



Benxi Beital Ductile Cast Iron Pipes Co.,Ltd.

Beital Town, Benxi City, Liaoning Province, P.R.China. 117017

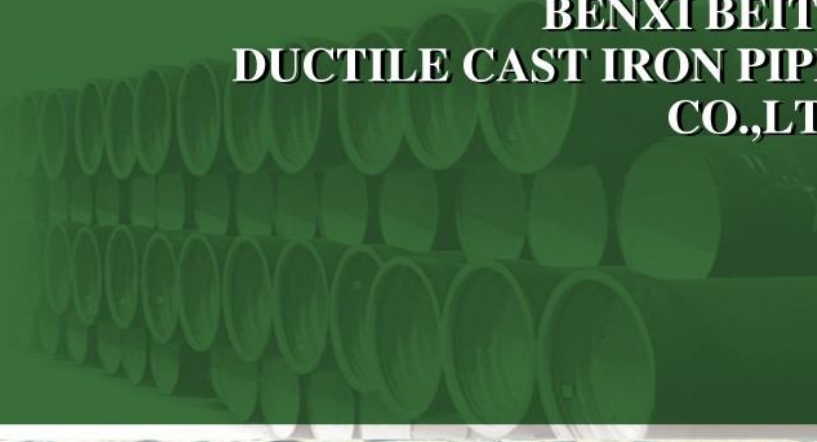
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**BENXI BEITAI
DUCTILE CAST IRON PIPES
CO.,LTD.**



BEITAI DI PIPES



COMPANY PROFILE

Benxi Beitai Ductile Cast Iron Pipes Co., Ltd. is one of the leading manufacturers for Ductile Cast Iron pipes and fittings in China with currently more than 600,000 tons annual capacity.

The company is a share-holding subsidiary company of Benxi Steel Group Corporation located in Beitai Town, Benxi City, Liaoning Province, P.R. China with occupied area of 24 hectares.

The company was formally put into operation since October 1994, whose products are Ductile Cast Iron pipes and fittings diameter range DN80mm to DN2600mm with T-type and other types joints. The products can meet the Standards of ISO2531, ISO4179, ISO8179, ISO7186, EN545, EN598, BS4772 and other equivalent standards following the requirement of customer. The company was well equipped from the beginning of foundation, most of the machines and facilities were imported from United States and Germany such as electric furnaces, centrifugal casting machines, annealing furnace, finishing lines and cement lining equipments.

Internal quality control system is applied strictly to guarantee the high quality of products. Since 1997, the company got the ISO9002/ISO9001 Quality system Certificates issued by Chinese Authority and SGS; Since 1998, the company got the Production Compliance Certificates issued by SGS and Bureau Veritas; Since 2003, the company was awarded the ISO14001 certificate.

"Beitai" brand ductile cast iron pipes and fittings are widely used in conveying water field, till now, the products have been sold to all over Chinese domestic market and exported to more than 36 countries and regions, such as Singapore, Hong Kong, Philippines, Vietnam, Burma, Pakistan, India, Sri Lanka, Syria, Jordan, Cyprus, Iraq, Iran, Korean, Saudi Arab, Turkey, Kuwait, U.A.E., Oman, Yemen, Qatar, Egypt, Algeria, Sudan, Ethiopia, Namibia, South America, Tunis, Libya, Kenya, Peru, Panama, Brazil, Spain, Russia, Kazakhstan, etc.

Our company always pursues the tenet that 'Quality is life and customer is God'. We sincerely wish to have the opportunity to cooperate with friends and partners all over the world to achieve win-win benefits.



MANUFACTURER'S QUALIFICATION STATEMENT

NAME AND OTHER INFORMATION

Name of manufacture: Benxi Beitai Ductile Cast Iron Pipes Co., Ltd.

Address of Head Office: Beitai Town, Benxi City, Liaoning Province, P.R. China. 117017

Established and /or Registered Date: August. 1994.

※ Note: After installing and test running of all the equipments during 1991 to 1994, the company-----Benxi Beitai Ductile Cast Iron Pipes Co., Ltd. was formally put into operation in October 1994. On Jan 1st, 2001, the company has been transferred into a share-holding company, with the current name Benxi Beitai Ductile Cast Iron Pipes Co., Ltd.

The company belongs to: Benxi Steel Group Corporation

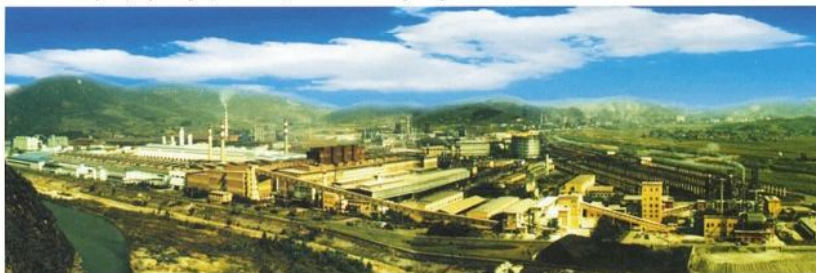
Ownership: State owned share-holding

Name of Principal Officer(Optional): Mr. Yang Jicheng (President)

Name of Product: DN 80-2600mm Ductile Cast Iron Pipes and Fittings

Number of Employees: 1420

Partial View of Beijing Company subsidiary Benxi Steel Group Corporation



Gate of Benxi Beitai DI Pipes Co. Ltd.



