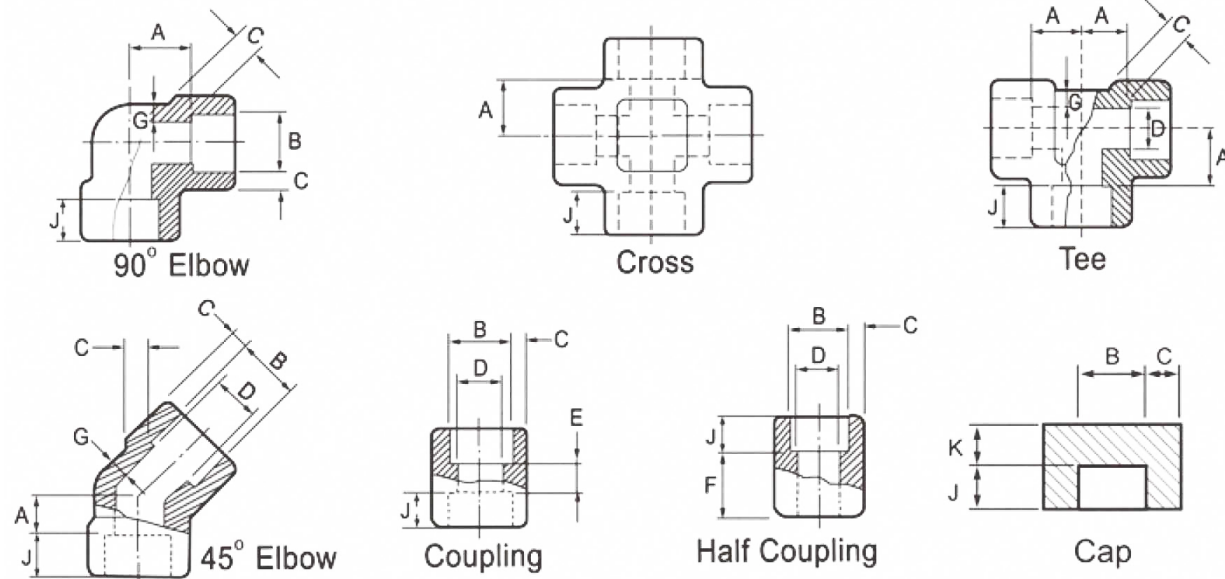


90-deg Elbow, 45-deg Elbow, Tee, Cross, Coupling & Cap



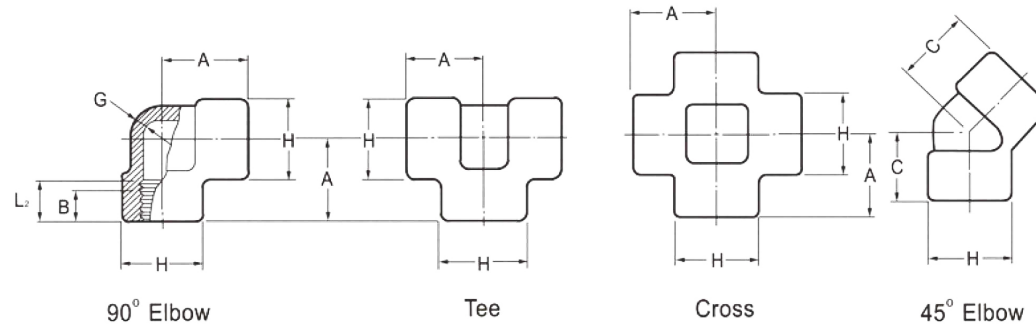
ASME B16.11

Nominal Pipe Size		Socket Bore Diameter B	Bore Diameter of Fittings, D[Note(2)]			Socket Wall Thickness, C[Note(3)]						Body Wall, G			Min. Depth of Socket, J	Center to Bottom of Socket, A						Laying Lengths			Tolerances, +			End Wall Thickness, Kmin.			
			Class Designation			Class Designation						Class Designation				90-deg Elbow, Tee, and Crosses		45-deg Elbow				Couplings		Half Couplings	A	E	F	Class Designation			
DN	NPS		3000	6000	9000	3000		6000		9000		3000		6000		9000		3000		6000		9000		E	F				Class Designation		
			Avg.	Min.		Avg.	Min.	Avg.	Min.	Avg.	Min.	Min.	Min.	Min.																	
80	3"	90.3	79.4	-	-	9.52	8.3	-	-	-	-	7.62	-	-	16	57	-	-	32	-	-	19	44.5	2.5	5	2.5	19	22.4	-		
		89.8	76.4	-	-																										
100	4"	116	104	-	-	10.7	9.35	-	-	-	-	8.56	-	-	19	67	-	-	41	-	-	19	48	2.5	5	2.5	22.4	28.4	-		
		115	101	-	-																										

Note:

- All dimensions are in millimeters
- Upper and lower values for each size are the respective maximum and minimum dimensions.
- Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Threaded Fittings-90-deg Elbow, 45-deg Elbow, Tee, Cross



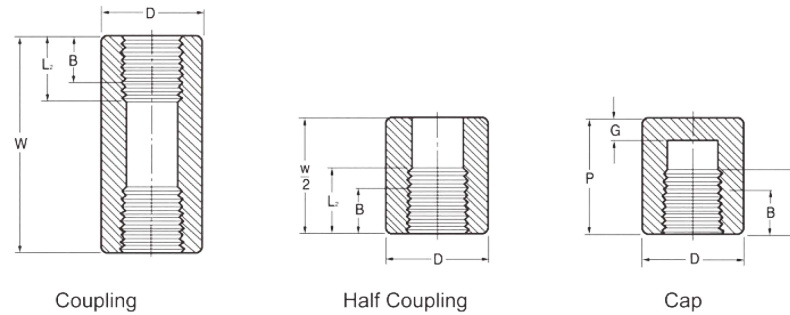
ASME B16.11

Nominal Pipe Size		Center-to End Elbows, Tees, Crosses, A			Center-to End 45-deg Elbow, C			Outside Diameter of Band, H			Min. Wall Thickness, G			Min. Length of Thread [Note(2)]	
DN	NPS	2000	3000	6000	2000	3000	6000	2000	3000	6000	2000	3000	6000	B	L2
6	1/8"	21	21	25	17	17	19	22	22	25	3.18	3.18	6.35	6.4	6.7
8	1/4"	21	25	28	17	19	22	22	25	33	3.18	3.3	6.6	8.1	10.2
10	3/8"	25	28	33	19	22	25	25	33	38	3.18	3.51	6.98	9.1	10.4
15	1/2"	28	33	38	22	25	28	33	38	46	3.18	4.09	8.15	10.9	13.6
20	3/4"	33	38	44	25	28	33	38	46	56	3.18	4.32	8.53	12.7	13.9
25	1"	38	44	51	28	33	35	46	56	62	3.68	4.98	9.93	14.7	17.3
32	1-1/4"	44	51	60	33	35	43	56	62	75	3.89	5.28	10.59	17	18
40	1-1/2"	51	60	64	35	43	44	62	75	84	4.01	5.56	11.07	17.8	18.4
50	2"	60	64	83	43	44	52	75	84	102	4.27	7.14	12.09	19	19.2
65	2-1/2"	76	83	95	52	52	64	92	102	121	5.61	7.65	15.29	23.6	28.9
80	3"	86	95	106	64	64	79	109	121	146	5.99	8.84	16.64	25.9	30.5
100	4"	106	114	114	79	79	79	146	152	152	6.55	11.18	18.67	27.7	33

Note:

- All dimensions are in millimeters
- Dimension B is minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ASME B1.20.1)

