



Dongjiang Water Mains
DN2200 x dn2000 Double Flange Reducer

DUCTILE IRON PIPE FITTINGS CATALOGUE

ISO 2531. BS4772.
BSEN545 / BSEN598



SINOTEC



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SEN Feng
吉林森峰管業

Couplings, Adaptors & Joint



Senfeng is specialized in Ductile Iron Pipes, Fittings and couplings, we are constantly extending our product lines to respond to new market demands.



Ductile Iron Pipe Fittings — ISO 2531 EN 545 EN 598



Company Profile

Jilin Senfeng Pipe Company Limited of Panshi City in Jilin China is a professional manufacturer of ductile iron pipes with fitting and couplings. Our product ranges from DN80 to DN2400 with compliance to ISO2531, BSEN545/598, AWWAC1100, C153, C219 and more. Our production capacity is 8000 tons per year with vast applications like water supply, sewage and drainage. Our products are widely used in China and exported to the world like in Middle East, North America, Africa and Southeast Asia with great success. .

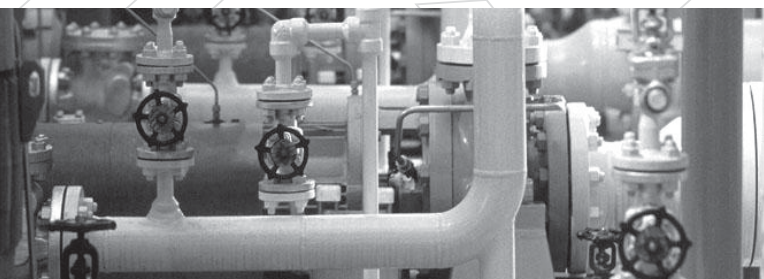
It is our commitment of providing utmost care in every commercial facet from productions, quality, and reliability to customer service to ensure full satisfaction at customers. We emphasize to devote abundant resources and efforts to develop new products for the new pipe market.

Our company is well accepted and being nominated by many renowned international customers as a preferred supplier. We are in full capability in providing a full solution in many specific applications.

Noti. to Saudi Arabia



SGS Certification



TUV Certificate ISO2531, En545



Intertek-to Saudi Arabia-certificate-Flange



WRAS Certification

TUV Certificate ISO2531, En545

TUV Certificate En598

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Technical of Ductile Iron Pipe Fittings

General Specification information

Applied standards	GB13295, ISO2531, BSEN545/598
Joint Type	T-type, K-type, Flanged-type joint, other joint type based on mutual agreed design.
Diameter range	DN80-2600mm
Workmanship	By Lost-Foam (EPC) process
Wall thickness	Class K12, K14
Coating and Lining	Internal cement lining according to BS4027/BSEN197-1, external zinc-rich painting plus bitumen coating according to ISO8179, fusion bond epoxy powder coating to BS6920 and BENS14901 is available

General Specification information

Type of fitting	DN (mm)	Deviation (mm)
Fittings for socket joints	80-1200	±25
Pipe & Fittings for Flanged joints	80-2600	±10
Flanged socket	80-1200	±25
Flanged spigot	1400-2000	±35
Collar		
Taper	1400-2000	±35
Tee		
Bend 90°	80-2000	±(15+0.03DN)
Bend 45°	80-2000	±(10+0.025DN)
Bend 22.5°、11.25°	80-1200	±(10+0.02DN)
	1400-2000	±(10+0.025DN)

Weight and its tolerance

The total weight of fittings is the body weight plus socket (or flange) part calculated as per density of 7050kg/m³, the tolerance on weight of bends, fittings with branch and unified fittings is -12%, other fittings are -8%, no upper limit. The values of weight shall be adjusted according to its weight, accurate to 0.1kg for fittings less than 100kg, and 1kg for fittings exceed 100kg.

Mechanical properties

Fittings and accessories of ductile iron shall have the properties given below:

Item	Tensile strength N/mm ²	Brinell hardness HB	Elongation %
Value	≥420	≤250	≥5

Chemical analysis

Chemical elements of metal shall fall within below range.

Element	C	Si	Mn	S	P	Mg	RE
%	3.4-3.9	2.5-3.0	≤0.4	≤0.02	≤0.08	0.02-0.06	0.02-0.04

Metallurgical microscopy examination

Item	Nodulizing rate	Ferrite	Pearlite	Cementite
%	≥70	≥50	≤30	≤5

Thickness of fittings

The minimum wall thickness of fittings is 7mm, the nominal wall thickness can be calculated by such formula:

$$T = K(0.5 + 0.001DN), \quad T \text{ is nominal wall thickness (mm); } DN \text{ - nominal diameter (mm),}$$

K is the coefficient used for wall thickness class, it is selected from a series of whole number, 8,9,10,12,14,...

Tees, crosses with branches are class K14, other fittings are class K12.

The nominal wall thickness of different size is listed below:

DN	80	100	150	200	250	300	350	400	450	500	600
K9	6.0	6.1	6.3	6.4	6.8	7.2	7.7	8.1	8.6	9.0	9.9
K12	7.0	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	13.2
K14	8.1	8.4	9.1	9.8	10.5	11.2	11.9	12.6	13.3	14.0	15.4
Tolerance	-2.3	-2.4	-2.5	-2.5	-2.6	-2.6	-2.7	-2.7	-2.8	-2.8	-2.9

DN	700	800	900	1000	1100	1200	1400	1600	1800	2000
K9	10.8	11.7	12.6	13.5	14.4	15.3	17.1	18.9	20.7	22.5
K12	14.4	15.6	16.8	18.0	19.2	20.4	22.8	25.2	27.6	30.3
K14	16.8	18.2	19.6	21.0	22.4	23.8	26.6	29.4	32.2	35.0
Tolerance	-3.0	-3.1	-3.2	-3.3	-3.4	-3.5	-3.7	-3.9	-4.1	-4.3

Pressure test

The pressure test shall be carried out on all fittings before the application of their external and internal coatings, except for the metallic zinc coating of pipes which may be applied before the test. No leakage or sweating should be detected during test.

DN (mm)	Minimum works test pressure(bar)
80-300	25
350-600	16
700-1600	10

Note: The works hydrostatic test pressure is less for fittings than for pipes because the shape of the fittings makes it difficult to provide sufficient restraint to high internal pressure during the test.
For DN80-300mm, 16 bar for pipes and fittings with PN10 flanges.

Lining

Fittings are supplied with manually applied cement mortar lining, the mortar of the lining is composed of cement, sand and water.

The mortar contains by mass minimum one part of cement to 3.5 parts of sand.

The nominal thickness of the lining and minimum permissible values are given in the table below.

DN (mm)	Nominal lining thickness (mm)	Minimum at one point (mm)
≤300	4	2.5
350-600	5	3
700-1200	6	3.5
1400-2000	9	6

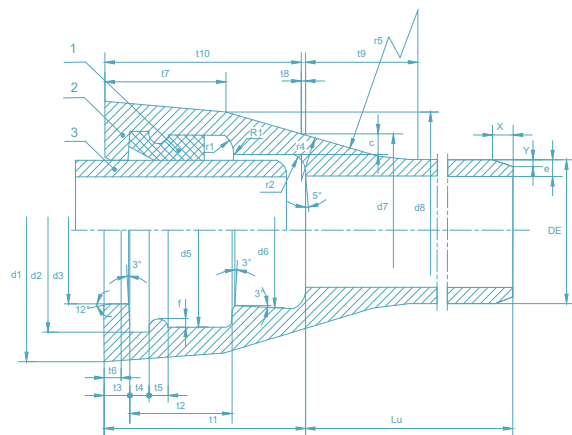
Note: The surface of the cement mortar lining shall be uniform and smooth. Trowel marks, protrusion of sand grains and surface texture inherent to the method of manufacture are acceptable.

Storage of fittings in hot, dry environment can cause metal expansion and mortar shrinkage which can result in dry lining developing areas of disbondment and shrinkage cracks exceeding the given width. When the lining is re-exposed to water, it will swell by absorption of moisture and the cracks will close to conform to above table and will eventually heal by autogenous process.

Coating

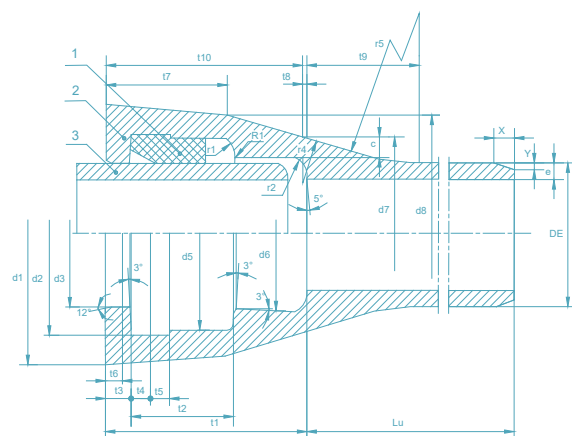
A layer of zinc-rich coating+bitumen shall be uniformly covered the whole surface of the casting and have a smooth regular appearance.

The mean mass of zinc rich painting shall not be less than 200g/m², the mean thickness of the coating shall be not less than 70μm and the local minimum thickness shall be not less than 50μm.



Type	1	2	3
T	Gasket	Socket	Spigot

DN80-1200 T-Type Joint

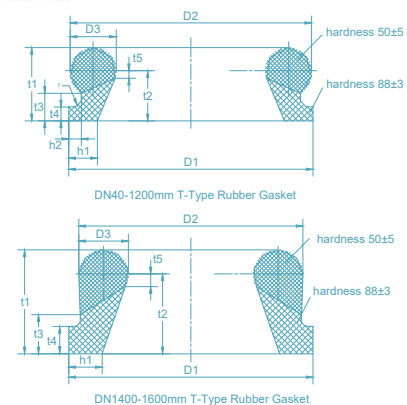


Type	1	2	3
T	Gasket	Socket	Spigot

DN1400-1600 T-Type Joint

DN	DE		d1	d2		d3		d5		d6		d7	d8	c
80	98	+1	140	123		100.5		119.1		103.2		122	135	8
100	118	-2.8	163	143	±1	120.5	±1	138.9	±1	123.4		142	155.7	8.4
150	170	+1	217	195		172.5		190.6		175.3		195.6	209	9.1
200	222	+1	278	250	+1.5	224.5	+1.5	245.2	+1.5	227.8	±2	251	265	9.8
250	274	-3	336	301.5	-1	276.5	-1	296.9	-1	279.7		305	323	10.5
300	326	+1	393	356.5	+1.8	328.5	+1.8	351.7	+1.8	332.1		368.5	384	11.2
350	378	-3.3	448	408	-1	380.5	-1	403.4	-1	383.8		410.3	433	11.9
400	429	+1	500	462	+2.1	431.5	+2.1	457.2	+2.1	435.8	±2.5	463	482.4	12.6
450	480	-3.5	540	514	-1	482.5	-1	509	-1	487		518.4	533	13.3
500	532	+1	604	568	+2.2	534.5	+2.2	562.6	+2.2	539.4	±3	569.7	590.6	14
600	635	-3.6	713	673.4	-1	637.5	-1	668	-1	642.6		676.7	698.8	15.4
700	738	+1	824	788	+2.4	740.5	+2.4	779.3	+2.4	745.8	±3.5	789	813	16.8
800	842	-4	943	894	-1	844.5	-1	885.9	-1	850	±3.8	892.2	922.3	18.2
900	945	+1	1052	1000	+3.5	947.5	+3.5	991.3	+3.5	953.2	±4.1	999.2	1030.5	19.6
1000	1048	-4.2	1158	1105	-1	1050.5	-1	1097.1	-1	1056.4	±4.4	1106	1139	21
1100	1152	+1	1267	1211	+4.4	1155	+4.4	1202.5	+4.4	1160.2	±4.7	1213.5	1247.3	22.4
1200	1255	-5	1377	1317	-1	1258	-1	1308	-1	1264	±5	1321	1355.6	23.8
1400	1462	+1	1610	1529	+5.6	1465	+5.6	1509	+5.6	1471	±5.6	1535	1584.5	26.6
1600	1668	-6	1814	1740	-1	1673	-1	1717	-1	1678	±6.2	1748	-	-

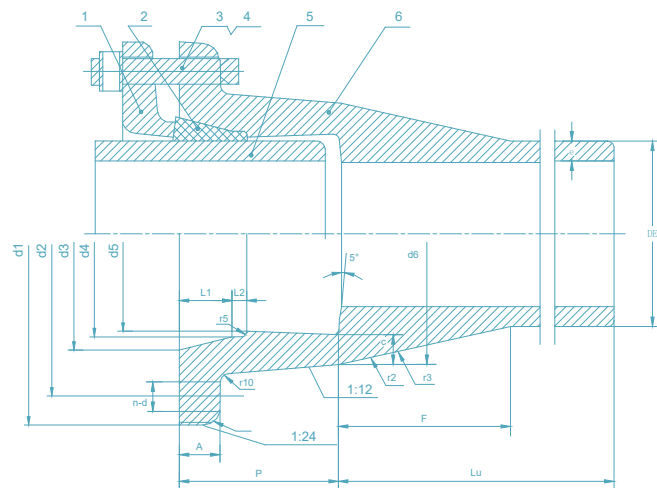
DN	f	t1	t2	t3	t4	t5	t6	t7	t8	t9	t10	r1	r2	r4	r5	X	Y	Mass (kg)
80	3.5	85	40	12	6	5	8	48	5	39	80	4	5	22	62	6	2	3.2
100	3.5	88	40	12	6	5	8	48	5	39	88	4	5	17	68	9	3	4.3
150	3.5	94	40	12	6	5	8	48	5	43	94	4	5	18.5	74	9	3	10.3
200	4	100	45	15	7	6	10	56	6.2	48	100	4	6	35	70	9	3	14.2
250	4	105	47	15	7	6	10	58	6.8	48	105	4	6	36	72	9	3	18.6
300	4.5	110	50	17	8.5	7	12	61	7.2	56	110	6	7	37	74	9	3	23.7
350	4.5	110	50	17	8.5	7	12	61	5.1	55	113	6	7	24.5	98	9	3	29.3
400	5	110	55	19	9.5	8	14	68	5.1	58	116	6	8	26	104	9	3	36.2
450	5	120	55	19	9.5	8	15	68	6	66	120	6	8	28	105	9	3	42.8
500	5.5	120	60	21	11	9	16	75	7	63	120	6	10	29	116	9	3	59.3
600	6	120	65	21	12	10	16	80	9.2	62	120	6	10	32	128	9	3	79.1
700	7	150	80	21	18	12	16	90	10.6	77	150	8	10	35	140	15	5	102.6
800	8	160	85	21	18	14	16	96.5	12.4	86.5	160	8	10	38	160	15	5	129.9
900	9	175	90	21	20	16	16	103	14.2	92.5	175	8	10	42	175	15	5	161.3
1000	9	185	95	22	20	16	16	110	16	103	185	8	10	45	200	15	5	194.7
1100	10	200	100	24	23	18	16	116	17	107.5	200	10	12	46.5	207.5	15	5	237.7
1200	10	215	105	25	23	18	17	122	17.8	112	215	10	12	48	215	15	5	279.3
1400	-	239	115	27	25	-	18	125	19	129	239	10	12	100	205	20	7	375.4
1600	-	262	125	30	27	-	20	125	19	165	262	10	10	380	210	21	7	375.4



T - type Rubber Ring



DN	D1	D2	D3	H1	H2	T1	T2	T3	T4	T5	r
40	85	83	16	10	4.5	24	16	10	5	3	3
50	95	93	16	10	4.5	24	16	10	5	3	3
60	105	103	16	10	4.5	26	18	10	5	3	3
65	110	108	16	10	4.5	26	18	10	5	3	3
80	126	123	16	10	4.5	26	18	10	5	3	3
100	146	144	16	10	4.5	26	18	10	5	3	3.5
125	172	170	16	10	4.5	26	18	10	5	3	3.5
150	200	198	16	10	4.5	26	18	10	5	3	3.5
200	256	254	18	11	5	30	21	12	6	4	4
250	310	308	18	11	5	32	23	12	6	4	4
300	366	364	20	12	5.5	34	24	14	7	4	4.5
350	420	418	20	12	5.5	34	24	14	7	4	4.5
400	475	473	22	13	6	38	27	16	8	5	5
450	528	526	23	13	6	38	27	16	8	5	5
500	583	581	24	14	6.5	42	30	18	9	6	5.5
600	692	690	26	15	7	46	33	20	10	7	6
700	809	803	33.5	20	10	55	39	24	16	8	7
800	919	913	35.5	21	11	60	43	26	16	9	8
900	1026	1020	37.5	22	12	65	47	28	18	10	9
1000	1133	1127	39.5	23	12	70	51	30	18	10	9
1100	1242	1235	40.0	25	13.5	74	54	32	19	10	10
1200	1352	1345	43.5	27	13.5	78	57	34	20	11	10
1400	1569	1549	41.5	27		80	58	28	23	22	
1500	1677	1660	42	30		70	49	20	25	22	
1600	1799	1779	42	32.5		70	49	30	23	20	



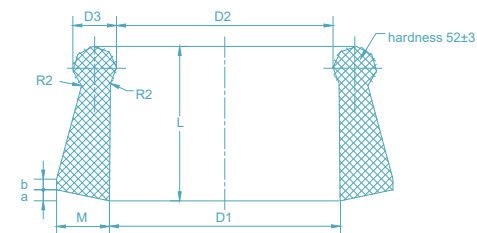
Type	1	2	3	4	5	6
K	Gland	Gasket	Bolt	Nut	Spigot	Socket