CERTIFICATES

In October of 1994, the company started formally production. From then on, BEITAI Brand Ductile Cast Iron Pipes have been awarded the following main certificates:

Jul. 1996	NEW SCIENCE AND TECHNOLOGY PRODUCTS CERTIFICATE awarded by Benxi City
Mar. 1997	RECOMMENDED PRODUCTS FOR WATER SUPPLY CERTIFICATE awarded by China City and Country Water Supply Association.
Apr. 1997	ISO 9002 QUALITY SYSTEM CERTIFICATE awarded by China Metallurgical Industry Quality System Certification Center, and was renewed every year, certificate NO.: 02203 Q 10044RIL
Sept. 1997	GOLD MEDAL OF NEW PRODUCTS awarded by the Government of Liaoning Province
Jul. 1999	PRODUCTION CERTIFICATE issued by SGS-CSTC Standards Technical Services Co., Ltd, and is renewed every year. Certificate No.: PRIN99007
Aug. 1999	RECOMMENDED PRODUCTS FOR INFRASTRUCTURE CERTIFICATE awarded by China Construction Materials Association and Was renewed every year.
Oct. 1999	FAMOUS PRODUCTS FOR EXPORT CERTIFICATE issued by China Commodity Inspection Bureau and was renewed every year.
Jun. 2002	ISO 9002 QUALITY SYSTEM CERTIFICATE issued by Suggest, renewed with ISO9001:2000 version in Oct.2003. Certificate No.: CN02/0367
Dec. 2003	ISO14001 certificate issued by SGS and renewed every year, certificate No.: CH03/1064.
Aug. 2005	COMPLIANCE CERTIFICATE issued by Bureau Veritas and renewed every half-year. Certificate No.: 05IND-IC1032-1/2



MAJOR EXPORT RECORDS IN THE LATEST FIVE YEARS

Year	Country or region	Specification (mm)	Quantity (Ton)
2005	Irap	DN80-1500	22200
	Iran	DN150-500	1500
	Saudi Arab	DN150-1000	4400
	UAE	DN100-600	800
	Lebanon	DN80-300	2800
	Spain	DN100-600	5100
	Botswana	DN150-400	3900
	South Africa	DN200-700	900
	Congo	DN600-1000	1200
	Ethiopia	DN100-500	1400
	Mauritius	DN200-600	1400
	Peru	DN200-600	1200
	Philippine	DN150-1500	1100
	Vietnam	DN100-500	1000
	Sri Lanka	DN150-600	500
	Pakistan	DN200-400	800
	Singapore	DN150-600	900
2006	Hong Kong	DN80-1200	800
	Hong Kong	DN100-1600	300
	Ethiopia	DN80-600	2780
	Peru	DN80-500	3660
	Cyprus	DN300-900	420
	Tunisia	DN300-1400	1370
	Saudi Arab	DN150-1000	13200
	Lebanon	DN150-500	600
	Iran	DN100-1000	2000
	Syria	DN100-1000	2000
	Jordan	DN100-800	3000
	Turkey	DN100-1200	2460
	Singapore	DN100-300	480
	Comoro	DN100-300	360
	North Korea	DN400	180
	Russia	DN100-300	250
	Bangladesh	DN100-300	550
	Kazakhstan	DN200-600	120
2007	Ethiopia	DN80-600	2780
	Lebanon	DN150-500	600
	Saudi Arab	DN150-1000	23300
	Viet Nam	DN300-500	340
2009	Yemen	DN300-800	1500
	Nigeria	DN300-500	600
	Saudi Arab	DN250-1800	25000
	Kuwait	DN600-1400	13000
	Syria	DN200-400	1000
2010	Tunisia	DN800-1200	4300
	Philippine	DN1400	100
	Sri Lanka	DN100-700	4500
	Saudi Arab	DN150-180	54000
	Kuwait	DN1400	6500
	Algeria	DN80-600	2000
	Peru	DN80-500	1000
	New Zealand	DN800-900	500
	Jordan	DN150-1500	2800



PRODUCTION

DUCTILE IRON PIPES:

SIZE RANGE:

From DN80mm to DN2600mm



STANDARDS FOLLOW:

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



EFFECTIVE LENGTH:

5.5 or 6 meters.



WALL THICKNESS:

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

JOINT TYPE:

The normative joint are Push-on (Tyton-type) joint, Mechanical (K-type) joint.

Please contact us if other joints are required.



Push-on joint (T-type)



Mechanical joint (K-type)



Push-on joint (T-type) pipe

Mechanical joint (K-type) pipe DN2600mm



Self-restrained joint pipe



N₁₁-type joint pipe
for gas supply

INTERNAL LINING:

Depending on the internal condition of use, the following linings can be applied.

- Cement mortar Lining: cement mortar lining as per ISO4179, cement can be Portland cement, Blast Furnace cement, Sulphate Resisting cement, High Alumina cement according to characteristics of conveyed water

Size mm	Lining thickness(mm)	
	nominal	min. at one point
DN80-300	3	2
DN350-600	5	3
DN700-1200	6	3.5
DN1400-2000	9	6
DN2200-2600	12	7



Cement mortar lining internally, Zinc-bitumen coating externally pipes

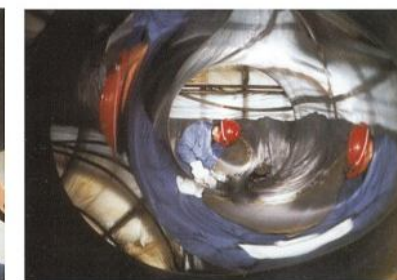
- Cement mortar with seal-coat;
 - Polyurethane;
 - Polyethylene;
 - Epoxy;
 - Bitumen Paint;
- (The second to sixth type of lining can be applied as per national standards and manufacturer's standards, please consult us for the details if you need)



Ceramic epoxy lining pipes for potable water pipeline



Ceramic epoxy lining pipes for sewage pipeline



EXTERNAL COATING:

Depending on the external conditions of use, the following coatings can be applied.

- Metallic Zinc with finishing layer in accordance with ISO8179-1, with a mean mass of zinc coating not less than 130 g/m²
- Zinc-rich paint with finishing layer in accordance with ISO8179-2;
- Bitumen paint, with dry film thickness not less than 70 microns;
- Polyethylene sleeves in accordance with ISO8180;



Polyurethane coating pipes.