Coupling, Half-Coupling&Cap

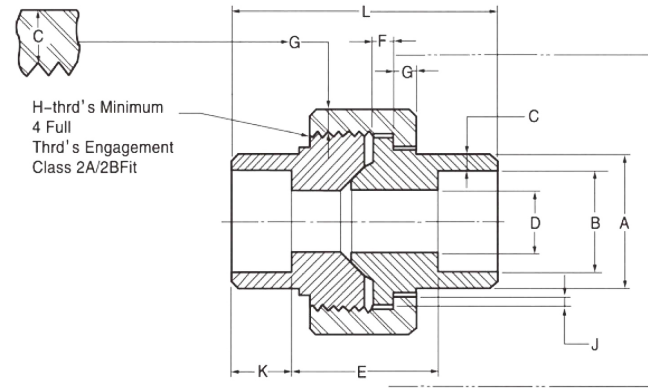


ASME B16.11

Nominal Pipe Size		End-to-End Couplings,W	End-to-End Caps,P		Outside Diameter,D		Min.End Wall Thickness,G		Min.Length of Thread[Note(2)]	
DN	NPS	3000&6000	3000	6000	3000	6000	3000	6000	3000	6000
6	1/8"	32	19	-	16	22	4.8	-	6.4	6.7
8	1/4"	35	25	27	19	25	4.8	6.4	8.1	10.2
10	3/8"	38	25	27	22	32	4.8	6.4	9.1	10.4
15	1/2"	48	32	33	28	38	6.4	7.9	10.9	13.6
20	3/4"	51	37	38	35	44	6.4	7.9	12.7	13.9
25	1"	60	41	43	44	57	9.7	11.2	14.7	17.3
32	1-1/4"	67	44	46	57	64	9.7	11.2	17	18
40	1-1/2"	79	44	48	64	76	11.2	12.7	17.8	18.4
50	2"	86	48	51	76	92	12.7	15.7	19	19.2
65	2-1/2"	92	60	64	92	108	15.7	19	23.6	28.9
80	3"	108	65	68	108	127	19	22.4	25.9	30.5
100	4"	121	68	75	140	159	22.4	28.4	27.7	33

- Note:
- All dimensions are in millimeters
 - Dimension B is minimum length of perfect thread.The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ASME B1.20.1).

Socket-Welding Unions



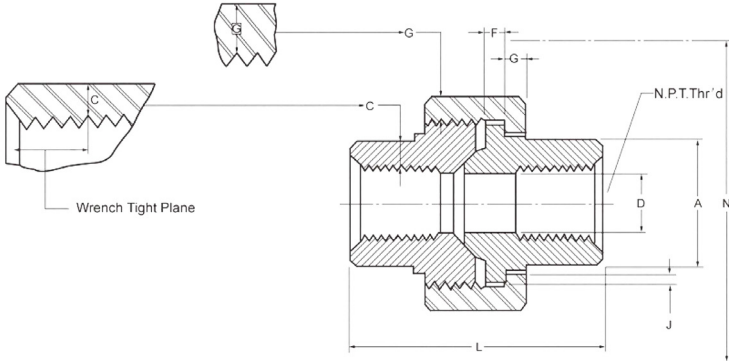
MSS SP-83/CLASS 3000

Nominal Pipe Size		Pipe End Min.,A	Socket Bore Dia.,B		Socket Wall Min.,C	Water Way Bore,D		Laying Length,E		Male Flange Min.,F	Nut Min.,G	Thrds Per Inch,H	Bearing Min.,J	Depth of Socket Min.,K	Length Assem. Nominal,L	Clear Assem Nut,N
DN	NPS		Max.	Min.		Max.	Min.	Max.	Min.							
6	1/8"	21.8	11.18	10.67	3.18	7.59	6.07	22.4	19.1	3.18	3.18	16	1.24	9.7	41.4	50.8
8	1/4"	21.8	14.61	14.1	3.3	10.01	8.48	22.4	19.1	3.18	3.18	16	1.24	9.7	41.4	50.8
10	3/8"	25.9	18.03	17.53	3.51	13.28	11.76	26.9	20.6	3.43	3.43	14	1.37	9.7	46	55.9
15	1/2"	31.2	22.23	21.73	4.09	16.56	15.04	26.9	20.6	3.68	3.68	14	1.5	9.7	49	58.4
20	3/4"	37.1	27.56	27.05	4.27	21.69	20.17	31.8	25.4	4.06	4.06	11	1.68	12.7	56.9	66
25	1"	45.5	34.29	33.78	4.98	27.41	25.88	34.3	26.2	4.57	4.45	11	1.85	12.7	62	78.7
32	1-1/4"	54.9	43.05	42.55	5.28	35.81	34.29	40.6	32.5	5.33	5.21	11	2.13	12.7	71.1	94
40	1-1/2"	61.5	49.15	48.64	5.54	41.66	40.13	42.2	34	5.84	5.59	10	2.31	12.7	76.5	111.8
50	2"	75.2	61.62	61.11	6.05	53.26	51.74	45.5	37.3	6.6	6.35	10	2.69	15.7	86.1	132.1
65	2-1/2"	91.7	74.45	73.81	7.67	64.24	61.19	61.7	52.1	7.49	7.11	8	3.07	15.7	102.4	149.9
80	3"	109.2	90.42	89.79	8.31	79.45	76.4	63.8	53.6	8.26	8	8	3.53	15.7	109	175.3

