



Forged Fittings





Materials

The steel for Anvil Forged Carbon Steel Fittings consists of forging, bars, seamless pipe or tubes which conform to the requirements for melting process, chemical composition and mechanical properties of ASTM A105.

Design Basis

ASME B16.11 - Forged fittings, socket-weld and threaded

Dimensions

ASME B16.11, unless otherwise noted

Threads

ANSI/ASME B1.20.1 NPT Threads

Forged Steel Fittings

In accordance with ASME standard B16.11 - "Forged Fittings, Socket-Welding and Threaded" this table shows the schedule of pipe corresponding to each class of fitting for rating purposes.

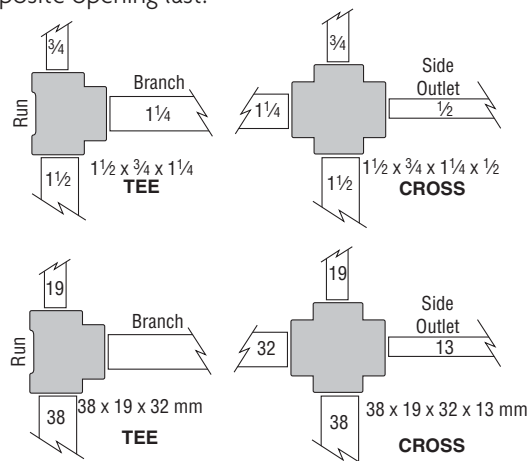
PRESSURE RATINGS		
Class	Schedule	
	N.P.T.	S.W.
2000	80	—
3000	160	80
6000	XXS/XXH	160

ASME B16.11 provides that the maximum allowable pressure of a fitting be computed in accordance with the applicable piping code or regulation for straight seamless pipe or for material of equivalent composition and mechanical properties to the fitting. Any corrosion or mechanical allowances and any reduction in allowable stress due to temperature or other service conditions must be applied to the pipe and fitting alike.

Reducing Fittings

Reducing elbows, tees and crosses are available in both threaded and socket-welding.

On reducing tees and crosses give the size of the largest run opening; then give the opposite opening. On a tee give the branch size last. On a cross give the largest side outlet third and the opposite opening last.



Forged Steel Fittings

Class 3000 Threaded

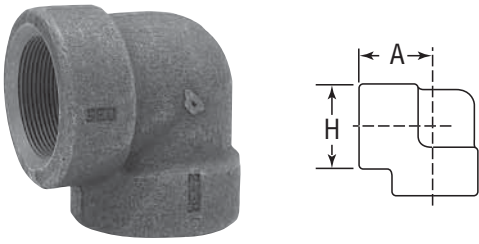
FIGURE 2111 90° Elbows	Size		A		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.81	21	0.88	22	0.23	0.10
	1/4	8	0.97	25	1.00	25	0.35	0.16
	3/8	10	1.12	28	1.31	33	0.66	0.30
	1/2	15	1.31	33	1.50	38	0.93	0.42
	3/4	20	1.50	38	1.81	46	1.48	0.67
	1	25	1.75	44	2.19	56	2.30	1.04
	1 1/4	32	2.00	51	2.44	62	2.68	1.22
	1 1/2	40	2.38	60	2.97	75	5.30	2.40
	2	50	2.50	64	3.31	84	5.85	2.65
	2 1/2	65	3.25	83	4.00	102	10.00	4.54
	3	80	3.75	95	4.75	121	17.20	7.80
	4	100	4.50	114	6.00	152	29.30	13.29

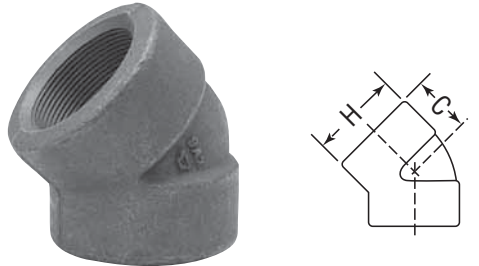
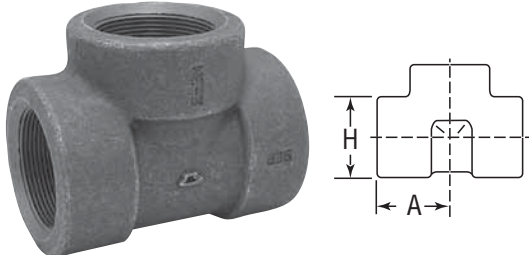
FIGURE 2112 45° Elbows	Size		C		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.69	17	0.88	22	0.18	0.08
	1/4	8	0.75	19	1.00	25	0.25	0.11
	3/8	10	0.88	22	1.31	33	0.53	0.24
	1/2	15	1.00	25	1.50	38	0.78	0.35
	3/4	20	1.12	28	1.81	46	1.20	0.54
	1	25	1.31	33	2.19	56	1.90	0.86
	1 1/4	32	1.38	35	2.44	62	2.30	1.04
	1 1/2	40	1.69	43	2.97	75	4.16	1.89
	2	50	1.72	44	3.31	84	5.12	2.32
	2 1/2	65	2.06	52	4.00	102	7.70	3.49
	3	80	2.50	64	4.75	121	12.00	5.44
	4	100	3.12	79	6.00	152	19.70	8.93

FIGURE 2114 Tees	Size		A		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.81	21	0.88	22	0.31	0.14
	1/4	8	0.97	25	1.00	25	0.42	0.19
	3/8	10	1.12	28	1.31	33	0.93	0.42
	1/2	15	1.31	33	1.50	38	1.20	0.54
	3/4	20	1.50	38	1.81	46	1.84	0.83
	1	25	1.75	44	2.19	56	3.05	1.38
	1 1/4	32	2.00	51	2.44	62	3.62	1.64
	1 1/2	40	2.38	60	2.97	75	6.65	3.02
	2	50	2.50	64	3.31	84	7.15	3.24
	2 1/2	65	3.25	83	4.00	102	13.70	6.21
	3	80	3.75	95	4.75	121	21.00	9.52
	4	100	4.50	114	6.00	152	38.00	17.23

Forged Steel Fittings

Class 3000 Threaded

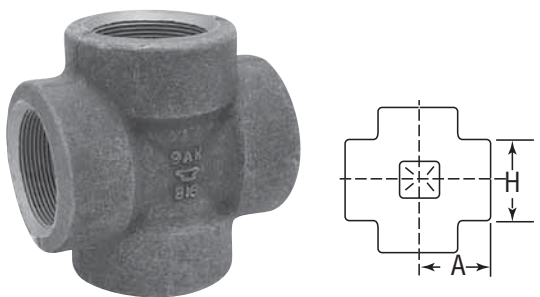
FIGURE 2115 Crosses	Size		A		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.81	21	0.88	22	—	—
	1/4	8	0.97	25	1.00	25	—	—
	3/8	10	1.12	28	1.31	33	—	—
	1/2	15	1.31	33	1.50	38	1.40	0.63
	3/4	20	1.50	38	1.81	46	2.10	0.95
	1	25	1.75	44	2.19	56	3.50	1.59
	1 1/4	32	2.00	51	2.44	62	4.30	1.95
	1 1/2	40	2.38	60	2.97	75	8.20	3.72
	2	50	2.50	64	3.31	84	8.40	3.81
	2 1/2	65	3.25	83	4.00	102	17.10	7.76
	3	80	3.75	95	4.75	121	20.00	9.07
	4	100	4.50	114	6.00	152	32.00	14.51

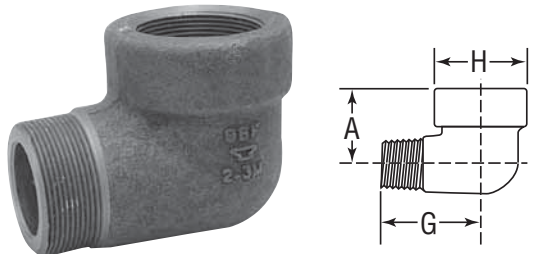
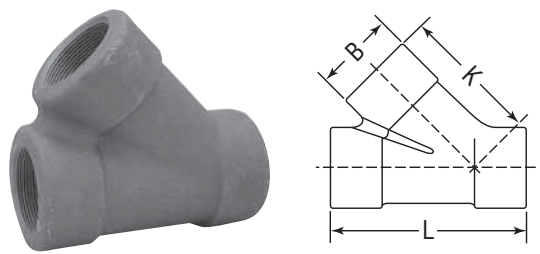
FIGURE 2113 90° Street Elbows	Size		A		G		H		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg
	1/8	6	0.75	19	1.00	25	0.75	19	—	—
	1/4	8	0.88	22	1.25	32	1.00	25	0.23	0.10
	3/8	10	1.00	25	1.50	38	1.25	32	0.38	0.17
	1/2	15	1.12	28	1.62	41	1.50	38	0.53	0.24
	3/4	20	1.38	35	1.88	48	1.75	44	0.88	0.40
	1	25	1.75	44	2.25	57	2.00	51	1.40	0.63
	1 1/4	32	2.00	51	2.62	66	2.44	62	2.40	1.09
	1 1/2	40	2.12	54	2.81	71	2.75	70	2.90	1.32
	2	50	2.50	64	3.31	84	3.31	84	5.00	2.27

FIGURE 2116 Laterals	Size		B		K		L		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg
	1/2	15	1.56	39.62	2.56	65.02	3.56	90.42	1.75	0.79
	3/4	20	1.84	46.74	3.00	76.20	4.13	104.90	2.75	1.24
	1	25	2.22	56.39	3.50	88.90	4.81	122.17	4.63	2.10
	1 1/4	32	2.50	63.50	3.94	100.08	5.38	136.65	5.50	2.48
	1 1/2	40	3.03	79.96	4.75	120.65	6.44	163.58	10.81	4.91
	2	50	3.34	84.84	5.00	127.00	6.63	168.40	11.50	5.23

Forged Steel Fittings

Class 3000 Threaded

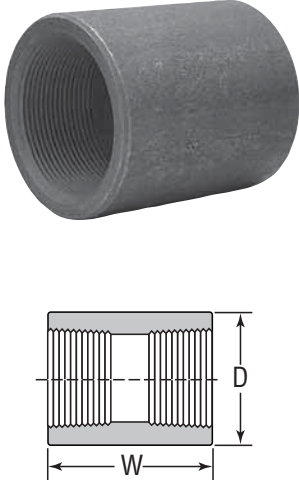
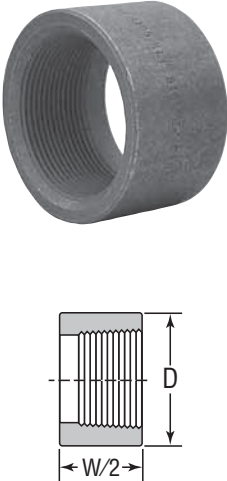
FIGURE 2117 Couplings	Size		D		W		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.62	16	1.25	32	0.14	0.06
	1/4	8	0.75	19	1.38	35	0.10	0.05
	3/8	10	0.88	22	1.50	38	0.13	0.06
	1/2	15	1.12	28	1.88	48	0.28	0.13
	3/4	20	1.38	35	2.00	51	0.44	0.20
	1	25	1.75	44	2.38	60	1.08	0.49
	1 1/4	32	2.25	57	2.62	67	1.68	0.76
	1 1/2	40	2.50	64	3.12	79	2.17	0.98
	2	50	3.00	76	3.38	86	3.20	1.45
	2 1/2	65	3.62	92	3.62	92	4.70	2.13
	3	80	4.25	108	4.25	108	6.80	3.08
	4	100	5.50	140	4.75	121	12.30	5.58

