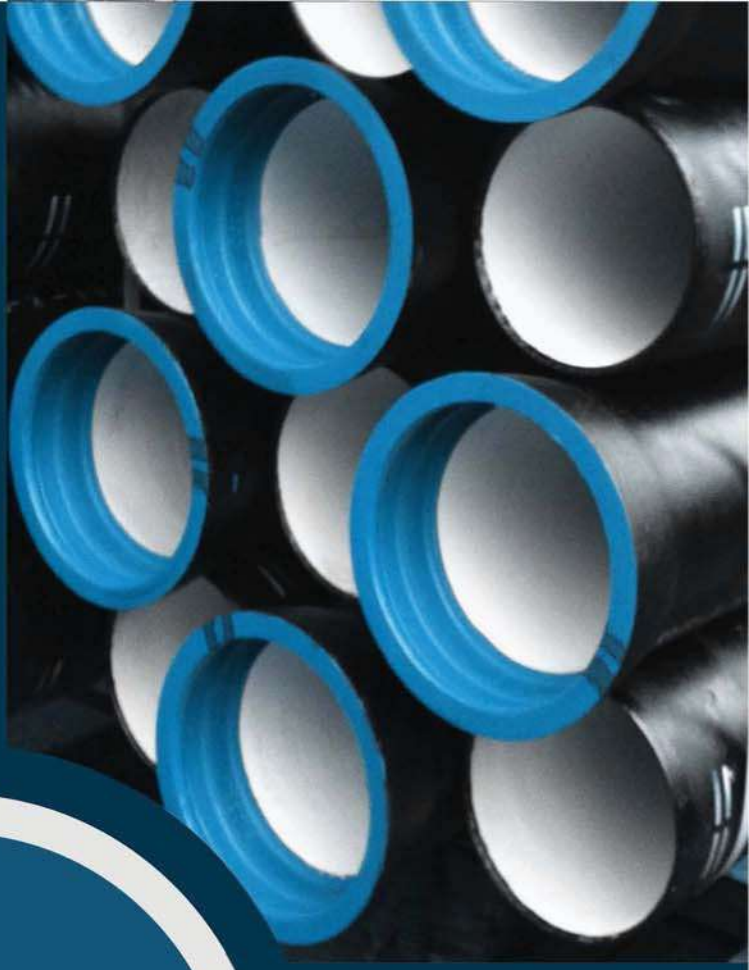
DUCTILE IRON PIPES

ISO 2531. BS4772. BSEN545 / BSEN598



SINOTEC

JILIN SENFENG PIPE CO., LTD.

Address: B-1 Jiancaijiayuan, Fukang Road(132300)
Panshi City, Jilin Province, China

Sole Agent: Essential Trading Co., Ltd

Address: 15/F., Toi Shan Centre,128 Johnston Road, Wanchai, HongKong
Tel: 28339906
Fax: 28385587
E-mail: essenthk@essential.imsbiz.com.hk
Website: https://essential-hk.com/

Content

Company profile

JILIN SENFENG PIPE CO. LTD. (JSP) is dedicated to manufacturing of ductile iron (D.I.) pipes, fittings and valves, plus piping accessories.

Dominant products (D.I. series) have won widespread acceptance in the global market. Diameter size from DN80 to DN2400 with full series of jointing types according to standards in conformity to ISO2531, BS EN545/598, AWWA C110, C153 & C219 etc., and nonstandard by client requirements. The quality products widely service in water supply and drainage systems and natural gas transportation for many important projects in China, the Middle East, North America, Africa and Southeast Asia.

JSP is certificated by SGS through the ISO 9001:2008, by TUV through ISO2531, BS EN545/598, and by WRAS through BS 6920-1 to demonstrate its commitment to quality and customer satisfaction, as well as continuously improving its quality management systems and integrating the realities of a changing world.

DUCTILE IRON PIPES

History of Ductile Iron

Grey Iron is being produced since hundreds of years. In 1948, a major event occured when small amount of magnesium were added to molten cast iron.

