TSP®

MALLEABLE IRON PIPE FITTINGS

CERTIFIED ISO 9001:2008 COMPANY

LOW-LEAD UPC C®

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MI - Fittings
41VS

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GENERAL INFORMATION

1. PRODUCT STANDARD AND APPLICATION RANGE

Galvanized and Black Malleable Iron Pipe Standard Specification :

Class : 150 LBS and 300 LBS

STANDARD	
Design	ANSI/ASME B16.3 ANSI/ASME B16.14 ANSI/ASME B16.39
Material	ASTM A 197
Threads	ANSI/ASME B1.20.1
Zinc Coating	ASTM A 153
Reinforcement	Banded

Mechanical Properties of Blackheart Malleable Cast Iron

Tensile Strength (min)	Elongation (min)	Yield Strength
275 Mpa	5 %	200 Mpa

Pressure – Temperature Ratings For Class 150

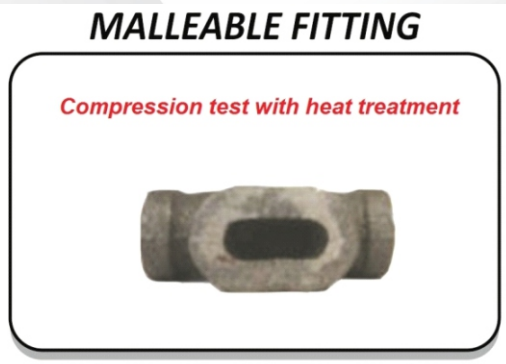
Temperature (° C)	**Pressure (Bar)**
-29 to 66	20.7
100	17.5
125	15.2
150	12.8
175	10.5

Pressure – Temperature Ratings For Class 300

Temperature (ºC)	Pressure (Bar)		
	Sizes : 1/4 - 1”	Sizes : 11/4 - 2	Sizes : 21/2 – 3
-29 to 66	137.9	103.4	69.0
100	119.6	90.5	61.5
125	106.4	81.1	56.1
150	93.1	71.8	50.7
175	79.9	62.5	45.2
200	66.6	53.1	39.8
225	53.4	43.8	34.3
250	40.1	34.5	28.9
275	26.9	25.2	23.4
288	20.7	20.7	20.7

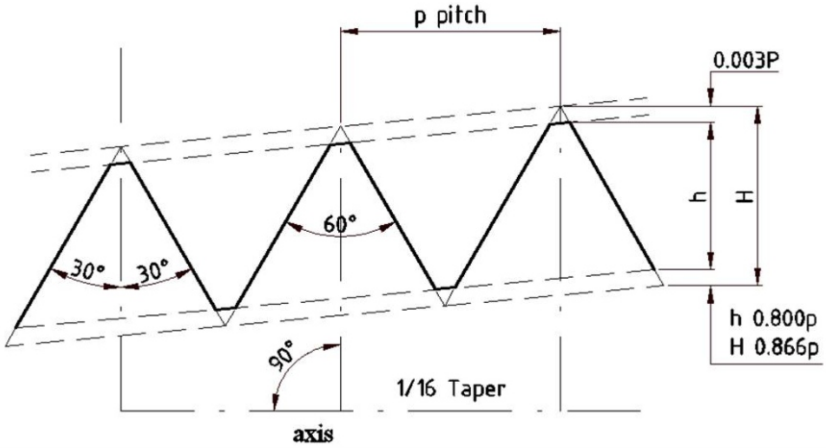
Coating :

Galvanized	Hot Dip Zinc Coating (min) 0.0034 inch / 80 µm/ 571 gr / m².



2.BASIC DIMENSIONS FOR AMERICAN STANDARD THREADS

This information is selected from the ASME B1.20.1, table 7



H = 0.866 P   h = 0.800 P

Taper Thread (NPT)

Dimension, in inch

Designation of threads size	Outside Diameter of Pipe	Number of thread in inch	Pitch	Height (depth) of thread	Hand tight Engagement		Effective Thread (length)	Tolerance on position of gauge plane	
					Length	Diameter		On External thread	On Internal thread
Inch	D		P	h				Turns of thread	
1/8	0.405	27.0	0.03704	0.02963	0.1615	0.37360	0.2639	± 1	± 1
¼	0.540	18.0	0.05556	0.04444	0.2278	0.49163	0.4018	± 1	± 1
3/8	0.675	18.0	0.05556	0.04444	0.2400	0.62701	0.4078	± 1	± 1
½	0.840	14.0	0.07143	0.05714	0.3200	0.77843	0.5337	± 1	± 1
¾	1.050	14.0	0.07143	0.05714	0.3390	0.98887	0.5457	± 1	± 1
1	1.315	11.5	0.08696	0.06957	0.4000	1.23863	0.6828	± 1	± 1
11/4	1.660	11.5	0.08696	0.06957	0.4200	1.58338	0.7068	± 1	± 1
11/2	1.900	11.5	0.08696	0.06957	0.4200	1.82234	0.7235	± 1	± 1
2	2.375	11.5	0.08696	0.06957	0.4360	2.29627	0.7565	± 1	± 1
21/2	2.875	8.0	0.12500	0.10000	0.6820	2.76216	1.1375	± 1	± 1
3	3.500	8.0	0.12500	0.10000	0.7660	3.38850	1.2000	± 1	± 1
31/2	4.000	8.0	0.12500	0.10000	0.8210	3.88881	1.2500	± 1	± 1
4	4.500	8.0	0.12500	0.10000	0.8440	4.38712	1.3000	± 1	± 1
5	5.563	8.0	0.12500	0.10000	0.9370	5.44929	1.4063	± 1	± 1
6	8.625	8.0	0.12500	0.10000	0.9580	6.50597	1.5125	± 1	± 1

MALLEABLE IRON PIPE FITTINGS


FIG NO. 3
(Elbows 90)
Page. 5


FIG NO. 4
(Red Elbows 90)
Page. 6


FIG NO. 6
(Elbows 45)
Page. 7


FIG NO. 7B
(Street Elbows 90)
Page. 8


FIG NO. -
(Street Elbows 45)
Page. 9


FIG NO. 13
(Tees)
Page. 9 - 10


FIG NO. 14
(Red Tees)
Page. 11-13


FIG NO. 19A
(Crosses)
Page. 14


FIG NO. 21A
(Caps)
Page. 14 -15


FIG NO. 24B
(Couplings)
Page. 16


FIG NO. 26
(Red Couplings)
Page. 17


FIG NO. 29
(Locknuts)
Page. 18


FIG NO. 32
(Nipples)
Page. 18


FIG NO. 30
(Bushings)
Page. 19 - 20


FIG NO. 31A
(Square Head Plugs)
Page. 21

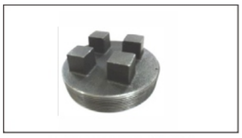


FIG NO. 31B
(Slotted Head Plugs)
Page. 21

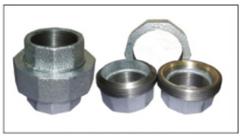


FIG NO.35B
(Union Brass)
Page. 22


FIG NO. 35C
(Union Non Brass)
Page. 23

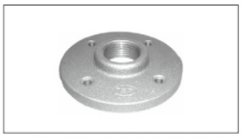
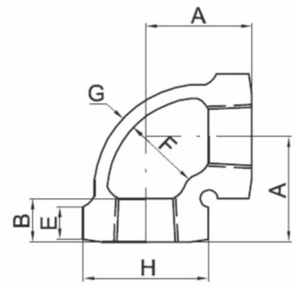

