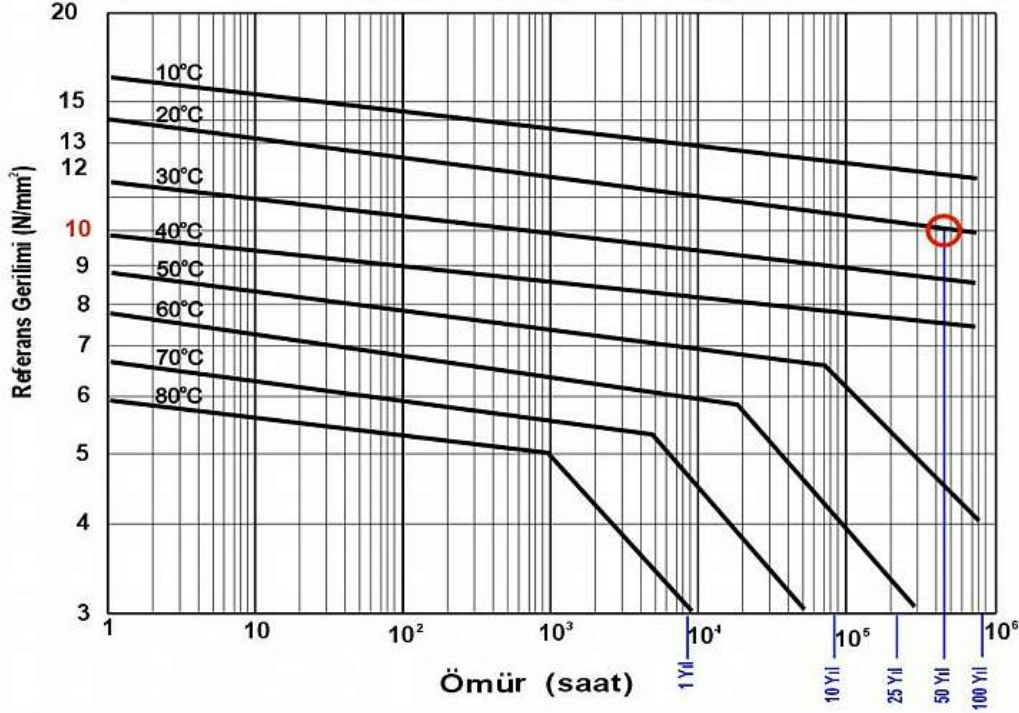


Internal Pressure Creep Curves for PE-80 Pipes

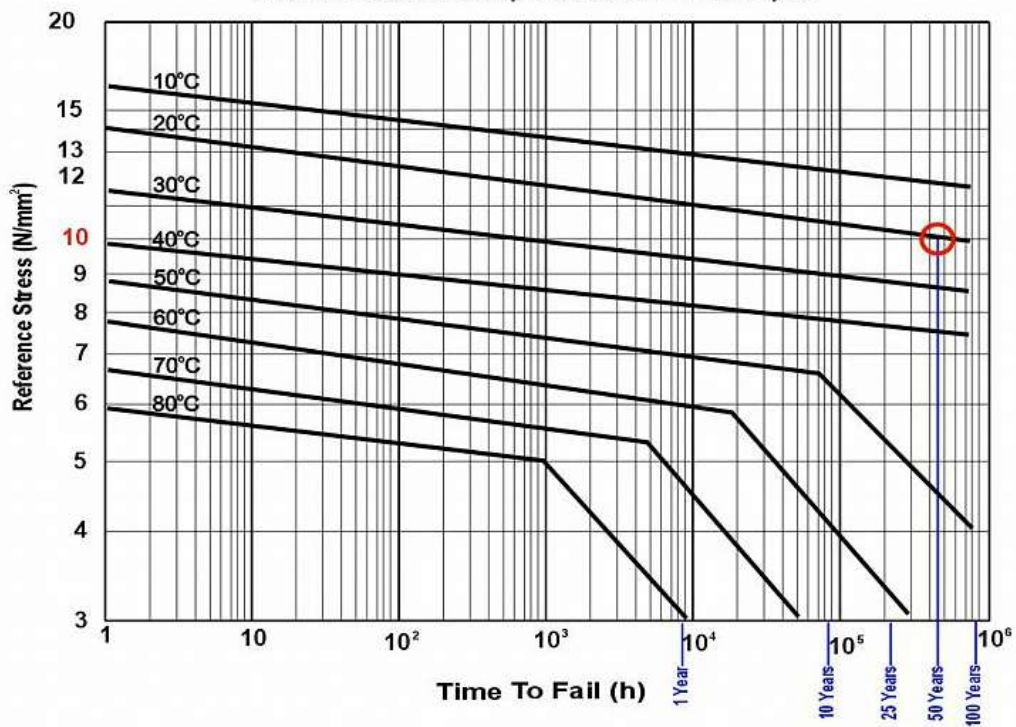




PE-100 Borular İçin Ömür Eğrileri



Internal Pressure Creep Curves for PE-100 Pipes



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 açığı yapmamalı, alt sıra ise yanıl 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

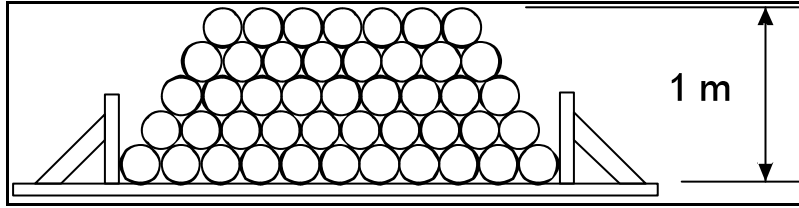
Some precautions have to be taken when storing PE products.

* 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

- * Borular yatay bir düzlemde depolanmalı ve keskin objelerle temas etmemelidir.
- * PE fittingler kapalı bir alanda, naylon ambalajlar içinde depolanmalıdır.
- * Boru ve fittinglerin toprak, pislik, atık su veya solventler ile teması önlenmelidir.

2.1.2- Taşıma

* Donma noktası civarı ve daha düşük sıcaklıklarda, PE sertleşerek darbe ve gerilimlere karşı daha dirençsiz olur. Bundan dolayı, borular yere düşürülmemelidir, 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.

Stacking of pipes

- * 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.

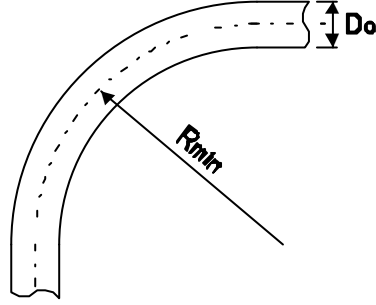
2.1.2- Handling

* 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 fittingler vasıta üstünden yere atılmamalıdır.

- * 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- Mesnetleme

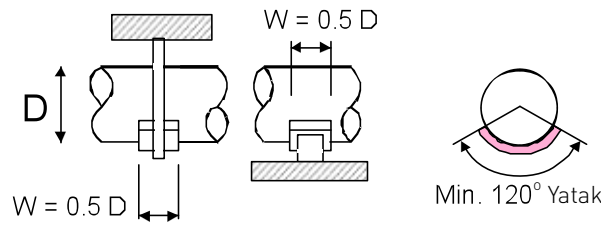
2.2.1- Açıkta (havada) mesnetlenmiş döşeme

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.

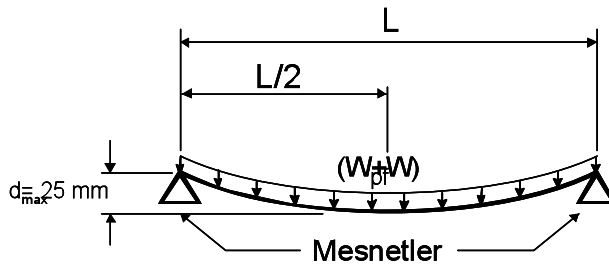
2.2- Supporting

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:

$$L = [(3840 \times E \times I \times d) / (5(W_p + W_f))]^{1/4} / 100$$

Açıklamalar;

L: Mesnet aralığı (m)

E: Elastisite modülü (MPa)

I: Borunun atalet momenti (cm⁴)

d: izin verilen çökme (cm)

W_p: Borunun birim ağırlığı (kg/cm)

W_f: 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:

$$L = [(3840 \times E \times I \times d) / (5(W_p + W_f))]^{1/4} / 100$$

The explanations;

L: The effective span (m)

E: The elasticity modüle (MPa)

I: The inertial momentum of the pipe

d: The allowed collapse value

W_p: The unit weight of the pipe

W_f: 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

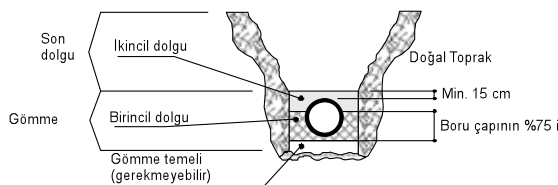


2.2.2- Toprağa gömerek döşeme

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).

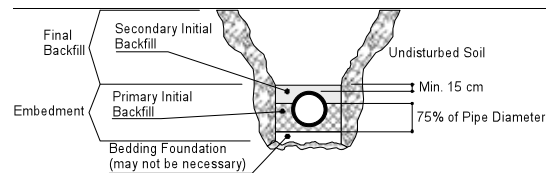


Figure for Terminology of Pipe Embedment Materials

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 yönergelerinin hazırlanması gereklidir. Aslında çoğu zaman aşağıda belirtilen genel uygulama yöntemlerinin de yeterli olduğu bir gerçektir. Bu uygulamalar, tipik olarak, fazla derine döşenmediğinden 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 dayanıklılıkta olduklarından, özel bir çökme incelemesi gerektirmemektedirler].