FIGURE 2119 Half Couplings	Size		D		W/2		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.62	16	0.63	16	0.05	0.02
	1/4	8	0.75	19	0.69	18	0.04	0.02
	3/8	10	0.88	22	0.75	19	0.06	0.03
	1/2	15	1.12	28	0.94	24	0.12	0.05
	3/4	20	1.38	35	1.00	26	0.21	0.10
	1	25	1.75	44	1.19	30	0.43	0.20
	1 1/4	32	2.25	57	1.31	34	0.76	0.34
	1 1/2	40	2.50	64	1.56	40	1.14	0.52
	2	50	3.00	76	1.69	43	1.50	0.68
	2 1/2	65	3.62	92	1.81	46	2.40	1.09
	3	80	4.25	108	2.13	54	3.25	1.47
	4	100	5.50	140	2.38	61	6.25	2.83

Forged Steel Fittings

Class 3000 Threaded

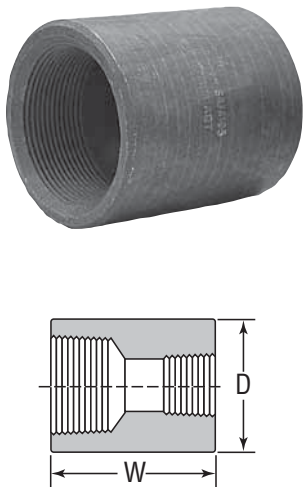
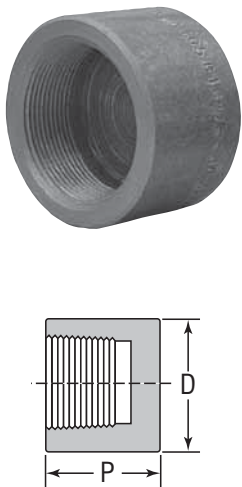
FIGURE 2118 Reducing Couplings	Size				D		W		Unit Weight	
	NPS	DN	NPS	DN	in	mm	in	mm	lbs	kg
	1/4	8	1/8	6	0.75	19	1.38	35	0.10	0.05
	3/8	10	1/8	6	0.88	22	1.50	38	0.15	0.07
	1/2	15	1/8	6	1.12	28	1.88	48	0.35	0.16
	3/4	20	1/8	6	1.38	35	2.00	51	0.52	0.24
	1	25	1/8	6	1.75	44	2.38	60	1.10	0.50
	1 1/4	32	1/4	8	2.25	57	2.62	67	2.08	0.94
	1 1/2	40	1/4	8	2.50	64	3.12	79	2.93	1.33
	2	50	1/4	8	3.00	76	3.38	86	4.40	2.00
	2 1/2	65	3/4	20	3.62	92	3.62	92	7.50	3.40
	3	80	3/4	20	4.25	108	4.25	108	11.00	4.99
	4	100	1 1/2	40	5.50	140	4.75	121	20.50	9.30

FIGURE 2120 Pipe Caps	Size		D		P		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.62	16	0.75	19	0.07	0.03
	1/4	8	0.75	19	1.00	25	0.08	0.04
	3/8	10	0.88	22	1.00	25	0.11	0.05
	1/2	15	1.12	28	1.25	32	0.23	0.10
	3/4	20	1.38	35	1.44	37	0.40	0.18
	1	25	1.75	44	1.62	41	0.79	0.36
	1 1/4	32	2.25	57	1.75	44	1.21	0.55
	1 1/2	40	2.50	64	1.75	44	1.75	0.79
	2	50	3.00	76	1.88	48	2.46	1.12
	2 1/2	65	3.62	92	2.38	60	4.37	1.98
	3	80	4.25	108	2.56	65	6.50	2.95
	4	100	5.50	140	2.69	68	11.30	5.12

Forged Steel Fittings

Class 6000 Threaded

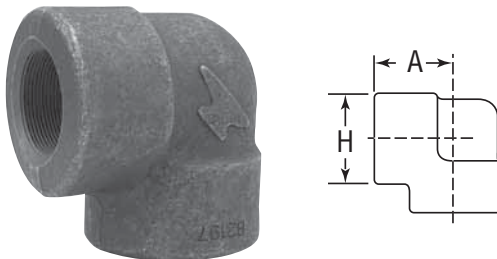
FIGURE 2131 90° Elbows		Size		A		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg	
	1/8	6	0.97	25	1.00	25	—	—	
	1/4	8	1.12	28	1.31	33	—	—	
	3/8	10	1.31	33	1.50	38	—	—	
	1/2	15	1.50	38	1.81	46	1.50	0.68	
	3/4	20	1.75	44	2.19	56	2.60	1.18	
	1	25	2.00	51	2.44	62	3.50	1.59	
	1 1/4	32	2.38	60	2.97	75	6.00	2.72	
	1 1/2	40	2.50	64	3.31	84	8.00	3.63	
	2	50	3.25	83	4.00	102	13.00	5.90	
	2 1/2	65	3.75	95	4.75	121	22.30	10.11	
	3	80	4.19	106	5.75	146	36.00	16.33	
	4	100	4.50	114	6.00	152	—	—	

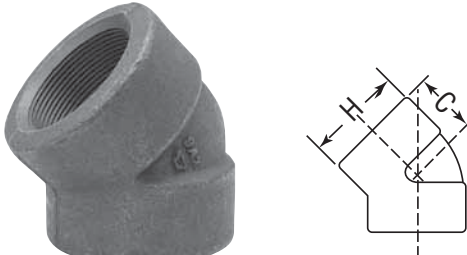
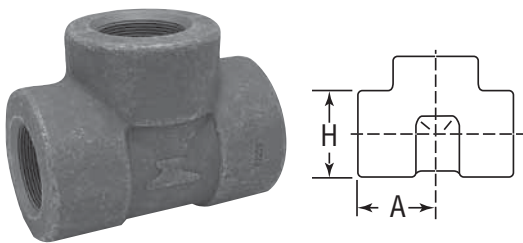
FIGURE 2132 45° Elbows		Size		C		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg	
	1/8	6	0.75	19	1.00	25	—	—	
	1/4	8	0.88	22	1.31	33	—	—	
	3/8	10	1.00	25	1.50	38	—	—	
	1/2	15	1.12	28	1.81	46	2.25	1.02	
	3/4	20	1.31	33	2.19	56	2.30	1.04	
	1	25	1.38	35	2.44	62	2.69	1.22	
	1 1/4	32	1.69	43	2.97	75	4.69	2.13	
	1 1/2	40	1.72	44	3.31	84	5.60	2.54	
	2	50	2.06	52	4.00	102	9.50	4.31	
	2 1/2	65	2.50	64	4.75	121	15.50	7.03	
	3	80	3.12	79	5.75	146	31.00	14.06	
	4	100	3.12	79	6.00	152	—	—	

FIGURE 2134 Tees		Size		A		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg	
	1/8	6	0.97	25	1.00	25	—	—	
	1/4	8	1.12	28	1.31	33	—	—	
	3/8	10	1.31	33	1.50	38	—	—	
	1/2	15	1.50	38	1.81	46	2.25	1.02	
	3/4	20	1.75	44	2.19	56	2.30	1.04	
	1	25	2.00	51	2.44	62	2.69	1.22	
	1 1/4	32	2.38	60	2.97	75	4.69	2.13	
	1 1/2	40	2.50	64	3.31	84	5.60	2.54	
	2	50	3.25	83	4.00	102	9.50	4.31	
	2 1/2	65	3.75	95	4.75	121	15.50	7.03	
	3	80	4.19	106	5.75	146	31.00	14.06	
	4	100	4.50	114	6.00	152	—	—	

Forged Steel Fittings

Class 6000 Threaded

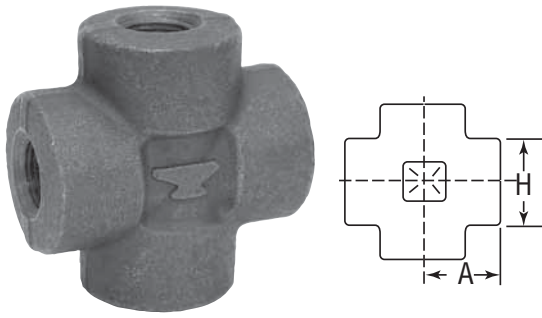
FIGURE 2135 Crosses		Size		A		H		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg	
	1/8	6	0.97	25	1.00	25	0.56	0.25	
	1/4	8	1.12	28	1.31	33	1.19	0.54	
	3/8	10	1.31	33	1.50	38	1.50	0.68	
	1/2	15	1.50	38	1.81	46	2.60	1.18	
	3/4	20	1.75	44	2.19	56	4.30	1.95	
	1	25	2.00	51	2.44	62	5.70	2.59	
	1 1/4	32	2.38	60	2.97	75	9.60	4.35	
	1 1/2	40	2.50	64	3.31	84	11.40	5.17	
	2	50	3.25	83	4.00	102	21.40	9.71	
	2 1/2	65	3.75	95	4.75	121	28.30	12.83	
	3	80	4.19	106	5.75	146	59.00	26.76	
	4	100	4.50	114	6.00	152	43.50	19.73	

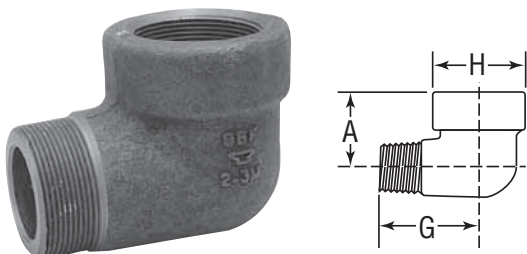
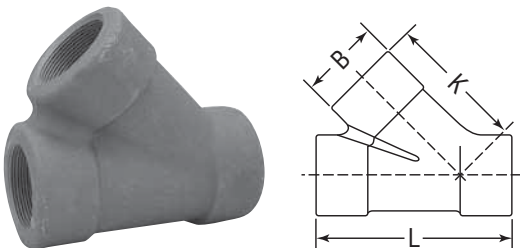
FIGURE 2133 90° Street Elbows		Size		A		G		H		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg	
	1/8	6	0.88	22	1.25	32	1.00	25	—	—	
	1/4	8	1.00	25	1.50	38	1.25	32	0.38	0.17	
	3/8	10	1.12	28	1.62	41	1.50	38	0.44	0.20	
	1/2	15	1.38	35	1.88	48	1.75	44	1.10	0.50	
	3/4	20	1.75	44	2.25	57	2.00	51	1.62	0.73	
	1	25	2.00	51	2.62	66	2.44	62	2.80	1.27	
	1 1/4	32	2.12	54	2.81	71	2.75	70	3.80	1.72	
	1 1/2	40	2.50	64	3.31	84	3.31	84	7.20	3.27	

FIGURE 2136 Laterals		Size		B		K		L		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg	
	½	15	1.84	46.74	3.00	76.20	4.13	104.90	3.25	1.46	
	¾	20	2.22	56.39	3.50	88.90	4.81	122.17	5.44	2.45	
	1	25	2.50	63.5	3.94	100.08	5.38	136.65	7.19	3.23	
	1¼	32	3.03	76.96	4.75	120.65	6.44	163.58	12.31	5.54	
	1½	40	3.34	84.84	5.00	127.00	6.63	168.40	15.95	7.25	

Forged Steel Fittings

Class 6000 Threaded

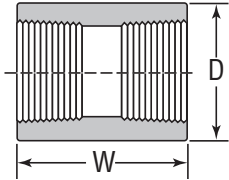
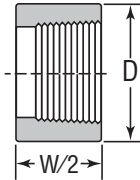
FIGURE 2137 Couplings	Size		D		W		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
 	1/8	6	0.88	22	1.25	32	0.17	0.08
	1/4	8	1.00	25	1.38	35	0.30	0.14
	3/8	10	1.25	32	1.50	38	0.45	0.20
	1/2	15	1.50	38	1.88	48	0.70	0.32
	3/4	20	1.75	44	2.00	51	1.15	0.52
	1	25	2.25	57	2.38	60	1.83	0.83
	1 1/4	32	2.50	64	2.62	67	2.08	0.94
	1 1/2	40	3.00	76	3.12	79	3.95	1.79
	2	50	3.62	92	3.38	86	6.50	2.95
	2 1/2	65	4.25	108	3.62	92	—	—
	3	80	5.00	127	4.25	108	—	—
	4	100	6.25	159	4.75	121	—	—