Epoxy coating pipes

- Polyurethane;
- Thicker Metallic Zinc with finishing layer;
- Polyethylene;
- Epoxy;

(the fifth to eighth type of coating can be applied as per our national standards and Manufacturer's standards, please consult us for the details if you need)

PACKING:

The pipes of DN ≤ 300mm are bound with steel belts, others are in bulk. Special packing can be arranged after mutually agreed.

Pipes in Bundles



Pipes in Bulk



ACCESSORIES FOR DI PIPES

FITTINGS:

Ductile Cast Iron fittings are produced in accordance with the ISO2531, ISO7186, EN545, EN598, BS4772, etc., lined internally with cement as per ISO4179, coated externally with rich zinc followed by bituminous paint. Please consult us if you need special lining or coating, such as FBE or Polyurethane.

All fittings are packed with wooden crate or loose condition on wooden pallet according to their sizes.



RUBBER GASKETS

Rubber gaskets for pipes are produced in accordance with ISO4633. All gaskets are packed with plastic bags. Gaskets should be stored in closed warehouse to avoid sunlight and high temperatures (prefer below 25 °C).



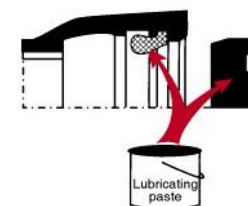
POLYETHYLENE SLEEVES

As per customer requirement, polyethylene sleeves of 200-250 microns thickness will be supplied in accordance with ISO8180 in rolls. Sleeves should be stored in warehouse to avoid direct sunlight.



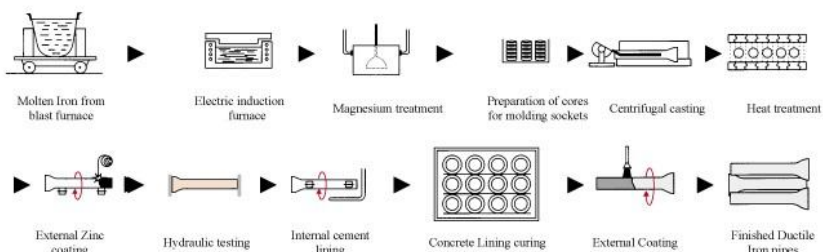
LUBRICATING PASTE

Food grade lubricating paste will be used when assembling the joints of pipes. It is water dissolved materials packaged in containers and should be stored in temperature range (-20 °C to +60 °C).



PIPE MANUFACTURE PROCESS AND MAIN EQUIPMENTS

PIPE MANUFACTURE PROCESS



MAIN EQUIPMENTS LIST AND PICTURES

The main manufacturing equipments for Pipes:

Main Equipments	Qty	Annual Capacity
45-Tons Furnace	3	650,000 tons.
10-Tons Medium Frequency Furnace	10	500,000tons.
20-Tons Medium Frequency Furnace	3	100,000 tons
Water Cooling Centrifugal Casting Machine (DN80-DN300)	2	100,000 tons.
Water Cooling Centrifugal Casting Machine (DN80-DN400)	4	
Water Cooling Centrifugal Casting Machine (DN300-DN800)	2	200,000tons.
Water Cooling Centrifugal Casting Machine (DN700-DN1200)	2	200,000tons.
Centrifugal Casting Machine (DN1200-DN2600)	4	100,000tons
Annealing Furnace 46Meters Long (DN80-DN400)	1	500,000 tons.
Annealing Furnace 46Meters Long (DN80-DN1200)	2	
Annealing Furnace (DN1200-DN2600)	4	200,000 tons.
Finishing Line (DN80-DN400)	2	120,000tons.
Finishing Line (DN300-DN800)	1	280,000 tons.
Finishing Line (DN400-DN1200)	1	
Finishing Line (DN1200-DN2600)	1	200,000tons
Zinc Spraying Machine	4	600,000tons.
Cement Lining Machine	6	600,000 tons.
Cement Curing Line	3	600,000 tons.
Bitumen Spraying Machine	3	600,000 tons.



Electric Furnaces



Centrifugal casting Machine
(for DN100-350 mm pipe)



Centrifugal casting Machine
(for DN700-DN1200 mm pipe)

Centrifugal casting Machine
(for DN1200-2600mm pipe)



Zinc Spraying Machine



Finishing Line
(for DN400-DN1200 mm pipe)

Cement Mortar Lining Machine
(for DN400-DN1200mm pipe)



