INTERPLANT STANDARD - STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR CAST IRON FITTINGS FOR PRESSURE PIPES FOR WATER AND SEWAGE** *(First Revision)*	**IPSS:1-06-004-01**
	Based on IS 1538:1993	Formerly : IPSS:1-06-004-83

0. FOREWORD

0.1 This Inter Plant Standard prepared by the Standards Committee on Pipes, Fittings, Valves and Piping Layout, IPSS 1:6 with the active participation of the representatives of all the steel plants and associated organization in the field was adopted in April 2001.

0.2 Inter Plant Standards for steel industry primarily aim at achieving rationalization and unification of parts and sub-assemblies used in steel plant equipment and accessories, and provide guidance in indenting stores or equipment for existing or new installations by individual steel plants. For exercising effective control on inventories, it is advisable to adopt procedure for installation as mentioned in this standard for the purpose of company standards of individual steel plants. It is not desirable to make deviations in technical requirements.

0.3 This IPSS Standard was first published in year 1983 and was based on IS 1538 (Parts 1 to 23):1976. Now IPSS Standard has been revised to keep in line with the revised IS 1538:1993.

1. SCOPE

1.1 This Standard covers the following categories of cast iron fittings to be used with the cast iron pipes as per IPSS:1-06-003 :

a) All socketed tees,
b) 90° double socketed bends,
c) 45° double socketed bends,
d) Collars,
e) Flanged sockets,
f) Flanged spigots, and
g) Double socketed tapers.

1.2 This standard is generally based on IS 1538:1993 `Specification for cast iron fittings for pressure pipes for water, gas and sewage (third revision)'. For convenience of reference, the clause numbers of the Indian Standard for each requirement are given in Appendix-A along with the number of the matching clauses of this standard.

1.3 If there is any subsequent revision in IS 1538, the changes will take place as per latest revision.

2. MATERIAL AND MANUFACTURE

2.1 Material and manufacture of different categories of fittings shall be according to IS 1538:1993.

3. DIMENSIONS

3.1 The main dimensions of different sizes (NB) of pipe fittings of the categories mentioned in 1 are given in Tables 1 to 7 respectively.

3.2 The main dimensions of socket for the fittings having socketed ends are given in Table-8.

4. DESIGNATION - Examples of different categories of cast iron fittings shall be as follows :

4.1 All socketed tees of nominal bore 500 mm having a branch of nominal bore 400 mm :

All Socketed Tee NB 500 x 500 > 400 IPSS:1-06-004

4.2 90° double socketed bend of nominal bore 450 mm

90° Double Socketed Bend NB 450 IPSS:1-06-004

4.3 45° double socketed bend of nominal bore 300 mm

45° Double Socketed Bend NB 300 IPSS:1-06-004

4.4 Collar of nominal bore 100 mm

Collar NB 100 IPSS:1-06-004

4.5 Flanged socket of nominal bore 800 mm

Flanged Socket NB 800 IPSS:1-06-004

4.6 Flanged spigot of nominal bore 250 mm

Flanged spigot NB 250 IPSS:1-06-004

4.7 Double socketed taper having larger nominal bore 600 mm and smaller nominal bore 500 mm

Double socketed reducer NB 600 x 500 IPSS: 1-06-004

5. TESTS

5.1 The following tests shall be performed in accordance with IS 1538:1993.

a) Mechanical test,
b) Brinell hardness test,
c) Retest, and
d) Hydraulic test.

5.2 The manufacturer shali supply a test certificate along with each supply.

6. TOLERANCES

6.1 The tolerances on external diameter of the barrel, the internal diameter, the depth of the socket for lead joints, thickness, length and mass shall be according to IS 1538:1993.

7. COATING

7.1 Coating and marking shall be in accordance with IS 1538:1993.

8. MARKING

8.1 Each fitting shall have cast stamped or indelibly painted on it appropriately the following marks :

a) Manufacturer's name, initial or identification mark,
b) The nominal diameter,
c) Mass of fitting,
d) The number of this Inter Plant Standard, and
e) The last two digits of the year of manufacture.