FIGURE 2141 Half Couplings	Size		D		W/2		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
 	1/8	6	0.88	22	0.63	16	0.08	0.04
	1/4	8	1.00	25	0.69	18	0.13	0.06
	3/8	10	1.25	32	0.75	19	0.22	0.10
	1/2	15	1.50	38	0.94	24	0.35	0.16
	3/4	20	1.75	44	1.00	26	0.46	0.21
	1	25	2.25	57	1.19	30	0.95	0.43
	1 1/4	32	2.50	64	1.31	34	1.10	0.50
	1 1/2	40	3.00	76	1.56	40	2.12	0.96
	2	50	3.62	92	1.69	43	3.00	1.36
	2 1/2	65	4.25	108	1.81	46	—	—
	3	80	5.00	127	2.13	54	—	—
	4	100	6.25	159	2.38	61	—	—

Forged Steel Fittings

Class 6000 Threaded

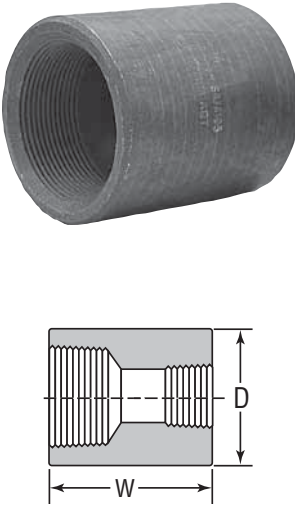
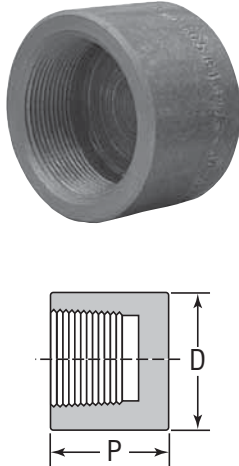
FIGURE 2138 Reducing Couplings 	Size				D		W		Unit Weight	
	NPS	DN	NPS	DN	in	mm	in	mm	lbs	kg
	1/4	8	1/8	6	1.00	25	1.38	35	–	–
	3/8	10	1/8	6	1.25	32	1.50	38	–	–
	1/2	15	1/8	6	1.50	38	1.88	48	0.78	0.35
	3/4	20	1/4	8	1.75	44	2.00	51	1.16	0.53
	1	25	1/4	8	2.25	57	2.38	60	2.03	0.92
	1 1/4	32	1/2	15	2.50	64	2.62	67	2.73	1.24
	1 1/2	40	3/4	20	3.00	76	3.12	79	4.70	2.13
	2	50	3/4	20	3.62	92	3.38	86	7.50	3.40
	2 1/2	65	1 1/4	32	4.25	108	3.62	92	–	–
	3	80	1 1/2	40	5.00	127	4.25	108	–	–
	4	100	2	50	6.25	159	4.75	121	–	–

FIGURE 2143 Pipe Caps 	Size		D		P		Unit Weight	
	NPS	DN	in	mm	in	mm	lbs	kg
	1/8	6	0.88	22	1.00	25	0.01	0.00
	1/4	8	1.00	25	1.06	27	0.01	0.00
	3/8	10	1.25	32	1.06	27	0.01	0.00
	1/2	15	1.50	38	1.31	33	0.41	0.19
	3/4	20	1.75	44	1.50	38	0.57	0.26
	1	25	2.25	57	1.69	43	1.17	0.53
	1 1/4	32	2.50	64	1.81	46	1.42	0.64
	1 1/2	40	3.00	76	1.88	48	2.17	0.98
	2	50	3.62	92	2.00	51	3.66	1.66
	2 1/2	65	4.25	108	2.50	64	4.94	2.24
	3	80	5.00	127	2.69	68	7.66	3.47
	4	100	6.25	159	2.94	75	14.53	6.59

Forged Steel Fittings

Class 3000 Socket Weld

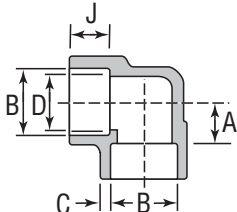
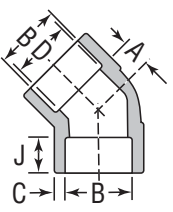
FIGURE 2150 90° Elbows	Size		A Nominal		B Socket Dia.		C Minimum		D Bore Dia.		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
 	1/8	6	0.44	11.0	.440 .420	11.2 10.8	0.125	3.18	.299 .239	7.6 6.1	0.38	9.5	0.25	0.11
	1/4	8	0.44	11.0	.575 .555	14.6 14.2	0.130	3.30	.394 .334	10.0 8.5	0.38	9.5	0.31	0.14
	3/8	10	0.53	13.5	.710 .690	18.0 17.6	0.138	3.50	.523 .463	13.3 11.8	0.38	9.5	0.31	0.14
	1/2	15	0.62	15.5	.875 .855	22.2 21.8	0.161	4.09	.652 .592	16.6 15.0	0.38	9.5	0.53	0.24
	3/4	20	0.75	19.0	1.085 1.065	27.6 27.2	0.168	4.27	.854 .794	21.7 20.2	0.50	12.5	0.64	0.29
	1	25	0.88	22.5	1.350 1.330	34.3 33.9	0.196	4.98	1.079 1.019	27.4 25.9	0.50	12.5	0.95	0.43
	1 1/4	32	1.06	27.0	1.695 1.675	43.1 42.7	0.208	5.28	1.410 1.350	35.8 34.3	0.50	12.5	1.60	0.73
	1 1/2	40	1.25	32.0	1.935 1.915	49.2 48.8	0.218	5.54	1.640 1.580	41.6 40.1	0.50	12.5	2.12	0.96
	2	50	1.50	38.0	2.426 2.406	61.7 61.2	0.238	6.04	2.097 2.037	53.3 51.7	0.62	16.0	3.66	1.66
	2 1/2	65	1.62	41.0	2.931 2.906	74.4 73.9	0.302	7.67	2.529 2.409	64.2 61.2	0.62	16.0	6.10	2.77
	3	80	2.25	57.0	3.560 3.535	90.3 89.8	0.327	8.30	3.128 3.008	79.4 76.4	0.62	16.0	9.70	4.40
	4	100	2.62	66.5	4.570 4.545	115.7 115.2	0.368	9.35	4.086 3.966	103.8 100.7	0.75	19.0	23.00	10.43

FIGURE 2151 45° Elbows	Size		A Nominal		B Socket Dia.		C Minimum		D Bore Dia.		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
 	1/8	6	0.31	8.0	.440 .420	11.2 10.8	0.125	3.18	.299 .239	7.6 6.1	0.38	9.5	0.18	0.08
	1/4	8	0.31	8.0	.575 .555	14.6 14.2	0.130	3.30	.394 .334	10.0 8.5	0.38	9.5	0.16	0.07
	3/8	10	0.31	8.0	.710 .690	18.0 17.6	0.138	3.50	.523 .463	13.3 11.8	0.38	9.5	0.18	0.08
	1/2	15	0.44	11.0	.875 .855	22.2 21.8	0.161	4.09	.652 .592	16.6 15.0	0.38	9.5	0.43	0.20
	3/4	20	0.50	13.0	1.085 1.065	27.6 27.2	0.168	4.27	.854 .794	21.7 20.2	0.50	12.5	0.58	0.26
	1	25	0.56	14.0	1.350 1.330	34.3 33.9	0.196	4.98	1.079 1.019	27.4 25.9	0.50	12.5	0.90	0.41
	1 1/4	32	0.69	17.5	1.695 1.675	43.1 42.7	0.208	5.28	1.410 1.350	35.8 34.3	0.50	12.5	1.30	0.59
	1 1/2	40	0.81	20.5	1.935 1.915	49.2 48.8	0.218	5.54	1.640 1.580	41.6 40.1	0.50	12.5	1.57	0.71
	2	50	1.00	25.5	2.426 2.406	61.7 61.2	0.238	6.04	2.097 2.037	53.3 51.7	0.62	16.0	2.73	1.24
	2 1/2	65	1.12	28.5	2.931 2.906	74.4 73.9	0.302	7.67	2.529 2.409	64.2 61.2	0.62	16.0	7.50	3.40
	3	80	1.25	32.0	3.560 3.535	90.3 89.8	0.327	8.30	3.128 3.008	79.4 76.4	0.62	16.0	10.40	4.72
	4	100	1.62	41.0	4.570 4.545	115.7 115.2	0.368	9.35	4.086 3.966	103.8 100.7	0.75	19.0	19.80	8.98

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 3000 Socket Weld

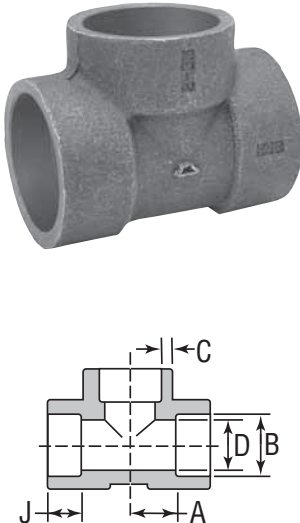
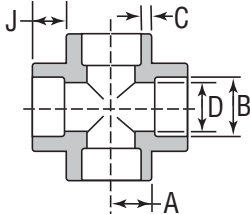
FIGURE 2152 Tees	Size		A Nominal		B Socket Dia.		C Minimum		D Bore Dia.		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
	1/8	6	0.44	11.0	.440 .420	11.2 10.8	0.125	3.18	.299 .239	7.6 6.1	0.38	9.5	0.28	0.13
	1/4	8	0.44	11.0	.575 .555	14.6 14.2	0.130	3.30	.394 .334	10.0 8.5	0.38	9.5	0.24	0.11
	3/8	10	0.53	13.5	.710 .690	18.0 17.6	0.138	3.50	.523 .463	13.3 11.8	0.38	9.5	0.38	0.17
	1/2	15	0.62	15.5	.875 .855	22.2 21.8	0.161	4.09	.652 .592	16.6 15.0	0.38	9.5	0.65	0.29
	3/4	20	0.75	19.0	1.085 1.065	27.6 27.2	0.168	4.27	.854 .794	21.7 20.2	0.50	12.5	0.86	0.39
	1	25	0.88	22.5	1.350 1.330	34.3 33.9	0.196	4.98	1.079 1.019	27.4 25.9	0.50	12.5	1.37	0.62
	1 1/4	32	1.06	27.0	1.695 1.675	43.1 42.7	0.208	5.28	1.410 1.350	35.8 34.3	0.50	12.5	2.00	0.91
	1 1/2	40	1.25	32.0	1.935 1.915	49.2 48.8	0.218	5.54	1.640 1.580	41.6 40.1	0.50	12.5	2.80	1.27
	2	50	1.50	38.0	2.426 2.406	61.7 61.2	0.238	6.04	2.097 2.037	53.3 51.7	0.62	16.0	3.85	1.75
	2 1/2	65	1.62	41.0	2.931 2.906	74.4 73.9	0.302	7.67	2.529 2.409	64.2 61.2	0.62	16.0	8.20	3.72
	3	80	2.25	57.0	3.560 3.535	90.3 89.8	0.327	8.30	3.128 3.008	79.4 76.4	0.62	16.0	12.00	5.44
	4	100	2.62	66.5	4.570 4.545	115.7 115.2	0.368	9.35	4.086 3.966	103.8 100.7	0.75	19.0	29.00	13.15