FLOOR FLANGE

Fig No. 3 - ELBOWS 90^0 BANDED (BL 90)



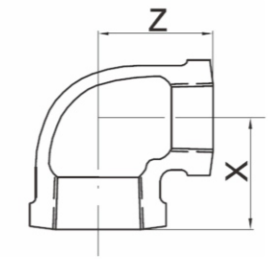
Dimension of Class 150 - (in Inch)

SIZE	A	B (min)	E (min)	F		G	H (min)
				Min	**Max**		
1/4"	0.81	0.32	0,21	0,54	0,58	0,09	0,84
3/8"	0.95	0.36	0,23	0,67	0,72	0,10	1,01
1/2"	1.12	0.43	0,25	0,84	0,90	0,10	1,20
3/4"	1.31	0.50	0,27	1,05	1,11	0,12	1,46
1"	1.50	0.58	0,30	1,31	1,38	0,13	1,77
1¼"	1.75	0.67	0,34	1,66	1,73	0,14	2,15
1½"	1.94	0.70	0,37	1,90	1,97	0,15	2,43
2"	2.25	0,75	0,42	2,37	2,44	0,17	2,96
2½"	2.70	0,92	0,48	2,87	2,97	0,21	3,59
3"	3.08	0,98	0,55	3,50	3,60	0,23	4,28
3½"	3.42	1,03	0,60	4,00	4,10	0,25	4,84
4"	3.79	1,08	0,66	4,50	4,60	0,26	5,40
5"	4.50	1,18	0,78	5,56	5,56	0,30	6,58
6"	5.13	1,28	0,90	6,62	6,72	0,34	7,77

Dimension of Class 300 - (in Inch)

SIZE	A	B (min)	E (min)	F		G	H (min)
				Min	**Max**		
1/2"	1,25	0,57	0,50	0,84	0,90	0,16	1,34
3/4"	1,44	0,64	0,56	1,05	1,11	0,18	1,63
1"	1,63	0,75	0,62	1,31	1,38	0,20	1,95
1¼"	1,94	0,84	0,69	1,66	1,73	0,22	2,39
1 ½"	2,13	0,87	0,75	1,90	1,97	0,24	2,68
2"	2,50	1,00	0,84	2,37	2,44	0,26	3,28

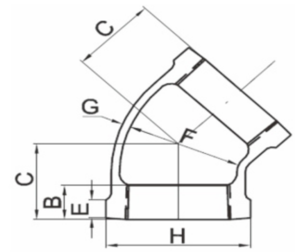
Fig No. 4 - REDUCING ELBOWS 90^0 BANDED (BRL)



Dimension of Class 150 - (in Inch)		
SIZE	**X**	**Z**
1/4 X 1/8"	0,74	0,76
3/8 X 1/4"	0,88	0,90
3/8 X 1/8"	0,81	0,85
1/2 X 3/8"	1,04	1,03
1/2 X 1/4"	0,97	0,98
3/4 X 1/2"	1,20	1,22
3/4 X 3/8"	1,12	1,13
3/4 X 1/4"	1,05	1,08
1 X 3/4"	1,37	1,45
1 X 1/2"	1,26	1,36
1 X 3/8"	1,18	1,27
1¼ X 1"	1,58	1,67
1¼X 3/4"	1,45	1,62
1¼X 1/2"	1,34	1,53
1½ X 1¼"	1,82	1,88
1½ X 1"	1,65	1,80
1½ X 3/4"	1,52	1,75
2 X 1½"	2,02	2,16
2 X 1¼"	1,90	2,10
2 X 1"	1,73	2,02
2 X 3/4"	1,60	1,97
2½ X 2"	2,39	2,60
2½ X 1½"	2,16	2,51
3 X 2½"	2,83	2,99
3 X 2"	2,52	2,89
4 X 3"	3,30	3,60

Note : For dimensions not given, see the dimensions table of Elbow

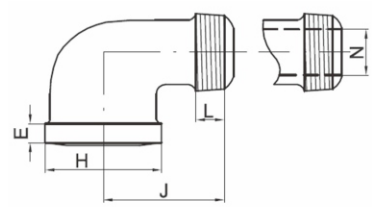
Fig No. 6 - ELBOWS 45^0 BANDED (BL 45)



Dimension of Class 150 - (in Inch)							
SIZE	**C**	**B** (min)	**E** (min)	**F**		**G**	**H** (min)
				Min	**Max**		
1/4"	0,73	0.32	0,21	0,54	0,58	0,09	0,84
3/8"	0,80	0.36	0,23	0,67	0,72	0,10	1,01
1/2"	0,88	0.43	0,25	0,84	0,90	0,10	1,20
3/4"	0,98	0.50	0,27	1,05	1,11	0,12	1,46
1"	1,12	0.58	0,30	1,31	1,38	0,13	1,77
1¼ "	1,29	0.67	0,34	1,66	1,73	0,14	2,15
1½"	1,43	0.70	0,37	1,90	1,97	0,15	2,43
2"	1,68	0,75	0,42	2,37	2,44	0,17	2,96
2½"	1,95	0,92	0,48	2,87	2,97	0,21	3,59
3"	2,17	0,98	0,55	3,50	3,60	0,23	4,28
3½"	2,39	1,03	0,60	4,00	4,10	0,25	4,84
4"	2,61	1,08	0,66	4,50	4,60	0,26	5,40
5"	3,05	1,18	0,78	5,56	5,66	0,30	6,58
6"	3,46	1,28	0,90	6,62	6,72	0,34	7,77

Dimension of Class 300 - (in Inch)							
SIZE	**C**	**B** (min)	**E** (min)	**F**		**G**	**H** (min)
				Min	**Max**		
1/2"	1,00	0,57	0,50	0,84	0,90	0,16	1,34
3/4"	1,13	0,64	0,56	1,05	1,11	0,18	1,63
1"	1,31	0,75	0,62	1,31	1,38	0,20	1,95
1¼"	1,50	0,84	0,69	1,66	1,73	0,22	2,39
1½"	1,69	0,87	0,75	1,90	1,97	0,24	2,68
2"	2,00	1,00	0,84	2,37	2,44	0,26	3,28