It was found that the Flaky Graphite were changed to spheroidal, accordingly all mechanical properties of the metal were changed, the new metal is called Ductile Iron.

Advantages of Ductile Iron Pipe

◆ Ductile iron pipe possesses excellent mechanical properties. It has the tensile strength, yield strength and module of elasticity that are comparable with steel pipe.

◆ Ductile iron pipe has high corrosion resistance. Ductile iron pipes are lined with cement or resins, and coated with bitumen paints, which solves the problems of internal and external corrosion that grey iron pipes and steel pipes can not solve. Therefore, the users don't have to take any anti-corrosive measures. It also prevents secondary pollution to the water quality.

◆ The joints are flexible and have good adaptability. The connections of ductile iron pipes are push-on joints or gland mechanical joints with rubber gaskets, and have good leak tightness and ductility. No welding is required. The designed deflection is 3~5 °, so the number of fittings required can be reduced. The joints can absorb the stress caused by foundation settlement and prevent pipe rupture.

◆ Easy to assembly. Ductile iron pipe installation is convenient and not subject to weather conditions. The installation does not need sophisticated equipments and workers do not have to be highly professional.

◆ The pipes satisfy the highest hygienic standards. Drinking water and ground water are protected by pipe walls which seal against diffusion. The pipes are resistant to extremely high internal pressure.

◆ The service time is up to 50 years, with the material properties unaffected.

◆ High load-bearing capacity.

◆ Ductile iron pipes are environmentally-friendly. Pipes are sustainable and recyclable, and the materials used are inorganic.

◆ Both deep and shallow top covers are possible. The pipes are suitable for all soils and laying methods.

Economic advantages.

◆ No need for change of soils or additional bedding for the pipes, and the soils excavated can be re-used.

◆ Major savings of time and money, because the soil excavated does not have to be taken away.

Main applications of ductile iron pipes

◆ Drinking and irrigation water networks

◆ Sewerage networks

◆ Fire fighting systems

◆ Transmission of gas & fuel

Size range

◆ DN80-DN2600

Effective length

◆ 5.5 OR 6 meters

Wall thickness

K9 is the normative one; we can supply K7, K8, K10, K12 if requested.

e=K(0.5+0.001) with a minimum of 6mm; K7,8,9,10,11,12...

Tolerance on wall thickness (for centrifugal cast): if e>6mm, -(1.3+0.001 DN)

Tolerances on other dimensions are as per JSP[1] designing.

Standards follow

◆ ISO2531 ◆ ISO4179 ◆ISO8179 ◆ ISO4633 ◆ ISO7186 ◆EN545 ◆EN598 ◆BS4772 and other equivalent standards.