FIGURE 2153 Crosses	Size		A Nominal		B Socket Dia.		C Minimum		D Bore Dia.		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
 	⅛	6	0.44	11.0	.440 .420	11.2 10.8	0.125	3.18	.299 .239	7.6 6.1	0.38	9.5	0.45	0.20
	¼	8	0.44	11.0	.575 .555	14.6 14.2	0.130	3.30	.394 .334	10.0 8.5	0.38	9.5	0.38	0.17
	⅜	10	0.53	13.5	.710 .690	18.0 17.6	0.138	3.50	.523 .463	13.3 11.8	0.38	9.5	0.32	0.15
	½	15	0.62	15.5	.875 .855	22.2 21.8	0.161	4.09	.652 .592	16.6 15.0	0.38	9.5	0.81	0.37
	¾	20	0.75	19.0	1.085 1.065	27.6 27.2	0.168	4.27	.854 .794	21.7 20.2	0.50	12.5	1.10	0.50
	1	25	0.88	22.5	1.350 1.330	34.3 33.9	0.196	4.98	1.079 1.019	27.4 25.9	0.50	12.5	1.56	0.71
	1¼	32	1.06	27.0	1.695 1.675	43.1 42.7	0.208	5.28	1.410 1.350	35.8 34.3	0.50	12.5	2.44	1.11
	1½	40	1.25	32.0	1.935 1.915	49.2 48.8	0.218	5.54	1.640 1.580	41.6 40.1	0.50	12.5	3.25	1.47
	2	50	1.50	38.0	2.426 2.406	61.7 61.2	0.238	6.04	2.097 2.037	53.3 51.7	0.62	16.0	5.20	2.36
	2½	65	1.62	41.0	2.931 2.906	74.4 73.9	0.302	7.67	2.529 2.409	64.2 61.2	0.62	16.0	13.40	6.08
	3	80	2.25	57.0	3.560 3.535	90.3 89.8	0.327	8.30	3.128 3.008	79.4 76.4	0.62	16.0	20.00	9.07
	4	100	2.62	66.5	4.570 4.545	115.7 115.2	0.368	9.35	4.086 3.966	103.8 100.7	0.75	19.0	—	—

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 3000 Socket Weld

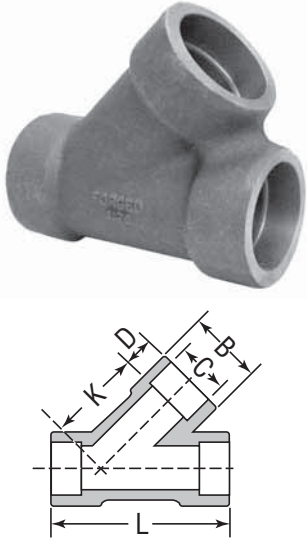
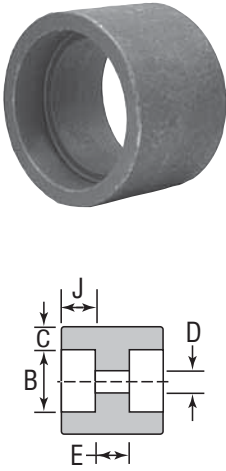
FIGURE 2158 Laterals	Size		B		C		D		K		L		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
	½	15	1.31	33.27	0.855	21.72	0.375	8.89	2.125	54.66	3.000	76.20	1.00	0.45
	¾	20	1.56	39.62	1.065	27.05	0.500	12.70	2.563	65.10	3.563	90.50	1.50	0.68
	1	25	1.84	46.74	1.330	33.78	0.500	12.70	3.000	76.2	4.125	104.78	2.38	1.07
	1¼	32	2.22	56.39	1.675	41.91	0.500	12.70	3.500	88.90	4.813	122.25	3.75	1.69
	1½	40	2.50	63.50	1.915	49.53	0.500	12.70	3.938	100.03	5.375	135.89	4.13	1.91
	2	50	3.03	79.96	2.406	61.11	0.625	16.51	4.750	120.65	6.438	163.53	6.29	2.83

FIGURE 2154 Couplings	Size		B Socket Dia.		C Minimum		D Bore Dia.		E		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
	⅝	6	.440 .420	11.2 10.8	0.125	3.18	.299 .239	7.6 6.1	0.25	6.5	0.38	9.5	0.08	0.04
	¾	8	.575 .555	14.6 14.2	0.130	3.30	.394 .334	10.0 8.5	0.25	6.5	0.38	9.5	0.10	0.05
	⅞	10	.710 .690	18.0 17.6	0.138	3.50	.523 .463	13.3 11.8	0.25	6.5	0.38	9.5	0.16	0.07
	½	15	.875 .855	22.2 21.8	0.161	4.09	.652 .592	16.6 15.0	0.38	9.5	0.38	9.5	0.21	0.10
	¾	20	1.085 1.065	27.6 27.2	0.168	4.27	.854 .794	21.7 20.2	0.38	9.5	0.50	12.5	0.40	0.18
	1	25	1.350 1.330	34.3 33.9	0.196	4.98	1.079 1.019	27.4 25.9	0.50	12.5	0.50	12.5	0.55	0.25
	1¼	32	1.695 1.675	43.1 42.7	0.208	5.28	1.410 1.350	35.8 34.3	0.50	12.5	0.50	12.5	0.75	0.34
	1½	40	1.935 1.915	49.2 48.8	0.218	5.54	1.640 1.580	41.6 40.1	0.50	12.5	0.50	12.5	1.10	0.50
	2	50	2.426 2.406	61.7 61.2	0.238	6.04	2.097 2.037	53.3 51.7	0.75	19.0	0.62	16.0	1.65	0.75
	2½	65	2.931 2.906	74.4 73.9	0.302	7.67	2.529 2.409	64.2 61.2	0.75	19.0	0.62	16.0	3.25	1.47
	3	80	3.560 3.535	90.3 89.8	0.327	8.30	3.128 3.008	79.4 76.4	0.75	19.0	0.62	16.0	5.10	2.31
	4	100	4.570 4.545	115.7 115.2	0.368	9.35	4.086 3.966	103.8 100.7	0.75	19.0	0.75	19.0	7.50	3.40

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately ⅛ in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 3000 Socket Weld

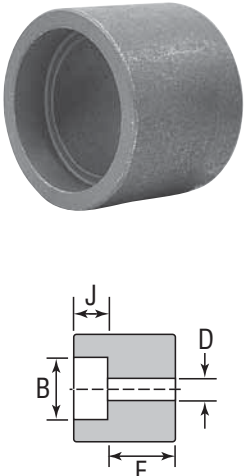
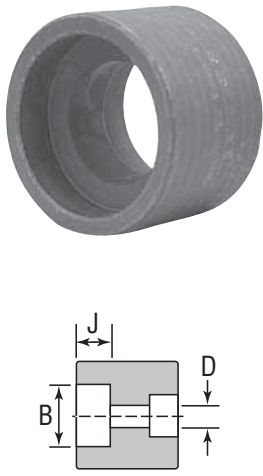
FIGURE 2155 Half Couplings	Size		B Socket Dia.		D Bore Dia.		F		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
	1/8	6	.440 .420	11.2 10.8	.299 .239	7.6 6.1	0.62	16.0	0.38	9.5	0.09	0.04
	1/4	8	.575 .555	14.6 14.2	.394 .334	10.0 8.5	0.62	16.0	0.38	9.5	0.12	0.05
	3/8	10	.710 .690	18.0 17.6	.523 .463	13.3 11.8	0.69	17.5	0.38	9.5	0.23	0.10
	1/2	15	.875 .855	22.2 21.8	.652 .592	16.6 15.0	0.88	22.5	0.38	9.5	0.28	0.13
	3/4	20	1.085 1.065	27.6 27.2	.854 .794	21.7 20.2	0.94	24.0	0.50	12.5	0.43	0.20
	1	25	1.350 1.330	34.3 33.9	1.079 1.019	27.4 25.9	1.12	28.5	0.50	12.5	0.66	0.30
	1 1/4	32	1.695 1.675	43.1 42.7	1.410 1.350	35.8 34.3	1.19	30.0	0.50	12.5	1.10	0.50
	1 1/2	40	1.935 1.915	49.2 48.8	1.640 1.580	41.6 40.1	1.25	32.0	0.50	12.5	1.06	0.48
	2	50	2.426 2.406	61.7 61.2	2.097 2.037	53.3 51.7	1.62	41.0	0.62	16.0	2.15	0.98
	2 1/2	65	2.931 2.906	74.4 73.9	2.529 2.409	64.2 61.2	1.69	43.0	0.62	16.0	3.70	1.68
	3	80	3.560 3.535	90.3 89.8	3.128 3.008	79.4 76.4	1.75	44.5	0.62	16.0	6.00	2.72
	4	100	4.570 4.545	115.7 115.2	4.086 3.966	103.8 100.7	1.88	48.0	0.75	19.0	8.00	3.63

FIGURE 2156 Reducing Couplings	Size				B Socket Dia.		D Bore Dia.		E		J Socket Depth Minimum		Unit Weight	
			Lowest Reduction											
	NPS	DN	NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
	1/4	8	1/8	6	.575 .555	14.6 14.2	.394 .334	10.0 8.5	0.25	6.5	0.38	9.5	0.10	0.05
	3/8	10	1/8	6	.710 .690	18.0 17.6	.523 .463	13.3 11.8	0.25	6.5	0.38	9.5	0.16	0.07
	1/2	15	1/8	6	.875 .855	22.2 21.8	.652 .592	16.6 15.0	0.38	9.5	0.38	9.5	0.21	0.10
	3/4	20	1/8	6	1.085 1.065	27.6 27.2	.854 .794	21.7 20.2	0.38	9.5	0.50	12.5	0.40	0.18
	1	25	1/8	6	1.350 1.330	34.3 33.9	1.079 1.019	27.4 25.9	0.50	12.5	0.50	12.5	0.55	0.25
	1 1/4	32	1/4	8	1.695 1.675	43.1 42.7	1.410 1.350	35.8 34.3	0.50	12.5	0.50	12.5	0.75	0.34
	1 1/2	40	1/4	8	1.935 1.915	49.2 48.8	1.640 1.580	41.6 40.1	0.50	12.5	0.50	12.5	1.10	0.50
	2	50	1/2	15	2.426 2.406	61.7 61.2	2.097 2.037	53.3 51.7	0.75	19.0	0.62	16.0	1.65	0.75
	2 1/2	65	1/2	15	2.931 2.906	74.4 73.9	2.529 2.409	64.2 61.2	0.75	19.0	0.62	16.0	3.25	1.47
	3	80	1 1/2	40	3.560 3.535	90.3 89.8	3.128 3.008	79.4 76.4	0.75	19.0	0.62	16.0	5.10	2.31
	4	100	2	50	4.570 4.545	115.7 115.2	4.086 3.966	103.8 100.7	0.75	19.0	0.75	19.0	7.50	3.40

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 3000 Socket Weld

FIGURE 2157 Pipe Caps	Size		B <i>Socket Dia.</i>		C <i>Minimum</i>		J <i>Socket Depth</i> <i>Minimum</i>		K		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
	1/8	6	.440 .420	11.2 10.8	0.125	3.18	0.38	9.5	0.19	4.8	0.07	0.03
	1/4	8	.575 .555	14.6 14.2	0.130	3.30	0.38	9.5	0.19	4.8	0.09	0.04
	3/8	10	.710 .690	18.0 17.6	0.138	3.50	0.38	9.5	0.19	4.8	0.17	0.08
	1/2	15	.875 .855	22.2 21.8	0.161	4.09	0.38	9.5	0.25	6.4	0.30	0.14
	3/4	20	1.085 1.065	27.6 27.2	0.168	4.27	0.50	12.5	0.25	6.4	0.37	0.17
	1	25	1.350 1.330	34.3 33.9	0.196	4.98	0.50	12.5	0.38	9.6	0.60	0.27
	1 1/4	32	1.695 1.675	43.1 42.7	0.208	5.28	0.50	12.5	0.38	9.6	0.96	0.44
	1 1/2	40	1.935 1.915	49.2 48.8	0.218	5.54	0.50	12.5	0.44	11.2	1.20	0.54
	2	50	2.426 2.406	61.7 61.2	0.238	6.04	0.62	16.0	0.50	12.7	2.00	0.91
	2 1/2	65	2.931 2.906	74.4 73.9	0.302	7.67	0.62	16.0	0.62	15.7	2.75	1.25
	3	80	3.560 3.535	90.3 89.8	0.327	8.30	0.62	16.0	0.75	19.0	5.00	2.27
	4	100	4.570 4.545	115.7 115.2	0.368	9.35	0.75	19.0	0.88	22.4	8.25	3.74