8.2 Marking may be done on the barrels of fittings or on the outside of the sockets.

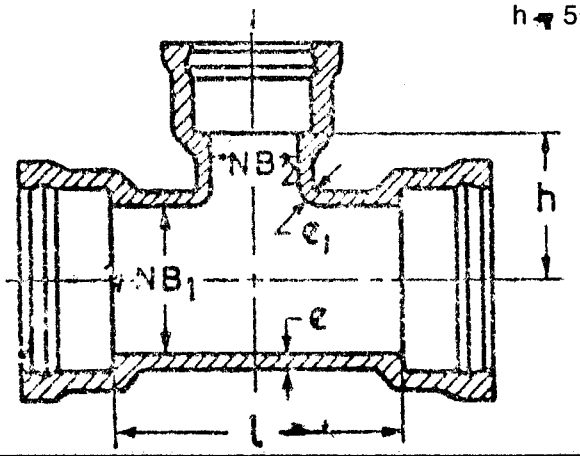
8.3 Any other mark required by the purchaser may be painted.

TABLE 1 MAIN DIMENSIONS OF ALL SOCKETED TEE

(Clause 3)

All dimensions in mm

e = 14/12 (7+0.02 NB1)
l = 100 + 1.4 NB1
h = 50 + 0.5 NB1 + 0.2 NB2



NB1	NB2	e	e_1	l	h	Mass (Approx) Kg.	NB1	NB2	e	e_1	l	h	Mass (Approx) Kg.
80	80	10.0	10.0	212	106	23		300	22.2	19.5	940	410	521
	80	10.5	10.5	240	116	28		350	22.2	21.0	940	420	531
100	100	10.5	10.5	240	120	30	600	400	22.2	22.2	940	430	543
	100	11.7	11.7	310	145	47		450	22.2	22.2	940	440	556
150	150	11.7	11.7	310	155	53		500	22.2	22.2	940	450	569
	100	12.8	12.8	380	170	69		600	22.2	22.2	940	470	602
200	150	12.8	12.8	380	180	74							
	200	12.8	12.8	380	190	81		350	24.5	21.0	1080	470	729
	150	14.0	14.0	450	205	102		400	24.5	22.5	1080	480	742
250	200	14.0	14.0	450	215	108		450	24.5	24.0	1080	490	756
	250	14.0	14.0	450	225	116		500	24.5	24.5	1080	500	769
	150	15.2	15.0	520	230	134	700	600	24.5	24.5	1080	520	795
300	200	15.2	15.2	520	240	142		700	24.5	24.5	1080	540	832
	250	15.2	15.2	520	250	150		400	26.8	22.5	1220	530	982
	300	15.2	15.2	520	260	159		450	26.8	24.0	1220	540	996
	200	16.3	16.3	590	265	182		500	26.8	25.5	1220	550	1010
350	250	16.3	16.3	590	275	190	800	600	26.8	26.8	1220	570	1040
	300	16.3	16.3	590	285	199		700	26.8	26.8	1220	590	1072
	350	16.3	16.3	590	295	209		800	26.8	26.8	1220	610	1114
	200	17.5	16.5	660	290	229		450	29.2	24.0	1360	590	1288
	250	17.5	17.5	660	300	237		500	29.2	25.5	1360	600	1302
400	300	17.5	17.5	660	310	246		600	29.2	28.5	1360	620	1337
	350	17.5	17.5	660	320	256		700	29.2	29.2	1360	640	1371
	400	17.5	17.5	660	330	268	900	800	29.2	29.2	1360	660	1405
	250	18.7	18.0	730	325	295		900	29.2	29.2	1360	680	1453
	300	18.7	18.7	730	335	304		500	31.5	25.5	1500	650	1648
450	350	18.7	18.7	730	345	314		600	31.5	28.5	1500	670	1681
	400	18.7	18.7	730	355	324		700	31.5	31.5	1500	690	1723
	450	18.7	18.7	730	365	337	1000	800	31.5	31.5	1500	710	1759
	250	19.8	18.0	800	350	356		900	31.5	31.5	1500	730	1797
	300	19.8	19.5	800	360	365		1000	31.5	31.5	1500	750	1852
500	350	19.8	19.8	800	370	375		600	32.6	28.5	1570	700	1885
	400	19.8	19.8	800	380	386		700	32.6	29.2	1570	720	1925
	450	19.8	19.8	800	390	398	1050	750	32.6	29.2	1570	725	1950
	500	19.8	19.8	800	400	413		900	32.6	31.5	1570	755	2005
								1050	32.6	32.6	1570	785	2084