Bitumen coating



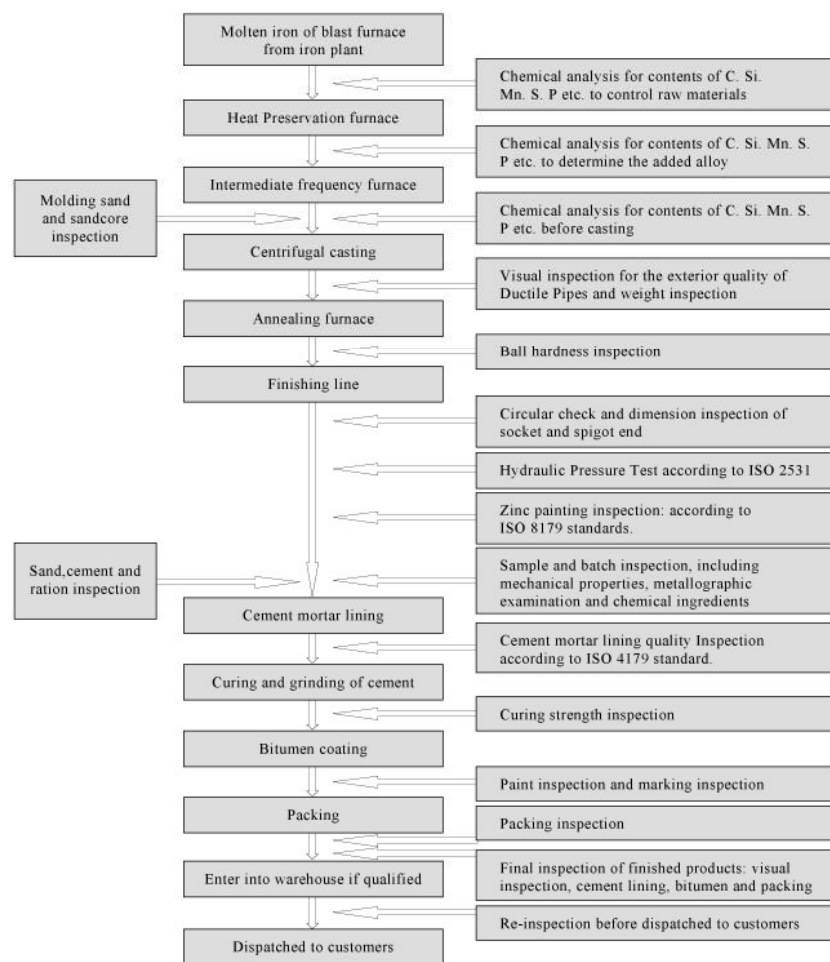
Annealing Furnace 46Meters Long

1	2	3
		4
7	6	5
8		
9		

QUALITY CONTROL AND INSPECTION

QUALITY CONTROL SYSTEM:

QUALITY GUARANTEE PROCEDURE OF DUCTILE CAST IRON PIPES



TEST AND INSPECTION PLAN(QAP)

Item No.	Description	Objective	Quality Control Processing (By Mill)
1	Raw material used for Ductile pipes	Property or chemical composition for main elements	Review records as per ISO9001 quality operation file.
2	Induction furnace and treated metal.	Molten metal temperature	In manufacturing as per ISO9001 quality operation file.
		Chemical composition of molten metal	Analysis the samples per furnace as per the standards of manufacturer's.
		Spheroidization & Nodularity	Analysis the samples per furnace as per the standards of manufacturer's.
3	Casting	Check for surface defect finish & integrity	Visual check and weight check.
4	DI pipes	Heat treatment(annealing)	Check Micro-structure of samples as per Let requirement of ISO standards.
		Mechanical test	Check tensile, elongation, hardness of the samples as per ISO standard.
		Hydrostatic test	100% pressure test.
		Size and dimension	Checking Dimension of length and joint, OD, wall thickness, contour.
5	Zinc spraying	Zinc coating	Checking the sample pipes' zinc spraying mass.
6	Lining and coating	Cement lining.	100% surface defects visual check, check thickness of the lining randomly as per ISO standards.
		Bitumen coating	100% surface defects visual check, check randomly for coating thickness.
7	Marking and packing.	Identification	100% visual check

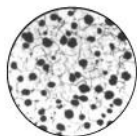
All the tests and inspections are according to ISO2531 and ISO9001. Other standards will be followed accordingly if requested.

TECHNICAL SPECIFICATION

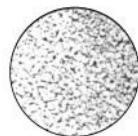
ADVANTAGES OF DUCTILE IRON PIPES

Better Mechanical properties:

Microstructure comparison for Ductile Iron, steel and Grey cast Iron:



Ductile iron pipe



Steel pipe



Grey cast iron pipe

Better Mechanical properties than Steel pipe and Grey cast iron pipe (as following table):

Type of Pipe	Mechanical Properties		
	Tensile strength	Elongation(%)	Hardness (HB)
Ductile Iron pipe	$\geq 420 \text{ N/mm}^2$	(DN ≤ 1000) ≥ 10 (DN > 1000) ≥ 7	≤ 230
Grey Cast Iron pipe	150--260 N/mm ²	Negligible	≤ 230
Steel Pipe	$\geq 400 \text{ N/mm}^2$	≥ 18	Approx. 140

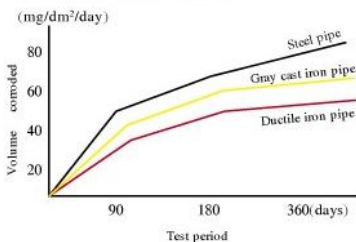
Ring test



High Corrosion resistance:

Better Corrosion resistance than Steel pipe and Grey cast iron pipe:

Corrosion resistance to seawater



Type of Pipe	Corroded volume when merged into sea water (gr/cm ²)	
	After 45 days	After 90 days
Ductile Iron pipe	0.0060	0.0090
Gray Cast Iron pipe	0.0060	0.0103
Steel Pipe	0.0294	0.0396

RAW MATERIAL CONTROL (MOLTEN IRON):

All the pig iron for manufacturing the Pipes and Fittings are supplied by the BEIYING COMPANY, who is famous for its low Sulphur and Phosphorus "BEITAI BRAND GINSENG IRON". The factory internal control reference of main chemical composition for DI pipes is as follows:

Composition	Rate(%)
C	3.4-4.0
Si	2.1-2.5
Mn	Max 0.30
S	Max 0.02
P	Max 0.06
Mg	0.03-0.08

Average Density of Metal is:

Approximate 7050 Kg/m³



Open Air Mine of BEIYING COMPANY



Iron Factory of BEIYING company just nearby our company



High quality molten iron transported to our company from Iron Factory by train



High quality molten iron arrive to our company from Iron Factory and go for chemical analysis.