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 6000 Socket Weld

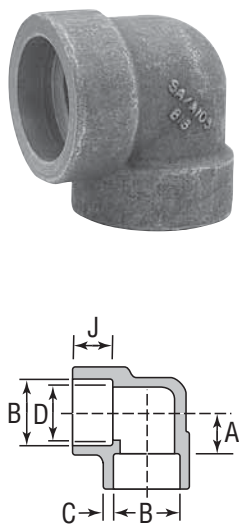
FIGURE 2170 90° Elbows 	Size		A Nominal		B Socket Dia.		C Minimum		D Bore Dia.		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
	½	15	0.75	19.0	.875 .855	22.2 21.8	0.204	5.18	.494 .434	12.5 11.0	0.38	9.5	0.90	0.41
	¾	20	0.88	22.5	1.085 1.065	27.6 27.2	0.238	6.04	.642 .582	16.3 14.8	0.50	12.5	1.50	0.68
	1	25	1.06	27.0	1.350 1.330	34.3 33.9	0.273	6.93	.845 .785	21.5 19.9	0.50	12.5	2.32	1.05
	1¼	32	1.25	32.0	1.695 1.675	43.1 42.7	0.273	6.93	1.190 1.130	30.2 28.7	0.50	12.5	3.00	1.36
	1½	40	1.50	38.0	1.935 1.915	49.2 48.8	0.307	7.80	1.368 1.308	34.7 33.2	0.50	12.5	5.50	2.49
	2	50	1.62	41.0	2.426 2.406	61.7 61.2	0.374	9.50	1.717 1.657	43.6 42.1	0.62	16.0	6.50	2.95
	2½	65	2.25	57.1	2.931 2.906	74.4 73.9	0.41	10.41	2.185 2.065	55.5 52.5	0.62	16.0	12.00	5.44
	3	80	2.50	63.5	3.560 3.535	90.3 89.8	0.48	12.19	2.684 2.564	68.2 65.1	0.62	16.0	19.60	8.89
	4	100	2.62	66.5	4.570 4.545	115.7 115.2	0.58	14.73	3.498 3.378	88.8 85.8	0.75	19.0	36.40	16.51

FIGURE 2171 45° Elbows 	Size		A		B Socket Dia.		C Minimum		D Bore Dia.		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
	½	15	0.50	12.5	.875 .855	22.2 21.8	0.204	5.18	.494 .434	12.5 11.0	0.38	9.5	0.90	0.41
	¾	20	0.56	14.0	1.085 1.065	27.6 27.2	0.238	6.04	.642 .582	16.3 14.8	0.50	12.5	1.50	0.68
	1	25	0.69	17.5	1.350 1.330	34.3 33.9	0.273	6.93	.845 .785	21.5 19.9	0.50	12.5	2.32	1.05
	1¼	32	0.81	20.5	1.695 1.675	43.1 42.7	0.273	6.93	1.190 1.130	30.2 28.7	0.50	12.5	3.00	1.36
	1½	40	1.00	25.5	1.935 1.915	49.2 48.8	0.307	7.80	1.368 1.308	34.7 33.2	0.50	12.5	5.50	2.49
	2	50	1.12	28.5	2.426 2.406	61.7 61.2	0.374	9.50	1.717 1.657	43.6 42.1	0.62	16.0	6.50	2.95
	2½	65	1.25	31.8	2.931 2.906	74.4 73.9	0.41	10.41	2.185 2.065	55.5 52.5	0.62	16.0	12.00	5.44
	3	80	1.38	35.1	3.560 3.535	90.3 89.8	0.48	12.19	2.684 2.564	68.2 65.1	0.62	16.0	19.60	8.89
	4	100	1.58	40.1	4.570 4.545	115.7 115.2	0.58	14.73	3.498 3.378	88.8 85.8	0.75	19.0	36.40	16.51

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.
Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 6000 Socket Weld

FIGURE 2172 Tees		Size		A		B <i>Socket Dia.</i>		C <i>Minimum</i>		D <i>Bore Dia.</i>		J <i>Socket Depth Minimum</i>		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
½	15	0.75	19.0	.875 .855	22.2 21.8	0.204	5.18	.494 .434	12.5 11.0	0.38	9.5	1.16	0.53		
¾	20	0.88	22.5	1.085 1.065	27.6 27.2	0.238	6.04	.642 .582	16.3 14.8	0.50	12.5	2.00	0.91		
1	25	1.06	27.0	1.350 1.330	34.3 33.9	0.273	6.93	.845 .785	21.5 19.9	0.50	12.5	3.16	1.43		
1¼	32	1.25	32.0	1.695 1.675	43.1 42.7	0.273	6.93	1.190 1.130	30.2 28.7	0.50	12.5	3.62	1.64		
1½	40	1.50	38.0	1.935 1.915	49.2 48.8	0.307	7.80	1.368 1.308	34.7 33.2	0.50	12.5	7.10	3.22		
2	50	1.62	41.0	2.426 2.406	61.7 61.2	0.374	9.50	1.717 1.657	43.6 42.1	0.62	16.0	8.90	4.04		
2½	65	2.25	57.1	2.931 2.906	74.4 73.9	0.41	10.41	2.185 2.065	55.5 52.5	0.62	16.0	16.63	7.54		
3	80	2.50	63.5	3.560 3.535	90.3 89.8	0.48	12.19	2.684 2.564	68.2 65.1	0.62	16.0	23.80	10.79		
4	100	2.62	66.5	4.570 4.545	115.7 115.2	0.58	14.73	3.498 3.378	88.8 85.8	0.75	19.0	45.32	20.55		

FIGURE 2173 Crosses		Size		A		B <i>Socket Dia.</i>		C <i>Minimum</i>		D <i>Bore Dia.</i>		J <i>Socket Depth Minimum</i>		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
½	15	0.75	19.0	.875 .855	22.2 21.8	0.204	5.18	.494 .434	12.5 11.0	0.38	9.5	1.40	0.63		
¾	20	0.88	22.5	1.085 1.065	27.6 27.2	0.238	6.04	.642 .582	16.3 14.8	0.50	12.5	2.30	1.04		
1	25	1.06	27.0	1.350 1.330	34.3 33.9	0.273	6.93	.845 .785	21.5 19.9	0.50	12.5	3.80	1.72		
1¼	32	1.25	32.0	1.695 1.675	43.1 42.7	0.273	6.93	1.190 1.130	30.2 28.7	0.50	12.5	4.70	2.13		
1½	40	1.50	38.0	1.935 1.915	49.2 48.8	0.307	7.80	1.368 1.308	34.7 33.2	0.50	12.5	8.70	3.95		
2	50	1.62	41.0	2.426 2.406	61.7 61.2	0.374	9.50	1.717 1.657	43.6 42.1	0.62	16.0	9.30	4.22		

FIGURE 2178 Laterals		Size		B		C		D		K		L		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
½	15	1.56	39.62	0.855	21.72	0.375	8.89	2.56	65.10	3.56	90.50	2.00	0.91		
¾	20	1.84	46.74	1.065	27.05	0.500	12.70	3.00	76.20	4.13	104.78	3.06	1.39		
1	25	2.22	56.39	1.330	33.78	0.500	12.70	3.50	88.90	4.81	122.17	5.13	2.33		
1¼	32	2.50	63.50	1.675	41.91	0.500	12.70	3.94	100.08	5.38	135.89	6.25	2.84		
1½	40	3.03	76.96	1.915	49.53	0.500	12.70	4.75	120.65	6.44	163.58	11.94	5.43		

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 6000 Socket Weld

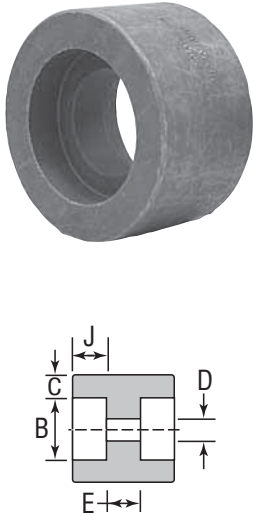
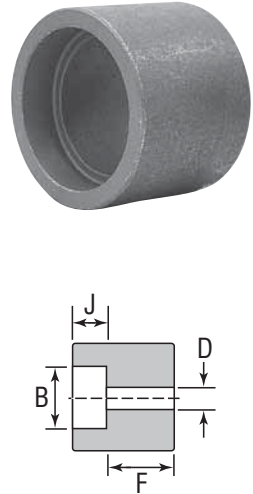
FIGURE 2174 Couplings	Size		B Socket Dia.		C Minimum		D Bore Dia.		E		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
	1/2	15	.875 .855	22.2 21.8	0.204	5.18	.494 .434	12.5 11.0	0.38	9.5	0.38	9.5	0.53	0.24
	3/4	20	1.085 1.065	27.6 27.2	0.238	6.04	.642 .582	16.3 14.8	0.38	9.5	0.50	12.5	0.56	0.25
	1	25	1.350 1.330	34.3 33.9	0.273	6.93	.845 .785	21.5 19.9	0.50	12.5	0.50	12.5	0.92	0.42
	1 1/4	32	1.695 1.675	43.1 42.7	0.273	6.93	1.190 1.130	30.2 28.7	0.50	12.5	0.50	12.5	1.16	0.53
	1 1/2	40	1.935 1.915	49.2 48.8	0.307	7.80	1.368 1.308	34.7 33.2	0.50	12.5	0.50	12.5	2.57	1.17
	2	50	2.426 2.406	61.7 61.2	0.374	9.50	1.717 1.657	43.6 42.1	0.75	19.0	0.62	16.0	4.75	2.15
	2 1/2	65	2.931 2.906	74.4 73.9	0.410	10.41	2.185 2.065	55.5 52.5	0.75	19.0	0.62	16.0	—	—
	3	80	3.560 3.535	90.3 89.8	0.480	12.19	2.684 2.564	68.2 65.1	0.75	19.0	0.62	16.0	—	—
	4	100	4.570 4.545	115.7 115.2	0.580	14.73	3.498 3.378	88.8 85.8	0.75	19.0	0.75	19.0	—	—

FIGURE 2175 Half Couplings	Size		B Socket Dia.		D Bore Dia.		F		J Socket Depth Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
	1/2	15	.875 .855	22.2 21.8	.494 .434	12.5 11.0	0.88	22.5	0.38	9.5	0.56	0.25
	3/4	20	1.085 1.065	27.6 27.2	.642 .582	16.3 14.8	0.94	24.0	0.50	12.5	0.95	0.43
	1	25	1.350 1.330	34.3 33.9	.845 .785	21.5 19.9	1.12	28.5	0.50	12.5	1.12	0.51
	1 1/4	32	1.695 1.675	43.1 42.7	1.190 1.130	30.2 28.7	1.19	30.0	0.50	12.5	1.87	0.85
	1 1/2	40	1.935 1.915	49.2 48.8	1.368 1.308	34.7 33.2	1.25	32.0	0.50	12.5	2.87	1.30
	2	50	2.426 2.406	61.7 61.2	1.717 1.657	43.6 42.1	1.62	41.0	0.62	16.0	3.62	1.64
	2 1/2	65	2.931 2.906	74.4 73.9	2.185 2.065	55.5 52.5	1.69	43.0	0.62	16.0	—	—
	3	80	3.560 3.535	90.3 89.8	2.684 2.564	68.2 65.1	1.75	44.5	0.62	16.0	—	—
	4	100	4.570 4.545	115.7 115.2	3.498 3.378	88.8 85.8	1.88	48.0	0.75	19.0	—	—