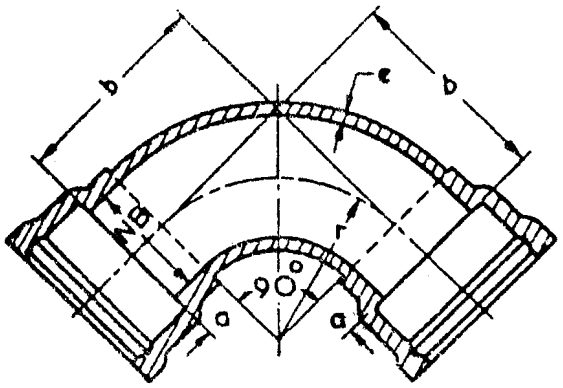
NOTE : For socket details, please see Table-8

TABLE 2 MAIN DIMENSIONS OF 90° DOUBLE SOCKETED BENDS

(Clause 3)

All dimensions in mm

e = 14/12 (7+0.02 NB)
r = 65 + 0.9NB
a = 35 + 0.1 NB
b = 100 + NB



NB	e	r	a	b	Mass (Approx) Kg	NB	e	r	a	b	Mass (Approx) Kg
80	10.0	137	43	180	18	450	18.7	470	80	550	290
100	10.5	155	45	200	24	500	19.8	515	85	600	370
150	11.7	200	50	250	43	600	22.2	605	95	700	546
200	12.8	245	55	300	67	700	24.5	695	105	800	770
250	14.0	290	60	350	98	800	26.8	785	115	900	1047
300	15.2	335	65	400	135	900	29.2	875	125	1000	1389
350	16.3	380	70	450	181	1000	31.5	965	135	1100	1780
400	17.5	425	75	500	234	1050	32.6	1010	140	1150	2012

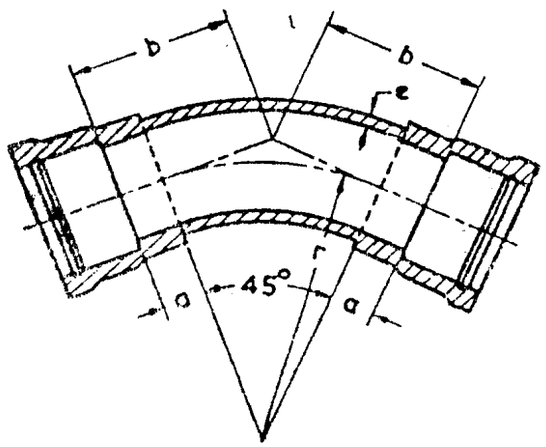
NOTE : For socket details, please see Table-8

TABLE 3 MAIN DIMENSIONS OF 45° DOUBLE SOCKETED BENDS

(Clause 3)

All dimensions in mm

e = 14/12 (7+0.02 NB)
r = 200 + NB
a = 35 + 0.1 NB
b = 117.8 + 0.514 NB



NB	e	r	a	b	Mass (Approx) Kg	NB	e	r	a	b	Mass (Approx) Kg
80	10.0	280	43	159	18	450	18.7	650	80	349	248
100	10.5	300	45	169	24	500	19.8	700	85	375	310
150	11.7	350	50	195	41	600	22.2	800	95	426	448
200	12.8	400	55	221	62	700	24.5	900	105	478	619
250	14.0	450	60	246	89	800	26.8	1000	115	529	827
300	15.2	500	65	272	121	900	29.2	1100	125	580	1077
350	16.3	550	70	298	159	1000	31.5	1200	135	632	1368
400	17.5	600	75	324	202	1050	32.6	1250	140	660	1540

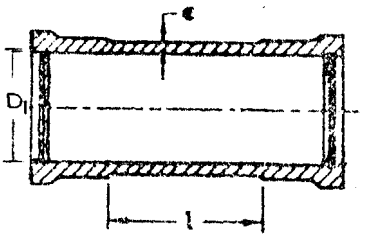
NOTE : For socket details, please see Table-8

TABLE 4 MAIN DIMENSIONS OF COLLARS

(Clause 3)