ISO 9001:2008 Certification

Noti. to Saudi Arabia

Intertek-to Saudi Arabia-certificate

TUV certificate 598

WRAS

TUV certificate ISO2531,En545

Flow sheet

01 Melting iron plus treatment

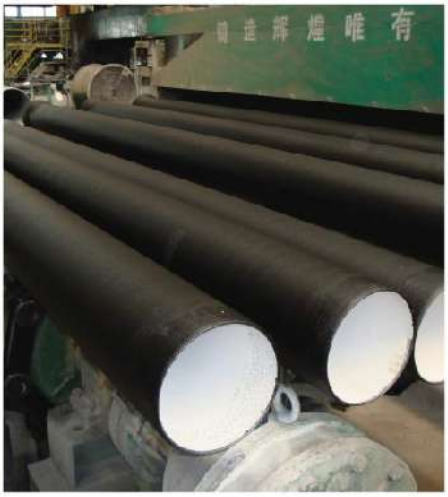
02 Centrifugal casting

03 Annealing

04 Hydraulic test

05 Zinc coating

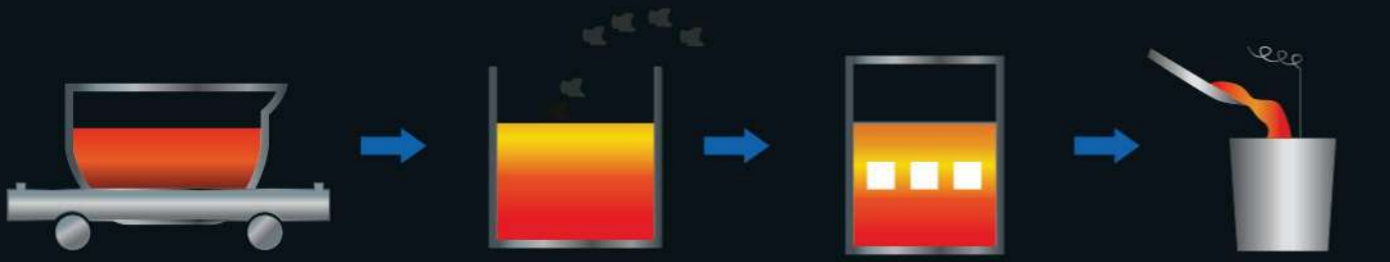
06 Cement lining



07 External bitumen and internal epoxy seal coat

08 Packing

Pipe manufacture process

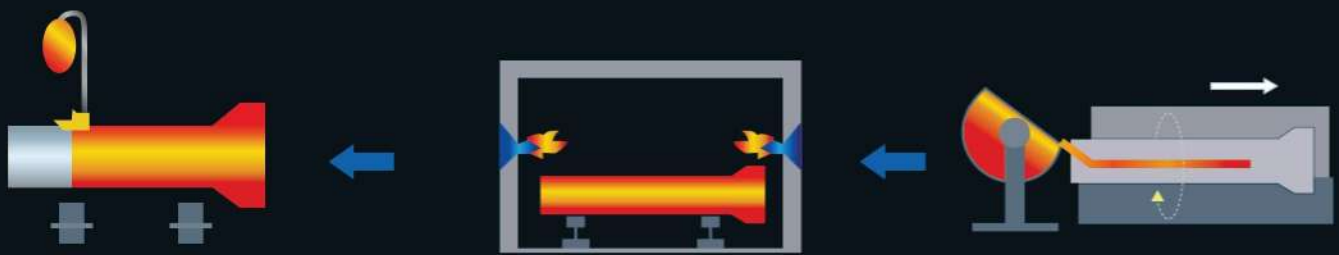


Molten iron

Molten iron purification

Heating and spheroidization

spheroidization



Zinc spraying

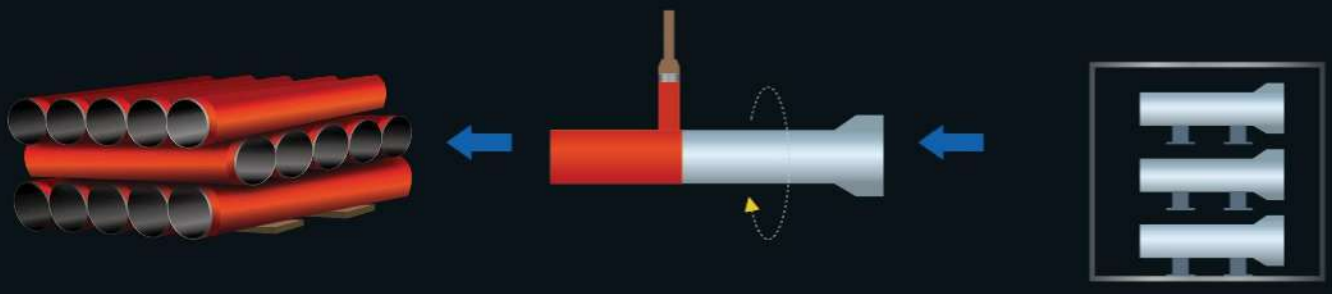
Annealing

centrifugal casting

Rounding and grinding

Hydraulic test

Cement lining

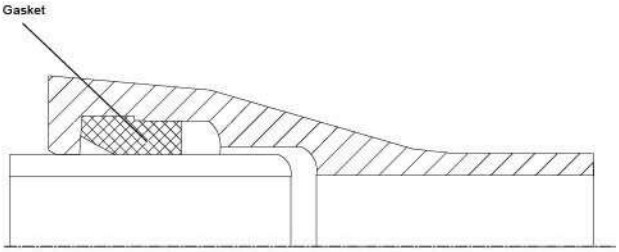


Packing

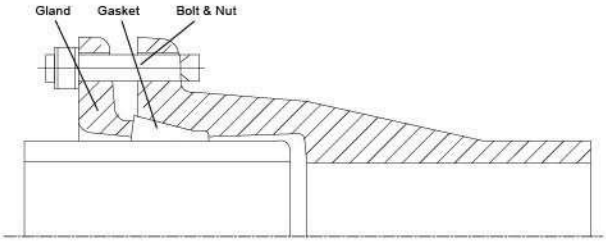
Biturnen coating

Cultivating

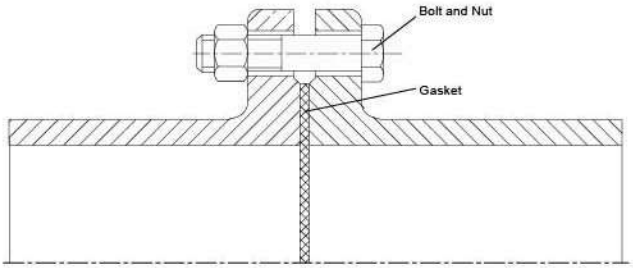
Joint type



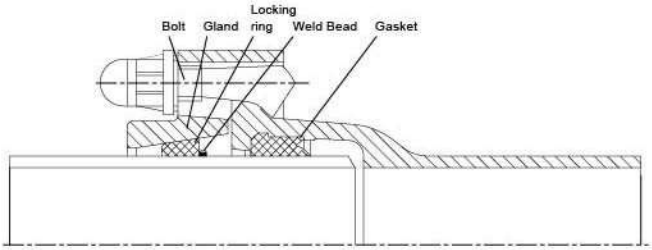
Push-on joint (T-type)



Mechanical joint (K-type)



Flanged joint



Self-restrained joint pipe

The joints of ductile iron pipe are various. Each of them shall be only applied to certain range of dimensions or depending on specific requirements. Please contact us if other joints are required.

Coating and lining

The Coating and Lining are made to protect the ductile iron pipe in order to guarantee its long lifetime use. However, the materials are various according to different applications of ductile iron pipe and different soil conditions.

Cement Mortar Lining

Offers internal cement mortar lining, centrifugally applied as per ISO 4179, BSEN 545 and BSEN598.

Other Linings and Coatings

Pipes offer a range of internal lining and external coating systems to suit different ground conditions.

Internal Linings

(1) High alumina cement mortar lining to BSEN598 and sulphate resistance cement mortar lining to BSEN545/BSEN197-1/BS6920

high alumina cement mortar lining is applicable to inner anti-corrosion for sewage pipes, improving resistance to erosion of the sewage components. Internal sulphate resistant cement mortar lining is applicable for portable water, treated effluent or sea water

(2) Polyurethane lining to BSEN15655

PU lining consists of two-component, solvent-free, 100% solids polyurethanematerial, which has very good corrosion resistance and wears resistance property. Because of its smooth surface it has small resistance when grinding and good retarding performance, it can be used to transport drinking water andsewage with different material, can also improve the life of ductile iron pipes and ensure water quality transferred.

As the PU has excellent resistance to chemical and electrical corrosion, it can be used for ductile iron pipes' lining and coating to meet the complex soil burial environment and enhance the service life of pipes. PU lining surface should be smooth, flat and no obvious spiral.

