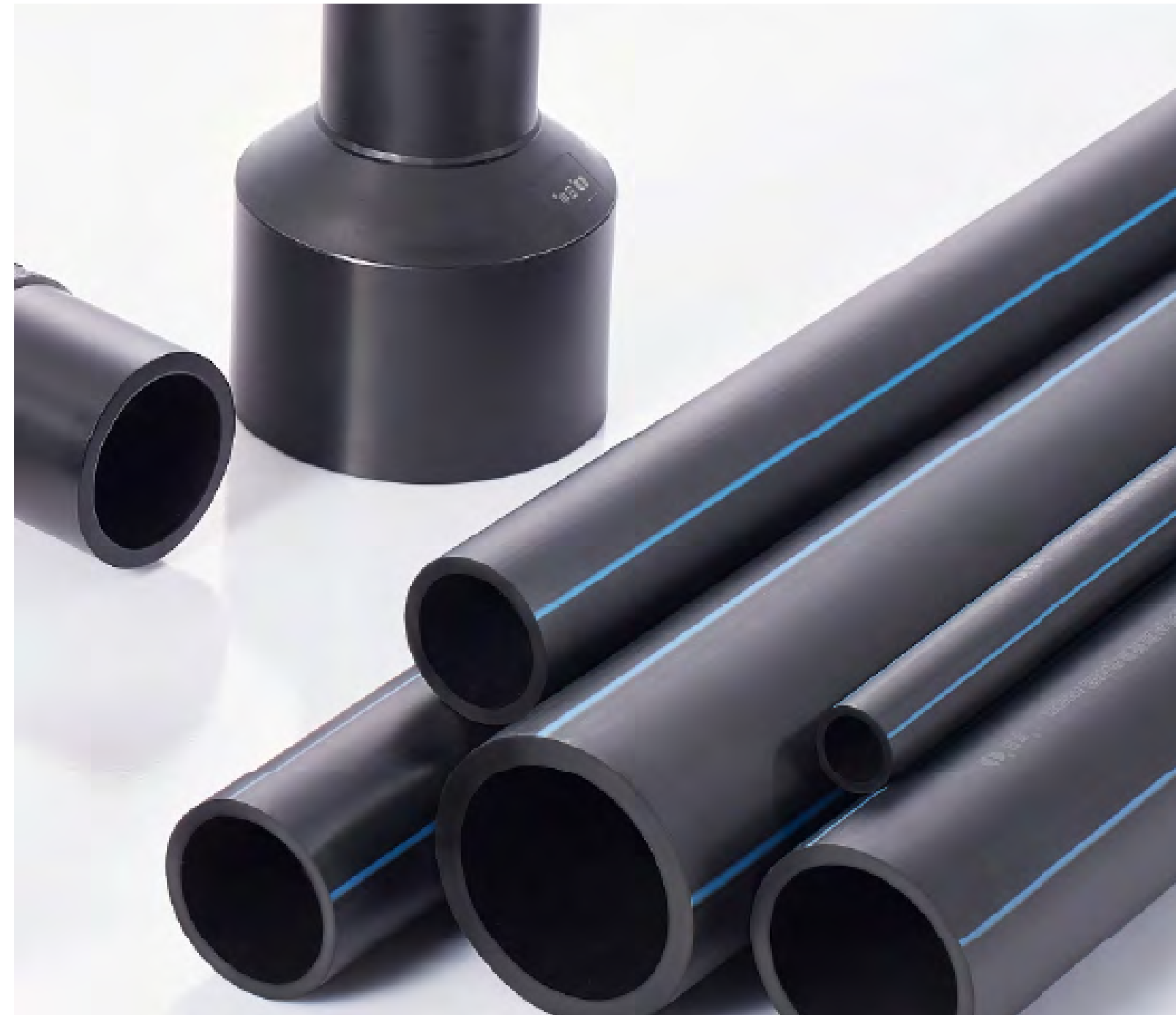




Municipal HDPE Pipeline System

RIFENG Catalog

CATALOGUE

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ABOUT RIFENG

RIFENG is a leading multinational corporation, providing one-stop piping solutions applied in residential, commercial, agricultural, industrial, and infrastructural sectors.

Established in 1996 Rifeng first introduced the most advanced piping technologies and facilities from Europe in the 1990s since then it has been pioneering China's plastic piping industry and has changed the customers' mindset of taking galvanized pipes for plumbing.

Rifeng is passionate to provide customers with more hygienic and secure piping products all the time.

Today Rifeng has largely increased its scale, and we have over 8,000 employees, 70 branches & subsidiaries, and 300,000 distributors, we have served customers in more than 100 countries and regions.

8,000

employees

300,000

distributors worldwide

100+

serving over 100
countries & regions

70

branches & subsidiaries

HONRARY CERTIFICATE

Rifeng has successively won national top brand honors such as "China Famous Brand", "China Famous Trademark", "CNAS National Laboratory", and "Intertek Satellite Laboratory Accreditation of

TianxiangGroup". It is the only brand in China to receive the four majorinternational certifications and ranks among the top in the plastic pipelineindustry with numerous brands.

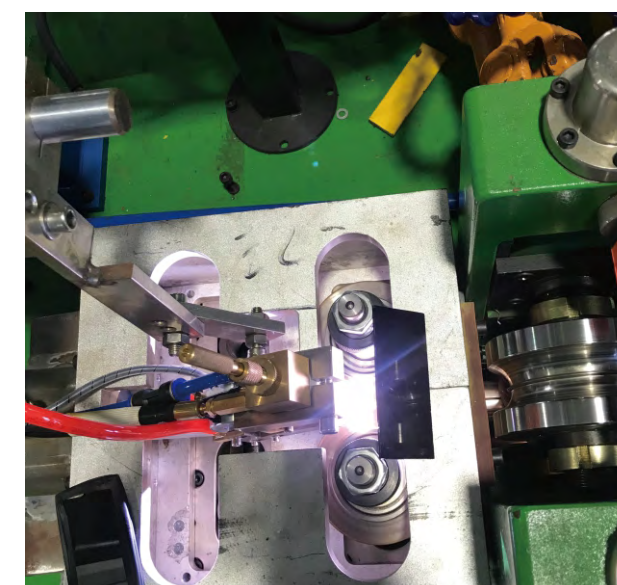
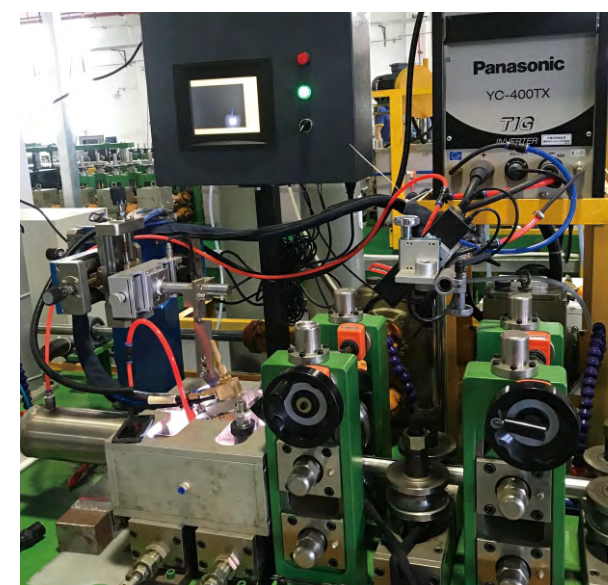


ENTERPRISE STRENGTH



Rifeng has multiple large-scale modern production bases in Foshan, Tianjin, Hubei and other places in China. In the field of pipelines, hundreds of plastic pipe production lines and thousands of various machining equipment are equipped, as well as internationally advanced product and raw material research and development testing equipment such as TA differential scanning calorimeter from the United States, Spike direct reading spectrometer from Germany, Leica microscope from Germany,

and high-pressure pressure burst testing machine from Denmark; In the field of sanitary-ware, Rifeng has established modern research and manufacturing centers for bathroom hardware, bathroom cabinets, shower rooms, ceramic sanitary ware, etc., equipped with advanced production lines at home and abroad, and bathroom production capacity is at the forefront of the domestic industry.



R&D TECHNOLOGY

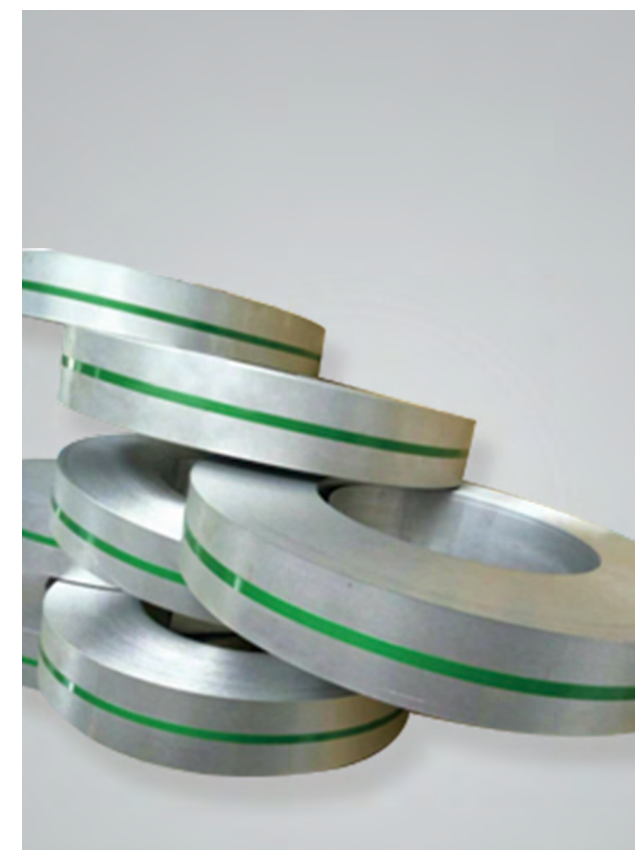
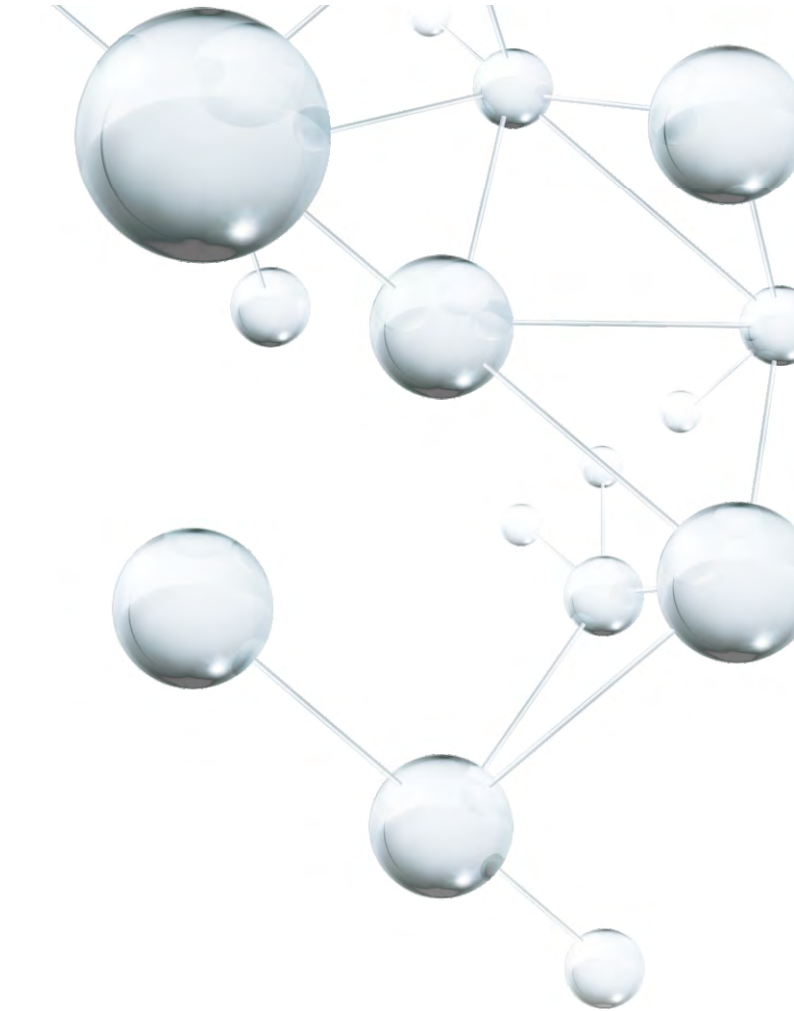


400 domestic and foreign patents

With leading international technological strength, Rifeng has obtained nearly 400 patents from China and overseas, and has been awarded multiple honorary titles such as "National Torch Plan Key High tech Enterprise", "National High tech Enterprise", and "China Innovation Design Red Star Award".

Lead and participate in the compilation of multiple national and industry standards

Rifeng has successively led and participated in the compilation of dozens of national and local technical standards and construction specifications, and has undertaken training tasks for pipeline design and construction teams in more than ten provinces and cities. We spare no effort to shoulder the responsibilities of industry leaders, promote industry development, and is highly praised by the industry.



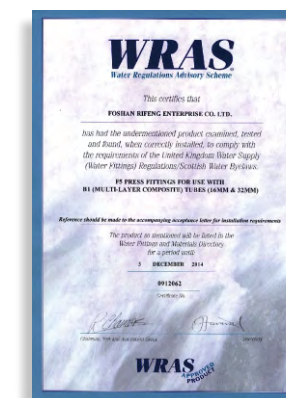
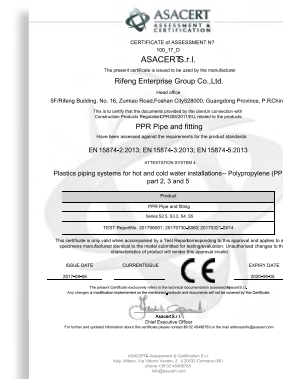
EXCELLENT QUALITY

Obtained multiple authoritative certifications

We have obtained ISO9001 quality management system certification from TUV Rheinland, Germany and ISO14001 environmental management system certification, and have passed more than 60 international authoritative certifications, including IAPMO and NSF from the United States, SKZ and DVGW from Germany, WRAS from the United Kingdom, CSTB from France, Watermark from Australia, etc. Our quality is trustworthy.

Bestselling in over 100 countries and regions

As of now, Rifeng sells hundreds of millions of meters of new pipelines every year, and its products are sold well in more than 100 countries and regions such as Europe and America, becoming the common choice of billions of households worldwide.



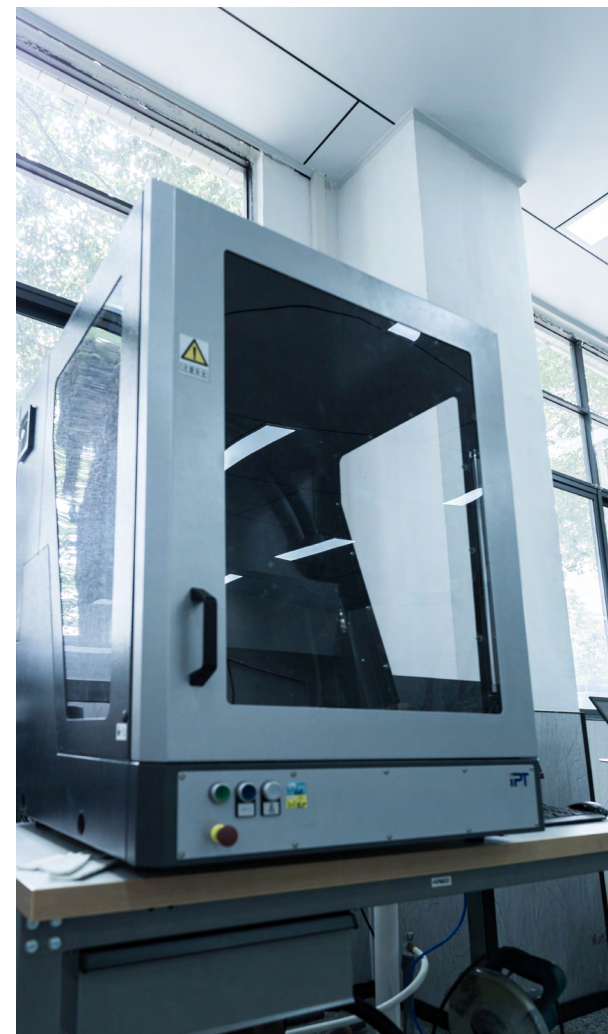
QUALITY CONTROL



Testing Machines

INSPECTION

Rifeng strictly implements the ISO9001 quality management system and has established a set of standardized quality inspection standards based on it. We have internationally advanced testing instruments and methods, a professional testing team, and strict testing according to national and regional testing standards to ensure that each batch of products meets the qualified standards.



BEST SERVICE



1 PRE-SALE

- Sales and engineers conduct thorough research and communication on user needs
- Understand user needs
- Provide free project application solution consulting services;
- Customer are the core of the targeted planning and development of pipeline system application solutions.

2 ON-SALE

- Provide free installation guidance and training;
- Provide on-site installation supervision when necessary;
- Provide strong logistics information distribution services;
- Provide 24 hours service consultation.

3 AFTER-SALES

- Establish project product system application image file
- Irregular follow-up service;
- 24-hour project emergency treatment service;
- 24 hours timely and effective complaint handling.



24 24-HOUR HOUR HOTLINE
800-8303820
400-1110211

INDUSTRY LAYOUT



PRODUCTION
BASE



PRODUCTION BASE IN FOSHAN



PRODUCTION BASE IN TIANJIN



PRODUCTION BASE IN CHONGQING



PRODUCTION BASE IN WEINAN



PRODUCTION BASE IN HUANGSHI



MUNICIPAL WATER SUPPLY PIPING SYSTEM

HDPE Water Supply Pipes and Fittings

Product Overview

Material:
PE100

Pressure Rating:
0.6MPa, 0.8MPa, 1.0MPa, 1.25MPa, 1.6MPa

Size:
All nominal sizes available from DN20 to DN1600
(Ref. Pipe Specification Tab)

Standard:
GB/T 13663

Colors:
Customized, default is black

Supply Form:
Customized, default DN20-63 packed by roll, and 50m or 100m for each roll; else, 5.8m or 11.8m for straight length.

Advantages

Non-toxic:
Reach food sanitation standards. No heavy metal additives and no secondary pollution during water transportation.

Corrosion Resistance:
High chemical stability, normally no chemical reaction will happen.

Easy to install:
light weight, easy to transport and using heat/electro socket/butt fusion.

High flow capacity:
smooth interior walls and low pressure loss

Excellent Flexibility:
No affected by foundation settlement, easy to change pipeline direction without fittings to avoid obstacles.

Excellent UV resistance:
Can be stored and used outdoor for long time

Long Service Life:
can work over 50 years under proper use.

Trench-less technology:
abrasion proof is 4 times over the normal metal pipe.

High impact and breakage resistance:
no damage by water hammer impact at 2.5 times of nominal pressure.

Low temperature resistance:
brittleness temperature is -70°C, and can be installed normally at 0°C.

Applications

- Municipal water supply
- Industrial material transportation
- Mineral and sand slurry
- Marine aquaculture industry
- Farming irrigation
- Commercial & Residential water supply
- Sewage treatment

Pipe Physical Properties			
Items	Property		Demand
1	Extension Rate at Break, %		≥350
2	Longitudinal Reversion (100°C), %		≤3
3	Oxidation Induction Time (210°C), min		≥20
4	Melt Mass-Flow Rate		The change rate of pipes and raw materials shall not exceed 25%
5	Static Hydraulic Pressure Test	20°C, 100h	PE100, 12.0Mpa; No crack or leakage
		80°C, 165h	PE100, 5.4Mpa; No crack or leakage
		80°C, 1000h	PE100, 5.0Mpa; No crack or leakage
Note: The static hydraulic pressure test at 80°C for 165 hours only considers brittle failure. If ductile failure occurs during the test time, select the lower ring stress according to the standard and retest according to the corresponding minimum failure time			

Fitting Physical Properties			
Items	Property		Demand
1	Oxidation induction time (200℃)		≥20min
2	Melt Mass-Flow Rate		The change rate of pipes and raw materials shall not exceed 25%
3	Welding strength of electro fusion fittings		The percentage of brittle failure is no more than 33.3%
4	Socket fittings - Welding strength of butt welded fittings		Destructive testing result is ductile failure
5	Tapping Saddle impact strength		No crack or leakage
6	Static Hydraulic Pressure Test	20℃, 100h	PE100, 12.0Mpa; No crack or leakage
		80℃, 165h	PE100, 5.4Mpa; No crack or leakage
		80℃, 1000h	PE100, 5.0Mpa; No crack or leakage
Note: The static hydraulic pressure test at 80℃ for 165 hours only considers brittle failure. If ductile failure occurs during the test time, select the lower ring stress according to the standard and retest according to the corresponding minimum failure time			

Product Specifications

Size chart of PE100 pipe

Unit: mm

	STANDARD SIZE RATIO								
	AVERAGE DIAMETER Demand		SDR26	SDR21	SDR17	SDR13.6	SDR11	SDR9	
DN	MINMUM	MINMUM	NOMINAL PRESSURE						MAXIMUM UNROUNDNESS
			PN0.6	PN0.8	PN1.0	PN1.25	PN1.6	PN2.0	
			WALL THICKNESS	WALL THICKNESS	WALL THICKNESS	WALL THICKNESS	WALL THICKNESS	WALL THICKNESS	
20	20	20.3	-	-	-	-	2.3	2.3	1.2
25	25	25.3	-	-	-	2.3	2.3	3.0	1.2
32	32	32.3	-	-	2.3	2.4	3.0	3.6	1.3
40	40	40.4	-	2.3	2.4	3.0	3.7	4.5	1.4
50	50	50.4	2.3	2.4	3.0	3.7	4.6	5.6	1.4
63	63	63.4	2.5	3.0	3.8	4.7	5.8	7.1	1.5
75	75	75.5	2.9	3.6	4.5	5.6	6.8	8.4	1.6
90	90	90.6	3.5	4.3	5.4	6.7	8.2	10.1	1.8
110	110	110.7	4.2	5.3	6.6	8.1	10.0	12.3	2.2
125	125	125.8	4.8	6.0	7.4	9.2	11.4	14.0	2.5
140	140	140.9	5.4	6.7	8.3	10.3	12.7	15.7	2.8
160	160	161.0	6.2	7.7	9.5	11.8	14.6	17.9	3.2
180	180	181.1	6.9	8.6	10.7	13.3	16.4	20.1	3.5
200	200	201.2	7.7	9.6	11.9	14.7	18.2	22.4	4.0
225	225	226.4	8.6	10.8	13.4	16.6	20.5	25.2	4.5
250	250	251.5	9.6	11.9	14.8	18.4	22.7	27.9	5.0
280	280	281.7	10.7	13.4	16.6	20.6	25.4	31.3	9.8
315	315	316.9	12.1	15.0	18.7	23.2	28.6	35.2	11.1
355	355	357.2	13.6	16.9	21.1	26.1	32.2	39.7	12.5
400	400	402.4	15.3	19.1	23.7	29.4	36.3	44.7	14.0
450	450	452.7	17.2	21.5	26.7	33.1	40.9	50.3	15.6
500	500	503.0	19.1	23.9	29.7	36.8	45.4	55.8	17.5
560	560	563.4	21.4	26.7	33.2	41.2	50.8	62.5	19.6
630	630	633.8	24.1	30.0	37.4	46.3	57.2	70.3	22.1
710	710	714.0	27.2	33.9	42.1	52.2	64.5	-	-
800	800	804.2	30.6	38.1	47.4	58.8	72.6	-	-
900	900	908.1	34.4	42.9	53.3	66.2	81.7	-	-
1000	1000	1009.0	38.2	47.7	59.3	72.5	90.2	-	-
1200	1200	1210.8	45.9	57.2	67.9	88.2	-	-	-

Polyethylene Pipes Classification

Indication of material with signs and design tension.

Pipe Class	Minimum Required Strength(MRS)	Design Pressure MPA
HDPE	10,0	8,0
LDPE	3,2	2,5

Note: The design tension, the design coefficient are derived from MRS when C=1,25.

Specifications	HDPE	LDPE
Melt Flow Index (g/10min) 190°C-2,16 kg.	0,07	0,4
Density g/cm3	0,95	0,920
Thermal Resitance min.	>60	>40
Tensile Strain at Break %	≥600	≥600
Tensile Stress at Yield	>20	>10
Modulus of Elasticity, Mpa	950	500

Q = MRS/C
C: Safety factor (1,25)
MRS : Minimum required strength

Polyethylene Pipes Classification

SDR = D / S

D = Outer Diameter
S = Wall thickness
SDR = Standard dimension ratio

Sb = Q / PN = (SDR - 1) / 2

Q = Pipe Strength
PN = Nominal Pressure
Sb = Pipe Classification

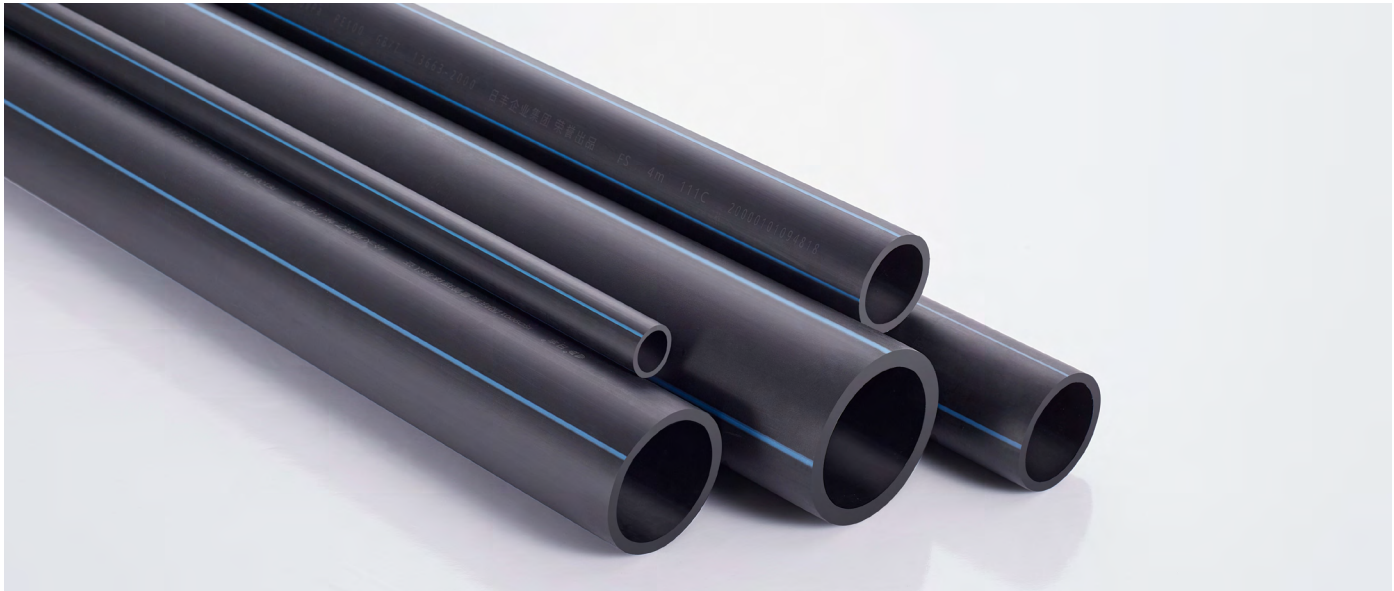
Sb = Q / PN = (20 * Q) / (SDR - 1)

SR = EI / r³m

SR = Relative stiffness
E = Modulus of Elasticity
I = Geometrical moment of inertia
r_m = Average radius

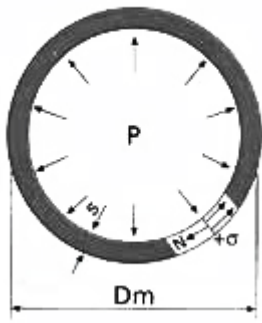
From the formula for drinking water pipes

SR = (2E / (3(SDR - 1)³)) = 0,66 (E / (SDR - 1)³)



Theoretical Calculations

Calculation of Wall Thickness of Pipe



$$N = \frac{pD_m}{2}$$

D :Mean diamete r
p :Inner pressure
N :tension

$$D_m = \frac{D+d}{2} = D-s$$

Stress on pipe walls

$$\sigma = \frac{pD_m}{2s}$$

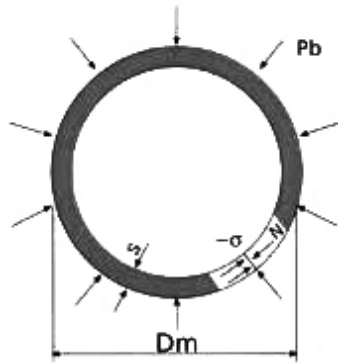
Wall thickness
$$s = \frac{pD_m}{2\sigma}$$

Since PE pipes are referred with outer diameters in international standards they are obtained by replacing Dm with the formula

$$s = \frac{pD}{2\sigma + p}$$

and used in the pipe wall thickness calculation.

External Hydrostatic Pressure



In case of external hydro-static pressure

$$N = \frac{P_b D_m}{2}$$

Load occurs. And the resulting compression stress;

$$\sigma = \frac{P_b D_m}{2}$$

Under the external pressure, pipes should also be inspected in case of buckling.

$$\sigma_b = \frac{2E}{1+\nu^2} \left[\frac{s}{D_m} \right]^2$$

The pressure that forms the stress in the formula,

$$\sigma_b = \frac{2E}{1+\nu^2} \left[\frac{s}{D_m} \right]^2$$

i.e.
E: Elasticity Module
u: Poisson's ratio
s: Wall thickness
Dm: Mean diameter

Water Hammer

The velocity change of the flow in pipe will create pressure fluctuation. Velocity change on the pressure.

$$\Delta p = c \frac{\Delta v}{g}$$

D: Inner Diameter
K: Bulk modulus of the pipe wall
Δv: The velocity change
Δp: The pressure change
c: Speed of sound in the water

Pressure in case of suppression
Hmax = Hs + Δp
Pressure in case of depression
Hmin = Hs - Δp
In order to calculate C

$$c = \sqrt{\frac{9900}{48,3 + K \frac{D}{s}}}$$

In the other water hammer calculation methods, the sound velocity in the water

$$c = \sqrt{\frac{E_p g / \gamma}{\frac{E_p}{E_w} + \frac{D_m}{s}}}$$

Ew: Modulus of Elasticity of the water
Ep: Modulus of Elasticity of the pipe material
γ: Specific gravity of the water
Dm: Mean diameter
s: Wall thickness
g: Acceleration of gravity (9,81 m/s2)
u: Poisson's ratio

Ep : For buried pipes
$$\frac{E_p}{\nu^2}$$

In addition, since
$$\frac{E_p}{E_w} \ll \frac{D_m}{s}$$

$$\frac{E_p}{E_w}$$
 can be neglected. In this case, the formula is as follows.

$$c = \sqrt{\frac{E_p g / \gamma * s}{1 - \nu^2 D_m}}$$

Thermal Expansion - Linear

When installing HDPE (PE-80, PE-100) pipes, the elongation rate due to the temperature variability must be taken into consideration. If the temperature rises there will be a longitudinal elongation and a decrease in the temperature. There will be an elongation or shortening of 0,18mm for each K amount of heat exchange (1 K=1 °C) at 1 m. of PE pipe.

$$\Delta L = L * \Delta T * \delta$$

$$(\Delta L = m * K . mm / m . K)$$

Elongation Coefficient for Plastic Materials

Material	Coefficient mm/mK
HDPE	0.18
PP	0.15
PVDF	0.14
PB	0.12
PVC	0.07
GFK	0.02

For example, in case of an elongation or shortening of the length due to the heat in a line made with PE pipe, the pipe will slip from its turning point and not from its fixed point. For a 15m pipe, if the normal operating temperature is Tv=20°C, the maximum operating temperature is T1=70°C and the minimum operating temperature is T2=5°C Accordingly, temperature dependent length changes are calculated as follows:

Elongation due to heat rise:
ΔL=L. ΔT1.d = 15x50x0,18=135 mm.

Elongation due to heat drop:
-ΔL=L. ΔT2.d = 15x15x0,18=40,5 mm.

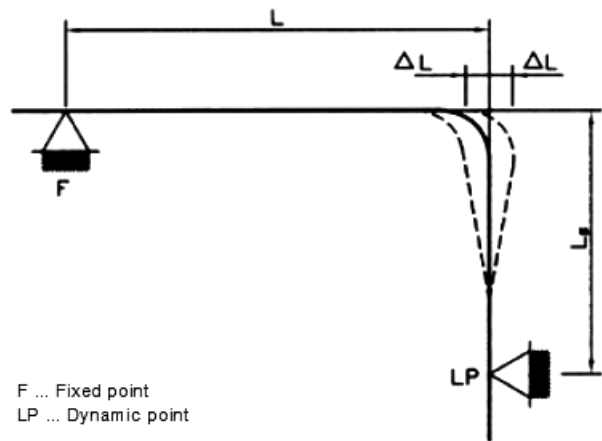
$$L_s = k * \sqrt{d * \Delta L}$$

Ls: Fixing distance (mm.)
d: Pipe outer diameter (mm.)
k: Factor for HDPE 26, for PP 30, for PVC 33,5

For a PE pipe with a diameter of Ø50 mm.
AL= 135 mm. and the factor is 26 Clip distance

$$L_s = 26 . \sqrt{50 . 135} = 2136.12 \text{ mm.}$$





Expansion areas

Flexibility

$$R = \frac{E * D_m}{2 * \sigma}$$

Maximum bending radius for PE pipes:

R: Bending radius (mm)

Dm: Mean diameter of pipe (mm)

E: Pipe modulus of Elasticity (N/mm²)

σ: Stress (N/mm²)

PE Class	environmental stress N/mm ²
PE 63	5
PE 80	6.3
HDPE	8

For the acceptable small bending radius, it should not be smaller than the values given in the following table

Acceptable minimum bending radius			
Pipe Raw Material	Operating temperature	SDR 17	SDR 11
PE 80 or PE100	20°C	30 x da	20 x da
-	10°C	50 x da	35 x da
-	0°C	75 x da	50 x da

The probability of the fracture is critical when calculating the bending diameter for thin wall pipes.

When calculating the acceptable bending radius for thin wall pipes (considering fracture) the following formula is used.

$$RK = \frac{rm^2}{0.28.s} \text{ (mm)}$$

rm: Mean radius of pipe (mm)

s: Wall thickness (mm)

When calculating the acceptable bending radius in thick wall pipes (considering stress-shrinkage) the following formula is used.

$$R = \frac{ra.100}{E} \text{ (mm)}$$

ra: Pipe outer radius (mm.)

E: Stress-shrinkage (mm)

* Stress-shrinkage ratio should not exceed 2,5%

Bending Radius of PE pipes comparing to SDR

Pipe Type	SDR	Acceptable Bending Radius R D= Pipe Outer Diameter
1	41	50 d
2	33	40 d
3	26	30 d
4	17.6	20 d
5	11	20 d
6	7.4	20 d

For acceptable bending radius at operating temperatures below 0°C, t should be added 2,5 to the values specified in the table above.

At operating temperatures between 0° and 20°C, the acceptable bending radius is determined by interpolation (ratio) method.

Buckling (Slump) Calculation in case of Negative Pressure in Buried Pipes

In case of negative pressure the buckling control of buried pipes is carried out according to ATV127. This calculation is performed in the following order.