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

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 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.

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:

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, hendekdeki 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 genişmiş 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 fittingli 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 kullanılmalı 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 kavilendirmek 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, genişlen 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 fittings, 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 genişleme/büzülmeler vs. dolaylı 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 fittings, dirsek ve Te ayrımlar için boru ile aynı dolgu malzemesi yeterlidir. Servis bağlantıları da PE malzemeden yapılırsa özel sıkıştırma gerekmez. Servis bağlantıları taşıyıcı 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

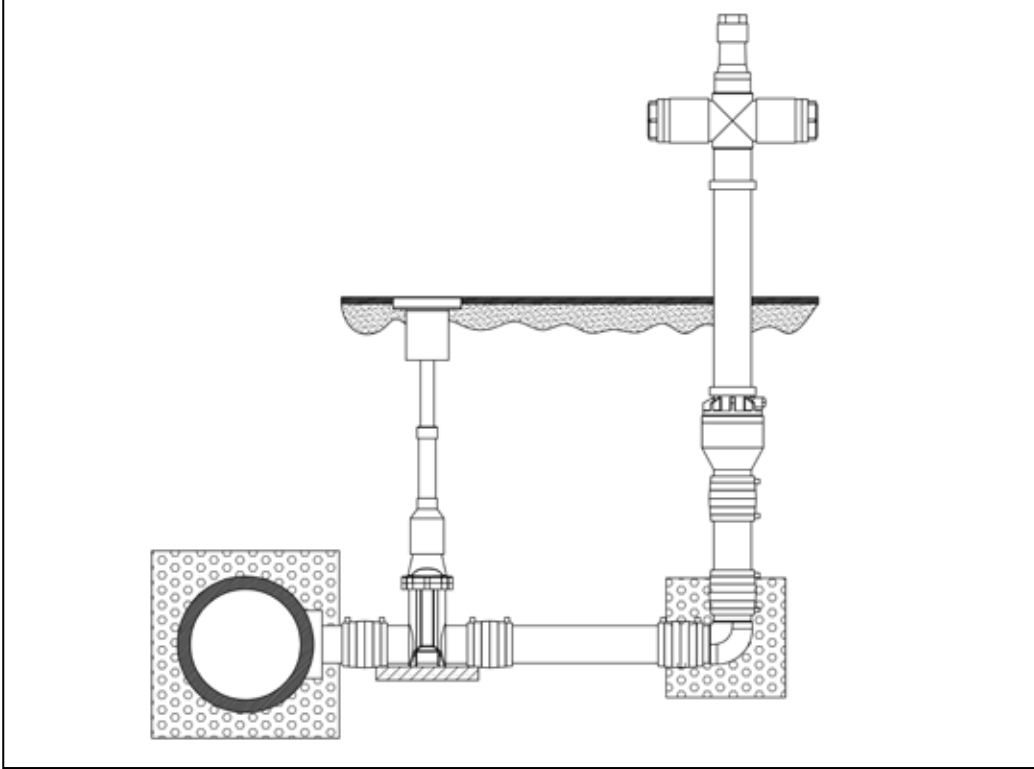
Heat fused PE pipe and fittings are monolithic structures, which do not require thrust blocks to restrain the longitudinal loads resulting from pipe pressurization.

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 fittinglerin gömülmesine dair çeşitli örnekler

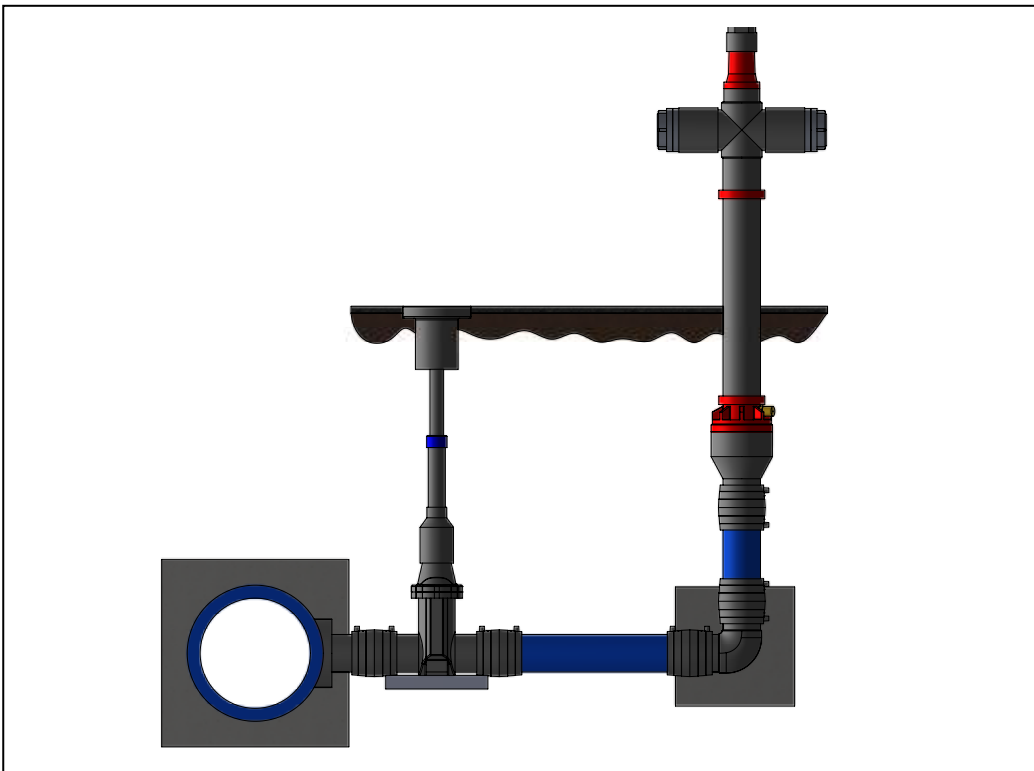


Figure for samples of PE fittings burial

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 %96'sı, deniz suyunun ise %94'ü 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 Esnekler – 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 yüzebilmesi, su doldurulunca da batabilmesi. 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. Aynı 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 taşıdığı suyun ağırlığı arasındaki fark kadardır. Bu bağlantı şu şekilde ifade edilebilir:

$$F = [W_{boru} + W_{madde}] - W_{taşma}$$

F = birim metredeki kaldırma kuvveti, kg/m boru

W_{boru} = borunun birim ağırlığı, kg/m boru

W_{madde} = 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, dependant 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:

$$F = [W_{pipe} + W_{cont}] - W_{displ}$$

F = buoyant force, kg/m of pipe

W_{pipe} = weight of pipe, kg/m of pipe

W_{cont} = weight of pipe contents, kg/m of pipe

W_{displ} = weight of water displaced by pipe, kg/m of pipe

3.2. Minimum weighting for the anchoring of a submerged pipe in its final position is determined.

Wtaşma = borunun taşıdığı 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) taşıdığı su ağırlığının %25 ile %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 taşıdığı su ağırlığının en az %40 l 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 gerilmeleri 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.

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 spacings 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 spacings. 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 akıntılarının çok olduğu deniz uygulamalarında, alt kısmı üst kısmından daha ağır olan ağırlıklı blokları daha avantajlı olmaktadır. Bu blokların üst ve alt kısımlarında korozyona dayanıklı (ör. paslanmaz çelik) kaldırma kulakları, cıvata-somun bulunmalıdır.

Ağırlık bloklarının tipik ağırlıkları aşağıdaki tabloda verilmiştir:

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).

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, kıyıda 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 düşebilecek 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. Ağırılık 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 ağırılıklar bağlanır ve boru suya indirilerek platform bir sonraki ağırılık bağlama noktasına ilerletilir. Her durumda, boruyu en az miktarda kaldırmak için platformun yüzeyi suya mümkün olduğunca yakın olmalıdır.

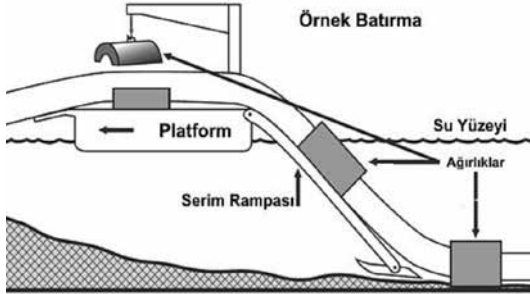
8. Eklenmiş borunun suya indirilmesi (bu aşama bir önceki aşama ile aynı anda yapılabilir)

Ağırılık eklenmiş boru, bir rampa aracılığı ile suya kolay indirme için kullanılabilir. Rampa, suyun içine doğru o şekilde uzatılmalıdır ki, boru suya indiği zaman ağırılığı 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 uçundan 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 dibine 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 fazla basınçta hava kullanılmamalıdır.

10. Karadan suya geçişin tamamlanması

Borunun batırılma işi bittikten sonra, karadan suya olan geçişte yapılmış olan hendek doldurularak üstten

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.