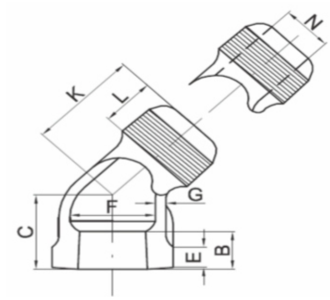
Fig No. 7B - STREET ELBOWS 90^0 BANDED (BSL 90)



Dimension of Class 150 - (in Inch)						
SIZE	**A**	**E** (min)	**H** (min)	**J**	**L** (min)	**N**
1/8"	0,69	0,20	0,69	1,00	0,26	0,20
1/4"	0.81	0,21	0,84	1,19	0,40	0,26
3/8"	0.95	0,23	1,01	1,44	0,41	0,37
1/2"	1.12	0,25	1,20	1,63	0,53	0,51
3/4"	1.31	0,27	1,46	1,89	0,55	0,69
1"	1.50	0,30	1,77	2,14	0,68	0,91
1¼"	1.75	0,34	2,15	2,45	0,71	1,19
1½"	1.94	0,37	2,43	2,69	0,72	1,39
2"	2.25	0,42	2,96	3,26	0,76	1,79
2½"	2.70	0,48	3,59	3,86	1,14	2,20
1"	1.50	0,30	1,77	2,14	0,68	0,91
1¼"	1.75	0,34	2,15	2,45	0,71	1,19
1½"	1.94	0,37	2,43	2,69	0,72	1,39
2"	2.25	0,42	2,96	3,26	0,76	1,79

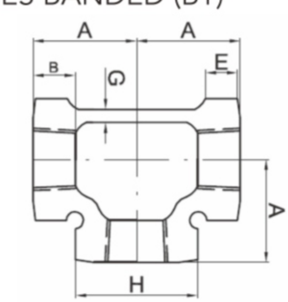
Dimension of Class 300 - (in Inch)					
SIZE	**A**	**H** (min)	**J**	**L** (min)	**N**
1/2"	1.25	1.34	2.00	0.53	0.49
3/4"	1.44	1.63	2.19	0.55	0.67
1"	1.63	1.95	2.56	0.68	0.88
1 ¼"	1.94	2.39	2.88	0.71	1.16
1½"	2.13	2.68	3.13	0.72	1.35
2"	2.50	3.28	3.69	0.76	1.75

STREET ELBOWS 45⁰ BANDED (BSL 45)



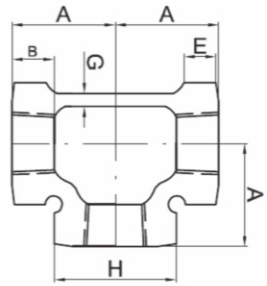
Dimension of Class 150 - (in Inch)									
SIZE	**C**	**B** (min)	**E** (min)	**F**		**G**	**K**	**L** (min)	**N**
				Min	**Max**				
1/4"	0.73	0.32	0.21	0.54	0.58	0.09	0.94	0.40	0.26
3/8"	0.80	0.36	0.23	0.67	0.72	0.10	1.03	0.41	0.37
1/2"	0.88	0.43	0.25	0.84	0.90	0.10	1.15	0.53	0.51
3/4"	0.98	0.50	0.27	1.05	1.11	0.12	1.29	0.55	0.69
1"	1.12	0.58	0.30	1.31	1.38	0.13	1.47	0.68	0.91
1¼"	1.29	0.67	0.34	1.66	1.73	0.14	1.71	0.71	1.19
1½"	1.43	0.70	0.37	1.90	1.97	0.15	1.88	0.72	1.39
2"	1.68	0.75	0.42	2.37	2.44	0.17	2.22	0.76	1.79
2½"	1.95	0.92	0.48	2.87	2.97	0.21	2.57	1.14	2.20
3"	2.17	0.98	0.55	3.50	3.60	0.23	3.00	1.20	2.78
4"	2.61	1.08	0.66	4.50	4.60	0.26	3.70	1.30	3.70
5"	-	1.18	0.78	5.56	5.66	0.30	-	1.41	4.69
6"	-	1.28	0.90	6.62	0.34	0.34	-	1.51	5.67

Fig No. 13 - TEES BANDED (BT)



Dimension of Class 150 - (in Inch)					
SIZE	**A**	**B** (min)	**E** (min)	**G**	**H** (min)
1/8"	0.69	0.25	0.20	0.09	0.69
1/4"	0.81	0.32	0.21	0.09	0.84
3/8"	0.95	0.36	0.23	0.10	1.01
1/2"	1.12	0.43	0.25	0.10	1.20
3/4"	1.31	0.50	0.27	0.12	1.46
1"	1.50	0.58	0.30	0.13	1.77

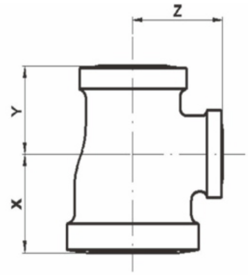
Fig No. 13 - TEES BANDED (BT)



Dimension of Class 150 - (in Inch)					
SIZE	**A**	**B** (min)	**E** (min)	**G**	**H** (min)
1¼"	1.75	0.67	0.34	0.14	2.15
1½"	1.94	0.70	0.37	0.15	2.43
2"	2.25	0.75	0.42	0.17	2.96
2½"	2.70	0.92	0.48	0.21	3.59
3"	3.08	0.98	0.55	0.23	4.28
3½"	3.42	1.03	0.60	0.25	4.84
4"	3.79	1.08	0.66	0.26	5.40
5"	4.50	1.18	0.78	0.30	6.58
6"	5.13	1.28	0.90	0.34	7.77

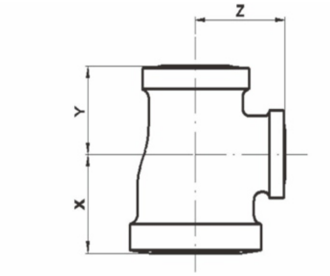
Dimension of Class 300 - (in Inch)					
SIZE	**A**	**B** (min)	**E** (min)	**G**	**H** (min)
1/2"	1.25	0.57	0.50	0.16	1.34
3/4"	1.44	0.64	0.56	0.18	1.63
1"	1.63	0.75	0.62	0.20	1.95
1¼"	1.94	0.84	0.69	0.22	2.39
1½"	2.13	0.87	0.75	0.24	2.68
2"	2.50	1.00	0.84	0.26	3.28

Fig No. 14 - REDUCING TEES BANDED (BRT)