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

Class 6000 Socket Weld

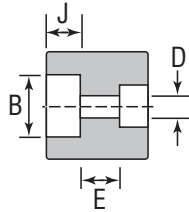
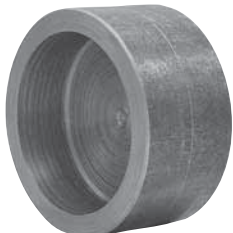
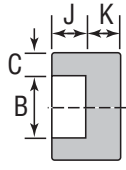
FIGURE 2176 Reducing Couplings	Size				B Socket Dia.		D Bore Dia.		E		J Socket Depth Minimum		Unit Weight	
	Lowest Reduction													
	NPS	DN	NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
 	½	15	¼	8	.875 .855	22.2 21.8	.494 .434	12.5 11.0	0.38	9.5	0.38	9.5	—	—
	¾	20	⅜	10	1.085 1.065	27.6 27.2	.642 .582	16.3 14.8	0.38	9.5	0.50	12.5	0.81	0.37
	1	25	⅜	10	1.350 1.330	34.3 33.9	.845 .785	21.5 19.9	0.50	12.5	0.50	12.5	1.80	0.82
	1¼	32	½	15	1.695 1.675	43.1 42.7	1.190 1.130	30.2 28.7	0.50	12.5	0.50	12.5	2.00	0.91
	1½	40	½	15	1.935 1.915	49.2 48.8	1.368 1.308	34.7 33.2	0.50	12.5	0.50	12.5	3.20	1.45
	2	50	¾	20	2.426 2.406	61.7 61.2	1.717 1.657	43.6 42.1	0.75	19.0	0.62	16.0	5.40	2.45
	2½	65	1¼	32	2.931 2.906	74.4 73.9	2.185 2.065	55.5 52.5	0.75	19.0	0.62	16.0	—	—
	3	80	1½	40	3.560 3.535	90.3 89.8	2.684 2.564	68.2 65.1	0.75	19.0	0.62	16.0	—	—
	4	100	2	50	4.570 4.545	115.7 115.2	3.498 3.378	88.8 85.8	0.75	19.0	0.75	19.0	—	—

FIGURE 2177 Pipe Caps	Size		B Socket Dia.		C Minimum		J Socket Depth Minimum		K Minimum		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
 	1/2	15	.875 .855	22.2 21.8	0.204	5.18	0.38	9.5	0.31	7.9	0.42	0.19
	3/4	20	1.085 1.065	27.6 27.2	0.238	6.04	0.50	12.5	0.31	7.9	0.58	0.26
	1	25	1.350 1.330	34.3 33.9	0.273	6.93	0.50	12.5	0.44	11.2	1.21	0.55
	1 1/4	32	1.695 1.675	43.1 42.7	0.273	6.93	0.50	12.5	0.44	11.2	1.00	0.45
	1 1/2	40	1.935 1.915	49.2 48.8	0.307	7.80	0.50	12.5	0.50	12.7	2.12	0.96
	2	50	2.426 2.406	61.7 61.2	0.374	9.50	0.62	16.0	0.62	15.7	4.87	2.21
	2 1/2	65	2.931 2.906	74.4 73.9	0.41	10.41	0.62	16.0	0.75	19.0	—	—
	3	80	3.560 3.535	90.3 89.8	0.48	12.19	0.62	16.0	0.88	22.4	—	—
	4	100	4.570 4.545	115.7 115.2	0.58	14.73	0.75	19.0	1.12	28.4	—	—

Note: When the pipe is seated against the bottom of the socket prior to welding, to prevent possible cracking of the fillet welds, it is recommended that the pipe be withdrawn approximately 1/16 in (1.6mm) away from contact with the bottom of the socket before starting the weld.

Average of socket wall thickness around periphery shall be no less than listed values. The minimum values are permitted in localized areas.

Forged Steel Fittings

High Pressure Plugs

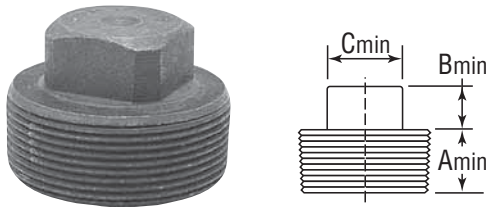
FIGURE 2122 Square Head Plugs		Size		A		B		C		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg	
	1/8	6	0.38	10	0.25	6	0.28	7	0.02	0.01	
	1/4	8	0.44	11	0.25	6	0.38	10	0.03	0.01	
	3/8	10	0.50	13	0.31	8	0.44	11	0.06	0.03	
	1/2	15	0.56	14	0.38	10	0.56	14	0.10	0.05	
	3/4	20	0.62	16	0.44	11	0.62	16	0.18	0.08	
	1	25	0.75	19	0.50	13	0.81	21	0.38	0.17	
	1 1/4	32	0.81	21	0.56	14	0.94	24	0.62	0.28	
	1 1/2	40	0.81	21	0.62	16	1.12	28	0.88	0.40	
	2	50	0.88	22	0.69	18	1.31	32	1.40	0.63	
	2 1/2	65	1.06	27	0.75	19	1.50	36	2.20	1.00	
	3	80	1.12	28	0.81	21	1.69	41	3.40	1.54	
	4	100	1.25	32	1.00	25	2.50	65	8.50	3.85	

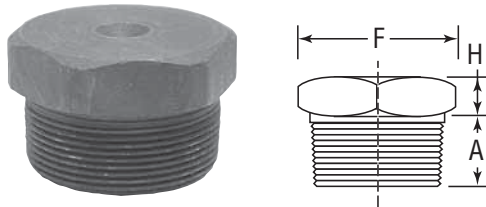
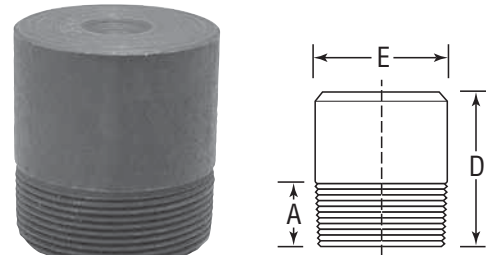
FIGURE 2142 Hex Head Plugs		Size		A		F Across Flats		H		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg	
	1/8	6	0.38	10	0.44	11	0.25	6	0.03	0.01	
	1/4	8	0.44	11	0.62	16	0.25	6	0.05	0.02	
	3/8	10	0.50	13	0.69	18	0.31	8	0.09	0.04	
	1/2	15	0.56	14	0.88	22	0.31	8	0.13	0.06	
	3/4	20	0.62	16	1.06	27	0.38	10	0.27	0.12	
	1	25	0.75	19	1.38	36	0.38	10	0.48	0.22	
	1 1/4	32	0.81	21	1.75	46	0.56	14	0.94	0.43	
	1 1/2	40	0.81	21	2.00	50	0.62	16	1.20	0.54	
	2	50	0.88	22	2.50	65	0.69	18	2.40	1.09	
	2 1/2	65	1.06	27	3.00	75	0.75	19	3.80	1.72	
	3	80	1.12	28	3.50	90	0.81	21	4.80	2.18	
	4	100	1.25	32	4.62	115	1.00	25	13.00	5.90	

FIGURE 2121 Round Head Plugs		Size		A		D		E		Unit Weight	
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg	
	1/8	6	0.38	10	1.38	35	0.41	10	0.05	0.02	
	1/4	8	0.44	11	1.62	41	0.53	13	0.10	0.05	
	3/8	10	0.50	13	1.62	41	0.69	18	0.16	0.07	
	1/2	15	0.56	14	1.75	44	0.84	21	0.28	0.13	
	3/4	20	0.62	16	1.75	44	1.06	27	0.42	0.19	
	1	25	0.75	19	2.00	51	1.31	33	0.82	0.37	
	1 1/4	32	0.81	21	2.00	51	1.69	43	1.20	0.54	
	1 1/2	40	0.81	21	2.00	51	1.91	49	1.50	0.68	
	2	50	0.88	22	2.50	64	2.38	60	3.20	1.45	
	2 1/2	65	1.06	27	2.75	70	2.88	73	—	—	
	3	80	1.12	28	2.75	70	3.50	89	—	—	
	4	100	1.25	32	3.00	76	4.50	114	—	—	

Note: Plugs and bushings are not identified by Pressure Class. They may be used for ratings up to Pressure Class 6000 (per ASME B16.11)

Forged Steel Fittings

High Pressure Bushings

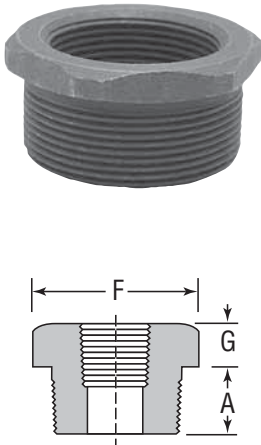
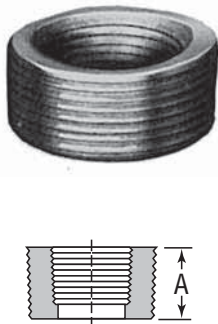
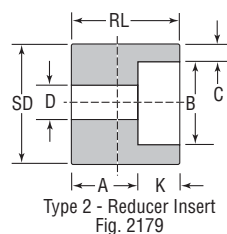
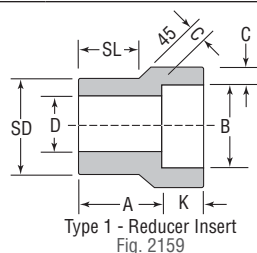
FIGURE 2139 Hex Head Bushings	Size				A		F		G		Unit Weight	
			Lowest Reduction									
	NPS	DN	NPS	DN	in	mm	in	mm	in	mm	lbs	kg
	1/4	8	1/8	6	0.44	11	0.62	16	0.12	3	0.02	0.01
	3/8	10	1/8	6	0.50	13	0.69	18	0.16	4	0.03	0.01
	1/2	15	1/8	6	0.56	14	0.88	22	0.19	5	0.06	0.03
	3/4	20	1/8	6	0.62	16	1.06	27	0.22	6	0.11	0.05
	1	25	1/8	6	0.75	19	1.38	36	0.25	6	0.20	0.09
	1 1/4	32	1/8	6	0.81	21	1.75	46	0.28	7	0.40	0.18
	1 1/2	40	1/4	8	0.81	21	2.00	50	0.31	8	0.50	0.23
	2	50	1/4	8	0.88	22	2.50	65	0.34	9	0.85	0.39
	2 1/2	65	1/2	15	1.06	27	3.00	75	0.38	10	1.20	0.54
	3	80	1/2	15	1.12	28	3.50	90	0.41	10	2.60	1.18
	4	100	1 1/2	40	1.25	32	4.62	115	0.50	13	7.00	3.17

FIGURE 2140 Flush Bushings	Size				A		Unit Weight	
			Lowest Reduction					
	NPS	DN	NPS	DN	in	mm	lbs	kg
	¼	8	⅛	6	0.44	11	0.03	0.01
	⅜	10	⅛	6	0.50	13	0.03	0.01
	½	15	⅛	6	0.56	14	0.06	0.03
	¾	20	⅛	6	0.62	16	0.09	0.04
	1	25	⅛	6	0.75	19	0.12	0.05
	1¼	32	⅛	6	0.81	21	0.15	0.07
	1½	40	¼	8	0.81	21	0.20	0.09
	2	50	¼	8	0.88	22	0.35	0.16

Note: Plugs and bushings are not identified by Pressure Class. They may be used for ratings up to Pressure Class 6000 (per ASME B16.11)

Forged Steel Fittings

Socket-Weld Reducer Inserts



CLASS 3000

For use with Schedule 40 and 80 Pipe

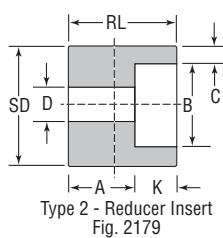
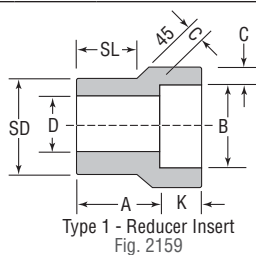
Reducer inserts comply with MSS standard SP-79. They enable standard socket-weld fittings to be used for making any combination of pipe line reductions quickly and economically. Socket-weld reducer inserts serve SD D the same purpose as threaded reducing bushings with threaded fittings.