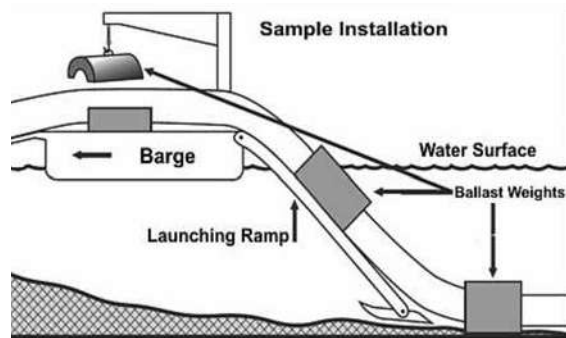
7. Fixing the ballast weights

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.



To prepare the pipe for submersion, it is first accurately positioned over its intended location.

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.

Basıncı borularda, uzun süreli kullanımı limitleyen faktör sıcaklıktır, bu da genellikle 60°C'tir. 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 valved 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		

Basıncısız 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 kırılğan olsa bile, diğer malzemelere göre yırtılma açısından daha sağlamdır.

Isıl Genleşme / Büzülme Etkileri

Boru ve kaynaklı ek yerleri, sıcaklık değişiminden dolayı olan gerilmeleri rahatça karşılayabilir. Genellikle, tamamen PE olan bir sistemde genleşme sınırlama veya kompensatör 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 gerilmeleri uygulayacaktır.

Hafifletici olarak, PE malzemenin düşük elastisite modülü genleşme / büzülmeden dolayı olan gerilmelerin yarattığı kuvvetin önemli ölçüde azalmasını sağlar. Bu gerilmelerin 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 than 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 kılma şu denklem ile hesaplanır: $\Delta L = \alpha (T_2 - T_1) L$

Açıklama;

ΔL = Teorik boy değişimi (m.)

$\Delta L \rightarrow 0$ uzama

$\Delta L < 0$ kılma

α = Sıcaklık genişleme katsayısı, PE 100 için 1.8×10^{-4} m/m.°C

T_1 = İlk sıcaklık (°C)

T_2 = Son sıcaklık (°C)

L = Borunun ilk sıcaklıktaki (T_1) boyu (m.)

Esnek PE boru baskı kuvvetini tam olarak iletmez. Sıcaklık artarken, boru da mesnetlerine tam kuvvet vermeden önce genellikle yana doğru yitkavli 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 genişleme katsayısı, PE 100 için 1.8×10^{-4} m/m.°C

ΔT = Sıcaklık değişimi, °C

Mesnet yüklerini en aza indirmek veya genişlemede hareketi borunun belli bir tarafına vermek için montajda bir tarafa doğru hafif bir esneme yapılabilir. Bu aynı zamanda borunun büzülmesi zaman düz bir hatta gerilemesini de engeller. Ayrıca, daha önceden yitkavli hareket verilmiş olan bir boru, genişleme 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.

$$L_p = L + 1.1 \Delta L$$

Açıklama;

L_p = genişlemiş boru boyu, m.

Yani, L aralığında yerleştirilmiş mesnetler, boru üzerinde L_p 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: $\Delta L = \alpha (T_2 - T_1) L$

Where

ΔL = Theoretical length change (m.)

$\Delta L > 0$ is expansion

$\Delta L < 0$ is contraction

α = Coefficient of linear expansion, 1.8×10^{-4} m/m.°C for PE 100

T_1 = Initial temperature (°C)

T_2 = Final temperature (°C)

L = Length of pipe (m.) at initial temperature, T_1

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.

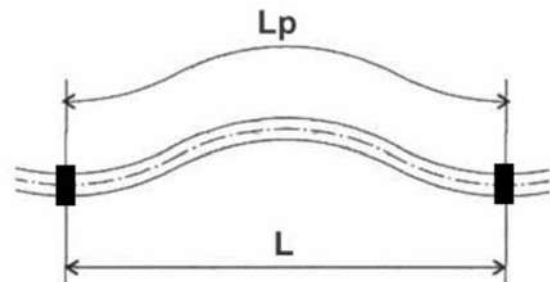
Determine the length change, ΔL , for the change from ambient temperature at the time of installation, to the minimum expected temperature, add approximately 10% as a safety factor; then add this length to the anchor point distance, L .

The length of the expanded pipe may be determined from:

$$L_p = L + 1.1 \Delta L$$

Where

L_p = expanded pipe length, m.



Genişlemiş 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.

$\Delta L = 1.8 \times 10^{-4} (50-20) 10 = 0,054$ m bulunur.

Yanal öteleme verilerek istenirse;

$L_p = 10 + 1.1 \times 0,054 = 10,06$ 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 ötelenme 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.

$\Delta L = 1.8 \times 10^{-4} (50-20) 10 = 0.054$ m

If some lateral deflection is to be given to the pipe;

$L_p = 10 + 1.1 \times 0.054 = 10.06$ m

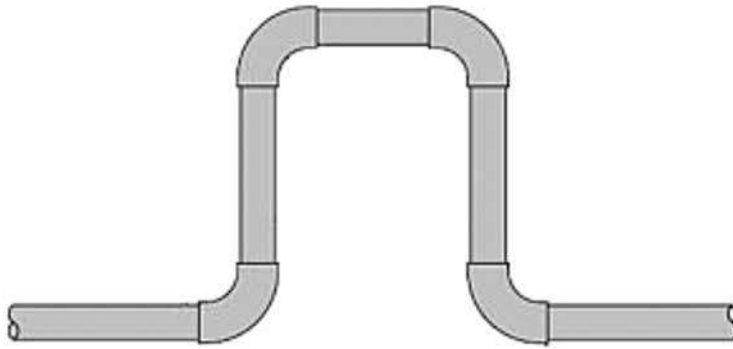
This means, with supports spaced at 10m distance, a length of 10.06m marked on the pipe will be installed between the 10m apart supports, the supports being coincident with the markings on the pipe, thus a lateral deflection be given.

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 genişlediği zaman görsel etkisi azalacaktır. Öngerilimli yapmaktan kasıt, genişeceği öngörülen boyun yarısı kadar ($\Delta L/2$) ters tarafa kasıntılı olarak montaj yapılmalıdır. Böylece, boru genişlediği zaman omeganın uçları arasında öngörülenin yarısı kadar kapanma olacak ve gözü normalde yapacağı kadar rahatsız etmeyecektir. Asgari düz boyun hesabı şu formülle yapılabilir:

$$L_s = 26\sqrt{D_o \cdot \Delta L / 2}$$

Açıklama;

L_s : Asgari düz boy, mm

D_o : 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:

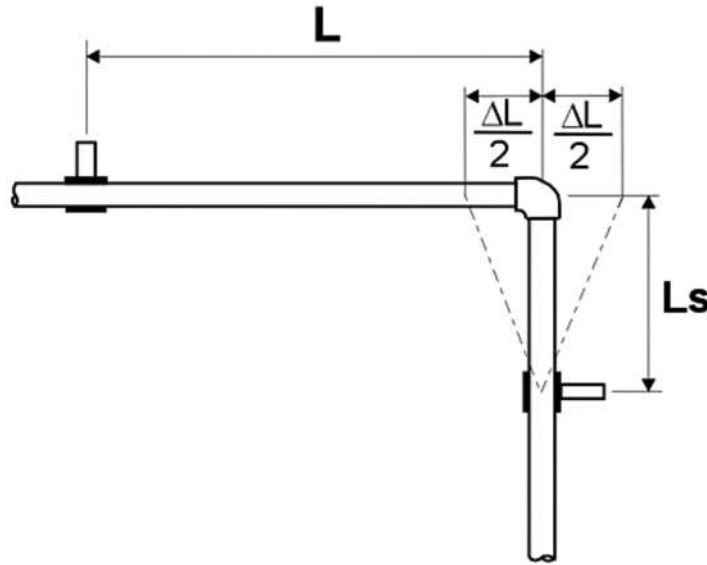
$$L_s = 26\sqrt{D_o \cdot \Delta L / 2}$$

Where

L_s : Min. Straight length, mm

D_o : Outer diameter of pipe, mm

ΔL : Calculated change in length, mm



Asgari düz boy hesabı terminolojisi
Terminology for minimum straight length

Örnek Çözüm:

D_o : 63 mm

T_1 = 20°C

T_2 = 50°C

L = 2m.

$\Delta L = 1.8 \times 10^{-4} (50 - 20) 2 = 0,011 \text{ m} = 11 \text{ mm}$ bulunur.

$L_s = 26\sqrt{63 \times 11/2} = 484 \text{ mm}$ olarak hesaplanır.

Sample Problem:

D_o : 63 mm

T_1 = 20°C

T_2 = 50°C

L = 2m.

$\Delta L = 1.8 \times 10^{-4} (50 - 20) 2 = 0.011 \text{ m} = 11 \text{ mm}$

$L_s = 26\sqrt{63 \times 11/2} = 484 \text{ mm}$

2.4- Mekanik İşleme

Kesme, frezeleme ve delme işlemleri PE malzemede problemsiz olarak yapılabilir.

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	\leftarrow 10	3-5
Adım P (mm)	3-5	3-5	----	----	----
Kesme hızı (m/min)	\leftarrow 3000	\leftarrow 3000	200-500	\leftarrow 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)	----	----	\leftarrow 8	----	----
Uç açısı φ (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	\leftarrow 10	3-5
Pitch P (mm)	3-5	3-5	----	----	----
Cutting Speed (m/min)	\leftarrow 3000	\leftarrow 3000	200-500	\leftarrow 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)	----	----	\leftarrow 8	----	----
Tool Tip Angle φ (o)	----	----	----	----	100

2.5- Birleştirme İşlemleri

PE boru ve/veya fittingler birbirlerine eriterek kaynatma (füzyon) veya mekanik fittingler ile bağlanırlar. PE borular, diğer malzemelerden olan borulara dıştan sıkmalı fittingler, flanşlar veya amaca uygun yapılmış diğer geçiş adaptörleri ile bağlanabilirler. Bağlantı fittingleri 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 fittingin iç yüzeyi füzyon sıcaklığına gelene kadar ısıtılır. Boru fittinge 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.