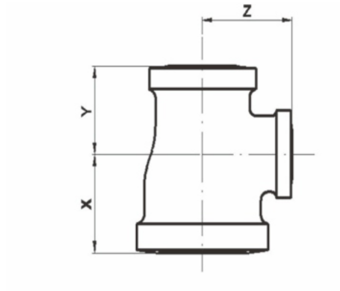
Dimension of Class 150 - (in Inch)							
SIZE	**X**	**Y**	**Z**	**SIZE**	**X**	**Y**	**Z**
1/4 X 1/4 X 1/8"	0.74	0.74	0.76	1 X 1 X 1/2"	1.26	1.26	1.36
1/8 X 1/8 X 1/4"	0.76	0.76	0.74	1 X 1 X 3/8"	1.18	1.18	1.27
3/8 X 3/8 X 1/4"	0.88	0.88	0.90	1 X 1 X 1/4"	1.11	1.11	1.22
3/8 X 3/8 X 1/8 "	0.81	0.81	0.85	1 X 3/4 X 1"	1.50	1.45	1.50
3/8X 1/4 X 3/8"	0.95	0.90	0.95	1 X 3/4 X 3/4"	1.37	1.31	1.45
3/8 X 1/4 X 1/4"	0.88	0.81	0.90	1 X 3/4 X 1/2"	1.26	1.20	1.36
1/4 X 1/4 X 3/8"	0.90	0.90	0.88	1 X 1/2 X 1"	1.50	1.36	1.50
1/2 X 1/2 X 3/8"	1.04	1.04	1.03	1 X 1/2 X 3/4"	1.37	1.22	1.45
1/2 X 1/2 X 1/4"	0.97	0.97	0.98	1 X 1/2 X 1/2"	1.26	1.12	1.36
1/2 X 3/8 X 1/2"	1.12	1.03	1.12	3/4 X 3/4 X 1"	1.45	1.45	1.37
1/2 X 3/8 X 3/8"	1.04	0.95	1.03	1/2 X 1/2 X 1"	1.36	1.36	1.26
1/2 X 1/4 X 1/2"	1.12	0.98	1.12	1¼ X 1¼X 1"	1.58	1.58	1.67
3/8 X 3/8 X 1/2"	1.03	1.03	1.04	1¼X 1¼ X ¾"	1.45	1.45	1.62
3/4 X 3/4 X 1/2"	1.20	1.20	1.22	1¼ X 1¼ X ½"	1.34	1.34	1.53
3/4 X 3/4 X 3/8"	1.12	1.12	1.13	1¼ X 1¼ X 3/8"	1.26	1.26	1.44
3/4 X 3/4 X 1/4"	1.05	1.05	1.08	1¼ X 1 X 1¼"	1.75	1.67	1.75
3/4 X 1/2 X 3/4"	1.31	1.22	1.31	1¼ X 1 X 1"	1.58	1.50	1.67
3/4 X 1/2 X 1/2"	1.20	1.12	1.22	1¼ X 1 X 3/4"	1.45	1.37	1.62
3/4 X 1/2 X 3/8"	1.12	1.04	1.13	1¼ X 1 X 1/2"	1.34	1.26	1.53
3/4 X 3/8 X 3/4"	1.31	1.13	1.31	1¼ X 3/4 X 1¼"	1.75	1.62	1.75
3/4 X 3/8 X 3/8"	1.12	0.95	1.13	1¼ X ¾X 1"	1.58	1.45	1.67
3/4 X 1/4 X 3/4"	1.31	1.08	1.31	1¼X 3/4 X 3/4"	1.45	1.31	1.62
1/2 X 1/2 X 3/4"	1.22	1.22	1.20	1¼ X 1/2 X 1¼"	1.75	1.53	1.75
1 X 1 X 3/4"	1.37	1.37	1.45	1¼ X 1/2 X 1"	1.58	1.36	1.67

Fig No. 14 - REDUCING TEES BANDED (BRT)



Dimension of Class 150 - (in Inch)							
SIZE	**X**	**Y**	**Z**	**SIZE**	**X**	**Y**	**Z**
1 X 1 X 1¼"	1.67	1.67	1.58	2 X 1½ X 1½"	2.02	1.94	2.16
3/4 X 3/4 X 1 ¼"	1.62	1.62	1.45	2 X 1½ X 1¼"	1.90	1.82	2.10
1 ½ X 1 ½ X 1¾"	1.82	1.82	1.88	2 X 1½ X 1"	1.73	1.65	2.02
1½ X 1½ X 1"	1.65	1.65	1.80	2 X 1¼ X 2"	2.25	2.10	2.25
1½ X 1½ X 3/4"	1.52	1.52	1.75	2 X 1¼ X 1½"	2.02	1.88	2.16
1½ X 1½ X 1/2"	1.41	1.41	1.66	2 X 1¼ X 1¼"	1.90	1.75	2.10
1½ X 1¼X 1½"	1.94	1.88	1.94	2 X 1 X 2"	2.25	2.02	2.25
1½ X 1¼ X 1¼"	1.82	1.75	1.88	2 X 1 X 1½"	2.02	1.80	2.16
1½ X 1¼ X 1"	1.65	1.58	1.80	2 X 3/4 X 2"	2.25	1.97	2.25
1½ X 1¼ X ¾"	1.52	1.45	1.75	2 X 1/2 X 2"	2.25	1.88	2.25
1½ X 1¼ X ½"	1.41	1.34	1.66	1½ X 1½ X 2"	2.16	2.16	2.02
1½ X 1 X 1½"	1.94	1.80	1.94	1¼ X 1¼X 2"	2.10	2.10	1.90
1½ X 1 X 1¼"	1.82	1.67	1.88	1 X 1 X 2"	2.02	2.02	1.73
1½ X 1 X 1"	1.65	1.50	1.80	2½X 2½ X 2"	2.39	2.39	2.60
1½ X ¾X 1½"	1.94	1.75	1.94	2½X 2½X1½"	2.16	2.16	2.51
1½ X ½ X 1½"	1.94	1.66	1.94	2½X2½X 1¼"	2.04	2.04	2.45
1¼ X 1¼X 1½"	1.88	1.88	1.82	2½X 2½ X 1"	1.87	1.87	2.37
1 X 1 X 1½"	1.80	1.80	1.65	2½X2½ X3/4"	1.74	1.74	2.32
2 X 2 X 1½"	2.02	2.02	2.16	2½X2X 2½"	2.70	2.60	2.70
2 X 2 X 1¼"	1.90	1.90	2.10	2½X 2 X 2"	2.39	2.25	2.60
2 X 2 X 1"	1.73	1.73	2.02	2½X 1½ X 2½"	2.70	2.51	2.70
2 X 2 X 3/4"	1.60	1.60	1.97	2½X 1½ X 2"	2.39	2.16	2.60
2 X 2 X 1/2"	1.49	1.49	1.88	2 X 2 X 2½"	2.60	2.60	2.39
2 X 1½ X 2"	2.25	2.16	2.25	3 X 3 X 2½"	2.83	2.83	2.99