Soil Properties

Acceptable small bending radius			Dpr dependent E-values at compression grade Mpa					
Group	Density kN/m ³	Inner friction angle σ	85	90	92	95	97	100
G1	20	35	2	6	9	16	23	40
G2	20	30	1.2	3	4	8	11	20
G3	20	25	0.8	2	3	5	8	13
G4	20	20	0.8	1.5	2	4	6	10

Soil elasticity modulus according to the compaction proctor index Dpr.

$$E = \frac{2,74.10^{-7}}{G} e^{0,188Dpr}$$

Soil Load Calculation

$$P_E = X * \gamma_B h$$

x : load cycling factor

γ_B : Soil specific gravity

h : Filling height

$$x = \frac{1 - e^{-2 \frac{h}{b} K_1 \tan \delta}}{2 \frac{h}{b} K_1 \tan \delta}$$

If the trench is bevelled

$$x_\beta = 1 - \frac{\beta}{90} + x \frac{\beta}{90}$$

β: Slope angle

K₁: 0,5

δ:S : 2/3Ø

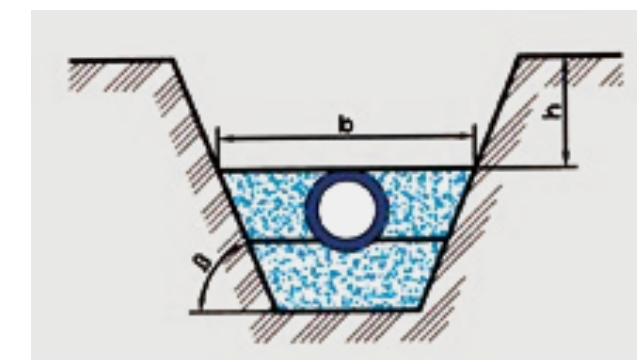
Soil classification according to ATV 127

Group 1: Non-cohesive soil (sand, gravel)

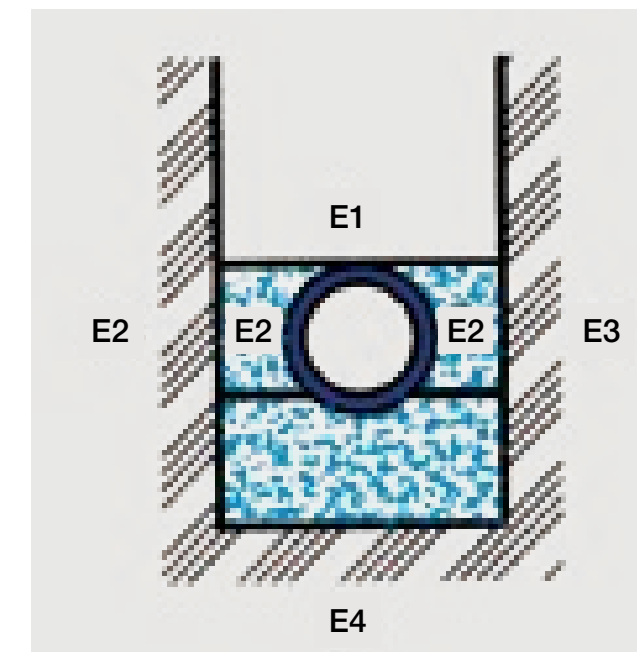
Group 2: Slightly cohesive soil (non-uniform sand and gravel)

Group 3: Cohesive mixed soil (stone flour, shredded rock, clay sand)

Group 4: Cohesive, clay soil



Slope Trench



Vertical Trench

Calculation of Buckling Safety Factor

The buckling safety factor is calculated by the following formula and must be greater than 2 (safety factor due to the slump)

$$\gamma = \frac{1}{\frac{q_v}{q_{vkrit}} + \frac{P_a}{P_{akrit}}}$$

q_v : Vertical Earth Load (MPa)
 q_{vkrit} : Critical vertical earth load (MPa)
 P_a : External pressure (MPa)
 P_{akrit} : Critical external pressure (MPa)

there is external water in the P_a soil the pressure of it is added to the vacuum pressure that will occur in the sudden discharge. That is, the vacuum pressure is taken as the externally applied pressure. The following sequence is used to calculate the variables in this formula.

Critical q_v calculation

Horizontal bedding stiffness S_{Bh}

$$\Delta f = \frac{\frac{b}{d_a} - 1}{1,154 + 0,444 \left(\frac{b}{d_a} - 1 \right)} \leq 1,44$$

$$\xi = \frac{1.44}{\Delta f + (1.44 * \Delta f) \frac{E_2}{E_3}}$$

$$S_{Bh} = 0.6 * \xi * E_2$$

$$q_{vkrit} = 2\sqrt{S_R * S_{Bh}}$$

S_R : Relative stiffness (MPa)
 S_{Bh} : Vertical bedding stiffness (MPa)

Calculation of vertical soil stress q_v

The following steps are used to calculate the vertical soil stress

$$a' = \frac{E_1}{E_2} > 0.25$$

if $a' < 0,251$ then $a' = 0,251$

$$\max \lambda = 1 + \frac{\frac{h}{d_a}}{\frac{3.5}{a'} + \frac{2.2}{\frac{E_4}{E_1}(a' - 0.25)} + \left(\frac{0.62}{a'} + \frac{1.6}{\frac{E_4}{E_1}(a' - 0.25)} \right) * \frac{h}{d_a}}$$

$$\lambda_R = \frac{\max \lambda * V_s + a' * \frac{4K_2 * \max \lambda - 1}{3}}{V_s + a' * \frac{3 + K_2 * \max \lambda - 1}{3}} \leq 4$$

$$1 \leq b/d_a \leq 4$$

$$\lambda_{RG} = \frac{\lambda_R - 1}{3} * \frac{b}{d_a} + \frac{4 - \lambda_R}{3}$$

$$4 \leq b/d_a \leq \infty$$

$$\lambda_{RG} = \lambda_R = \text{Constant}$$

$$q_v = \lambda_{RG} * P_E$$

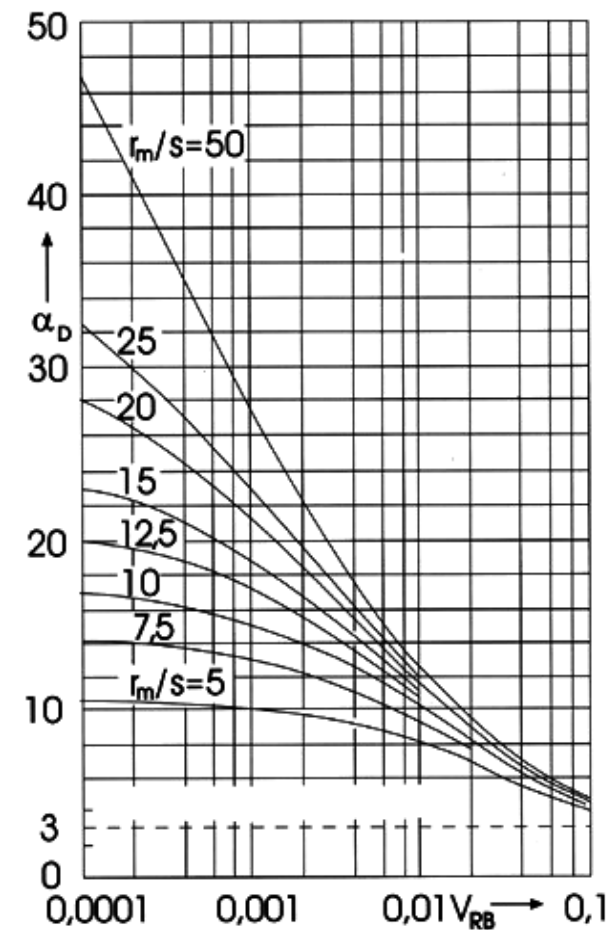


Critical P_a calculation

$$P_{a,crit} = \alpha_D * S_R$$

α_D It is determined from below chart.
 α_D should be calculated VRB. S_R is the relative stiffness.

$$V_{RB} = \frac{S_R}{S_{Bh}}$$



Calculation of S_r Relative Stiffness

The relative stiffness in the pressure lines depends on the mean radius, the wall thickness and the modulus of elasticity of the material.

$$S_R = \frac{EI}{r_m^3}$$

E : Pipe modulus of Elasticity (Pa)
 I : The moment of inertia of the pipe section (m⁴/m)
 r_m : Mean radius (m)
 S_R : Relative stiffness (Pa)

The moment of inertia of the pipe section is

$$I_p = \frac{S^3}{12}$$

S : Pipe wall thickness (m.)
 r_m : Mean radius

$$r_m = \frac{r_o + r_i}{2}$$

r_i : Inner radius (m)
 r_o : Outer radius (m)



Hydraulic Calculation Principles

Roughness Coefficients

William - Hazzen: 149
Colebrooke - White: 0,02 mm.
Darcy - Weissbach: 0,02 mm.

Colebrooke-White Formula

Here $\frac{1}{\sqrt{\lambda}} \approx -2 \log \left[\frac{2,51}{Re \sqrt{\lambda}} + \frac{k/D_i}{3,72} \right]$ $Re = \frac{v \cdot D_i}{\nu}$

λ : Roughness coefficients
Re: Reynolds number
k : Roughness (m.)
Di : Inner Diameter
v : Velocity (m/s)
 ν : Kinematic viscosity for 20°C water 1x106 (m2/s)

$Q = V \cdot A$

Q : Flow rate (lt/s)
V : Flow Velocity
A : Cross Section (mm2)

William - Hazzen Formula

$v = 0,85 \cdot C R^{0,63} J^{0,54}$
 $Q = 0,278748 \cdot C D^{2,63} J^{0,54}$

Here
v : Velocity (m/s)
Q : Flow rate (m3/s)
C : William - Hazzen coeffic ient
R : Hydraulic radius (equal to D/4) (m.)
J :Hydraulic slope (m/m)

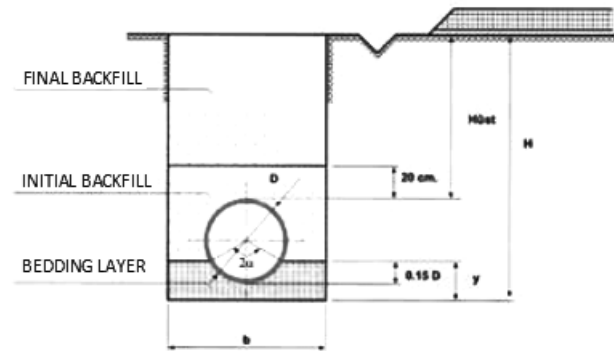
Darcy - Weisbach Formula

$J = \lambda \cdot \frac{L}{D_i} \cdot \frac{v^2}{2g}$

Here
J Hydraulic loss
 λ : Roughness coefficient
Di : Inner Diameter (m)
v : Velocity (m/s)
g : Acceleration of gravity (9,81 m/s2)

PE100 Pipes Laying Section

Notes:
1-FINAL BACKFILL: Compressed normal filler,
2-INITIAL BACKFILL: Compressed soil filler free of harmful substances such as stone,
3-BEDDING LAYER: (Compressed sand)
b: Trench width (cm)
y: Bedding layer (cm)
H: Trench depth
Htop: Distance between the ground to the top of the pipe (cm) (should be min. 50cm)
D: Pipe outer diameter (cm.)
2a: Bedding angle in terms of degree
If D<600 mm then y= 20 cm. b= D+2x20 cm.
If 600 mm.<D<1000 mm. y= 20 cm. b= D+2x30
D>1000 mm. then y= 30 cm. b= 2+2x30 cm.



Transportation and storage of HDPE pipes



Precautions for HDPE pipeline storage:
Environmental requirements: HDPE pipes should be stored in a well ventilated and suitable temperature environment. The temperature should be controlled between -5°C and 40°C, avoiding direct sunlight and soaking in rainwater. If temporary storage is required outdoors, it should be covered to prevent exposure to sunlight and rain.

Stacking method: Pipelines should be placed flat on a flat surface, and the stacking height should generally not exceed 1.5 meters. For porous or coiled tubes, they can be placed flat but should avoid heavy pressure or squeezing. If bricks or other objects are used to block the rolling of pipes, it can effectively prevent them from rolling.

Avoid impact and compression: During transportation and stacking, pipes should be protected from severe impact and compression. Pipelines cannot be dragged directly on the ground to prevent wear and deformation.

Classified storage: Pipes of different diameters and wall thicknesses should be stacked separately for easy management and use.

Storage period: The storage period of pipelines generally does not exceed 2 years, calculated from the date of production. Clear no fire signs should be placed in the storage area and kept away from heat sources and harmful substances.

Precautions for HDPE pipeline transportation:
Proper fixation: During transportation, ensure that the pipeline is properly secured to prevent rolling. There should be appropriate gaps between pipelines to prevent them from sliding.

Avoid direct sunlight: HDPE pipes should be kept away from direct sunlight to prevent damage caused by rising temperatures. During high temperatures in



summer, measures should be taken to prevent pipeline exposure to sunlight and maintain air circulation between pipes.

Handle with care: During transportation and loading/unloading, handle with care to avoid severe impact and throwing. The contact between the cable and the pipeline should be isolated and protected by soft materials.

Prevent heavy pressure and mechanical damage: During transportation, pipelines should be protected from being crushed by heavy objects or mechanical damage. When stacking pipelines, their height should not exceed 2 meters, and they should be fixed to the transport vehicle with flexible straps or ropes to prevent rolling and collision.

Avoid high and low temperature environments: HDPE pipes should be transported and constructed in high and low temperatures, direct sunlight, and rainy and snowy weather. The maximum operating temperature is 45 degrees Celsius, and protective measures should also be taken during low temperatures in winter.

Waterproof measures: During storage, strict waterproof measures should be taken to prevent the pipeline from getting damp. The socket should be kept clean to prevent moisture from entering the interior of the pipeline.

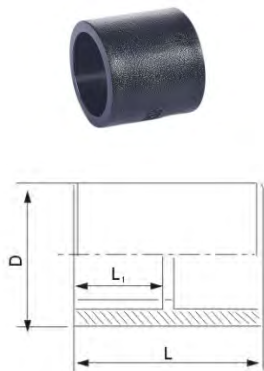
Avoid contact with chemicals: HDPE pipes must not come into contact with other chemicals such as oil, acid, alkali, etc. to prevent corrosion and damage.

Use appropriate transportation tools: The transportation tools should be flat and free of sharp objects to prevent damage to the pipelines. When stacking pipes of different diameters, large and heavy ones should be placed at the bottom and light ones at the top, and blocked with wooden wedges or boards.

Fitting Product List

Socket FusionJoint Fittings

Straight coupling (Soc x Soc)



Description CN	SDR	D	L	L1
F23-DN110(Black)	SDR11	130	83	37
F23-DN20(Black)	SDR11	26	37	14.5
F23-DN25(Black)	SDR11	31.6	39	18
F23-DN32(Black)	SDR11	39.4	44.5	20
F23-DN40(Black)	SDR11	49	48	22
F23-DN50(Black)	SDR11	60.5	54	25
F23-DN63(Black)	SDR11	76	62	28
F23-DN75(Black)	SDR11	89	66	30
F23-DN90(Black)	SDR11	106.5	72	33

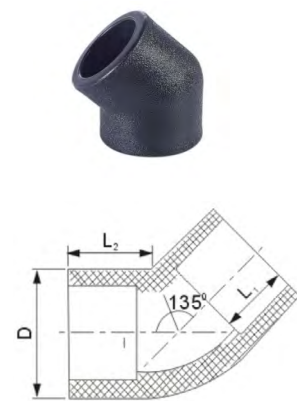
Reducer (Soc x Soc)



Description CN	SDR	D	d	L	L1	L2
F23-DN25X20(Black)	SDR11	32	27.3	36.47	18.1	15.11
F23-DN32X20(Black)	SDR11	39.4	26	41	20	14.5
F23-DN32X25(Black)	SDR11	40	32.1	41.4	21.3	16.1
F23-DN40X20(Black)	SDR11	49.5	27.5	48.8	22.2	15.6
F23-DN40X25(Black)	SDR11	49.86	32.06	52.9	22.8	17.7
F23-DN40X32(Black)	SDR11	51.8	41.9	49.7	21.83	19.7
F23-DN50X20(Black)	SDR11	61.75	25.1	64.3	25.6	15.62
F23-DN50X25(Black)	SDR11	61	31.4	62.68	25.9	17.51
F23-DN50X32(Black)	SDR11	60.95	40	58	25.5	19.8
F23-DN50X40(Black)	SDR11	61.8	49.6	56.3	26.2	21.5
F23-DN63X20(Black)	SDR11	77.3	26.95	70	29.5	15.95
F23-DN63X25(Black)	SDR11	76.5	32	72.5	27.5	18
F23-DN63X32(Black)	SDR11	77.3	40.5	72.3	29.5	19.73
F23-DN63X40(Black)	SDR11	77.4	49.7	69.5	29.4	22.3
F23-DN63X50(Black)	SDR11	76.5	60.5	63	27.5	25
F23-DN75X32(Black)	SDR11	91.63	48.17	74	30.86	18.3
F23-DN75X40(Black)	SDR11	91.56	50.33	67.6	30.5	20.51
F23-DN75X50(Black)	SDR11	91	61.4	68	30.5	23.5
F23-DN75X63(Black)	SDR11	88.32	75.45	68.9	30.12	27.3
F23-DN90X40(Black)	SDR11	108.6	50.5	80	34.8	20.65
F23-DN90X50(Black)	SDR11	108	62	78	33.56	23.56
F23-DN90X63(Black)	SDR11	108.3	77.2	77.5	33.4	29.9
F23-DN90X75(Black)	SDR11	109.1	91.2	73.9	33.6	30.1
F23-DN110X40(Black)	SDR11	132	49.31	94.5	37.69	24
F23-DN110X50(Black)	SDR11	134	62.17	92	37.8	24.23
F23-DN110X63(Black)	SDR11	132.26	77.59	104	39.17	29.73
F23-DN110X75(Black)	SDR11	134.5	93.4	87	38.5	30.3
F23-DN110X90(Black)	SDR11	132.6	109.15	83.9	38.13	33.3

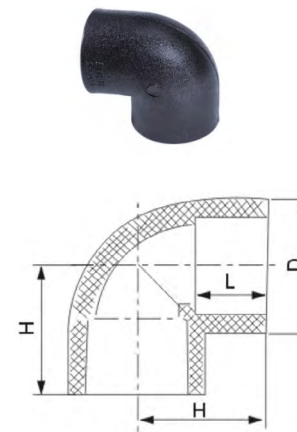
Socket Fusion Joint Fitting

Equal Elbow 45° (Soc x Soc)



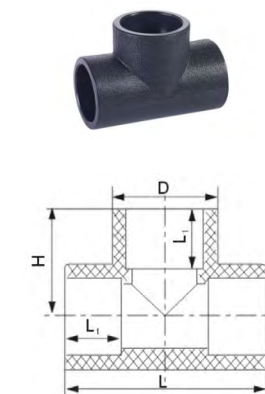
Description CN	SDR	D	L1	L2
F23-DN110X45°(Black)	SDR11	133.3	37.15	38.96
F23-DN20X45°(Black)	SDR11	27.69	16	17.5
F23-DN25X45°(Black)	SDR11	33.9	17.9	22
F23-DN32X45°(Black)	SDR11	42	20.12	21.49
F23-DN40X45°(Black)	SDR11	53	22	23.8
F23-DN50X45°(Black)	SDR11	66.57	25	26
F23-DN63X45°(Black)	SDR11	83.51	29.15	25.8
F23-DN75X45°(Black)	SDR11	98	32.44	27
F23-DN90X45°(Black)	SDR11	117.84	35.8	29.6

Equal Elbow 90° (Soc X Soc)



Description CN	SDR	D	H	L
F23-DN110X90°(Black)	SDR11	129.5	102	37
F23-DN20X90°(Black)	SDR11	26	26	15
F23-DN25X90°(Black)	SDR11	31.6	31	18
F23-DN32X90°(Black)	SDR11	39.4	41	20
F23-DN40X90°(Black)	SDR11	50	45	22
F23-DN50X90°(Black)	SDR11	60.5	55.75	25
F23-DN63X90°(Black)	SDR11	76.5	63.7	28
F23-DN75X90°(Black)	SDR11	89	75	30
F23-DN90X90°(Black)	SDR11	107	86	33

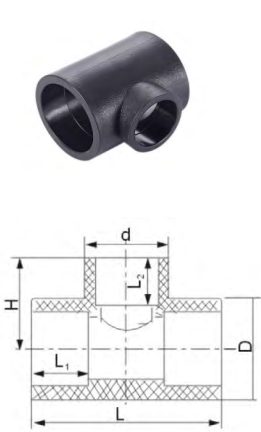
Equal Tee (Soc X Soc)



Description CN	SDR	D	L	L1	H
F23-DN110(Black)	SDR11	137.1	190.85	37.16	94.82
F23-DN20(Black)	SDR11	26	58	15	29
F23-DN25(Black)	SDR11	31.6	66	18	33
F23-DN32(Black)	SDR11	40.26	80.7	20	40.7
F23-DN40(Black)	SDR11	48.65	94.59	22.1	46.51
F23-DN50(Black)	SDR11	60.7	115.5	25	57
F23-DN63(Black)	SDR11	76.5	137	27	67.75
F23-DN75(Black)	SDR11	92.47	141.62	29.94	70.55
F23-DN90(Black)	SDR11	111.3	164.74	33.4	81.9

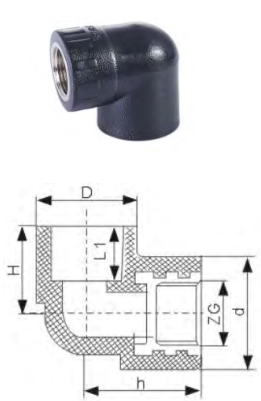
Socket Fusion Joint Fitting

Reducing tee (Soc x Soc x Soc)



Description CN	SDR	D	d	L	L1	L2	H	H
F23-DN110X40X110(Black)	SDR11	135	50	123	37	21	77	29.3
F23-DN110X50X110(Black)	SDR11	135	63.35	134.37	37.7	24.26	80	36.66
F23-DN110X63X110(Black)	SDR11	135.15	80.27	158.65	39.6	29.13	97	39.82
F23-DN110X75X110(Black)	SDR11	135	92	157	37	30	98	35.45
F23-DN110X90X110(Black)	SDR11	133.8	110.5	172.3	38.21	33.46	76.63	37.31
F23-DN25X20X25(Black)	SDR11	31.8	27.34	58.42	17.3	15.74	29.3	40.2
F23-DN32X20X32(Black)	SDR11	40	25	67.14	20.23	16.3	36.66	40.76
F23-DN32X25X32(Black)	SDR11	40	32	73.6	20	18	39	42.48
F23-DN40X20X40(Black)	SDR11	50.85	25	70.3	22.1	15.93	35.45	44.45
F23-DN40X25X40(Black)	SDR11	50	31	77.7	21.7	17.8	37.31	52
F23-DN40X32X40(Black)	SDR11	49.9	40.7	84.9	21.8	20	40.2	56
F23-DN50X20X50(Black)	SDR11	62.43	27.64	76.35	25.2	16.33	40.76	57.35
F23-DN50X25X50(Black)	SDR11	60.5	31.6	85	25	20	49	50.8
F23-DN50X32X50(Black)	SDR11	62.3	40.9	90	25.1	19.9	44.45	52.8
F23-DN50X40X50(Black)	SDR11	61.7	50.8	99	25	22.3	52	56.6
F23-DN63X20X63(Black)	SDR11	77.5	27	84	29	17	56	49.74
F23-DN63X25X63(Black)	SDR11	76.5	31.6	89.2	27.5	18	56.75	49.96
F23-DN63X32X63(Black)	SDR11	76.5	39.4	97	27.5	20	58.75	53.88
F23-DN63X40X63(Black)	SDR11	78.2	51.7	108.1	29	21.85	52.8	57.06
F23-DN63X50X63(Black)	SDR11	76.5	60.5	117	27.5	25	67.75	56.6
F23-DN75X32X75(Black)	SDR11	91.5	41	99.5	29.8	18.5	49.74	60.08
F23-DN75X40X75(Black)	SDR11	91.5	51.44	107.7	29.4	20.8	49.96	62.4
F23-DN75X50X75(Black)	SDR11	90.9	62.3	116.9	29	25.2	53.88	56.37
F23-DN75X63X75(Black)	SDR11	91.5	78.5	130.4	29.3	27.7	57.06	77
F23-DN90X40X90(Black)	SDR11	110.2	51.5	115.5	34.6	21.5	56.6	66.3
F23-DN90X50X90(Black)	SDR11	111	62.7	125.8	33.6	24.6	60.08	107.34
F23-DN90X63X90(Black)	SDR11	107	76.5	147	33	27	83	98
F23-DN90X75X90(Black)	SDR11	110.3	51.43	115.7	33.66	21.67	56.37	76.63

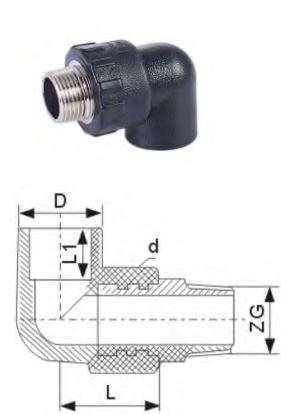
Female Thread Elbow (Soc xFipt with Metal Insert)



Description CN	SDR	D	d	H	h	L1
F23-DN20X1/2F(Black)	SDR11	27.87	35.8	26.67	31.4	15.4
F23-DN25X1/2F(Black)	SDR11	33.4	39.31	29.5	33.76	18.12
F23-DN25X3/4F(Black)	SDR11	33.89	44.14	27.5	39.87	18.15
F23-DN32X1/2F(Black)	SDR11	41.3	41.25	32	33.92	19.9
F23-DN32X1F(Black)	SDR11	42.6	55.4	34.67	38.45	20.5
F23-DN32X3/4F(Black)	SDR11	42.3	44	37.86	35.54	19.3
F23-DN63X2F(Black)	SDR11	78	87.45	56.13	58	30

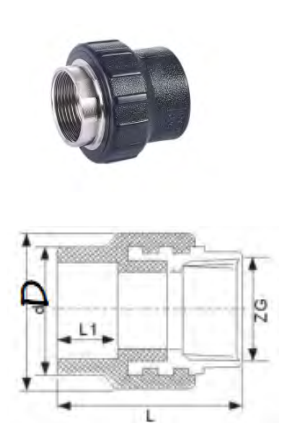
Socket Fusion Joint Fitting

Male Thread Elbow (Soc x Mipt with Metal insert)



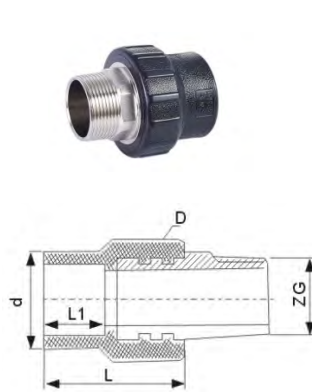
Description CN	SDR	D	d	L	L1
F23-DN20X1/2M(Black)	SDR11	27.76	35.34	34.88	15.52
F23-DN25X1/2M(Black)	SDR11	33.21	39.07	41.14	18.2
F23-DN25X3/4M(Black)	SDR11	33.48	44.1	34.8	18.3
F23-DN32X1M(Black)	SDR11	42.4	56.4	44.2	20.23
F23-DN32X3/4M(Black)	SDR11	42.75	43.9	42.18	19.81

Female Thread Adapter (Soc X Fipt with Metal Insert)



Description CN	SDR	D	L	L1	H
F23-DN20X1/2F(Black)	SDR11	29.5	26.8	40	16
F23-DN20X3/4F(Black)	SDR11	36.8	27.7	41.4	18.3
F23-DN25X1/2F(Black)	SDR11	40	33.3	41.5	18
F23-DN25X3/4F(Black)	SDR11	42.3	33.4	44.5	19.9
F23-DN32X1/2F(Black)	SDR11	45.6	41.3	44.86	20.27
F23-DN32X1F(Black)	SDR11	56.6	42	56.8	20
F23-DN32X3/4F(Black)	SDR11	45.2	41.2	44.9	20.4
F23-DN40X1 1/4F(Black)	SDR11	71.1	52.17	66.34	21.9
F23-DN50X1 1/2F(Black)	SDR11	79	62.4	68.9	25.4
F23-DN63X2F(Black)	SDR11	95	78.43	74.5	29.6
F23-DN75X2 1/2F(Black)	SDR11	112	98	89	34.5

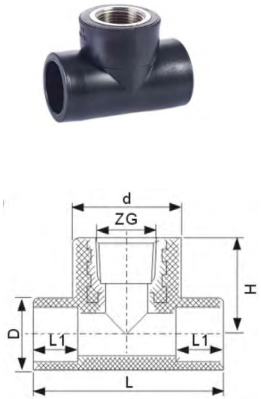
Male Thread Adapter (Soc x Mipt with Metal insert)



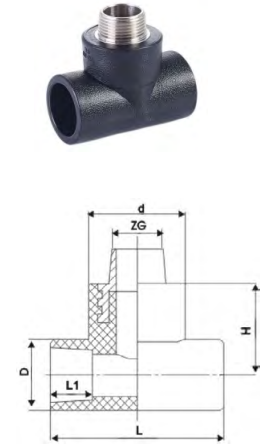
Description CN	SDR	D	d	L	L1
F23-DN20X1/2M(Black)	SDR11	40	27	38	16
F23-DN20X3/4M(Black)	SDR11	43	27	39	16
F23-DN25X1/2M(Black)	SDR11	40.48	33.13	40.8	18.25
F23-DN25X3/4M(Black)	SDR11	43.85	33.6	44.3	18.2
F23-DN32X1/2M(Black)	SDR11	45.2	41.38	45	20.2
F23-DN32X1M(Black)	SDR11	56	41.95	46	20.27
F23-DN32X3/4M(Black)	SDR11	22.83	41.24	44.4	24.5
F23-DN40X1 1/4M(Black)	SDR11	70.04	52.19	55.3	21.87
F23-DN50X1 1/2M(Black)	SDR11	79.7	62.5	56.35	25.4
F23-DN63X2M(Black)	SDR11	91.46	78.26	59.13	29.1
F23-DN75X2 1/2M(Black)	SDR11	116.8	96.3	74	35.4

Socket Fusion Joint Fitting

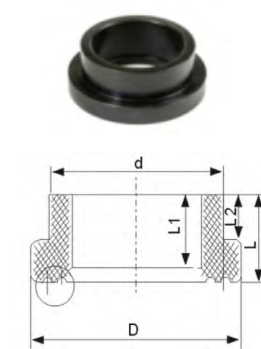
Female Thread Tee (Soc X Soc X Fipt with Metal Insert)

	Description CN	SDR	D	d	H	L	L1
	F23-DN20X1/2FX20(Black)	SDR11	26.9	36.65	30.35	66.2	15.79
	F23-DN25X1/2FX25(Black)	SDR11	32.7	36.28	33.08	70	17.59
	F23-DN25X3/4FX25(Black)	SDR11	36.68	41.7	35.15	70	17.57
	F23-DN32X1/2FX32(Black)	SDR11	41.7	36.72	35.41	61.6	19.98
	F23-DN32X1FX32(Black)	SDR11	43.4	53.8	40.25	93.14	19.9
	F23-DN32X3/4FX32(Black)	SDR11	41.6	43.08	35.05	74.6	20.1
	F23-DN50X1/2FX50(Black)	SDR11	62	41	51	91	25.5
	F23-DN50X3/4FX50(Black)	SDR11	62	41	51	91	25.5
	F23-DN63X3/4FX63(Black)	SDR11	82	44	52	92	29

Male Thread Tee (Soc x Soc x Mipt with Metal Insert)

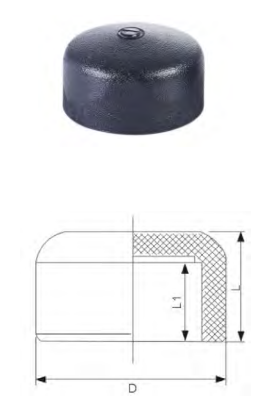
	Description CN	SDR	D	d	H	L	L1
	F23-DN20X1/2MX20(Black)	SDR11	26.53	36.3	32.94	65.75	15.91
	F23-DN25X1/2MX25(Black)	SDR11	32.47	36	36.7	69.51	17.16
	F23-DN25X3/4MX25(Black)	SDR11	32.47	41.45	38.31	70.15	17.64
	F23-DN32X1/2MX32(Black)	SDR11	42.3	42.73	34.88	74.3	19.73
	F23-DN32X1MX32(Black)	SDR11	42.3	42.7	34.9	74.3	19.8
	F23-DN32X3/4MX32(Black)	SDR11	42.3	42.7	34.8	74.3	19.7
	F23-DN63X1/2MX63(Black)	SDR11	83.5	44	53	92.5	29

Stub Flange (Soc x Flange)

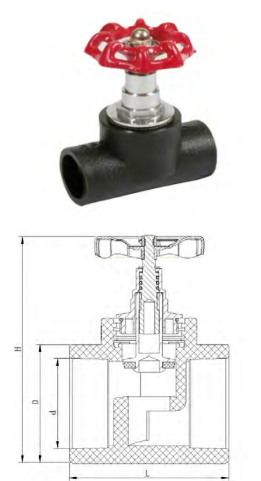
	Description CN	SDR	D	d	L	L1	L2
	F23-DN110(Black)	SDR11	152.40	132.10	42.68	39.60	29.73
	F23-DN40(Black)	SDR11	63.37	49.85	27.37	22.18	16.07
	F23-DN50(Black)	SDR11	72.90	61.35	29.45	25.10	19.00
	F23-DN63(Black)	SDR11	90.60	76.20	32.17	28.20	20.35
	F23-DN75(Black)	SDR11	112.60	91.50	37.56	32.53	24.76
	F23-DN90(Black)	SDR11	126	110	39	35	25

Socket Fusion Joint Fitting

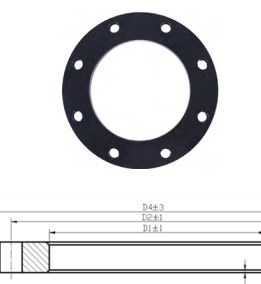
Cap (Soc)

	Description CN	SDR	D	L	L1
	F23-DN110(Black)	SDR11	134	65	38
	F23-DN20(Black)	SDR11	26.8	21.3	17
	F23-DN25(Black)	SDR11	31.24	21.55	17.24
	F23-DN32(Black)	SDR11	39.65	25.1	19.3
	F23-DN40(Black)	SDR11	51.3	27.8	20.5
	F23-DN50(Black)	SDR11	62.3	34.1	23.95
	F23-DN63(Black)	SDR11	76.56	37.7	28.2
	F23-DN75(Black)	SDR11	91.6	43.17	31.3
	F23-DN90(Black)	SDR11	110.8	49.45	34.16

Stop Valve (Soc x Soc)

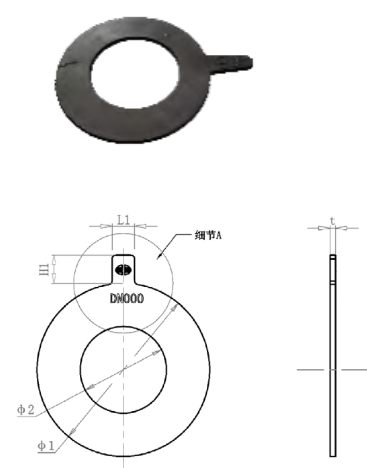
	Description CN	SDR	D	d	H	L
	F23-DN20(Black)	SDR11	28	19	87	66.5
	F23-DN25(Black)	SDR11	33	24	93.8	72.4
	F23-DN32(Black)	SDR11	41	31	98.5	80
	F23-DN40(Black)	SDR11	50.6	39	119.5	94.3
	F23-DN50(Black)	SDR11	62.3	49	131.3	111.6
	F23-DN63(Black)	SDR11	78.7	62	168.5	137.8
	F23-DN75(Black)	SDR11	91	74	179.3	135.8

Flange (Steel Tray)

	Description CN	SDR	D1	D2	D3	D4	n	H
	F23-dn63-PN1.6(Black)	SDR11	81	125	18	150	4	12.5
	F23-dn110-PN1.6(Black)	SDR11	135	180	18	205	8	13.5
	F23-dn90-PN1.6(Black)	SDR11	112	160	18	185	4	12.5
	F23-dn50-PN1.6(Black)	SDR11	64	110	18	135	4	12.5
	F23-dn40-PN1.6(Black)	SDR11	55	98	18	125	4	12.5
	F23-dn75-PN1.6(Black)	SDR11	96	145	18	170	4	12.5

Socket Fusion Joint Fitting

Rubber Gasket (universal)

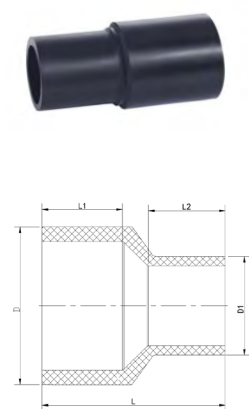


Description CN	SDR	D	L	L1
F23-dn40(Black)	77.8	33	2.4	38
F23-dn50(Black)	92	46	2.9	17
F23-dn63(Black)	107	59	3	17.24
F23-dn75(Black)	125.5	70	3	19.3
F23-dn90(Black)	139.5	85	3	20.5
F23-dn110(Black)	160	100	3	23.95
F23-dn125(Black)	161	109.2	3	28.2
F23-dn160(Black)	218	140	3	31.3
F23-dn180(Black)	216	153.7	3	34.16
F23-dn200(Black)	273	175	3	-
F23-dn225(Black)	272.5	195	3	-
F23-dn250(Black)	330	220	3	-
F23-dn280(Black)	330	237	3	-
F23-dn315(Black)	385	278	3	-
F23-dn355(Black)	440	313	4.5	-
F23-dn400(Black)	485	352	5	-
F23-dn450(Black)	540	390	5	-
F23-dn500(Black)	590	440	5	-
F23-dn630(Black)	690	550	5	-
F23-dn710(Black)	800	626	6	-
F23-dn800(Black)	910	700	6	-

Note: Rubber Gasket is an universal components for butt fusion joint, socket fusion joint and Electro fusion joint