Size				Class 3000 – For use with Schedule 40 and 80 Pipe										Unit Weight	
				A		D		C Min.		SL		RL Min.			
NPS	DN	NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
½	15	¼	8	0.81	20.57	0.364	9.25	0.149	3.78	0.62	15.75	—	—	0.18	0.08
		⅜	10	0.81	20.57	0.493	12.52	0.158	4.00	0.62	15.75	—	—		
¾	20	¼	8	0.69	17.53	0.364	9.25	0.149	3.78	—	—	1.06	27	0.25	0.11
		⅜	10	0.62	15.75	0.493	12.52	0.158	4.00	—	—	1.06	27		
		½	15	0.88	22.35	0.622	15.80	0.184	4.67	0.69	17.53	—	—		
1	25	¼	8	0.75	19.05	0.364	9.25	0.149	3.78	—	—	1.12	28	0.35	0.16
		⅜	10	0.69	17.53	0.493	12.52	0.158	4.00	—	—	1.12	28		
		½	15	0.62	15.75	0.622	15.80	0.184	4.67	—	—	1.12	28		
		¾	20	0.94	23.88	0.824	20.93	0.193	4.90	0.75	19.05	—	—		
1¼	32	¼	8	0.88	22.35	0.364	9.25	0.149	3.78	—	—	1.25	32	0.35	0.25
		⅜	10	0.81	20.57	0.493	12.52	0.158	4.00	—	—	1.25	32		
		½	15	0.75	19.05	0.622	15.80	0.184	4.67	—	—	1.25	32		
		¾	20	0.69	17.53	0.824	20.93	0.193	4.90	—	—	1.25	32		
		1	25	1.00	25.40	1.049	26.65	0.224	5.69	0.81	20.57	—	—		
1½	40	⅜	10	0.88	22.35	0.493	12.52	0.158	4.00	—	—	1.31	33	0.62	0.28
		½	15	0.81	20.57	0.622	15.80	0.184	4.67	—	—	1.31	33		
		¾	20	0.75	19.05	0.824	20.93	0.193	4.90	—	—	1.31	33		
		1	25	0.69	17.53	1.049	26.65	0.224	5.69	—	—	1.31	33		
		1¼	32	1.12	28.45	1.380	35.05	0.239	6.00	0.88	22.35	—	—		
2	50	½	15	1.00	25.40	0.622	15.80	0.184	4.67	—	—	1.50	38	1.50	0.68
		¾	20	0.94	23.88	0.824	20.93	0.193	4.90	—	—	1.50	38		
		1	25	0.88	22.35	1.049	26.65	0.224	5.69	—	—	1.50	38		
		1¼	32	0.81	20.57	1.380	35.05	0.239	6.00	—	—	1.50	38		
		1½	40	1.25	31.75	1.610	40.64	0.250	6.35	1.00	25.40	—	—		
2½	65	¾	20	1.56	39.62	0.824	20.93	0.193	4.90	—	—	2.12	54	3.00	1.36
		1	25	1.50	38.10	1.049	26.65	0.224	5.69	—	—	2.12	54		
		1¼	32	1.44	36.58	1.380	35.05	0.239	6.00	—	—	2.12	54		
		1½	40	1.38	35.05	1.610	40.64	0.250	6.35	—	—	2.12	54		
		2	50	1.81	46.00	2.067	52.50	0.273	6.93	1.50	38.10	—	—		
3	80	1	25	1.25	31.75	1.049	26.65	0.224	5.69	—	—	1.87	47	4.40	2.00
		1¼	32	1.19	30.23	1.380	35.05	0.239	6.00	—	—	1.87	47		
		1½	40	1.12	28.45	1.610	40.64	0.250	6.35	—	—	1.87	47		
		2	50	1.00	25.40	2.067	52.50	0.273	6.93	—	—	1.87	47		
		2½	65	1.50	38.10	2.469	62.71	0.345	8.76	1.25	31.75	—	—		

To minimize the possibility of cracking of the fillet welds, it is recommended that the shank portion of the reducer be withdrawn approximately .0625 in. (1.6 mm) away from the contact with the bottom of the socket before starting the weld. Likewise, the pipe is to be kept away from contacting the bottom of the reducer socket before welding.

Forged Steel Fittings

Socket-Weld Reducer Inserts



CLASS 6000

For use with Schedule 160 Pipe

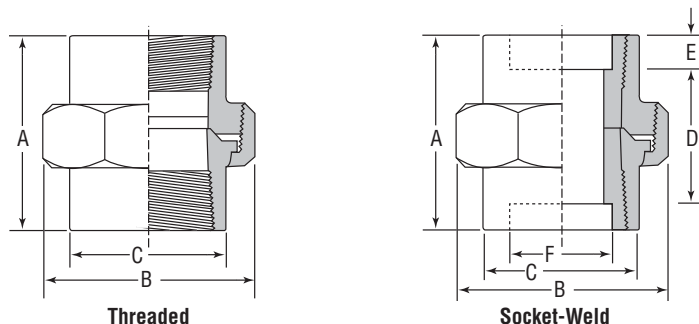
Reducer inserts comply with MSS standard SP-79. They enable standard socket-weld fittings to be used for making any combination of pipe line reductions quickly and economically. Socket-weld reducer inserts serve SD D the same purpose as threaded reducing bushings with threaded fittings.

Size				Class 6000 – For use with Schedule 160 Pipe												Unit Weight	
				Type	A		D		C Min.		SL		RL Min.				
NPS	DN	NPS	DN		in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg	
¾	20	¼	8	2	0.88	22.35	0.250	6.35	0.181	4.60	–	–	–	32	0.81	0.37	
		⅜	10	1	0.88	22.35	0.359	9.12	0.198	5.00	0.75	19.05	1.26	–			
		½	15	1	1.00	25.40	0.464	11.79	0.235	6.00	0.75	19.05	–	–			
1	25	¼	8	2	0.94	23.88	0.250	6.35	0.181	4.60	–	–	1.31	33	1.80	0.82	
		⅜	10	2	0.88	22.35	0.359	9.12	0.198	5.00	–	–	1.31	33			
		½	15	1	1.12	28.45	0.464	11.79	0.235	6.00	0.81	20.57	–	–			
		¾	20	1	1.12	28.45	0.612	15.49	0.274	6.96	0.81	20.57	–	–			
1¼	32	¼	8	2	1.00	25.40	0.250	6.35	0.181	4.60	–	–	1.37	35	2.00	0.91	
		⅜	10	2	0.94	23.88	0.359	9.12	0.198	5.00	–	–	1.37	35			
		½	15	2	0.88	22.35	0.464	11.79	0.235	6.00	–	–	1.37	35			
		¾	20	2	0.81	20.57	0.612	15.49	0.274	6.96	–	–	1.37	35			
		1	25	1	1.19	30.23	0.815	20.70	0.312	7.92	0.88	22.35	–	–			
1½	40	⅜	10	2	1.12	28.45	0.359	9.12	0.198	5.00	–	–	1.56	40	3.20	1.45	
		½	15	2	1.06	26.92	0.464	11.79	0.235	6.00	–	–	1.56	40			
		¾	20	2	1.00	25.40	0.612	15.49	0.274	6.96	–	–	1.56	40			
		1	25	1	1.15	29.21	0.815	20.70	0.312	7.92	1.00	25.40	–	–			
		1¼	32	1	1.38	35.05	1.160	29.46	0.312	7.92	1.00	25.40	–	–			
2	50	½	15	2	1.12	28.45	0.464	11.79	0.235	6.00	–	–	1.62	41	5.40	2.45	
		¾	20	2	1.06	26.92	0.612	15.49	0.274	6.96	–	–	1.62	41			
		1	25	2	1.00	25.40	0.815	20.70	0.312	7.92	–	–	1.62	41			
		1¼	32	2	0.94	23.88	1.160	29.46	0.312	7.92	–	–	1.62	41			

To minimize the possibility of cracking of the fillet welds, it is recommended that the shank portion of the reducer be withdrawn approximately .0625 in. (1.6 mm) away from the contact with the bottom of the socket before starting the weld. Likewise, the pipe is to be kept away from contacting the bottom of the reducer socket before welding.

Forged Steel Unions

Class 3000 Threaded & Socket-Weld



Manufactured to MSS standard practice SP83
(Class 6000 by method of MSS SP83)

FIGURE 2125: Threaded Union

Size		A		B		C*		D		E		F		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
1/4	8	1 11/16	43	1 31/64	38	53/64	21	25/32	20	7/16	11	0.555 0.575	14 15	0.30	0.14
3/8	10	1 27/32	47	1 11/16	43	1	25	31/32	25	7/16	11	0.690 0.710	18 18	0.50	0.23
1/2	15	2	51	1 15/16	49	1 3/16	30	1 3/32	28	7/16	11	0.855 0.875	22 22	0.70	0.32
3/4	20	2 5/16	59	2 3/8	60	1 15/32	37	1 5/32	29	9/16	14	1.065 1.085	27 28	1.20	0.54
1	25	2 7/16	62	2 25/32	71	1 25/32	45	1 3/8	35	9/16	14	1.330 1.350	34 34	1.70	0.77
1 1/4	32	2 7/8	73	3 23/64	85	2 7/32	68.6	1 45/64	43	9/16	14	1.675 1.695	43 43	2.50	1.13
1 1/2	40	3	76	3 23/64	85	2 35/64	65	1 7/8	48	9/16	14	1.915 1.935	49 49	3.30	1.50
2	50	3 1/2	89	4 27/64	112	3 1/16	78	2 1/16	52	1 1/16	17	2.406 2.426	61 62	5.30	2.40
2 1/2	65	4 1/4	108	5 15/64	133	3 9/16	90	2 3/8	60	7/8	22	2.906 2.931	74 74	8.60	3.90
3	80	4 7/16	113	6 5/32	156	4 9/32	109	2 7/16	62	1	25	3.535 3.560	90 90	12.70	5.76

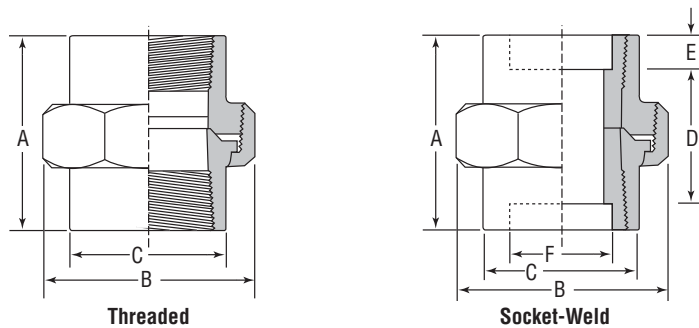
FIGURE 2126: Socket-Weld Union

Size		A		B		C*		D		E		F		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
1/4	8	1 11/16	43	1 31/64	38	53/64	21	25/32	20	7/16	11	0.555 0.575	14 15	0.30	0.14
3/8	10	1 27/32	47	1 11/16	43	1	25	31/32	25	7/16	11	0.690 0.710	18 18	0.50	0.23
1/2	15	2	51	1 15/16	49	1 3/16	30	1 3/32	28	7/16	11	0.855 0.875	22 22	0.70	0.32
3/4	20	2 5/16	59	2 3/8	60	1 15/32	37	1 5/32	29	9/16	14	1.065 1.085	27 28	1.20	0.54
1	25	2 7/16	62	2 25/32	71	1 25/32	45	1 3/8	35	9/16	14	1.330 1.350	34 34	1.70	0.77
1 1/4	32	2 7/8	73	3 23/64	85	2 7/32	68.6	1 45/64	43	9/16	14	1.675 1.695	43 43	2.50	1.13
1 1/2	40	3	76	3 23/64	85	2 35/64	65	1 7/8	48	9/16	14	1.915 1.935	49 49	3.30	1.50
2	50	3 1/2	89	4 27/64	112	3 1/16	78	2 1/16	52	1 1/16	17	2.406 2.426	61 62	5.30	2.40
2 1/2	65	4 1/4	108	5 15/64	133	3 9/16	90	2 3/8	60	7/8	22	2.906 2.931	74 74	8.60	3.90
3	80	4 7/16	113	6 5/32	156	4 9/32	109	2 7/16	62	1	25	3.535 3.560	90 90	12.70	5.76

**C* dimension measures across octagon corners or across the diameter as applicable. The 2 1/2" NPS (65 DN) and 3" NPS (80 DN) – 3000 and 2" NPS (50 DN) – 6000 sizes have octagonal male and female ends; the other sizes are round.