K-Type Joint

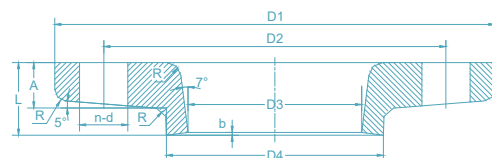
DN	DE		D1	D2	D3	D4		D5		D6	A
100	118	+1 -3	234	188	148	130	±1	121	+2 -1	140	19
150	170		288	242	200	182		173		194	20
200	222		341	295	252	234		225		247	20
250	274		395	349	304	286		277		301	21
300	326		455	409	360	342		329		358	22
350	378		508	462	412	394	±1.5	382	+3 -1	410	23
400	429		561	515	463	445		433		462	23
450	480		614	568	514	496		484		515	24
500	532		667	621	566	548		536		568	25
600	635		773	727	669	651		639		675	26
700	738	+1 -4	892	838	780	758	±2	743	+3.5 -2	781	28
800	842		999	942	884	862		847		888	29
900	945		1123	1057	987	965		950		994	31
1000	1048	+1 -5	1231	1160	1090	1068		1054	+3.5 -3	1101	32
1100	1152	+1 -5.2	1338	1272	1194	1172		1158		1208	33
1200	1255	+1 -5.5	1444	1378	1297	1275		1261		1314	35
1400	1462	+1 -6	1657	1591	1504	1482	±2.5	1469	+4 -3	1527	38
1500	1565		1766	1700	1608	1586		1573		1634	40
1600	1668	+1 -6.5	1874	1808	1720	1690		1678	+4.5 -3	1740	41
1800	1875	+1 -7	2089	2023	1927	1897	±2.8	1883	+5 -4	1954	43
2000	2082	+1 -7.5	2305	2239	2134	2104		2091	+5.5 -4	2168	46
2200	2288		2519	2453	2340	2310		2298		2381	49
2400	2495		2734	2668	2547	2517		2505		2595	52
2600	2702		2949	2883	2754	2724		2713		2809	55

DN	C	P	F	r1	r2	r3	L1	L2	d	N	Mass(kg)
100	8.4	80	50	8	28	100	33	9	23	4	5.9
150	9.1	80	53	8	18	110	33	9	23	6	8.4
200	9.8	80	57	8	32	115	33	9	23	6	11
250	10.5	80	60	10	20	125	33	9	23	8	14.1
300	11.2	110	68	10	35	135	33	13	23	8	22.4
350	11.9	110	72	10	45	145	33	13	23	10	27.2
400	12.6	110	75	10	40	150	33	13	23	12	31.5
450	13.3	110	78	10	50	150	33	13	23	12	37.3
500	14	110	82	10	55	160	33	13	23	14	42.8
600	15.4	110	89	10	55	170	33	13	23	14	55.4
700	16.8	120	96	10	50	190	43	14	27	16	73.9
800	18.2	120	103	10	52	208	43	14	27	20	90.2
900	19.6	120	110	10	50	225	43	14	33	20	115.6
1000	21	130	119	15	50	240	43	15	33	20	146.6
1100	22	130	126	15	80	245	43	15	33	24	172.4
1200	24	130	133	15	85	250	43	15	33	28	201
1400	27	130	147	15	70	280	43	15	33	28	265.8
1500	28	130	155	15	60	300	43	15	33	28	298.8
1600	29	160	163	15	50	354	59	17	33	30	375.4
1800	32	170	179	20	60	370	59	17	33	34	490.6
2000	35	180	195	20	120	380	59	17	33	36	626.4
2200	38	190	210	20	150	390	59	17	33	40	784.2
2400	41	200	226	20	170	402	59	17	33	44	966.2
2600	43	210	242	20	185	415	59	17	33	48	1173.7



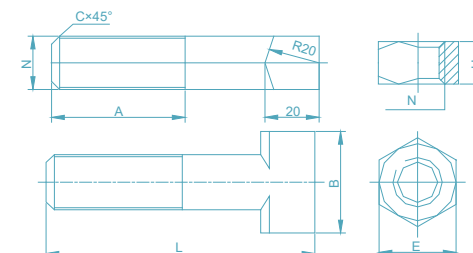
K - type Rubber Ring

DN	D1	D2	D3	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



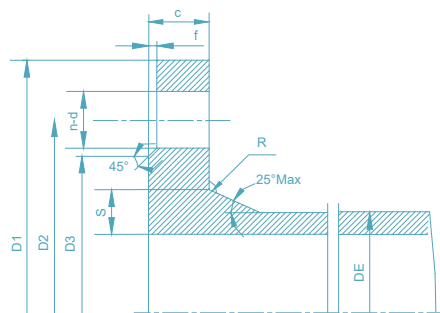
Gland for K-type Joint

DN	D1	D2	D3	D4	A	L	R	B	n-d	Mass	
										Kg/pc	Kg/2pc
100	234	188	122	146	16	35	5	2	4-23	4.1	8.2
150	288	242	174	198	17	36	5	2	6-23	5.7	11.4
200	341	295	226	250	18	37	5	2	6-23	7.5	17
250	395	349	278	302	19	38	5	2	8-23	9.5	19
300	455	409	330	354	20	39	5	2	8-23	12.2	24.4
350	508	462	382	406	21	40	5	2	10-23	14.6	29.2
400	561	515	433	457	22	41	7	2	12-23	17.2	34.4
500	667	621	536	560	24	43	7	2	14-23	22.9	45.8
600	773	727	639	663	25	44	7	2	14-23	28.5	57
700	892	838	743	773	26	45	7	2.5	16-27	38.6	77.2
800	999	945	847	877	28	47	9	2.5	20-27	47.4	94.8
900	1123	1057	950	980	29	48	9	2.5	20-33	61.9	123.8
1000	1231	1165	1054	1083	30	49	9	2.5	20-33	63.8	127.6
1100	1338	1272	1158	1187	31	50	9	2.5	24-33	68.5	137
1200	1444	1378	1262	1290	32	51	9	2.5	28-33	82.5	165
1400	1657	1591	1469	1497	34	53	9	3	28-33	104	208
1500	1766	1700	1573	1605	35	54	9	3	30-33	119	238
1600	1874	1808	1676	1711	36	55	9	3	30-33	123	246
1800	2089	2023	1883	1918	38	57	11	3	34-33	162	324
2000	2305	2239	2090	2125	40	59	11	3	36-33	196	392
2200	2519	2453	2296	2331	43	62	11	3	40-33	238	476
2400	2734	2668	2503	2538	46	65	11	3	44-33	318	636
2600	2949	2883	2710	2745	49	68	11	3	48-33	378	756



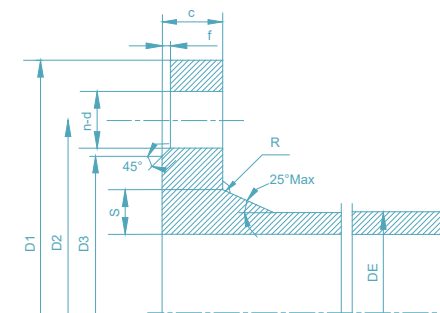
T-Head Bolts and Nuts for K-type Joint

DN	Dia.	L	A	B	C	E	H
100-150	M20	95	65	40	3	30	16
200-300		100					
350-600		110					
700-800	M24	120	75	55	4	36	21.5
900	M30	130	85	75	5	46	25.6
1000							
1100		140					
1200							
1400		150					
1500							
1600							
1800		160					
2000			90				



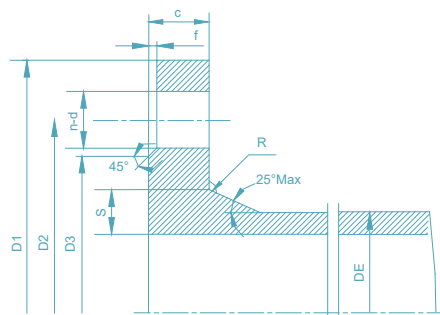
PN10 Flange

DN	D1	D2	D3	DE	c	f	S	R	n	d	Bolt size & Length	Mass (Kg)
80	200	160	132	98	19	3	15	6	8	19	M16×65	2.9
100	220	180	156	118	19	3	15	6	8	19	M16×65	3.3
150	285	240	211	170	19	3	15	8	8	23	M20×70	4.9
200	340	295	266	222	20	3	16	8	8	23	M20×70	6.8
250	400	350	319	274	22	3	17.5	10	12	23	M20×80	9.6
300	455	400	370	326	24.5	4	19.5	10	12	23	M20×80	12.8
350	505	460	429	378	24.5	4	19.5	10	16	23	M20×80	14.1
400	565	515	480	429	24.5	4	19.5	10	16	28	M24×85	16.3
450	615	565	530	480	24.5	4	20.5	12	20	28	M24×85	18.1
500	670	620	582	532	26.5	4	21	12	20	28	M24×85	20.8
600	780	725	682	635	30	5	24	12	20	31	M27×100	30.8
700	895	840	794	738	32.5	5	23	16	24	31	M27×100	40.5
800	1015	950	901	842	35	5	24.5	16	24	34	M30×110	54.8
900	1115	1050	1001	945	37.5	5	26.5	16	28	34	M30×120	64.3
1000	1230	1160	1112	1048	40	5	28	16	28	37	M33×130	81.4
1100	1340	1270	1218	1152	42.5	5	30	20	32	37	M33×130	105
1200	1455	1380	1328	1255	45	5	31.5	20	32	40	M36×140	120.9
1400	1675	1590	1530	1462	46	5	32	20	36	43	M39×150	147.8
1600	1915	1820	1750	1668	49	5	34.5	20	40	49	M45×160	206.4
1800	2115	2020	1950	1875	52	5	36.5	20	44	49	M45×160	236.3
2000	2325	2230	2150	2082	55	5	38.5	20	48	49	M45×170	279.4



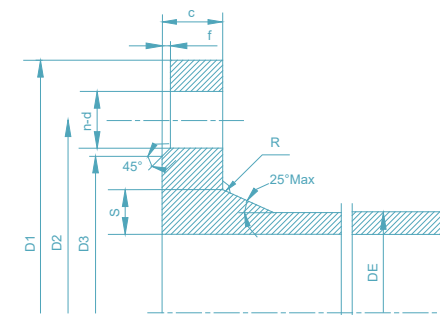
PN16 Flange

DN	D1	D2	D3	DE	C	F	S	R	n	d	Bolt size & Length	Mass (Kg)
80	200	160	132	98	19	3	15	6	8	19	M16×65	2.9
100	220	180	156	118	19	3	15	6	8	19	M16×65	3.3
150	285	240	211	170	19	3	15	8	8	23	M20×70	4.9
200	340	295	266	222	20	3	16	8	12	23	M20×70	6.6
250	400	355	319	274	22	3	17.5	10	12	28	M24×90	9.2
300	455	410	370	326	24.5	4	19.5	10	12	28	M24×90	12.4
350	520	470	429	378	26.5	4	21	10	16	28	M24×90	17.2
400	580	525	480	429	28	4	22.5	10	16	31	M27×100	21.9
450	640	585	548	480	30	4	24	12	20	31	M27×100	26.7
500	715	650	609	532	31.5	4	25	12	20	34	M30×110	37.0
600	840	770	720	635	36	5	29	12	20	37	M33×120	57.3
700	910	840	794	738	39.5	5	27.5	16	24	37	M33×130	55.6
800	1025	950	901	842	43	5	30	16	24	40	M36×140	74.0
900	1125	1050	1001	945	46.5	5	32.5	16	28	40	M36×140	88.2
1000	1255	1170	1112	1048	50	5	35	16	28	43	M39×160	122.9
1100	1355	1270	1218	1152	53.5	5	37.5	20	32	43	M39×160	141
1200	1485	1390	1328	1255	57	5	40	20	32	49	M45×170	185.2
1400	1685	1590	1530	1462	60	5	42	20	36	49	M45×180	215.9
1600	1930	1820	1750	1668	65	5	45.5	20	40	56	M52×190	308.4
1800	2130	2020	1950	1875	70	5	49	20	44	56	M52×200	362.2
2000	2345	2230	2150	2082	75	5	52.5	20	48	62	M56×220	432.2



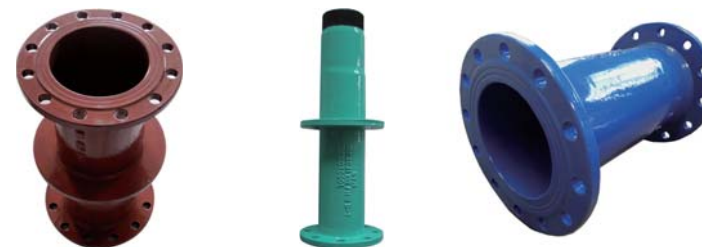
PN25 Flange

DN	D1	D2	D3	DE	C	F	S	R	n	d	Bolt size & Length	Mass (Kg)
80	200	160	132	98	19	3	15	6	8	19	M16×65	2.9
100	235	190	156	118	19	3	15	6	8	23	M20×70	3.8
150	300	250	211	170	20	3	16	8	8	28	M24×80	5.9
200	360	310	274	222	22	3	17.5	8	12	28	M24×80	8.7
250	425	370	330	274	24.5	3	19.5	10	12	31	M27×90	13.1
300	485	430	389	326	27.5	4	22	10	16	31	M27×90	18.0
350	555	490	448	378	30	4	24	10	16	34	M30×110	25.5
400	620	550	503	429	32	4	25.5	10	16	37	M33×120	33.2
450	670	600	548	480	34.5	4	27.5	12	20	37	M33×120	42.2
500	730	660	609	532	36.5	4	29	12	20	37	M33×120	48.7
600	845	770	720	635	42	5	33.5	12	20	40	M36×140	71.5
700	960	875	820	738	46.5	5	32.5	16	24	43	M39×150	90.3
800	1085	990	928	842	51	5	35.5	16	24	49	M45×160	123.2
900	1185	1090	1028	945	55.5	5	39	16	28	49	M45×170	148.6
1000	1320	1210	1140	1048	60	5	42	16	28	56	M52×180	200.7
1100	1420	1310	1240	1152	64.5	5	45	20	32	56	M52×180	224
1200	1530	1420	1350	1255	69	5	48.5	20	32	56	M52×200	284.7
1400	1755	1640	1560	1462	74	5	52	20	36	62	M56×220	368.1
1600	1975	1860	1780	1668	81	5	56.5	20	40	62	M56×230	485.5
1800	2195	2070	1985	1875	88	5	61.5	20	44	70	M64×260	601.9
2000	2425	2300	2210	2082	95	5	66.5	20	48	70	M64×270	784.9



PN40 Flange

DN	D1	D2	D3	DE	C	F	S	R	n	d	Bolt size & Length	Mass (Kg)
80	200	160	132	98	19	3	15	6	8	19	M16×65	2.9
100	235	190	156	118	19	3	15	6	8	23	M20×70	3.8
150	300	250	211	170	26	3	18	8	8	28	M24×90	8.0
200	375	320	284	222	30	3	21	8	12	31	M27×100	14.0
250	450	385	345	274	34.5	3	24	10	12	34	M30×110	23.2
300	515	450	409	326	39.5	4	27.5	10	16	34	M30×120	33.5
350	580	510	465	378	44	4	31	10	16	37	M33×130	46.7
400	660	585	535	429	48	4	35	10	16	40	M36×140	66.9
450	685	610	560	480	50	4	35	12	20	40	M36×150	65.5
500	755	670	615	532	52	4	36.5	12	20	43	M39×150	82.3
600	890	795	735	635	58	5	40.5	12	20	49	M45×170	124.1

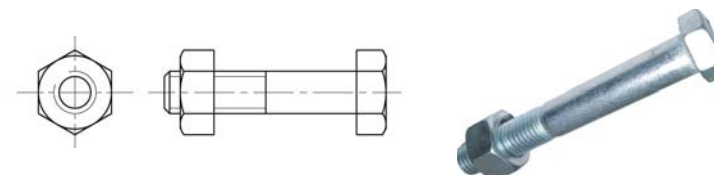


Tolerances on flange dimensions

Dimensions and tolerances in millimeters

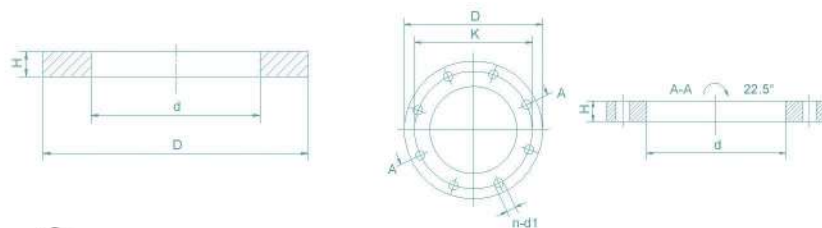
Dimensions for all types		DN				
		DN50—100	DN125300	DN350—600	DN700—1200	DN14002000
Symbol	Designation	Suggested tolerances				
D1	Outside diameter	Not specified but the minimum shall provide a sufficient bearing area for standard hexagonal bolt				
D3	Facing diameter	+4.5 -4	+5.5 -4.5	+6.5 -5	+8.5 -5.5	+10 -6
f1	Facing height	Height				
		2	3	4	5	6
		Tolerances				
		+1 -1	+1.5 -2	+2 -3	+2.5 -4	+3 -5
b1	Flange thickness at edge	Thickness				
		<25	26 to 40	41 to 55	56 to 70	>71
		Tolerances				
		±4	±4.5	±5	±6	±7
L2	Diameter of bolt holes	Diameter of boltholes				
		<20		>22		
		Tolerances				
		+0.5 0		+1 0		
D2	Diameter of bolt circle	Diameter of bolt circle for bolt size				
		M10	M12 to M24	M27 to M45	M52	>M56
		Tolerances				
		±1	±1.5	±2	±3	±3.5
-	Center to center of adjacent bolt holes	Center to center				
		M10	M12 to M24	M27 to M45	M52	>M56
		Tolerances				
		±0.5	±0.75	±1	±1.5	±1.75
-	Parallelism of bolting surface with joint surface	2° max				
1) b=c-f1						

1) b=c-f1



Hexagonal Bolts and Nuts for flanges

DN	PN10 Flange		PN16 Flange		PN25 Flange		PN40 Flange	
	M×L	n	M×L	n	M×L	n	M×L	n
80	M16×65	8	M16×65	8	M16×65	8	M16×65	8
100	M16×65	8	M16×65	8	M20×70	8	M20×70	8
125	M16×65	8	M16×65	8	M24×80	8	M24×80	8
150	M20×70	8	M20×70	8	M24×80	8	M24×90	8
200	M20×70	8	M20×70	12	M24×80	12	M27×100	12
250	M20×80	12	M24×90	12	M27×90	12	M30×110	12
300	M20×80	12	M24×90	12	M27×90	16	M30×120	16
350	M20×80	16	M24×90	16	M30×110	16	M33×130	16
400	M24×90	16	M27×100	16	M33×120	16	M36×140	16
450	M24×90	20	M27×100	20	M33×120	20	M36×150	20
500	M24×90	20	M30×110	20	N33×120	20	M39×150	20
600	M27×100	20	M33×120	20	M36×140	20	M45×170	20
700	M27×100	24	N33×120	24	M39×140	24		
800	M30×110	24	M36×140	24	M45×160	24		
900	M30×120	28	M36×140	28	M45×170	28		
1000	M33×130	28	M39×150	28	M45×180	28		
1100	M33×130	32	M39×160	32	M52×180	32		
1200	M36×140	32	M45×170	32	M52×200	32		
1400	M39×150	36	M45×180	36	M56×220	36		
1500	M39×150	36	M52×190	36	M56×230	36		
1600	M45×160	40	M52×190	40	M56×230	40		
1800	M45×160	44	M52×200	44	M64×260	44		
2000	M45×170	48	M56×220	48	M64×270	48		
2200	M52×190	52	M56×230	52				
2400	M52×200	56	M56×240	56				
2600	M52×200	60	M56×250	60				