Butt Fusion Joint Fittings

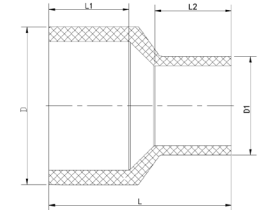
Reducer PN1.0



Description CN	SDR	D	D1	L	L1	L2
F23-dn90x32-PN1.0(Black)	SDR17	90	32	175	86	63
F23-dn90x40-PN1.0(Black)	SDR17	90	40	174	86	60
F23-dn90x50-PN1.0(Black)	SDR17	90	50	165	79	55
F23-dn90x63-PN1.0(Black)	SDR17	90	63	162	79	63
F23-dn90x75-PN1.0(Black)	SDR17	90	75	162	79	70
F23-dn110x40-PN1.0(Black)	SDR17	110	40	180	82	49
F23-dn110x50-PN1.0(Black)	SDR17	110	50	180	82	55
F23-dn110x63-PN1.0(Black)	SDR17	110	63	180	82	63
F23-dn110x75-PN1.0(Black)	SDR17	110	75	178	82	70
F23-dn110x90-PN1.0(Black)	SDR17	110	90	178	82	79
F23-dn125x63-PN1.0(Black)	SDR17	125	63	195	103	72
F23-dn125x75-PN1.0(Black)	SDR17	125	75	200	103	70
F23-dn125x90-PN1.0(Black)	SDR17	125	90	198	105	74
F23-dn125x110-PN1.0(Black)	SDR17	125	110	200	102	80
F23-dn140x110-PN1.0(Black)	SDR17	140	110	210	100	92
F23-dn160x50-PN1.0(Black)	SDR17	160	50	199	98	55
F23-dn160x63-PN1.0(Black)	SDR17	160	63	202	98	63
F23-dn160x75-PN1.0(Black)	SDR17	160	75	204	98	70
F23-dn160x90-PN1.0(Black)	SDR17	160	90	208	98	79
F23-dn160x110-PN1.0(Black)	SDR17	160	110	204	98	82
F23-dn160x125-PN1.0(Black)	SDR17	160	125	204	98	87
F23-dn160x140-PN1.0(Black)	SDR17	160	140	210	98	92
F23-dn180x160-PN1.0(Black)	SDR17	180	160	235	108	98
F23-dn200x63-PN1.0(Black)	SDR17	200	63	230	112	63
F23-dn200x75-PN1.0(Black)	SDR17	200	75	232	112	70
F23-dn200x90-PN1.0(Black)	SDR17	200	90	236	112	79
F23-dn200x110-PN1.0(Black)	SDR17	200	110	232	112	82
F23-dn200x125-PN1.0(Black)	SDR17	200	125	232	112	87
F23-dn200x160-PN1.0(Black)	SDR17	200	160	230	112	98
F23-dn200x180-PN1.0(Black)	SDR17	200	180	238	112	105
F23-dn225x110-PN1.0(Black)	SDR17	225	110	248	120	82
F23-dn225x125-PN1.0(Black)	SDR17	225	125	251	120	87
F23-dn225x160-PN1.0(Black)	SDR17	225	160	250	120	98
F23-dn225x200-PN1.0(Black)	SDR17	225	200	262	120	112
F23-dn250x110-PN1.0(Black)	SDR17	250	110	262	129	82
F23-dn250x125-PN1.0(Black)	SDR17	250	125	262	129	87
F23-dn250x160-PN1.0(Black)	SDR17	250	160	268	129	98
F23-dn250x200-PN1.0(Black)	SDR17	250	200	274	129	112
F23-dn250x225-PN1.0(Black)	SDR17	250	225	278	129	120
F23-dn280x200-PN1.0(Black)	SDR17	280	200	283	139	112
F23-dn280x250-PN1.0(Black)	SDR17	280	250	287	139	129

Butt Fusion Joint Fittings

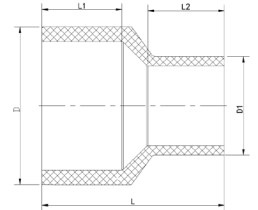
Reducer PN1.0



Description CN	SDR	D	D1	L	L1	L2
F23-dn315X160-PN1.0(Black)	SDR17	315	160	312	150	110
F23-dn315X200-PN1.0(Black)	SDR17	315	200	312	150	115
F23-dn315X225-PN1.0(Black)	SDR17	315	225	312	150	120
F23-dn315X250-PN1.0(Black)	SDR17	315	250	312	150	129
F23-dn315X280-PN1.0(Black)	SDR17	315	280	305	150	139
F23-dn355X250-PN1.0(Black)	SDR17	355	250	323	165	120
F23-dn355X315-PN1.0(Black)	SDR17	355	315	325	165	140
F23-dn400X160-PN1.0(Black)	SDR17	400	160	310	128	137
F23-dn400X200-PN1.0(Black)	SDR17	400	200	310	130	138
F23-dn400X250-PN1.0(Black)	SDR17	400	250	310	130	140
F23-dn400X315-PN1.0(Black)	SDR17	400	315	310	130	140
F23-dn400X355-PN1.0(Black)	SDR17	400	355	310	132	138
F23-dn450x250-PN1.0(Black)	SDR17	450	250	374	165	129
F23-dn450x315-PN1.0(Black)	SDR17	450	315	370	165	150
F23-dn450x400-PN1.0(Black)	SDR17	450	400	335	165	145
F23-dn500X315-PN1.0(Black)	SDR17	500	315	418	190	150
F23-dn500x400-PN1.0(Black)	SDR17	500	400	375	190	140
F23-dn500x450-PN1.0(Black)	SDR17	500	450	375	190	155
F23-dn630X400-PN1.0(Black)	SDR17	630	400	429	208	140
F23-dn630X450-PN1.0(Black)	SDR17	630	450	429	208	155
F23-dn630X500-PN1.0(Black)	SDR17	630	500	442	208	185

Butt Fusion Joint Fittings

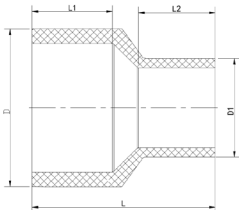
Reducer PN1.6



Description CN	SDR	D	d	L	L1	L2
F23-dn63X20-PN1.6(Black)	SDR11	63	20	130	63	41
F23-dn63X25-PN1.6(Black)	SDR11	63	25	128	63	42
F23-dn63X32-PN1.6(Black)	SDR11	63	32	128	63	44
F23-dn63X40-PN1.6(Black)	SDR11	63	40	130	63	50
F23-dn63X50-PN1.6(Black)	SDR11	63	50	130	63	55
F23-dn75X32-PN1.6(Black)	SDR11	75	32	150	75	54
F23-dn75X40-PN1.6(Black)	SDR11	75	40	150	75	54
F23-dn75X50-PN1.6(Black)	SDR11	75	50	148	75	54
F23-dn75X63-PN1.6(Black)	SDR11	75	63	148	75	63
F23-dn90X32-PN1.6(Black)	SDR11	90	32	175	86	63
F23-dn90X40-PN1.6(Black)	SDR11	90	40	174	86	60
F23-dn90X50-PN1.6(Black)	SDR11	90	50	165	79	55
F23-dn90X63-PN1.6(Black)	SDR11	90	63	162	79	63
F23-dn90X75-PN1.6(Black)	SDR11	90	75	162	79	70
F23-dn110X40-PN1.6(Black)	SDR11	110	40	180	82	49
F23-dn110X50-PN1.6(Black)	SDR11	110	50	180	82	55
F23-dn110X63-PN1.6(Black)	SDR11	110	63	180	82	63
F23-dn110X75-PN1.6(Black)	SDR11	110	75	178	82	70
F23-dn110X90-PN1.6(Black)	SDR11	110	90	178	82	79
F23-dn125X63-PN1.6(Black)	SDR11	125	75	195	103	72
F23-dn125X75-PN1.6(Black)	SDR11	125	90	200	103	70
F23-dn125X90-PN1.6(Black)	SDR11	125	110	198	105	74
F23-dn125X110-PN1.6(Black)	SDR11	125	63	200	102	80
F23-dn140X110-PN1.6(Black)	SDR11	140	110	210	100	92
F23-dn160X50-PN1.6(Black)	SDR11	160	50	199	98	55
F23-dn160X63-PN1.6(Black)	SDR11	160	63	202	98	63
F23-dn160X75-PN1.6(Black)	SDR11	160	75	204	98	70
F23-dn160X90-PN1.6(Black)	SDR11	160	90	208	98	79
F23-dn160X110-PN1.6(Black)	SDR11	160	110	204	98	82
F23-dn160X125-PN1.6(Black)	SDR11	160	125	204	98	87
F23-dn160X140-PN1.6(Black)	SDR11	160	140	210	98	92
F23-dn180X160-PN1.6(Black)	SDR11	180	160	235	108	98
F23-dn200X63-PN1.6(Black)	SDR11	200	63	230	112	63
F23-dn200X75-PN1.6(Black)	SDR11	200	75	232	112	70
F23-dn200X90-PN1.6(Black)	SDR11	200	90	236	112	79
F23-dn200X110-PN1.6(Black)	SDR11	200	110	232	112	82
F23-dn200X125-PN1.6(Black)	SDR11	200	125	232	112	87
F23-dn200X160-PN1.6(Black)	SDR11	200	160	230	112	98
F23-dn200X180-PN1.6(Black)	SDR11	200	180	238	112	105
F23-dn225X110-PN1.6(Black)	SDR11	225	110	248	120	82
F23-dn225X125-PN1.6(Black)	SDR11	225	125	251	120	87
F23-dn225X160-PN1.6(Black)	SDR11	225	160	250	120	98
F23-dn225X200-PN1.6(Black)	SDR11	225	200	262	120	112

Butt Fusion Joint Fittings

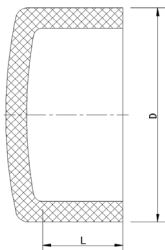
Reducer PN1.6



Description CN	SDR	D	d	L	L1	L2
F23-dn250X110-PN1.6(Black)	SDR11	250	110	262	129	82
F23-dn250X125-PN1.6(Black)	SDR11	250	125	262	129	87
F23-dn250X160-PN1.6(Black)	SDR11	250	160	268	129	98
F23-dn250X200-PN1.6(Black)	SDR11	250	200	274	129	112
F23-dn250X225-PN1.6(Black)	SDR11	250	225	278	129	120
F23-dn280X200-PN1.6(Black)	SDR11	280	200	283	139	112
F23-dn280X250-PN1.6(Black)	SDR11	280	250	287	139	129
F23-dn315X160-PN1.6(Black)	SDR11	315	160	312	150	110
F23-dn315X200-PN1.6(Black)	SDR11	315	200	312	150	115
F23-dn315X225-PN1.6(Black)	SDR11	315	225	312	150	120
F23-dn315X250-PN1.6(Black)	SDR11	315	250	312	150	129
F23-dn315X280-PN1.6(Black)	SDR11	315	280	305	150	139
F23-dn355X250-PN1.6(Black)	SDR11	355	250	323	165	120
F23-dn355X315-PN1.6(Black)	SDR11	355	315	325	165	140
F23-dn400X160-PN1.6(Black)	SDR11	400	160	310	128	137
F23-dn400X200-PN1.6(Black)	SDR11	400	200	310	130	138
F23-dn400x250-PN1.6(Black)	SDR11	400	250	310	130	140
F23-dn400X315-PN1.6(Black)	SDR11	400	315	310	130	140
F23-dn400X355-PN1.6(Black)	SDR11	400	355	310	132	138
F23-dn450x250-PN1.6(Black)	SDR11	450	250	374	165	129
F23-dn450x315-PN1.6(Black)	SDR11	450	315	370	165	150
F23-dn450x400-PN1.6(Black)	SDR11	450	400	335	165	145
F23-dn500x315-PN1.6(Black)	SDR11	500	315	418	190	150
F23-dn500x400-PN1.6(Black)	SDR11	500	400	375	190	140
F23-dn500x450-PN1.6(Black)	SDR11	500	450	375	190	155
F23-dn630x400-PN1.6(Black)	SDR11	630	400	429	208	140
F23-dn630x450-PN1.6(Black)	SDR11	630	450	429	208	155
F23-dn630x500-PN1.6(Black)	SDR11	630	500	442	208	185

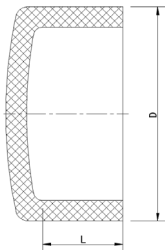
Butt Fusion Joint Fittings

Cap PN1.0



Description CN	SDR	D	L1
F23-dn90-PN1.0(Black)	SDR17	90	82
F23-dn110-PN1.0(Black)	SDR17	110	83
F23-dn125-PN1.0(Black)	SDR17	125	87
F23-dn140-PN1.0(Black)	SDR17	140	96
F23-dn160-PN1.0(Black)	SDR17	160	105
F23-dn180-PN1.0(Black)	SDR17	180	125
F23-dn200-PN1.0(Black)	SDR17	200	113
F23-dn225-PN1.0(Black)	SDR17	225	120
F23-dn250-PN1.0(Black)	SDR17	250	132
F23-dn280-PN1.0(Black)	SDR17	280	135
F23-dn315-PN1.0(Black)	SDR17	315	152
F23-dn355-PN1.0(Black)	SDR17	355	164
F23-dn400-PN1.0(Black)	SDR17	400	225
F23-dn450-PN1.0(Black)	SDR17	450	225
F23-dn500-PN1.0(Black)	SDR17	500	225
F23-dn560-PN1.0(Black)	SDR17	560	225
F23-dn630-PN1.0(Black)	SDR17	630	225

Cap PN1.6



Description CN	SDR	D	L1
F23-dn63-PN1.6(Black)	SDR11	63	63
F23-dn75-PN1.6(Black)	SDR11	75	76
F23-dn90-PN1.6(Black)	SDR11	90	82
F23-dn110-PN1.6(Black)	SDR11	110	83
F23-dn125-PN1.6(Black)	SDR11	125	87
F23-dn140-PN1.6(Black)	SDR11	140	96
F23-dn160-PN1.6(Black)	SDR11	160	105
F23-dn180-PN1.6(Black)	SDR11	180	125
F23-dn200-PN1.6(Black)	SDR11	200	113
F23-dn225-PN1.6(Black)	SDR11	225	120
F23-dn250-PN1.6(Black)	SDR11	250	132
F23-dn280-PN1.6(Black)	SDR11	280	135
F23-dn315-PN1.6(Black)	SDR11	315	152
F23-dn355-PN1.6(Black)	SDR11	355	164
F23-dn400-PN1.6(Black)	SDR11	400	225
F23-dn450-PN1.6(Black)	SDR11	450	225
F23-dn500-PN1.6(Black)	SDR11	500	225
F23-dn560-PN1.6(Black)	SDR11	560	225
F23-dn630-PN1.6(Black)	SDR11	630	225

Butt Fusion Joint Fittings

Equal Tee PN1.0

Description CN	SDR	D	L	L1	L2
F23-dn90-PN1.0(Black)	SDR17	90	268	76	140
F23-dn110-PN1.0(Black)	SDR17	110	305	85	153
F23-dn125-PN1.0(Black)	SDR17	125	320	85	181
F23-dn140-PN1.0(Black)	SDR17	140	343	88	182
F23-dn160-PN1.0(Black)	SDR17	160	396	98	197
F23-dn180-PN1.0(Black)	SDR17	180	370	85	205
F23-dn200-PN1.0(Black)	SDR17	200	445	107	226
F23-dn225-PN1.0(Black)	SDR17	225	508	125	247
F23-dn250-PN1.0(Black)	SDR17	250	565	129	283
F23-dn280-PN1.0(Black)	SDR17	280	602	136	304
F23-dn315-PN1.0(Black)	SDR17	315	670	150	335
F23-dn355-PN1.0(Black)	SDR17	355	720	164	360
F23-dn400-PN1.0(Black)	SDR17	400	720	140	380
F23-dn450-PN1.0(Black)	SDR17	450	775	130	445
F23-dn500-PN1.0(Black)	SDR17	500	835	130	510
F23-dn560-PN1.0(Black)	SDR17	560	905	140	545
F23-dn630-PN1.0(Black)	SDR17	630	995	140	600
F23-dn710-PN1.0(Black)	SDR17	710	1150	170	615

Equal Tee PN1.6

Description CN	SDR	D	L	L1	L2
F23-dn63-PN1.6(Black)	SDR11	63	213	63	107
F23-dn75-PN1.6(Black)	SDR11	75	240	70	120
F23-dn90-PN1.6(Black)	SDR11	90	268	76	140
F23-dn110-PN1.6(Black)	SDR11	110	305	85	153
F23-dn125-PN1.6(Black)	SDR11	125	320	85	181
F23-dn140-PN1.6(Black)	SDR11	140	343	88	182
F23-dn160-PN1.6(Black)	SDR11	160	396	98	197
F23-dn180-PN1.6(Black)	SDR11	180	370	85	205
F23-dn200-PN1.6(Black)	SDR11	200	440	107	235
F23-dn225-PN1.6(Black)	SDR11	225	508	125	247
F23-dn250-PN1.6(Black)	SDR11	250	565	129	283
F23-dn280-PN1.6(Black)	SDR11	280	602	136	304
F23-dn315-PN1.6(Black)	SDR11	315	670	150	335
F23-dn355-PN1.6(Black)	SDR11	355	720	164	360
F23-dn400-PN1.6(Black)	SDR11	400	720	140	380
F23-dn450-PN1.6(Black)	SDR11	450	775	130	445
F23-dn500-PN1.6(Black)	SDR11	500	835	130	510
F23-dn560-PN1.6(Black)	SDR11	560	905	140	545
F23-dn630-PN1.6(Black)	SDR11	630	995	140	600
F23-dn710-PN1.6(Black)	SDR11	710	1150	170	615

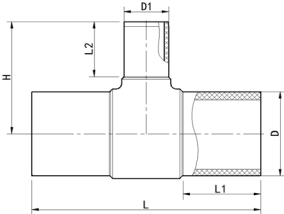
Butt Fusion Joint Fittings

Reducing tee PN1.0

Description CN	SDR	D	D1	L	L1	L2	H
F23-dn90x32x90-PN1.0(Black)	SDR17	90	32	202	79	44	102
F23-dn90x40x90-PN1.0(Black)	SDR17	90	40	214	79	49	107
F23-dn90x50x90-PN1.0(Black)	SDR17	90	50	227	79	55	113
F23-dn90x63x90-PN1.0(Black)	SDR17	90	63	239	79	63	121
F23-dn90x75x90-PN1.0(Black)	SDR17	90	75	250	79	70	128
F23-dn110X32X110-PN1.0(Black)	SDR17	110	32	218	82	44	115
F23-dn110X40X110-PN1.0(Black)	SDR17	110	40	230	82	49	120
F23-dn110x50x110-PN1.0(Black)	SDR17	110	50	235	82	55	126
F23-dn110X63X110-PN1.0(Black)	SDR17	110	63	250	82	63	134
F23-dn110X75X110-PN1.0(Black)	SDR17	110	75	260	82	70	141
F23-dn110X90X110-PN1.0(Black)	SDR17	110	90	280	82	79	150
F23-dn125x63x125-PN1.0(Black)	SDR17	125	63	270	87	70	145
F23-dn125x75x125-PN1.0(Black)	SDR17	125	75	288	87	78	157
F23-dn125X90X125-PN1.0(Black)	SDR17	125	90	299	87	80	165
F23-dn125X110X125-PN1.0(Black)	SDR17	125	110	319	87	88	166
F23-dn140x110x140-PN1.0(Black)	SDR17	140	110	343	95	125	212
F23-dn160X32X160-PN1.0(Black)	SDR17	160	32	280	98	45	140
F23-dn160X40X160-PN1.0(Black)	SDR17	160	40	280	98	50	144
F23-dn160x50x160-PN1.0(Black)	SDR17	160	50	280	98	56	150
F23-dn160X63X160-PN1.0(Black)	SDR17	160	63	290	98	66	161
F23-dn160X75X160-PN1.0(Black)	SDR17	160	75	308	98	70	166
F23-dn160X90X160-PN1.0(Black)	SDR17	160	90	320	98	79	176
F23-dn160X110X160-PN1.0(Black)	SDR17	160	110	340	98	82	180
F23-dn160X125X160-PN1.0(Black)	SDR17	160	125	330	90	93	192
F23-dn180X110X180-PN1.0(Black)	SDR17	180	110	370	110	105	213
F23-dn180X160X180-PN1.0(Black)	SDR17	180	160	370	87	105	213
F23-dn200x40x200-PN1.0(Black)	SDR17	200	40	285	100	58	185
F23-dn200x50x200-PN1.0(Black)	SDR17	200	50	314	110	62	180
F23-dn200X63X200-PN1.0(Black)	SDR17	200	63	313	108	64	185
F23-dn200X75X200-PN1.0(Black)	SDR17	200	75	338	112	70	190
F23-dn200X90X200-PN1.0(Black)	SDR17	200	90	335	110	82	198
F23-dn200X110X200-PN1.0(Black)	SDR17	200	110	360	107	82	204
F23-dn200X125X200-PN1.0(Black)	SDR17	200	125	390	110	94	215
F23-dn200X160X200-PN1.0(Black)	SDR17	200	160	408	107	98	220
F23-dn225X90X225-PN1.0(Black)	SDR17	225	90	413	143	104	248
F23-dn225X110X225-PN1.0(Black)	SDR17	225	110	413	128	100	235
F23-dn225X160X225-PN1.0(Black)	SDR17	225	160	410	110	120	252
F23-dn225X200X225-PN1.0(Black)	SDR17	225	200	413	90	130	257
F23-dn250X90X250-PN1.0(Black)	SDR17	250	90	400	129	79	232
F23-dn250X110X250-PN1.0(Black)	SDR17	250	110	420	129	82	234
F23-dn250x125x250-PN1.0(Black)	SDR17	250	125	435	129	87	239
F23-dn250X160X250-PN1.0(Black)	SDR17	250	160	470	129	98	250
F23-dn250X200X250-PN1.0(Black)	SDR17	250	200	510	129	112	265

Butt Fusion Joint Fittings

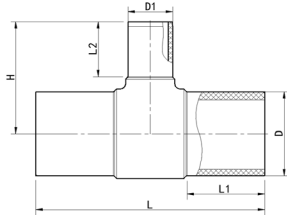
Reducing tee PN1.0



Description CN	SDR	D	D1	L	L1	L2	H
F23-dn250X225X250-PN1.0(Black)	SDR17	250	225	540	129	120	275
F23-dn280X110X280-PN1.0(Black)	SDR17	280	110	420	135	82	245
F23-dn280X160X280-PN1.0(Black)	SDR17	280	160	475	137	98	260
F23-dn280X200X280-PN1.0(Black)	SDR17	280	200	486	125	120	278
F23-dn280X225X280-PN1.0(Black)	SDR17	280	225	533	139	120	284
F23-dn315X110X315-PN1.0(Black)	SDR17	315	110	445	150	82	265
F23-dn315X160X315-PN1.0(Black)	SDR17	315	160	505	150	98	278
F23-dn315X200X315-PN1.0(Black)	SDR17	315	200	540	150	112	292
F23-dn315X225X315-PN1.0(Black)	SDR17	315	225	560	150	120	305
F23-dn315X250X315-PN1.0(Black)	SDR17	315	250	585	150	129	310
F23-dn355X160X355-PN1.0(Black)	SDR17	355	160	492	150	100	291
F23-dn355X200X355-PN1.0(Black)	SDR17	355	200	495	130	120	305
F23-dn400X110X400-PN1.0(Black)	SDR17	400	110	508	160	112	350
F23-dn400X160X400-PN1.0(Black)	SDR17	400	160	508	150	135	360
F23-dn400X200X400-PN1.0(Black)	SDR17	400	200	508	135	140	360
F23-dn400X250X400-PN1.0(Black)	SDR17	400	250	616	160	135	360
F23-dn400X315X400-PN1.0(Black)	SDR17	400	315	616	130	135	350
F23-dn450X250X450-PN1.0(Black)	SDR17	450	250	609	145	129	390
F23-dn450X315X450-PN1.0(Black)	SDR17	450	315	670	145	150	410
F23-dn450X400X450-PN1.0(Black)	SDR17	450	400	760	145	170	435
F23-dn500X315X500-PN1.0(Black)	SDR17	500	315	674	140	150	435
F23-dn500X400X500-PN1.0(Black)	SDR17	500	400	750	140	170	460
F23-dn500X450X500-PN1.0(Black)	SDR17	500	450	810	140	170	460
F23-dn630X400X630-PN1.0(Black)	SDR17	630	400	760	140	170	525
F23-dn630X450X630-PN1.0(Black)	SDR17	630	450	810	140	170	525
F23-dn630X500X630-PN1.0(Black)	SDR17	630	500	860	140	170	530
F23-dn710X400X710-PN1.0(Black)	SDR17	710	400	840	170	190	595
F23-dn710X500X710-PN1.0(Black)	SDR17	710	500	940	170	210	615
F23-dn710X630X710-PN1.0(Black)	SDR17	710	630	1070	170	210	615

Butt Fusion Joint Fittings

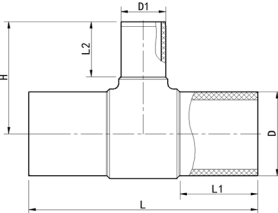
Reducing tee PN1.6



Description CN	SDR	D	D1	L	L1	L2	H
F23-dn63X25X63-PN1.6(Black)	SDR11	63	25	171	63	41	83
F23-dn63X32X63-PN1.6(Black)	SDR11	63	32	178	63	44	87
F23-dn63X40X63-PN1.6(Black)	SDR11	63	40	186	63	49	93
F23-dn63X50X63-PN1.6(Black)	SDR11	63	50	200	63	55	99
F23-dn75X32X75-PN1.6(Black)	SDR11	75	32	197	70	44	95
F23-dn75X40X75-PN1.6(Black)	SDR11	75	40	205	70	49	100
F23-dn75X50X75-PN1.6(Black)	SDR11	75	50	215	70	55	105
F23-dn75X63X75-PN1.6(Black)	SDR11	75	63	225	70	63	113
F23-dn90x32x90-PN1.6(Black)	SDR11	90	32	202	79	44	102
F23-dn90X40X90-PN1.6(Black)	SDR11	90	40	214	79	49	107
F23-dn90X50X90-PN1.6(Black)	SDR11	90	50	227	79	55	113
F23-dn90X63X90-PN1.6(Black)	SDR11	90	63	239	79	63	121
F23-dn90X75X90-PN1.6(Black)	SDR11	90	75	250	79	70	128
F23-dn110x32x110-PN1.6(Black)	SDR11	110	32	218	82	44	115
F23-dn110x40x110-PN1.6(Black)	SDR11	110	40	230	82	49	120
F23-dn110X50X110-PN1.6(Black)	SDR11	110	50	235	82	55	126
F23-dn110X63X110-PN1.6(Black)	SDR11	110	63	250	82	63	134
F23-dn110X75X110-PN1.6(Black)	SDR11	110	75	260	82	70	141
F23-dn110X90X110-PN1.6(Black)	SDR11	110	90	280	82	79	150
F23-dn125X63X125-PN1.6(Black)	SDR11	125	63	270	87	70	145
F23-dn125X75X125-PN1.6(Black)	SDR11	125	75	288	87	78	157
F23-dn125X90X125-PN1.6(Black)	SDR11	125	90	299	87	80	165
F23-dn125X110X125-PN1.6(Black)	SDR11	125	110	319	87	88	166
F23-dn140x110x140-PN1.6(Black)	SDR11	140	110	343	95	125	212
F23-dn160x32x160-PN1.6(Black)	SDR11	160	32	280	98	45	140
F23-dn160x40x160-PN1.6(Black)	SDR11	160	40	280	98	50	144
F23-dn160x50x160-PN1.6(Black)	SDR11	160	50	280	98	56	150
F23-dn160X63X160-PN1.6(Black)	SDR11	160	63	290	98	66	161
F23-dn160X75X160-PN1.6(Black)	SDR11	160	75	308	98	70	166
F23-dn160X90X160-PN1.6(Black)	SDR11	160	90	320	98	79	176
F23-dn160X110X160-PN1.6(Black)	SDR11	160	110	340	98	82	180
F23-dn160X125X160-PN1.6(Black)	SDR11	160	125	330	90	93	192
F23-dn180X110X180-PN1.6(Black)	SDR11	180	110	370	110	105	213
F23-dn180X160X180-PN1.6(Black)	SDR11	180	160	370	87	105	213
F23-dn200X40X200-PN1.6(Black)	SDR11	200	40	285	100	58	185
F23-dn200X50X200-PN1.6(Black)	SDR11	200	50	314	110	62	180
F23-dn200X63X200-PN1.6(Black)	SDR11	200	63	310	105	64	185
F23-dn200X75X200-PN1.6(Black)	SDR11	200	75	338	112	70	190
F23-dn200X90X200-PN1.6(Black)	SDR11	200	90	335	105	79	202
F23-dn200X110X200-PN1.6(Black)	SDR11	200	110	385	112	88	213
F23-dn200X125X200-PN1.6(Black)	SDR11	200	125	390	110	94	215
F23-dn200X160X200-PN1.6(Black)	SDR11	200	160	390	95	90	210
F23-dn225X90X225-PN1.6(Black)	SDR11	225	90	413	143	104	248

Butt Fusion Joint Fittings

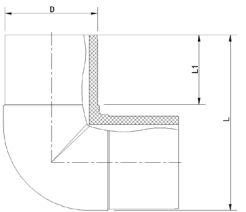
Reducing tee PN1.6



Description CN	SDR	D	D1	L	L1	L2	H
F23-dn225X110X225-PN1.6(Black)	SDR11	225	110	413	128	100	235
F23-dn225X160X225-PN1.6(Black)	SDR11	225	160	410	110	120	252
F23-dn225X200X225-PN1.6(Black)	SDR11	225	200	413	90	130	257
F23-dn250X90X250-PN1.6(Black)	SDR11	250	90	400	129	79	232
F23-dn250X110X250-PN1.6(Black)	SDR11	250	110	420	129	82	234
F23-dn250X125X250-PN1.6(Black)	SDR11	250	125	435	129	87	239
F23-dn250X160X250-PN1.6(Black)	SDR11	250	160	470	129	98	250
F23-dn250X200X250-PN1.6(Black)	SDR11	250	200	510	129	112	265
F23-dn250X225X250-PN1.6(Black)	SDR11	250	225	540	129	120	275
F23-dn280X110X280-PN1.6(Black)	SDR11	280	110	420	135	82	245
F23-dn280X160X280-PN1.6(Black)	SDR11	280	160	475	137	98	260
F23-dn280X200X280-PN1.6(Black)	SDR11	280	200	486	125	120	278
F23-dn280X225X280-PN1.6(Black)	SDR11	280	225	533	139	120	284
F23-dn315X110X315-PN1.6(Black)	SDR11	315	110	445	150	82	265
F23-dn315X160X315-PN1.6(Black)	SDR11	315	160	505	150	98	278
F23-dn315X200X315-PN1.6(Black)	SDR11	315	200	540	150	112	292
F23-dn315X225X315-PN1.6(Black)	SDR11	315	225	560	150	120	305
F23-dn315X250X315-PN1.6(Black)	SDR11	315	250	585	150	129	310
F23-dn355x160x355-PN1.6(Black)	SDR11	355	160	492	150	100	291
F23-dn355x200x355-PN1.6(Black)	SDR11	355	200	495	130	120	305
F23-dn400X110X400-PN1.6(Black)	SDR11	400	110	508	160	112	350
F23-dn400X160X400-PN1.6(Black)	SDR11	400	160	508	150	135	360
F23-dn400X200X400-PN1.6(Black)	SDR11	400	200	508	135	140	360
F23-dn400X250X400-PN1.6(Black)	SDR11	400	250	616	160	135	360
F23-dn400X315X400-PN1.6(Black)	SDR11	400	315	616	130	135	350
F23-dn450X250X450-PN1.6(Black)	SDR11	450	250	609	145	129	390
F23-dn450X315X450-PN1.6(Black)	SDR11	450	315	670	145	150	410
F23-dn450X400X450-PN1.6(Black)	SDR11	450	400	760	145	170	435
F23-dn500X315X500-PN1.6(Black)	SDR11	500	315	674	140	150	435
F23-dn500X400X500-PN1.6(Black)	SDR11	500	400	750	140	170	460
F23-dn500X450X500-PN1.6(Black)	SDR11	500	450	810	140	170	460
F23-dn630X400X630-PN1.6(Black)	SDR11	630	400	760	140	170	525
F23-dn630X450X630-PN1.6(Black)	SDR11	630	450	810	140	170	525
F23-dn630X500X630-PN1.6(Black)	SDR11	630	500	860	140	170	530
F23-dn710X400X710-PN1.6(Black)	SDR11	710	400	840	170	190	595
F23-dn710X500X710-PN1.6(Black)	SDR11	710	500	940	170	210	615
F23-dn710X630X710-PN1.6(Black)	SDR11	710	630	1070	170	210	615

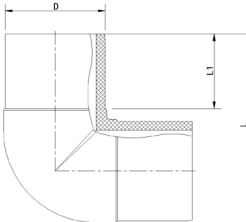
Butt Fusion Joint Fittings

Equal Elbow 90°PN1.0



Description CN	SDR	D	L	L1
F23-dn90X90°-PN1.0(Black)	SDR17	90	185	79
F23-dn110X90°-PN1.0(Black)	SDR17	110	207	82
F23-dn125X90°-PN1.0(Black)	SDR17	125	245	100
F23-dn140x90°-PN1.0(Black)	SDR17	140	245	85
F23-dn160X90°-PN1.0(Black)	SDR17	160	278	98
F23-dn180X90°-PN1.0(Black)	SDR17	180	300	105
F23-dn200X90°-PN1.0(Black)	SDR17	200	355	125
F23-dn225X90°-PN1.0(Black)	SDR17	225	400	140
F23-dn250X90°-PN1.0(Black)	SDR17	250	416	129
F23-dn280X90°-PN1.0(Black)	SDR17	280	435	130
F23-dn315X90°-PN1.0(Black)	SDR17	315	515	150
F23-dn355X90°-PN1.0(Black)	SDR17	355	545	160
F23-dn400X90°-PN1.0(Black)	SDR17	400	580	150
F23-dn450X90°-PN1.0(Black)	SDR17	450	635	135
F23-dn500X90°-PN1.0(Black)	SDR17	500	700	135
F23-dn560x90°-PN1.0(Black)	SDR17	560	750	130
F23-dn630X90°-PN1.0(Black)	SDR17	630	820	130
F23-dn710x90°-PN1.0(Black)	SDR17	710	910	160
F23-dn800X90°-PN1.0(Black)	SDR17	800	1010	160
F23-dn1000x90°-PN1.0(Black)	SDR17	1000	1235	160

Equal Elbow 90°PN1.6



Description CN	SDR	D	L	L1
F23-dn63X90°-PN1.6(Black)	SDR11	63	135	63
F23-dn75X90°-PN1.6(Black)	SDR11	75	165	72
F23-dn90X90°-PN1.6(Black)	SDR11	90	185	79
F23-dn110X90°-PN1.6(Black)	SDR11	110	207	82
F23-dn125X90°-PN1.6(Black)	SDR11	125	245	100
F23-dn140x90°-PN1.6(Black)	SDR11	140	245	85
F23-dn160X90°-PN1.6(Black)	SDR11	160	278	98
F23-dn180X90°-PN1.6(Black)	SDR11	180	300	105
F23-dn200X90°-PN1.6(Black)	SDR11	200	355	125
F23-dn225X90°-PN1.6(Black)	SDR11	225	400	140
F23-dn250X90°-PN1.6(Black)	SDR11	250	416	129
F23-dn280X90°-PN1.6(Black)	SDR11	280	435	130
F23-dn315X90°-PN1.6(Black)	SDR11	315	515	150
F23-dn355X90°-PN1.6(Black)	SDR11	355	545	160
F23-dn400X90°-PN1.6(Black)	SDR11	400	580	150
F23-dn450X90°-PN1.6(Black)	SDR11	450	635	135
F23-dn500X90°-PN1.6(Black)	SDR11	500	700	135
F23-dn560x90°-PN1.6(Black)	SDR11	560	750	130
F23-dn630X90°-PN1.6(Black)	SDR11	630	820	130
F23-dn710x90°-PN1.6(Black)	SDR11	710	910	160
F23-dn800x90°-PN1.6(Black)	SDR11	800	1010	160

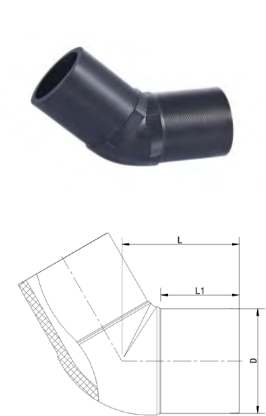
Butt Fusion Joint Fittings

Equal Elbow 45° PN1.0



Description CN	SDR	D	L	L1
F23-dn90X45°-PN1.0(Black)	SDR17	90	105	79
F23-dn110X45°-PN1.0(Black)	SDR17	110	118	82
F23-dn125X45°-PN1.0(Black)	SDR17	125	125	87
F23-dn140x45°-PN1.0(Black)	SDR17	140	135	90
F23-dn160X45°-PN1.0(Black)	SDR17	160	142	98
F23-dn180x45°-PN1.0(Black)	SDR17	180	142	94
F23-dn200X45°-PN1.0(Black)	SDR17	200	162	110
F23-dn225X45°-PN1.0(Black)	SDR17	225	180	125
F23-dn250X45°-PN1.0(Black)	SDR17	250	190	125
F23-dn280X45°-PN1.0(Black)	SDR17	280	230	134
F23-dn315X45°-PN1.0(Black)	SDR17	315	240	150
F23-dn355X45°-PN1.0(Black)	SDR17	355	270	147
F23-dn400X45°-PN1.0(Black)	SDR17	400	255	150
F23-dn450X45°-PN1.0(Black)	SDR17	450	255	135
F23-dn500X45°-PN1.0(Black)	SDR17	500	260	135
F23-dn560x45°-PN1.0(Black)	SDR17	560	265	130
F23-dn630X45°-PN1.0(Black)	SDR17	630	300	140
F23-dn710x45°-PN1.0(Black)	SDR17	710	330	160
F23-dn800X45°-PN1.0(Black)	SDR17	800	355	160
F23-dn1000x45°-PN1.0(Black)	SDR17	1000	410	160