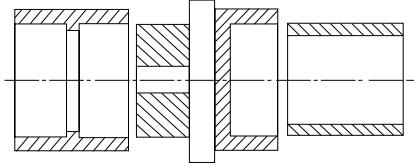
The principle of heat fusion is to heat two surfaces to a designated temperature, then fuse them together by application of a sufficient force. This force causes the melted materials to flow and mix, thereby resulting in fusion. When fused according to the pipe and/or fitting manufacturers' procedures, 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

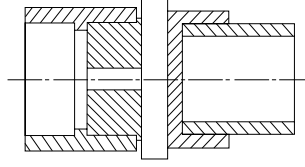
This technique consists of simultaneously heating both the external surface of the pipe end and the internal surface of the socket fitting until the material reaches the recommended fusion temperature, inspecting the melt pattern, inserting the pipe end into the socket, and holding it in place until 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.

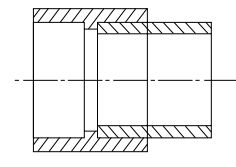
Soket Kaynak İçin Şematik resim
Schematic Sketch For Socket Welding



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. Ucu ve fittingin 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. Ekle-necek yüzeylerdeki talaş, traşlama artıkları, yağ, pislik vb tamamen temizlenmelidir.

3. Isıtma

Isıtıcı sıcaklığı kontrol edilmelidir (250-270oC). Isıtıcının yüzeyleri, boru ve fittingin kaynatılacak yüzeylerine geçirilmeli ve imalatçının önerileri doğrultusunda ısıtılmalıdır. Genel olarak uygulanan değerler aşağıdaki tabloda verilmiştir.

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 fitting 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 fitting ve boru ütünden çıkarılmalı ve hızlı bir şekilde dudakları birleşene kadar çevirmeden birbirlerine geçirilmelidir. Kaynak yerinin soğumasını beklenmeli, daha sonra kelepçe çıkarılmalıdır.

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.

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).

2.5.2- EF (Elektrofüzyon) Kaynak

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).

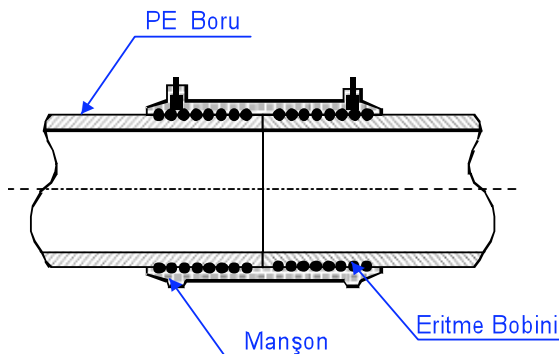
The maximum test pressure is 1,5xPN (max. PN+5). The piping system has to be protected against changes in ambient temperature (UV-radiation).

2.5.2- EF (Electrofusion) Welding

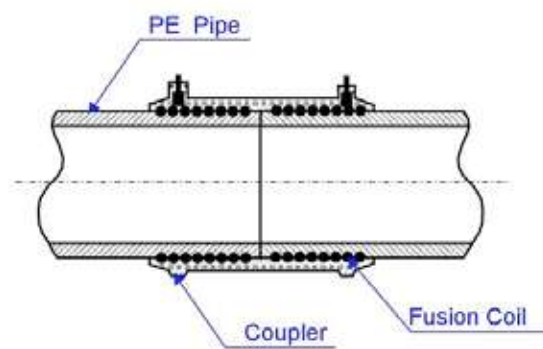


Bu füzyon tekniği, Bölüm 2.5.1 de belirtilen teknikten farklılıklar gösterir. İkisi arasındaki temel fark, ısının uygulanma metodundadır. Konvansiyonel füzyonda, boru ve fitting yüzeylerini ısıtmak için bir ısıtıcı ekipman kullanılmaktadır. Elektrofüzyon (EF) tekniğinde ise, fittingin içine yerleştirilmiş bir dirence elektrik verilerek ısınması ve malzemeyi eriterek birbirlerine kaynatması sağlanmaktadır. Altta 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:

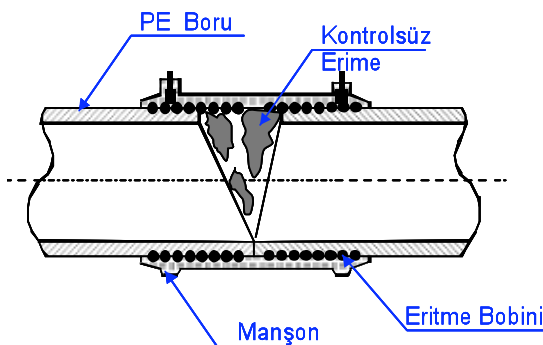
1. Borunun kazınip temizlenerek hazırlanması
2. Borunun işaretlenmesi
3. Boru ve fittingin birbirine geçirilip ayarlanarak sabitlenmesi
4. Elektrik uygulanması
5. Soğutulma ve sabitlemelerin sökülmesi
6. İşlemin dökümanlanması

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, sonra üstünde kalan talaş vb temizlenerek kaynağa hazır hale getirilmelidir. Traşlama için özel yapım el aletleri kullanılmalıdır.

Borunun düzgün bir şekilde kesilmemesi, fittingdeki 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)



Düğüen kesilmeyen boru uçlarının kaynağa olumsuz etkisi

General steps to be followed when performing electrofusion joining are:

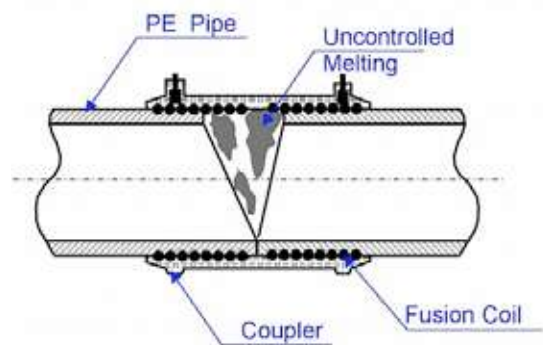
1. Prepare the pipe (scrape, clean)
2. Mark the pipe
3. Align and restrain pipe and fitting per manufacturer's recommendations
4. Apply the electric current
5. Cool and remove the clamps
6. Document the fusion process

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 area 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)



Unwanted result of welding improperly cut pipe ends



Borunun İşaretlenmesi

Kaynak alanı, borunun fitting içine gireceği derinlik olarak tanımlanabilir (fittingin 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 fittingin içine sokarken fittingin kontak terminallerinin üstte kalmasına dikkat edilmelidir. Boru fitting içerisine yerleştirildikten sonra rahatlıkla döndürülebilir. Borular eğilme gerilimine maruz kalmamalı ve fitting içerisinde kendi ağırlıklarını rahatlıkla taşıyabilmelidir. Borunun serbest uçlarına destek konulabilir.

Boru, fittingin 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 girilmedi 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 beklendikten 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 yerinin oynaması kaynağın performansını olumsuz olarak etkiler.

Kaynağın Dökümanlanması

Kaynak makinesi, kaynatma için gerilim uygulamanın yanısıra, zaman, sıcaklık, basınç gibi parametreleri de kontrol etmektedir. Yapılan her kaynak makinenin 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, fittingin 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 paper.



Oksitli tabakanın traşlanması/ Scraping the oxidated layer

Boru ve fittingin ayarlanması ve kaynak öncesi sıkılması

Boru üzerinde doğru konumlandırıldıktan sonra, Te-branşman parçası civataları 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

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Kaynak işlemi herhangi bir nedente (enerji kesintisi, vb.) kesintiye uğrar ise kaynaklı parçanın soğuması için yeteri kadar beklendikten sonra kaynak işlemine devam edilebilir. TEGA Fitinglerinin soğuma süreleri barkod etiketleri üzerinde verilmiştir.

Soğutma ve Keleççelerin Sökülmesi

Yapılan kaynak, öngörülen süre kadar beklenip soğuması sağlanmalıdır. Tam soğumadan keleççenin sökülmesi ve ek yerinin oynaması kaynağın performansını olumsuz olarak etkiler.

Kaynağın Dökümanlanması

Kaynak makinesi, kaynatma için gerilim uygulamanın yanısıra, zaman, sıcaklık, basınç gibi parametreleri de kontrol etmektedir. Yapılan her kaynak makinenin 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.