(3) Internal cement mortar lining to BSEN197-1 plus 150um epoxy seal coat to BS6920 and ISO16132

The epoxy seal coat is apply on top of the internal cement mortar lining with excellent adhesive strength and impact resistance in which provide excellent anti-corrosion and protection properties. It is also suitable to use for portable water, treated effluent or seaw water.

External Coatings

(1) Standard pipe coating: Metallic zinc plus bitumen coated

The standard pipe coating is zinc plus bitumen. Zinc is a proven pipeline coating system used throughout the world for more than 30 years.Pure metallic zinc coating plus bitumen layer provide a high degree of protection against most soil conditions.

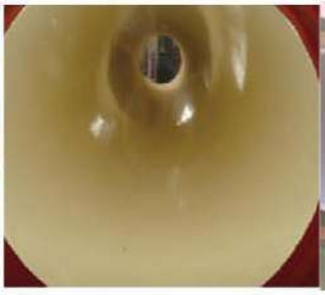
Metallic: Zinc + bitumen coating

Internal cement mortar lining

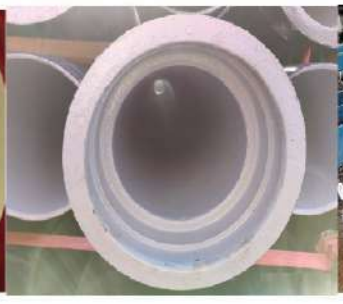
Internal high alumina cement mortar lined plus red epoxy