Note:

•All dimensions are in millimeters

Threaded Fittings Unions

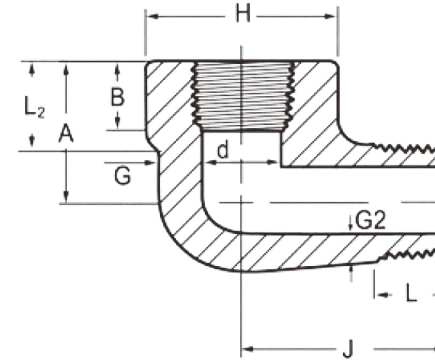


MSS SP-83/CLASS 3000

Nominal Pipe Size		Pipe End Min.,A	Wall Min.,C	Water Way Bore,D		Male Flange Min.,F	Nut Min.,G	Threads Per Inch.,H	Bearing Min.,J	Length Assem. Nominal,L	Clear Assem. Nut,N
DN	NPS			Max.	Min.						
6	1/8"	14.7	2.41	8.43	6.43	3.18	3.18	16	1.24	41.4	50.8
8	1/4"	19	3.02	11.13	9.45	3.18	3.18	16	1.24	41.4	50.8
10	3/8"	22.9	3.2	14.27	13.51	3.43	3.43	14	1.37	46	55.9
15	1/2"	27.7	3.73	17.86	17.07	3.68	3.68	14	1.5	49	58.4
20	3/4"	33.5	3.91	23.01	21.39	4.06	4.06	11	1.68	56.9	66
25	1"	41.4	4.55	28.98	27.74	4.57	4.45	11	1.85	62	78.7
32	1-1/4"	50.5	4.85	37.69	35.36	5.33	5.21	11	2.13	71.1	94
40	1-1/2"	57.2	5.08	43.54	41.2	5.84	5.59	10	2.31	76.5	111.8
50	2"	70.1	5.54	55.58	52.12	6.6	6.35	10	2.69	86.1	132.1
65	2-1/2"	85.3	7.01	66.27	64.31	7.49	7.11	8	3.07	102.4	149.9
80	3"	102.4	7.62	88.25	77.27	8.26	8	8	3.53	109	175.3