All dimensions in mm

e = 14/12 (7+0.02 D1)
l = 150 + 0.1 NB



NB	D1	e	l	Mass (Approx) Kg	NB	D1	e	l	Mass (Approx) Kg
80	116	10.9	158	14	450	501	19.9	195	133
100	137	11.4	160	17	500	553	21.1	200	159
150	189	12.6	165	28	600	657	23.5	210	216
200	241	13.8	170	40	700	760	25.9	220	283
250	294	15.0	175	55	800	865	28.4	230	360
300	346	16.2	180	71	900	968	30.8	240	448
350	398	17.5	185	90	1000	1072	33.2	250	547
400	449	18.6	190	110	1050	1143	34.8	255	601

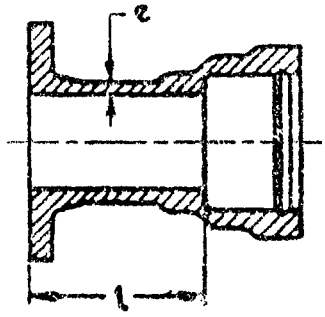
NOTE : For socket details, please see Table-8

TABLE 5 MAIN DIMENSIONS OF FLANGED SOCKETS

(Clause 3)

All dimensions in mm

e = 14/12 (7+0.02 NB)



NB	e	l	Mass (Approx) Kg	NB	e	l	Mass (Approx) Kg
80	10.0	150	13	450	18.7	300	142
100	10.5	150	16	500	19.8	300	173
150	11.7	150	26	600	22.2	300	234
200	12.8	150	37	700	24.5	300	306
250	14.0	300	62	800	26.8	300	391
300	15.2	300	79	900	29.2	300	476
350	16.3	300	100	1000	31.5	300	580
400	17.5	300	123	1050	32.6	500	780

NOTE: For socket details, please see Table-8 and

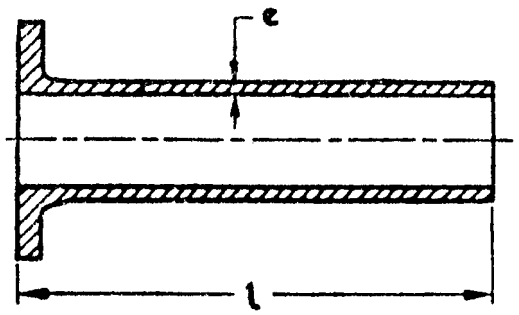
For flanged details, please see Table-1 of IS 1535:1993

TABLE 6 MAIN DIMENSIONS OF FLANGED SPIGOTS

(Clause 3)

All dimensions in mm

e = 14/12 (7+0.02 NB)



NB	e	l	Mass (Approx) Kg	NB	e	l	Mass (Approx) Kg
80	10.0	400	12	450	18.7	500	123
100	10.5	400	14	500	19.8	500	146
150	11.7	400	23	600	22.2	600	227
200	12.8	500	39	700	24.5	600	295
250	14.0	500	53	800	26.8	600	375
300	15.2	500	68	900	29.2	600	455
350	16.3	500	85	1000	31.5	600	552
400	17.5	500	104	1050	32.6	800	745

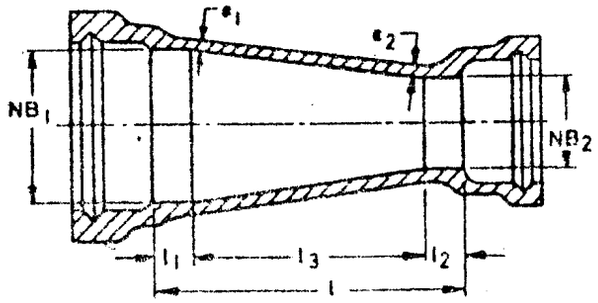
NOTE: For flanged details, please see Table-1 of IS 1535:1993

TABLE 7 MAIN DIMENSIONS OF DOUBLE SOCKETED TAPPERS

(Clause 3)

All dimensions in mm

e_1 = 14/12 (7+0.02 NB1)
e_2 = 14/12 (7+0.02 NB2)
l_1 = 35 + 0.1 NB1
l_2 = 35 + 0.1 NB2