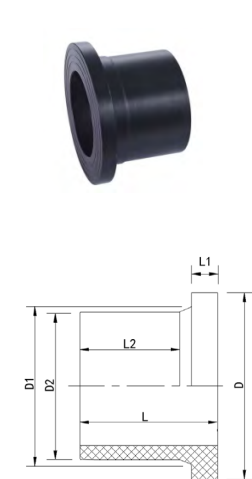
Equal Elbow 45° PN1.6



Description CN	SDR	D	L	L1
F23-dn63x45°-PN1.6(Black)	SDR11	63	89	63
F23-dn75X45°-PN1.6(Black)	SDR11	75	95	70
F23-dn90X45°-PN1.6(Black)	SDR11	90	105	79
F23-dn110X45°-PN1.6(Black)	SDR11	110	118	82
F23-dn125X45°-PN1.6(Black)	SDR11	125	125	87
F23-dn140x45°-PN1.6(Black)	SDR11	140	135	90
F23-dn160X45°-PN1.6(Black)	SDR11	160	142	98
F23-dn180x45°-PN1.6(Black)	SDR11	180	142	94
F23-dn200X45°-PN1.6(Black)	SDR11	200	162	110
F23-dn225X45°-PN1.6(Black)	SDR11	225	180	125
F23-dn250X45°-PN1.6(Black)	SDR11	250	190	125
F23-dn280X45°-PN1.6(Black)	SDR11	280	230	134
F23-dn315X45°-PN1.6(Black)	SDR11	315	240	150
F23-dn355X45°-PN1.6(Black)	SDR11	355	270	147
F23-dn400X45°-PN1.6(Black)	SDR11	400	255	150
F23-dn450X45°-PN1.6(Black)	SDR11	450	255	135
F23-dn500X45°-PN1.6(Black)	SDR11	500	260	135
F23-dn560x45°-PN1.6(Black)	SDR11	560	265	130
F23-dn630X45°-PN1.6(Black)	SDR11	630	300	140
F23-dn710x45°-PN1.6(Black)	SDR11	710	330	160
F23-dn800X45°-PN1.6(Black)	SDR11	800	335	160

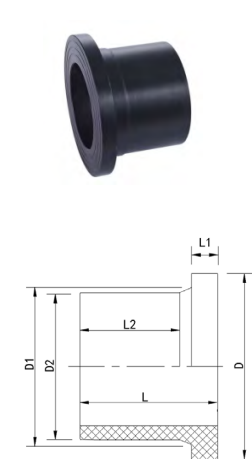
Butt Fusion Joint Fittings

Stub Flange PN1.0



Description CN	SDR	D	D1	D2	L	L1	L2
F23-dn50-PN1.0(Black)	SDR17	88	61	50	85	12	56
F23-dn63-PN1.0(Black)	SDR17	102	75	63	102	13	65
F23-dn75-PN1.0(Black)	SDR17	122	89	75	110	15	74
F23-dn90-PN1.0(Black)	SDR17	138	105	90	115	16	79
F23-dn110-PN1.0(Black)	SDR17	158	125	110	122	19	82
F23-dn125-PN1.0(Black)	SDR17	158	132	125	115	20	87
F23-dn140-PN1.0(Black)	SDR17	188	155	140	136	24	92
F23-dn160-PN1.0(Black)	SDR17	212	175	160	145	23	98
F23-dn180-PN1.0(Black)	SDR17	212	182	180	154	25	105
F23-dn200-PN1.0(Black)	SDR17	268	232	200	162	25	112
F23-dn225-PN1.0(Black)	SDR17	268	232	225	173	30	120
F23-dn250-PN1.0(Black)	SDR17	320	285	250	185	31	129
F23-dn280-PN1.0(Black)	SDR17	320	291	280	196	33	139
F23-dn315-PN1.0(Black)	SDR17	370	335	315	205	35	140
F23-dn355-PN1.0(Black)	SDR17	430	375	355	235	38	164
F23-dn400-PN1.0(Black)	SDR17	482	427	400	230	40	158
F23-dn450-PN1.0(Black)	SDR17	538	468	450	230	45	155
F23-dn500-PN1.0(Black)	SDR17	585	518	500	230	53	145
F23-dn560-PN1.0(Black)	SDR17	685	575	560	220	54	130
F23-dn630-PN1.0(Black)	SDR17	690	642	630	220	60	125
F23-dn710-PN1.0(Black)	SDR17	800	736	710	220	52	150
F23-dn800-PN1.0(Black)	SDR17	905	836	800	230	60	150
F23-dn1000-PN1.0(Black)	SDR17	1110	1043	1000	250	70	150
F23-dn1200-PN1.0(Black)	SDR17	1330	1235	1200	295	75	185

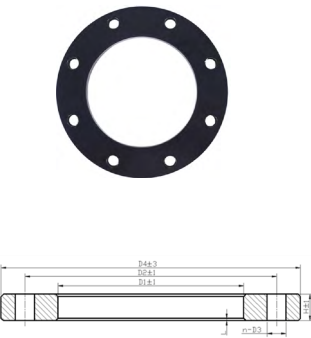
Stub Flange PN1.6



Description CN	SDR	D	D1	D2	L	L1	L2
F23-dn40-PN1.6(Black)	SDR11	78	50	40	76	10	50
F23-dn50-PN1.6(Black)	SDR11	88	61	50	85	12	56
F23-dn63-PN1.6(Black)	SDR11	102	75	63	102	13	65
F23-dn75-PN1.6(Black)	SDR11	122	89	75	110	15	74
F23-dn90-PN1.6(Black)	SDR11	138	105	90	115	16	79
F23-dn110-PN1.6(Black)	SDR11	158	125	110	122	19	82
F23-dn125-PN1.6(Black)	SDR11	158	132	125	115	20	87
F23-dn140-PN1.6(Black)	SDR11	188	155	140	136	24	92
F23-dn160-PN1.6(Black)	SDR11	212	175	160	145	23	98
F23-dn180-PN1.6(Black)	SDR11	212	182	180	154	25	105
F23-dn200-PN1.6(Black)	SDR11	268	232	200	162	25	112
F23-dn225-PN1.6(Black)	SDR11	268	232	225	173	30	120
F23-dn250-PN1.6(Black)	SDR11	320	285	250	185	31	129
F23-dn280-PN1.6(Black)	SDR11	320	291	280	196	33	139
F23-dn315-PN1.6(Black)	SDR11	370	335	315	205	35	140
F23-dn355-PN1.6(Black)	SDR11	430	375	355	235	38	164
F23-dn400-PN1.6(Black)	SDR11	482	427	400	230	40	158
F23-dn450-PN1.6(Black)	SDR11	538	468	450	230	45	155
F23-dn500-PN1.6(Black)	SDR11	585	518	500	230	53	145
F23-dn560-PN1.6(Black)	SDR11	685	575	560	220	54	130
F23-dn630-PN1.6(Black)	SDR11	690	642	630	220	60	125
F23-dn710-PN1.6(Black)	SDR11	800	736	710	238	70	150
F23-dn800-PN1.6(Black)	SDR11	905	836	800	250	78	150
F23-dn1000-PN1.6(Black)	SDR11	1110	1043	1000	275	94	150
F23-dn1200-PN1.6(Black)	SDR11	1330	1235	1200	340	120	185

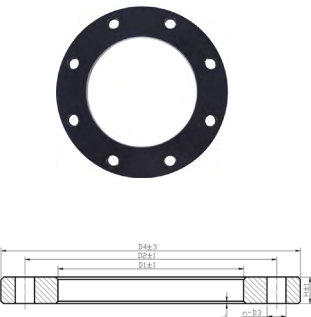
Butt Fusion Joint Fittings

Flange (Steel Tray) PN1.0



Description CN	PN	D1	D2	D3	D4	n	H
F23-dn40-PN1.0 1.6(Black)	PN10\PN16	53	100	18	140	4	18
F23-dn50-PN1.0 1.6(Black)	PN10\PN16	63	110	18	150	4	18
F23-dn63-PN1.0/1.6(Black)	PN10\PN16	77	125	18	165	4	18
F23-dn75-PN1.0/1.6(Black)	PN10\PN16	91	145	18	185	4	18
F23-dn90-PN1.0/1.6(Black)	PN10\PN16	107	160	18	200	8	20
F23-dn110/125-PN1.0/1.6(Black)	PN10\PN16	134	180	18	220	8	20
F23-dn140-PN1.0 1.6(Black)	PN10\PN16	157	210	18	250	8	22
F23-dn160/180-PN1.0/1.6(Black)	PN10\PN16	183	240	22	285	8	22
F23-dn200/225-PN1.0(Black)	PN10	237	295	22	340	8	24
F23-dn250/280-PN1.0(Black)	PN10	293	350	22	395	12	26
F23-dn315-PN1.0(Black)	PN10	338	400	22	445	12	26
F23-dn355-PN1.0(Black)	PN10	378	460	22	505	16	26
F23-dn400-PN1.0(Black)	PN10	430	515	26	565	16	26
F23-dn450-PN1.0(Black)	PN10	472	565	26	615	20	28
F23-dn500-PN1.0(Black)	PN10	522	620	26	670	20	28
F23-dn560-PN1.0(Black)	PN10	580	725	30	780	20	34
F23-dn630-PN1.0(Black)	PN10	646	725	30	780	20	34
F23-dn710-PN1.0(Black)	PN10	738	840	30	895	24	34
F23-dn800-PN1.0(Black)	PN10	840	950	33	1015	24	36
F23-dn1000-PN1.0(Black)	PN10	1047	1160	36	1230	28	38
F23-dn1200-PN1.0(Black)	PN10	1237	1380	39	1455	32	44
F23-dn800-PN1.0(Black)	SDR17	905	836	800	230	60	150
F23-dn1000-PN1.0(Black)	SDR17	1110	1043	1000	250	70	150
F23-dn1200-PN1.0(Black)	SDR17	1330	1235	1200	295	75	185

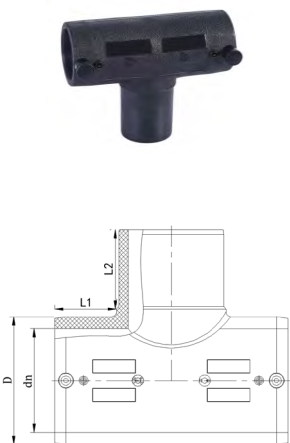
Flange (Steel Tray) PN1.6



Description CN	PN	D1	D2	D3	D4	n	H
F23-dn140-PN1.6(Black)	PN16	157	210	18	250	8	22
F23-dn200/225-PN1.6(Black)	PN16	237	295	22	340	12	24
F23-dn250/280-PN1.6(Black)	PN16	293	355	26	405	12	26
F23-dn315-PN1.6(Black)	PN16	338	410	26	460	12	28
F23-dn355-PN1.6(Black)	PN16	378	470	26	520	16	30
F23-dn400-PN1.6(Black)	PN16	430	525	30	580	16	32
F23-dn450-PN1.6(Black)	PN16	472	585	30	640	20	40
F23-dn500-PN1.6(Black)	PN16	522	650	33	715	20	44
F23-dn560-PN1.6(Black)	PN16	580	770	36	840	20	54
F23-dn630-PN1.6(Black)	PN16	646	770	36	840	20	54
F23-dn710-PN1.6(Black)	PN16	738	840	36	910	24	40
F23-dn800-PN1.6(Black)	PN16	840	950	39	1025	24	42
F23-dn710-PN1.6(Black)	PN16	1047	1170	42	1255	28	46
F23-dn710-PN1.6(Black)	PN16	1237	1390	48	1485	32	52

Electro Fusion Fittings

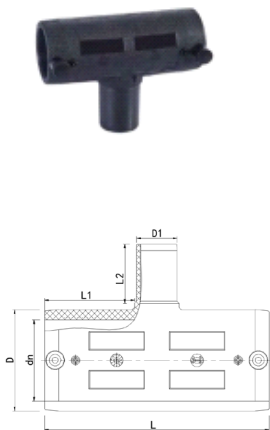
E/F Equal Tee



Description CN	SDR	D	D1	L	L1	L2
F23-dn25(Black)	SDR11	40	25	96	38	42
F23-dn32(Black)	SDR11	46	32	116	42	42
F23-dn40(Black)	SDR11	56	40	136	48	52
F23-dn50(Black)	SDR11	64	50	152	50	56
F23-dn63(Black)	SDR11	81	63	165	54	63
F23-dn75(Black)	SDR11	94	75	190	60	71
F23-dn90(Black)	SDR11	112	90	210	65	79
F23-dn110(Black)	SDR11	136	110	245	75	82
F23-dn125(Black)	SDR11	155	125	260	76	87
F23-dn160(Black)	SDR11	195	160	312	85	98
F23-dn200(Black)	SDR11	242	200	368	97	112
F23-dn225(Black)	SDR11	272	225	398	105	120
F23-dn250(Black)	SDR11	300	250	440	110	129
F23-dn315(Black)	SDR11	376	315	505	118	150
F23-dn355(Black)	SDR11	427	355	570	142	150
F23-dn400-PN1.6(Black)	SDR11	482	400	635	156	175
F23-dn355-PN1.0(Black)	SDR17	405	355	600	146	172
F23-dn450-PN1.0(Black)	SDR17	515	450	720	165	160
F23-dn500-PN1.0(Black)	SDR17	568	500	750	175	160
F23-dn630-PN1.0(Black)	SDR17	716	630	830	190	180
F23-dn32-PN2.0(Black)	SDR9	46	32	116	42	42
F23-dn40-PN2.0(Black)	SDR9	56	40	136	48	52
F23-dn50-PN2.0(Black)	SDR9	64	50	152	50	56
F23-dn63-PN2.0(Black)	SDR9	83	63	176	55	63
F23-dn75-PN2.0(Black)	SDR9	96	75	199	60	70
F23-dn90-PN2.0(Black)	SDR9	115	90	224	65	79
F23-dn110-PN2.0(Black)	SDR9	138	110	264	75	83
F23-dn125-PN2.0(Black)	SDR9	158	125	277	90	87
F23-dn160-PN2.0(Black)	SDR9	200	160	345	90	99
F23-dn200(Black)-PN2.0(Black)	SDR9	250	200	415	105	112
F23-dn250-PN2.0(Black)	SDR9	312	250	487	115	130
F23-dn315-PN2.0(Black)	SDR9	392	315	588	130	150

Electro Fusion Fittings

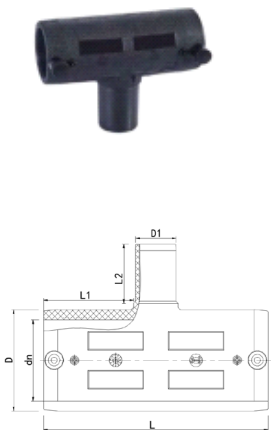
E/F Reducing Tee



Product Descriptions	SDR	D	dn	D1	L	L1	L2
F23-dn25X20X25(Black)	SDR11	40	25	20	93	38	42
F23-dn32X20X32(Black)	SDR11	46	32	20	115	43	42
F23-dn32X25X32(Black)	SDR11	46	32	25	115	43	42
F23-dn40X20X40(Black)	SDR11	56	40	20	125	52	42
F23-dn40X25X40(Black)	SDR11	56	40	25	125	52	42
F23-dn40X32X40(Black)	SDR11	57	40	32	136	46	52
F23-dn50X25X50(Black)	SDR11	64	50	25	150	50	42
F23-dn50X32X50(Black)	SDR11	64	50	32	150	50	45
F23-dn50X40X50(Black)	SDR11	64	50	40	150	50	50
F23-dn63X25X63(Black)	SDR11	81	63	25	175	55	42
F23-dn63X32X63(Black)	SDR11	81	63	32	146	55	45
F23-dn63X40X63(Black)	SDR11	81	63	40	146	55	50
F23-dn63X50X63(Black)	SDR11	81	63	50	156	55	56
F23-dn75X32X75(Black)	SDR11	95	75	32	152	60	45
F23-dn75X40X75(Black)	SDR11	95	75	40	160	60	50
F23-dn75X50X75(Black)	SDR11	95	75	50	168	60	55
F23-dn75X63X75(Black)	SDR11	95	75	63	178	60	64
F23-dn90X32X90(Black)	SDR11	112	90	32	164	65	45
F23-dn90X40X90(Black)	SDR11	112	90	40	170	65	50
F23-dn90X50X90(Black)	SDR11	112	90	50	180	65	55
F23-dn90X63X90(Black)	SDR11	112	90	63	188	65	64
F23-dn90X75X90(Black)	SDR11	112	90	75	198	65	71
F23-dn110X32X110(Black)	SDR11	135	110	32	175	70	45
F23-dn110X40X110(Black)	SDR11	135	110	40	183	70	49
F23-dn110X50X110(Black)	SDR11	135	110	50	194	70	55
F23-dn110X63X110(Black)	SDR11	135	110	63	205	70	64
F23-dn110X75X110(Black)	SDR11	135	110	75	215	70	71
F23-dn110X90X110(Black)	SDR11	135	110	90	228	70	79
F23-dn125X90X125(Black)	SDR11	155	125	90	225	73	79
F23-dn160X50X160(Black)	SDR11	194	160	50	228	84	55
F23-dn160X63X160(Black)	SDR11	194	160	63	229	84	65
F23-dn160X75X160(Black)	SDR11	194	160	75	238	84	71
F23-dn160X90X160 (Black)	SDR11	194	160	90	252	84	79
F23-dn160X110X160 (Black)	SDR11	194	160	110	270	84	82
F23-dn200X63X200 (Black)	SDR11	239	200	63	258	98	65
F23-dn200X75X200 (Black)	SDR11	239	200	75	268	98	70
F23-dn200X90X200 (Black)	SDR11	239	200	90	280	98	79
F23-dn200X110X200 (Black)	SDR11	239	200	110	296	98	82
F23-dn200X160X200 (Black)	SDR11	239	200	160	338	98	98
F23-dn225x110x225 (Black)	SDR11	272	225	110	292	100	79
F23-dn225x160x225 (Black)	SDR11	272	225	160	342	100	98
F23-dn225x200x225 (Black)	SDR11	272	225	200	380	100	112
F23-dn250X90X250 (Black)	SDR11	300	250	90	300	115	79
F23-dn250X110X250 (Black)	SDR11	300	250	110	318	115	82
F23-dn250X160X250 (Black)	SDR11	300	250	160	360	115	98
F23-dn250X200X250 (Black)	SDR11	300	250	200	392	115	112
F23-dn315X110X315 (Black)	SDR11	378	315	110	338	120	82
F23-dn315X160X315 (Black)	SDR11	378	315	160	378	120	98
F23-dn315X200X315 (Black)	SDR11	378	315	200	410	120	112
F23-dn315X250X315 (Black)	SDR11	378	315	250	450	120	129
F23-dn355X200X355 (Black)	SDR11	427	355	200	490	160	112
F23-dn355X250X355 (Black)	SDR11	427	355	250	490	142	129

Electro Fusion Fittings

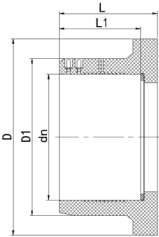
E/F Reducing Tee



Product Descriptions	SDR	D	dn	D1	L	L1	L2
F23-dn355X315X355 (Black)	SDR11	427	355	315	570	157	150
F23-dn400x200x400-PN1.6 (Black)	SDR11	482	400	200	460	150	112
F23-dn400x250x400-PN1.6 (Black)	SDR11	482	400	250	505	150	129
F23-dn400x315x400-PN1.6 (Black)	SDR11	482	400	315	560	150	150
F23-dn450x250x450-PN1.0 (Black)	SDR17	514	450	250	550	160	129
F23-dn450x315x450-PN1.0 (Black)	SDR17	514	450	315	606	160	150
F23-dn450x400x450-PN1.0 (Black)	SDR17	514	450	400	680	160	180
F23-dn500x315x500-PN1.0 (Black)	SDR17	578	500	315	640	178	150
F23-dn500x400x500-PN1.0 (Black)	SDR17	578	500	400	710	178	145
F23-dn500x450x500-PN1.0 (Black)	SDR17	578	500	450	755	178	162
F23-dn630x400x630-PN1.0 (Black)	SDR17	715	630	400	740	195	145
F23-dn630x450x630-PN1.0 (Black)	SDR17	715	630	450	786	195	162
F23-dn630x500x630-PN1.0 (Black)	SDR17	715	630	500	830	195	180
F23-dn40x32x40-PN2.0 (Black)	SDR9	57	40	32	136	46	51
F23-dn50x25x50-PN2.0 (Black)	SDR9	65	50	25	150	50	42
F23-dn50x32x50-PN2.0 (Black)	SDR9	65	50	32	150	50	45
F23-dn50x40x50-PN2.0 (Black)	SDR9	65	50	40	150	50	50
F23-dn63x25x63-PN2.0 (Black)	SDR9	83	63	25	175	50	42
F23-dn63x32x63-PN2.0 (Black)	SDR9	83	63	32	175	55	45
F23-dn63x40x63-PN2.0 (Black)	SDR9	83	63	40	175	50	50
F23-dn63x50x63-PN2.0 (Black)	SDR9	83	63	50	175	55	56
F23-dn75x32x75-PN2.0 (Black)	SDR9	96	75	32	200	60	45
F23-dn75x40x75-PN2.0 (Black)	SDR9	96	75	40	200	60	50
F23-dn75x50x75-PN2.0 (Black)	SDR9	96	75	50	200	60	56
F23-dn75x63x75-PN2.0 (Black)	SDR9	96	75	63	200	60	66
F23-dn90x32x90-PN2.0 (Black)	SDR9	115	90	32	225	65	45
F23-dn90x40x90-PN2.0 (Black)	SDR9	115	90	40	225	65	50
F23-dn90x50x90-PN2.0 (Black)	SDR9	115	90	50	225	65	56
F23-dn90x63x90-PN2.0 (Black)	SDR9	115	90	63	225	65	66
F23-dn90x75x90-PN2.0 (Black)	SDR9	115	90	75	225	65	71
F23-dn110x32x110-PN2.0 (Black)	SDR9	137	110	32	265	75	45
F23-dn110x40x110-PN2.0 (Black)	SDR9	137	110	40	265	75	50
F23-dn110x50x110-PN2.0 (Black)	SDR9	137	110	50	265	75	56
F23-dn110x63x110-PN2.0 (Black)	SDR9	137	110	63	265	75	66
F23-dn110x75x110-PN2.0 (Black)	SDR9	137	110	75	265	75	71
F23-dn110x90x110-PN2.0 (Black)	SDR9	137	110	90	265	75	80
F23-dn160x63x160-PN2.0 (Black)	SDR9	200	160	63	345	90	66
F23-dn160x75x160-PN2.0 (Black)	SDR9	200	160	75	345	90	71
F23-dn160x90x160-PN2.0 (Black)	SDR9	200	160	90	345	90	80
F23-dn160x110x160-PN2.0 (Black)	SDR9	200	160	110	345	90	83
F23-dn200x63x200-PN2.0 (Black)	SDR9	250	200	63	416	120	66
F23-dn200x75x200-PN2.0 (Black)	SDR9	250	200	75	416	120	71
F23-dn200x90x200-PN2.0 (Black)	SDR9	250	200	90	416	120	79
F23-dn200x110x200-PN2.0 (Black)	SDR9	250	200	110	416	120	82
F23-dn200x160x200-PN2.0 (Black)	SDR9	250	200	160	416	120	98
F23-dn250x90x250-PN2.0 (Black)	SDR9	312	250	90	486	130	79
F23-dn250x110x250-PN2.0 (Black)	SDR9	312	250	110	486	130	83
F23-dn250x160x250-PN2.0 (Black)	SDR9	312	250	160	486	130	99
F23-dn250x200x250-PN2.0 (Black)	SDR9	312	250	200	486	130	113
F23-dn315x110x315-PN2.0 (Black)	SDR9	392	315	110	588	150	83
F23-dn315x160x315-PN2.0 (Black)	SDR9	392	315	160	588	150	98
F23-dn315x200x315-PN2.0 (Black)	SDR9	392	315	200	588	150	112
F23-dn315x250x315-PN2.0 (Black)	SDR9	392	315	250	588	150	129

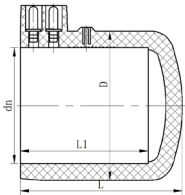
Electro Fusion Fittings

E/F Stub Flange



Description CN	SDR	D	D1	dn	L	L1
F23-dn50-PN1.6(Black)	SDR11	88	66	50	72	66
F23-dn63-PN1.6(Black)	SDR11	102	80	63	75	70
F23-dn75-PN1.6(Black)	SDR11	125	95	75	76	70
F23-dn90-PN1.6(Black)	SDR11	140	110	90	85	80
F23-dn125-PN1.6(Black)	SDR11	190	152	125	98	92
F23-dn110-PN1.6(Black)	SDR11	175	136	110	90	85
F23-dn160-PN1.6(Black)	SDR11	238	194	160	112	105
F23-dn200-PN1.6(Black)	SDR11	290	240	200	122	115
F23-dn250-PN1.6(Black)	SDR11	350	298	250	133	128
F23-dn315-PN1.6(Black)	SDR11	404	367	315	160	155
F23-dn400-PN1.6(Black)	SDR11	528	478	400	225	217
F23-dn450-PN1.6(Black)	SDR11	585	539	450	235	228
F23-dn500-PN1.6(Black)	SDR11	648	598	500	258	250
F23-dn560-PN1.6(Black)	SDR11	730	670	560	260	252
F23-dn200-PN1.0(Black)	SDR17	290	228	200	115	110
F23-dn250-PN1.0(Black)	SDR17	350	298	250	133	128
F23-dn315-PN1.0(Black)	SDR17	402	358	315	145	140
F23-dn355-PN1.0(Black)	SDR17	455	405	355	170	163
F23-dn400-PN1.0(Black)	SDR17	527	459	400	225	217
F23-dn450-PN1.0(Black)	SDR17	584	510	450	235	228
F23-dn500-PN1.0(Black)	SDR17	645	580	500	258	250
F23-dn560-PN1.0(Black)	SDR17	720	646	560	260	252
F23-dn630-PN1.0(Black)	SDR17	810	718	630	280	270
F23-dn710-PN1.0(Black)	SDR17	720	646	560	260	252
F23-dn800-PN1.0(Black)	SDR17	720	646	560	260	252
F23-dn50-PN2.0(Black)	SDR9	88	67	50	78	73
F23-dn63-PN2.0(Black)	SDR9	102	82	63	83	78
F23-dn75-PN2.0(Black)	SDR9	122	96	75	80	75
F23-dn90-PN2.0(Black)	SDR9	138	115	90	84	78
F23-dn110-PN2.0(Black)	SDR9	158	140	110	90	84
F23-dn160-PN2.0(Black)	SDR9	240	200	160	112	105
F23-dn200-PN2.0(Black)	SDR9	286	250	200	130	120
F23-dn250-PN2.0(Black)	SDR9	354	312	250	136	125
F23-dn315-PN2.0(Black)	SDR9	425	388	315	165	155

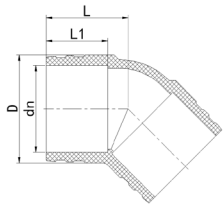
E/F Cap



Description CN	SDR	D	dn	L1	L
F23-dn50-PN1.6(Black)	SDR11	65	50	64	78
F23-dn63-PN1.6(Black)	SDR11	80	63	70	88
F23-dn75-PN1.6(Black)	SDR11	95	75	73	92
F23-dn90-PN1.6(Black)	SDR11	112	90	78	105
F23-dn110-PN1.6(Black)	SDR11	136	110	90	112
F23-dn160-PN1.6(Black)	SDR11	194	160	105	135
F23-dn200-PN1.6(Black)	SDR11	240	200	110	145
F23-dn250-PN1.6(Black)	SDR11	299	250	125	170
F23-dn315-PN1.6(Black)	SDR11	377	315	130	185
F23-dn160-PN2.0(Black)	SDR9	240	200	160	112
F23-dn200-PN2.0(Black)	SDR9	286	250	200	130
F23-dn250-PN2.0(Black)	SDR9	354	312	250	136
F23-dn315-PN2.0(Black)	SDR9	425	388	315	165

Electro Fusion Fittings

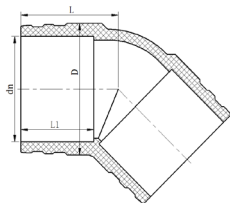
E/F Equal Elbow(45°)



Description CN	SDR	D	dn	L	L1
F23-dn20-PN1.6(Black)	SDR11	33	20	72	35
F23-dn25-PN1.6(Black)	SDR11	39	25	85	42
F23-dn32-PN1.6(Black)	SDR11	44	32	86	42
F23-dn40-PN1.6(Black)	SDR11	55	40	98	47
F23-dn50-PN1.6(Black)	SDR11	64	50	100	49
F23-dn63-PN1.6(Black)	SDR11	80	63	105	52
F23-dn75-PN1.6(Black)	SDR11	95	75	115	57
F23-dn90-PN1.6(Black)	SDR11	111	90	125	61
F23-dn110-PN1.6(Black)	SDR11	133	110	140	68
F23-dn125-PN1.6(Black)	SDR11	154	125	142	70
F23-dn140-PN1.6(Black)	SDR11	173	140	155	77
F23-dn160-PN1.6(Black)	SDR11	193	160	165	82
F23-dn180-PN1.6(Black)	SDR11	218	180	185	92
F23-dn200-PN1.6(Black)	SDR11	240	200	188	94
F23-dn225-PN1.6(Black)	SDR11	270	225	210	103
F23-dn250-PN1.6(Black)	SDR11	298	250	215	106
F23-dn280-PN1.6(Black)	SDR11	337	280	215	106
F23-dn315-PN1.6(Black)	SDR11	378	315	238	118
F23-dn355-PN1.6(Black)	SDR11	427	355	280	138
F23-dn400-PN1.6(Black)	SDR11	479	400	285	140
F23-dn450-PN1.6(Black)	SDR11	538	450	326	162
F23-dn500-PN1.6(Black)	SDR11	598	500	378	188
F23-dn560-PN1.6(Black)	SDR11	670	560	388	192
F23-dn630-PN1.6(Black)	SDR11	752	630	418	208
F23-dn710-PN1.6(Black)	SDR11	848	710	445	222
F23-dn800-PN1.6(Black)	SDR11	954	800	470	234
F23-dn20-PN2.0(Black)	SDR9	34	20	72	35
F23-dn25-PN2.0(Black)	SDR9	39	25	85	40
F23-dn32-PN2.0(Black)	SDR9	45	32	88	42
F23-dn40-PN2.0(Black)	SDR9	56	40	98	47
F23-dn50-PN2.0(Black)	SDR9	66	50	98	47
F23-dn63-PN2.0(Black)	SDR9	84	63	125	60
F23-dn75-PN2.0(Black)	SDR9	96	75	120	58
F23-dn90-PN2.0(Black)	SDR9	118	90	148	72
F23-dn110-PN2.0(Black)	SDR9	138	110	150	73
F23-dn125-PN2.0(Black)	SDR9	157	125	178	87
F23-dn140-PN2.0(Black)	SDR9	176	140	183	90
F23-dn160-PN2.0(Black)	SDR9	200	160	180	90
F23-dn200-PN2.0(Black)	SDR9	250	200	210	105
F23-dn225-PN2.0(Black)	SDR9	280	225	220	110
F23-dn250-PN2.0(Black)	SDR9	312	250	230	115
F23-dn280-PN2.0(Black)	SDR9	349	280	240	120
F23-dn315-PN2.0(Black)	SDR9	393	315	265	132
F23-dn110-PN1.0(Black)	SDR17	129	110	107	53
F23-dn160-PN1.0(Black)	SDR17	185	160	138	68
F23-dn200-PN1.0(Black)	SDR17	229	200	162	80
F23-dn225-PN1.0(Black)	SDR17	258	225	178	88
F23-dn250-PN1.0(Black)	SDR17	286	250	192	95

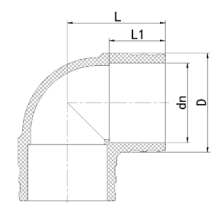
Electro Fusion Fittings

E/F Equal Elbow(45°)



Description CN	SDR	D	dn	L	L1
F23-dn315-PN1.0(Black)	SDR17	360	315	235	116
F23-dn355-PN1.0(Black)	SDR17	407	355	270	132
F23-dn400-PN1.0(Black)	SDR17	452	400	280	140
F23-dn450-PN1.0(Black)	SDR17	510	450	320	160
F23-dn500-PN1.0(Black)	SDR17	565	500	360	180
F23-dn630-PN1.0(Black)	SDR17	712	630	390	195
F23-dn710-PN1.0(Black)	SDR17	805	710	435	217
F23-dn800-PN1.0(Black)	SDR17	905	800	460	230
F23-dn900-PN1.0(Black)	SDR17	1035	900	470	235
F23-dn1000-PN1.0(Black)	SDR17	1150	1000	580	290

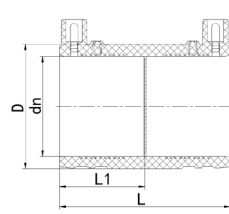
E/F Elbow 90°



Description CN	SDR	D	dn	L	L1
F23-dn25X90°-PN1.6(Black)	SDR11	40	25	55	42
F23-dn32X90°-PN1.6(Black)	SDR11	46	32	60	44
F23-dn40X90°-PN1.6(Black)	SDR11	55	40	70	45
F23-dn50X90°-PN1.6(Black)	SDR11	65	50	77	50
F23-dn63X90°-PN1.6(Black)	SDR11	80	63	86	50
F23-dn75X90°-PN1.6(Black)	SDR11	94	75	100	60
F23-dn90X90°-PN1.6(Black)	SDR11	112	90	110	63
F23-dn110X90°-PN1.6(Black)	SDR11	134	110	130	72
F23-dn125X90°-PN1.6(Black)	SDR11	153	125	138	74
F23-dn160X90°-PN1.6(Black)	SDR11	193	160	168	85
F23-dn200X90°-PN1.6(Black)	SDR11	240	200	200	98
F23-dn225X90°-PN1.6(Black)	SDR11	272	225	218	105
F23-dn250X90°-PN1.6(Black)	SDR11	300	250	237	110
F23-dn315X90°-PN1.6(Black)	SDR11	380	315	278	118
F23-dn355x90°-PN1.6(Black)	SDR11	428	355	320	145
F23-dn400x90°-PN1.6(Black)	SDR11	480	400	365	158
F23-dn630x90°-PN1.0(Black)	SDR17	715	630	515	195
F23-dn25x90°-PN2.0(Black)	SDR9	40	25	55	42
F23-dn32x90°-PN2.0(Black)	SDR9	46	32	60	44
F23-dn40x90°-PN2.0(Black)	SDR9	56	40	70	45
F23-dn50x90°-PN2.0(Black)	SDR9	65	50	77	50
F23-dn63x90°-PN2.0(Black)	SDR9	81	63	90	55
F23-dn75x90°-PN2.0(Black)	SDR9	95	75	100	60
F23-dn90x90°-PN2.0(Black)	SDR9	114	90	112	65
F23-dn110x90°-PN2.0(Black)	SDR9	138	110	132	75
F23-dn125x90°-PN2.0(Black)	SDR9	167	125	152	100
F23-dn160x90°-PN2.0(Black)	SDR9	201	160	174	90
F23-dn200x90°-PN2.0(Black)	SDR9	280	200	210	105
F23-dn250x90°-PN2.0(Black)	SDR9	312	250	245	114
F23-dn315x90°-PN2.0(Black)	SDR9	392	315	295	132