Fig No. 14 - REDUCING TEES BANDED (BRT)

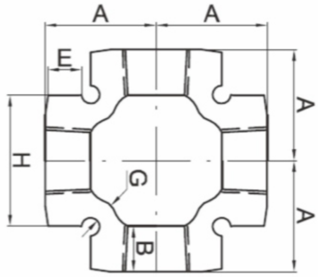


Dimension of Class 150 - (in Inch)							
SIZE	**X**	**Y**	**Z**	**SIZE**	**X**	**Y**	**Z**
3 X 3 X 2"	2.52	2.52	2.89	4 X 4 X 3"	3.30	3.30	3.60
3 X 3 X 1 ½"	2.29	2.29	2.80	4 X 4 X 2½"	3.05	3.05	3.51
3 X 3 X 1¼"	2.17	2.17	2.74	4 X 4 X 2"	2.74	2.74	3.41
3 X 3 X 1"	2.00	2.00	2.66	4 X 4 X1½"	2.51	2.51	3.32
3 X 3 X 3/4"	1.87	1.87	2.61	4 X 3 X 4"	3.79	3.60	3.79
3 X 2½ X 3"	3.08	2.99	3.08	3 X 3 X 4"	3.60	3.60	3.30
3 X2½ X2½"	2.83	2.70	2.99				
3 X2 ½ X 2"	2.52	2.39	2.89				
3 X 2 X 3"	3.08	2.89	3.08				
3 X 2 X2"	2.52	2.25	2.89				
2½ X2½ X3"	2.99	2.99	2.83				

Dimension of Class 300 - (in Inch)							
SIZE	**X**	**Y**	**Z**	**SIZE**	**X**	**Y**	**Z**
3/4 X 3/4 X 1/2"	1.31	1.31	1.38	1 ½ X 1 ½ X 1"	1.81	1.81	2.00
1 X 1 X 1/2"	1.44	1.44	1.50	1 ½ X 1 ½ X 1¼"	2.00	2.00	2.06
1 X 1 X 3/4"	1.50	1.50	1.56	2 X 2 X 1 ½"	1.75	1.75	2.06
1 ¼ X 1 ¼ X 1/2"	1.50	1.50	1.69	2 X 2 X 3/4"	1.81	1.81	2.13
1 ¼ X 1 ¼ X 3/4"	1.63	1.63	1.75	2 X 2 X 1"	2.00	2.00	2.25
1 ¼ X 1¼ X 1"	1.75	1.75	1.81	2 X 2 X 1 ¼"	2.13	2.13	2.31
1 ½ X 1 ½ X 1/2"	1.63	1.63	1.81	2 X 2 X 1 ½"	2.25	2.25	2.38
1 ½ X 1 ½ X 3/4"	1.69	1.69	1.88				

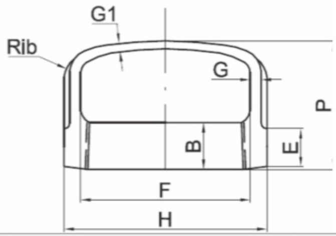
Note : For dimensions not given, see the dimensions table of Tees

Fig No. 19A - CROSSES (BCR)



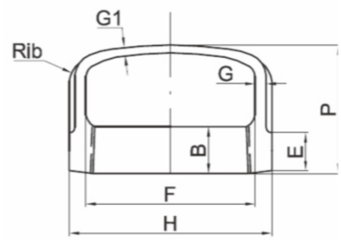
Dimension of Class 150 - (in Inch)					
SIZE	A	B (min)	E (min)	G	H (min)
1/4"	0.81	0.32	0.21	0.09	0.84
3/8"	0.95	0.36	0.23	0.10	1.01
1/2"	1.12	0.43	0.25	0.10	1.20
3/4"	1.31	0.50	0.27	0.12	1.46
1"	1.50	0.58	0.30	0.13	1.77
1¼"	1.75	0.67	0.34	0.14	2.15
1½"	1.94	0.70	0.37	0.15	2.43
2"	2.25	0.75	0.42	0.17	2.96
2½"	2.70	0.92	0.48	0.21	3.59
3"	3.08	0.98	0.55	0.23	4.28
3½"	3.42	1.03	0.60	0.25	4.84
4"	3.79	1.08	0.66	0.26	5.40
5"	4.50	1.18	0.78	0.30	6.58
6"	5.13	1.28	0.90	0.34	7.77

Fig No. 21A - ROUND CAPS BANDED (RC)



Dimension of Class 150 - (in Inch)									
SIZE	B (min)	E (min)	F		G	H (min)	P (min)	Ribs	G1
			Min	Max					
1/4"	0.32	0.21	0.54	0.58	0.09	0.84	0.63	-	-
3/8"	0.36	0.23	0.67	0.72	0.10	1.01	0.74	-	-
1/2"	0.43	0.25	0.84	0.90	0.10	1.20	0.87	0.10	-
3/4"	0.50	0.27	1.05	1.11	0.12	1.46	0.97	0.12	0.13
1"	0.58	0.30	1.31	1.38	0.13	1.77	1.16	0.13	0.15

Fig No. 21A - ROUND CAPS BANDED (RC)



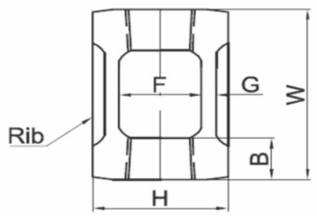
Dimension of Class 150 - (in Inch)

SIZE	B (min)	E (min)	F Min	F Max	G	H (min)	P (min)	Ribs	G1
1¼"	0.67	0.34	1.66	1.73	0.14	2.15	1.28	0.14	0.17
1½"	0.70	0.37	1.90	1.97	0.15	2.43	1.33	0.15	0.19
2"	0.75	0.42	2.37	2.44	0.17	2.46	1.45	0.17	0.22
2½"	0.92	0.48	2.87	2.97	0.21	3.59	1.70	0.21	0.25
3"	0.98	0.55	3.50	3.60	0.23	4.28	1.80	0.23	0.29
3½"	1.03	0.60	4.00	4.10	0.25	4.84	1.90	0.25	0.30
4"	1.08	0.66	4.50	4.60	0.26	5.40	2.08	0.26	0.36
5"	1.18	0.78	5.56	5.66	0.30	6.58	2.32	0.30	-
6"	1.28	0.90	6.62	6.72	0.34	7.77	2.55	0.34	-

Dimension of Class 300 - (in Inch)