MECHANICAL PROPERTIES:

The mechanical properties of Pipes shall be as shown in the table:

Type of Cast	Minimum Tensile strength	Minimum Elongation Percent After fracture, A		Hardness Max. (HB)
	DN80-2600mm	DN80-1000mm	DN1100-2600mm	
Pipes centrifugally cast	420 MPa	10%	7%	230
Pipes not centrifugally cast, fittings and accessories	420 Mpa	5%	5%	250

Note:

- By agreement between manufacturer and purchaser, the 0.2% proof stress may be measured. It shall be not less than 270 MPa when $A \geq 12\%$ for DN60-1000mm or 10% for DN >1000mm.
- For centrifugally cast pipes of DN60-1000mm, the minimum elongation after fracture shall be 7% for thickness classes greater than K12



HYDROSTATIC TEST PRESSURE AT WORKS:

All Pipes and fittings shall be subjected to a works hydrostatic test for a duration of at least 10 seconds at the minimum internal test pressure given in the table.

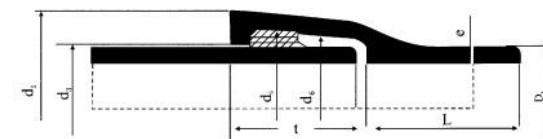


DN (mm)	Minimum work test pressure (Bar)		
	Pipes centrifugally cast		Pipes not centrifugally cast and fittings ¹⁾
	K<9	K≥9	All thickness classes
≤300	$0.5(k+1)^2$	50	25 ²⁾
350-600	$0.5k^2$	40	16
700-1000	$0.5(k-1)^2$	32	10
1200-2000	$0.5(k-2)^2$	25	10
2200-2600	$0.5(k-3)^2$	18	10

- The works hydrostatic test pressure for fittings is less than that for pipes because the shape of fittings makes it difficult to provide sufficient restraint to high pressure during test.
- 16 bar for pipes and fittings with PN10 flanges.

PIPE DATA:

A). T-type joint pipes:



1) Dimension of T-type joint pipes

Unit:mm

Nominal Diameter	D4	d1	t	d3	d5	d6	Wall Thickness & Tolerance: e				
							K7	K8	K9	K10	K12
DN80	98	140	85	100.5	119.1	103.2	6 _{-1.38}	6 _{-1.38}	6.0 _{-1.38}	6.0 _{-1.38}	7.0 _{-1.38}
DN100	118	163	88	120.5	138.9	123.4	6 _{-1.38}	6 _{-1.38}	6.1 _{-1.4}	6.1 _{-1.4}	7.2 _{-1.4}
DN125	144	190	91	146.5	164.8	150	6 _{-1.38}	6 _{-1.38}	6.2 _{-1.43}	6.3 _{-1.43}	7.5 _{-1.43}
DN150	170	217	94	172.5	190.6	175.3	6 _{-1.38}	6 _{-1.38}	6.3 _{-1.45}	6.2 _{-1.45}	7.8 _{-1.45}
DN200	222	278	100	224.5	245.2	227.8	6 _{-1.38}	6 _{-1.38}	6.4 _{-1.5}	7.0 _{-1.5}	8.4 _{-1.5}
DN250	274	336	105	276.5	296.9	279.7	6 _{-1.38}	6 _{-1.38}	6.8 _{-1.5}	7.5 _{-1.5}	9.0 _{-1.5}
DN300	326	393	110	328.5	351.7	332.1	6 _{-1.38}	6.4 _{-1.6}	7.2 _{-1.6}	8.0 _{-1.6}	9.6 _{-1.6}
DN350	378	448	110	380.5	403.4	383.8	6 _{-1.38}	6.8 _{-1.65}	7.7 _{-1.65}	8.5 _{-1.65}	10.2 _{-1.65}
DN400	429	500	110	431.5	457.2	435.8	6.3 _{-1.7}	7.2 _{-1.7}	8.1 _{-1.7}	9.0 _{-1.7}	10.8 _{-1.7}
DN450	480	552	120	482.5	509	487	6.7 _{-1.75}	7.6 _{-1.75}	8.6 _{-1.75}	9.5 _{-1.75}	11.4 _{-1.75}
DN500	532	604	120	534.5	562.6	539.4	7.0 _{-1.8}	8.0 _{-1.8}	9.0 _{-1.8}	10.0 _{-1.8}	12.0 _{-1.8}
DN600	635	713	120	637.5	668.0	642.6	7.7 _{-1.9}	8.8 _{-1.9}	9.9 _{-1.9}	11.0 _{-1.9}	13.2 _{-1.9}
DN700	738	824	150	740.5	779.3	745.8	8.4 _{-2.0}	9.6 _{-2.0}	10.8 _{-2.0}	12.0 _{-2.0}	14.4 _{-2.0}
DN800	842	943	160	844.5	885.9	850	9.1 _{-2.1}	10.4 _{-2.1}	11.7 _{-2.1}	13.0 _{-2.1}	15.6 _{-2.1}
DN900	945	1052	175	947.5	991.3	953.2	9.8 _{-2.2}	11.2 _{-2.2}	12.6 _{-2.2}	14.0 _{-2.2}	16.8 _{-2.2}
DN1000	1048	1158	185	1050.5	1097.1	1056.4	10.5 _{-2.3}	12.0 _{-2.3}	13.5 _{-2.3}	15.0 _{-2.3}	18.0 _{-2.3}
DN1100	1152	1267	200	1155	1202.5	1160.2	11.2 _{-2.4}	12.8 _{-2.4}	14.4 _{-2.4}	16.0 _{-2.4}	19.2 _{-2.4}
DN1200	1255	1377	215	1258	1308	1264	11.9 _{-2.5}	13.6 _{-2.5}	15.3 _{-2.5}	17.0 _{-2.5}	20.4 _{-2.5}
DN1400	1462	1610	239	1465	1509	1471	13.3 _{-2.7}	15.2 _{-2.7}	17.1 _{-2.7}	19.0 _{-2.7}	22.8 _{-2.7}
DN1500	1565	1695	247	1568	1615	1575	14.0 _{-2.8}	16.0 _{-2.8}	18.0 _{-2.8}	20.0 _{-2.8}	24.0 _{-2.8}
DN1600	1668	1814	262	1671	1717	1678	14.7 _{-2.9}	16.8 _{-2.9}	18.9 _{-2.9}	21.0 _{-2.9}	25.2 _{-2.9}

Wall Thickness: $e = K(0.5 + 0.001 DN)$ with a minimum of 6 mm; $K = 7, 8, 9, 10, 11, 12, \dots$

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

Tolerances on other dimensions are as per Beitai's designing.