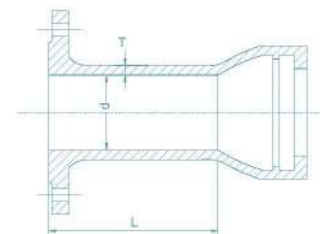


Flange Rubber Gasket - Half Face (IBC)

DN	D	d	H
80	132	80	3
100	156	100	3
16	211	150	3
200	266	200	3
250	319	250	3
300	370	300	4
350	429	350	4
400	480	400	4
450	548	450	4
500	609	500	4
600	720	600	5
700	794	700	5
800	901	800	5
900	1001	900	5
1000	1112	1000	5
1100	1218	1100	5
1200	1328	1200	5
1400	1542	1400	5
1600	1765	1620	5
1800	1965	1820	5
2000	2170	2020	5

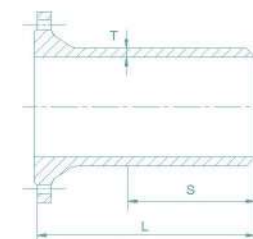
Flange Rubber Gasket - Full Face for PN16

DN	D	d	k	d1	H
80	200	80	160	19	6
100	220	100	180	19	6
150	285	150	240	23	6
200	340	200	295	23	6
250	400	250	355	23	6
300	455	300	410	28	6
350	520	350	470	28	7
400	580	400	525	31	7
500	715	500	650	34	7
600	840	600	770	37	7
700	910	700	840	37	7
800	1025	800	950	41	7
900	1125	900	1050	41	7
1000	1255	1000	1170	44	7
1200	1485	1200	1390	50	7
1400	1685	1400	1590	50	7
1600	1930	1600	1820	57	7



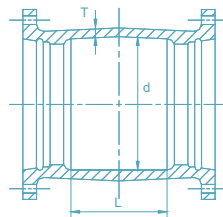
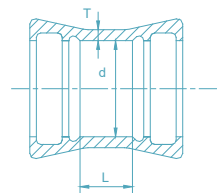
Flanged Sockets

DN	d	L	T-type Mass(kg)			K-type Mass(kg)		
			PN10	PN16	PN25	PN10	PN16	PN25
80	109	130	7.4	7.4	7.4	9.6	9.6	9.6
100	130	130	9	9	9.5	11.4	11.4	12.4
150	183	135	14.2	14.2	15.2	16.7	16.7	17.7
200	235	140	20.5	20	22	22.7	22.2	24.2
250	288	145	28	27.5	31.5	29.4	28.9	32.9
300	340	150	37	36.5	42	42.4	41.9	47.4
350	393	155	45	48	56	50.4	53.4	61.2
400	445	160	55	60	71	60.2	65.2	76.2
450	498	165	66.5	76.5	87.5	70.6	80.6	91.9
500	550	170	78	93	104	80.9	85.9	94.9
600	655	180	108	135	149	108	133	147
700	760	190	144	159	216	161	176	211
800	865	200	189	208	287	206	225	274
900	970	210	235	258	356	257	281	341
1000	1075	220	293	324	458	293	324	458
1200	1285	240	456	521	664	456	521	664
1400	1447	310	759	820	960	654	723	882
1600	1699	330	1185	1278	1438	897	999	1176
1800	1906	350	1308	1421	1638	1137	1263	1503
2000	2133	370				1428	1581	1933



Flanged Spigots

DN	L	S	Mass(kg)		
			PN10	PN16	PN25
80	350	215	7.8	7.8	7.8
100	360	215	9.6	9.6	10.2
150	380	225	15.6	15.6	16.6
200	400	230	22.5	22.5	24.5
250	420	240	32	31.5	35.5
300	440	250	43	42.5	47.5
350	460	260	52	55	64
400	480	270	64	70	81
450	500	280	79	88	103
500	520	290	94	109	121
600	560	310	133	159	173
700	600	330	179	194	228
800	600	330	226	245	294
900	600	330	272	295	356
1000	600	330	328	369	447
1200	600	330	456	520	620
1400	710	390	664	732	884
1600	780	430	922	1024	1202
1800	850	470	1196	1322	1562
2000	920	500	1534	1687	2040

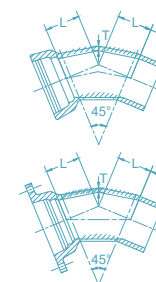
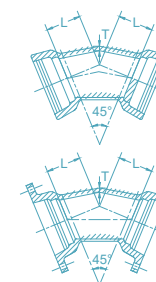
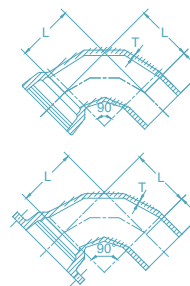
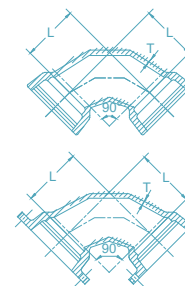


Collars T-type & MJ - K- type (standard length)

DN	d	L	Mass(kg)		K type include 2 glands
			T	K	
80	109	160	7.9	11.6	19.8
100	130	160	9.9	14.7	22.9
150	183	165	15.9	20.3	31.7
200	235	170	23	27.4	42.4
250	288	175	31.5	34.3	53.3
300	340	180	41	51.8	76.2
350	393	185	52	62.4	91.9
400	445	190	64	74.4	109
450	498	195	91	96.2	142
500	550	200	93	98.8	145
600	655	210	129	125	182
700	760	220	172	202	280
800	865	230	223	250	345
900	970	240	282	319	443
1000	1075	250	349	349	477
1200	1285	270	560	560	725
1400	1477	340	816	816	1024
1600	1683	360	1395	1094	1340
1800	1889	380	1822	1426	1750
2000	2095	400		1818	2210

Collars MJ - K- type (long type)

DN	d	L	Mas (kg)	K type include 2 glands
80	109	410	13.5	21.7
100	130	410	16.5	24.7
150	183	415	24.4	35.8
200	235	420	32.6	47.6
250	288	425	42.5	61.5
300	340	430	61.7	86.1
350	393	435	78.6	108
400	445	440	100.4	135
450	498	445	126.9	173
500	550	450	134.6	181
600	655	460	171.9	229
700	760	470	261.5	339
800	865	480	323.4	419
900	970	490	407.7	532
1000	1075	500	454.4	582
1200	1285	620	760.0	925
1400	1492	660	1076	1284
1600	1699	710	1421	1667
1800	1905	730	1828	2152
2000	2107	750	2301	2693



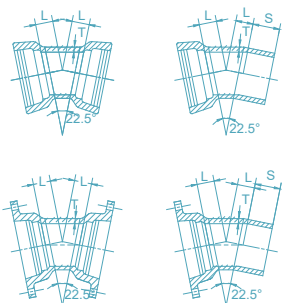
Socket 90° bends



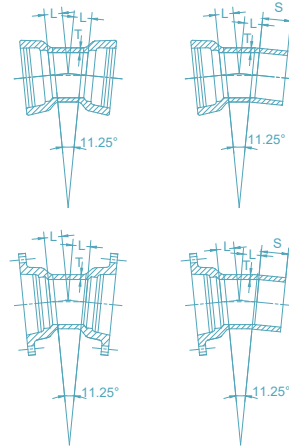
Socket 45° bends

DN	L	S	Mass(Kg)			
			Double-socket		Socket-spigot	
			T-type	K-type	T-type	K-type
80	100	150	8.6	11.1	10.1	17.7
100	120	150	11.4	16.2	13.3	15.7
150	170	200	20.5	25.5	24	23.9
200	220	200	33.0	37.4	38.3	36.4
250	270	200	48.5	51.3	60.6	51.6
300	320	200	68.0	78.8	7.8	75
350	370	200	98.4	109	111.7	105
400	420	200	129	139	145.6	135
450	470	200	163	172	184.8	139
500	520	200	204	210	229.6	208
600	620	200	303	300	337.1	299
700	720	200	436	428	490	478
800	820	200	595	572	665	628
900	920	250	793	778	880	849
1000	1020	250	1045	986	1137	1024
1200	1220	250	1624	1624	1798	1651
1400	1220	300	2419	2419	2170	2059
1600	1290	300	3444	3014	2904	2732
1800	1320	300	4283	3833		4100
2000		400				4700

DN	L	S	Mass(Kg)			
			Double-socket		Socket-spigot	
			T-type	K-type	T-type	K-type
80	55	150	7.7	10.3	8.1	9.8
100	65	150	10.1	14.9	10.6	13
150	85	200	17.4	22.5	18.2	20.7
200	110	200	27	31.4	28.2	30.4
250	130	200	38.5	41.3	40.2	41.6
300	150	200	53	63.8	54.6	42.9
350	170	200	70	80.4	71.3	76.5
400	195	200	89	99.4	89.9	95.1
450	220	200	123	132	125	129
500	240	200	129	145	139	142
600	285	200	202	198	200	198
700	330	200	282	302	275	271
800	370	200	378	395	365	262
900	415	250	496	539	485	480
1000	460	250	635	710	608	835
1200	550	250	986	1109	930	905
1400	515	300	1509	1273	1231	1200
1600	565	300	2117	1740	1695	1670
1800	610	380	2615	2296		2200
2000	660	380		2970		3005



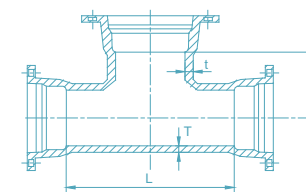
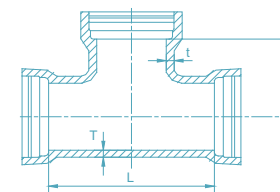
Socket 22.5° bends



Socket 11.25° bends

DN	L	S	Mass(Kg)			
			Double -socket		Socket -spigot	
			T-type	K-type	T-type	K-type
80	40	150	7.3	9.9	7.7	8.5
100	40	150	9.3	14.1	9.8	12.2
150	55	200	15.9	21	16.8	19.3
200	65	200	24	28.4	25.2	27.4
250	75	200	33.5	36.3	35.2	36.6
300	85	200	44.5	55.3	46.2	51.6
350	95	200	58	68.4	59	64.2
400	110	200	74	84.4	79.5	84.7
450	120	200	102	110	107	111
500	130	200	111	117	117	119
600	150	200	157	154	161	159
700	175	200	248	240	210	206
800	195	200	331	308	274	270
900	220	250	432	417	375	345
1000	240	250	550	469	443	430
1200	285	250	851	689	660	660
1400	260	300	1241	857	891	880
1600	280	300	1628	1198	1214	1200
1800	305	380	2037	1588		1767
2000	330	380		2144		2290

DN	L	S	Mass(Kg)			
			Double -socket		Socket -spigot	
			T-type	K-type	T-type	K-type
80	30	150	7.1	9.6	7.4	8.5
100	30	150	8.9	13.7	9.4	11.7
150	35	200	14.8	17.3	16	15.7
200	40	200	22	26.4	23.2	25.4
250	50	200	30.5	33.3	32.2	33.6
300	55	200	40.5	51.3	42.2	47.6
350	60	200	52	62.4	53.3	58.5
400	65	200	65	75.4	70.5	75.7
450	70	200	91.9	100	97	101
500	75	200	96	102	102	104
600	85	200	134	130	138	136
700	95	200	216	208	174	170
800	110	200	286	263	226	220
900	120	250	374	359	284	280
1000	130	250	473	473	354	360
1200	150	250	724	541	512	510
1400	130	300	1047	672	705	715
1600	140	300	1376	1007	962	950
1800	155	380	1704	1331	1390	1390
2000	165	380		1702	1800	1801



All socket tee

DN	dn	L	H	Mass(Kg)	
				T-type	K-type
80	80	170	85	12.4	17.7
100	80	170	95	14.8	21.5
	100	190	95	16.1	23.2
150	80	170	120	21.5	29.2
	100	195	120	23.5	31
	150	255	125	28	35.6
200	80	175	145	30	37.9
	100	200	145	32	38.8
	150	255	150	37	44
250	80	175	165	40	48.3
	100	200	165	42.7	47.9
	150	260	175	51.1	56.4
	200	315	180	55.9	60.9
	250	375	185	63.2	67.4
300	80	180	190	51.5	-
	100	200	195	54.2	67.4
	150	260	200	64.3	77.6
	200	320	205	69.9	82.9
	250	375	210	79.9	92.1
	300	435	215	86.2	102
350	80	180	215	63.6	-
	100	205	220	67.2	80
	150	265	225	79.6	92.6
	200	320	230	84.9	97.5
	250	380	235	96.9	109
	300	435	240	106	122
	350	495	245	116	131
400	80	185	240	76.1	-
	100	210	245	82.2	95
	150	265	240	96.7	110
	200	325	255	102	115
	250	380	260	116	128
	300	440	265	126	142
	350	500	270	137	152
	400	555	275	150	166

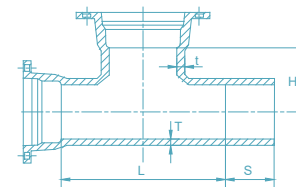
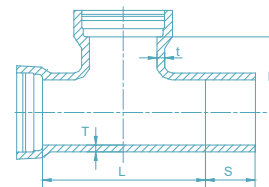
DN	dn	L	H	Mass(Kg)	
				T-type	K-type
80	185	265	101	-	-
100	210	270	106	116	-
150	270	275	116	126	-
200	325	280	127	137	-
450	250	385	285	138	147
	300	445	290	149	163
	350	500	295	161	175
	400	560	300	173	186
	450	615	305	186	198
500	80	190	290	110	-
	100	215	295	115	123
	150	270	300	137	145
	200	330	305	141	149
	250	390	310	161	168
	300	445	315	174	185
	350	505	320	187	198
	400	560	325	199	210
	450	620	330	214	224
	500	680	340	234	242
	80	195	340	165	-
	100	220	345	169	168
	150	280	350	185	184
	200	335	355	188	187
	250	395	360	215	213
	300	450	365	231	233
	350	510	370	246	248
	400	570	375	258	260
	450	625	380	280	281
	500	685	390	296	296
	600	800	400	343	338
600	80	205	395	217	207
	100	230	395	224	215
	150	285	400	241	232
	200	345	405	259	250
	250	400	410	277	267
	300	460	420	297	290

DN	dn	L	H	Mass(Kg)	
				T-type	K-type
700	350	520	425	317	310
	400	575	430	337	329
	450	635	435	361	350
	500	690	440	380	370
	600	810	450	430	416
	700	925	460	486	470
800	80	210	445	278	254
	100	235	445	287	264
	150	290	450	307	284
	200	350	455	330	305
	250	410	460	352	328
	300	465	470	374	353
	350	525	475	398	376
	400	580	480	420	398
	450	640	485	448	422
	500	700	490	472	447
	600	815	500	526	497
	700	930	510	586	556
	800	1045	525	655	618
900	80	215	495	349	322
	100	240	495	360	333
	150	300	500	386	359
	200	355	505	410	382
	250	415	510	437	408
	300	470	515	462	438
	350	530	525	490	464
	400	590	530	518	491
	450	645	535	547	518
	500	705	540	574	546
	600	820	550	635	602
	700	935	560	700	667
	800	1050	570	774	733
	900	1170	585	858	815
1000	80	225	545	433	434
	100	245	545	443	445
	150	305	550	474	475



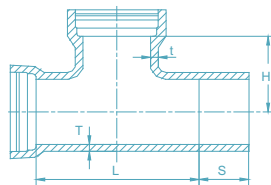
All Socket Tee

DN	dn	L	H	Mass(Kg)	
				T-type	K-type
1000	200	360	555	502	503
	250	420	560	533	533
	300	480	570	564	568
	350	535	575	594	597
	400	595	580	626	628
	450	650	585	659	658
	500	710	590	690	690
	600	825	600	758	754
	700	940	610	831	825
	800	1060	625	913	901
1200	900	1175	635	1000	985
	1000	1290	645	1096	1096
	80	235	645	631	632
	100	260	645	648	649
	150	315	650	685	686
	200	375	655	725	726
	250	430	660	766	766
	300	490	670	816	819
	350	550	675	845	849
	400	605	680	884	886
1400	450	665	685	929	928
	500	720	690	966	966
	600	840	700	1054	1050
	700	955	710	1143	1138
	800	1070	725	1239	1226
	900	1185	735	1339	1325
	1000	1300	745	1447	1447
	1200	1535	765	1697	1697
	80	250	745	988.8	998
	100	270	745	1006	1015.9
1600	150	330	750	1058	1067.5
	200	385	755	1110	1118.8
	250	445	760	1153	1161.5
	300	500	770	1209	1218.9
	350	560	775	1257	1269.1
	400	620	780	1307	1317
	450	675	785	1357	1367
	500	735	790	1402	1411.7
	600	850	800	1507	1522.1
	700	965	810	1627	1633.0
1800	800	1080	825	1737	1743.1
	900	1200	835	1861	1861.0
	1000	1315	845	1984	1984.0
	1200	1545	865	2279	2279.0
	1400	1780	890	2648	2648.0
	80	260	845	-	1032
	100	280	845	-	1054
	150	340	850	-	1119
	200	400	855	1551	1122
	250	455	860	1616	1186
2000	300	515	870	1674	1246
	350	570	875	-	1371
	400	630	880	1797	1373
	450	690	885	-	1500
	500	745	890	1946	1523
	600	860	900	2044	1620
	700	980	910	-	1819
	800	1095	925	2318	1875
	900	1210	935	-	2086
	1000	1325	945	2618	2167
2200	1200	1560	965	2942	2456
	1400	1790	990	3341	2764
	1600	2020	1010	3800	3155
	80	270	945	-	1340
	100	295	945	-	1373
	150	350	950	-	1446
	200	410	955	1897	1449
	250	470	960	1980	1531
	300	525	970	2063	1680
	350	585	975	-	1759
2400	400	640	980	2208	1831
	450	700	985	-	1911
	500	760	990	2353	1989
	600	875	1000	2526	2139
	700	990	1010	-	2295
	800	1105	1025	2835	237
	900	1220	1035	-	2612
	1000	1340	1045	3173	2703
	1200	1570	1065	3543	3037
	1400	1800	1090	3983	3387
2600	1600	2035	1110	4473	3809
	1800	2265	1135	4958	4285
	80	280	1045	-	1710
	100	305	1045	-	1744
	150	365	1050	-	1838
	200	420	1055	-	1924
	250	480	1060	-	2020
	300	540	1070	-	2117
	350	600	1075	-	2204
	400	655	1080	-	2205
2800	450	710	1085	-	2386
	500	770	1090	-	2479
	600	885	1100	-	2660
	700	1000	1110	-	2845
	800	1120	1125	-	3035
	900	1235	1135	-	3226
	1000	1350	1145	-	3437
	1200	1580	1165	-	3846
	1400	1815	1190	-	4244
	1600	2045	1210	-	4695
3000	1800	2280	1235	-	5218
	2000	2510	1255	-	5787