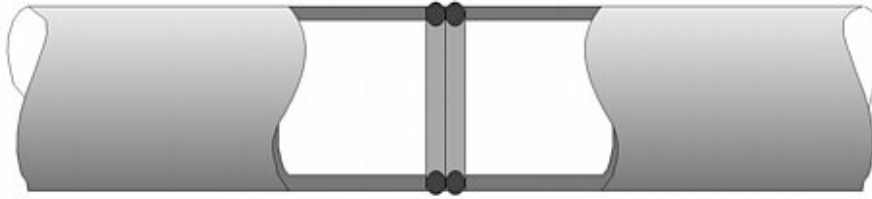
Branşmanın delinmesi/
Tapping process

2.5.3- Alın Kaynak

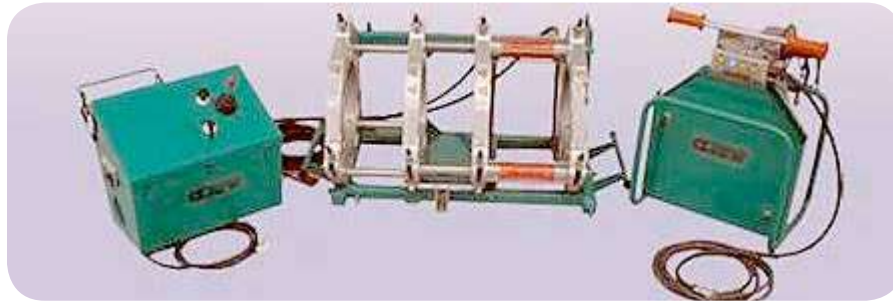
PE boruları peşpeşe bağlamak için kullanılan, boruların birbirine eklenecek alın kesitleri eritilerek birleştirme şeklinde uygulanan en yaygın yöntemdir (alttaki şekil)

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, kaynağa oluşan iç ve/veya dış dudakların yok edilmesi istenebilir. Dış dudaklar çevresel traşlayıcılar kullanılarak yok edilebilir, ancak bu yapılırken çentik oluşturmamaya dikkat edilmelidir. Elektrikli makineler de 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 planing 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 Time sn	Birleştirme Basıncı Join Pressure sn	Soğutma Süresi Cooling Time dak
	P= 0.15 N/mm ²	P= 0.20 N/mm ²			P= 0.15 N/mm ²
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 makineleri 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 ettirilmesi sırasında ölçülür fakat hizalama (alignment) basıncını geçmemelidir.

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 (planing) 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.
The workpiece movement pressure Pw should be measured at the welding area and added to the equalizing pressure

Kirlenme veya oluşabilecek hasarları önlemek için ütüü 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 $p = 0,01 \text{ N/mm}^2$ değerine düşürülerek Kaynatma Parametreleri Tablosundaki ön-ısıtma süresi beklenmelidir. Ütü kaldırılarak kaynak yapılacak yüzler (ayar süresi olabildiğince kısa olarak) birleştirilmelidir.

Birleşme işlemi boyunca istenen değere ulaşana kadar ayar basıncını sürekli artırılarak, 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 matzemelerden 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 kaynakılır; adaptörün dişli ucu da karşı parçaya bağlanır.

Aşağıdaki resimlerde dişi ve erkek adaptörler görülmektedir.

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 $p = 0,01 \text{ N/mm}^2$ 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.

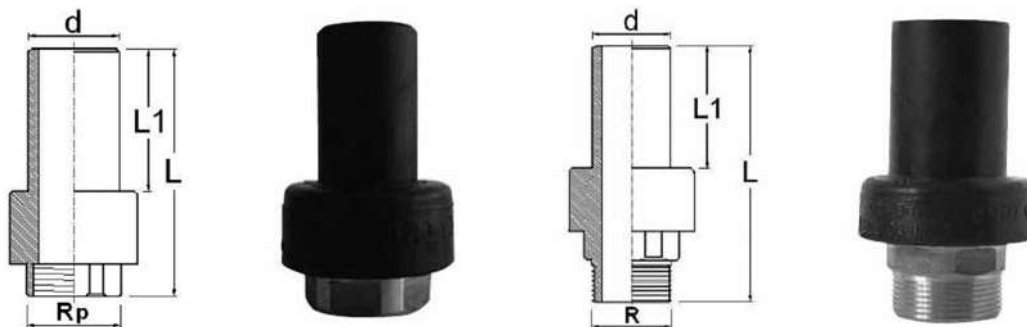
2.5.4- Threaded and Flanged Connections

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.



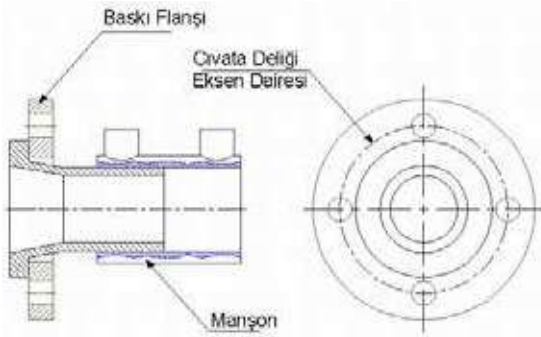
Dişi ve erkek adaptör resimleri/ Pictures for female and male threaded adapters

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 takdirde, PE flanş civatalarının 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 civataları civata deliğinden kabaca 3 mm daha düşük çaptadır. Somun ve baskı flanşı arasında mutlaka yassı pul kullanılmalıdır. Flanş civataları, civata dişleri somundan en az 2-3 diş dışarıda kalacak uzunlukta olmalıdır.



Tipik flanş bağlantı detayı

Flanş Montajı

Sıkıştırmadan önce, karşılıklı flanşlar tam ekseninde ve yüzeyleri paralel olmalıdır. Ayarsız flanşları sıkırmak, kaçaqlara sebep olabilir.

Montaja başlamadan önce civata, 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.

Civatalar, 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;

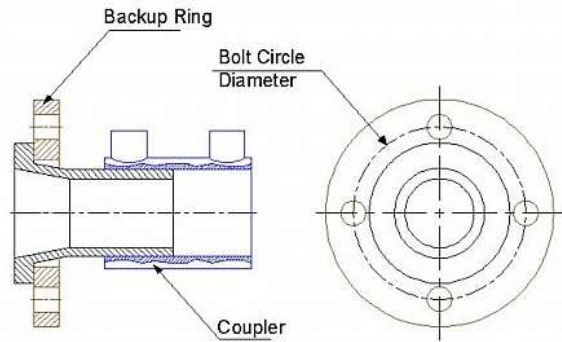
Mechanical Compression Couplings for Small Diameter Pipes Mechanical Bolt Type Couplings

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.



Typical 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 cıvadan 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 aynı 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 evsafa 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 torquing to the final torque value the first time. A torque wrench is recommended for tightening.

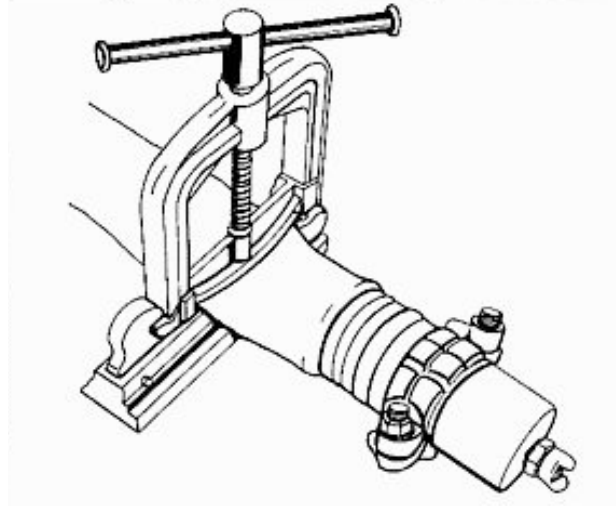
2.5.5 Repairing of PE Pipes

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.

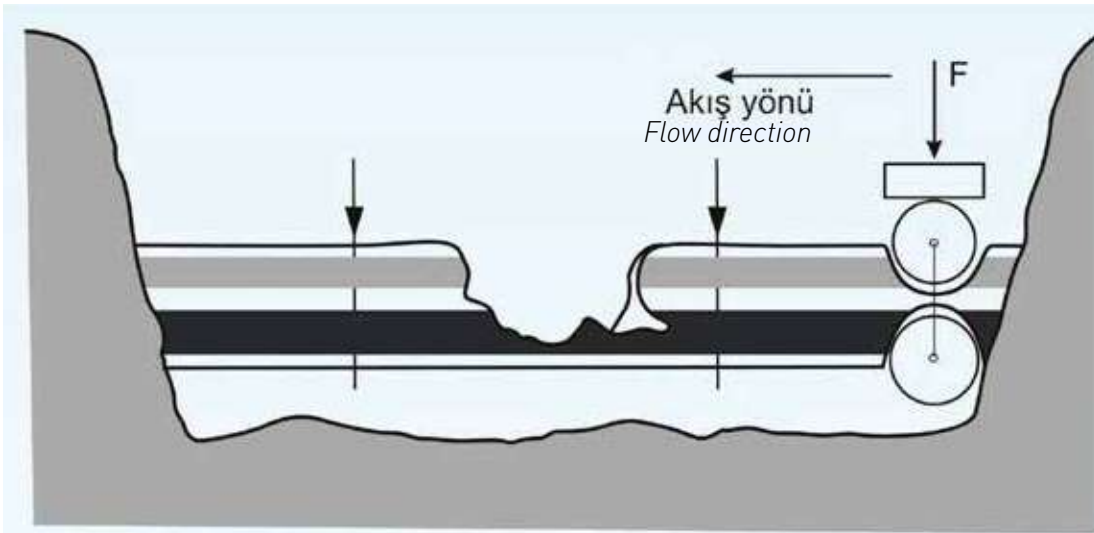
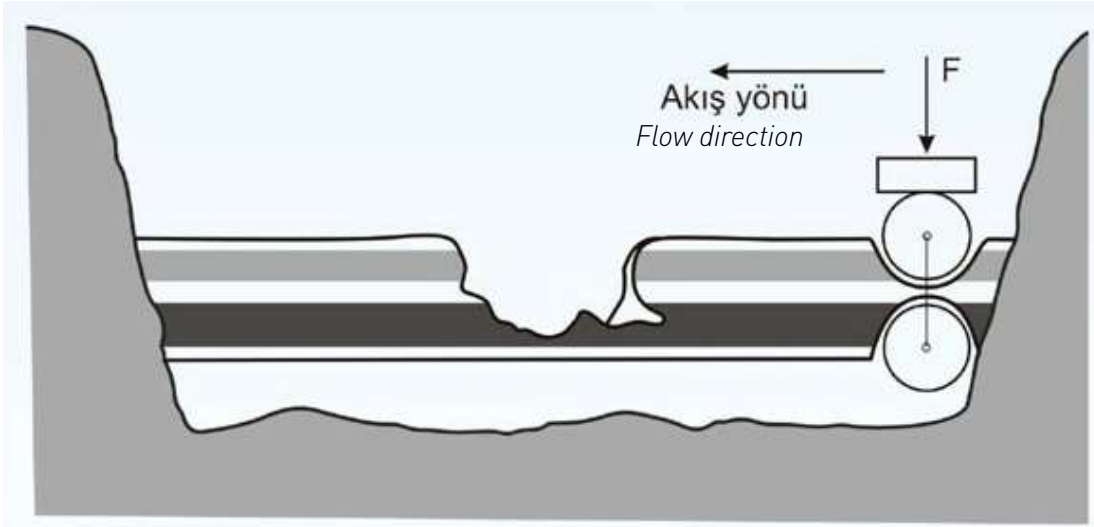
More extensive damage will require the section of pipe to be cut out and replaced. This is a relatively simple process, firstly isolating the damaged section by the use of squeeze-off tools, cutting out the section and replacing with new pipe using electrofusion couplers to tie-in the sections. It is important that the replacement section is of suitable diameter and pressure rating to maintain the integrity of the pipeline.