2) Weight and volume of T-type joint pipes:

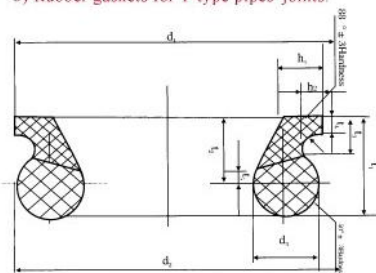
Nominal Dia.	Volume 6m/pcs (CBM)	App Mass of Socket Section (kg)	Weight of pipe with the effective length of 6 meter (iron only) (kg)					Weight of pipe with the effective length of 5.5 meter (iron only) (kg)				
			K7	K8	K9	K10	K12	K7	K8	K9	K10	K12
DN80	0.092	3.4	77	77	77	77	88	71	71	71	71	81
DN100	0.124	4.3	95	95	95	95	110	86	86	86	88	102
DN125	0.162	5.7	116	116	119	121	142	107	107	106	111	131
DN150	0.232	7.1	138	138	144	149	175	127	127	127	137	162
DN200	0.386	10.3	182	182	194	211	249	168	168	176	194	229
DN250	0.574	14.2	228	228	255	280	331	210	210	235	258	305
DN300	0.797	18.6	274	290	323	357	422	255	268	298	329	389
DN350	1.050	23.7	320	359	403	442	522	296	331	371	407	481
DN400	1.326	29.3	382	433	482	532	629	354	399	445	490	580
DN450	1.651	36.0	459	515	575	633	748	425	475	532	583	689
DN500	1.983	42.8	530	600	669	737	872	491	554	616	679	803
DN600	2.790	59.3	700	792	882	972	1150	648	731	814	896	1059
DN700	3.763	79.1	891	1009	1123	1237	1463	826	931	1036	1141	1348
DN800	4.923	102.6	1107	1255	1394	1535	1815	1026	1156	1286	1416	1673
DN900	6.174	129.9	1343	1521	1691	1862	2200	1247	1404	1561	1718	2029
DN1000	7.544	161.3	1609	1814	2017	2221	2624	1488	1675	1862	2049	2419
DN1100	8.603	194.7	1893	2133	2372	2611	3086	1752	1971	2196	2409	2849
DN1200	10.787	237.7	2198	2482	2758	3038	3583	2040	2295	2548	2802	3304
DN1400	14.638	385.8	2946	3307	3669	4029	4746	2733	3065	3395	3726	4383
DN1500	16.229	474.4	3361	3768	4175	4581	5390	3120	3494	3867	4239	4980
Dn1600	19.000	526.2	3756	4213	4668	5122	6028	3487	3906	4323	4740	5570

Tolerance on standard Lengths of pipes is 4-30mm, 10% short lengths pipe is allowed in one order.

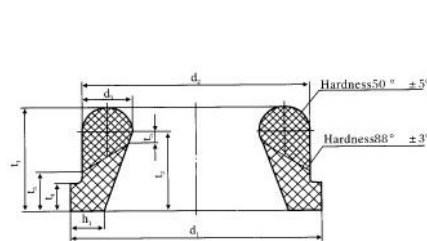
Tolerance on Straightness of pipes: maximum deviation of 0.125% of their length.

Average Density of Metal is: Approximate 7050 Kg/m3.

3) Rubber gaskets for T-type pipes' joints:



DN80-1200 T-type rubber gasket

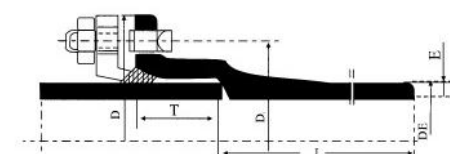


DN400-1600 T-type rubber gasket

Dimension of T-type joint rubber gaskets:

DN mm	d1 mm	d2 mm	d3 mm	h1 mm	h2 mm	t1 mm	t2 mm	t3 mm	t4 mm	t5 mm	R mm	Compress%	
												Max	Min
80	126	123	16	10	4.5	26	18	10	5	3	3	42.4	2.5
100	146	144	16	10	4.5	26	18	10	5	3	3.5	42.7	3.1
125	172	170	16	10	4.5	26	18	10	5	3	3.5	41.7	3.4
150	200	198	16	10	4.5	26	18	10	5	3	3.5	43.7	3.4
200	256	254	18	11	5	30	21	12	6	4	4	42.7	3.6
250	310	308	18	11	5	32	23	12	6	4	4	43.5	3.9
300	366	364	20	12	5.5	34	24	14	7	4	4.5	42.2	4.0
350	420	418	20	12	5.5	34	24	14	7	4	4.5	42.9	4.3
400	475	473	22	13	6	38	27	16	8	5	5	41.8	4.8
450	528	526	23	13	6	38	27	16	8	5	5	42.5	7.4
500	583	581	24	14	6.5	42	30	18	9	6	5.5	41.6	5.2
600	692	690	26	15	7	46	33	20	10	7	6	41.5	6.0
700	809	803	33.5	20	10	55	39	24	16	8	7	42.2	11.3
800	919	913	35.5	21	11	60	43	26	16	9	8	41.8	11.3
900	1026	1020	37.5	22	12	65	47	28	18	10	9	41.7	11.2
1000	1133	1127	39.5	23	12	70	51	30	18	10	9	41.1	10.9
1100	1242	1235	40.0	25	13.5	74	54	32	19	10	10	40.1	8.4
1200	1352	1345	43.5	27	13.5	78	57	34	20	11	10	42.0	11.5
1400	1569	1549	41.5	27	---	80	58	28	23	22	---	42.0	15.8
1500	1677	1660	42	30	---	70	49	20	25	22	---	42.8	26.2
1600	1799	1779	42	32.5	---	70	49	30	23	20	---	44.0	26.8