SIZE	B (min)	E (min)	F Min	F Max	G	H (min)	P (min)	G1
1/2"	0.57	0.50	0.84	0.90	0.16	1.34	0.98	0.20
3/4"	0.64	0.56	1.05	1.11	0.18	1.63	1.08	0.23
1"	0.75	0.62	1.31	1.38	0.20	1.95	1.26	0.25
1¼"	0.84	0.69	1.66	1.73	0.22	2.39	1.38	0.28
1½"	0.87	0.75	1.90	1.97	0.24	2.68	1.43	0.30
2"	1.00	0.84	2.37	2.44	0.26	3.28	1.68	0.33
2½"	1.17	0.94	2.87	2.97	0.31	3.86	2.06	0.39
3"	1.23	1.00	3.50	3.60	0.35	4.62	2.17	0.44

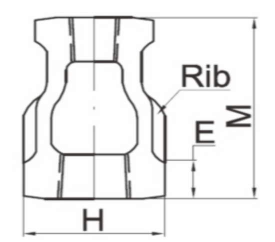
Fig No. 24B - COUPLINGS BANDED (BS)



Dimension of Class 150 - (in Inch)							
SIZE	B (min)	F		G	H (min)	Ribs	W
		Min	Max				
1/8"	0.25	0.4	0.43	0.09	0.69	0.09	0.96
1/4"	0.32	0.54	0.58	0.09	0.84	0.09	1.06
3/8"	0.36	0.67	0.72	0.10	1.01	0.10	1.16
1/2"	0.43	0.84	0.90	0.10	1.20	0.10	1.34
3/4"	0.50	1.05	1.11	0.12	1.46	0.12	1.52
1"	0.58	1.31	1.38	0.13	1.77	0.13	1.67
1¼"	0.67	1.66	1.73	0.14	2.15	0.14	1.93
1½"	0.70	1.90	1.97	0.15	2.43	0.15	2.15
2"	0.75	2.37	2.44	0.17	2.96	0.17	2.53
2½"	0.92	2.87	2.97	0.21	3.59	0.21	2.88
3"	0.98	3.50	3.60	0.23	4.28	0.23	3.18
4"	1.08	4.50	4.60	0.26	5.40	0.26	3.69

Dimension of Class 300 - (in Inch)							
SIZE	B (min)	F		G	H (min)	Ribs	W
		Min	Max				
1/2"	0.57	0.84	0.90	0.16	1.34	0.16	1.87
3/4"	0.64	1.05	1.11	0.18	1.63	0.18	2.12
1"	0.75	1.31	1.38	0.20	1.95	0.20	2.37
1¼"	0.84	1.66	1.73	0.22	2.39	0.22	2.87
1½"	0.87	1.90	1.97	0.24	2.68	0.24	2.87
2"	1.00	2.37	2.44	0.26	3.28	0.26	3.62

Fig No. 26 - REDUCING COUPLINGS BANDED (BRS)

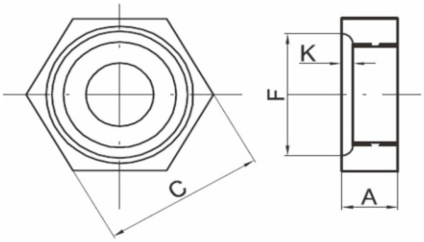


Dimension of Class 150 - (in Inch)				
SIZE	**E** (min)	**H** (min)	**Ribs**	**M**
1/4"	0.21	0.84	0.09	1.00
3/8"	0.23	1.01	0.10	1.13
1/2"	0.25	1.20	0.10	1.25
3/4"	0.27	1.46	0.12	1.44
1"	0.30	1.77	0.13	1.69
1¼"	0.34	2.15	0.14	2.06
1½"	0.37	2.43	0.15	2.31
2"	0.42	2.96	0.17	2.81
2½"	0.48	3.59	0.21	3.25
3"	0.55	4.28	0.23	3.69
4"	0.66	5.40	0.26	4.38

Dimension of Class 300 - (in Inch)				
SIZE	**E** (min)	**H** (min)	**Ribs**	**M**
1/4"	0.38	0.93	0.14	1.69
3/8"	0.44	1.12	0.15	1.44
1/2"	0.50	1.34	0.16	1.69
3/4"	0.56	1.63	0.18	1.75
1"	0.62	1.95	0.20	2
1¼"	0.69	2.39	0.22	2.38
1½"	0.75	2.68	0.24	2.69
2"	0.84	3.28	0.26	3.19

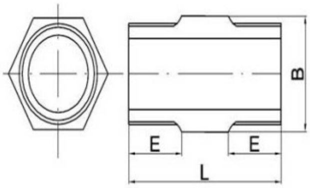
Note : For dimensions not given, see the dimensions table of Sockets

Fig No. 29 - LOCKNUTS (LN)



Dimension of Class 150 - (in Inch)				
SIZE	**A** (min)	**C** (min)	**F** (min)	**K**
1/4"	0.25	0.84	0.66	0.06
3/8"	0.28	1.00	0.77	0.06
1/2"	0.31	1.18	0.97	0.06
3/4"	0.34	1.43	1.23	0.06
1"	0.38	1.75	1.50	0.06
1 ¼"	0.42	2.10	1.86	0.06
1 ½"	0.47	2.35	2.12	0.06
2"	0.53	2.88	2.63	0.09
2 ½"	0.59	3.50	3.18	0.09
3"	0.67	4.27	3.84	0.09
3 ½"	0.73	4.84	4.38	0.13
4"	0.80	5.38	5.00	0.13

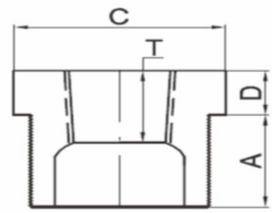
Fig No. 32 - NIPPLES (N)



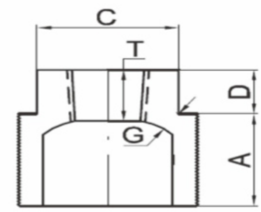
Dimension of Class 150 - (in Inch)				
SIZE	**E**	**N**	**L**	**FEATURE**
1/2"	0,63	0,51	1,65	OCTAGON
3/4"	0,71	0,71	1,85	OCTAGON
1"	0,79	0,94	2,05	OCTAGON
1 ¼"	0,87	1,26	2,20	OCTAGON
1 ½"	0,91	1,46	2,36	OCTAGON
2"	0,98	1,89	2,60	DECAGON

NOTE : REFERENCE STANDARD JIS B.2301

Fig No. 30 - BUSHINGS (HB)