Note:
 •All dimensions are in millimeters

Street Elbows



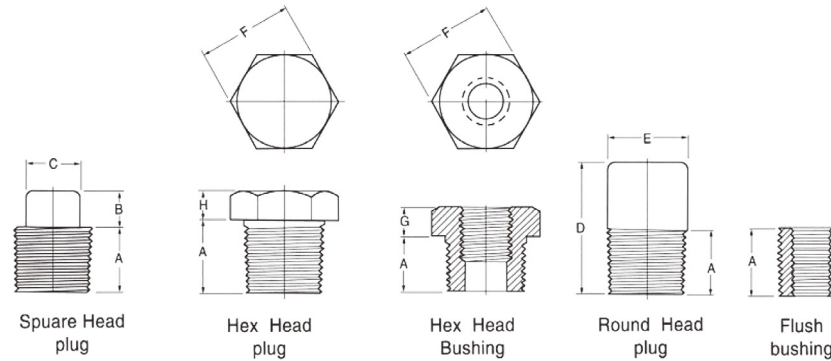
ASME B16.11

Nominal Pipe Size		Center-to-Female End Street Ells, A		Center-to-male End Street Ells, J		Outside Diameter of Band, H		Min. Wall Thickness, G1		Min. Wall Thickness, G2		Min. Length Internal Thread		Min. Length Male Thread, L
		Class Designation		Class Designation		Class Designation		Class Designation		Class Designation		B	L2	
DN	NPS	3000	6000	3000	6000	3000	6000	3000	6000	3000	6000			
6	1/8"	19	22	25	32	19	25	3.18	5.08	2.74	4.22	6.4	6.7	10
8	1/4"	22	25	32	38	25	32	3.3	5.66	3.22	5.28	8.1	10.2	11
10	3/8"	25	28	38	41	32	38	3.51	6.98	3.5	5.59	9.1	10.4	13
15	1/2"	28	35	41	48	38	44	4.09	8.15	4.16	6.53	10.9	13.6	14
20	3/4"	35	44	48	57	44	51	4.32	8.53	4.88	6.86	12.7	13.9	16
25	1"	44	51	57	66	51	62	4.98	9.93	5.56	7.95	14.7	17.3	19
32	1-1/4"	51	54	66	71	62	70	5.28	10.59	5.56	8.48	17	18	21
40	1-1/2"	54	64	71	84	70	84	5.56	11.07	6.25	8.89	17.8	18.4	21
50	2"	64	83	84	105	84	102	7.14	12.09	7.64	9.7	19	19.2	22

Note:

- All dimensions are in millimeters
- Dimension A of this table for the appropriate fitting size may also be used at the option of the manufacture
- Dimension H of this table for the appropriate fitting size may also be used at the option of the manufacture
- Wall thickness before threading
- Dimension B is minimum length of perfect thread. The length of useful thread (B plus threads with fully formed roots and flat crests) shall not be less than L₂ (effective length of external thread) required by American National Standard for Pipe Threads (ASME B1.20.1).

Plugs and Bushings

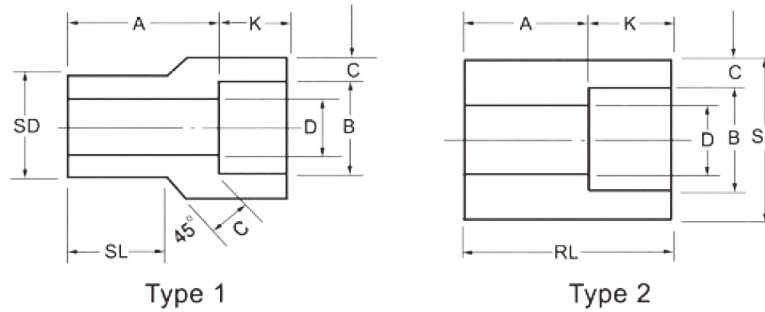


ASME B6.11

Nominal Pipe Size		Min. Length, A	Square Head Plugs		Round Head Plugs		Hex Plugs & Bushings		
			Min. Square Height, B	Min. Width Flats, C	Nominal Head Diameter, E	Min. Length, D	Nominal Width Flats, E	Min. Hex Height	
DN	NPS							Bushing, G	Plug, H
6	1/8"	10	6	7	10	35	11	--	6
8	1/4"	11	6	10	14	41	16	3	6
10	3/8"	13	8	11	18	41	18	4	8
15	1/2"	14	10	14	21	44	22	5	8
20	3/4"	16	11	16	27	44	27	6	10
25	1"	19	13	21	33	51	36	6	10
32	1-1/4"	21	14	24	43	51	46	7	14
40	1-1/2"	21	16	28	48	51	50	8	16
50	2"	22	18	32	60	64	65	9	18
65	2-1/2"	27	19	36	73	70	75	10	19
80	3"	28	21	41	89	70	90	10	21
100	4"	32	25	65	114	76	115	13	25

- Note:
- All dimensions are in millimeters
 - Cautionary Note Regarding Hex Bushing: Hex head bushings of one-size reduction should not be used in services where they might be subject to harmful loads and forces other than internal pressures