Electro Fusion Fittings

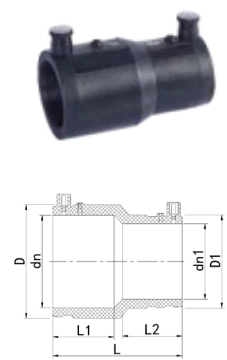
E/F Reducer



Description CN	SDR	D	dn	D1	dn1	L	L1	L2
F23-dn20-PN1.6(Black)	SDR11	33	20	72	35	99	44	40
F23-dn25-PN1.6(Black)	SDR11	39	25	85	42	100	49	42
F23-dn32-PN1.6(Black)	SDR11	44	32	86	42	110	55	43
F23-dn40-PN1.6(Black)	SDR11	55	40	98	47	114	55	45
F23-dn50-PN1.6(Black)	SDR11	64	50	100	49	131	63	44
F23-dn63-PN1.6(Black)	SDR11	80	63	105	52	130	63	50
F23-dn75-PN1.6(Black)	SDR11	95	75	115	57	130	62	60
F23-dn90-PN1.6(Black)	SDR11	111	90	125	61	145	55	49
F23-dn110-PN1.6(Black)	SDR11	133	110	140	68	130	60	55
F23-dn125-PN1.6(Black)	SDR11	154	125	142	70	122	60	55
F23-dn140-PN1.6(Black)	SDR11	173	140	155	77	150	72	55
F23-dn160-PN1.6(Black)	SDR11	193	160	165	82	150	72	60
F23-dn180-PN1.6(Black)	SDR11	218	180	185	92	145	72	64
F23-dn200-PN1.6(Black)	SDR11	240	200	188	94	158	73	53
F23-dn225-PN1.6(Black)	SDR11	270	225	210	103	156	73	55
F23-dn250-PN1.6(Black)	SDR11	298	250	215	106	150	73	58
F23-dn280-PN1.6(Black)	SDR11	337	280	215	106	152	72	68
F23-dn315-PN1.6(Black)	SDR11	378	315	238	118	164	80	76
F23-dn355-PN1.6(Black)	SDR11	427	355	280	138	196	88	73
F23-dn400-PN1.6(Black)	SDR11	479	400	285	140	193	88	80
F23-dn450-PN1.6(Black)	SDR11	538	450	326	162	193	88	86
F23-dn500-PN1.6(Black)	SDR11	598	500	378	188	218	93	70
F23-dn560-PN1.6(Black)	SDR11	670	560	388	192	213	93	75
F23-dn630-PN1.6(Black)	SDR11	752	630	418	208	199	93	85
F23-dn710-PN1.6(Black)	SDR11	848	710	445	222	240	107	75
F23-dn800-PN1.6(Black)	SDR11	954	800	470	234	227	107	85
F23-dn20-PN2.0(Black)	SDR9	34	20	72	35	217	107	95
F23-dn25-PN2.0(Black)	SDR9	39	25	85	40	252	107	75
F23-dn32-PN2.0(Black)	SDR9	45	32	88	42	238	107	86
F23-dn40-PN2.0(Black)	SDR9	56	40	98	47	225	107	93
F23-dn50-PN2.0(Black)	SDR9	66	50	98	47	225	107	105
F23-dn63-PN2.0(Black)	SDR9	84	63	125	60	294	117	75
F23-dn75-PN2.0(Black)	SDR9	96	75	120	58	278	117	85
F23-dn90-PN2.0(Black)	SDR9	118	90	148	72	270	117	96
F23-dn110-PN2.0(Black)	SDR9	138	110	150	73	266	117	105
F23-dn125-PN2.0(Black)	SDR9	157	125	178	87	246	117	97
F23-dn140-PN2.0(Black)	SDR9	176	140	183	90	330	145	110
F23-dn160-PN2.0(Black)	SDR9	200	160	180	90	310	145	120
F23-dn200-PN2.0(Black)	SDR9	250	200	210	105	350	160	120
F23-dn225-PN2.0(Black)	SDR9	280	225	220	110	330	160	140
F23-dn250-PN2.0(Black)	SDR9	312	250	230	115	99	44	40
F23-dn280-PN2.0(Black)	SDR9	349	280	240	120	100	49	40
F23-dn315-PN2.0(Black)	SDR9	393	315	265	132	110	55	43
F23-dn110-PN1.0(Black)	SDR17	129	110	107	53	114	55	45
F23-dn160-PN1.0(Black)	SDR17	185	160	138	68	131	63	44
F23-dn200-PN1.0(Black)	SDR17	229	200	162	80	130	63	49
F23-dn225-PN1.0(Black)	SDR17	258	225	178	88	135	63	50
F23-dn250-PN1.0(Black)	SDR17	286	250	192	95	154	70	63
F23-dn315-PN1.0(Black)	SDR17	360	315	235	116	167	79	63
F23-dn355-PN1.0(Black)	SDR17	407	355	270	132	161	79	66
F23-dn400-PN1.0(Black)	SDR17	452	400	280	140	193	95	66
F23-dn450-PN1.0(Black)	SDR17	510	450	320	160	187	98	73
F23-dn500-PN1.0(Black)	SDR17	565	500	360	180	193	98	74
F23-dn630-PN1.0(Black)	SDR17	712	630	390	195	195	98	84
F23-dn710-PN1.0(Black)	SDR17	805	710	435	217	-	-	-
F23-dn800-PN1.0(Black)	SDR17	905	800	460	230	-	-	-
F23-dn900-PN1.0(Black)	SDR17	1035	900	470	235	-	-	-
F23-dn1000-PN1.0(Black)	SDR17	1150	1000	580	290	-	-	-

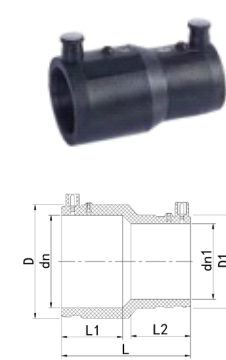
Electro Fusion Fittings

E/F Reducer

	Description CN	SDR	D	dn	D1	dn1	L	L1	L2
	F23-dn32X25-PN1.6(Black)	SDR11	47	32	40	25	99	44	40
	F23-dn40X32-PN1.6(Black)	SDR11	56	40	46	32	100	49	42
	F23-dn50X32-PN1.6(Black)	SDR11	67	50	47	32	110	55	43
	F23-dn50X40-PN1.6(Black)	SDR11	67	50	56	40	114	55	45
	F23-dn63X32-PN1.6(Black)	SDR11	85	63	47	32	131	63	44
	F23-dn63X40-PN1.6(Black)	SDR11	85	63	55	40	130	63	50
	F23-dn63X50-PN1.6(Black)	SDR11	82	63	66	50	130	62	60
	F23-dn75X40-PN1.6(Black)	SDR11	103	75	58	40	145	55	49
	F23-dn75x50-PN1.6(Black)	SDR11	95	75	67	50	130	60	55
	F23-dn75X63-PN1.6(Black)	SDR11	95	75	80	63	122	60	55
	F23-dn90x50-PN1.6(Black)	SDR11	111	90	67	50	150	72	55
	F23-dn90X63-PN1.6(Black)	SDR11	111	90	80	63	150	72	60
	F23-dn90X75-PN1.6(Black)	SDR11	111	90	95	75	145	72	64
	F23-dn110X50-PN1.6(Black)	SDR11	135	110	67	50	158	73	53
	F23-dn110X63-PN1.6(Black)	SDR11	135	110	80	63	156	73	55
	F23-dn110X75-PN1.6(Black)	SDR11	135	110	95	75	150	73	58
	F23-dn110X90-PN1.6(Black)	SDR11	135	110	111	90	152	72	68
	F23-dn125X110-PN1.6(Black)	SDR11	155	125	135	110	164	80	76
	F23-dn160X90-PN1.6(Black)	SDR11	197	160	111	90	196	88	73
	F23-dn160X110-PN1.6(Black)	SDR11	197	160	135	110	193	88	80
	F23-dn160X125-PN1.6(Black)	SDR11	197	160	155	125	193	88	86
	F23-dn200X90-PN1.6(Black)	SDR11	242	200	112	90	218	93	70
	F23-dn200X110-PN1.6(Black)	SDR11	242	200	135	110	213	93	75
	F23-dn200X160-PN1.6(Black)	SDR11	242	200	195	160	199	93	85
	F23-dn225X110-PN1.6(Black)	SDR11	273	225	136	110	240	107	75
	F23-dn225X160-PN1.6(Black)	SDR11	273	225	196	160	227	107	85
	F23-dn225X200-PN1.6(Black)	SDR11	273	225	242	200	217	107	95
	F23-dn250X110-PN1.6(Black)	SDR11	301	250	138	110	252	107	75
	F23-dn250X160-PN1.6(Black)	SDR11	301	250	195	160	238	107	86
	F23-dn250X200-PN1.6(Black)	SDR11	301	250	241	200	225	107	93
	F23-dn250X225-PN1.6(Black)	SDR11	301	250	271	225	225	107	105
	F23-dn315X110-PN1.6(Black)	SDR11	380	315	136	110	294	117	75
	F23-dn315X160-PN1.6(Black)	SDR11	380	315	195	160	278	117	85
	F23-dn315X200-PN1.6(Black)	SDR11	380	315	241	200	270	117	96
	F23-dn315X225-PN1.6(Black)	SDR11	380	315	271	225	266	117	105
	F23-dn315X250-PN1.6(Black)	SDR11	380	315	301	250	246	117	97
	F23-dn400x250-PN1.6(Black)	SDR11	482	400	300	250	330	145	110
	F23-dn400x315-PN1.6(Black)	SDR11	482	400	380	315	310	145	120
	F23-dn450x315-PN1.6(Black)	SDR11	540	450	380	315	350	160	120
	F23-dn450x400-PN1.6(Black)	SDR11	540	450	482	400	330	160	140
	F23-dn32x25-PN2.0(Black)	SDR9	47	32	40	25	99	44	40
	F23-dn40x32-PN2.0(Black)	SDR9	56	40	47	32	100	49	40
	F23-dn50x32-PN2.0(Black)	SDR9	68	50	47	32	110	55	43
	F23-dn50x40-PN2.0(Black)	SDR9	68	50	56	40	114	55	45
	F23-dn63x32-PN2.0(Black)	SDR9	85	63	47	32	131	63	44
	F23-dn63x40-PN2.0(Black)	SDR9	85	63	55	40	130	63	49
	F23-dn63x50-PN2.0(Black)	SDR9	85	63	68	50	135	63	50
	F23-dn75x63-PN2.0(Black)	SDR9	103	75	88	63	154	70	63
	F23-dn90x63-PN2.0(Black)	SDR9	121	90	88	63	167	79	63
	F23-dn90x75-PN2.0(Black)	SDR9	120	90	100	75	161	79	66
	F23-dn110x63-PN2.0(Black)	SDR9	141	110	88	63	193	95	66
	F23-dn110x75-PN2.0(Black)	SDR9	141	110	101	75	187	98	73
	F23-dn110x90-PN2.0(Black)	SDR9	141	110	127	90	193	98	74

Electro Fusion Fittings

E/F Reducer

	Description CN	SDR	D	dn	D1	dn1	L	L1	L2
	F23-dn125x110-PN2.0(Black)	SDR9	156	125	141	110	195	98	84
	F23-dn160x90-PN2.0(Black)	SDR9	200	160	117	90	216	100	75
	F23-dn160x110-PN2.0(Black)	SDR9	203	160	142	110	246	128	98
	F23-dn200x90-PN2.0(Black)	SDR9	250	200	117	90	258	105	75
	F23-dn200x110-PN2.0(Black)	SDR9	250	200	140	110	248	118	68
	F23-dn200x160-PN2.0(Black)	SDR9	250	200	200	110	224	116	85
	F23-dn250x160-PN2.0(Black)	SDR9	312	250	205	160	274	130	100
	F23-dn250x200-PN2.0(Black)	SDR9	312	250	250	200	275	130	100
	F23-dn315x200-PN2.0(Black)	SDR9	392	315	250	200	323	130	115
	F23-dn315x250-PN2.0(Black)	SDR9	392	315	312	250	295	130	118

E/F Flange (Steel Tray)

Description CN	PN	D1	D3	D4	D5	H	n
F23-dn50-PN1.6(Black)	16	70	110	145	18	11	4
F23-dn63-PN1.6(Black)	16	86	125	160	18	12	4
F23-dn75-PN1.6(Black)	16	100	145	180	18	12	4
F23-dn90-PN1.6(Black)	16	120	160	195	18	12	8
F23-dn110-PN1.6(Black)	16	142	180	215	18	13	8
F23-dn125-PN1.6(Black)	16	164	210	245	18	13	8
F23-dn160-PN1.6(Black)	16	203	240	280	22	14	8
F23-dn200-PN1.6(Black)	16	254	295	335	22	16	12
F23-dn225-PN1.6(Black)	16	269	295	335	22	16	12
F23-dn250-PN1.6(Black)	16	305	355	400	26	17	12
F23-dn315-PN1.6(Black)	16	379	410	455	26	20	12
F23-dn355-PN1.6(Black)	16	433	470	515	26	22	16
F23-dn400-PN1.6(Black)	16	488	525	575	30	23	16
F23-dn450-PN1.6(Black)	16	541	585	635	30	26	20
F23-dn500-PN1.6(Black)	16	602	650	710	33	28	20
F23-dn560-PN1.6(Black)	16	672	770	835	36	32	20
F23-dn200-PN1.0(Black)	10	248	295	335	22	14	8
F23-dn225-PN1.0(Black)	10	268	295	335	22	14	8
F23-dn250-PN1.0(Black)	10	305	350	390	22	15	12
F23-dn315-PN1.0(Black)	10	371	400	440	22	17	12
F23-dn355-PN1.0(Black)	10	417	460	500	22	18	16
F23-dn400-PN1.0(Black)	10	471	515	560	26	19	16
F23-dn450-PN1.0(Black)	10	523	565	610	26	21	20
F23-dn500-PN1.0(Black)	10	587	620	665	26	23	20
F23-dn560-PN1.0(Black)	10	670	725	775	30	26	20
F23-dn630-PN1.0(Black)	10	737	840	890	30	30	24
F23-dn710-PN1.0(Black)	10	802	840	890	30	32	24
F23-dn800-PN1.0(Black)	10	903	950	1010	30	33	24
F23-dn50-PN2.0(Black)	20	70	110	145	18	14	4
F23-dn63-PN2.0(Black)	20	86	125	160	18	15	4
F23-dn75-PN2.0(Black)	20	100	145	180	18	15	4
F23-dn90-PN2.0(Black)	20	122	160	195	18	16	8
F23-dn110-PN2.0(Black)	20	150	180	215	18	17	8
F23-dn160-PN2.0(Black)	20	207	240	280	22	18	8
F23-dn200-PN2.0(Black)	20	260	295	335	22	20	12
F23-dn250-PN2.0(Black)	20	317	355	400	26	22	12
F23-dn315-PN2.0(Black)	20	390	430	475	30	25	16



ENGINEERING TECHNICAL MANUAL

For HDPE PIPING SYSTEM

Preparations

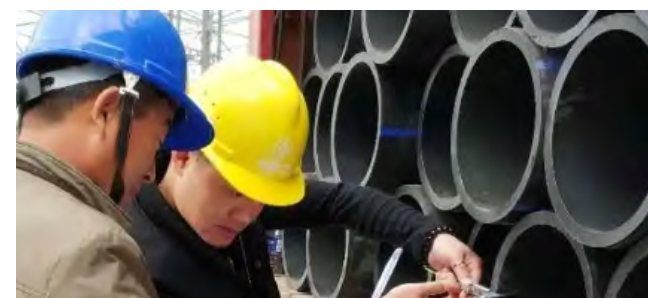
Construction technicians should learn the drawings carefully, grasp the design intent, and promptly contact the owner, supervisor, and design personnel for any problems found in the drawings. They should also conduct a drawing review and keep records of it. Installation personnel must be familiar with the general properties of PE pipes and grasp the necessary operating points;

Before prefabrication, the material plan based on the design and construction drawings should be made up, and the required materials & equipment of proper specifications and models should also be transported to the site.



Material and equipment requirements: Pipes, fittings, etc. arriving at the site must be carefully inspected and verified by the supervisor and owner for material quality, quality assurance certificate, specifications, models, etc. Only after passing the inspection can they be stored and labeled separately.

- The inner and outer walls of pipes and fittings should be smooth and flat, without bubbles, cracks, peeling, obvious marks or depressions, and the color should be basically consistent
- The section face of the pipe should be perpendicular to the axis of the pipe. The pipe fittings should be complete, without defects or deformations;
- Pipes and fittings should not be exposed to sunlight for a long time. To avoid pipe bending during storage and transportation, they should be stacked flat. When handling pipes and fittings, they should be handled with care and avoid oil stains. It is strictly prohibited to violently impact, touch with sharp objects, throw, drop, or drag them;
- If there is a big temperature difference between the construction site and the material storage area, the pipes and fittings should be placed on site for sometime before installation to balance the temperature.



Pipeline system design

1. System design and construction specifications

According to CJJ/T 98-2014 Technical Specification for Plastic Water Supply Pipeline Engineering in Buildings or CJJ101-2016 Technical Specification for Buried Plastic Water Supply Pipeline Engineering,

1.1 System Design

1.1.1 System working pressure calculation

$$PN=CA \cdot P_m / f$$

In the formula:

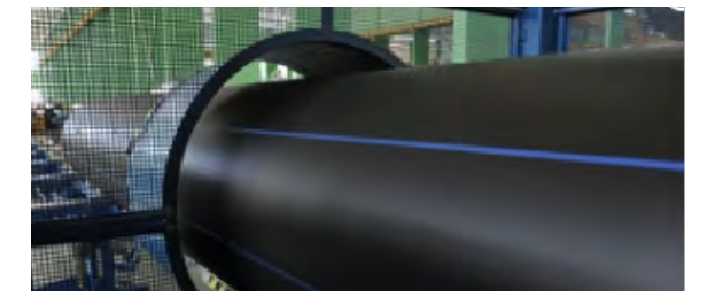
PN - nominal pressure of pipe material, MPa;

CA - Safety factor for engineering application pipes, taken as 1.2~1.5;

Pm - system working pressure, MPa;

f - indicates the pressure reduction coefficient considering temperature increases

Temperature, °C	f
0<T≤20	1.00
20<T≤25	0.93
25<T30	0.87
30<T≤35	0.80
35<T≤40	0.71



1.1.2 Hydraulic calculation of pipelines

1.1.2.1 Hydraulic Calculation of Building Water Supply Pipeline

- Calculation of water head loss per unit length of building water supply pipeline:

$$i = 105 C_h^{(-1.85)} \cdot d_j^{(-1.87)} \cdot q_g^{1.85}$$

In the formula:

i - Water head loss per unit length of cold water pipe, kPa/m (100mm/m):

Ch - Hai Cheng William coefficient, which can be taken as 140;

DJ - calculated inner diameter of pipeline, mm;

QG - Design flow rate of water supply pipeline, m³/s.

- The local head loss of the pipeline system should be taken as a percentage of the head loss along the pipeline network based on the connection status of the pipe fittings. When the inner diameter of the pipe fittings is consistent with the inner diameter of the pipeline, the pipe and fittings should be connected by socket. When using

three-way water diversion, it is advisable to take 25% to 30% of the head loss along the pipeline, and when using a water divider for water diversion, it is advisable to take 15% to 20% of the head loss along the pipeline.

1.1.2.2 Hydraulic calculation of buried water supply pipelines

- The total head loss of the pipeline can be calculated according to the following formula:
 $h_z = h_y + h_j$

In the formula:
 H_z - total head loss of pipeline, m;
 H_y - Head loss along the pipeline, m;
 H_i - Local head loss of pipeline, m;



- The head loss along the pipeline can be calculated according to the following formula:

$$h_y = \lambda \frac{L}{d} \cdot \frac{v^2}{2g}$$
$$\frac{1}{\sqrt{\lambda}} = -2 \log \left[\frac{2.51}{Re \sqrt{\lambda}} + \frac{\Delta}{3.72 d_i} \right]$$
$$Re = \frac{v d_i}{\gamma}$$
$$\gamma = \frac{0.01775}{1 + 0.0337T + 0.00022T^2} \times 10^{-1}$$

In the formula:
 λ - Hydraulic friction coefficient of pipeline
 L - Pipeline length, m;
 D_i - Inner diameter of pipeline, m;
 V - Average velocity of water flow in the pipeline, m/s;
 G - Gravity acceleration, taken as 9.81m/s²;
 Δ - Equivalent roughness of the pipeline, m, can be taken as 0.010x10-3m~0.013x10-3m;
 Re Reynolds number;
 Y - motion viscosity of water, m/s²; Water temperature, °C
 T - Water temperature, °C .



- The local head loss of the pipeline can be calculated according to the following formula:

$$h_i = \sum \frac{\zeta v^2}{2g}$$

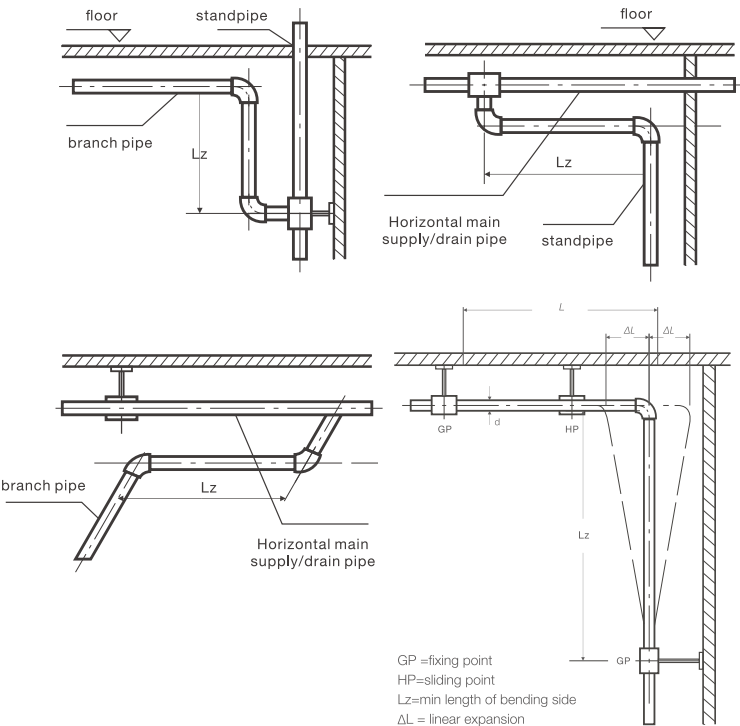
In the formula:
 ζ - local resistance coefficient of the pipeline.
When the calculation data is insufficient, the local water head loss of municipal water supply network pipelines can be calculated at 8% to 12% of the loss along the pipeline network, and the residential one can be calculated at 12% to 18% of the loss along the pipeline network.

1.1.3 Calculation and compensation of temperature difference deformation in pipeline system

- Calculation of pipeline expansion or contraction:

$$\Delta L = L \cdot \alpha \cdot \Delta t$$
$$\Delta t = 0.65 \Delta t_s + 0.1 \Delta t_g$$

ΔL -- Calculate the axial expansion and contraction of the pipe section, mm;
 L - Calculate the length of the pipe section, in millimeters;
 α - Expansion coefficient of the pipe, 18x10-5~20x10-5 (1/° C);
 Δt - Calculate temperature difference, °C ;
 Δt_s - maximum temperature difference inside the pipeline, °C .
 Δt_g - Temperature difference in the surrounding environment of the pipeline, °C .

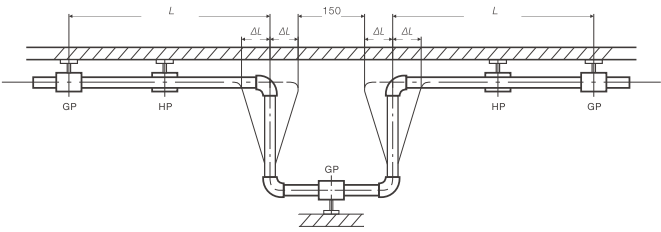


- The pipeline system adopts free arm compensation, and longer straight pipe sections can be arranged around the beams and columns of the building for free arm compensation. Calculation of minimum free arm L_n :

$$L_n = K \cdot \sqrt{\Delta L d_n}$$

In the formula:
 L_n - minimum free arm length, mm;
 K - Pipe coefficient, taken as 20.
 ΔL -- Calculate the axial expansion and contraction length of the pipe section, mm;
 D_n - nominal outer diameter of the pipe, mm.

- When installed pipelines for building water supply have been properly fixed by brackets according to the regulations, the compensation facilities may not be required.
- Buried pipelines can be laid in a meandering manner or naturally curved along the terrain to provide some compensation.



Pipeline layout

Residential communities, industrial parks, and mining enterprises, the water distribution main pipes with a nominal outer diameter of less than or equal to 200mm can be arranged around buildings, and the net distance from the exterior wall should not be less than 1.0m;

The minimum soil cover depth for buried polyethylene water supply pipes should not be less than 0.6m under sidewalks and 1.0m under light vehicle lanes.

The minimum horizontal clearance between pipelines and buildings, structures, and other engineering pipelines should comply with the following regulations:

- Distance from buildings: 1.0m for pipes with a nominal outer diameter of 200mm or less, and 3.0m for pipes with a nominal outer diameter greater than 200mm
- Distance between rainwater and sewage pipes: 0.5-1.0m for pipes with a nominal outer diameter of 200mm or less, and 1.0-1.5m for pipes with a nominal outer diameter greater than 200mm;
- Distance from gas pipe: 0.5m for medium and low pressure pipes, 1.0-1.5m for high pressure pipes
- The distance from the power cable is 0.5m
- The distance from the edge of the roadside stone is 0.5m
- The distance from the foot of the railway slope is 6.0

When the above spacing is difficult to ensure, corresponding safety protection measures should be taken.

The distance between PE pipeline and heated pipeline should be calculated and determined under the condition that the surface temperature of the polyethylene pipeline does not exceed 40 °C. The minimum distance shall not be less than 1.5m

When pipelines cross highways, expressways, railways, and major municipal pipeline facilities the casing such as reinforced concrete pipes, steel pipes, or ductile iron pipes should be used. The outer diameter of the casing should not be less than the outer diameter of the crossing pipe plus 100mm, and the work should be coordinated with relevant parties;

When pipelines intersect with other pipelines, the clear distance for the intersection points should not be less than 0.15m



Excavation

The pipeline must be laid on the original soil foundation, and the over excavated part should be backfilled and compacted;

When encountering waste structures, hard stones, wood, garbage and other debris at the bottom of the trench, they must be removed, and then a layer of sand with a thickness of not less than 0.15m must be laid, leveled and compacted;

For rock foundations, a sand layer with a thickness of not less than 0.15m should be laid

For weak pipe foundations and special corrosive soils, treatment should be carried out according to design requirements

Nominal outer diameter	Trench bottom width
dn≤400	≥dn+300
400>dn≤630	≥dn+450

When the pipe fittings are connected at the bottom of the trench or at the position where the pipe is connected to accessories, the width should be appropriately enlarged

Minimum width for trench bottom.

Laying and Backfilling

The pipeline should be constructed by sections according to the construction organization design, and normally, the pipes should be put along the trench where the pipeline will be laid. For long installation intervals or every day end of work, the pipe opening should be sealed and protected;

When the pipe is moved into the trench, it must not be damaged, and there should be no obvious scratches on the surface. Non metallic ropes should be used to put the pipe into the trench

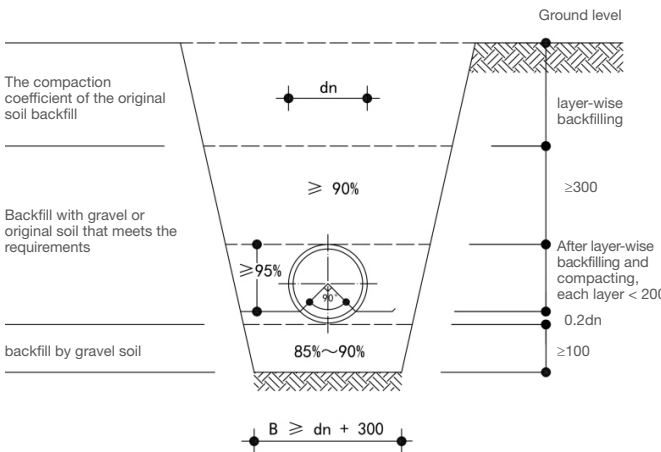
Insulation measures should be taken for pipes crossing cold regions

When the pipeline is laid in each sections and the system will be closed, it is advisable to choose the time period with the smallest difference between the operating water temperature and the construction environment temperature;

After the pipeline is laid, backfilling work should be done as soon as possible. During backfilling, the pipeline connection part should be left until water pressure test completed.

When backfilling, the bottom of the pipe should be filled first, and then both sides of the pipe should be backfilled at the same time, and then backfilled to 0.5m above the top of the pipe. When there is accumulated water in the trench, it must be drained before backfilling;

The backfilled soil should be compacted in layers, with a thickness of 0.2-0.3m for each layer. The backfilled soil on both sides of the pipeline and within 0.5m above the top of the pipeline should not contain debris such as gravel, bricks, garbage, etc. Frozen soil should not be used for backfilling. When the backfilled soil exceeds 0.5 above the top of the pipe, small machinery can be used for compaction. The thickness of each layer of soil cover is 0.25-0.4m.



Fig_1 section drawing of backfilling after pipe being laid

Machinery	Thickness before compaction
wooden tamper, iron tamper	≤0.2
Frog-type rammer	0.2-0.25
Road roller (lightweight)	0.2-0.3
Road roller with vibrator	≤0.4

thickness of each layer backfilled soil without compaction

Only after the pressure test and acceptance of concealed work inspection, and also after the manual backfilling over 0.5m above the top of the pipeline, then machinery can be used for backfilling work. But it is not allowed to drive above the pipeline. Mechanical backfilling should be carried out when the pipeline is filled with water.

Hydraulic Pressure Test

Regulations on Hydraulic Test

Before the pressure test of the pipeline, it should be soaked in water for no less than 24 hours

The hydrostatic pressure for hydraulic test should not be less than 1.5 times of the working pressure of the pipeline, and the test pressure should not be less than 0.80MPa. It is prohibited to use air to replace water to do the pressure test.

The length of the pipeline for hydraulic test should not exceed 1000 meters, and for pipe sections with accessories, the length should not exceed 500 meters. Pipelines with pipes of different material in the system should undergo pressure testing separately. Generally, the test length for the same diameter is 500 meters;

The firmness and reliability of the supporting baffle at the end of the pressure test pipe section should be checked. During the pressure test, the supporting facilities must not be loose or detached, and the valve shall not be used as a sealing plate.

The pressure test section shall not include water hammer arresters, outdoor fire hydrants, and other pipeline accessories. All valves included in the pipeline system shall be fully open.



Preparations before testing

Pipeline pressure testing uses a pipeline pressure testing pump as the pressure source;

Special flanges for PE pipes shall be installed at both ends of the pipeline, sealed with dedicated blocking plates, and pressure testing equipment and accessories shall be installed on the plates;

Automatic air release valves should be installed at the high points at both ends of the pressurized pipeline to ensure that all gas in the pipeline is discharged. The air release device can be installed at the high point of the saddle type tee or blocking plate;

Before use, all types of valves should be cleaned of dirt inside the valve, checked for flexible rotation of the valve stem, and checked for cracks, sand holes, etc. in the valve body and parts. The installation position and stem direction of the valve should be easy to maintain and operate, and the installation should be flat and firm;



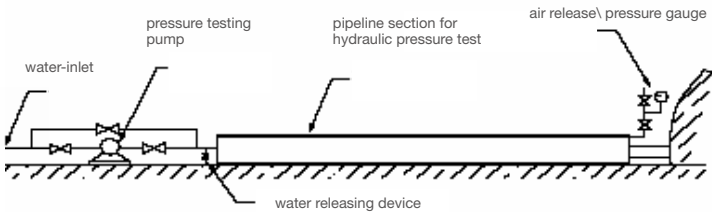
Main device

Device	Usage
diesel Generator	power for pressure testing pump
pressure testing pump	pressure test
centrifugal pump	water discharge
pressure gauge	pressure reading
lifting jack	support the blocking plate
sleeper wood	support the blocking plate
water meter	discharged water quantity reading
automatic air release valve	automatically release air

main device

Pressure Test Stage

The pipeline hydraulic test is divided into a pre-test stage and a main-test stage, which are conducted in two stages.



Fig_2 sketch of water pressure test

Steps of pre-test stage

Reduce the pressure inside the pipeline to atmospheric pressure and maintain it for 60 minutes. During this period, it should be ensured that air does not enter the pipeline;

The static water pressure of the hydraulic test should not be less than 1.5 times of the working pressure of the pipeline, and the test pressure should not be lower than 0.80MPa. By slowly increasing the pressure of the pipeline to the test pressure and stabilizing it for 30 minutes. During this period, if there is a pressure drop, water can be injected to supplement the pressure, but it should not be higher than the test pressure. Check for any leakage at pipeline interfaces, fittings, etc. When there is leakage, the pressure test should be suspended, and the cause should be identified and corresponding measures should be taken before reorganizing the pressure test;

Stop injecting water to supplement pressure and stabilize for 60 minutes. If the pressure drops to more than 70% of the test pressure after 60 minutes, the pre-test stage is completed. If the pressure drops below 70% of the test pressure after 60 minutes, the pressure test should be stopped, and the cause should be identified and corresponding measures be taken before re-organizing the pressure test.

Steps for main-test stage

After the pre-test stage, quickly drain the pipeline and reduce the pressure by 10% to 15% of the test pressure. Accurately calculate the quantity of water released during the depressurization period, set as $V(L)$. Calculate the maximum quantity of water allowed to be released $V_{max}(L)$ according to the following formula

- $V_{max}=1.2 V \Delta P \{ 1/E_w + d_i/(e*n*E_p)\}$
- In the formula, V represents the total volume of the pressure testing pipeline (L);
- ΔP - pressure reduction amount (MPa);
- E_w - bulk modulus of water (MPa). E_w at different water temperatures, see Table 4;
- E_p - the elastic modulus of the pipe (MPa), which is related to the water temperature and pressure test time, as shown in Table 5;
- D_i - Inner diameter of pipeline (m);

Temperature (°C)	Bulk modulus	Temperature	Bulk modulus
5	2082	20	2170
10	2110	25	2210
15	2140	30	2230

Bulk modulus under different water temperature

Temperature (°C)	PE100 Elastic modulus Ew (MPa)		
	1h	2h	3h
5	990	930	900
10	900	850	820
15	820	780	750
20	750	710	680
25	690	650	630
30	640	610	600

Bulk modulus under different water temperature

Record the remaining pressure in the pipeline every 3 minutes, which should be recorded for 30 minutes. When there is an upward trend in the remaining pressure inside the pipeline within 30 minutes, the water pressure test result is qualified;

If there is no upward trend in the remaining water pressure in the pipeline within 30 minutes, it should be observed continuously for another 60 minutes. When the pressure drop does not exceed 0.02 MPa within the entire 90 minutes, the hydraulic test result is qualified;

When both of the above conditions cannot be met during the main-test stage, the hydraulic test result is considered unqualified. The cause should be identified and corresponding measures taken before reorganizing the pressure test.

Pipe Connection and Installation

Connection Method	Applied Pipe Size	Machine	Operation Space
Hot Melt Butt Welding	≥DN63	Hot Melt Butt Welding Machine	Need big space, suggest to construct outdoor
Electro-Fusion	All Sizes	Electro Fusion Machine	Need small space, can be constructed both indoor and outdoor
Hot Melt Socket	DN20 ~ DN110	Hot Melt Socket Welding Machine	Need small space, can be constructed both indoor and outdoor

Notes: Flanges, threads, and steel wire adapters can be used to connect pipes with other materials

Hot Melt Butt Welding

Principle of Hot melt butt welding

The principle of butt welding is to push to tightly adhere two flat end faces to a heating plate, heat them until they melt. Remove the heating plate, place the two melted end faces together, press and hold them for a period of time, and then let the joint cool down;

Hot melt butt welding is commonly used for connecting larger diameter pipes, generally larger than 63mm. A heating plate at a certain temperature is placed between two aligned pipes or fittings and heated for a certain period of time. The heating plate is removed, and the two ends to be welded are quickly butt welded together under a certain pressure and kept under pressure for a certain period of time to cool, forming an interface with a strength higher than that of the pipe body.

Hot melt butt welding machine

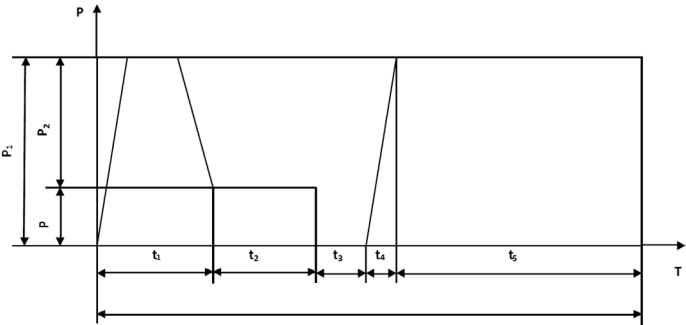
Hot melt butt welding machine is a specialized equipment that heats the end faces of pipes (or fittings) to melt them, quickly adheres them together, and maintains a certain pressure for cooling, thereby achieving the purpose of welding;

Hot melt butt welding machines can generally be divided into two types: ordinary hot melt butt welding machines and automatic hot melt butt welding machines. They are generally composed of a frame, milling cutter, heating plate, and hydraulic station.