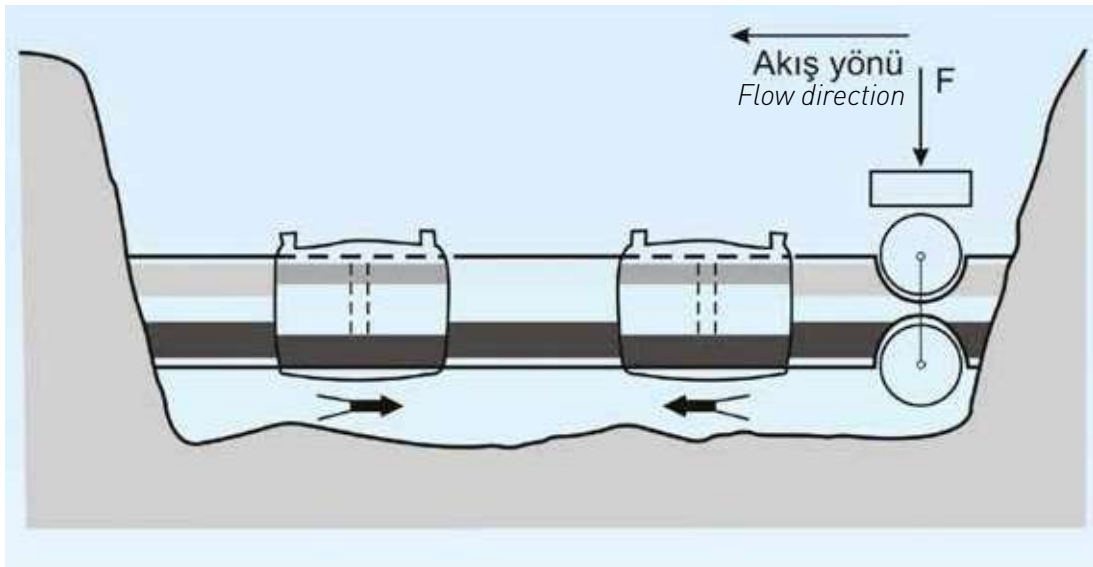
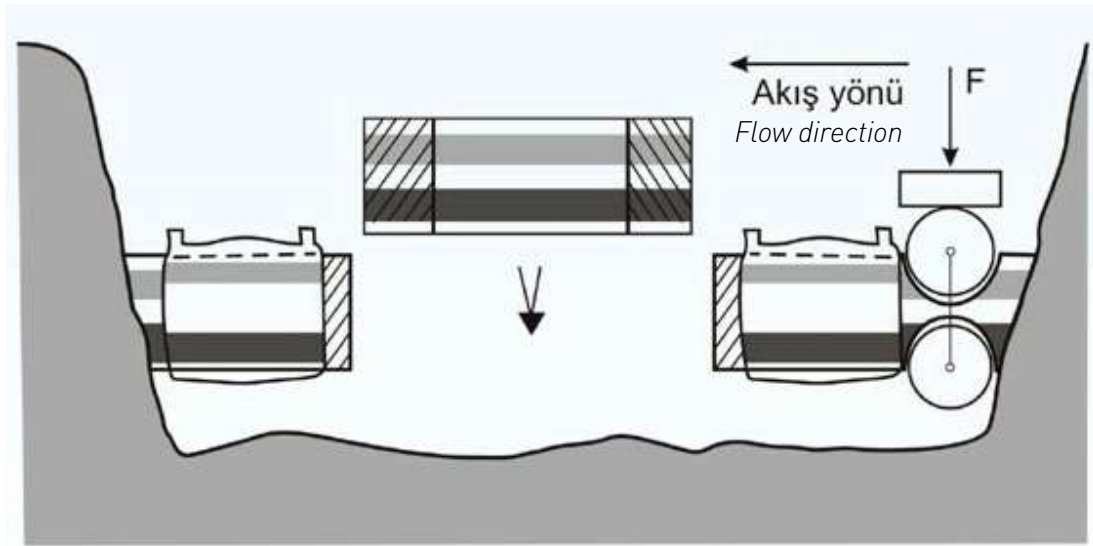
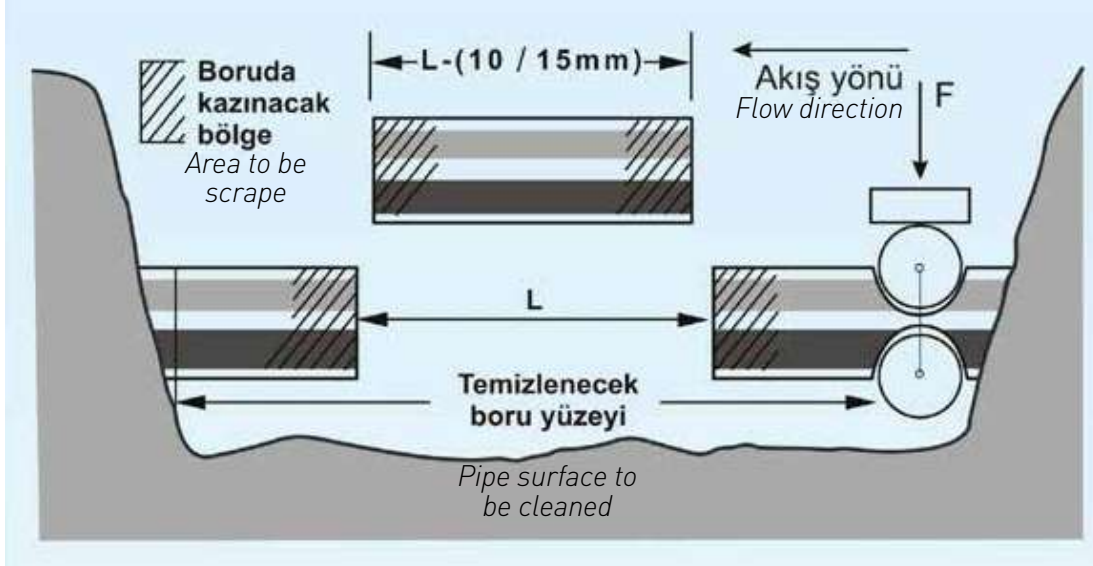
In all cases reference should be made to local or national codes of practice and all health and safety procedures should be closely followed.

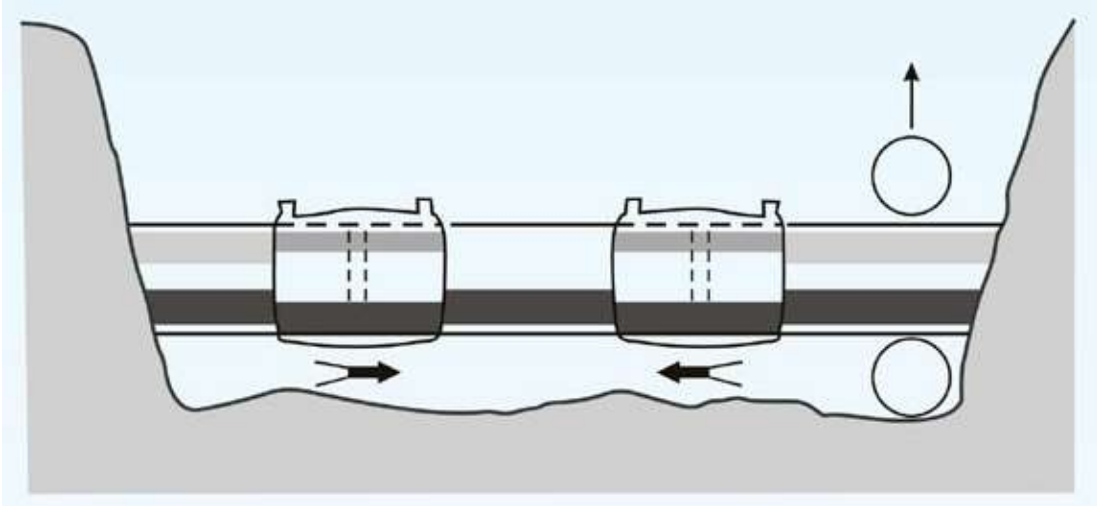
Below are figures for a typical sequence of repair steps, and explainings follow after:



PE boruyu sıkarak büzme/ Squeezing PE pipe with a clamping device







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. Basıncı 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 gözlemlene 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 bitiremeyebilir. 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 fittinglerden oluşan basınçlı sistemlerde:

- * 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) <i>Test Section Temp. (°C)</i>	≤ 27	≤ 32	≤ 38	≤ 43	≤ 49	≤ 54	≤ 60
Katsayı <i>Factor</i>	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 denetlenilebilecek 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.

$$SDR = D_o / t$$

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 grafikdir. 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.