Polyurethane coating

Internal fusion bond epoxy powder coating

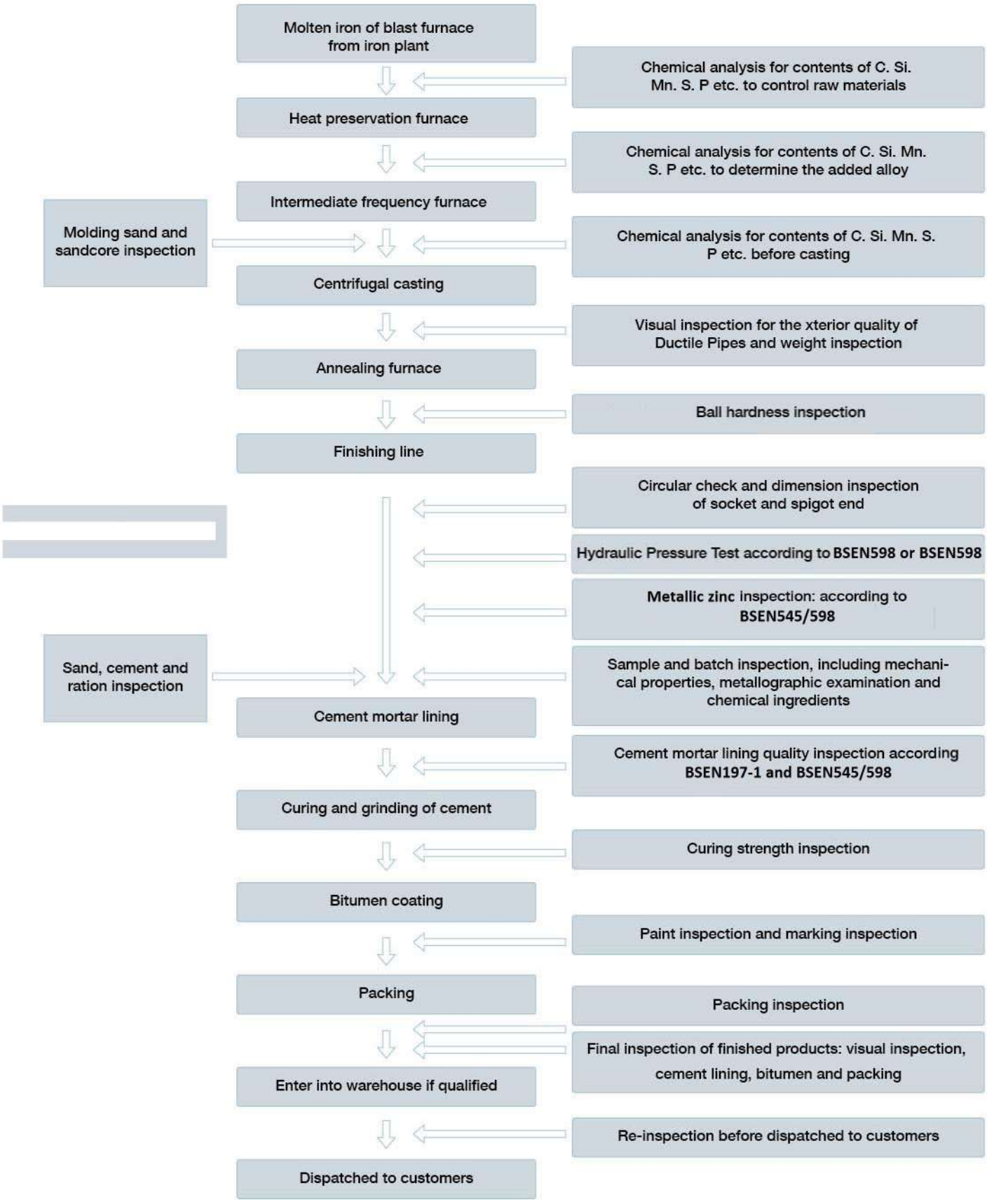


Internal PU lining



Internal sulphate resistant cement mortar lining with epoxy seal coat

Quality control system



Tolerances on Dimensions

Tolerances on Dimensions

Tolerance on Lengths	Tolerance on Wall thickness
±30	- (1.3 + 0.001 DN)

DN	DE	Tolerance	DN	DE	Tolerance
80	98	+1 / –2.2	800	842	+1 / –4.5
100	118	+1 / –2.8	900	945	+1 / –4.8
150	170	+1 / –2.9	1000	1048	+1 / –5.0
200	222	+1 / –3.0	1100	1152	+1 / –5.4
250	274	+1 / –3.1	1200	1255	+1 / –5.8
300	326	+1 / –3.3	1400	1462	+1 / –6.6
350	378	+1 / –3.4	1500	1565	+1 / –7.0
400	429	+1 / –3.5	1600	1668	+1 / –7.4
450	480	+1 / –3.6	1800	1875	+1 / –8.2
500	532	+1 / –3.8	2000	2082	+1 / –9.0
600	635	+1 / –4.0	2200	2288	+1 / –9.8
700	738	+1 / –4.3	2400	2495	+1 / –10.6

Dimensions in mm

Straightness of Pipes

Pipes shall be straight with a maximum deviation of 0.125% of their length.

DNxxx=DN80-600

Marking

DN80	C100	DN350	C40
DN100	C100	DN400	C40
DN150	C64	DN450	C40
DN200	C50	DN500	C30
DN250	C50	DN600	C30
DN300	C40		

Mechanical properties

Type of cast	Minimum Tensile strength	Minimum Elongation After fracture, A(%)		Hardness Max.(HB)
	DN80-2600mm	DN80-1000mm	DN1100-2600mm	
Pipes centrifugally cast	420MPa	(DN≤1000) ≥10 (DN>1000) ≥7	7%	230
Pipes not centrifugally cast	420MPa	5%	5%	230

Angular Deflection & Straight Draw of "Push in" type flexible Joint(Tyton Joint)

DN (Nominal Size) mm	Allowable Angular Deflection	Allowable Straight Draw Without Deflection
80 ~ 300	5°	38mm
350 ~ 600	4°	38mm
700 ~ 800	4°	56mm
900 ~ 1200	4°	70mm
1400 ~ 1600	4°	95mm
1800 ~ 2000	1 1/2°	105mm