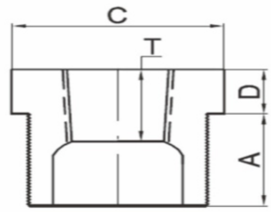
Outside Head Bushings



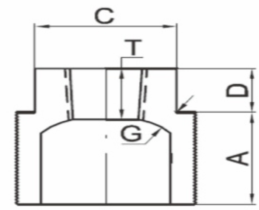
Inside Head Bushings

Dimension of Class 150 - (in Inch)						
SIZE	**A** (min)	**T** (min)	**D** (min)	**C** (min)		**G**
				Outside	**Inside**	
1/4 X 1/8"	0.44	0.26	0.14	0.64	-	-
3/8 X 1/4"	0.48	0.40	0.16	0.68	-	-
3/8 X 1/8"	0.48	0.25	0.16	0.68	-	-
1/2 X 3/8"	0.56	0.41	0.19	0.87	-	-
1/2 X 1/4"	0.56	0.32	0.19	0.87	-	-
1/2 X 1/8"	0.56	0.25	0.19	0.87	-	-
3/4 X 1/2"	0.63	0.53	0.22	1.15	-	-
3/4 X 3/8"	0.63	0.36	0.22	1.15	-	-
3/4 X 1/4"	0.63	0.32	0.22	1.15	-	-
3/4 X 1/8"	0.63	0.25	0.22	1.15	-	-
1 X 3/4"	0.75	0.50	0.25	1.42	-	-
1 X 1/2"	0.75	0.43	0.25	1.42	-	-
1 X 3/8"	0.75	0.36	0.30	-	1.12	-
1 X 1/4"	0.75	0.32	0.30	-	1.12	-
1 X 1/8"	0.75	0.25	0.30	-	1.12	-
1 ¼ X 1"	0.80	0.58	0.28	1.76	-	-
1 ¼ X 3/4"	0.80	0.50	0.28	1.76	-	-
1 ¼ X 1/2"	0.80	0.43	0.24	-	1.34	0.18
1 ¼X 3/8"	0.80	0.36	0.34	-	1.12	0.18
1 ¼ X 1/4"	0.80	0.32	0.34	-	1.12	0.18
1 ½ X 1 ¼"	0.83	0.77	0.31	2.00	-	-
1 ½ X 1"	0.83	0.58	0.31	2.00	-	-
1 ½ X 3/4"	0.83	0.50	0.37	-	1.63	0.20
1 ½ X 1/2"	0.83	0.43	0.37	-	1.34	0.20
1 ½ X 3/8"	0.83	0.36	0.37	-	1.12	0.20
1 ½ X 1/4"	0.83	0.32	0.37	-	1.12	0.20
2 X 1 ½"	0.88	0.70	0.34	2.48	-	-
2 X 1 ¼"	0.88	0.67	0.34	2.48	-	-
2 X 1"	0.88	0.58	0.41	-	1.95	0.22

Fig No. 30 - BUSHINGS (HB)



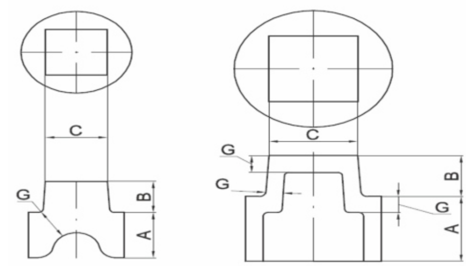
Outside Head Bushings



Inside Head Bushings

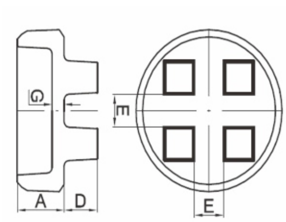
Dimension of Class 150 - (in Inch)						
SIZE	**A** (min)	**T** (min)	**D** (min)	**C** (min)		**G**
				Outside	**Inside**	
2 X 3/4"	0.88	0.50	0.41	-	1.63	0.22
2 X 1/2"	0.88	0.43	0.41	-	1.34	0.22
2 X 3/8"	0.88	0.36	0.41	-	1.12	0.22
2 X 1/4"	0.88	0.32	0.41	-	1.12	0.22
2 1/2 X 2"	1.07	0.75	0.37	2.98	-	-
2 ½ X 1 ½"	1.07	0.70	0.44	2.68	-	-
2 ½ X 1 ¼"	1.07	0.67	0.44	-	2.39	0.24
2 ½ X 1"	1.07	0.58	0.44	-	1.95	0.24
2 ½X 3/4"	1.07	0.50	0.44	-	1.63	0.24
2 ½ X 1/2"	1.07	0.43	0.44	-	1.34	0.24
3 X 2 ½"	1.13	0.92	0.40	3.86	-	-
3 X 2"	1.13	0.75	0.48	3.28	-	-
3 X 1½"	1.13	0.70	0.48	-	2.68	0.26
3 X 1 ¼"	1.13	0.67	0.48	-	2.39	0.26
3 X 1"	1.13	0.58	0.48	-	1.95	0.26
3 X 3/4"	1.13	0.50	0.48	-	1.63	0.26
3 X 1/2"	1.13	0.43	0.48	-	1.34	0.26
4 X 3"	1.22	0.98	0.50	4.62	-	-
4 X 2 ½"	1.22	0.92	0.60	-	3.86	0.31
4 X 2"	1.22	0.75	0.60	-	3.28	0.31
4 X 1 ½"	1.22	0.70	0.60	-	2.68	0.31
4 X 1 ¼"	1.22	0.67	0.60	-	2.39	0.31
4 X 1"	1.22	0.58	0.60	-	1.95	0.31
6 X 5"	1.40	1.18	0.63	7.05	-	-
6 X 4"	1.40	1.08	0.75	-	5.79	0.43
6 X 3"	1.40	0.98	0.75	-	4.62	0.43
6 X 2 ½"	1.40	0.92	0.75	-	3.86	0.43
6 X 2"	1.40	0.75	0.75	-	3.28	0.43

Fig No. 31A - SQUARE HEAD PLUGS (P SQUARE)



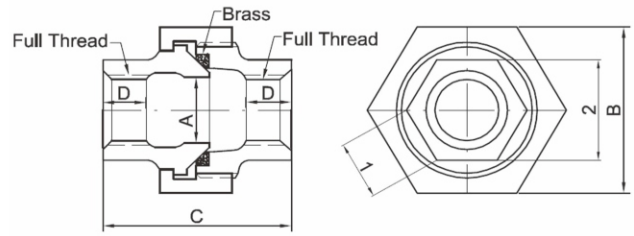
Dimension of Class 150 - (in Inch)				
SIZE	**A** (min)	**B** (min)	**C**	**G**
1/4"	0.44	0.28	3/8	-
3/8"	0.48	0.31	7/16	-
1/2"	0.56	0.38	9/16	0.16
3/4"	0.63	0.44	5/8	0.18
1"	0.75	0.50	13/16	0.20
1 ¼"	0.80	0.56	15/16	0.22
1 ½"	0.83	0.62	1-1/8	0.24
2"	0.88	0.68	1-5/16	0.26
2 ½"	1.07	0.74	1-1/2	0.29
3"	1.13	0.80	1-1 1/16	0.31