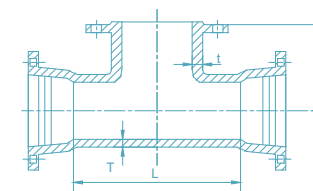
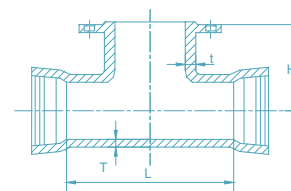
Socket Spigot Tee with Socket Branch

DN	dn	L	H	S	Mass(kg)	
					T-type	K-type
80	80	170	85	150	13.1	16
100	80	170	95	150	15.6	18.8
	100	190	95	150	16.9	21.7
	80	170	120	200	22.6	27
	100	195	120	200	24.6	29.5
	150	255	125	200	28.9	34
	80	175	145	200	31.4	35.2
	100	200	145	200	33.2	37.8
	150	255	150	200	38.2	42.9
	200	315	155	200	44	48.4
150	80	200	210	200	41.3	42
	100	200	215	200	45.6	44.3
	150	255	220	200	57.1	56.3
	200	315	225	200	61.6	58.8
	250	375	230	200	69.6	66.8
	100	205	235	200	57.5	65.3
	150	260	240	200	67.1	65.3
	200	320	245	200	72.3	75.1
	250	375	250	200	82.7	89.5
	300	435	260	200	89.1	100
200	100	205	260	200	66.1	77.5
	150	260	265	200	82.1	89.5
	200	320	270	200	86.1	94.5
	250	375	275	200	99.1	106
	300	435	285	200	106.6	120
	350	495	290	200	119.6	129
	100	210	285	200	84.7	91.8
	150	265	290	200	98.7	106
	200	325	295	200	103	110
	250	375	300	200	118	125
250	300	435	310	200	128	138
	350	495	315	200	139	149
	400	560	320	200	152	163
	100	215	320	200	107	114
	150	270	320	200	116	123
300	200	320	330	200	139	149
	250	375	335	200	150	159
	300	445	340	200	162	171
	350	495	345	200	170	181
	400	560	350	200	185	193
	450	620	350	200	185	193
	100	215	345	200	115	120
	150	275	345	200	136	141
	200	330	345	200	140	145
	250	380	350	200	161	165
350	300	450	360	200	174	182
	350	500	365	200	186	194
	400	565	370	200	199	207
	450	620	375	200	212	228
	500	680	380	200	231	237
	100	220	395	200	165	169
	150	285	395	200	180	180
	200	340	395	200	183	183
	250	380	400	200	210	210
	300	455	410	200	227	234
400	350	500	415	200	241	245
	400	570	420	200	252	256
	450	620	425	200	274	277
	500	685	430	200	287	289
	600	800	440	200	334	332
	100	345	445	200	225	248
	150	345	445	200	241	253
	200	345	445	200	264	258
	300	460	460	200	301	290
	400	575	470	200	336	329
450	500	650	480	200	380	370
	600	810	490	200	435	424
	700	925	500	20	511	499
	100	350	495	200	287	277
	150	350	495	200	307	298



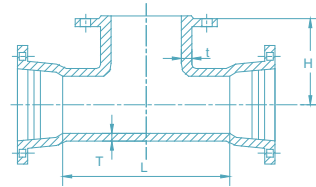
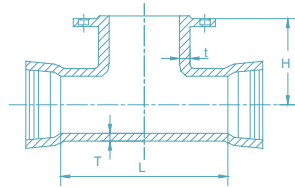
Socket Spigot Tee with Socket Branch

DN	dn	L	H	S	Mass(kg)	
					T-type	K-type
800	200	350	495	200	330	307
	300	465	510	200	374	351
	400	580	520	200	420	391
	500	815	530	200	42	460
	600	815	540	200	593	581
	700	1045	550	200	640	611
900	800	1045	560	200	665	641
	100	355	545	200	415	403
	150	355	545	200	421	409
	200	355	545	200	429	416
	300	590	570	200	490	475
	400	590	570	200	527	515
1000	500	820	590	200	720	705
	600	820	590	200	804	789
	700	1050	615	200	840	820
	800	1050	615	200	874	846
	900	1170	625	200	915	885
	100	360	595	250	505	493
1200	150	360	595	250	510	500
	200	360	595	250	515	504
	300	595	620	250	620	606
	400	595	620	250	630	614
	500	830	640	250	941	926
	600	830	640	250	966	955
1400	700	1055	665	250	1020	1002
	800	1055	665	250	1087	1060
	900	1290	685	250	1100	1070
	1000	1290	685	250	1167	1137
	100	375	700	250	712	649
	150	375	700	250	718	686
1600	200	375	700	250	725	726
	300	605	720	250	890	745
	400	605	720	250	903	755
	500	715	740	250	966	900
	600	840	740	250	1064	1050
	700	1045	765	250	1243	1080
1800	800	1070	765	250	1374	1332
	900	1185	785	250	1510	1460
	1000	1300	785	250	1582	1530
	1200	1535	805	250	1825	1751
	100	385	820	300	885	885
	200	385	820	300	890	891
2000	400	800	820	300	1096	1098
	600	1030	840	300	1304	1412
	800	1260	865	300	1527	1631
	1000	1495	865	300	1774	1876
	1200	1725	905	300	2049	2123
	1400	1960	930	300	2323	2426
2200	1600	2175	965	300	2646	2746
	1800	2445	1175	300	3323	3426
	2000	2690	1295	300	4000	4100
	2200	2940	1415	300	4677	4777
	2400	3190	1535	300	5354	5454
	2600	3440	1655	300	6031	6131



Double Socket Tee with Flange Branch

DN	dn	L	H	Mass(kg)					
				T-type		K-type			
				PN10	PN16	PN25	PN10	PN16	PN25
80	80	170	160	13.5	13.5	13.5	-	-	-
100	80	170	175	15.8	15.8	15.8	20	20	20
	100	190	180	17.2	17.2	17.2	22	22	22
	100	190	180	17.2	17.2	17.2	22	22	22
150	80	170	205	23	23	23	28	28	28
	100	195	210	24.5	24.5	25	29.5	29.5	29.5
	150	255	220	29.5	29.5	30.5	34.5	34.5	34.5
200	80	175	235	31.5	31.5	31.5	36	36	36
	100	200	240	33.5	33.5	34	38	38	38
	150	255	250	39	39	40	43.4	43.4	43.4
250	200	315	260	45.6	46	47.5	50	50.4	52
	80	175	265	44	44	44	46.6	45.6	45.6
	100	200	270	43.5	43.5	44	46	46	46.5
300	150	260	280	56.6	56.6	57.6	59	59	60
	200	315	290	57	57	59	60	60	62
	250	375	300	65	66	69	67.6	68.6	71.6
350	100	200	300	55	55	56	66	66	67
	150	260	310	68	68	69	79	79	80
	200	320	320	71	70	73	82	80	84
400	250	375	330	83	81	85	94	91	96
	300	435	340	89	91	95	100	102	106
	100	205	330	68	68	68	78	78	78
450	150	265	340	82.3	81.3	82.3	93	93	93
	200	320	350	86	86	88	96	96	98
	250	380	360	103	114	125	114	124	135
500	300	435	370	111	118	129	122	128	139
	350	495	380	117	120	129	127	130	139
	100	210	360	83	83	83	93	93	93
550	150	265	370	98	98	98	108	108	108
	200	325	380	103	102	104	113	113	114
	250	380	390	119	118	122	127	128	132
600	300	440	400	131	131	137	141	141	147
	350	500	410	143	146	153	153	156	163
	100	230	480	171	171	171	167	167	168
650	150	280	490	187	187	188	182	182	183
	200	340	500	189	189	191	185	185	188
	250	395	510	219	218	222	215	215	218
700	300	450	520	235	235	240	231	231	236
	350	510	530	252	255	263	247	251	260
	400	570	540	258	263	274	254	259	270
750	450	625	550	285	293	309	281	289	305
	500	685	560	304	309	331	301	305	327
	600	800	580	340	366	380	336	363	376
800	100	230	510	242	242	243	243	243	244
	150	285	515	246	246	247	246	246	247
	200	345	525	242	242	241	249	249	251
850	300	460	540	300	300	306	301	301	307



Double Socket Tee with Flange Branch

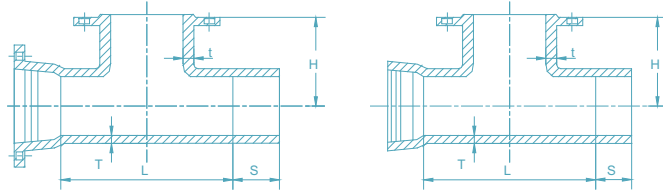
DN	dn	L	H	Mass(kg)					
				T-type			K-type		
				PN10	PN16	PN25	PN10	PN16	PN25
700	350	520	545	312	315	324	313	316	325
	400	575	555	320	325	344	329	334	345
	450	635	560	369	378	391	370	379	392
	500	690	570	391	406	418	392	407	419
	600	810	585	421	445	456	422	445	457
	700	925	600	460	475	525	476	488	525
	100	235	570	304	304	305	295	295	295
800	150	290	580	308	308	309	298	298	299
	200	350	585	306	306	313	302	301	303
	250	410	590	351	351	355	342	341	346
	300	465	600	371	371	377	362	362	368
	400	580	615	398	403	421	396	401	412
	500	700	630	522	537	549	513	528	540
	600	815	645	579	605	624	579	603	614
900	700	930	660	620	635	669	611	626	660
	800	1045	675	623	642	708	631	646	699
	100	240	630	378	378	378	365	365	366
	150	300	635	381	381	382	368	368	369
	200	355	645	379	379	386	371	371	373
	300	470	660	455	455	461	442	442	448
	400	590	675	490	495	513	484	488	499
1000	500	705	690	666	681	683	653	668	690
	600	820	705	748	774	784	745	769	783
	700	935	720	788	803	837	775	790	824
	800	1050	735	808	823	876	795	810	863
	900	1170	750	835	838	920	822	841	907
	100	245	690	461	461	462	461	461	462
	150	305	695	464	464	465	464	464	465
1100	200	360	705	462	462	469	467	467	469
	250	420	710	521	521	525	521	521	525
	300	480	720	552	552	558	552	552	558
	400	595	735	591	596	614	598	603	614

DN	dn	L	H	Mass(kg)					
				T-type			K-type		
				PN10	PN16	PN25	PN10	PN16	PN25
1000	500	710	750	852	867	879	852	867	879
	600	825	765	947	973	994	958	982	994
	700	940	780	985	1000	1032	985	1000	1032
	800	1060	795	1006	1021	1074	1006	1021	1074
	900	1175	810	1052	1076	1137	1052	1076	1137
	1000	1290	825	1044	1086	1192	1072	1106	1192
	100	260	810	676	676	676	676	676	676
1200	200	375	825	682	682	684	682	682	684
	300	490	840	769	769	775	769	769	775
	400	605	855	852	856	867	852	856	867
	500	720	870	968	973	995	968	973	995
	600	840	885	1000	1027	1067	1031	1055	1067
	700	955	900	1169	1184	1218	1169	1184	1218
	800	1070	915	1190	1210	1295	1227	1242	1295
1400	900	1185	930	1367	1427	1452	1367	1427	1452
	1000	1300	945	1436	1470	1556	1436	1470	1556
	1200	1535	975	1682	1736	1846	1682	1736	1864
	100	450	905	1120	1120	1120	1120	1120	1120
	200	565	920	1240	1240	1242	948	948	950
	300	680	935	1338	1338	1343	1046	1046	1051
	400	800	950	1442	1449	1458	1150	1156	1166
1600	500	915	965	1540	1554	1564	1247	1262	1272
	600	1030	980	1681	1706	1718	1389	1414	1426
	800	1260	1010	1908	1926	1972	1616	1634	1680
	1000	1495	1040	2155	2193	2266	1863	1901	1973
	1200	1725	1070	2398	2457	2547	2106	2164	2255
	1400	1960	1100	2686	2747	2887	2394	2455	2595
	200	580	1030	1748	1748	1750	1318	1318	1320
1800	250	635	1040	1810	1809	1813	1380	1379	1383
	300	695	1045	1876	1876	1881	1446	1446	1451
	400	810	1060	2002	2008	2017	1572	1578	1587
	500	925	1075	2129	2143	2154	1699	1713	1724



Double Socket Tee with Flange Branch

DN	dn	L	H	Mass(kg)					
				T-type			K-type		
				PN10	PN16	PN25	PN10	PN16	PN25
1600	600	1040	1090	2260	2285	2297	1908	1934	1967
	800	1275	1120	2811	2829	2875	2381	2399	2445
	1000	1505	1150	2824	2862	2935	2480	2522	2594
	1200	1740	1180	3146	3205	3295	2799	2863	2954
	1400	1970	1210	3478	3539	3679	3048	3109	3249
	1600	2200	1240	3883	3975	4135	3453	3545	3705
	200	595	1150	2146	2146	2148	1697	1697	1699
1800	250	650	1150	2220	2220	2224	1771	1771	1774
	300	705	1155	2295	2294	2300	1846	1845	1850
	400	820	1170	2448	2454	2463	1998	2005	2014
	500	940	1185	2608	2623	2633	2159	2174	2184
	600	1055	1200	2766	2791	2803	2414	2440	2453
	800	1285	1230	3092	3109	3155	2748	2767	2813
	1000	1520	1260	3434	3472	3545	3095	3137	3210
2000	1200	1750	1290	3798	3856	3947	3460	3524	3614
	1400	1980	1320	4173	4233	4373	3723	3784	3924
	1600	2215	1350	4617	4710	4870	4168	4260	4421
	1800	2445	1380	5075	5188	5405	4626	4739	4956
	200	600	1250				2117	2117	2119
	250	660	1260				2214	2214	2218
	300	720	1270				2312	2311	2317
2200	400	835	1290				2496	2502	2511
	500	950	1305				2681	2695	2705
	600	1065	1310				2988	3015	3028
	800	1300	1340				3231	3248	3294
	1000	1530	1370				3790	3832	3904
	1200	1760	1400				4014	4072	4163
	1400	1995	1430				4645	4713	4852
2400	1600	2225	1460				4892	4984	5144
	1800	2460	1490				5367	5480	5697
	2000	2690	1520				5999	6136	6458



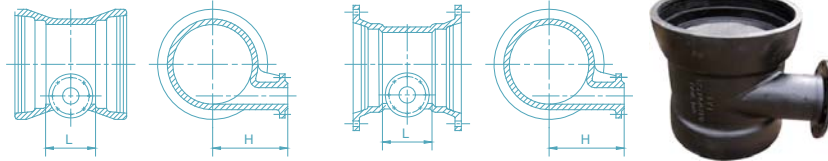
Socket Spigot Tee with Flange Branch

DN	dn	L	H	S	Mass(kg)					
					T-type			K-type		
					PN10	PN16	PN25	PN10	PN16	PN25
80	80	170	165	150	14	14	14	15.8	15.8	15.8
100	80	170	175	150	16.4	16.4	16.4	18.7	18.7	18.7
	100	190	180	150	17.8	17.8	17.8	20.1	20.1	20.1
	100	190	180	150	17.8	17.8	17.8	20.1	20.1	20.1
150	80	170	205	200	23.7	23.7	23.7	26.1	26.1	26.1
	100	195	210	200	25.5	25.5	25.8	27.6	27.6	27.6
	150	255	220	200	30.2	30.2	31.2	32.7	32.7	33.0
200	80	175	235	200	32.5	32.5	32.5	34.5	34.5	34.5
	100	200	240	200	34.3	34.3	34.3	36.3	36.3	36.3
	150	255	250	200	40.2	40.2	40.2	42.2	42.2	43.2
250	80	200	270	200	46.6	46.6	46.6	48.6	48.6	48.6
	100	200	270	200	46.6	46.6	46.6	48.6	48.6	48.6
	150	255	280	200	57.3	57.3	58.3	58.7	58.7	59.7
300	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	290	200	57.7	57.7	59.7	59.1	59.1	61.1
350	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	300	200	65.7	66.7	69.7	67.1	68.1	71.1
400	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	300	200	65.7	66.7	69.7	67.1	68.1	71.1
450	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	300	200	65.7	66.7	69.7	67.1	68.1	71.1



Socket Spigot Tee with Flange Branch

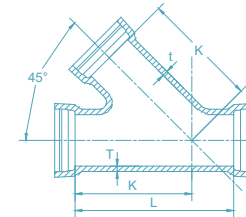
DN	dn	L	H	S	Mass(kg)					
					T-type			K-type		
					PN10	PN16	PN25	PN10	PN16	PN25
80	80	170	165	150	14	14	14	15.8	15.8	15.8
100	80	170	175	150	16.4	16.4	16.4	18.7	18.7	18.7
	100	190	180	150	17.8	17.8	17.8	20.1	20.1	20.1
	100	190	180	150	17.8	17.8	17.8	20.1	20.1	20.1
150	80	170	205	200	23.7	23.7	23.7	26.1	26.1	26.1
	100	195	210	200	25.5	25.5	25.8	27.6	27.6	27.6
	150	255	220	200	30.2	30.2	31.2	32.7	32.7	33.0
200	80	175	235	200	32.5	32.5	32.5	34.5	34.5	34.5
	100	200	240	200	34.3	34.3	34.3	36.3	36.3	36.3
	150	255	250	200	40.2	40.2	40.2	42.2	42.2	43.2
250	80	200	270	200	46.6	46.6	46.6	48.6	48.6	48.6
	100	200	270	200	46.6	46.6	46.6	48.6	48.6	48.6
	150	255	280	200	57.3	57.3	58.3	58.7	58.7	59.7
300	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	290	200	57.7	57.7	59.7	59.1	59.1	61.1
350	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	300	200	65.7	66.7	69.7	67.1	68.1	71.1
400	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	300	200	65.7	66.7	69.7	67.1	68.1	71.1
450	80	200	270	200	43.4	43.4	43.4	44.8	44.8	44.8
	100	200	270	200	44.9	44.9	44.9	46.4	46.4	46.9
	150	255	300	200	65.7	66.7	69.7	67.1	68.1	71.1