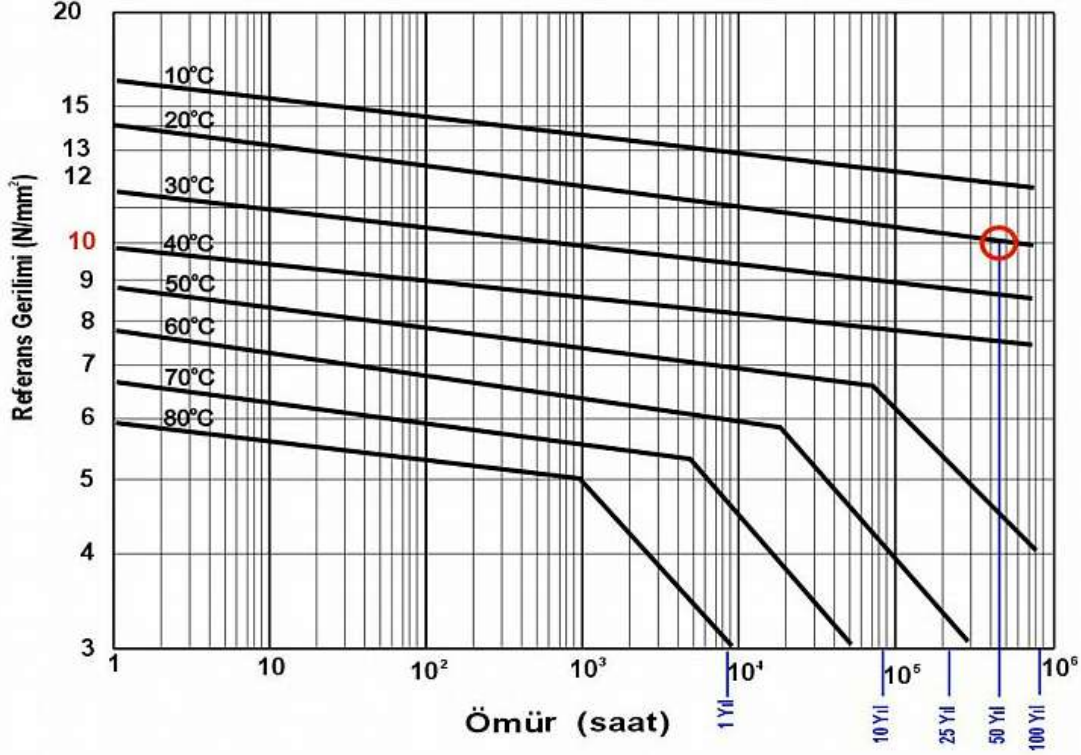
$$SDR = D_o / t$$

Working Pressure Calculation

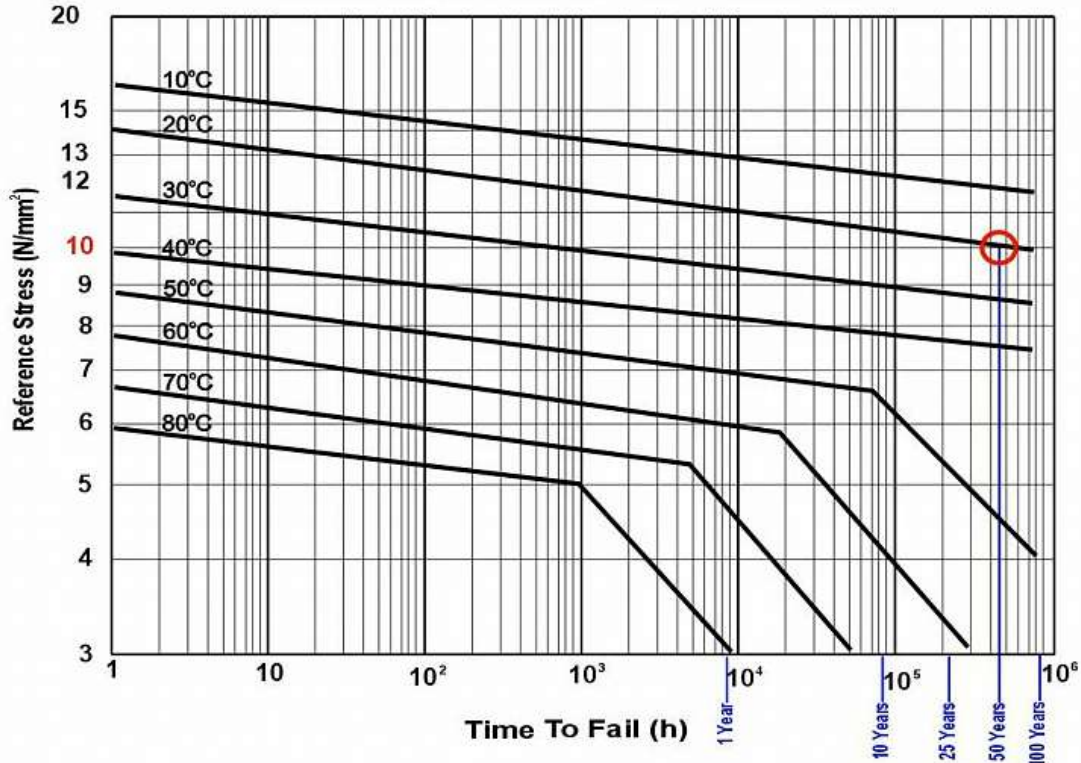
To calculate the safety factor and permissible operating pressure it is necessary to know the long term rupture stress of a material. Creep Curve below, is such diagram for PE. This diagram allows the long term rupture stress K to be read depending on the desired operating life and working temperature.



PE-100 Borular İçin Ömür Eğrileri



Internal Pressure Creep Curves for PE-100 Pipes



Efektif emniyet faktörü şu formül ile bulunur:

$$C = 20 \cdot (K \cdot t) / P \cdot (D_o - t)$$

Açıklama,

K = uzun dönem çatlama gerilimi (N/mm²) (K yukarıdaki grafikten okunacaktır)

t = boru et kalınlığı (mm)

D_o = 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:

$$P_{max} = (20 \cdot K) / (C \cdot (SDR - 1)) \quad (\text{bar})$$

Özet olarak; çalışma hesapları için 2 seçenek vardır:

1- Boru özellikleri bilirse;

$$P_{max} = (20 \cdot MRS) / (C \cdot (SDR - 1)) \quad (\text{bar})$$

2- Çalışma şartları bilirse;

$$SDR = 1 + ((20 \cdot MRS) / (C \cdot P_{max}))$$

Açıklama; (MRS : Minimum Required Strength – Asgari Gereklili 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 :

$$C = 20 \cdot (K \cdot t) / P \cdot (D_o - t)$$

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)

D_o = 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

$$P_{max} = (20 \cdot K) / (C \cdot (SDR - 1)) \quad (\text{bar})$$

As a summary; two alternatives for operational calculations are:

1- When the pipe geometry is known;

$$P_{max} = (20 \cdot MRS) / (C \cdot (SDR - 1)) \quad (\text{bar})$$

2- When the operating conditions are known;

$$SDR = 1 + ((20 \cdot MRS) / (C \cdot P_{max}))$$

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 içindeki Akışkan Sıcaklığı Temperature of fluid in pipe	Çalışma Süresi Operating Period	SDR	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
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
	10	6,5	10,4	16,2
	15	5,9	9,5	14,8
60	5	4,8	7,7	12,1
	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 ($f_s=0,8$) 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

$P_{max} = (20 \cdot MRS) / (C \cdot (SDR-1)) = (20 \times 10) / (1,25 \times (17-1)) = 10$ bar

Alın kaynak emniyet faktörü de hesaba katılırsa, $P_{max} = 10 \times 0,8 = 8$ bar olur.

b- Çalışma şartlarının bilinmesi durumu:

PE-100 boru, MRS=10

Akışkan: Su, C=1,25

$P_{max} = 12$ bar

$SDR = 1 + ((20 \cdot MRS) / (C \cdot P_{max})) = 1 + ((20 \times 10) / (1,25 \times 12)) = 14,33$

yani SDR=11 olan bir boru seçilmelidir.

Alın kaynak emniyet faktörü de hesaba katılırsa, $SDR = 14,33 \times 0,8 = 11,46$ bulunur, bu durumda da SDR=11 olan bir boru uygundur.