Fig No. 31B - SLOTTED HEAD PLUGS (P SLOTTED)



Dimension of Class 150 - (in Inch)				
SIZE	**A** (min)	**D** (min)	**E** (min)	**G**
4"	1.22	1.00	0.88	0.37
5"	1.31	1.00	0.88	0.46
6"	1.40	1.25	1.25	0.52
8"	1.57	1.38	1.50	0.66

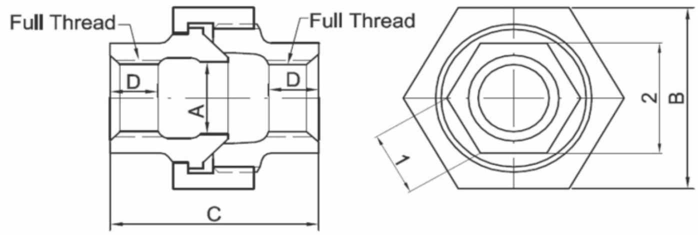
Fig No. 35B - UNIONS FEMALE CONICAL JOINT BRASS TO IRON SEAT (CU BRASS)



Dimension of Class 150 - (in Inch)							
SIZE	**A** (min)	**B** (min)	**C** (min)	**D** (min)	**1**	**2**	**FEATURE**
1/4"	0.36	1.10	1.44	0.40	0.41	0.72	HEXAGON
3/8"	0.52	1.26	1.61	0.41	0.51	0.88	HEXAGON
1/2"	0.61	1.45	1.72	0.53	0.44	1.07	OCTAGON
3/4"	0.80	1.71	1.94	0.55	0.53	1.27	OCTAGON
1"	1.00	2.07	2.06	0.68	0.64	1.56	OCTAGON
1¼"	1.31	2.50	2.26	0.71	0.63	1.92	DECAGON
1½"	1.55	2.82	2.41	0.72	0.71	2.20	DECAGON
2"	2.03	3.41	2.75	0.76	0.88	2.72	DECAGON
2½"	2.38	4.12	3.22	1.14	1.07	3.30	DECAGON
3"	3.00	4.75	3.50	1.20	1.28	3.90	DECAGON
4"	4.03	6.00	3.85	1.30	1.62	5.00	DECAGON

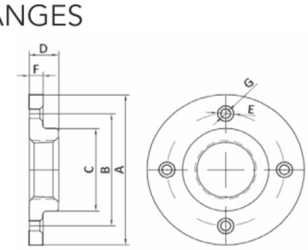
Dimension of Class 300 - (in Inch)							
SIZE	**A** (min)	**B** (min)	**C** (min)	**D** (min)	**1**	**2**	**FEATURE**
1/4"	0.30	1.34	1.56	0.43	0.43	0.43	HEXAGON
3/8"	0.41	1.50	1.71	0.47	0.54	0.97	HEXAGON
1/2"	0.53	1.75	1.81	0.57	0.45	1.09	OCTAGON
3/4"	0.75	2.15	2.13	0.65	0.55	1.33	OCTAGON
1"	0.94	2.48	2.30	0.75	0.56	1.72	DECAGON
1¼"	1.28	3.01	2.66	0.85	0.67	2.06	DECAGON
1½"	1.50	3.29	2.85	0.87	0.74	2.26	DECAGON
2"	1.93	3.96	3.23	1.00	0.93	2.85	DECAGON
2½"	2.32	4.72	3.31	1.16	1.13	3.46	DECAGON
3"	2.89	5.37	4.11	1.22	1.29	3.98	DECAGON

Fig No. 35C - UNION FEMALE CONICAL JOINT IRON TO IRON SEAT (CU)



Dimension of Class 150 - (in Inch)							
SIZE	**A** (min)	**B** (min)	**C** (min)	**D** (min)	**1**	**2**	**FEATURE**
1/4"	0.36	1.10	1.44	0.40	0,41	0,72	HEXAGON
3/8"	0.52	1.26	1.61	0.41	0,51	0,88	HEXAGON
1/2"	0.61	1.45	1.72	0.53	0,44	1,07	OCTAGON
3/4"	0.80	1.71	1.94	0.55	0,53	1,27	OCTAGON
1"	1.00	2.07	2.06	0.68	0,64	1,56	OCTAGON
1¼"	1.31	2.50	2.26	0.71	0,63	1,92	DECAGON
1½"	1.55	2.82	2.41	0.72	0,71	2,20	DECAGON
2"	2.03	3.41	2.75	0.76	0,88	2,72	DECAGON
2½"	2.38	4.12	3.22	1.14	1,07	3,30	DECAGON
3"	3.00	4.75	3.50	1.20	1,28	3,90	DECAGON
4"	4.03	6.00	3.85	1.30	1,62	5,00	DECAGON

FLOOR FLANGES



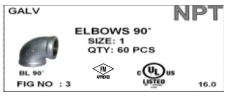
Dimension of Class 150 - (in Inch)							
SIZE	**A**	**B**	**C**	**D**	**E**	**F**	**G**
1/2"	3.48	2.50	1.12	0.51	0.39	0.28	0.26
3/4"	3.48	2.50	1.38	0.59	0.39	0.28	0.26
1"	4.02	3.00	1.79	0.71	0.41	0.35	0.26
1¼"	4.02	3.00	2.20	0.75	0.41	0.35	0.26
1½"	4.49	3.50	2.30	0.85	0.59	0.37	0.31
2"	5.49	4.25	2.81	0.98	0.59	0.39	0.31

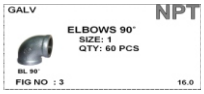
PACKAGING STANDARD

Name	Master Carton	Inner Carton	Linner & Layar Carton	
STANDARD CARTON	 MADE IN INDONESIA	 MADE IN INDONESIA		
L X WX H	325x255x234 mm	240x152x209 mm	310x245x220 mm	310x240 mm
L X WX H		240x104x209 mm		
L X WX H		155x119x209 mm		
JUMBO CARTON				
L X W X H	486x315x234 mm		470x300x220 mm	470x300 mm

STICKER

STICKER OF MASTER CARTON

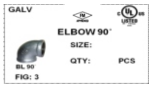


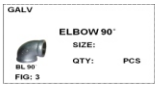


PRODUCTION
DATE:
SHIFT:
CHECKED: /S /T
PACKED: /

IDENTIFICATION OF PRODUCT

STICKER OF INNER CARTON





NOTE :

STICKER FOR GALVANIZED : YELLOW

STICKER FOR BLACK : WHITE

NOTE :

PT. TRI SINAR PURNAMA

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