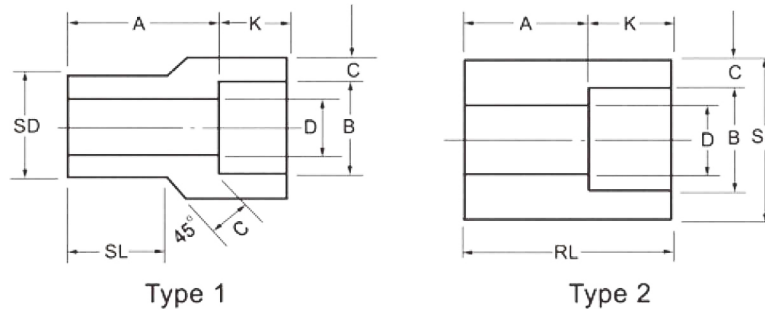
Socket-Welding Reducer Insert



MSS SP-79

Nominal Pipe Size		Type [Note(2)]		Socket		Shank Dia.,SD	Laying Length,A		Bore,D		Wall Min.,C		Wall Min.,C			
DN	NPS	3M	6M	Dia.,B	Depth Min.,K		3M	6M	3M	6M	3M	6M	SL		RL Min.	
													3M	6M	3M	6M
10X8	3/8"X1/4"	1	1	14.35	10	17.15	19	21	9	6.5	3.78	4.6	14	16	-	-
15X10	1/2"X3/8"	1	1	17.78	10	21.34	21	23	12.5	9	4.01	5.03	16	16	-	-
15X8	1/2"X1/4"	1	1	14.35	10	21.34	21	21	9	6.5	3.78	4.6	16	16	-	-
20X15	3/4"X1/2"	1	1	21.97	10	26.67	22	25	16	11.5	4.67	5.97	17	19	27	-
20X10	3/4"X3/8"	2	1	17.78	10	26.67	16	22	12.5	9	4.01	5.03	-	19	27	32
20X8	3/4"X1/4"	2	2	14.35	10	26.67	18	22	9	6.5	3.78	4.6	-	-	-	-
25X20	1"X3/4"	1	1	27.31	13	33.4	24	28	21	15.5	4.9	6.96	19	21	-	-
25X15	1"X1/2"	2	1	21.97	10	33.4	16	28	16	11.5	4.67	5.97	-	21	28	-
25X10	1"X3/8"	2	2	17.78	10	33.4	18	22	12.5	9	4.01	5.03	-	-	28	33
25X8	1"X1/4"	2	2	14.35	10	33.4	19	24	9	6.5	3.78	4.6	-	-	28	33
32X25	1-1/4"X1"	1	1	34.04	13	42.16	25	30	26.5	20.5	5.69	7.92	21	22	-	-
32X20	1-1/4"X3/4"	2	2	27.31	13	42.16	18	21	21	15.5	4.9	6.96	-	-	32	35
32X15	1-1/4"X1/2"	2	2	21.97	10	42.16	19	22	16	11.5	4.67	5.97	-	-	32	35
32X10	1-1/4"X3/8"	2	2	17.78	10	42.16	21	24	12.5	9	4.01	5.03	-	-	32	35
32X8	1-1/4"X1/4"	2	2	14.35	10	42.16	22	25	9	6.5	3.78	4.6	-	-	32	35
40X32	1-1/2"X1-1/4"	1	1	42.8	13	48.26	28	35	35	29.5	6.07	7.92	22	25	-	-
40X25	1-1/2" X1"	2	1	34.04	13	48.26	18	29	26.5	20.5	5.69	7.92	-	25	33	-
40X20	1-1/2"X3/4"	2	2	27.31	13	48.26	19	25	21	15.5	4.9	6.96	-	-	33	40
40X15	1-1/2"X1/2"	2	2	21.97	10	48.26	21	27	16	11.5	4.67	5.97	-	-	33	40
40X10	1-1/2" X3/8"	2	2	17.78	10	48.26	22	28	12.5	9	4.01	5.03	-	-	33	40