Boru çapının hesaplanması:

Akış izlemlerinin hesaplanması kütlelerin eşitliği denkleminde 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.

$$D_i = 18,8 \cdot \sqrt{(Q/V)} \quad (Q \dots m^3/h)$$

$$D_i = 35,7 \cdot \sqrt{(Q/V)} \quad (Q \dots lt/s)$$

Açıklama,

D_i ... 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 ($f_s=0,8$).

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

$P_{max} = (20 \cdot MRS) / (C \cdot (SDR-1)) = (20 \times 10) / (1.25 \times (17-1)) = 10$ bar

Considering butt-welding safety factor, $P_{max} = 10 \times 0,8 = 8$ bar

b- If operating conditions are known:

PE-100 pipe, MRS=10

Fluid: Water, C=1.25

$P_{max} = 12$ bar

$SDR = 1 + ((20 \cdot MRS) / (C \cdot P_{max})) = 1 + ((20 \times 10) / (1.25 \times 12)) = 14,33$

So a pipe with SDR=11 should be chosen.

Considering butt-welding safety factor, $SDR = 14,33 \times 0,8 = 11,46$ 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.

$$D_i = 18,8 \cdot \sqrt{(Q/V)} \quad (Q \dots m^3/h)$$

$$D_i = 35,7 \cdot \sqrt{(Q/V)} \quad (Q \dots lt/s)$$

Where,

D_i ... 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:

$V \sim 0,5 / 1,0$ m/s (emiş tarafı)

$V \sim 1,0 / 3,0$ m/s (basma tarafı)

Akış hızının hesaplanmasında gazlar için aşağıdaki değerler referans olarak kullanılabilir:

$V \sim 10 / 30$ 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:

$$\Delta P = \Delta P_p + \Delta P_f \quad (\text{bar})$$

Açıklama,

ΔP_p Düz borulardaki basınç kaybı

$$\Delta P_p = (f \cdot L \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102) \quad (\text{bar})$$

fboru 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)

ΔP_f Vana ve fittinglerdeki basınç kaybı

$$\Delta P_f = (f \cdot L_{eff} \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102) \quad (\text{bar})$$

L_{eff} Fitinglerdeki basınç kaybını belirlemek için eşdeğer düz boru boyu;

$$L_{eff} = R \cdot D_i / 1000$$

Açıklama,

L_{eff} ... efektif boru uzunluğu (m)

D_i boru iç çapı (mm)

R aşağıdaki tablodan alınır:

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		

$V \sim 1,0 / 3,0$ m/s (pressure side)

Reference values for the calculation of flow velocities may be for gases.

$V \sim 10 / 30$ 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:

$$\Delta P = \Delta P_p + \Delta P_f \quad (\text{bar})$$

Where,

ΔP_p Pressure loss in straight pipes

$$\Delta P_p = (f \cdot L \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102) \quad (\text{bar})$$

fpipe frictional index (in most cases $f = 0,02$)

L.....length of piping system (m)

D_iinside diameter of pipe (mm)

ρ ... medium density (kg/m³)

V... flow velocity (m/s)

ΔP_f Pressure loss in valves and fittings

$$\Delta P_f = (f \cdot L_{eff} \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102) \quad (\text{bar})$$

L_{eff} The equivalent length of pipe to be used to estimate the friction loss due to fittings;

$$L_{eff} = R \cdot D_i / 1000$$

Where,

L_{eff} ... effective Pipeline length (m)

D_i pipe internal diameter (mm)

R is taken from Table below.

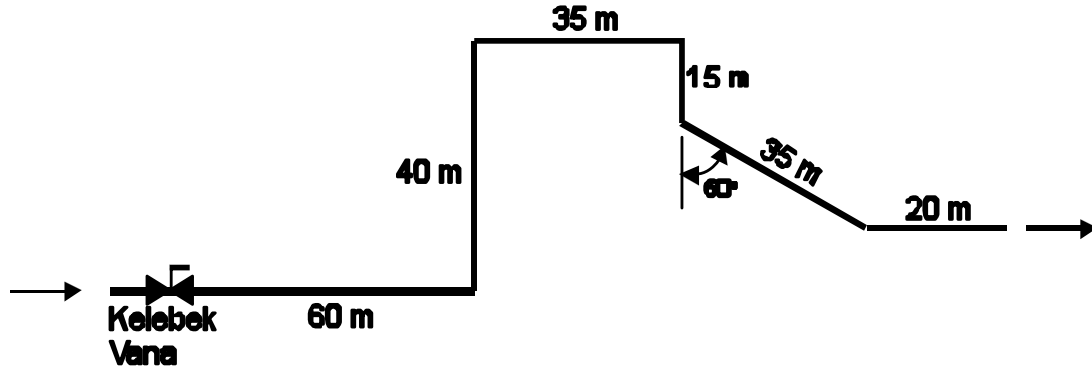
Piping Component	R	Piping Component	R
90° Molded Elbow	40	30° Fabricated Elbow (2 or more miters)	8
45° Molded elbow	21	30° Fabricated Elbow (1 miter)	8
15° Molded Elbow	6	15° Fabricated Elbow (1 miter)	6
90° Fabricated Elbow (3 or more miters)	24	Equal Outlet Tee, Run/Branch	60
90° Fabricated Elbow (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:

$$D_i = 18,8 \cdot \sqrt{(Q/V)} = 18,8 \times \sqrt{(350 / 2,5)} = 222 \text{ mm}$$

SDR=17 ve $D_o=250$ mm borunun $D_i = 220,6$ mm gelir, bu boru uygundur.

Bu çapta borudaki su hızı 2,54 m/s bulunur.

Düz borulardaki basınç kaybı:

$$\Delta P_p = (f \cdot L \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102)$$

$$\Delta P_p = (0,02 \times 205 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,6 \text{ bar}$$

Vana ve fittinglerdeki basınç kaybı:

$$\Delta P_f = (f \cdot L_{eff} \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102)$$

$$\text{Kelebek Vana } \Delta P_p = (0,02 \times 40 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 1 \text{ adet} = 0,12 \text{ bar}$$

$$90^\circ \text{ Döküm Dirsek } \Delta P_p = (0,02 \times 40 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 3 \text{ adet} = 0,36 \text{ bar}$$

$$60^\circ \text{ Parçalı Dirsek } \Delta P_p = (0,02 \times 25 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 1 \text{ adet} = 0,08 \text{ bar}$$

$$30^\circ \text{ Parçalı Dirsek } \Delta P_p = (0,02 \times 8 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 1 \text{ adet} = 0,02 \text{ bar}$$

Vana ve fittinglerdeki basınç kayıpları toplamı: 0,58 bar

Düz borular ile fittinglerin toplam kaybı: $0,6 + 0,58 = 1,18$ bar olarak bulunur.

Calculation of pipe inside diameter:

$$D_i = 18,8 \cdot \sqrt{(Q/V)} = 18,8 \times \sqrt{(350 / 2,5)} = 222 \text{ mm}$$

For SDR=17 and $D_o=250$ mm, $D_i = 220,6$ mm, this pipe is suitable. The water velocity in this pipe is calculated as 2.54 m/s.

Pressure loss in straight pipes:

$$\Delta P_p = (f \cdot L \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102)$$

$$\Delta P_p = (0,02 \times 205 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,6 \text{ bar}$$

Pressure loss in valve and fittings:

$$\Delta P_f = (f \cdot L_{eff} \cdot \rho \cdot V^2) / (D_i \cdot 2 \cdot 102)$$

$$\text{Butterfly Valve } \Delta P_p = (0,02 \times 40 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 1 \text{ item} = 0,12 \text{ bar}$$

$$90^\circ \text{ Molded Elbow } \Delta P_p = (0,02 \times 40 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 3 \text{ items} = 0,36 \text{ bar}$$

$$60^\circ \text{ Fabr. Elbow } \Delta P_p = (0,02 \times 25 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 1 \text{ item} = 0,08 \text{ bar}$$

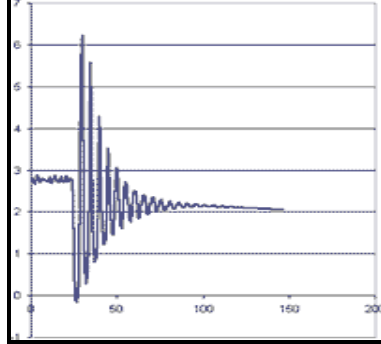
$$30^\circ \text{ Fabr. Elbow } \Delta P_p = (0,02 \times 8 \times 999 \times (2,54)^2) / (220,6 \times 2 \times 100) = 0,12 \text{ bar} \times 1 \text{ item} = 0,02 \text{ bar}$$

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 bsinçının kısa süreli olarak normal çalışma bsinçının 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 stabilises 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 bsinçı (Pmax) üstüne gelebilecek koç darbesi bsinçı
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 açip 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:

$$P_s = 101 \cdot [(BM \cdot E) / (w/g) \cdot (E + BM \cdot SDR)]^{1/2} \cdot w \cdot Vc / (10210 \cdot g)$$

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/m ³)
g.....	Yerçekimi ivmesi	(9.81m/s ²)
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: $P_s = 101 \cdot [(BM \cdot E) / (w/g) \cdot (E + BM \cdot SDR)]^{1/2} \cdot w \cdot Vc / (10210 \cdot g)$

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/m ³ for water)
g.....	Acceleration due to gravity	(9.81m/s ²)
Ps.....	Change in pressure	(bar)
Vc.....	Change in velocity of fluid	(m/s) (equals velocity of fluid before sudden shutdown)



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