Hot melt butt welding steps and process control

After heating and melting the end faces of the pipes or fittings, apply a certain pressure to cool them together. The schematic diagram of its cycle is:

- P1- pressure displayed on the gauge (MPa);
P2- Welding specified pressure (MPa);
P - drag pressure (MPa);
T1- time for the edge to rise to reach the specified height (s);
T2- heat absorption time (s);
T3- Switching time (s);
T4- time to adjust to P1 (s);
T5- Cooling time (min).



Nominal wall thickness, en	Minimum height reached by preheated edge, (mm)	t2 : Heat absorption time (s) usually 10en	t3: Maximum switching time (s)	t5: Minimum cooling time (min)
4.3~6.9	0.5	40~70	5	6~10
7.0~11.4	1.0	70~120	6	10~16
12.2~18.2	1.0	120~180	8	17~24
20.1~25.5	1.5	210~260	10	25~32
28.3~32.2	1.5	280~320	12	33~40

P1=P+P2

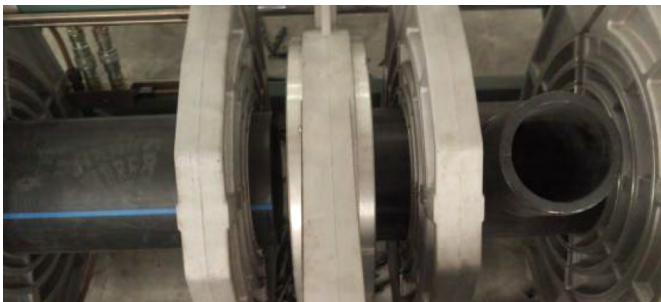
P: The gauge pressure to overcome the frictional resistance of dragging pipe and the butt-jointing machine itself. The actual value can be measured by the welding machine during welding.

P2: Calculated and regulated welding pressure, $P2=(0.15 \pm 0.02) \times S1/S2$

Among them, S1 is the cross-sectional area of the pipe or fitting, measured in mm². S2 is the total effective area of the piston in the hydraulic cylinder of the welding machine, measured in mm², provided by the welding machine manufacturer.

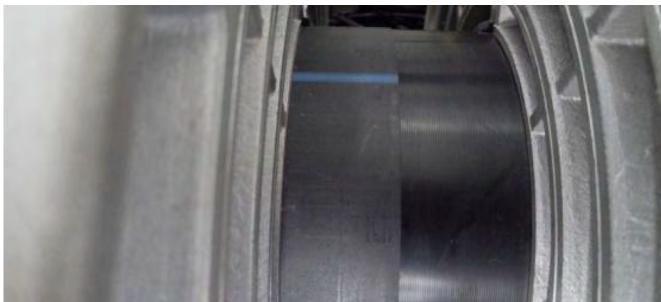
Attention: Due to differences in ambient temperature, the heating time should be adjusted appropriately according to the ambient temperature.

Steps of hot butt welding



1 PREPARE

Connect the power supply of the hot melt butt jointing machine, set the heating plate temperature PE100 to (225 ± 10) C, and prepare the corresponding fixtures. Install the pipe or fitting into the butt jointing machine and cut the end faces flat.



2 ALIGNMENT

Check if the pipes are aligned, if not, the misalignment should be less than 10% of the wall thickness, and test the drag pressure P.

Welding quality inspection

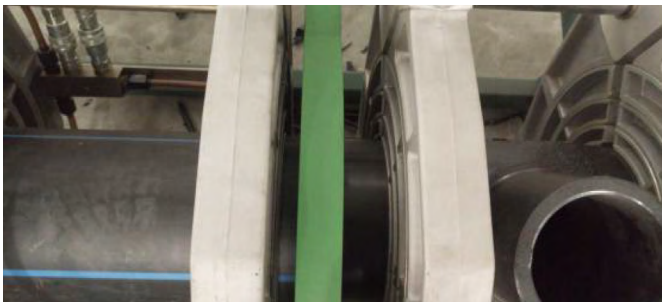
Visual inspection of welding joints: Welding joints have smooth and symmetrical rolled edges along the pipe or fitting, with the lowest depth of the rolled edge not lower than the surface of the pipe or fitting;

Symmetry inspection of joints: It is required that the misalignment at any point adjacent to the outside of the rolled edge on both sides of the weld seam should not exceed 10% of the pipe wall thickness;

Edge cutting inspection: Use an outer edge cutting knife to cut off the rolled edge. The rolled edge should be solid, smooth, and have a wide root. The bottom surface of the rolled edge should not have contamination, holes, etc. If impurities or small holes are found, it is judged as unqualified.

Welding precautions

Clean the welding surface and heating tools before and after connecting the hot melt machine. Dirt on Welding surface should be wiped clean with a clean cotton cloth, and polyethylene residue on heating tools can only be removed by a wooden scraper;



3 HEAT

Place the heating plate and adjust it to the specified heating pressure P to start heating. When the flanging height reaches the regulated value, release the pressure to P and turn to the heat absorption stage until the heat absorption time reaches the regulated value.



4 JOIN

Promptly remove the heating plate, adjust to the docking pressure P1, dock the pipes, and maintain pressure and cooling to the specified time. Then, check the docking and flanging situation, and complete the hot melt butt welding.

Check whether the butt welding machine matches the diameter of the pipe and the specified butt welding cycle;

When closing, there should be no obvious gap between the two welding surface of the 2 pipes, and the maximum gap width should not exceed: 0.3mm (DN<225mm) or 0.5mm (225mm<DN<400mm) or 1.0mm (DN>400mm). If the above requirements are not met, milling should be carried out again until the above requirements are met;

The press holding and cooling time for hot melt connections should comply with the regulations of the connection equipment manufacturer and the pipe manufacturer. During the press holding and cooling time, the pipe should not be moved or subjected to external forces on the surface of the pipe;

After heating is completed, the connecting piece should quickly detach from the heating plate and use uniform external force to make it fully contact and form a uniformed rolled edge.

Note

Drag pressure usually no more than 50% of the welding pressure.

Oil cylinder section area value should be provided by welding machine supplier.

- The cooling time of the weld seam can be appropriately shortened, but it must be ensured that it is fully cooled;
- During the cooling period of the weld seam, it is strictly prohibited to apply any external force to it;
- The another end of the welded pipeline that do not be welded must be sealed with plugs to prevent cooling caused by wind blowing on the pipeline;
- After each welding is completed, it must be inspected visually, and those that do not meet the requirements must be cut off and reworked.

Steps of ElectroFusion connection

1 MARK

Mark the inserting depth of the pipe

2 SCRAPE

Scrape the oxide layer on the end face of the pipe with a scraper, generally with a scraping thickness of 0.1-0.2mm;

3 INSERT

Insert the pipe into the fitting to be electro melt and connected;

4 POWER-ON

Connect the wiring terminals of the fitting to the positive and negative electrodes of the electro melting machine;

5 CONNECT

Use the scanner on the electro melting welding machine to scan the barcode on the electro fusion pipe fittings and read the required parameters for connection

6 Welding and Cooling.

Electro Fusion Connection

Welding machine

Electro fusion welding machine:

1. main machine
2. Scanner
3. positive and negative electrodes



Auxiliary tools:

1. flat scraper: generally used to scrape off the oxide layer on the outer surface of pipes (fittings)
2. Rotating cutter: used for quickly cutting pipes
3. Marker
4. Flat ruler



Connection precautions

Pipe scraping must be uniform and without any missed scraping;

Pipe fittings should only be unpacked during use to keep them clean and dry;

Confirm that the connection column of the pipe fittings is in good contact with the welding machine joint and there is no looseness before welding. If it does not match, please replace the matching plug;

Ensure that the pipe is inserted into the position of the pipe fitting stopper, otherwise problems such as electric heating wire burning idly, short circuit, smoking, burning, and melt overflow may occur; Verify the fittings so that the pipes and fittings are aligned on the same axis. Connect the output joint of the welding machine to the electrofusion fittings. Scan the barcode or manually input the welding parameters. Only after confirming that the parameters are correct, then can start welding work

It is strictly prohibited to heat and weld “twice” or “multiple times”;

Before the end of the cooling time, the pipeline should not be moved, stepped on, or cut. Keep cooling for the specified time until the needle in the signal hole protrudes, which indicates that the welding is complete.

Factors affecting the quality of electro fusion connection

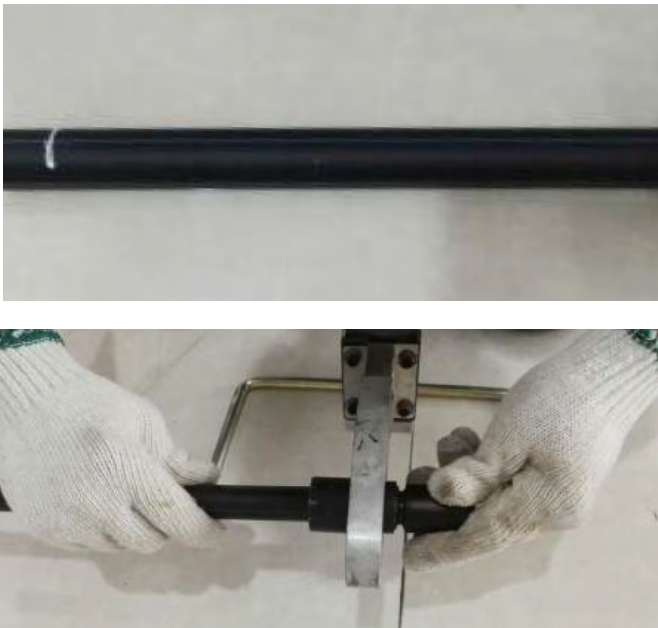
The impact of voltage fluctuations on interface quality:

The resistance value of the resistance wire inside the given electro melting fitting is constant, therefore, the heating power of the resistance wire depends entirely on the voltage provided by the power supply. Therefore, the quality of the weld will deteriorate due to voltage fluctuations affecting the heating power;

The Influence of Welding Time on Interface Quality:
The required heat range for each electro melting fitting of different specifications is fixed, and either excessive or insufficient heat will have a fatal impact on the welding quality. Under the premise of fixed welding voltage and pipe resistance, welding time is the only determining factor for the heat generation of the fittings, so it is necessary to accurately control the welding time;

The impact of environmental temperature on interface quality:
The change in ambient temperature during the welding process directly affects the heat transfer conditions in the fusion zone, which in turn affects the quality of the fusion. Therefore, the welding machine must be able to monitor the ambient temperature and automatically adjust the output parameters based on the deviation results;

The impact of improper operations on interface quality:
The so-called improper operation refers to, on one hand, the scraping or cleaning of the pipe during welding that does not meet the specifications (especially the improper assembly of the socket and the large slope at the end of the socket), which requires the operator to have certain welding knowledge. On the other hand, the mistakes when inputting melt welding parameters, which should be avoided through the settings of the welding machine itself.



- 3 CONNECT**
After reaching the heating time, immediately remove the pipe and fittings from the heater, quickly and evenly insert them into the required depth without rotation, and form a uniform rolled edge at the joint;
- 4 COOL**
After the connection is completed, the pipe and fittings must be tightly held for sufficient cooling time, and can only be released after cooling to certain extent.



The hot melt socket connection needs a fusion splicer to heat the pipes and fittings. The heating depth and timing shall follow the guidance in the table below.

Nominal outer diameter	Heat fusion depth	Heat fusion depth	Hand-holding time	Hand-holding time
20	14	5	15	2
25	15	7	15	2
32	16.5	8	15	4
40	18	12	20	4
50	20	18	20	4
63	23.9	24	30	5
75	25	30	30	6
90	28	40	40	8
110	32	50	40	8

Heat fusion requirement for pipes and fittings

Precautions for welding

- Measure the length of the pipe fitting socket, mark the insertion depth, and clean the dirt on the pipe, pipe fitting to be connected surface, and hot melt socket connection tool heating surface with a clean cotton cloth;
- After reaching the heating time, immediately remove the pipe and fittings at the same time, quickly insert them, and form a uniform rolled edge at the joint;
- When inserting, the tube end should be guided into the heating sleeve, inserted to the marked depth, and rotation is strictly prohibited;
- The overflow should not contain greasy dirt or impurities, and there should be no obvious gaps at the junction;
- Heat the hot melt machine within the range of 220 ± 5°C, and wait until red light turns on, which means it is in a state of insulation, then can proceed the welding operation.



MUNICIPAL DRAINAGE PIPING SYSTEM

HDPE Double-Wall Corrugated Pipe

Product Overview

Material:
High Density Polyethylene

Ring Stiffness:
SN2, SN4, SN8, SN16, SN32

Size:
All nominal sizes available from DN160 to DN1200 (Ref. Pipe Specification Tab)

Standard:
ISO 8772; CJ/T358-2010

Colors:
Customized, default is black

Supply Form:
Customized, default 5.8m for straight length.

Advantages

High strength:
High ring stiffness and flexibility ensures excellent resistance against compression, bending and impact, and adaptable to uneven settlement of foundations.

Economic:
under the same load condition, thinner pipe can satisfy the requirements, which can save around half of the raw material.

Chemically stable:
outstanding chemical properties, such as Corrosion resistance,non-toxic, pollution-free, environmental protection ;

Easy to install:
Light weight, easy to transport and maintenance, so that can greatly save time and cost:

Low temperature resistance:
brittleness temperature is -70°C, and can be installed normally above -30°C.

Pipe Specification

NOMINAL DIAMETER DN(mm)	RING STIFFNESS GRADE	
DN225	S1(SN4)	S2(SN8)
DN300	S1(SN4)	S2(SN8)
DN400	S1(SN4)	S2(SN8)
DN500	S1(SN4)	S2(SN8)
DN600	S1(SN4)	S2(SN8)
DN800	S1(SN4)	S2(SN8)

Note_1: DN1000 and DN1200 pipe can be customized

Note_2: SN10, 12.5 and 16 can be customized

Physical Propertites

NUMBER	ITEMS		INDICATIONS	METHODS
1	Just ring degrees KN/m2	S1	≥4	GB/T9647
		S2	≥8	
2	Flexible ring		The specimen is round, no directional bending; no rupture, no wall detachment	GB/T14152
3	Impact properties		TIR≤10%	GB/T9647
4	Oven test		No bubbles, no stratification, no cracking	GB/T19472.1
5	Creep test		≤4	GB/T18042
6	Joint seal test		No rupture, no leakage	

Long service life:
avoid exposing under sunlight and ultraviolet rays, the pipe can serve over 50 years.

Efficient to use: smoother inner wall than traditional pipe, friction pressure loss greatly reduced.

Recyclable:
HDPE materials can be recycled

Applications

Municipal works:
used for drainage, sewage pipe;

Building engineering:
used for building storm water pipes,underground drainage pipes, sewage pipes, ventilation pipes;

Industry:
chemical, hospital,environmental protection and other industries sewage pipe;

Agricultural engineering:
farmland, fruit and tea garden, and forest belt drainage pipe;

Road engineering:
seepage and drainage pipes for railways and highways;

Mine:
used for mine ventilation, air supply, drainage pipe

Double-wall corrugated pipe with hole:
it can be used for seepage and drainage of saline-alkali expressway.

Playground engineering:
seepage and drain pipe for golf course & football field.



MUNICIPAL TRENCHLESS PIPING SYSTEM

Trenchless HDPE Drain Pipe

Product Overview

- Material:**
High Density Polyethylene
- Ring Stiffness:**
SN4 and SN8 (SN10, 12.5 and 16 need to be customized)
- Size:**
From DN200 to DN800 (Ref to table. DN1000 and DN1200 need to be customized)
- Standard:**
GB/T 19472.1-2019; EN/13476
- Colors:**
Customized, default is black
- Supply Form:**
Customized, default 5.8m or 11.8m for straight length.

Applications

- Municipal field,** urban and rural area water supply pipe, such as for fire-fighting and drinking purpose.
- Agriculture and forestry field,** such as for irrigation and drainage.
- Building engineering field,** such as civil building piping system.
- Chemical fields,** liquid material transportation and feeding for industries such as for chemical fiber, food, printing and dyeing, pharmaceutical, paper-making, metallurgy, light-industry and others.

Advantages

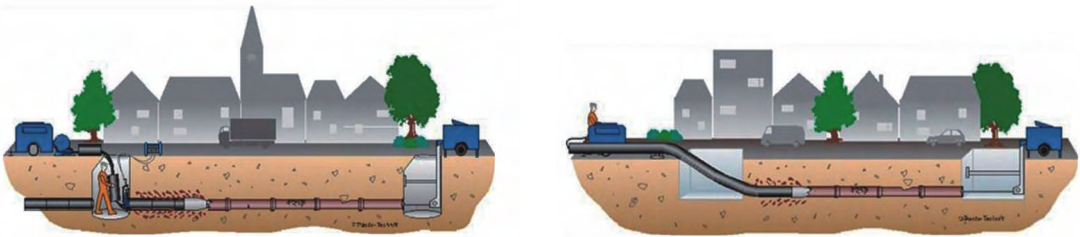
- Excellent wear resistance:**
4 times of that of steel tube
- Excellent toughness:**
amazing seismic performance, and even seriously deformed, the pipeline is still difficult to break.
- High strength:**
High ring stiffness and flexibility ensures excellent resistance against compression, bending and impact, and adaptable to uneven settlement of foundations.
- Economic:**
under the same load condition, thinner pipe can satisfy the requirements, which can save around half of the raw material.
- Chemically stable:**
outstanding chemical properties, such as Corrosion resistance,non-toxic, pollution-free, environmental protection ;
- Easy to install:**
Light weight, easy to transport and maintenance, so that can greatly save time and cost:
- Long service life:**
avoid exposing under sunlight and ultraviolet rays, the pipe can serve over 50 years.
- Efficient to use:**
smoother inner wall than traditional pipe, transfer 30% more flux compared with the steel pipe under the same inner diameter.
- Recyclable:**
HDPE materials can be recycled

Pipe Specifications

NOMINAL DIAMETER DN	WALL THICKNESS,MM				
	SDR33/SN2	SDR26/SN4	SDR21/SN8	SDR17/SN16	SDR13.6/SN32
160	4.9	6.2	7.7	9.5	11.8
180	5.5	6.9	8.6	10.7	13.3
200	6.2	7.7	9.6	11.9	14.7
225	6.9	8.6	10.8	13.4	16.6
250	7.7	9.6	11.9	14.8	18.4
280	8.6	10.7	13.4	16.6	20.6
315	9.7	12.1	15.0	18.7	23.2
355	10.9	13.6	16.9	21.1	26.1
400	12.3	15.3	19.1	23.7	29.4
450	13.8	17.2	21.5	26.7	33.1
500	15.3	19.1	23.9	29.7	36.8
560	17.2	21.4	26.7	33.2	41.2
630	19.3	24.1	30.0	37.4	46.3
710	21.8	27.2	33.9	42.1	52.2
800	24.5	30.6	38.1	47.4	58.8
900	27.6	34.4	42.9	53.3	
1000	30.6	38.2	47.7	59.3	
1200	36.7	45.9	57.2		

Physical Properties

NUMBER	ITEMS	REQUIREMENTS
1	Extension rate at break, %	≥350
2	Longitudinal reversion (110°0, %)	≤3
3	Oxidation induction time (200°C), min	≥20
4	Ring stiffness, KN/ RRF	SN2≥2,SN4≥4,SN8>8,SN16>16,SN32>32
5	Tensile yield stress, MPa	≥20
6	Impact resistance	TIR≤10%



Schematic diagram of pipeline repair technology



MUNICIPAL POWER PIPING SYSTEM

HDPE Low Voltage Power Cable Sheath

Application Fields

HDPE pipe is a product vigorously promoted by the Chinese power grid department and used in municipal low-voltage power protection sleeve. The product by our company has reliable quality, superior performance, high strength, wear and corrosion resistance, and long service life. They are widely used in the international market to guide, isolate, and protect power cables of different sizes, such as street lamps, garden lighting power supplies, and wires and cables in buildings.



Pipe Specification

Unit: mm

NOMINAL DIMENSION	WALL THICKNESS
DN32	2.0
DN50	3.0
DN60	3.5
DN75	4.0
DN89	4.5
DN110	4.0
DN110	5.0
DN110	8.0
DN160	6.5
DN160	7.0
DN160	8.0
DN160	10.0
DN200	10.0
DN200	12.0
DN225	15.0
DN225	17.0
DN280	18.0
DN315	20.0

Physical Properties

NUMBER	ITEMS		REQUIREMENTS	METHODS
1	HydrdulicPressure Test		No cracking, no leakage	GB/T6111
2	HydrdulicPressure Test		No cracking, no leakage	GB/T6111
3	Extensign rate at break		≥350	GB/T8804.3
4	Longitudinal reversion rate		≤3	GB/T6671
5	Oxidation induction time(200°C)		≥20	GB/T19466.6
6	Density		≥0.94	GB/T1033.1
7	Climate resistance (After the pipe accumulate accept the aging energy>3.5GJ/m³	HydrdulicPressure Test	No cracking, no leakage	
		Elongation at break	≥350	
		Oxidation induction time (200°C)	≥10	



MUNICIPAL COMMUNICATION
PIPING SYSTEM

HDPE Solid Wall Communication Piping

Product Introduction

HDPE solid wall communication pipe is a product vigorously promoted by China's post and telecommunications departments. The product by our company is reliable in quality, outstanding in advantages, excellent in ductility and toughness, corrosion resistance, low temperature resistance, smooth inner wall, and wear-resistant outer

wall. They can be used in pipe jacking construction and other construction methods, with a service life of up to 50 years. They are widely used in the international market as protective sleeve when lay Internet optical fibers, low-voltage cables, cable television networks, etc

Pipe Specification

Size for HDPE communication pipe

NOMINAL OUTER DIAMETERS	AVERAGE OUTSIDE DIAMETERS dem		WALL THICKNESS, E
	STANDARD VALUE	ALLOWABLE DEVIATION	MINIMUM VALUE
25	25	+0.3	1.8
32	32		1.8
40	40	+0.4	2.0
50	50	+0.5	2.1
63	63	+0.6	2.3
75	75	+0.7	2.5
90	90	+0.9	2.8
100	100		3.8
110	110	+1.0	4.2
125	125	+1.2	4.4
140	140	+1.3	4.6
160	160	+1.5	4.8
When nominalouter diameter specifications arenot listed in the table, the allowable positive deviationof the average outer diameter shall be less than orequal to the larger of the following two values.(1)0.3mm(2)0.09dn,the calculated result is rounded to 0.1mm and when the second decimal point is greater than zero.one place is carried forward			

Physical Properties

TEST	VALUE	TEST	VALUE
Drop hammer impact test	9/10 uncracked	Tensile strength (Mpa)	HDPE≥18 LDPE≥8
Flat test	no crack	Extension rafe at break (%)	≥350
The ring stiffness (KN/m2)	Sn4≥4 SN6.3≥6.3 SN8≥8 SN12.5≥12.5 SN16≥16	Longitudinal Reversiom rate (%)	≤3
Coefficient of static friction	≤0.35		



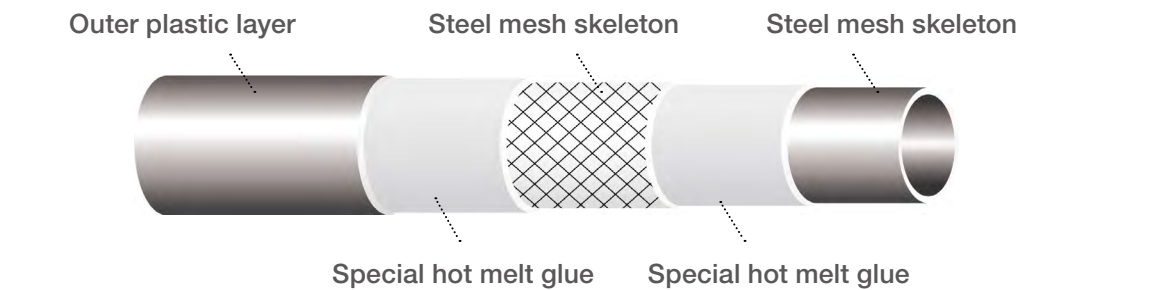
PE-METAL COMPOSITE PIPING SYSTEM

Plastic-Steel Mesh Skeleton-Plastic (PE) Composite Pipe

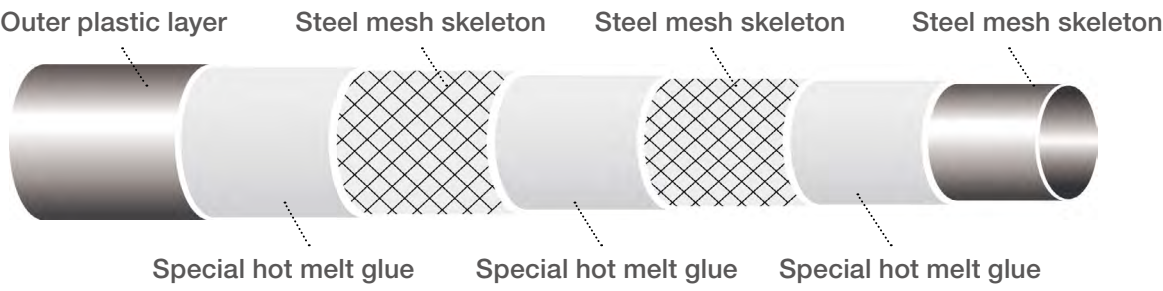
Brief Introduction: The pipe is mainly made of high-strength steel wire mesh and thermoplastic polyethylene, with steel wire winding mesh as the skeleton reinforcement of polyethylene plastic pipe. High density polyethylene (HDPE) is used as the matrix, and high-performance HDPE modified bonding resin is used to tightly connect the steel wire skeleton with the inner and outer high-density polyethylene layers, making it have excellent composite effect.

Due to its composite structure, it overcomes the disadvantage of easy corrosion of steel pipes and maintains the advantages of both steel pipes and plastic pipes. Adhesive resin is a high-performance adhesive material that belongs to the category of HDPE modified materials. It can completely melt together with HDPE under heating conditions, and its polar bonds have strong adhesive properties with steel wires. Due to the use of adhesive resin, the problem of no connection factor between steel and polyethylene has been successfully solved, resulting in a better composite effect.

Plastic-Steel Mesh Skeleton-Plastic Composite Pipe



Plastic-Dual Steel Mesh Skeleton-Plastic Composite Pipe



Product Overview

- Material:** PE, steel mesh skeleton
- Pressure Rating:** 0.4MPa - 3.5MPa (Ref. Spec Tab below).
- Size:** All nominal sizes available from DN50 to DN800 (Ref. Spec Tab below)
- Standard:** GB/T 32439-2015; Q/WXX 001-2010; CJ/T 189-2007
- Colors:** Customized, default is black
- Supply Form:** Customized, default 6 or 8 meters straight length(all size).

Pipe Specification

Plastic-Steel Mesh Skeleton-Plastic Composite Pipe water supply system and universal pipes for coal mine underground liquid

Nominal Outer Diameter d _n mm	average OD d _{em}		outer PE layer minimum thickness e _{y,min} mm	minimum DN for steel mesh skeleton mm	Nominal Pressure, PN MPa													
					0.8		1.0		1.6		2.0		2.5		3.5			
	d _{em,min} mm	d _{em,max} mm			Thickness Range/mm													
					Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max		
50	50.0	51.2	1.5	0.5	-	-	-	-	5.0	6.2	5.5	6.7	6.0	7.5	6.5	8.0		
63	63.0	64.0	1.5	0.5	-	-	-	-	5.5	6.7	6.0	7.2	6.5	8.0	7.0	8.5		
75	75.0	76.2	1.5	0.5	-	-	-	-	6.0	7.2	6.5	7.7	7.0	8.5	7.5	9.0		
90	90.0	91.4	2.0	0.5	-	-	-	-	6.5	8.0	7.0	8.5	7.5	9.0	8.0	9.5		
110	110.0	111.5	2.0	0.5	-	-	6.0	7.5	7.0	8.5	7.5	9.0	8.0	9.5	8.5	10.0		
125	125.0	126.6	2.0	0.6	-	-	6.0	7.5	7.5	9.0	8.0	9.5	8.5	10.0	9.5	11.0		
140	140.0	141.7	2.0	0.6	-	-	6.0	7.5	8.0	9.5	8.5	10.0	9.5	11.0	10.5	12.0		
160	160.0	162.0	2.5	0.6	-	-	6.5	8.0	9.0	10.5	9.5	11.0	10.5	12.5	11.5	13.5		
200	200.0	202.3	2.5	0.6	-	-	7.0	8.5	9.5	11.0	10.5	12.5	12.5	14.5	13.0	15.2		
225	225.0	227.5	2.5	0.6	-	-	8.0	9.5	10.0	12.0	10.5	12.5	12.5	14.5	-	-		
250	250.0	252.5	2.5	0.6	8.0	9.5	10.5	12.5	12.0	14.2	12.0	14.0	13.0	15.2	-	-		
315	315.0	317.7	3.5	0.6	9.5	11.0	12.0	14.0	13.0	15.5	13.0	15.5	14.5	17.0	-	-		
355	355.0	357.8	3.5	0.8	10.0	11.8	12.5	14.7	14.0	16.5	-	-	-	-	-	-		
400	400.0	403.0	3.5	0.8	10.5	12.5	13.0	15.2	15.0	17.8	-	-	-	-	-	-		
450	450.0	453.2	3.5	0.8	11.5	13.5	14.0	16.5	16.0	18.8	-	-	-	-	-	-		
500	500.0	503.2	3.5	0.8	12.5	14.7	16.0	18.8	18.0	20.8	-	-	-	-	-	-		
560	560.0	563.2	3.5	0.8	17.0	20.0	20.0	23.0	21.0	24.0	-	-	-	-	-	-		
630	630.0	633.2	3.5	0.8	20.0	23.0	22.0	25.0	24.0	27.0	-	-	-	-	-	-		
710	710.0	713.8	3.5	1.0	23.0	26.0	26.0	29.5	-	-	-	-	-	-	-	-		
800	800.0	803.8	3.5	1.0	27.0	30.5	30.0	33.5	-	-	-	-	-	-	-	-		

Note: Inner PE layer thickness should be no less than 1/3 of the pipe thickness

Standards

- GB/T 32439-2015;
- Q/WXX 001-2010;
- CJ/T 189-2007

Plastic-Steel Mesh Skeleton-Plastic Composite Pipe Natural gas and universal pipes for coal mine underground air.

Nominal Outer Diameter d _n mm		Nominal Pressure, PN MPa				
		0.4	0.6	0.8	1.0	1.25
Size	Deviation	Nominal wall thickness(mm) & deviation (mm)				
50	+1.2 0	-	4.5 ^{+1.2} ₀	5.0 ^{+1.2} ₀	5.5 ^{+1.5} ₀	5.5 ^{+1.5} ₀
63	+1.2 0	-	4.5 ^{+1.2} ₀	5.0 ^{+1.2} ₀	5.5 ^{+1.5} ₀	5.5 ^{+1.5} ₀
75	+1.2 0	-	5.0 ^{+1.5} ₀	5.0 ^{+1.2} ₀	5.5 ^{+1.5} ₀	6.0 ^{+1.5} ₀
90	+1.4 0	-	5.5 ^{+1.5} ₀	5.5 ^{+1.5} ₀	5.5 ^{+1.5} ₀	6.0 ^{+1.5} ₀
110	+1.5 0	5.5 ^{+1.5} ₀	7.0 ^{+1.5} ₀	7.0 ^{+1.5} ₀	7.5 ^{+1.5} ₀	8.5 ^{+1.5} ₀
140	+1.7 0	5.5 ^{+1.5} ₀	8.0 ^{+1.5} ₀	8.5 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.5 ^{+1.5} ₀
160	+2.0 0	6.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.5 ^{+1.5} ₀	10.0 ^{+2.0} ₀	10.5 ^{+2.0} ₀
200	+2.3 0	8.0 ^{+1.5} ₀	9.5 ^{+2.0} ₀	10.5 ^{+1.5} ₀	11.0 ^{+2.0} ₀	12.5 ^{+2.2} ₀
225	+2.5 0	10.5 ^{+2.0} ₀	10.0 ^{+2.2} ₀	10.5 ^{+2.0} ₀	11.0 ^{+2.0} ₀	-
250	+2.5 0	11.5 ^{+2.0} ₀	12.0 ^{+2.5} ₀	12.0 ^{+2.2} ₀	12.5 ^{+2.2} ₀	-
315	+2.7 0	12.0 ^{+2.3} ₀	13.0 ^{+2.5} ₀	13.0 ^{+2.5} ₀	-	-
355	+2.8 0	12.2 ^{+2.5} ₀	14.0 ^{+2.5} ₀	-	-	-
400	+3.0 0	12.5 ^{+2.5} ₀	15.0 ^{+2.8} ₀	-	-	-
450	+3.2 0	13.5 ^{+2.5} ₀	16.0 ^{+2.8} ₀	-	-	-
500	+3.2 0	15.5 ^{+2.8} ₀	18.0 ^{+3.0} ₀	-	-	-
560	+3.2 0	20.0 ^{+3.0} ₀	-	-	-	-
630	+3.2 0	23.0 ^{+3.0} ₀	-	-	-	-

Standards
CJ/T 189-2007; QWXX001-2010

Medium & Heavy Duty Plastic-Dual Steel Mesh Skeleton-Plastic Composite Pipe

Nominal Outer Diameter d _n mm		Nominal Pressure, PN MPa			
		2.0	2.5	3.5	4.0
Size	Deviation	Nominal wall thickness(mm) & deviation (mm)			
200	+2.3 0	-	12.0 ^{+2.0} ₀	12.0 ^{+2.0} ₀	12.0 ^{+2.0} ₀
225	+2.5 0	-	13.0 ^{+2.0} ₀	13.0 ^{+2.0} ₀	14.0 ^{+2.0} ₀
250	+2.5 0	-	14.0 ^{+2.2} ₀	14.0 ^{+2.2} ₀	15.0 ^{+2.2} ₀
315	+2.7 0	15.0 ^{+2.5} ₀	15.0 ^{+2.5} ₀	15.0 ^{+2.5} ₀	-
355	+2.8 0	15.5 ^{+2.5} ₀	15.5 ^{+2.5} ₀	-	-
400	+3.0 0	17.0 ^{+2.8} ₀	17.0 ^{+2.8} ₀	-	-
450	+3.2 0	18.0 ^{+3.0} ₀	18.0 ^{+3.0} ₀	-	-
500	+3.2 0	19.0 ^{+3.0} ₀	19.0 ^{+3.0} ₀	-	-

Standards
Q/0711 XX 601-2020

Temperature-Pressure Reduction Coefficient

Temperature, t/	t≤20	20<t≤30	30<t≤40
Correction coefficient	1.0	0.87	0.74

Pipe Specification

Pipe test

Test type	Test temperature/c	Test pressure/mpa	Test time/h	Property requirement
static hydraulic test tensiy	20	2PN	1	no crack, no leakage
	60	1.2PN	165	no crack, no leakage
	60	1.1PN	1000	no crack, no leakage
Burst pressure	20	Continuously increase the pressure until the sample burst:		≥3PN

Physical Mechanical Properties

Test type	Test temperature/c	Test pressure/mpa	Test time/h
Sr	property	requirements	test conditions
1	melt mass flowrate(MFR)	The change in MFR of polyethylene before and after processing shall not exceed 25%	5kg 190°C
2	oxidation induction time(OIT)	≥20min	200°C
3	Stability under compression cracking	no crack or peeling off	100mm/min
4	peel strength	Average peel strength≥15N/mm,single test peel strength≥12Nmm,and the peeling interface is ductile failure, with a flocculent surface	100mm/min
5	Circumferential static hydraulic strength	no burst or leakage for the ring groove cut	20℃、1.5PN、165h

Note, the table above only applicable to steel mesh skeleton PE composite pipes for water supply

Bending radius

Nominal Outer Diameter (dn mm)	90	110	140	160	200	225	250	315	≥355
Minimum allowable bending radius	80dn				100dn				110dn

Note: when there are joints on the pipe, the allowable bending radius should not be less than 200DN

Application

Municipal fields:

water supply, drainage and sewage collection, gas transportation.

Industrial fields:

corrosive gas/liquid/foam/solid particles transportation in industries such as petrochemical, fertilizer, mining, pesticides, textile, printing and dyeing

Mining fields:

high sulfur content media transportation, such as crude oil, brines, natural gas, waste water drain, mining slurry etc.

Marine fields:

desalination plants, sea water transportation

Highway fields:

buried pipes and protective sleeves under cross the highway

Electricity fields:

cable protective sleeves, desulfurization, waste residual conveying, process water transportation etc.