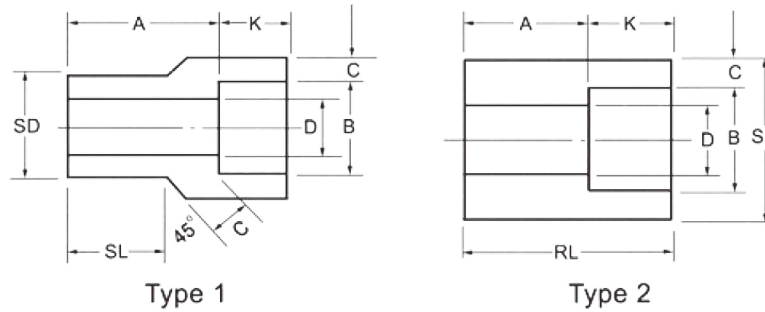
Socket-Welding Reducer Insert



MSS SP-79

Nominal Pipe Size		Type [Note(2)]		Socket		Shank Dia.,SD	Laying Length,A		Bore,D		Wall Min.,C		Wall Min.,C			
DN	NPS	3M	6M	Dia.,B	Depth Min.,K		3M	6M	3M	6M	3M	6M	SL		RL Min.	
													3M	6M	3M	6M
50X40	2"X1-1/2"	1	1	48.9	13	60.32	32	39	41	34	6.35	8.9	25	28	-	-
50X32	2"X1-1/4"	2	2	42.8	13	60.32	21	24	35	29.5	6.07	7.92	-	-	38	41
50X25	2 x1"	2	2	34.04	13	60.32	22	25	26.5	21	5.69	7.92	-	-	38	41
50X20	2"X3/4"	2	2	27.31	13	60.32	24	27	21	15.5	4.9	6.96	-	-	38	41
50X15	2"X1/2"	2	2	21.97	10	60.32	25	28	16	11.5	4.67	5.97	-	-	38	41
65X50	2-1/2"X2"	1	1	61.37	16	73.02	46	43	52.5	43	6.93	10.92	32	38	-	-
65X40	2-1/2"X1-1/2"	2	2	48.9	13	73.02	35	-	41	-	6.35	-	-	-	54	54
65X32	2-1/2"X1-1/4"	2	2	42.8	13	73.02	37	-	35	-	6.07	-	-	-	54	54
65X25	2-1/2"X1"	2	2	34.04	13	73.02	38	-	26.5	-	5.69	-	-	-	54	54
65X20	2-1/2 " X3/4"	2	2	27.31	13	73.02	40	-	21	-	4.9	-	-	-	54	54
80X65	3"X2-1/2"	1	1	74.07	16	88.9	38	-	62.5	-	8.76	-	32	45	-	-
80X50	3"X2"	2	2	61.37	16	88.9	25	-	52.5	-	6.93	-	-	-	48	54
80X40	3"X1-1/2"	2	2	48.9	13	88.9	29	-	41	-	6.35	-	-	-	48	54
80X32	3"X1-1/4"	2	2	42.8	13	88.9	30	-	35	-	6.07	-	-	-	48	54
80X25	3"X1	2	2	34.04	13	88.9	32	-	26.5	-	5.69	-	-	-	48	54
100X80	4"X3"	1	1	90.04	16	114.3	33	-	78	-	9.5	-	-	-	60	-
100X65	4"X2-1/2"	2	2	74.07	16	114.3	38	-	62.5	-	8.76	-	-	-	60	-
100X50	4"X2"	2	2	61.37	16	114.3	38	-	52.5	-	6.93	-	-	-	60	-
100X40	4"X1-1/2"	2	2	48.9	13	114.3	42	-	41	-	6.35	-	-	-	60	-
100X32	4"X1-1/4"	2	2	42.8	13	114.3	43	-	35	-	6.07	-	-	-	60	-

Socket-Welding Reducer Insert



MSS SP-79

Nominal Pipe Size		Type [Note(2)]		Socket		Shank Dia.,SD	Laying Length,A		Bore,D		Wall Min.,C		Wall Min.,C			
DN	NPS	3M	6M	Dia.,B	Depth Min.,K		3M	6M	3M	6M	3M	6M	SL		RL Min.	
													3M	6M	3M	6M

Note:

- All dimensions are in millimeters
- All the option of the manufacturer Type 2 Reducers may be furnished in Type 1 configuration
- 3M and 6M symbols denote 3000 and 6000 classes