Double Socket Level Invert Tee

DN	dn	L	H	Mass(kg)					
				T-type			K-type		
				PN10	PN16	PN25	PN10	PN16	PN25
200	100	200	240	36.5	36.5	37	41	41	41.5
	150	250	250	44	44	45	48.5	48.5	49.5
	200	300	270	47.5	47.5	49	51.1	51.1	52.6
250	150	255	280	62.6	62.6	63.5	66.2	66.2	67.1
	200	315	290	65	65	67	68.6	68.6	70.6
	250	365	300	59	59	60.5	69.8	69.8	71.3
300	150	260	310	74	74	75	74.8	74.8	75.8
	200	320	320	80	79	82	90.8	90.8	92.8
	300	400	330	73	73	73	83.4	83.4	83.4
350	150	265	340	91.5	91.5	92	102	102	102
	200	325	350	96	96	98	106	106	108
	350	450	360	89	89	89	99.4	99.4	99.4
400	150	265	370	101	101	102	111	111	112
	200	325	380	115	114	116	125	125	126
	400	450	390	134	133	138	144	144	148
450	100	210	400	114	114	114	121	121	121
	150	270	400	130	130	131	137	137	138
	200	325	410	142	142	144	149	149	151
500	150	270	420	155	154	159	162	162	166
	200	325	430	174	174	180	181	181	187
	300	410	424	124	125	130	130	130	131
550	150	274	430	149	150	151	155	156	157
	200	330	440	158	157	159	164	164	165
	250	390	450	182	181	185	188	188	191
600	300	445	460	201	201	206	207	207	212
	100	220	480	186	185	185	184	183	183
	150	280	490	199	199	200	197	197	198
650	200	340	500	205	205	207	203	203	205
	250	395	510	239	238	243	237	236	241

DN	dn	L	H	Mass(kg)					
				T-type			K-type		
				PN10	PN16	PN25	PN10	PN16	PN25
600	300	450	520	257	257	261	255	255	259
	350	510	530	283	289	295	281	287	293
	400	570	540	294	300	310	292	298	308
700	100	230	510	261	261	262	253	253	254
	150	285	515	265	265	266	255	255	256
	200	345	525	269	269	271	280	280	282
800	300	460	540	324	324	330	320	319	326
	100	235	570	328	328	329	308	308	309
	150	290	575	335	335	336	310	310	311
900	200	350	585	336	336	338	335	335	337
	250	410	590	379	379	383	355	354	358
	300	465	630	401	401	407	380	379	385
1000	150	300	635	409	409	410	382	382	383
	200	355	645	416	416	418	396	396	398
	300	470	660	491	491	497	460	459	465
1100	400	590	675	537	542	553	504	508	519
	100	145	690	449.9	449.8	450.4	407.9	407.8	408.4
	150	305	695	476.7	476.7	477.7	434.7	434.7	435.7
1200	200	360	705	504.4	504.4	506.2	462.4	462.4	462.2
	300	480	720	569.9	569.6	574.8	527.9	527.6	532.8
	200	375	825	738.1	738.1	739.9	626.1	626.1	627.9
1300	400	605	855	904.5	911.0	920.2	792.5	799.0	808.2
	200	565	920	1256	1256	1258	963.4	963.4	965.2
	400	800	950	1463	1470	1479	1171	1177	1187
1400	400	1030	980	1708	1733	1745	1415	1440	1453
	1600	400	810	1060	2029	2036	2045	1599	1606
	1800	400	820	1170	2486	2492	2501	2037	2043
2000	400	835	1280	-	-	-	2542	2548	2588
	600	1065	1310	-	-	-	2988	3015	3026

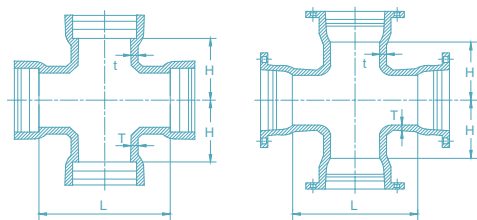


All Socket Tees with 45° Angle Branch



DN	dn	T	t	L	K	H	Mass(kg)	
							T-type	K-type
							21.4	21.4
80	80	8.1	8.1	290	215	215	25	25
100	80	8.4	8.1	290	225	230	26.8	26.8
150	100	8.4	8.4	320	240	240	37.1	37.1
200	100	9.1	8.1	290	250	265	39.4	39.4
250	150	9.1	9.1	390	300	300	46	46
300	150	9.8	8.1	290	275	300	52.7	52.3
350	100	9.8	8.4	320	290	310	55.3	54.9
400	150	9.8	9.1	390	325	335	62.8	62.4
450	200	9.8	9.8	460	360	360	71.5	70.9
500	80	10.5	8.1	290	300	335	72.5	71.7
550	100	10.5	8.4	320	315	345	75.4	74.6
600	150	10.5	9.1	390	350	370	83.8	83
650	200	10.5	9.8	460	385	395	93.7	92.7
700	250	10.5	10.5	530	420	420	104	103
750	80	11.2	8.1	290	325	370	96.3	96
800	100	11.2	8.4	320	340	380	99.6	98.8
850	150	11.2	9.1	390	375	405	109	108
900	200	11.2	9.8	460	410	430	120	119
950	250	11.2	10.5	530	445	455	132	131
1000	300	11.2	11.2	600	480	480	145	144
1050	100	11.9	8.4	380	405	455	126	139
1100	150	11.9	9.1	450	440	480	136	149
1150	20	11.9	9.8	520	475	505	146	159
1200	250	11.9	10.5	690	510	530	158	170
1250	300	11.9	11.2	660	545	555	171	187
1300	350	11.9	11.9	730	580	580	186	201
1350	100	12.6	8.4	380	430	490	159	172
1400	150	12.6	9.1	450	465	515	170	183
1450	200	12.6	9.8	520	500	540	182	195
1500	250	12.6	10.5	590	535	565	195	206
1550	300	12.6	11.2	660	570	590	209	225
1600	350	12.6	11.9	730	605	615	225	241

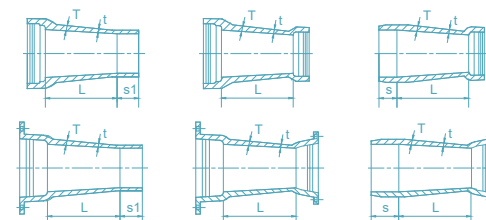
DN	dn	T	t	L	K	H	Mass(kg)	
							T-type	K-type
							242	258
400	100	13.3	8.4	380	455	525	198	208
450	150	13.3	9.1	450	490	550	210	221
500	200	13.3	9.8	520	525	575	223	233
550	250	13.3	10.5	590	560	600	237	247
600	350	13.3	11.9	730	630	650	270	283
650	400	13.3	12.6	800	665	675	288	301
700	450	13.3	13.3	870	700	700	307	320
750	100	14.0	8.4	380	480	560	243	251
800	150	14.0	9.1	450	515	585	256	264
850	200	14.0	9.8	520	550	610	269	277
900	250	14.0	10.5	590	585	635	286	293
950	300	14.0	11.2	660	620	660	303	314
1000	350	14.0	11.9	730	655	685	321	332
1050	400	14.0	12.6	800	690	710	340	351
1100	450	14.0	13.3	870	725	735	361	371
1150	500	14.0	14.0	940	760	760	383	392
1200	100	15.4	8.4	380	565	655	347	346
1250	150	15.4	9.1	450	600	680	364	363
1300	200	15.4	9.8	520	635	705	381	379
1350	250	15.4	10.5	590	670	730	399	379
1400	300	15.4	11.2	660	705	755	418	419
1450	350	15.4	11.9	730	740	780	439	440
1500	400	15.4	12.6	800	775	805	461	463
1550	450	15.4	13.3	870	810	830	485	486
1600	500	15.4	14.0	940	845	855	511	510
1650	600	15.4	15.4	1080	880	880	567	562



All Socket Cross

DN	dn	L	H	Mass(kg)	
				T-type	K-type
100	100	190	95	19.8	29.3
150	100	195	120	26.6	36.4
	150	255	125	33.6	43.8
200	100	200	145	34.2	43.4
	150	255	150	41.7	51.2
	200	315	155	50.9	59.7
250	100	200	170	44.9	52.4
	150	260	175	57.9	65.8
	200	315	180	64.2	71.4
	250	375	185	75.1	80.7
300	100	205	195	55.7	71.2
	150	260	200	71.1	87
	200	320	205	77.6	92.8
	250	380	210	93.3	107
	300	435	220	101	123
350	200	325	230	91.7	107
	250	380	235	110	123
	300	440	245	123	144
	350	495	250	137	157
400	200	325	255	108	122
	250	385	260	130	143
	300	440	270	142	163
	350	500	275	157	178
	400	560	280	177	198
500	250	390	310	174	183
	300	450	320	191	208
	350	505	325	207	223
	400	565	330	223	239
	500	680	340	272	284
600	300	455	370	249	256
	350	510	375	267	274

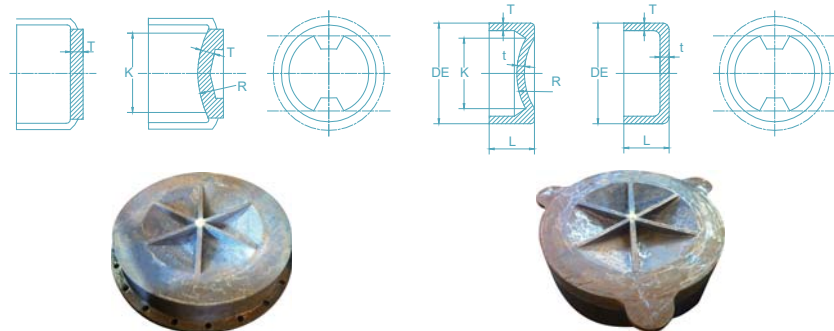
DN	dn	L	H	Mass(kg)	
				T-type	K-type
600	400	570	380	278	284
	500	685	390	330	332
	600	800	400	399	392
700	350	520	425	413	410
	400	575	430	447	441
	500	690	440	520	510
	600	810	450	607	589
	700	925	460	712	691
800	400	580	480	548	527
	500	700	490	682	608
	600	815	500	725	692
	700	930	510	831	796
900	800	1045	525	963	914
	500	705	540	757	729
	600	802	550	859	823
	700	935	560	969	930
1000	800	1050	575	1105	1052
	900	1170	585	1262	1205
	600	825	600	1011	1003
	700	940	610	1130	1120
	800	1060	625	1276	1251
1200	900	1175	635	1432	1404
	1000	1290	645	1612	1612
	800	1070	725	1677	1652
	900	1185	735	1847	1818
	1000	1300	745	2034	2034
1400	1200	1535	765	2497	2497
	900	1200	835	2261	2232
	1000	1315	845	2468	2468
	1200	1545	865	2940	2940
	1400	1780	890	3446	3446



Double Socket Taper/Reducer

DN	dn	L	Mass(kg)	
			T-type	K-type
100	80	90	8.5	12.3
150	80	190	13.5	17.5
	100	150	13.8	18.7
	80	290	20.5	23
200	100	250	20.5	25.2
	150	150	21	26
	80	390	28.5	31
250	100	300	28.5	32.2
	150	250	29	33.2
	200	150	29	33
300	80	490	39	42.9
	100	450	39	46.9
	150	350	39.5	46.9
	200	250	39.5	46.9
	250	150	38.5	45.7
350	80	600	51.5	57.9
	100	560	50	58.2
	150	460	52	60.1
	200	360	52	60.1
	250	260	51	62.1
400	300	160	49.5	64.9
	80	700	64	71.4
	100	660	65	72.3
	150	560	66.5	78.4
	200	460	67	78.3
450	250	360	66	77.2
	300	260	64	80.1
	350	160	62	78
	80	760	87.9	88.5
	100	760	87.9	94.2
500	150	660	88.9	95.3
	200	560	88.9	95.3
	250	460	89.2	94.2
	300	360	88.1	97.1
	350	260	86	95

DN	dn	L	Mass(kg)	
			T-type	K-type
450	400	160	83.1	92
500	80	900	101	109.8
	100	860	101	106
	150	760	102	114
	200	660	101	114
	250	560	101	113
600	300	460	100	116
	350	360	98	115
	400	260	94	111
	450	160	99.5	106
	80	1100	152	153
700	100	1060	152	153
	150	960	153	159
	200	860	154	159
	250	760	153	158
	300	660	152	161
800	350	560	151	159
	400	460	142	156
	450	360	149	151
	500	260	131	145
	200	1080	215.9	212.9
900	250	980	216.1	212.3
	300	880	218.5	216.3
	350	780	212.4	212.9
	400	680	206.7	208.5
	450	580	199.6	204.1
1000	500	480	194	204
	600	280	178	187
	400	880	285	277.9
	450	780	277.7	273.5
	500	680	272.2	266.6
1200	600	480	252	257
	700	280	229	236
	900	400	1080	387.4
	1000	360	-	-
	1800	360	-	-

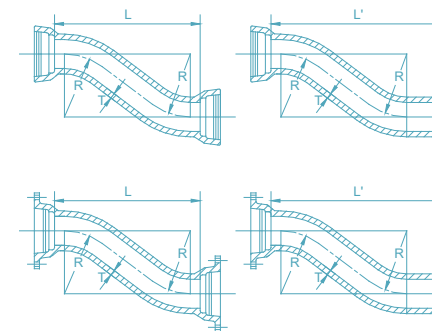


Caps

Plugs

DN	T	K&R	Mass(kg)	
			T-type	K-type
100	18		8.5	8.5
150	18		14.1	12.3
200	18		19.8	18.4
250	19.5		27.4	22
300	23		42.8	34
350	24	315	61.7	47.3
400	25	370	76.3	56
450	26	420	93.7	70
500	27	460	107	83
600	29.5	565	132	138
700	31	665	202	170
800	33	760	275	225
900	35	860	353	300
1000	37	960	454	370
1200	41	1160	613	580
1400	43	1260	1018	1027

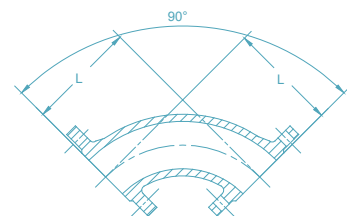
DN	DE	T	t	K&R	L	Mass(kg)	
						T-type	K-type
100	118	18	7.2		200	4.5	5.7
150	170	18	7.8		225	9.5	8.8
200	222	18	8.4		250	14.8	13
250	274	19.5	9.0		250	21.5	17.6
300	326	23	9.6		275	33.5	25.2
350	378	24	10.2	315	275	45.5	32.7
400	429	25	10.8	370	275	56	42.9
450	480	26	11.4	420	275	68.5	52.5
500	532	27	12	460	275	81	63.6
600	635	29.5	13.2	565	300	112	88.7
700	738	31	14.4	665	300	193	166
800	842	33	15.6	760	300	259	250
900	945	35	16.8	860	350	337	333
1000	1048	37	18	960	350	437	434
1200	1255	41	20.4	1160	350	783	671
1400	1462	43	22.4	1260	350	1078	710



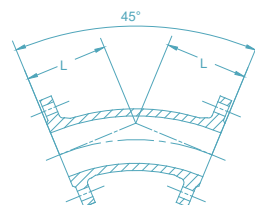
off-sets



DN	T	L	L'	R	Mass(kg)			
					T-type		K-type	
					Double- sockets	Sockets-spigots	Double- sockets	Sockets-spigots
100	7.2	350	510	150	18.7	11.3	23.5	12.9
150	7.8	355	515	150	36.2	19.1	41.3	20.4
200	8.4	450	630	200	51.6	31.9	56	32.6
250	9.0	535	715	250	70.4	48.7	73.2	48.6
300	9.6	640	820	300	90.7	72.1	102	75.9
350	10.2	680	860	350	123	94.4	133	97.9
400	10.8	820	1000	400	161	130	171	133
500	12.0	1010	1210	500	256	218	261	218
600	13.2	1200	1400	600	383	342	379	338
700	14.4	1380	1630	700	519	483	509	478



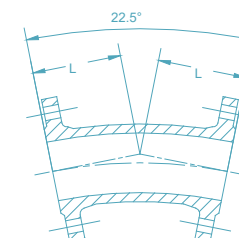
Double Flange 90° Bends



Double Flange 45° Bends

DN	L	Mass(kg)		
		PN10	PN16	PN25
80	165	9.6	9.6	9.6
100	180	11.9	11.9	12.9
150	220	20	20	22
200	260	31	30.5	34.5
250	350	50	49.5	57
300	400	70	70	81
350	450	90	96	113
400	500	116	127	149
450	550	143	160	190
500	600	181	211	235
600	700	272	325	353
700	800	386	416	473
800	900	533	572	653
900	1000	698	745	841
1000	1100	907	990	1163
1200	1300	1490	1619	1728
1400	1350	2199	2335	2640
1600	1450	2796	2983	-
1800	1500	3515	3750	-
2000	1650	4307	4613	-

DN	L	Mass(kg)		
		PN10	PN16	PN25
80	130	9.3	9.3	9.3
100	140	11.3	11.3	12.4
150	160	18.5	18.5	20.5
200	180	27.5	27	31
250	350	55	54	62
300	400	78	77	88
350	298	76	83	98
400	324	96	107	129
450	349	116	132	158
500	375	145	175	198
600	426	212	266	294
700	478	296	326	388
800	529	403	442	528
900	581	519	567	669
1000	632	668	751	881
1200	750	1050	1178	1345
1400	775	1388	1524	1852
1600	845	1915	2119	2416
1800	910	2465	2717	3125
2000	980	3149	3455	3907