Agricultural fields:

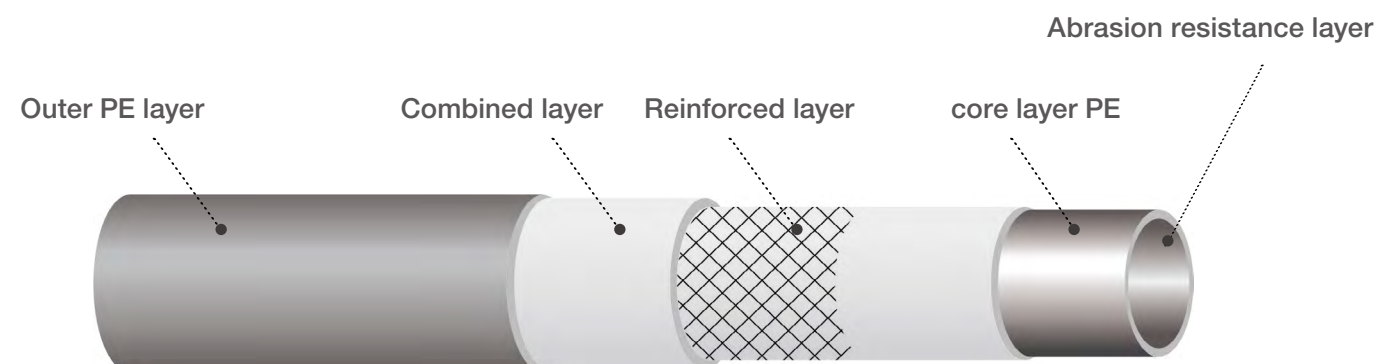
pressurized water conveying, such as in deep well , filter, underground channel etc.





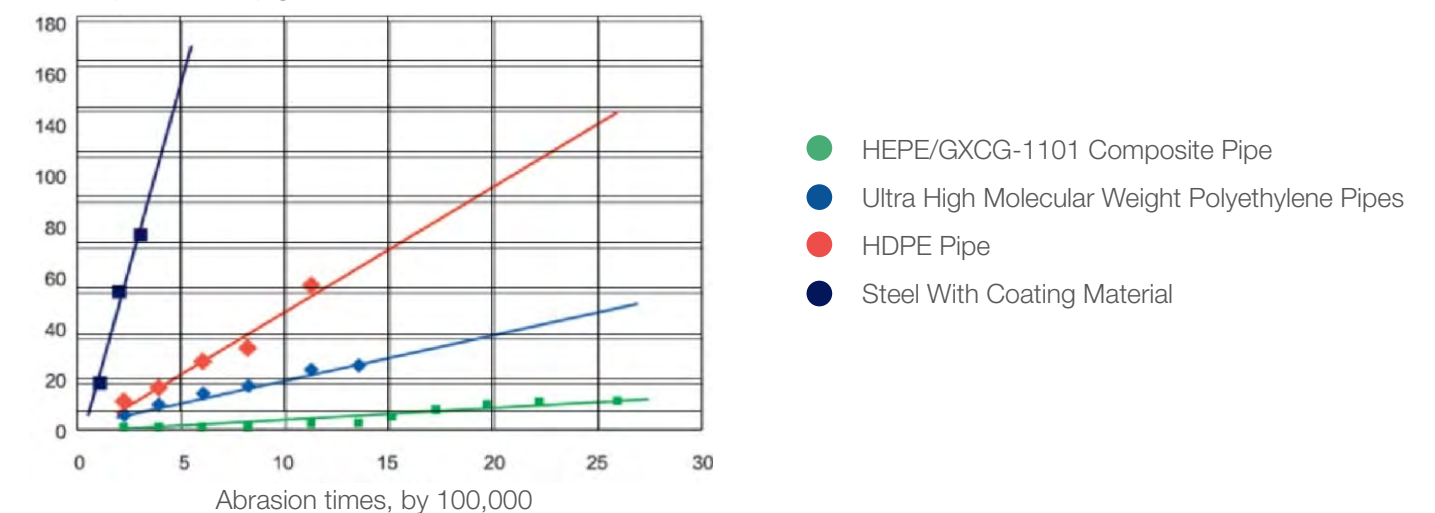
Plastic-Steel Mesh Skeleton-Plastic Composite Abrasion Resistant Pipe

On the basis of Plastic-Steel Mesh Skeleton-Plastic Composite Pipe, the inner PE layer material be replaced by an abrasion resistant type, which greatly increase the abrasion capacity and has a better performance compared with the ultra high molecular weight polyethylene pipes and inner side coating steel pipes.



Abrasion test result

Quantity abraded, by gramme



The material, specifications, size, deviations, and pressure rating of the base pipe (excluding the abrasion-resistant layer) of the Plastic-Steel Mesh Skeleton-Plastic Composite Abrasion Resistant Pipe shall comply with the provisions of GB/T32439-2015.

Specification table

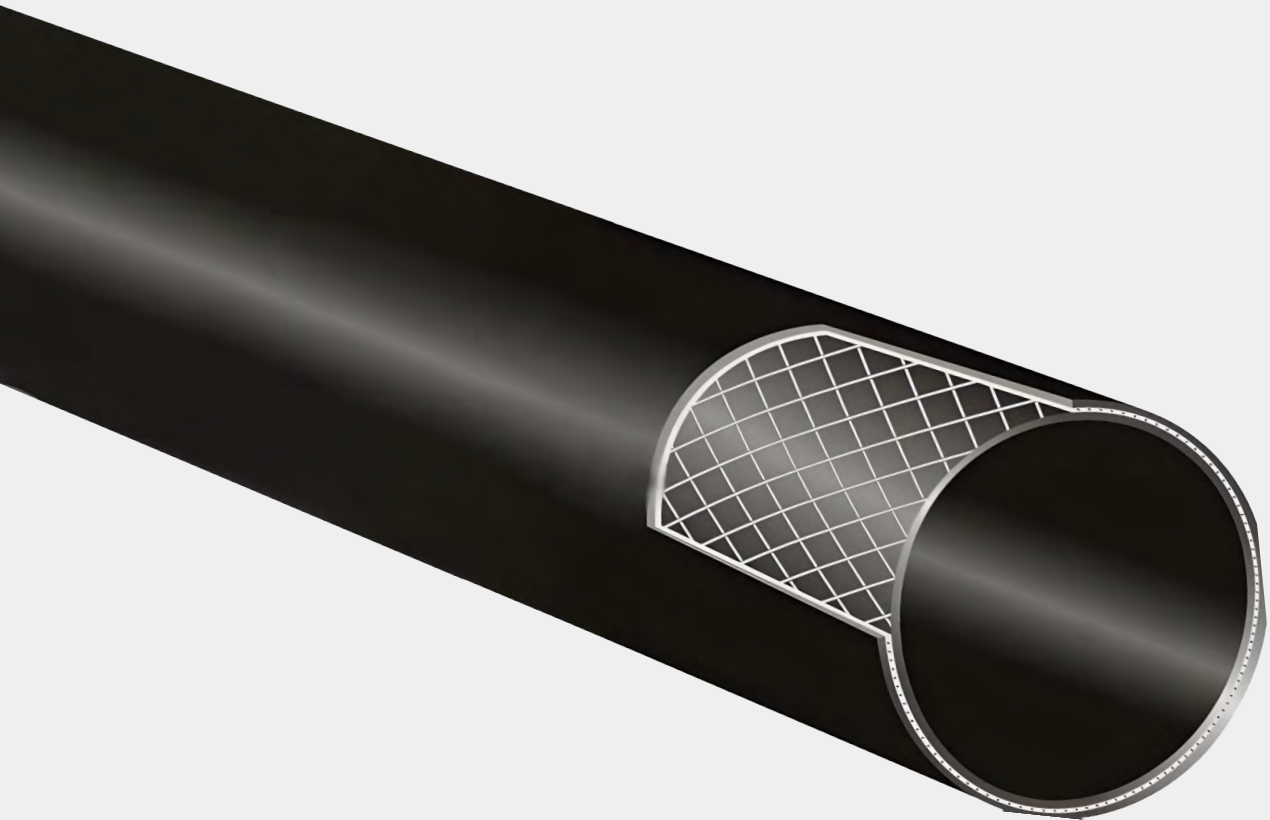
Nominal Diametermm	minimum thickness of abrasion layer mm	Stability under compression cracking	Inner pressure property	abrasion resistant property
200	2.5	Press to 50% of the nominal outer diameter of the composite pipe, no layer peeling off or cracks.	Conduct the test according to the provisions of GB/T6111-2003. The test temperature is 20 , the test pressure is 1.5 times the nominal pressure, and the test time is 1 hour. No burst, no leakage.	According to QB/T5101-2017 Plastic Pipe Abrasion Resistance Test Method, the mass abrasion rate after 1 million cycles shall not exceed 0.5%, and the wall thickness wear abraded off not exceed 1mm.
225	2.5			
250	2.5			
315	3.0			
355	3.0			
400	3.0			
450	3.5			
500	3.5			

Applications

- **Chemical fields:** solid-liquid mixtures transportation such as coal powder, silicon powder, salt slurry, alkali slurry, etc;
- **Electricity fields:** such as process pipelines for ash removal, slag discharge, powder delivery, powder return, and desulfurization in power plants;
- **Metallurgy fields:** long-distance pipeline transportation of refined mineral slurry and tailings, mineral and solvent process pipelines in beneficiation plants;
- **Cement fields:** concrete transportation and its raw material powder/slurry conveying in rotary kiln wet production lines;
- **Agriculture fields:** blow conveying ducts for the wheat, grains, husks, etc.

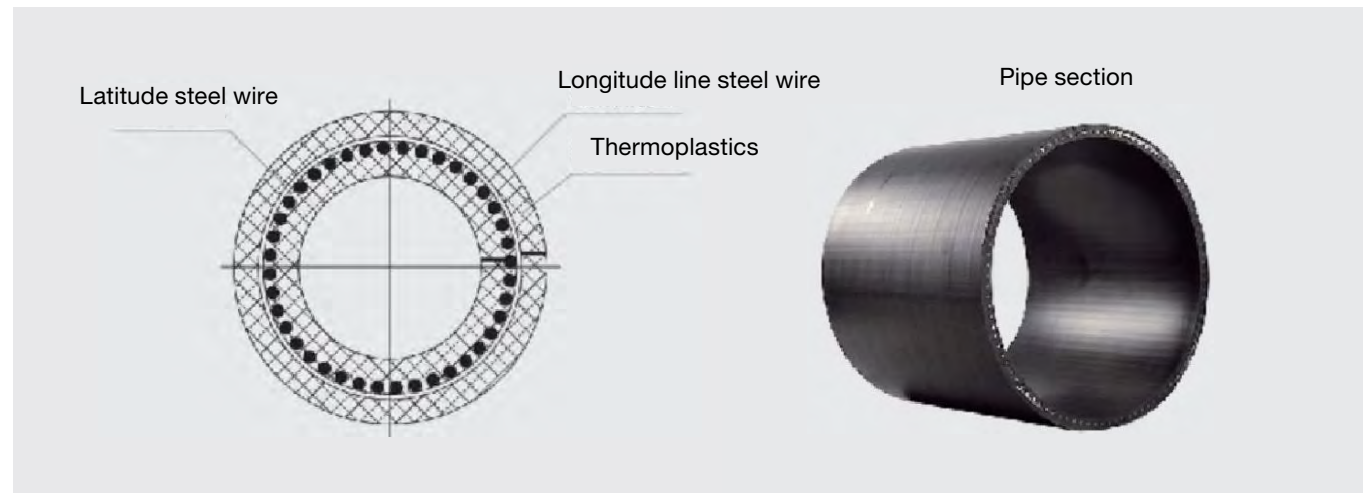


Mining Project, Slurry Transmission pipe



Fixed Inner/Outer Dia Plastic-Steel Mesh Skeleton-Plastic Composite Pipe

On the basis of Plastic-Steel Mesh Skeleton-Plastic Composite Pipe, the inner PE layer material be replaced by an abrasion resistant type, which greatly increase the abrasion capacity and has a better performance compared with the ultra high molecular weight polyethylene pipes and inner side coating steel pipes.



Pipe Specifications, by Outter Diameter

Nominal Inner Diameter, D _N /mm		Nominal Pressure/MPa Liquid, solid and mixed transportation, corrosive medium transportation/gas transportation					distance from Steel mesh to inner/outer wall/mm
Nominal Inner Diameter, DN mm	Average Inner Dia and limit deviation, mm	1.0/0.4	1.6/0.6	2.0/0.8	2.5/1.0	4.0/1.25	
		Nominal wall thickness, en; and limit deviation/mm					
75	75 ^{+1.0} ₀	-	-	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	≥2.0
90	90 ^{+1.0} ₀	-	-	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	
110	110 ^{+1.0} ₀	-	-	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	
125	125 ^{+1.0} ₀	-	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.0 ^{+1.5} ₀	9.0 ^{+2.0} ₀	
140	140 ^{+1.0} ₀	-	10.0 ^{+1.5} ₀	10.0 ^{+1.5} ₀	10.0 ^{+1.5} ₀	10.0 ^{+2.0} ₀	
160	160 ^{+1.5} ₀	-	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	12.5 ^{+3.0} ₀	≥2.5
180	180 ^{+1.5} ₀	-	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	12.5 ^{+3.0} ₀	
200	200 ^{+1.5} ₀	-	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	12.5 ^{+3.0} ₀	
225	225 ^{+1.5} ₀	-	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	12.5 ^{+3.0} ₀	
250	250 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	13.5 ^{+3.0} ₀	
280	280 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	13.5 ^{+3.0} ₀	≥3.0
315	315 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+2.0} ₀	12.5 ^{+3.0} ₀	13.5 ^{+3.0} ₀	
355	355 ^{+2.5} ₀	14.0 ^{+2.0} ₀	14.0 ^{+2.0} ₀	14.0 ^{+2.0} ₀	14.0 ^{+3.0} ₀	-	
400	400 ^{+2.5} ₀	15.0 ^{+2.0} ₀	15.0 ^{+2.0} ₀	15.0 ^{+2.0} ₀	15.0 ^{+3.0} ₀	-	
450	450 ^{+2.5} ₀	15.0 ^{+2.0} ₀	15.0 ^{+2.0} ₀	15.0 ^{+2.0} ₀	15.0 ^{+3.0} ₀	-	
500	500 ^{+2.5} ₀	16.0 ^{+2.0} ₀	16.0 ^{+2.0} ₀	16.0 ^{+2.0} ₀	16.0 ^{+3.0} ₀	-	
560	560 ^{+3.0} ₀	16.0 ^{+2.0} ₀	16.0 ^{+2.0} ₀	16.0 ^{+2.0} ₀	-	-	
630	630 ^{+3.0} ₀	20.0 ^{+3.0} ₀	20.0 ^{+3.0} ₀	20.0 ^{+3.0} ₀	-	-	
710	710 ^{+3.8} ₀	24.0 ^{+4.0} ₀	24.0 ^{+4.0} ₀	-	-	-	
800	800 ^{+3.8} ₀	25.0 ^{+6.0} ₀	25.0 ^{+6.0} ₀	-	-	-	

Standards

SY/T 6662.1-2012; QB/T 5538-2020; Q/420704 HBXX201-2023

Pipe specifications, by Inner Diameter

Nominal Inner Diameter, D _N /mm		Nominal Pressure/MPa Liquid, solid and mixed transportation, corrosive medium transportation/gas transportation				
Nominal Inner Diameter, DN mm	Average Inner Dia and limit deviation, mm	1.6/0.6	2.0/0.8	2.5/1.0	4.0/1.25	
		Nominal wall thickness, en; and limit deviation/mm				
50	±1	-	-	-	9.0 ^{+1.4} ₀	10.6 ^{+1.5} ₀
65		-	-	-	9.0 ^{+1.4} ₀	10.6 ^{+1.5} ₀
80		-	-	-	9.0 ^{+1.4} ₀	11.7 ^{+1.8} ₀
100		-	9.0 ^{+1.4} ₀	9.0 ^{+1.4} ₀	11.7 ^{+1.8} ₀	11.7 ^{+1.8} ₀
125		-	10.0 ^{+1.5} ₀	10.0 ^{+1.5} ₀	11.8 ^{+1.8} ₀	12.3 ^{+1.8} ₀
150	±0.8	12.0 ^{+1.8} ₀	12.0 ^{+1.8} ₀	12.0 ^{+1.8} ₀	12.0 ^{+2.4} ₀	15.5 ^{+2.5} ₀
200		12.0 ^{+1.8} ₀	12.0 ^{+1.8} ₀	12.5 ^{+1.9} ₀	12.5 ^{+1.9} ₀	-
250		12.0 ^{+1.8} ₀	12.5 ^{+1.9} ₀	12.5 ^{+1.9} ₀	13.0 ^{+2.0} ₀	-
300		12.5 ^{+1.9} ₀	12.5 ^{+1.9} ₀	12.5 ^{+3.2} ₀	-	-
350		15.0 ^{+2.4} ₀	15.0 ^{+2.4} ₀	15.5 ^{+2.6} ₀	-	-
400	±0.5	15.0 ^{+2.4} ₀	15.0 ^{+2.4} ₀	15.5 ^{+2.6} ₀	-	-
450		15.5 ^{+2.6} ₀	16.0 ^{+2.6} ₀	16.5 ^{+2.6} ₀	-	-
500		15.5 ^{+2.6} ₀	16.0 ^{+2.6} ₀	16.5 ^{+2.6} ₀	-	-
600		19.0 ^{+3.0} ₀	20.0 ^{+3.0} ₀	-	-	-
650		21.0 ^{+3.0} ₀	22.0 ^{+3.0} ₀	-	-	-
700		23.0 ^{+3.4} ₀	24.0 ^{+3.4} ₀	-	-	-
750		23.0 ^{+3.4} ₀	24.0 ^{+3.4} ₀	-	-	-
800		23.0 ^{+3.4} ₀	24.0 ^{+3.4} ₀	-	-	-

Standards

HG/T 3690-2022;CJ/T 123-2016;SY/T 6662.1-2012

Temperature Correction Coefficient

For pipelines connected by steel skeleton polyethylene composite fittings and mechanical connection fittings, the maximum working pressure of the pipes should be corrected when transporting media other than 20 . The correction method is to multiply the nominal pressure by the correction factor shown in Table 2. The applicable temperature correction range for buried composite pipes used for transporting gas media is -20 °C ~40 °C .

Nominal Pressure Correction coefficient

Temperaturt(°C)	-20<t≤20	20<t≤30	30<t≤40	40<t≤50	50<t≤60	60<t≤70	70<t≤80
Nominal PressureCorrection coefficient	1.0	0.95	0.90	0.86	0.81	0.76	0.60

Note: When the media transported by pipes has chemical effects such as corrosion and oxidation on polyethylene materials, the chemical corrosion characteristics of the medium should be consulted to determine the corresponding reduction factor. When transporting special hazardous media, codes and regulations should be followed.

Minimum Allowable Bending Radius For Pipes

Nominal Outer Diameter(OD,mm)	75	90	110	125	140	160	200	225	250	315	355	400	450	500	560	630
Nominal Inner Dia(ID,mm)	50	65	80	100	150	150	200	250	300	350	400	450	500	500	600	600
Best Allowable Bending Radius(r,m)	80d						100d				110d					

Distance between overhead laying supports

Nominal Outer Diameter(OD,mm)	75	90	110	125	140	160	200	225	250	315	355	400	450	500	560	630
Nominal Outer Diameter(OD,mm)	50	65	80	100	125	150	200	250	300	350	400	450	500	500	600	600
supports distance(m)	2.5		3.0		3.5		4.0				5.0					

Chemical Corrosion Resistance of Composite Pipes (Common Corrosive Media)

Chemical media		Concentration (mass fraction)	20	60
1	acetaldehyde	100%	S	L
2	Gasoline, petroleum, (aliphatic hydrocarbons)		S	L
3	mercury	100%	S	S
4	toluene	100%	L	NS
5	sodium hydroxide	40%	S	S
6	sulphuric acid	50%	S	S
		98%	S	NS
		fog	NS	NS

Notes:

S-Excellent corrosion resistance; L - Limited corrosion resistance; NS - Poor corrosion resistance; The corrosion resistance of pipes to more media can be found in standard SYIT 6662.1-2012

Other Main Parameters

Elastic modulus(GPa)	2.8-4
Surface resistivity (Q)	>10 ¹³
Surface volume resistivity(Q)	>10 ¹⁶
Dielectric strength(kv/cm)	700
Absolute equivalent roughness(mm)	0.01
Vicat softening point(°C)	117.9
Tensile and flexural strength(MPa)	22-23
Shore hardness	60
incision impact strength(J/mm²)	15
Bending creep modulus(MPa)	800

Physical Mechanical Properties

Items				Property requirement
1	Stability under compression cracking			No cracks on surface
2	longitudinal reversion (110°C, 1 hour duration), %			≤0.4
3	Short term static hydraulic test tensiity test	Temperature20°C, 100h, test pressure; Nominal Pressure*2.0		No crack no leakage
		Temperature70°C, 165h,test pressure; Nominal Pressure*1.5*0.76		
		Temperature80°C, 165h, test pressure; Nominal Pressure*1.5*0.6*2.291		
	Instantaneous blasting strength test	Gas medium	Temperature: 20°C,Instantaneous burst pressure	≥Nominal Pressure*3.3*1.6
		Other type of medium		≥Nominal Pressure*3
5	Chemical resistance	Chemical test type adn test requirements		No cracking, stickiness, abnormality or other abnormal
6	oxidation induction timing (200°C), min			≥20
7	melt mass flowrate (MFR) (190°C,5kg), g/10min			Variations before and after test, ±20%

Note: When pipes and fittings are used for conveying gas media, short-term static hydraulic strength tests at 20 °C and 80°C, oxidation induction tests, and melt mass flow rate tests shall be conducted; When used for conveying other types of media, short-term static hydraulic strength tests at 20°C and 70°C shall be conducted

Applications

Municipal fileds:

urban water supply and drainage, natural gas and gas transportation, hot water pipes (temperature<80°C).

Chemical fields:

corrosive media transportation in industries such as petrochemicals, acid alkali salt manufacturing, fertilizers, pesticides, pharmaceuticals, etc.slurry conveying pipes, engineering well pipes, pumping pipes

Mining fields:

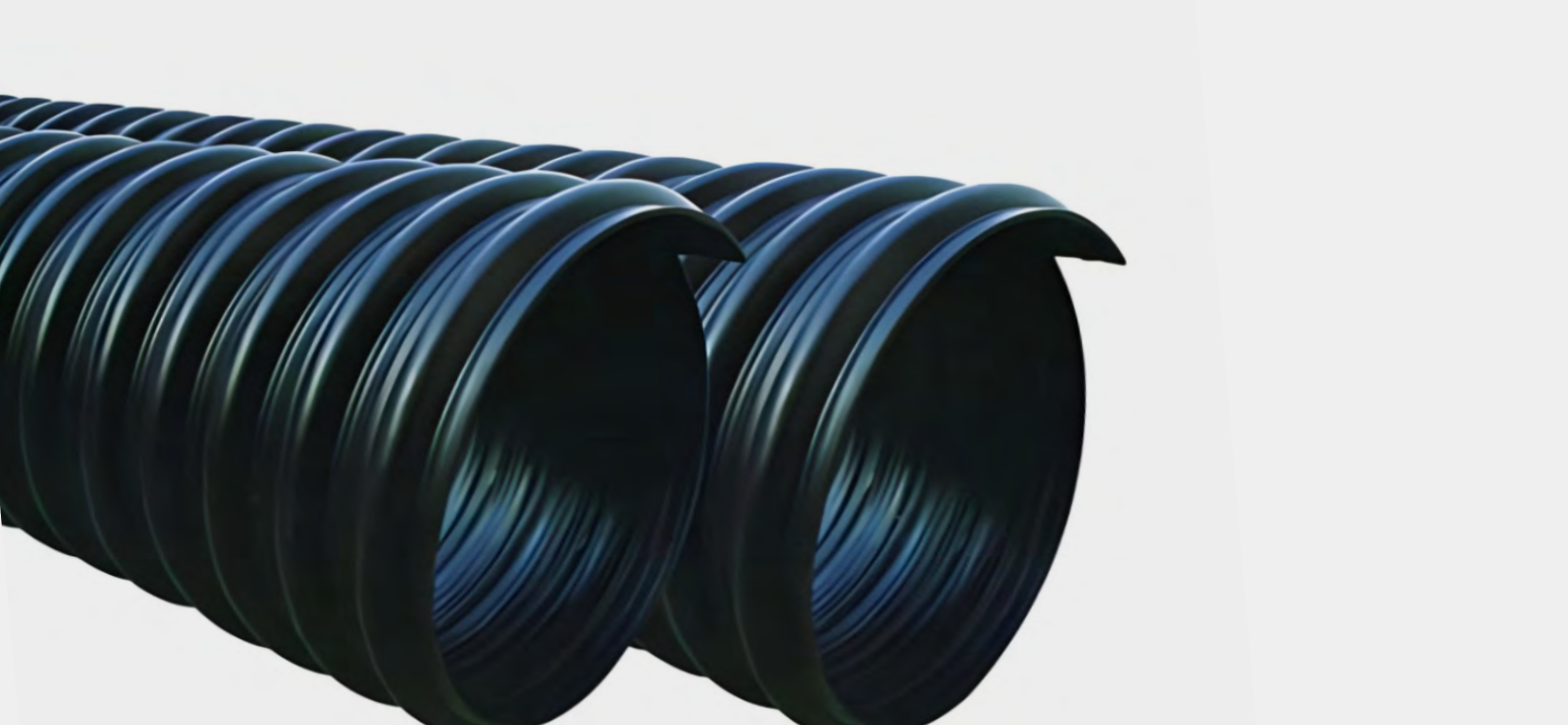
high sulfur content media transportation, such as crude oil, brines, natural gas, waste water drain, mining slurry etc.

Shipbuilding fields:

Domestic and structural piping systems such as sewage pipes, water supply and drainage pipes, and ballasting pipes on board.

Agriculture:

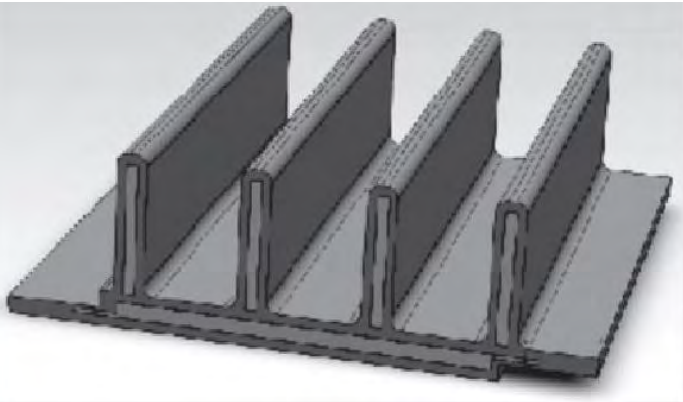
used for deep well pipes, filter pipes, irrigation pipes for dry land, drainage pipes for underground channels, etc. Seawater transportation: used for seawater transportation in desalination plants, coastal power plants, and port cities



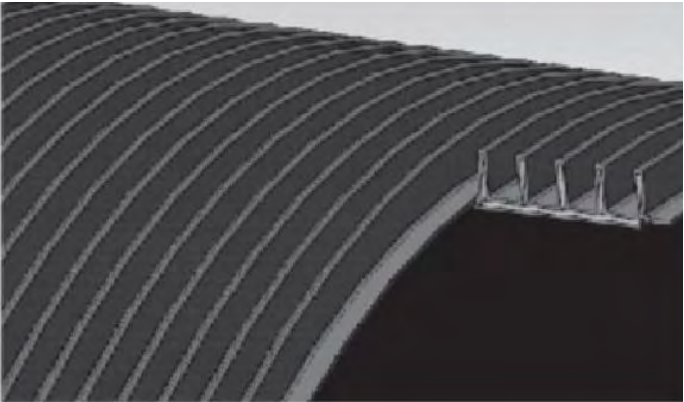
Multiple Steel reinforced Polyethylene Pipe

Multi reinforced steel plastic composite pipe (water supply) Multi reinforced steel plastic composite pressure pipe is a new type of steel plastic composite pressure conveying pipe that utilizes metal plastic composite type, steel plastic composite structure design, and strip winding welding forming technology based on existing

steel skeleton plastic composite pipe and steel strip reinforced drainage pipeline technologies. The pipeline system integrates structural wall technology, multi-layer wall technology, and steel plastic composite technology, effectively improving the radial strength and ring stiffness of the pipes.



Strip structure



Pipe structure

Product Features

- Integrated fusion during the winding process, with high bonding strength.
- The pipe has excellent resistance to internal and external pressure, and long-term stable strength
- The electric fusion welding connection technology is simple and reliable, with 100% leakage free, and will not cause waste of liquid resources during transportation.
- The inner wall is relatively smooth, with low conveying resistance, good hydraulic characteristics, and high conveying capacity Safe and non-toxic
- Flexible system, greatly reduces the damage caused by geological disasters such as earthquakes.
- Lightweight and low construction and installation costs.
- The cost of raw material consumption is lower than that of pure plastic or other structural wall plastic pressure pipes
- The overall project cost is low, the cost-effectiveness is high, and it has strong market competitiveness.
- Good stability of pipe structure
- Energy conservation and environmental protection

Pipe specifications

Nominal Dia dn	Average Inner Dia dom	allowable deviation %	Wall thickness e ₁ ≥	Structural height h _c ≥	Socket wall thickness e _{s1} ≥	Wall thickness e ₁ ≥	Structural height h _c ≥	Socket wall thickness e _{s1} ≥	Wall thickness e ₁ ≥	Structural height h _c ≥	Socket wall thickness e _{s1} ≥	Steel mesh to inner wall PE thickness e1,≥	PE thickness from the top of the steel strip e2,≥	PE thickness from both sides of the steel strip e3,≥	*PE thickness on the end face of the pipe e4,≥
			Nominal Pressure PN/MPa												
			0.6			0.8			1						
315	272	±1.5	6.0	17.0	19.0	6.0	17.0	19.0	6.0	17.0	9.0	2.0	2.0	2.0	5.0
355	315		6.0		19.0	6.0	17.0	19.0	6.0	17.0	19.0				
400	355		7.0	19.0	22.0	1.0	19.0	22.0	7.0	19.0	22.0				
450	405		7.0	20.0	22.0	7.0	20.0	22.0	7.0	20.0	22.0				
500	445	±1.0	8.0	20.0	25.0	8.0	20.0	25.0	8.0	20.0	25.0	2.5	2.5	1.2	
560	508		8.0	20.0	25.0	8.0	20.0	25.0	8.0	20.0	25.0				
630	570		8.0	22.0	29.0	8.0	22.0	29.0	8.0	22.0	29.0				
10	645	±0.8	9.0	23.0	29.0	9.0	23.0	29.0	9.0	23.0	29.0	3.0	3.0	1.5	
800	720		10.0	30.0	37.0	10.0	30.0	37.0	10.0	30.0	37.0				
900	820		10.0	30.0	37.0	10.0	30.0	37.0	10.0	30.0	37.0				
1000	912		10.0	35.0	38.0	10.0	35.0	37.0	10.0	35.0	37.0				
1100	1012		10.0	35.0	38.0	10.0	35.0	37.0	10.0	35.0	40.0				
1200	1112		10.0	35.0	38.0	10.0	35.0	37.0	11.0	37.0	40.0				
1400	1312		10.0	35.0	38.0	10.0	35.0	37.0	—						
1500	1412		10.0	35.0	38.0	10.0	35.0	37.0	—						
1600	1512		10.0	35.0	38.0	10.0	35.0	37.0							
Note: The wall thickness of the socket is only applicable to pipes with a socket at the end.															

Standards

QB/T 5401-2019; T/HBAS 050-2021; T/HBAS 007-2021

Temperature correction coefficient

When transporting media above 20°C, the maximum allowable pressure of the pipe can be determined by multiplying the correction factor shown in the table below by the nominal pressure

Temperature/	t≤20	20<t≤30	30<t≤40
Nominal PressureCorrection coefficient	1.00	0.90	0.80

Physical properties

Sr	Item	Test parameters	Sample quantity	requirements	Test method
1	Stability under compression cracking	Compress by 30% and maintain for 10 minutes	2	No cracking, peeling or other damage	7.4
2	static hydraulic test tensity	(23 ± 2)°C , 22 hours, 1.6PN; Water/Air	1	No burst, no leakage	7.5
		(23±2)°C; 165 hours; 1.5PN; Water/Air			
3	Burst pressure	(23±2)°C, Continuously increase the pressure until blast	1	The blasting pressure shall not be less than three times the nominal pressure	7.6
4	Heating and baking resistance	(110±2)°C, maintain for 90 minutes	2	After the sample is baked, there is no distortion or distortion, and there is no delamination or cracking in the weld seam	7.7
5	Carbon black content	-	3	2.0%—2.5%	7.8
6	oxidation induction (OIT)	210°C	2	≥20min	7.9
7	Spiral fusion seam tensile load	(23±2)°C	3	≥(0.4PNXDN)N/mm	7.10
8	Spiral fusion seam peel resistance	(23±2)°C	2	Non peeling or brittle peeling ratio ≤20%	7.11.1
9	Ring stiffness	(23±2)°C	3	DN315-DN1200;≥12.5KN/m²	7.12
				DN1300-DN1600;≥10KN/m²	
Choose any condition for the experiment					

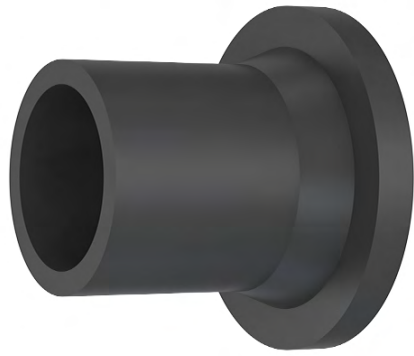
Applications

- Municipal pipeline, agricultural irrigation, township, factory, mine water supply and other fields.
- Pressure discharge field
- Water desalination, urban water source diversion, water resource allocation, large-scale industrial projects and other water diversion engineering fields



Inner Diameter Series Steel Skeleton Plastic Composite
Electro Fusion Fittings

Nominal Inner Diameter, mm	Series	Minimum melting zone length for single end socket L	Minimum lenght for single end socket L
50	75 ^{+0.5} ₀	55	65
65	86 ^{+0.5} ₀	55	65
80	103 ^{+0.5} ₀	55	70
100	123 ^{+0.5} ₀	60	80
125	148 ^{+0.5} ₀	70	90
150	173 ^{+0.7} ₀	80	110
200	224 ^{+0.8} ₀	120	140
250	274 ^{+0.8} ₀	140	160
300	324 ^{+0.8} ₀	170	190
350	381.5 ^{+0.8} ₀	260	285
400	431.5 ^{+0.8} ₀	300	325
450	483.5 ^{+0.8} ₀	450	450
500	533.5 ^{+0.8} ₀	500	500
600	641 ^{+1.0} ₀	600	600
650	694 ^{+1.0} ₀	650	650
700	748 ^{+1.0} ₀	700	700
750	798 ^{+1.0} ₀	750	750
800	848 ^{+1.0} ₀	800	800



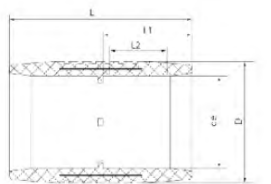
Inner Diameter Stub Flange

Nominal Inner Dia DN/ID	d	In mm
80	128	35
100	152	35
125	179	35
150	205	35
200	256	35
250	311	41

Note: When using other sealing forms such as gaskets, the processing form of the sealing surface should be according to relevant standards



Electro-Fusion PE Fitting and Steel Skeleton Plastic Composite Fittings

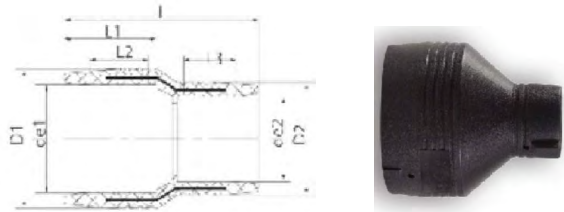


The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.

Nominal Diameter r		Outer Diameter d _o /mm		Length L/mm		insertion depth L ₁ /mm≥		Melting zone length , L ₂ /mm	
Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting
50	-	65	-	100	-	45	-	22	-
63	-	80	-	115	-	50	-	26	-
75	-	95	-	120	-	55	-	30	-
90	90	110	110	130	130	60	60	35	35
110	110	14C	140	145	145	70	70	40	40
125	125	155	155	150	150	75	75	45	45
140	140	170	170	170	170	80	80	50	50
160	160	200	200	180	180	90	90	55	55
200	200	250	250	215	215	100	100	60	60
225	225	270	270	225	225	105	105	65	65
250	250	300	300	235	230	110	110	75	75
315	315	370	370	270	270	125	125	85	85
355	355	410	410	300	300	145	145	95	95
400	400	465	465	310	310	150	150	100	100
450	150	510	510	340	340	160	160	105	105
500	500	570	570	350	350	165	165	120	120
560	560	630	630	355	355	165	165	120	120
630	630	715	715	410	410	195	195	150	150
710	710	780	780	440	440	230	230	165	165
800	800	895	895	480	480	240	240	170	170

Electro Fusion Reducer

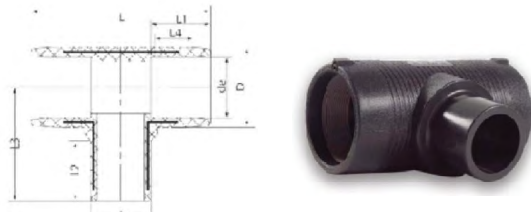
The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.