Large dia			Small dia				l	Large dia			Small dia				l
NB1	e_1	l_1	NB2	e_2	l_2	l_3		NB1	e_1	l_1	NB2	e_2	l_2	l_3	
100	10.5	45	80	10.0	43	112	200	500	19.8	85	400	17.5	75	440	600
150	11.7	50	80	10.0	43	307	400	500	19.8	85	450	18.5	80	435	600
150	11.7	50	100	10.5	45	305	400	600	22.2	95	450	18.7	80	425	600
200	12.8	55	100	10.5	45	300	400	600	22.2	95	500	19.8	85	420	600
200	12.8	55	150	11.7	50	295	400	700	24.5	105	500	19.8	85	410	600
250	14.0	60	150	11.7	50	290	400	700	24.5	105	600	22.2	95	400	600
250	14.0	60	200	12.8	55	285	400	800	26.8	115	600	22.2	95	390	600
300	15.2	65	200	12.8	55	280	400	800	26.8	115	700	24.5	105	380	600
300	15.2	65	250	14.0	60	275	400	900	29.2	125	700	24.5	105	370	600
350	16.3	70	250	14.0	60	470	600	900	29.2	125	800	26.8	115	360	600
350	16.3	70	300	15.2	65	465	600	1000	31.5	135	800	26.8	115	350	600
400	17.5	75	300	15.2	65	460	600	1000	31.5	135	900	29.2	125	340	600
400	17.5	75	350	16.3	70	455	600	1050	32.6	140	800	26.8	115	345	600
450	18.7	80	350	16.3	70	450	600	1050	32.6	140	1000	31.5	135	325	600
450	18.7	80	400	17.5	75	445	600								

NOTE: For socket details, please see Table-8

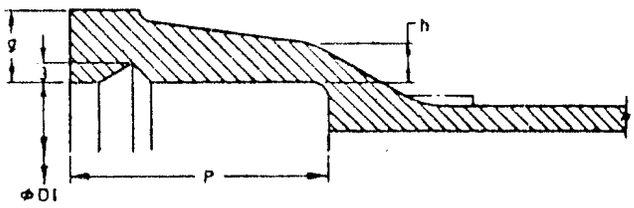
TABLE 8 MAIN DIMENSIONS OF SOCKET ENDS

(Clause 3)

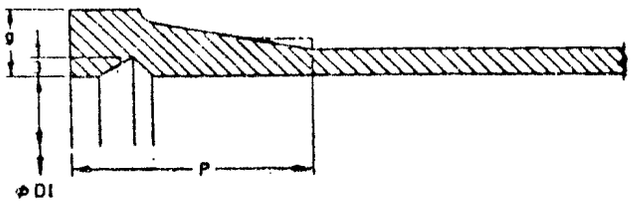
All dimensions in mm

g = 20 + 0.035 NB
h = 10 + 0.025 NB

Fittings
(excluding collars)



Collar



NB	D1	P	g (Min)	H (Min)
80	116	84	23	12
100	137	88	23.5	12.5
150	189	94	25.5	14
200	241	100	27	15
250	294	103	29	16.5
300	346	105	30.5	17.5
350	398	107	32.5	19
400	449	110	34	20
450	501	112	36	21
500	553	115	37.5	22.5
600	657	120	41	25
700	760	122	44.5	27.5
800	865	125	48	30
900	968	128	51.5	32.5
1000	1072	130	55	35
1050	1143	130	56.75	36.25

APPENDIX – A

(Clause 1.1)

COMPARATIVE STUDY OF IPSS:1-06-004-01 `SPECIFICATION FOR CAST IRON FITTINGS FOR PRESSURE PIPES FOR WATER AND SEWAGE'

AND

IS 1538:1993 ``SPECIFICATION FOR CAST IRON FITTINGS FOR PRESSURE PIPES FOR WATER AND SEWAGE (THIRD REVISION)'

Requirements		Clause reference in IPSS	Clause reference in ISs
Requirements which identical between IPSS and ISs	Material and manufacture Tests Tolerances Marking Coating	2.0 5.1 6 8 7	3 & 4 5, 6, 7 & 8 10 13 12
Requirements selected for steel plant use out of several choices	Dimensions	3 Table-1 Table-2 Table-3 Table-4 Table-5 Table-6 Table-7 Table-8	9 14 10 11 9 7 8 17 3
Supplementary requirement not contradicting ISs	Designation	4	—
Deviations from ISs	Nil	—	—