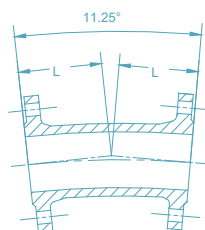
Double Flange 22.5° Bends

BS4772 Long Bend

DN	L	Mass(kg)		
		PN10	PN16	PN25
80	130	9.2	9.2	9.2
100	140	11.5	11.5	12.5
150	160	18.6	18.6	20.6
200	180	27.4	27	31.2
250	350	55.3	54.5	58.4
300	400	78.3	77.5	88.7
350	298	76.8	83	100
400	324	96	107	130
450	349	118	135	166
500	375	146	176	200
600	426	214	267	296
700	478	252	342	
800	529	288	448	
900	581	361	588	
1000	632	459	773	
1200	735	717	1213	
1400	835	1021	1635	
1600	940	2190	2325	
1800	480	1640	1864	
2000	520	2081	2357	

EN545 Series A Bend

DN	L	Mass(kg)		
		PN10	PN16	PN25
80	105	9.2	9.2	9.2
100	110	11.5	11.5	12.6
150	109	18.6	18.6	20.8
200	131	27	27	31
250	190	37.9	37.1	46
300	210	51	50.3	63
350	210	61.1	67.9	87.2
400	239	74.8	90.7	113.1
450	180	87.3	110	135.4
500	190	107.8	142.9	168.3
600	220	154.7	215.7	246
700	300	216.5	250.9	330.2
800	330	294.9	330.3	422.3
900	360	373	416.2	528.2
1000	390	477.2	552.6	697.8
1200	450	736.6	853.2	1035
1400	460	1021	1157	1388
1600	470	1284	1468	1789



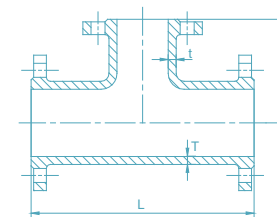
Double Flange 11.25° Bends

BS4772 Long Bend

DN	L	Mass(kg)		
		PN10	PN16	PN25
80	130	9.2	9.2	9.2
100	140	11.5	11.5	12.5
150	160	18.6	18.6	20.6
200	180	27.9	27.5	31.7
250	350	55.8	55	58.9
300	400	78.8	78	89.2
350	298	77.3	83.5	100
400	324	96.8	108	131
450	349	118	135	166
500	375	147	177	201
600	426	215	268	297
700	478	240	343	
800	529	270	451	
900	581	303	592	
1000	632	382	778	
1200	735	590	1220	
1400	835	827	1643	
1600	940	1203	2338	
1800	345	1342	1566	
2000	375	1694	1970	

EN545 Series A Bend

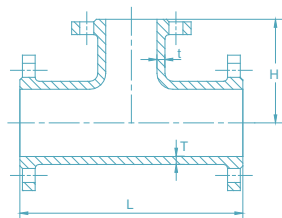
DN	L	Mass(kg)		
		PN10	PN16	PN25
80	113	9.2	9.2	9.2
100	115	11.5	11.5	12.5
150	113	17.2	17.2	19.5
200	132	24.3	24.4	28.8
250	165	34.7	33.8	42.8
300	175	46.4	45.7	58.4
350	191	54.9	61.8	81
400	205	66.8	82.7	105.1
450	135	76.6	99.3	124.7
500	140	93.6	128.7	154.1
600	160	134.7	195.7	225.9
700	205	206.6	241	320.3
800	230	270	308	367.3
900	245	303	351	450.2
1000	265	382	465	607
1200	360	639.2	755.8	937.2
1400	280	873.8	995.4	1275
1600	400	1203	1382	1664



All Flange Tees * items dimension are factory standard

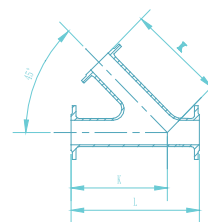
DN	dn	L	H	Mass(kg)		
				PN10	PN16	PN25
80	80	330	165	15.6	15.6	15.6
100	80	360	175	18.4	18.4	19.5
	100	360	180	19.4	19.4	21
	80	440	205	28.5	28.5	31
150	100	440	210	29.5	29.5	32
	150	440	220	32.5	32.5	36
	80	520	235	42	41.5	46
200	100	520	240	43	42	47.5
	150	520	250	46	45	51
	200	520	260	49.5	49	56
250	80	700	265	49.7	49.3	56.7
	100	700	275	68	67	75
	*150	700	300	72	71	81
	200	700	325	76	75	85
	250	700	350	82	81	93
300	100	800	300	94	93	105
	*150	800	325	98	97	109
	200	800	350	102	101	114
	*250	800	375	109	108	121
	300	800	400	116	115	131
350	100	850	325	116	122	139
	*150	850	325	119	125	142
	200	850	325	121	128	146
	250	850	325	128	134	154
	300	850	425	132	138	160
	350	850	425	142	151	176
	100	900	350	143	154	177
	*150	900	350	144	156	181
400	200	900	350	148	159	184
	*250	900	350	151	161	198
	*300	900	450	160	184	213
	350	900	450	170	183	215
	400	900	450	174	191	225

DN	dn	L	H	Mass(kg)		
				PN10	PN16	PN25
450	100	950	375	176	193	225
	*150	950	375	182	199	231
	200	950	375	190	207	240
	*250	950	375	199	216	250
	*300	950	475	210	227	263
	350	950	475	219	240	279
	*400	950	475	231	254	296
500	450	950	475	243	269	315
	100	1000	400	210	241	265
	150	1000	400	214	243	269
	200	1000	400	215	245	271
	250	1000	400	218	258	280
	300	1000	500	227	255	287
	350	1000	500	239	276	298
600	400	1000	500	242	276	311
	450	1000	500	249	298	327
	500	1000	500	252	297	332
	100	1100	450	268	329	352
	150	1100	450	283	340	370
	200	1100	450	305	358	388
	250	1100	450	307	360	392
	300	1100	550	312	374	398
	350	1100	550	326	380	413
	400	1100	550	329	387	427
700	450	1100	550	338	417	448
	500	1100	550	349	420	464
	600	1100	550	355	434	477
	100	540	510	253	295	
	150	595	515	255	296	
	200	650	525	258	298	
	250	705	530	310	335	
	300	760	540	319	342	
	350	815	545	340	375	

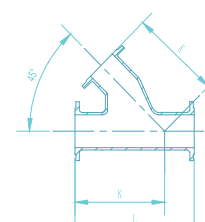


All Flange Tees

DN	dn	L	H	Mass(kg)		DN	dn	L	H	Mass(kg)	
				PN10	PN16					PN10	PN16
700	400	870	555	343	379	1000	200	770	705	546	629
	450	925	560	429	436		250	825	710	631	703
	500	980	570	442	481		300	880	720	651	739
	600	1090	585	476	523		350	935	725	660	753
	700	1200	600	477	523		400	990	735	668	755
800	100	580	570	345	383		450	1045	740	850	911
	150	635	575	349	387		500	1100	750	955	1007
	200	690	585	352	390		600	1650	765	1007	1116
	250	745	590	372	410		700	1650	780	1067	1152
	300	800	600	423	427		800	1650	795	1085	1168
	350	855	605	443	471		900	1650	810	1095	1219
	400	910	615	441	484		1000	1650	825	1105	1229
	450	965	620	519	563		100	660	810	996	1082
	500	1020	630	561	599		150	715	815	998	1084
	600	1350	645	613	678	1200	200	775	825	1000	1086
900	700	1350	660	663	711		250	830	830	1002	1094
	800	1350	675	657	715		300	890	840	1004	1106
	100	620	630	428	476		350	950	845	1006	1113
	150	675	635	432	480		400	1005	855	1008	1122
	200	730	645	436	484		500	1120	870	1109	1255
	250	785	650	499	533		600	1240	885	1101	1256
	300	840	660	523	569		700	1355	900	1279	1423
	350	895	665	538	588		800	1470	915	1291	1439
	400	950	675	541	594		900	1585	930	1427	1662
	450	1005	680	673	729		1000	1700	945	1494	1664
1000	500	1060	690	726	784		1200	1935	975	2201	2321
	600	1500	705	787	860		100	970	905	1227	1363
	700	1500	720	843	901	1400	200	1085	920	1231	1367
	800	1500	735	853	913		400	1320	950	1514	1656
	900	1500	750	860	924		600	1550	980	1655	1818
	100	660	690	524	572		800	1780	1010	1886	2041
	150	715	695	534	582		1000	2015	1040	2131	2309



Type N

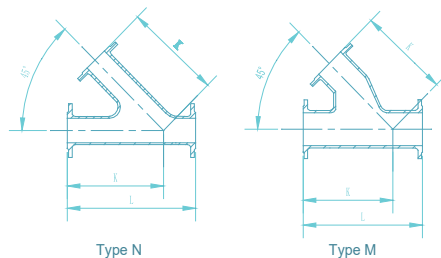


Type M



All Flange 45° Angle Branch Tees

DN	dn	Type	T	t	L	K	Mass(Kg)
							PN16
80	80	N	8.1	8.1	500	375	23
	80	N	8.4	8.1	500	390	27
	100	N	8.4	8.4	540	405	30
	80	N	9.1	8.1	590	480	41
	100	N	9.1	8.4	640	480	45
150	150	N	9.1	9.1	640	480	52
	80	N	9.8	8.1	635	535	55
	100	N	9.8	8.4	635	535	58
	150	N	9.8	9.1	735	560	71
	200	N	9.8	9.8	735	560	81
200	80	N	10.5	8.1	660	585	75
	100	N	10.5	8.4	710	610	82
	150	N	10.5	9.1	830	640	100
	200	N	10.5	9.8	830	640	112
	250	N	10.5	10.5	830	640	126
250	80	N	11.2	8.1	685	610	97
	100	N	11.2	8.4	685	610	100
	150	N	11.2	9.1	790	660	120
	200	N	11.2	9.8	865	685	140
	250	N	11.2	10.5	930	715	161
300	300	N	11.2	11.2	930	715	177
	100	N	11.9	8.4	685	635	124
	150	N	11.9	9.1	740	660	140
	200	N	11.9	9.8	840	710	165
	250	N	11.9	10.5	880	740	185
350	300	M	11.9	11.2	880	790	207
	350	M	11.9	11.9	880	790	168
	100	N	12.6	8.4	760	710	165
	150	N	12.6	9.1	815	740	180
400	200	N	12.6	9.8	865	760	200
	250	N	12.6	10.5	970	820	230
	250	M	12.6	11.2	970	870	254
	300	M	12.6	11.9	970	870	283
	400	M	12.6	12.6	970	870	310
	100	N	13.3	8.4	740	710	185
	150	N	13.3	9.1	840	760	211
	200	N	13.3	9.8	890	790	233
	250	N	13.3	10.5	990	820	272
	300	M	13.3	11.2	1040	900	298
450	350	M	13.3	11.9	1060	950	338
	400	M	13.3	12.6	1060	950	366
	450	M	13.3	13.3	1060	950	392
	150	N	14.0	9.1	790	765	245
	200	N	14.0	9.8	890	810	278
	250	N	14.0	10.5	940	840	304
	300	M	14.0	11.2	990	865	334
	350	M	14.0	11.9	1065	950	389
	400	M	14.0	12.6	1140	1025	439
	450	M	14.0	13.3	1140	1025	468
500	500	M	14.0	14.0	1140	1025	505
	150	N	15.4	9.1	890	840	354
	200	N	15.4	9.8	940	890	382
	250	N	15.4	10.5	990	915	413
	300	M	15.4	11.2	1090	965	460
	350	M	15.4	11.9	1160	1000	520
	400	M	15.4	12.6	1230	1035	568
	450	M	15.4	13.3	1295	1070	618
	500	M	15.4	14.0	1310	1180	680
	600	M	15.4	15.4	1310	1180	768



Type N

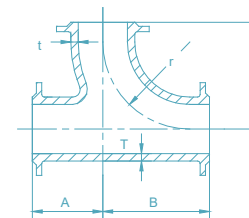
Type M



All Flange 45° Angle Branch Tees

DN	dn	Type	T	t	L	K	Mass(Kg) PN16
700	200	N	16.8	9.8	1040	1015	547
	250	N	16.8	10.5	1070	1040	582
	300	N	16.8	11.2	1170	1090	649
	350	M	16.8	11.9	1240	1125	708
	400	M	16.8	12.6	1310	1160	772
	450	M	16.8	13.3	1370	1195	860
	500	M	16.8	14.0	1440	1240	945
	600	M	16.8	15.4	1570	1370	1133
800	700	M	16.8	16.8	1570	1370	1240
	250	N	18.2	10.5	1180	1150	760
	300	N	18.2	11.2	1200	1170	800
	350	N	18.2	11.9	1270	1205	867
	400	M	18.2	12.6	1340	1240	938
	450	M	18.2	13.3	1400	1270	1009
	500	M	18.2	14.0	1470	1305	1128
	600	M	18.2	15.4	1600	1370	1314
900	700	M	18.2	16.8	1660	1450	1476
	800	M	18.2	18.2	1720	1520	1674
	300	N	19.6	11.2	1270	1245	980
	350	N	19.6	11.9	1340	1280	1056
	400	N	19.6	12.6	1410	1315	1136
	450	M	19.6	13.3	1350	1350	1218
	500	M	19.6	14.0	1560	1390	1322
	600	M	19.6	15.4	1730	1475	1590
	700	M	19.6	16.8	1780	1540	1757
	800	M	19.6	18.2	1830	1610	1964
	900	M	19.6	19.6	1880	1680	2194

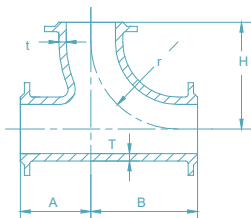
DN	dn	Type	T	t	L	K	Mass(Kg) PN16
1000	350	N	21.0	11.9	1415	1380	1320
	400	N	21.0	12.6	1485	1415	1408
	450	N	21.0	13.3	1550	1450	1500
	500	M	21.0	14.0	1680	1510	1647
	600	M	21.0	15.4	1800	1575	1915
	700	M	21.0	16.8	1930	1640	2144
	800	M	21.0	18.2	2060	1700	2410
	900	M	21.0	19.6	2180	1980	2812
1100	1000	M	21.0	21.0	2180	1980	3052
	400	N	22.4	12.6	1560	1515	1677
	450	N	22.4	13.3	1625	1550	1777
	500	M	22.4	14.0	1730	1600	1922
	600	M	22.4	15.4	1830	1650	2200
	700	M	22.4	16.8	1980	1790	2490
	800	M	22.4	18.2	2120	1930	2827
	900	M	22.4	19.6	2265	2065	3205
1200	1000	M	22.4	21.0	2265	2065	3452
	1100	M	22.4	22.4	2265	2065	3703
	450	N	23.8	13.3	1780	1700	2210
	500	N	23.8	14.0	1880	1750	2367
	600	M	23.8	15.4	1980	1855	2695
	700	M	23.8	16.8	2125	1920	2988
	800	M	23.8	18.2	2270	1990	3330
	900	M	23.8	19.6	2415	2060	3693
	1000	M	23.8	21.0	2480	2280	4136
	1100	M	23.8	22.4	2480	2280	4410
	1200	M	23.8	23.8	2480	2280	4728



All Flange Radial Tees

DN	dn	T	t	A	B	H	Mass(kg) PN16
80	80	8.1	8.1	165	380	380	24
100		8.4	8.1	180	390	390	28
		8.4	8.4	180	400	400	31
		8.4	8.4	180	400	400	31
150	80	9.1	8.1	220	395	415	40
	100	9.1	8.4	220	405	425	43
	150	9.1	9.1	220	450	450	52
200	80	9.8	8.1	220	400	440	53
	100	9.8	8.4	220	410	450	56
	150	9.8	9.1	260	455	475	67
	200	9.8	9.8	260	500	500	80
250	80	10.5	8.1	220	405	465	70
	100	10.5	8.4	220	415	475	74
	150	10.5	9.1	300	460	500	91
	200	10.5	9.8	300	505	525	104
	250	10.5	10.5	350	550	550	124
	300	11.2	8.1	220	415	490	90
300	100	11.2	8.4	300	425	500	101
	150	11.2	9.1	300	470	525	114
	200	11.2	9.8	400	515	550	137
	250	11.2	10.5	400	560	575	154
	300	11.2	11.2	400	600	600	174
	350	11.9	8.4	300	430	525	126
350	150	11.9	9.1	300	475	550	140
	200	11.9	9.8	400	520	575	166
	250	11.9	10.5	400	565	600	185
	300	11.9	11.2	400	605	625	206
	350	11.9	11.9	450	650	650	235
400	100	12.6	8.4	300	435	550	160

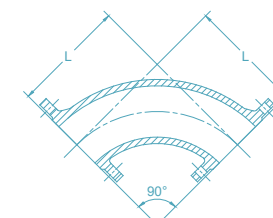
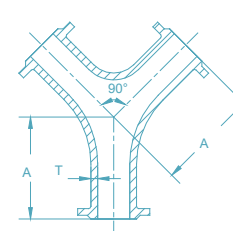
DN	dn	T	t	A	B	H	Mass(kg) PN16
400	50	12.6	9.1	300	480	575	170
	200	12.6	9.8	400	525	600	200
	250	12.6	10.5	400	570	625	218
	300	12.6	11.2	450	610	650	246
	350	12.6	11.9	450	655	675	272
	400	12.6	12.6	500	700	700	307
450	100	13.3	8.4	300	440	575	185
	150	13.3	9.1	300	485	600	197
	200	13.3	9.8	400	530	625	230
	250	13.3	10.5	450	575	650	260
	300	13.3	11.2	450	615	675	282
	350	13.3	11.9	450	660	700	310
500	400	13.3	12.6	550	705	725	355
	450	13.3	13.3	550	750	750	387
	150	14.0	9.1	300	495	625	241
	200	14.0	9.8	400	540	650	278
	250	14.0	10.5	450	585	675	310
	300	14.0	11.2	450	625	700	335
600	350	14.0	11.9	450	670	725	364
	400	14.0	12.6	550	715	750	413
	450	14.0	13.3	650	760	775	446
	500	14.0	14.0	600	800	800	497
	150	15.4	9.1	330	505	675	330
	200	15.4	9.8	400	550	700	375
	250	15.4	10.5	450	595	725	413
	300	15.4	11.2	450	635	750	441
	350	15.4	11.9	450	680	775	473
	400	15.4	12.6	550	725	800	532