B). K-type joint pipes:



1) Dimension of K-type joint pipes

Unit: mm

Nominal Diameter (mm)	D (mm)	D1 (mm)	DE (mm)	T (mm)	E - Wall Thickness & Tolerance of barrel of pipe (iron only)				
					K7	K8	K9	K10	K12
DN100	234	188	118	80	6.1.38	6.1.38	6.1.4	6.1.4	7.2.4
DN125	261	215	144	80	6.1.38	6.1.38	6.2.43	6.3.43	7.5.43
DN150	288	242	170	80	6.1.38	6.1.38	6.3.45	6.5.45	7.8.45
DN200	341	295	222	80	6.1.38	6.1.38	6.4.45	7.0.45	8.4.45
DN250	395	349	274	80	6.1.38	6.1.38	6.8.45	7.5.45	9.0.45
DN300	455	409	326	110	6.1.38	6.4.46	7.2.46	8.0.46	9.6.46
DN350	508	462	378	110	6.1.38	6.8.46	7.7.46	8.5.46	10.2.46
Dn400	561	515	429	110	6.3.47	7.2.47	8.1.47	9.0.47	10.8.47

DN450	614	568	480	110	6.7 _{-1.75}	7.6 _{-1.75}	8.6 _{-1.75}	9.5 _{-1.75}	11.4 _{-1.75}
DN500	667	621	532	110	7.0 _{-1.8}	8.0 _{-1.8}	9.0 _{-1.8}	10.0 _{-1.8}	12.0 _{-1.8}
DN600	773	727	635	110	7.7 _{-1.9}	8.8 _{-1.9}	9.9 _{-1.9}	11.0 _{-1.9}	13.2 _{-1.9}
DN700	892	838	738	120	8.4 _{-2.0}	9.6 _{-2.0}	10.8 _{-2.0}	12.0 _{-2.0}	14.4 _{-2.0}
DN800	999	942	842	120	9.1 _{-2.1}	10.4 _{-2.1}	11.7 _{-2.1}	13.0 _{-2.1}	15.6 _{-2.1}
DN900	1123	1057	945	120	9.8 _{-2.2}	11.2 _{-2.2}	12.6 _{-2.2}	14.0 _{-2.2}	16.8 _{-2.2}
DN1000	1231	1160	1048	130	10.5 _{-2.3}	12.0 _{-2.3}	13.5 _{-2.3}	15.0 _{-2.3}	18.0 _{-2.3}
DN1100	1338	1272	1152	130	11.2 _{-2.4}	12.8 _{-2.4}	14.4 _{-2.4}	16.0 _{-2.4}	19.2 _{-2.4}
DN1200	1444	1378	1255	130	11.9 _{-2.5}	13.6 _{-2.5}	15.3 _{-2.5}	17.0 _{-2.5}	20.4 _{-2.5}
DN1400	1657	1591	1462	130	13.3 _{-2.7}	15.2 _{-2.7}	17.1 _{-2.7}	19.0 _{-2.7}	22.8 _{-2.7}
DN1500	1766	1700	1565	130	14.0 _{-2.8}	16.0 _{-2.8}	18.0 _{-2.8}	20.0 _{-2.8}	24.0 _{-2.8}
DN1600	1874	1808	1668	160	14.7 _{-2.9}	16.8 _{-2.9}	18.9 _{-2.9}	21.0 _{-2.9}	25.2 _{-2.9}
DN1800	2089	2023	1875	170	16.1 _{-3.1}	18.4 _{-3.1}	20.7 _{-3.1}	23.0 _{-3.1}	27.6 _{-3.1}
DN2000	2305	2239	2082	180	17.5 _{-3.3}	20.0 _{-3.3}	22.5 _{-3.3}	25.0 _{-3.3}	30.0 _{-3.3}
DN2200	2519	2453	2288	190	18.9 _{-3.5}	21.6 _{-3.5}	24.3 _{-3.5}	27.0 _{-3.5}	32.4 _{-3.5}
DN2400	2734	2668	2495	200	20.3 _{-3.7}	23.2 _{-3.7}	26.1 _{-3.7}	29.0 _{-3.7}	34.8 _{-3.7}
DN2600	2949	2883	2702	210	21.7 _{-3.9}	24.8 _{-3.9}	27.9 _{-3.9}	31.0 _{-3.9}	37.2 _{-3.9}

Wall Thickness: $e=K(0.5+0.001 DN)$ with a minimum of 6 mm; $K=7.8.9.10.11.12...$

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

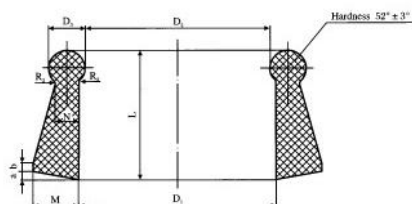
Tolerances on other dimensions are as per Beitai's designing.

2) Weight and volume of K-type joint pipes:

Nominal Diameter	Volume (CBM)	App. Mass of Socket Section (kg)	Weight of pipe, (effective length L=6m/pcs, iron only) (kg)				
			K7	K8	K9	K10	K12
1600	18.915	375.4	3605	4062	4517	4972	5877
1800	23.900	490.6	4468	5031	5591	6151	7266
2000	29.500	626.4	5428	6107	6784	7460	8807
2200	37.891	784.2	6483	7290	8094	8897	10496
2400	41.247	966.2	7642	8587	9529	10470	12344
2600	48.638	1173.7	8903	9997	11088	12177	14347

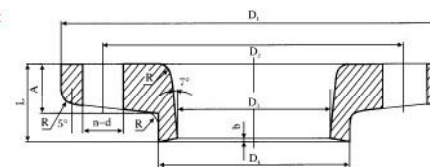
Note: The volume and weight data of DN100-1500mm pipes are same as the T-type joint pipes.