Pressure and Temperature Ratings

(a) Works Proof and Leak Tightness Pressures

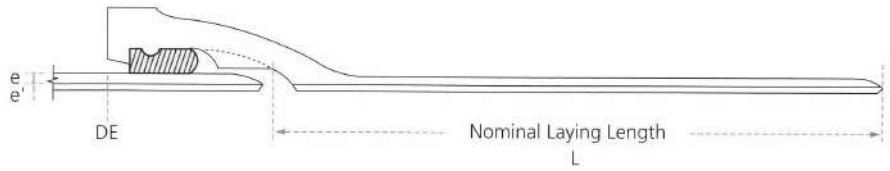
DN (Nominal Size)	Pipes bar	Fittings bar
80 ~ 300	50	25
350 ~ 600	40	16
700 ~ 1200	32	10
1400 ~ 2000	25	10

(b) The nominal pressure rating are applicable to the temperature range - 10°C to 120°C; the purchasers should consult the manufacturers where pressure-temperature conditions are out of this range.

Thickness of Internal cement mortar lining

Nominal diameter	Lining thickness(mm)	
	Nominal	Min. at one point
80≤DN≤300	4	2.5
350≤DN≤600	5	3
700≤DN≤1200	6	3.5
1400≤DN≤2000	9	6
2200≤DN≤2600	12	7

Push on "T" Type Flexible Joint(Tyton) Socket & Spigot Pipe Class K9/K12 (BSEN545/BSEN598)



Unit: mm

Nominal Size	Thickness			Outside diameter	Nominal laying length	Approx. Mass (Kg)			
	Unlined pipe		Cement lining			Pipe	Cement Lining	Pipe	Cement Lining
DN	e		e'	DE	L	K9		K12	
	K9	K12	BSEN						
80	6.0	7.0	4.0	98	6000	76.6	12.0	88.0	12.0
100	6.0	7.2	4.0	118	6000	94.9	14.9	110.5	14.9
150	6.0	7.8	4.0	170	6000	143.9	22.4	175.1	22.4
200	6.3	8.4	4.0	222	6000	193.9	29.9	251.0	29.9
250	6.8	9.0	4.0	274	6000	255.4	37.3	331.0	37.3
300	7.2	9.6	4.0	326	6000	323.4	44.7	422.4	44.7
350	7.7	10.2	5.0	378	6000	402.2	74.1	522.3	74.1
400	8.1	10.8	5.0	429	6000	482.3	84.6	629.3	84.6
450	8.6	11.4	5.0	480	6000	574.0	94.9	745.0	94.9
500	9.0	12.0	5.0	532	6000	668.6	106.0	872.0	106.0
600	9.9	13.2	6.0	635	6000	881.9	127.0	1150.0	127.0
700	10.8	14.4	6.0	738	6000	1225.5	177.0	1463.9	177.0
800	11.7	15.6	6.0	842	6000	1393.8	202.0	1815.6	202.0
900	12.6	16.8	6.0	945	6000	1691.1	227.0	2202.3	227.0
1000	13.5	18.0	6.0	1048	6000	2017.1	253.0	2624.9	2530.0
1100	14.4	19.2	6.0	1152	6000	2372.2	278.0	3085.6	278.0
1200	15.3	20.4	6.0	1255	6000	2758.3	303.0	3584.6	303.0
1400	17.1	22.8	9.0	1462	6000	3568.8	530.0	4646.4	530.0
1500	18.0	24.0	9.0	1565	6000	4037.5	565.0	5251.9	565.0
1600	18.9	25.2	9.0	1668	6000	3841.0	504.0	4973.9	504.0
1800	20.7	27.6	9.0	1875	6000	4764.0	567.0	6160.0	567.0
2000	22.5	30.0	9.0	2082	6000	5790.9	631.0	7476.4	631.0

BSE545:2010, Class 40, 50, 64, 100 are also available

Length of pipes other than the standard length can be supplied by agreement between the purchaser & the manufacturer