All Flange Radial Tees

DN	dn	T	t	A	B	H	Mass(kg) PN16
600	450	15.4	13.3	600	770	825	580
	500	15.4	14.0	600	810	850	626
	600	15.4	15.4	700	900	900	748
700	200	16.8	9.8	400	550	750	500
	250	16.8	10.5	450	595	775	554
	300	16.8	11.2	450	635	800	591
	350	16.8	11.9	450	680	825	632
	400	16.8	12.6	550	725	850	715
	450	16.8	13.3	600	770	875	779
	500	16.8	14.0	600	810	900	835
	600	16.8	15.4	700	900	950	995
	700	16.8	16.8	800	1000	1000	1154
	250	18.2	10.5	450	595	825	678
800	300	18.2	11.2	450	635	850	719
	350	18.2	11.9	450	680	875	765
	400	18.2	12.6	550	725	900	861
	450	18.2	13.3	600	770	925	934
	500	18.2	14.0	600	810	950	995
	600	18.2	15.4	700	900	1000	1174
	700	18.2	16.8	800	1000	1050	1353
	800	18.2	18.2	900	1100	1100	1565
	300	19.6	11.2	450	640	900	851
	350	19.6	11.9	450	685	925	907
900	400	19.6	12.6	550	730	950	1013
	450	19.6	13.3	600	775	975	1101
	500	19.6	14.0	600	815	1000	1167
	600	19.6	15.4	700	905	1050	1366
	700	19.6	16.8	800	1005	1100	1568

DN	dn	T	t	A	B	H	Mass(kg) PN16
900	800	19.6	18.2	900	1105	1150	1802
	900	19.6	19.6	1000	1200	1200	2047
	350	21.0	11.9	450	695	975	1103
1000	400	21.0	12.6	550	740	1000	1224
	450	21.0	13.3	600	785	1025	1323
	500	21.0	14.0	600	825	1050	1394
	600	21.0	15.4	700	915	1100	1616
	700	21.0	16.8	800	1015	1150	1841
	800	21.0	18.2	900	1115	1200	2099
	900	21.0	19.6	1000	1210	1250	2369
	1000	21.0	21.0	1100	1300	1300	2676
	400	22.4	12.6	550	750	1050	1416
	450	22.4	13.3	600	795	1075	1528
1100	500	22.4	14.0	600	835	1100	1605
	600	22.4	15.4	700	925	1150	1851
	700	22.4	16.8	800	1025	1200	2101
	800	22.4	18.2	900	1125	1250	2385
	900	22.4	19.6	1000	1220	1300	2678
	1000	22.4	21.0	1100	1310	1350	3012
	1100	22.4	22.4	1200	1400	1400	3353
	450	23.8	13.3	600	805	1125	1793
	500	23.8	14.0	600	845	1150	1877
	600	23.8	15.4	700	935	1200	2148
1200	700	23.8	16.8	800	1035	1250	2425
	800	23.8	18.2	900	1135	1300	2736
	900	23.8	19.6	1000	1230	1350	3056
	1000	23.8	21.0	1100	1320	1400	3417
	1100	23.8	22.4	1200	1410	1450	3785
	1200	23.8	23.8	1300	1500	1500	4200

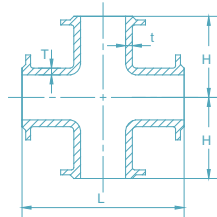


All Flange "Y" Tees

Double Flange 90° Long Radius Bends

DN	dn	T	A	Mass(kg) PN16
80	80	8.1	165	15.6
100	100	8.4	180	19.3
150	150	9.1	220	32.5
200	200	9.8	260	49
250	250	10.5	350	81
300	300	11.2	400	115
350	350	11.9	450	166
400	400	12.6	500	231
450	450	13.3	550	295
500	500	14.0	600	385
600	600	15.4	700	591

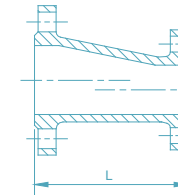
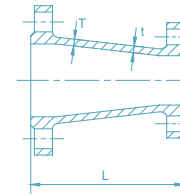
DN	L	R	Mass(kg)		
			PN10	PN16	PN25
80	380	330	14.5	14	14.5
100	400	340	18.0	18	19.0
150	450	385	30.5	30	32.5
200	500	430	46.5	46	50.0
250	550	475	67.0	65	73.5
300	600	515	91.0	90	101
350	650	560	117	121	138
400	700	605	149	157	180
450	750	650	184	197	221
500	800	690	227	252	275
600	900	780	332	379	403



All Flange Cross

DN	dn	T	t	L	H	Mass(Kg)		
						PN10	PN16	PN25
80	80	8.1	8.1	330	165	20.1	20.1	20.1
100	80	8.4	8.1	360	175	23	23	24.2
	100	8.4	8.4	360	180	25	25	27.1
150	80	9.1	8.1	440	205	33.1	33.1	36.1
	100	9.1	8.4	440	210	35.1	35.1	38.1
	150	9.1	9.1	440	220	41.1	41.1	46.1
200	80	9.8	8.1	520	235	46.5	45.9	50.7
	100	9.8	8.4	520	240	48.5	46.9	53.7
	150	9.8	9.1	520	250	54.5	53.9	60.7
	200	9.8	9.8	520	260	61.5	60.9	70.7
250	80	10.5	8.1	700	265	37.5	37.5	44.5
	100	10.5	8.4	700	275	74.1	72.9	81.1
	150	10.5	9.1	700	300	82.1	80.9	93.1
	200	10.5	9.8	700	325	90.1	88.9	101
300	250	10.5	10.5	700	350	102	101	117
	100	11.2	8.4	800	300	100	98.8	112
	150	11.2	9.1	800	325	108	107	120
	200	11.2	9.8	800	350	116	115	130
350	250	11.2	10.5	800	375	130	129	144
	300	11.2	11.2	800	400	144	143	164
	100	11.9	8.4	850	325	122	128	145
	150	11.9	9.1	850	325	128	134	151
400	200	11.9	9.8	850	325	132	140	159
	250	11.9	10.5	850	325	146	151	176
	300	11.9	11.2	850	425	154	160	187
	350	11.9	11.9	850	425	174	186	219
450	100	12.6	8.4	900	350	149	160	183
	150	12.6	9.1	900	350	151	164	191
	200	12.6	9.8	900	350	159	170	197
	250	12.6	10.5	900	350	160	174	225

DN	dn	T	t	L	H	Mass(Kg)		
						PN10	PN16	PN25
300	300	12.6	11.2	900	450	182	220	236
	350	12.6	11.9	900	450	202	228	249
	400	12.6	12.6	900	450	211	234	259
	450	12.6	13.3	900	450	218	241	266
450	100	13.3	8.4	950	375	186	203	235
	150	13.3	9.1	950	375	198	215	248
	200	13.3	9.8	950	375	213	230	265
	250	13.3	10.5	950	375	231	248	286
500	300	13.3	11.2	950	475	253	270	312
	350	13.3	11.9	950	475	272	296	343
	400	13.3	12.6	950	475	296	324	378
	450	13.3	13.3	950	475	320	354	416
550	100	14.0	8.4	1000	400	215	247	272
	150	14.0	9.1	1000	400	223	251	280
	200	14.0	9.8	1000	400	225	255	284
	250	14.0	10.5	1000	400	231	281	301
600	300	14.0	11.2	1000	500	249	275	316
	350	14.0	11.9	1000	500	273	290	338
	400	14.0	12.6	1000	500	279	317	364
	450	14.0	13.3	1000	500	293	361	396
650	500	14.0	14.0	1000	500	299	359	406
	100	15.4	8.4	1100	450	242	311	329
	150	15.4	9.1	1100	450	272	333	365
	200	15.4	9.8	1100	450	316	369	401
700	250	15.4	10.5	1100	450	321	373	409
	300	15.4	11.2	1100	550	330	400	420
	350	15.4	11.9	1100	550	358	413	451
	400	15.4	12.6	1100	550	364	427	479
750	450	15.4	13.3	1100	550	382	487	521
	500	15.4	14.0	1100	550	403	494	553
	550	15.4	14.7	1100	550	428	517	588
	600	15.4	15.4	1100	550	416	521	579

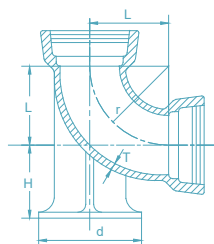


Double Flange Taper/Reducer

DN	dn	L	Mass(kg)		
			PN10	PN16	PN25
100	80	200	9.3	9.3	9.8
150	80	400	16	16.1	17.1
	100	300	15	15	17.5
200	80	600	25.1	25.1	26.9
	100	600	27.3	27.5	25
	150	300	22	27.5	25
	100	600	33	32.6	36.8
250	150	600	38.6	39.5	35.5
	200	300	30	29.5	35.5
	100	600	44	43.6	49.4
300	150	600	46.4	46	52.6
	200	600	51.7	51	58.7
	250	300	40.5	39.5	49
350	100	750	52.5	55.2	63.7
	150	700	56.0	58.8	67.7
	200	600	58.1	60.5	70.9
	250	600	64.9	67	79.2
400	300	300	49.5	52	66
	100	800	62.9	69.4	79.1
	150	750	66.6	73.1	83.2
	200	600	65.7	71	84.4
450	250	600	72	77	92.2
	300	600	78.8	84	101
	350	300	58	67	86
	100	900	76.7	86.0	96.9
500	150	800	77.4	86.7	98.0
	200	750	81.0	90.4	102.6
	250	600	79.5	87.5	96.9
	300	600	86.8	95	107

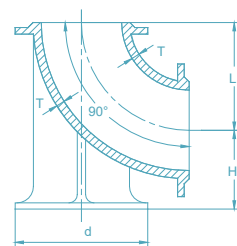
DN	dn	L	Mass(kg)		
			PN10	PN16	PN25
450	350	600	92.7	104	118
	400	300	72.4	81	113
	100	950	91.6	105.9	116.9
	150	900	95.8	110.2	121.6
500	200	800	95.7	110.0	122.3
	250	700	99.4	114	130
	300	600	96.2	111	129
	350	600	103	121	141
600	400	600	110	130	153
	450	300	116	139	157
	100	1050	125.8	150.6	163.5
	150	1000	130.1	155.1	168.5
700	250	900	139.5	164.1	180.2
	300	800	145	171	191
	350	700	138	167	190
	400	600	132	164	190
800	450	600	140	175	195
	500	600	149	190	216
	200	1100	181.1	195.3	229.6
	250	1050	186.8	200.6	236.7
900	300	1100	192.4	206.2	243.9
	350	900	188.3	205.2	245.6
	400	800	183.5	204.1	245.8
	450	700	190	213	251
1000	500	600	178	208	252
	600	600	195	243	288
	400	1030	260.8	285.0	340.2
	450	900	247.8	274.8	331.2
1100	500	800	255	285	347

DN	dn	L	Mass(kg)		
			PN10	PN16	PN25
800	600	600	234	275	340
	700	600	250	285	374
	400	1100	311.5	339.6	404.8
900	450	1100	347	380	467
	500	1000	337	377	470
	600	800	315	366	462
	700	600	293	333	446
	800	600	308	352	468
1000	500	1200	452	501	585
	600	1000	427	487	574
	700	800	403	452	556
	800	600	369	418	540
1200	900	600	373	438	545
	600	1150	555.2	638.5	741.6
	700	1345	698	768	882
	800	1160	695	765	897
1400	900	975	628	708	871
	1000	790	586	692	881
	700	850	554.7	629.6	801.8
	800	950	665.7	744.2	929.9
1600	900	1100	786.5	868.9	1065
	1000	1000	788	886.5	1099
	1200	850	814	947	1223
	1000	1650	1354	1484	1717
1800	1200	1000	1055	1205	1456
	1400	910	1103	1273	1641
	1000	1760	1620	1770	2060
2000	1200	1710	1747	1899	2199
	1400	1340	1588	1760	2067



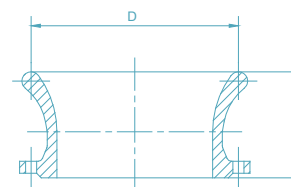
Double Socket 90° Duck-foot Bends

DN	L	H	d	Mass(kg)
				Type
100	120	125	200	14.8
150	170	160	250	28.5
200	220	190	300	44.5
250	270	225	350	68.5
300	320	255	400	100
350	370	290	450	133
400	420	320	500	180
450	470	355	550	230
500	520	385	600	294
600	620	450	700	442
700	720	515	800	618
800	820	580	900	832
900	920	645	1000	1113
1000	1020	710	1100	1435
1200	1220	840	1300	2153

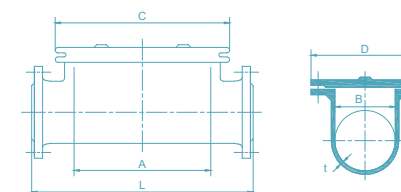


Double Flange 90° Duck-foot Bends

DN	L	H	d	Mass(kg)		
				PN10	PN16	PN26
100	180	125	200	17.8	17.8	18.8
150	220	160	250	30	30	32
200	260	190	300	46.5	46	50.5
250	350	225	350	75	75	82
300	400	255	400	106	105	116
350	450	290	450	139	145	162
400	500	320	500	178	189	212
450	550	355	550	229	249	275
500	600	385	600	283	313	337
600	700	450	700	428	481	509
700	800	515	800	700	741	811
800	900	580	900	846	884	982
900	1000	645	1000	1118	1165	1286
1000	1100	710	1100	1698	1781	1937
1200	1300	840	1300	2599	2709	



Flange Bell Mouth



Double Flange Hatchbox

DN	D	L	Mass(kg)		
			PN10	PN16	PN25
80	160	135	5.2	5.2	5.2
100	185	140	6.2	6.2	6.7
150	245	155	10.1	10.1	11.1
200	310	170	15	14.8	16.8
250	370	190	21	20.5	24.5
300	435	210	28.5	28.5	33.5
350	495	225	35.5	38	46
400	560	245	45	49.5	60.5
450	620	260	54	62	73
500	685	280	67	80	91
600	810	300	96.5	120	132
700	945	340	135	146	178.5
800	1055	380	182	197	243
900	1165	420	231	250	306
1000	1290	440	297	331	404
1200	1515	490	457	512	603
1400	1725	515	646	702	842
1600	1945	540	906	995	1156
1800	2130	730	1185	1297	1514
2000	2360	800	1530	1668	1990

DN	t	L	Clear opening		Cover	Number and Size of studs	Number and Size of studs	Mass(kg) PN16
			A	B				
80	8.1	800	400	80	520 200	-	10 x M16	65.0
100	8.4	800	400	100	535 235	-	10 x M20	70.0
150	9.1	800	400	150	550 300	4x M24	10 x M24	85.0
200	9.8	800	400	200	560 360	4x M24	12 x M24	98.5
250	10.5	950	500	250	675 425	4x M27	14 x M27	140.0
300	11.2	950	500	300	685 485	6x M27	18 x M27	188.0
350	11.9	950	500	350	705 555	6 x M30	18 x M30	252.0
400	12.6	1100	600	400	820 620	6 x M33	18 x M33	310.0
450	13.3	1100	600	450	820 670	6 x M33	20 x M33	367.0
500	14.0	1200	600	500	830 730	4x M33	22 x M33	422.0
600	15.4	1200	600	600	845 845	4x M36	22 x M36	474.0

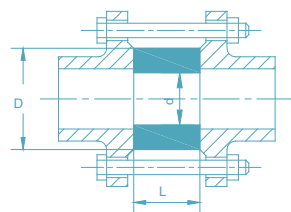
Maximum hydraulic working pressure rating 10bar.

Recommended maximum site hydraulic test pressure 16bar.

Hatchboxes in sizes less than 250mm have flat covers as shown.

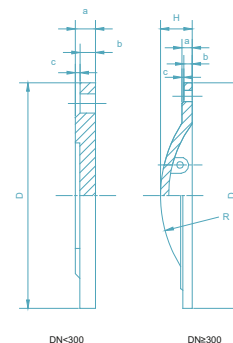
Sizes above 300mm and larger have ribbed covers.