Nominal Diameter de/mm		Outer Diameter D ₁ /mm≥		Nominal Diameter D _{e2} /mm		Outer Diameter D ₂ /mm≥		Length Lmm≥		insertion depth L ₁ /mm≥		Melting zone length L ₁ /mm≥	
Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting
63×50	-	80	-	50	-	65	-	120	-	50	-	26	-
75×50	-	95	-	50	-	65	-	130	-	55	-	30	-
75×63	-	95	-	63	-	80	-	130	-	55	-	30	-
90×50	-	110	-	50	-	65	-	150	-	60	-	35	-
90×63	-	110	-	63	-	80	-	150	-	60	-	35	-
90×75	-	110	-	75	-	95	-	150	-	60	-	35	-
110×50	-	140	-	50	-	65	-	155	-	65	-	40	-
110×63	-	140	-	63	-	80	-	155	-	65	-	40	-
110×75	-	140	-	75	-	95	-	160	-	65	-	40	-
110×90	-	140	-	90	-	110	-	160	-	65	-	40	-
125×90	-	155	-	90	-	110	-	180	-	70	-	45	-
140×90	-	170	-	90	-	110	-	180	-	80	-	50	-
140×110	-	170	-	110	-	140	-	180	-	80	-	50	-
160×90	-	200	-	90	-	110	-	205	-	90	-	55	-
160×110	-	200	-	110	-	140	-	205	-	90	-	55	-
160×140	-	200	-	140	-	170	-	205	-	90	-	55	-
200×110	-	245	-	110	-	140	-	245	-	100	-	60	-
200×160	200×160	245	245	160	160	200	200	245	245	100	100	60	60
225×160	225×160	265	265	160	160	195	195	255	255	105	105	65	65
225×200	225×200	265	265	200	200	240	240	255	255	105	105	65	65
250×110	250×110	290	290	110	110	140	140	260	260	110	110	75	75
250×160	250×160	290	290	160	160	195	195	260	260	110	110	75	75
250×200	250×200	290	290	200	200	240	240	260	260	110	110	75	75
250×225	250×225	290	290	225	225	265	265	260	260	110	110	75	75
315×200	315×200	365	365	200	200	240	240	310	310	120	120	80	80
315×250	315×250	365	365	250	250	290	290	310	310	120	120	80	80
400×250	-	470	-	250	-	300	-	325	-	155	-	100	-
400×315	-	470	-	315	-	370	-	325	-	155	-	100	-
500×315	-	580	-	315	-	370	-	375	-	170	-	120	-
500×400	-	580	-	400	-	470	-	375	-	170	-	120	-
500×450	-	580	-	450	-	520	-	375	-	170	-	120	-

Electro Fusion Equal Tee

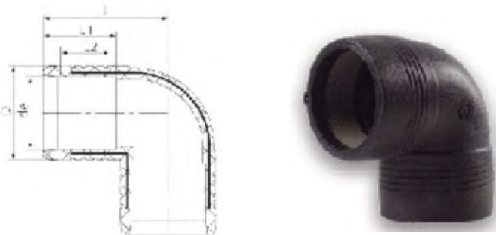
The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.



Nominal Diameter de/mm		Outer Diameter D/mm≥		Fittinglength L/mm≥		InsertionDepth L ₁ /mm≥		InsertionDepth L ₂ /mm≥		Fittinglength L ₃ /mm≥		MeltingzoneLength L ₄ /mm≥	
Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting
50	-	65	-	145	-	45	-	50	-	90	-	22	-
63	-	80	-	170	-	50	-	55	-	100	-	26	-
75	-	95	-	205	-	55	-	60	-	120	-	30	-
90	-	110	-	225	-	60	-	70	-	140	-	35	-
110	110	140	140	260	260	65	65	70	70	155	155	40	40
125	125	155	155	260	260	70	70	80	80	155	155	40	40
140	140	170	170	315	315	80	80	85	85	180	180	50	50
160	160	200	200	365	365	90	90	95	95	190	190	55	55
200	200	240	240	430	430	100	100	105	105	245	245	60	60
225	225	265	265	455	455	105	105	110	110	255	255	65	65
250	250	295	295	480	480	110	111	110	110	280	280	75	75
315	315	370	370	570	570	120	120	130	130	340	340	80	80
355		420		600		130		145		370		85	
400	400	465	465	655	655	135	135	150	150	415	415	95	95
450	450	525	525	730	730	145	145	170	170	460	460	105	105
500	500	580	580	745	745	165	165	170	170	480	480	120	120

Electro Fusion 90°Elbow

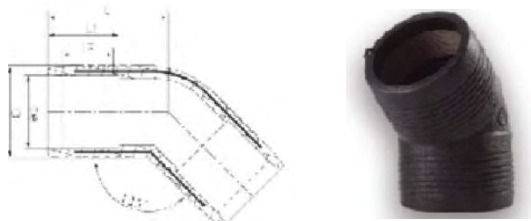
The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.



Nominal Diameter de/mm		Fitting Outer Dia D/mm≥		Fitting length L/mm≥		Insertion Depth L ₁ /mm≥		Melting zone Length L ₂ /mm≥	
Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting
50	-	65	-	75	-	45	-	22	-
63	-	80	-	80	-	50	-	26	-
75	-	95	-	90	-	55	-	30	-
90	-	110	-	110	-	60	-	35	-
110	140	135	135	125	125	70	70	40	40
140	160	170	170	145	145	80	80	50	50
160	200	195	195	170	170	90	90	55	55
200	225	235	235	185	185	100	100	60	60
225	250	265	265	205	205	105	105	65	65
250	315	290	290	220	220	110	110	75	75
315	355	360	360	265	265	120	120	80	80
355	400	410	410	300	300	130	130	85	85
400	-	465	465	320	320	140	140	100	100
450	-	525	-	380	-	145	-	105	-
500	-	590	-	385	-	165	-	120	-

Electro Fusion 45°Elbow

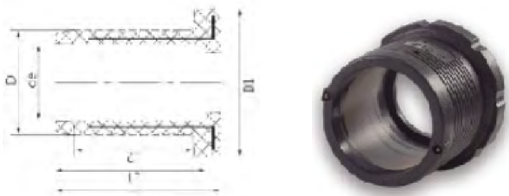
The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.



Nominal Diameter de/mm		Fitting Outer Dia D/mm≥		Fitting length L/mm≥		Insertion Depth L ₁ /mm≥		Melting zone Length L ₂ /mm≥	
Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting	Normal electro fusion fitting	Steel skeleton electro fusion fitting
50	-	65	-	80	-	45	-	22	-
63	-	80	-	80	-	50	-	26	-
75	-	95	-	85	-	55	-	30	-
90	-	110	-	100	-	60	-	35	-
110	110	135	113	110	110	70	70	40	40
125	125	155	155	115	115	75	75	45	45
160	160	195	195	135	135	90	90	55	55
200	200	240	240	165	165	100	100	60	60
225	225	270	270	170	170	105	105	65	65
250	250	290	290	185	185	110	110	75	75
315	315	360	360	200	200	120	120	80	80
400	400	465	465	265	265	140	140	100	100
630	630	710	710	410	410	195	195	150	150

Electro Fusion Stub Flange

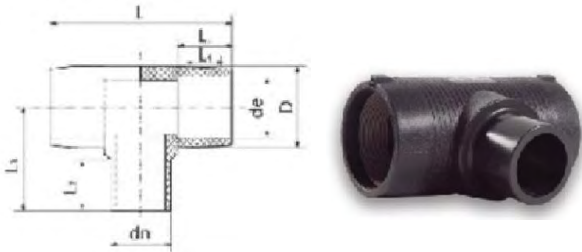
The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.



Nominal Diameter de/mm	Outer Diameter D/mm≥	Outer Diameter D ₁ /mm≥	Length L/mm≥	insertion depth L ₁ /mm≥	Melting zone length L ₂ /mm≥
50	70	95	110	100	50
63	80	110	115	105	55
75	95	130	135	125	70
90	115	145	140	130	75
110	140	165	145	135	80
125	155	205	155	140	85
140	170	190	150	140	85
160	190	225	155	150	90
200	235	270	160	155	90
225	260	295	160	155	95
250	285	330	165	155	100
315	360	385	165	155	100
355	390	440	170	160	110
400	440	485	170	160	115
450	495	495	200	185	125
500	550	605	220	210	130
560	610	670	225	210	135
630	710	720	230	225	160
710	775	835	235	225	165
800	880	935	245	235	170

Electro Fusion Reducing Tee

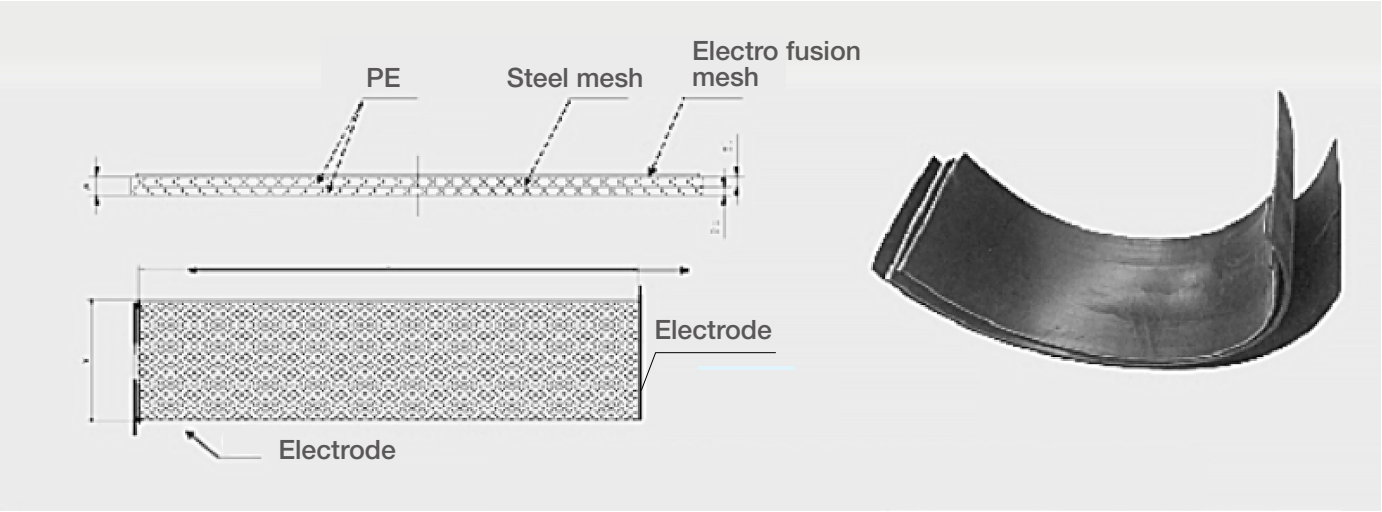
The bold-black lines in the picture represent the steel skeleton lining, otherwise they are normal pipe fittings.



Nominal Diameter d _e /mm	Outer Diameter D/mm≥	Nominal Diameter d _e /mm	Length L/mm≥	insertion depth L ₁ /mm≥	Socket length L ₂ /mm≥	Fitting height L ₃ /mm≥	Melting zone length L ₄ /mm≥
63	80	50	170	50	55	100	26
75	105	50	200	50	55	105	30
		63	200	55	55	110	
90	110	63	225	60	55	120	35
		75	225	60	60	125	
110	140	50	260	65	50	140	40
		63	260	65	60	145	
		75	260	65	60	145	
		90	260	65	70	145	
160	200	63	360	90	60	165	55
		75	360	90	65	165	
		90	360	90	65	170	
		110	360	90	110	180	
200	245	110	435	100	110	260	60
		160	435	100	130	275	
250	295	110	480	110	110	285	75
		160	480	110	110	345	
		200	480	110	110	400	
315	370	110	570	130	110	335	80
		200	570	130	140	350	
		250	570	130	150	355	
400	470	250	655	150	110	350	95
		315	655	150	130	400	
		355	655	150	130	415	
630	725	400	800	205	150	550	140
		500	800	205	175	575	

Steel Plastic Composite Reinforced Electro Fusion Belt

Normally used for the connection or maintenance of PE or PE composite pipe bigger than DN315.



The basic structure of an Electro fusion belt consists of resistance wire mesh layer - PE layer - steel mesh layer - PE layer, which obtained an invention patent

Standards
O/HBSDW 101-2017

Connection Method

After pipes being connected by electro fusion belt, the gap between the two ends of the belt should be filled up with extrusion filling welding, and then use reinforced electro fusion belt for treatment.

Applications

- Connection and maintenance of PE solid wall pipe
- Connection and maintenance of steel mesh skeleton reinforced PE composite pipe
- Connection and Maintenance of Steel Skeleton Plastic Composite Pipe
- Connection and maintenance of multi reinforced steel plastic composite pressure pipes
- Connection and maintenance of large-diameter winding structure wall pipes

Product Specifications

Pipe Nominal Dia dn	Nominal Pressure PN/MPa					Nominal Pressure PN/MPa					Distance from fusion welding surface to steel mesh e1,min	Distance from non-fusion welding surface to steel mesh e2,min
	0.6	0.8	1.0	1.25	1.6	0.6	0.8	1.0	1.25	1.6		
	Width w,min					Thickness e,mm						
	Nominal size and deviation											
250~400	300±5	300±5	300±5	300±5	300±5	9	9	9	9	9	4	3
450	300±5	300±5	300±5	300±5	395±5	9	9	9	9	11	4	3
500~800	395±5	395±5	395±5	395±5	395±5	11	11	11	11	11	5	4
1000~1200	495±5	495±5	495±5	-	-	13	13	13	-	-	5	4
1400~1800	495±5	495±5	495±5	-	-	13+11	13+11	13+11	-	-	5	4
2000~2200	495±5	495±5	-	-	-	13+11	13+11	-	-	-	-	-
2400~2600	495±5	-	-	-	-	13+11	-	-	-	-	5	4
Note 1: Pipe between DN1500mm~DN2600mm shall be connected by double-layer electro fusion belt. Note 2: The length of the electro fusion belt is according to the pipe size and using requirements . Note 3: The resistance range of the electro fusion belt should not exceed 10% of the design value												

- By using function, the type can be divided as connecting electro fusion belt and reinforced electro fusion belt.
- By the nominal pressure of the connected pipes, the type can be divided as 0.6MPa 0.8MPa 1.0MPa 1.25MPa and 1.6MPa etc.

Reinforced steel plastic composite enhanced electro fusion belt (mm): in mm

Pipe Nominal Dia D N	Minimum length
≤355	300
355<DN≤450	350
450<DN≤800	450
800<DN≤1200	550

Technical requirements for steel plastic composite enhanced electro fusion belt.

Items	Requirements
longitudinal reversion /%	≤0.6,No distortion, deformation or layering phenomenon
Carbon black content/%	2.0~2.5
Falling hammer impact performance(0°C),TIR/%	≤10
oxidation induction timing(200°C)/min	≥20
Electical resistance deviation	Nominal value×(1±10%)
Tearing of fusion welds test	Plastic peeling ratio of weld seam >70%

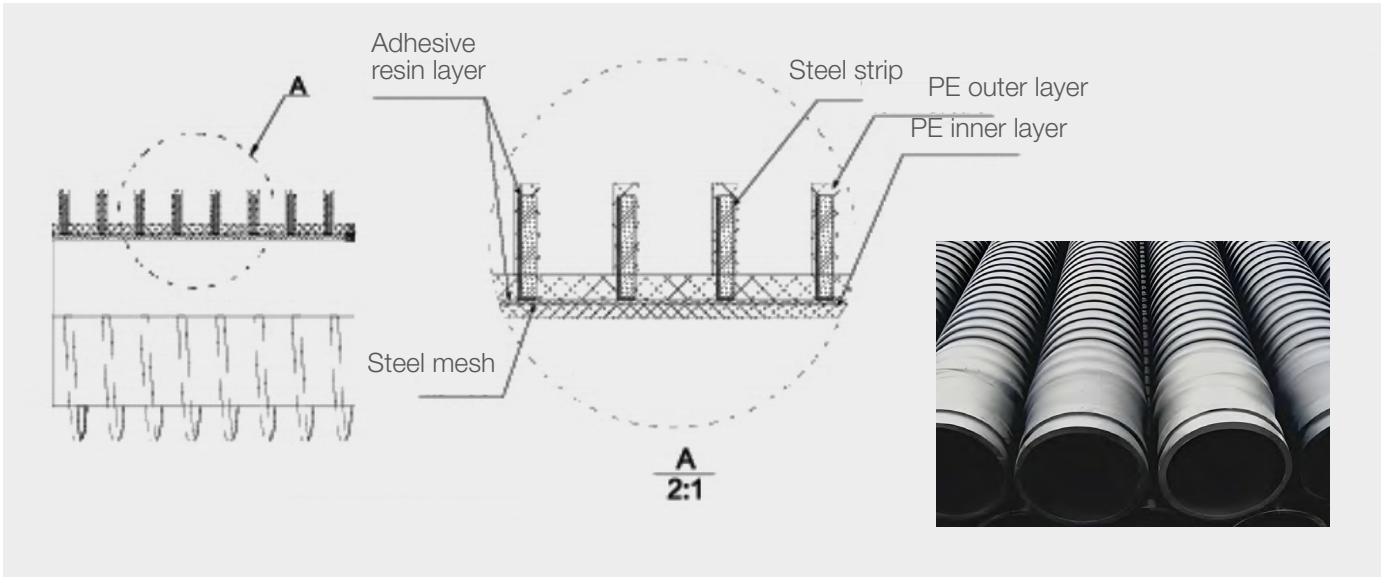
Multi Reinforced Composite Pipe for Low-Pressure Drainage

Structural Features

Machine woven steel mesh/strip are co-extruded with maleic anhydride grafted modified polyethylene adhesive resin, and then co-extruded with polyethylene pipeline special material to form plastic steel composite polyethylene profiles. The steel plastic interface strength is high and the structural stability is extremely high, completely solving the fatal defects of steel plastic composite pipes such as steel-plastic delamination.

The advanced hot state spiral winding welding technology ensures the bonding strength between plastic steel composite PE profiles.

The steel plastic winding composite reinforced pipe fully absorbs the advantages of machine woven steel mesh, steel strip, and PE material, and has excellent properties such as high strength, high ring stiffness, corrosion resistance, wear resistance, and low friction coefficient.



Product Features

- Structurally stable, high strength, high ring stiffness and high resistance to external loads.
- Easy and reliable connection, 100% leakage free, and will not cause soil pollution.
- Excellent corrosion resistance and long service life.
- Smooth inner wall, low roughness coefficient of the pipe wall (n can be taken between 0.009-0.011).
- Compared with concrete pipes with the same inner diameter, the water delivery capacity can be increased by more than 35% under the same conditions.
- Flexible pipes and excellent in restoring the original shape after external impacts and strong resistance to uneven settlement of foundation
- Lightweight, easy to transport, fast and convenient for installation and free from limitations of seasons or temperatures, which can save a lot of time and costs fot the construction.
- Energy saving and environmental protection

Applications

- Municipal drainage, sewage and other pipeline systems.
- Water conservancy systems such as irrigation, water diversion and storm drainage.
- Industrial wastewater system and sewage treatment systems.
- Protective sleeves for underground pipelines and communication cables.

Pipe Specifications And Ring Stiffness

Nominal Diameter dn,mm	Thickness e/mm≥	Structural height Hc/mm≥	Socket length Lc/mm≥
400	4	16	105
500	4	16	105
630	4	22	105
710	5	22	105
800	5	22	105
1000	5	32	155
1200	5	32	155
1400	5	34	155
1500	5	34	155
1600	5	34	155

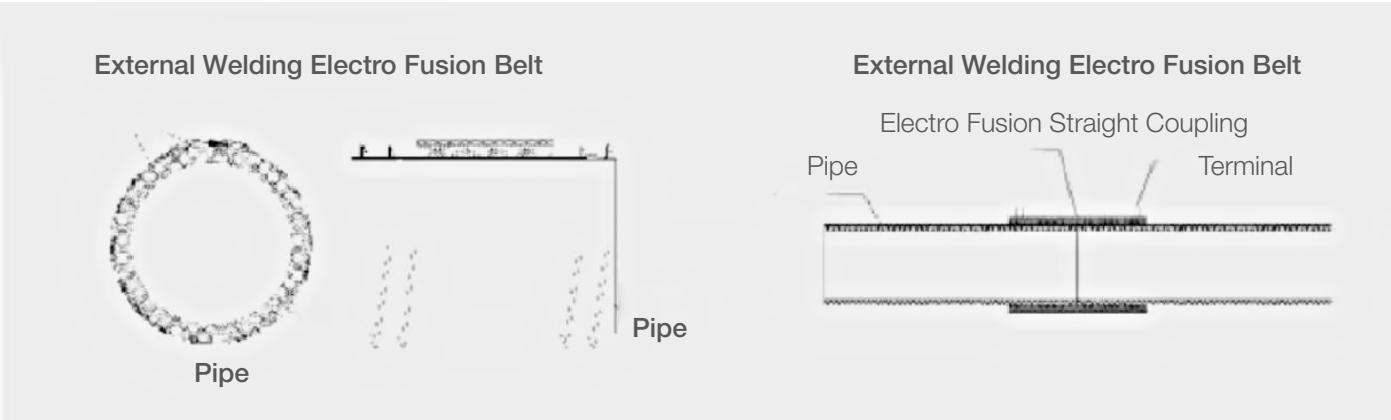
Pipe Specifications and Ring Stiffness

Item	Conditions	Property requirement
ring Stiffness/(KN/m²)	(23±2)°C	SN8≥8
		SN12.5≥12.5
		SN16≥16
Stability under compression cracking	Compress by 30% and hold for 10 minutes	No cracking, peeling or other damage
Heating and baking resistance	(110±2)°C, 90 min	After the sample is baked, there is no distortion or distortion, and there is no delamination or cracking in the weld seam
Compact resistance(TIR)/%	(0±1)°C	≤10
Oxidation induction timing(OIT)/min	210°C	≤20 min
Spiral fusion seam peel resistance	(23±2)°C	Non peeling or plastic peeling ratio≥80%

Standards

T/HBAS 050-2021, T/HBAS 007-2021, GB 50268-2008, CJJ143-2010

Connection Method



Steel plastic composite reinforced electro fusion belt external welding connection method



Steel Strip Reinforced PE Spiral Corrugated Pipe

Steel strip reinforced PE spiral corrugated pipe is a new type of corrugated pipe made of high-density polyethylene as the basic material, with the outer layer spiral winding around the pipe wall and lined with steel strip reinforced hollow ribs. In addition to the characteristics of corrosion resistance, smooth inner wall, and low flow resistance that ordinary plastic pipes have, it also has a ring stiffness greater than 12.5KN/m2 (spiral wound hollow wall polyethylene can only reach 8KN/) and higher strength and toughness due to the hollow surrounding structure reinforced by steel skeleton. It has the characteristics

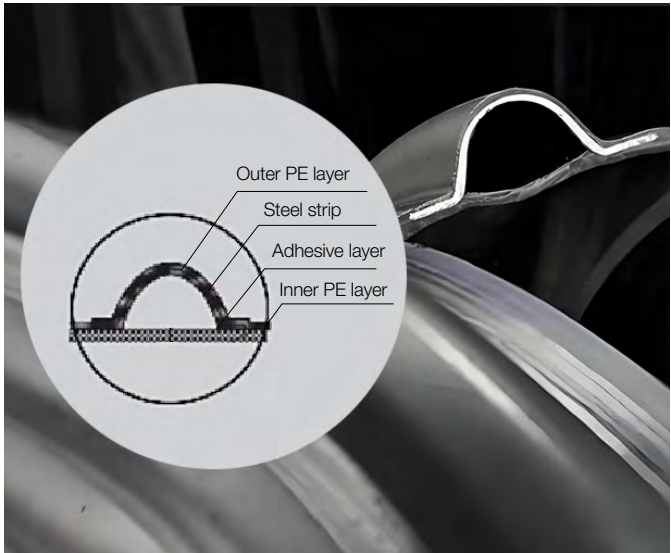
Product Features

- High ring stiffness, light weight, easy to install
- High reliability due to seamless inner wall formed by melt and interconnected plastic
- Multiple ways for pipe connection, easy to install.

Applications

- Municipal sewage discharge.
- Sewage treatment plant pipeline system;
- Airport, dock, highway drainage
- Farmland irrigation, water diversion, storm drainage
- Chemical industry and mining industry special fluid discharge
- Sleeve for power cable and communication cable underground

of light weight (40% lighter than spiral wound hollow wall polyethylene pipes), impact resistance and leakage free. Therefore, it is widely used in drainage, sewage, agricultural irrigation, coal mine ventilation, chemical industry, communication cable sleeve and other fields. Due to its light weight and convenient transportation and installation, it reduces the labor intensity of construction personnel and also lowers the cost of the project, making it an ideal substitute for concrete pipes and traditional plastic drainage pipes.



Pipe Specifications

Nominal Inner Dia(mm)	Minimum Average Inner Diameter(mm)	Minimum Steel Strip Thickness(mm)	Default Length(mm)	Note
250	245	0.4	10000 12000	The length of the pipe can also be customized, and the pipe length is not allowed to have a negative deviation exceeding 1/2 pitch of screw.
300	294	0.4		
400	392	0.4		
500	490	0.5		
600	588	0.5		
700	673	0.5		
800	785	0.7		
900	885	0.7		
1000	985	0.7		
1100	1085	0.7		
1200	1185	0.7		
1300	1285	1.0		
1400	1385	1.0		
1500	1485	1.0		
1600	1585	1.0		
1800	1785	1.0		
2000	1985	1.0		
2200	2185	1.2		
2400	2385	1.2		

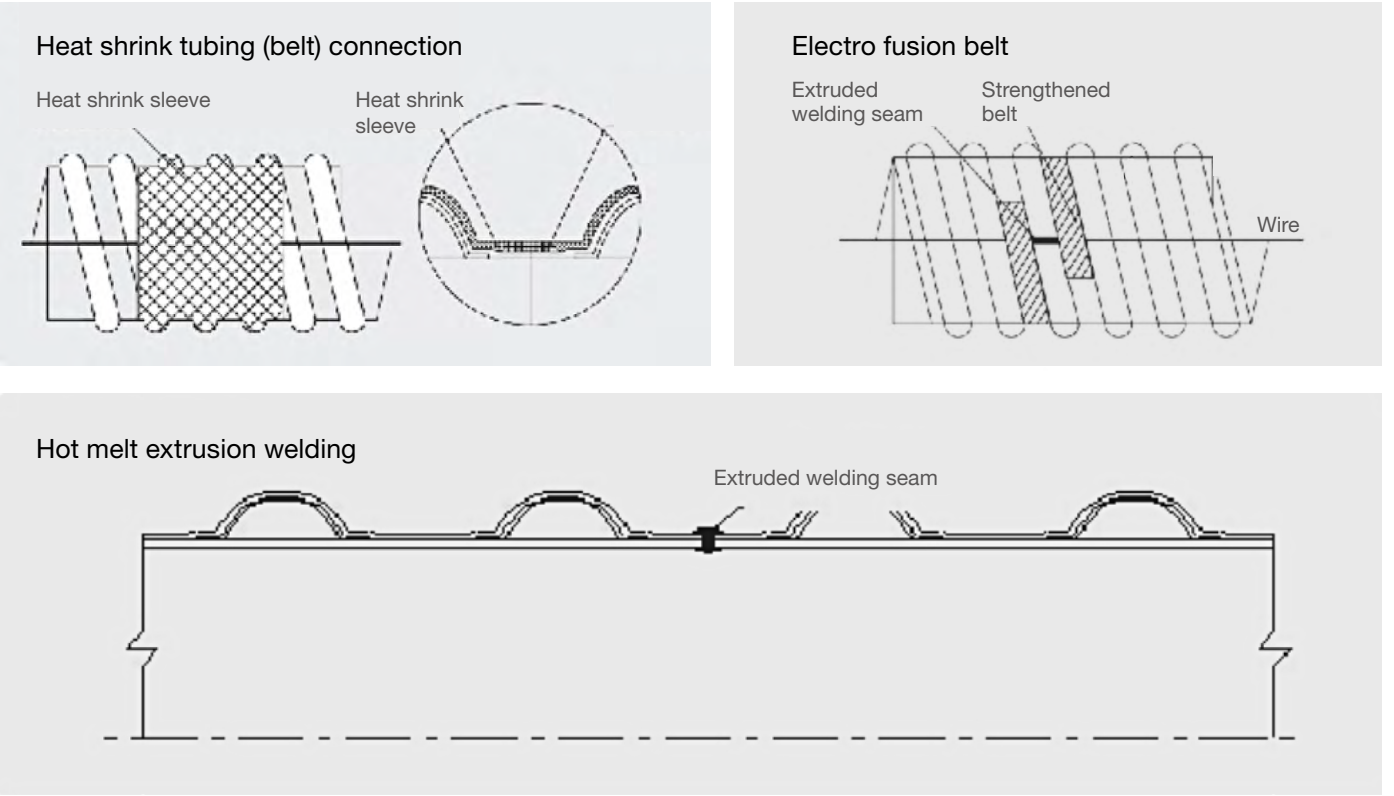
Nominal Ring Stiffness Level

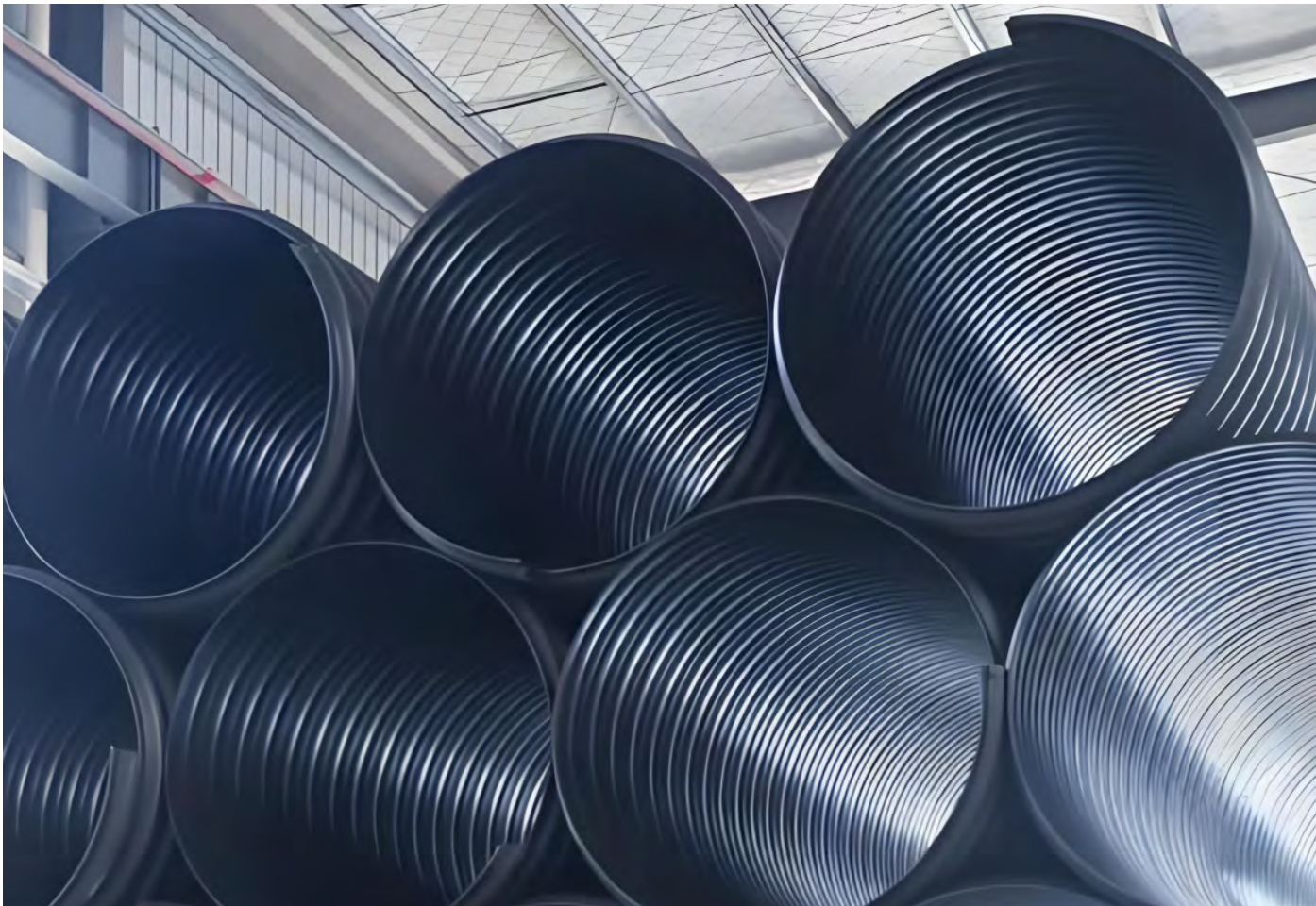
level	SN8	SN10	SN12.5
Ring Stiffness(KN/m²)	≥8	≥10	≥12.5

Standards

CJ/T 225-2011, CECS 223:2007

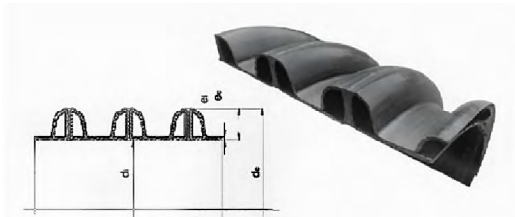
Connection Method





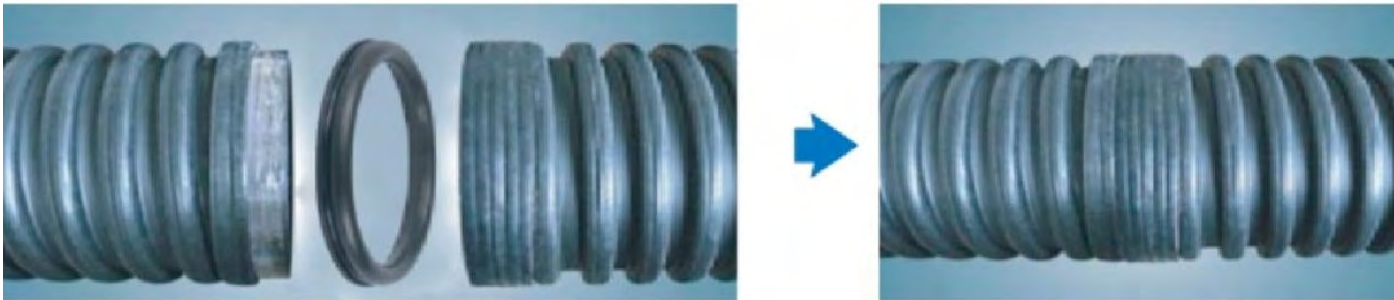
Inner Rib Reinforced PE Spiral Corrugated Pipe

Inner rib reinforced PE spiral corrugated pipe, made of high-density polyethylene (HDPE) as raw material, with strong corrosion resistance. The outer surface area of the pipe is large, forming a joint compressive strength with the soil. The internal rib structure ensures the ring stiffness requirements of the pipe material. The length of the pipe can be customized.



Connection Method

by rubber ring socket connection(DN300,400,500,600)



Pipe Specifications

Nominal diameter (DN/ID)	Minimum average inner diameter (D _{1,min})	Minimum inner layer thickness (E _{1,min})	Minimum structural height (E _{c,min})
200	195	1.3	14
250	245	1.6	17
300	294	2.0	21
400	392	2.5	28
500	490	3.0	35
600	588	3.5	43
700	673	4.0	51
800	785	4.5	59
1000	985	5.4	75
1200	1185	6.0	92

Standards

DB44/T 1098-2012; Q/ZXX005-2014; GBT 19472.2-2004; CECS164:2004

Physical properties

Property	Index		Test Basis
Ring Stiffness(kN/m ²)	≥ 6.3 ≥ 8 ≥ 10 ≥ 12.5		GB/T9647-2003
Impact Strength(%)	TIR ≤ 10		GB/T14152-2001
Ring Flexibility	no burst or delamination. More than 80% of permanent buckling deformation can be restored.		ISO13968-1997
Creep Rate	≤ 4		GB/T18042-2000
Longitudinal Reversion	$\leq 3\%$, The pipes no delamination, cracking, or bubbles		GB/T6671-2001
Seam Tensile Strength(N)	Nominal Size (ID or DN)	Minimum Tensile Force	GB/T8804.3-2003
	DN/ID ≤ 300	380	
	400 $\leq$ DN/ID ≤ 500	510	
	600 $\leq$ DN/ID ≤ 700	760	
	DN/ID ≥ 800	1020	

Product Features

- Pure plastic pipe with excellent corrosion resistance
- Pipe has large surface, and strong load-bearing capacity
- Tough, and strong to resist uneven settlement of the foundation.
- The outer wall structure of the pipe is wide and thick, with high tensile strength.
- Convenient and reliable connection, low construction cost.

Applications

- Building drainage and ventilation
- Chemical industry, hospital and environmental industry drainage
- Farming, plantation and forest irrigation
- Railway and expressway seepage and drainage
- Mining well ventilation and drainage.

Partner