3) K-type joint Rubber gasket.



DN	D ₁	D ₂	D ₃	L	M	N	A	b
100	116	111	11	45	15	6	4	4
150	167	162	11	45	15	6	4	4
200	218	213	11	45	15	6	4	4
250	269	264	11	45	15	6	4	4
300	319	312	15	49	18	8	4	4
350	370	363	15	49	18	8	4	4
400	420	413	15	49	18	8	4	4
450	471	465	15	49	18	8	4	4
500	521	514	15	49	18	8	4	4
600	622	615	15	49	18	8	4	4
700	723	716	18	61	21	11	4	4
800	825	818	18	61	21	11	4	4
900	926	919	18	61	21	11	4	4
1000	1027	1020	18	62	21	11	4	5
1100	1130	1123	18	62	21	11	4	5
1200	1230	1223	20	62	21.5	13	4	5
1400	1430	1423	20	62	21.5	13	4	5
1500	1532	1525	20	62	21.5	13	4	5
1600	1635	1628	23	80	27	15	4	5
1800	1833	1825	23	80	27	15	4	5
2000	2035	2027	23	80	27	15	4	5
2200	2235	2227	23	80	27	15	4	5
2400	2440	2432	23	80	27	15	4	5
2600	2645	2637	23	80	27	15	4	5

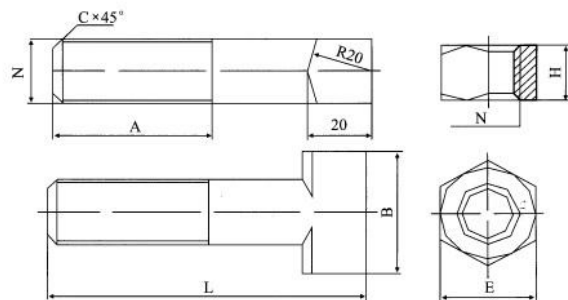
4) Ductile Iron Gland:



Unit:mm

DN mm	D ₁ mm	D ₂ mm	D ₃ mm	D ₄ mm	A mm	L mm	R mm	B mm	n-d/ (nos-mm)	Weight kg
100	234	188	122	146	16	35	5	2	4-23	4.1
150	288	242	174	198	17	36	5	2	6-23	5.7
200	341	295	226	250	18	37	5	2	6-23	7.5
250	395	349	278	302	19	38	5	2	8-23	9.5
300	455	409	330	354	20	39	5	2	8-23	12.2
350	508	462	382	406	21	40	5	2	10-23	14.6
400	561	515	433	457	22	41	7	2	12-23	17.2
450	667	621	536	560	24	43	7	2	14-23	22.9
500	773	727	639	663	25	44	7	2	14-23	28.5
600	892	838	743	773	26	45	7	2.5	16-27	38.6
700	999	945	847	877	28	47	9	2.5	20-27	47.4
800	1123	1057	950	980	29	48	9	2.5	20-33	61.9
1000	1231	1165	1054	1083	30	49	9	2.5	20-33	63.8
1100	1338	1272	1158	1187	31	50	9	2.5	24-33	68.5
1200	1444	1378	1262	1290	32	51	9	2.5	28-33	82.5
1400	1657	1591	1469	1497	34	53	9	3	28-33	104
1500	1766	1700	1573	1605	35	54	9	3	30-33	119
1600	1874	1808	1676	1711	36	55	9	3	30-33	123
1800	2089	2023	1883	1918	38	57	11	3	34-33	162
2000	2305	2239	2090	2125	40	59	11	3	36-33	196
2200	2519	2453	2296	2331	43	62	11	3	40-33	238
2400	2734	2668	2503	2538	46	65	11	3	44-33	318
2600	2949	2883	2710	2745	49	68	11	3	48-33	378

5) Dimension of Bolts and nuts:



For pipes mm	Dia. Mn	L mm	A mm	B mm	C mm	E mm	H mm	Nos for each gland
DN100	M20	95	65	40	3	30	16	4
DN150	M20	95	65	40	3	30	16	6
DN200	M20	100	65	40	3	30	16	6
DN250	M20	100	65	40	3	30	16	8
DN300	M20	100	65	40	3	30	16	8
DN350	M20	110	65	40	3	30	16	10
DN400	M20	110	65	40	3	30	16	12
DN450	M20	110	65	40	3	30	16	12
DN500	M20	110	65	40	3	30	16	14
DN600	M20	110	65	40	3	30	16	14
DN700	M24	120	75	55	4	36	21.5	16
DN800	M24	120	75	55	4	36	21.5	20
DN900	M30	130	85	75	5	46	25.6	20
DN1000	M30	130	85	75	5	46	25.6	20
DN1100	M30	140	85	75	5	46	25.6	24
DN1200	M30	140	85	75	5	46	25.6	28
DN1400	M30	150	85	75	5	46	25.6	28
DN1500	M30	150	85	75	5	46	25.6	28
DN1600	M30	150	85	75	5	46	25.6	30
DN1800	M30	160	85	75	5	46	25.6	34
DN2000	M30	160	90	75	5	46	25.6	36
DN2200	M30	170	90	75	5	46	25.6	40
DN2400	M30	170	90	75	5	46	25.6	44
Dn2600	M30	180	100	75	5	46	25.6	48

All bolts, nuts to be galvanized carbon steel or ductile iron as per requested.



BX STEEL