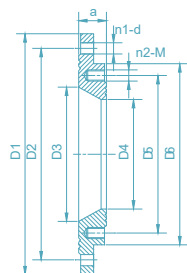
Pipe Blocks

DN	d	L		D			Mass(kg/m)		
		Min	Max	PN10	PN16	PN25	PN10	PN16	PN25
80	76	15	105	133	133	133	66.0	66	66.0
100	100	15	120	153	153	159	74.2	74	84.6
150	150	15	130	209	209	214	117.3	117	129.0
200	200	15	140	264	264	274	164.4	164	194.2
250	250	20	155	319	319	331	217.4	217	260.6
300	300	20	170	367	367	389	247.4	247	339.5
350	350	20	180	427	432	446	331.3	355	423.1
400	400	20	195	477	484	503	373.9	411	515.0
450	450	20	205	527	544	553	416.5	517	572.0
500	500	20	220	582	606	613	491.3	649	696.4
600	600	30	245	682	721	718	582.1	885	861.2
700	704	30	245	794	791	820	746.0	746	979.0
800	802	30	245	901	898	928	934.0	934	1207.0
900	897	30	250	1001	998	1028	1093.0	1093	1396.0
1000	1003	35	270	1112	1115	1140	1276.0	1276	1626.0
1100	1100	35	290	1218	1218	1240	1515.0	1515	1814.0
1200	1203	35	310	1328	1328	1350	1752.0	1752	2078.0
1400	1404	40	375	1530	1530	-	2047.0	2047	-
1600	1604	40	375	1750	1750	-	2711.0	2711	-



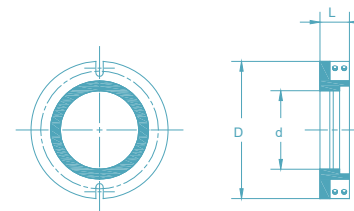
Blind Flanges

DN	D			a			b			c	Mass(kg)		
	PN10	PN16	PN25	PN10	PN16	PN25	PN10	PN16	PN25		PN10	PN16	PN25
80	200	200	200	19	19	19	16	16	16	3	3.5	3.5	3.5
100	220	220	235	19	19	19	16	16	16	3	4.3	4.3	4.8
150	285	285	300	19	19	20	16	16	17	3	7.2	7.2	8.3
200	340	340	360	20	20	22	17	17	19	3	11.0	10.8	13.3
250	400	400	425	22	22	24.5	19	19	21.5	3	16.9	16.6	21.0
300	455	455	485	24.5	24.5	27.5	20.5	20.5	23.5	4	24.0	23.5	30.0
350	505	520	555	24.5	26.5	30	20.5	22.5	26	4	29.5	33.5	43.5
400	565	580	620	24.5	28	32	20.5	24	28	4	36.5	44.5	58.0
450	615	640	670	24.5	30	34.5	21.5	26	30.5	4	46.5	63.5	79.0
500	670	715	730	26.5	31.5	36.5	22.5	27.5	32.5	4	56.0	77.0	94.0
600	780	840	845	30	36	42	25	31	37	5	85.0	121	144
700	895	910		32.5	39.5		27.5	34.5		5	123	156	
800	1015	1025		35	43		30	38		5	172	218	
900	1115	1125		37.5	46.5		32.5	41.5		5	224	286	
1000	1230	1255		40	50		35	45		5	293	387	
1200	1455	1485		45	57		40	52		5	575	662	
1400	1675	1685		46	60		41	55		5	739	994	
1600	1915	1930		49	65		44	60		5	1239	1409	
1800	2115	2130		52	70		47	65		5	1717	1858	
2000	2325	2345		55	75		50	70		5	2272	2407	



Reducing Flanges

DN	dn	D1	D2	D3	D4	D5	D6	n1	n2	d	M	a	Mass(Kg)
200	80	340	295	118	84	160	200	12	8	23	16	39	13.0
	100	340	295	144	104	180	220	12	8	23	16	39	13.0
250	100	400	35 5	148	104	180	220	12	8	28	16	41	18.6
	150	455	355	200	154	240	285	12	8	28	20	43	18.8
300	100	455	410	148	104	180	220	12	8	28	16	44	26.3
	150	455	410	200	154	240	285	12	8	28	20	44	25.9
	200	520	410	250	205	295	340	12	12	28	20	45	24.7
350	200	520	470	25 0	205	295	340	16	12	28	20	46	32.6
	250	520	470	303	254	355	400	16	12	28	24	48	36.5
400	100	580	525	148	104	180	220	16	8	31	16	47	46.0
	150	580	525	205	155	240	285	16	8	31	20	47	44.8
	200	580	525	270	205	295	340	16	12	31	20	48	42.4
	300	580	525	354	309	410	455	16	12	31	24	52	44.5
500	100	715	650	148	104	180	220	20	8	34	16	50	82.7
	150	715	650	203	155	240	285	20	8	34	20	50	81.3
	200	715	650	250	205	295	340	20	12	34	20	50	79.0
	300	715	650	354	309	400	455	20	12	34	24	56	74.7
	400	715	650	464	409	525	580	20	16	34	27	60	69.6
600	100	840	770	148	104	180	220	20	8	37	16	55	130.7
	200	840	770	250	205	295	340	20	12	37	20	56	126.6
	300	840	770	354	309	410	455	20	12	37	24	60	119.1
	400	840	770	464	409	525	580	20	16	37	27	64	112.6
800	100	1025	950	148	104	180	220	24	8	40	16	62	235.0
	150	1025	950	205	155	240	295	24	8	40	20	62	233.0
	200	1025	950	250	205	295	340	24	12	40	20	63	229.3
	300	1025	950	354	309	410	455	24	12	40	24	67	220.5
	400	1025	950	464	409	525	580	24	16	40	27	70	209.1
	450	1025	950	515	45 5	585	640	24	20	40	27	73	205.6
	500	1025	950	566	508	650	715	24	20	40	30	74	200.9
	600	1025	950	670	608	770	840	24	20	40	33	79	191.1

Split Puddle Flanges of Ductile Iron
(Designed for use on spun ductile iron pipes only)

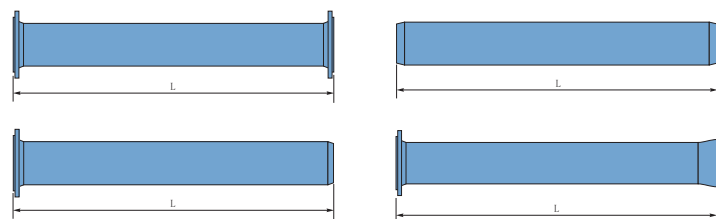
DN	D	L	d	Mass(kg)
80	260	110	100	11.5
100	305	110	120	14.5
150	390	130	172	23
200	430	130	224	28
250	490	130	276	37
300	555	130	329	46
350	610	130	381	50
400	660	150	432	62
450	725	150	483	73
500	790	150	535	85
600	900	165	638	120
700	1000	165	746	144
800	1100	185	850	189
900	1200	185	953	221
1000	1340	200	1056	342
1200	1570	225	1263	487
1400	1780	225	1470	634
1600	1996	225	1686	702

Split puddle flanges are designed for use on the bodies, if pipes are produced by the centrifugal casting method, i.e., spigot and socket spun pipes or flanged spun pipes. They are not suitable for use on the bodies of sand cast items.

Split puddle flanges are used to provide a water bar where a pipe passes through a wall. They should not be used to provide an anchorage for the pipe.

The flange is fitted to the pipe using sheeting of lead, asbestos fibre, rubber, roofing felt or similar material to provide a packing between the flange and the pipe body.

After the flange is bolted around the pipe, the circular chamber formed on one side of the flange is caulked with lead and yarn. Lead wool or lead substitute to affect the watertight seal. The caulked side of the flange should be towards the waterlogged side of the structure.



Straight Pipe, Cast-on Flange

Nominal Dia.	Weight of Pipe Barrel		Cast -on Flange						Socket Weight	K9 pipe
DN mm	K=9 Kg/m	K12 Kg/m	PN10		PN16		PN25		T-type Kg/socket	Kg/6m
			Kg/pc	Kg/2pc	Kg/pc	Kg/2pc	Kg/pc	Kg/2pc		
80	12.2	16	2.9	5.8	2.9	5.8	2.9	5.8	3.4	77
100	15.1	17.7	3.3	6.6	3.3	6.6	3.8	7.6	4.3	95
125	18.3	22.7	4.9	9.8	4.9	9.8	5.9	11.8	5.7	116
150	22.8	28	4.9	9.8	4.9	9.8	5.9	11.8	7.1	144
200	30.6	39.7	6.8	13.6	6.8	13.6	8.7	17.4	10.3	194
250	40.2	53	9.6	19.2	9.2	18.4	13.1	26.2	14.2	255
300	50.8	67.3	12.8	25.6	12.4	24.8	18	36	18.6	323
350	63.2	83.1	14.1	28.2	17.2	34.4	26	52	23.7	403
400	75.5	100	16.3	32.6	21.9	43.8	33	66	29.3	482
450	89.3	118	18.1	36.2	26.7	53.4	43	86	38.3	575
500	104.3	138	20.8	41.6	37.0	74.0	49	98	42.8	669
600	137.3	182	30.8	61.6	57.3	114.6	72	144	59.3	882
700	173.9	231	40.5	81.0	55.6	111.2	90.3	180.6	79.1	1123
800	215.2	286	54.8	109.6	74.0	148.0	123.2	246.4	102.6	1394
900	260.2	345	64.3	128.6	88.2	176.4	148.6	297.2	129.9	1691
1000	309.3	411	81.4	162.8	122.9	245.8	200.7	401.4	161.3	2017
1200	420.1	558	120.9	241.8	185.2	370.4	284.7	569.4	237.7	2758
1400	547.2	726	147.8	295.6	215.9	431.8	368.1	736.2	385.8	3669
1600	690.3	916	206.4	412.8	308.4	616.8	402	804		
1800	850.1	1129	236.3	472.6	362.2	724.2	457.5			
2000	1026	1363	279.4	558.8	432.2	864.4	565			

Weld-on Flange (short-neck)
Screw-on Flange

Weld-on Flange (long-neck)

DN mm	PN10		PN16	
	Kg/pc	Kg/2pc	Kg/pc	Kg/2pc
80	3.5	7	3.5	7
100	4	8	4	8
125	5	10	5	10
150	6.1	12.2	6.1	12.2
200	8.5	17	8.3	16.6
250	11.8	23.6	11.4	22.8
300	15.6	31.2	15.2	30.4
350	17.6	35.2	20.7	41.4
400	20.5	41	26.1	52.2
450	24.1	48.2	32.7	65.4
500	27.6	55.2	42.8	85.6
600	38.4	76.8	64.9	129.8
700	50.2	100.4	65.3	130.6
800	66.7	133.4	85.9	171.8
900	78.7	157.4	102.6	205.2
1000	98.6	197.2	140.1	280.2
1200	114.2	228.4	208.5	417
1400	178.2	356.4	246.3	492.6
1600	244.7	489.4	346.7	693.4
1800	283.5	567	409.4	818.8
2000	336.4	672.8	489.2	978.4

DN mm	PN10		PN16		PN25	
	Kg/pc	Kg/2pc	Kg/pc	Kg/2pc	Kg/pc	Kg/2pc
80	4	8	4	8	4	8
100	5	10	5	10	5.5	11
150	8	16	8	16	9	18
200	11	22	11	22	13	26
250	15	30	15	30	19	38
300	19	38	19	38	24	48
350	26	52	29	58	38	76
400	31	62	35	70	47	94
450	36	72	43	86	59	118
500	45	90	60	120	72	144
600	59	118	85	170	100	200
700	95	190	108	216	143	286
800	100	200	117	234	167	234
900	125	250	143	286	204	408
1000	145	290	180	360	258	516
1200	180	360	235	470	335	670
1400	225	450	290	580		
1600	280	560	450	900		
1800			533	1066		

Double Flange pipe K12 (cast-on)

DN	L	Mass(Kg) PN16	DN	L	Mass(Kg) PN16	DN	L	Mass(Kg) PN16	DN	L	Mass(Kg) PN16
80	200	9	250	200	29	450	300	89	800	900	406
	250	10		250	32		400	101		1000	434
	300	11		300	35		500	113		1500	577
	350	12		350	37		600	125		2000	720
	400	12.5		400	40		700	136	900	300	280
	450	13		450	43		800	148		400	315
	500	14		500	45		900	160		500	349
	600	15.5		600	51		1000	172		600	384
	700	17		700	56		1200	195		700	418
	800	19		800	61		1300	207		800	453
100	200	10.5		900	67		300	116		900	487
	250	11		1000	72		400	130		1000	522
	300	12		200	39	500	500	143		1500	694
	350	13		250	42		600	157		2000	867
	400	14		300	45		700	171	1000	300	370
	450	15		350	49		800	185		400	411
	500	15.5		400	52		900	199		500	452
	600	18		450	56		1000	212		600	493
	700	19	300	500	59		1500	281		700	534
	800	21		600	66		2000	350		800	575
	900	23		700	72	600	300	170		900	616
	1000	25		800	79		400	188		1000	657
150	200	16		900	86		500	206		1500	863
	250	17		1000	93		600	224	1100	2000	1068
	300	19		1200	106		700	242		1000	764
	350	20	350	200	51		800	261		1500	1005
	400	21		250	56		900	279		2000	1246
	450	23		300	60	700	1000	297	1200	1000	929
	500	24		350	64		1500	388		1500	1208
	600	27		400	68		2000	479		2000	1487
	700	30		500	76		300	181	1400	1000	1158
	800	33		600	85		400	204		1500	1521
200	900	35		700	93		500	227		2000	1884
	1000	38		800	101		600	250		1000	1533
	200	22		900	110	800	700	273	1600	1500	1991
	250	24		1000	118		800	296		2000	2449
	300	26		1200	135		900	320			
	350	28	400	300	74		1000	343			
	400	30		400	84		1500	458			
	450	32		500	94		2000	574			
	500	34		600	104		300	234			
	600	38		700	114		400	263			
	700	42		800	124		500	291			



Double Flange pipe (weld-on)

DN	L	Mass(Kg)			DN	L	Mass(Kg)			DN	L	Mass(Kg)		
		PN10	PN16	PN25			PN10	PN16	PN25			PN10	PN16	PN25
80	1000	24	24	24	250	5700	260	260	268	300	4000	668	720	750
	2000	40	40	40		2000	173	173	183		5000	805	857	887
	3000	45	45	45		3000	191	191	201		5500	874	926	956
	4000	57	57	57		4000	242	242	252		5700	901	953	983
	5000	69	69	69		5000	292	292	302	700	3000	712	738	808
	5500	76	76	76		5500	318	318	328		4000	886	912	982
	5700	78	78	78		5700	328	328	338		5000	1060	1086	1156
100	2000	46	46	47	350	2000	219	225	243		5500	1147	1173	1243
	3000	56	56	57		3000	242	248	266		5700	1182	1208	1278
	4000	71	71	72		4000	305	311	329	800	3000	846	880	980
	5000	86	86	87		5000	368	374	392		4000	1061	1095	1195
	5500	94	94	95		5500	400	406	424		5000	1276	1310	1410
	5700	97	97	98		5700	413	419	437		5500	1384	1418	1518
150	2000	72	72	74	400	2000	262	270	294		5700	1427	1461	1561
	3000	85	85	87		3000	289	297	321	900	3000	1031	1067	1189
	4000	108	108	110		4000	364	372	396		4000	1291	1327	1449
	5000	130	130	132		5000	440	448	472		5000	1551	1587	1709
	5500	142	142	144		5500	478	486	510		5500	1682	1718	1840
	5700	146	146	148	450	5700	493	501	525		5700	1734	1770	1892
200	2000	102	102	106		3000	340	354	386	1000	3000	1218	1288	1444
	3000	114	114	118		4000	430	444	476		4000	1528	1598	1754
	4000	145	145	149		5000	519	533	565		5000	1837	1907	2063
	5000	175	175	179		5500	564	578	610		5500	1992	2062	2218
	5500	191	191	195		5700	582	596	628		5700	2054	2124	2280
	5700	197	197	201	500	3000	403	433	457	1200	3000	1621	1731	1931
	2000	137	137	145		4000	508	538	562		4000	2041	2151	2351
250	3000	151	151	159		5000	612	642	666		5000	2461	2571	2771
	4000	191	191	199		5500	664	694	718		5500	2671	2781	2981
	5000	231	231	239		5700	685	715	739		5700	2755	2865	3065
	5500	252	252	260	600	3000	530	582	612					

Manufacturing Process of Ductile Iron Pipe Fittings



The pipeline components foundry utilises the Lost-foam casting process (EPC) together with induction melting facilities in the production of ductile iron fittings from DN80-2000mm.

The foundry is predominantly a Lost-foam moulding system, which can ensure the dimensionally precise and good surface quality of final casting fittings. Such workmanship also allows change the mould easily to produce lots of un-unified fittings.

Moulding



The most popular use of the lost foam process places expanded foam patterns in compacted unbonded sand. Patterns are coated with refractory, dried, placed in a flask, backed up with compacted unbonded sand, and liquid metal poured onto the pattern to replace the foam. The process uses expanded polystyrene (EPS), expanded polymethyl methacrylate (EPMMMA), blended EPS and EPMMMA and copolymers of the two compounds to form patterns that are consumed as each casting is produced.



The production of fittings molded form sections is a two-stage process. The forms most commonly used are produced from either polystyrene beads containing hydrocarbon expanding agents. The beads are first pre-expanded to a target density. After stabilization, the beads are blown into a pattern cavity with air through a venturi gun.

When the pattern cavity is filled, the bead fusion cycle is begun, steam is passed from one side of the tool to the opposite side through vents, and then the steam blowing direction is reversed. The steam causes the beads to soften, to expand and fill the interparticulate voids, and bond together to form a cohesive pattern of fittings' part.



The pattern must then be cooled. This is achieved with water sprays on back of the tool. The tool is then opened, the pulls extracted, and the foam ejected.

The foam pattern expands for a short time after ejection, as air diffuses into the beads, and then begins to shrink as pentane and water vapor diffuse out. Then, drying the patterns to control the dimensional changes to achieve dimensional consistency in the casting.



The foam sections are ready for cutting and assembly after dimensional stabilization, then, the pattern sections are glued together using a hot glue.

After assembly, fittings pattern clusters are coated with a thin layer of refractory by dipping, carefully control of the coating viscosity and rheology is necessary to obtain a uniform layer on each cluster.



After application, the coating will be completely dried, then placed the dried cluster in a flask and backed up with sand using vibrating table. Compact and make the sand fills all internal pattern cavities and packs tightly around the cluster to provide support. After a fittings pattern cluster is backed up with sand, the mould is ready to be poured.

Melting



Ductile Pig iron and other raw materials are charged into the induction furnace in controlled quantities and melted. Take samples and check, till to the chemical components and temperature are qualified according to the specification. Ductile iron is produced when a measured volume of this base iron is tapped into a pouring ladle which has been precharged with a weighed amount of magnesium-bearing ferro alloy,

whilst the nodularised iron occurs the final inoculation.

Pouring

the qualified liquid metal will be transferred to the platform for pouring casting, the vacuum pump system will work before pouring in order to keep the sand inside the flask tightened. Then, the liquid metal will be poured into the pattern of castings with a suitable speed and flow rate to form the fittings. Pouring consistency is more critical with the Lost-foam process to avoid sand collapse into the casting cavity. The pouring rate must be as rapid as possible to keep the sprue full to avoid mold collapse and to provide a constant metallostatic head pressure. After pouring, the cluster is allowed to solidify in the flask prior to be shaken out.

Cleaning and Machining

after shaken out the castings will be moved to shot-blasting machines to clean the surface, then grind them to the specified standards, machining and drilling will be done after the cleaning.

Hydrostatic Pressure Test

Each fittings will be checked by hydro-test machine in order to guarantee its leak-tightness. Fill water into the fittings, apply with high pressure state in the standards for a duration time not less than 30 seconds, no leakage or sweat should appeared.

Qualified fittings shall receive a internal cement lining in the following type

- ---a) Ordinary portland cement
- ---b) Sulphate resisting cement
- ---c) High-Aluminum cement

The mortar of lining compose of cement, sand and water, The surface of the cement mortar lining after curing shall be uniformly smooth, then curing for at least 48 hours make the mortar solidified, then a zinc-rich paint and bitumen layer will be covered on the external surface of fittings. Then the fittings will be moved to the warehouse and ready for dispatch.

If request by the client, Fusion bond Epoxy or Polyurethan coating will be applied as the coating and lining.

Quality Assurance

The plant adopt the ISO9001 quality management system to control the fittings quality. All the production processes are managed as per nominated standards and specification. The Lab has the complete instruments to test and check the quality of fittings.

Mechanical properties test

A test piece will be cast together with the fittings according to batch size requirements, then cut and machined into test bars, then analysis in the Lab to check the properties of this batch.

Chemical Analysis

Analysis the samples of molten iron: both for raw material and after nodular, then perform metallographic analysis.

Dimension checking

Dimension checking will be performed during the molding process, machining process and on finished products.