Forged Steel Unions

Class 6000 Threaded & Socket-Weld



Manufactured to MSS standard practice SP83
(Class 6000 by method of MSS SP83)

FIGURE 2127: Threaded Union

Size		A		B		C*		D		E		F		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
1/4	8	1 ²⁷ / ₃₂	47	1 ¹¹ / ₁₆	43	1	25	3 ¹ / ₃₂	25	7/ ₁₆	11	0.555 0.575	14 15	0.60	0.27
3/8	10	2	51	1 ¹⁵ / ₁₆	49	1 ³ / ₁₆	30	1 ³ / ₃₂	28	7/ ₁₆	11	0.690 0.710	18 18	0.80	0.36
1/2	15	2 ⁵ / ₁₆	59	2 ³ / ₈	60	1 ¹⁵ / ₃₂	37	1 ⁵ / ₃₂	29	9/ ₁₆	14	0.855 0.875	22 22	1.40	0.63
3/4	20	2 ⁷ / ₁₆	62	2 ²⁵ / ₃₂	71	1 ²⁵ / ₃₂	45	1 ³ / ₈	35	9/ ₁₆	14	1.065 1.085	27 28	2.00	0.91
1	25	2 ⁷ / ₈	73	3 ²³ / ₆₄	85	2 ⁷ / ₃₂	686	1 ⁴⁵ / ₆₄	43	9/ ₁₆	14	1.330 1.350	34 34	3.10	1.41
1 ¹ / ₄	32	3	76	3 ²³ / ₃₂	94	2 ³⁵ / ₆₄	65	1 ⁷ / ₈	48	9/ ₁₆	14	1.675 1.695	43 43	5.90	2.68
1 ¹ / ₂	40	3 ¹ / ₂	89	4 ²⁷ / ₆₄	112	3 ¹ / ₁₆	78	2 ¹ / ₁₆	52	1 ¹ / ₁₆	17	1.915 1.935	49 49	6.60	2.99
2	50	4 ¹ / ₈	105	5 ¹⁵ / ₆₄	133	3 ⁹ / ₁₆	90	2 ³ / ₈	60	7/ ₈	22	2.406 2.426	61 62	10.50	4.76

FIGURE 2128: Socket-Weld Union

Size		A		B		C*		D		E		F		Unit Weight	
NPS	DN	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	lbs	kg
1/4	8	1 ²⁷ / ₃₂	47	1 ¹¹ / ₁₆	43	1	25	3 ¹ / ₃₂	25	7/ ₁₆	11	0.555 0.575	14 15	0.60	0.27
3/8	10	2	51	1 ¹⁵ / ₁₆	49	1 ³ / ₁₆	30	1 ³ / ₃₂	28	7/ ₁₆	11	0.690 0.710	18 18	0.80	0.36
1/2	15	2 ⁵ / ₁₆	59	2 ³ / ₈	60	1 ¹⁵ / ₃₂	37	1 ⁵ / ₃₂	29	9/ ₁₆	14	0.855 0.875	22 22	1.40	0.63
3/4	20	2 ⁷ / ₁₆	62	2 ²⁵ / ₃₂	71	1 ²⁵ / ₃₂	45	1 ³ / ₈	35	9/ ₁₆	14	1.065 1.085	27 28	2.00	0.91
1	25	2 ⁷ / ₈	73	3 ²³ / ₆₄	85	2 ⁷ / ₃₂	686	1 ⁴⁵ / ₆₄	43	9/ ₁₆	14	1.330 1.350	34 34	3.10	1.41
1 ¹ / ₄	32	3	76	3 ²³ / ₃₂	94	2 ³⁵ / ₆₄	65	1 ⁷ / ₈	48	9/ ₁₆	14	1.675 1.695	43 43	5.90	2.68
1 ¹ / ₂	40	3 ¹ / ₂	89	4 ²⁷ / ₆₄	112	3 ¹ / ₁₆	78	2 ¹ / ₁₆	52	1 ¹ / ₁₆	17	1.915 1.935	49 49	6.60	2.99
2	50	4 ¹ / ₈	105	5 ¹⁵ / ₆₄	133	3 ⁹ / ₁₆	90	2 ³ / ₈	60	7/ ₈	22	2.406 2.426	61 62	10.50	4.76

**C* dimension measures across octagon corners or across the diameter as applicable. The 2¹/₂" NPS (65 DN) and 3" NPS (80 DN) – 3000 and 2" NPS (50 DN) – 6000 sizes have octagonal male and female ends; the other sizes are round.

Forged Steel Anvilets

Anvil **Anvilets** provide a strong branch pipe connection, considerably stronger than a welded pipe-to-pipe connection. Consequently, with good welding procedures, Anvil **Anvilets** offer greater resistance to distortion and bursting.

Anvil **Anvilets** readily and economically permit the adding of branch connectors to existing piping installations, eliminating the relatively higher cost of cutting or disassembly and re-assembly required for the installation of tees.

Anvil **Anvilets** of the same outlet size as a header or run pipe size (i.e. "Full Size" **Anvilets**) are so proportioned that the (ellipticallyshaped) hole in the header pipe has the minimum weakening or distortion effect, and yet provides good fluid flow characteristics.

Specifications

Chemical and physical properties are rigidly controlled to ensure consistently high quality. Physical and chemical test reports are available on request. Traceability of individual Anvilets can be established through the heat code of each fitting.

Anvil **Anvilets** meet the requirements of MSS standard SP-97. They are forged from steel which complies with ASTM A105.

Threaded Anvilets - conform with ASME B1.20.1.

Socket-Weld Anvilets - dimensions conform with ASME B16.11.

Buttweld Anvilets - ends conform with ASME B16.25.

Reinforcement Requirements

ASME B31.1 Power Piping Code

ASME B31.3 Refinery Code

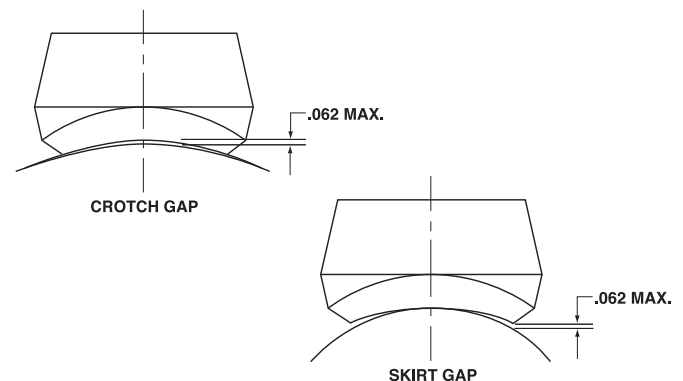
Forging Markings

Anvil **Anvilets** are clearly marked with the following:

- Outlet size
- Range of run pipe sizes that the **Anvilet** will fit
- The weight, schedule number, or pressure class
- The material specification
- Steel heat code identification

Installation Note

Anvil **Anvilets** are designed to have no more than a $\frac{1}{16}$ " gap (1.6mm) between the base or skirt of the **Anvilet** when it is seated directly upon the appropriate run pipe. However, it is recommended that the skirt of **Anvilets** be held slightly above the run pipe and tack welded to provide a small continuous root gap between the skirt and run pipe before completing the all-around welding beads or fillet.



Specials

Your local Anvil Branch will be more than happy to assist you with specially machined outlets and those made of alloy material.

Pressure Temperature Ratings

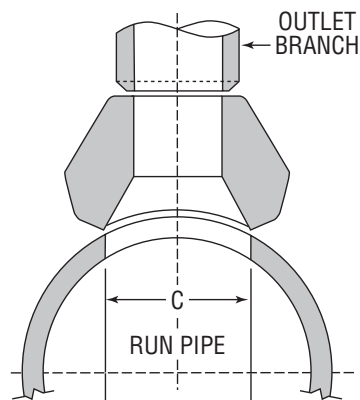
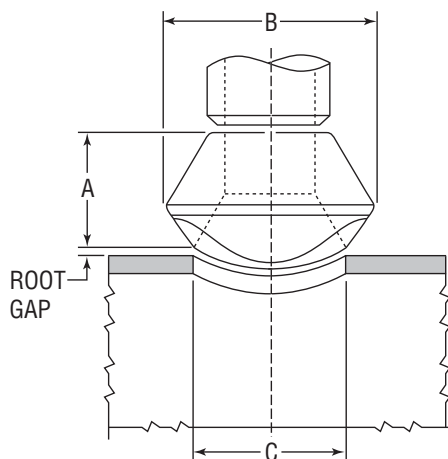
MSS standard Practice SP-97 gives the following correlation between fitting pressure class and pipe schedule number/wall thickness designation for calculation of pressure-temperature ratings:

Branch Connection Type	Pressure Class of Fitting	Branch Connection Size		Pipe Wall for Rating Basis
		NPS	DN	
Buttweld	STD	$\frac{1}{8}$ - 24	6 - 600	STD
	XS/XH	$\frac{1}{8}$ - 24	6 - 600	XS/XH
	SCH 160	$\frac{1}{2}$ - 6	15 - 150	SCH 160
Threaded	3,000	$\frac{1}{4}$ - 4	8 - 100	XS/XH
	6,000	$\frac{1}{2}$ - 2	15 - 50	SCH 160
Socket-Welding	3,000	$\frac{1}{2}$ - 2	15 - 50	XS/XH
	6,000	$\frac{1}{2}$ - 2	15 - 50	SCH 160

The maximum allowable pressure of a fitting is computed in accordance with the applicable piping code or regulation for straight seamless header (run) pipe or for material of equivalent composition and mechanical properties to the fitting. Any corrosion or mechanical allowances and any reduction in allowable stress due to temperature or other service conditions, must be applied to the pipe and fitting alike.

Universal Forged Steel Anvilets

Standard & Extra Strong Butt weld



BUTTWELD Standard



Outlet Size		Dimensions						Unit Weight	
		A		B		C			
NPS	DN	in	mm	in	mm	in	mm	lbs	kg
1/8	6	5/8	16	1	25	0.625	16	0.10	0.05
1/4	8	5/8	16	1	25	0.625	16	0.10	0.05
3/8	10	3/4	19	1	25	0.493	13	0.10	0.05
1/2	15	3/4	19	1 1/8	29	0.622	16	0.12	0.05
3/4	20	7/8	22	1 1/2	38	0.824	21	0.22	0.10
1	25	1 1/16	27	1 13/16	46	1.062	27	0.32	0.15
1 1/4	32	1 1/4	32	2 1/4	57	1.380	35	0.64	0.29
1 1/2	40	1 5/16	33	2 9/16	65	1.625	41	0.78	0.35
2	50	1 1/2	38	3 5/16	84	2.313	59	1.14	0.52
2 1/2	65	1 5/8	41	3 21/32	93	2.500	64	1.94	0.88
3	80	1 3/4	44	4 9/32	109	3.125	79	2.60	1.18
4	100	2	51	5 3/8	137	4.145	105	4.12	1.87
6	150	2 3/8	60	7 21/32	194	6.112	155	11.00	4.99
8	200	2 3/4	70	10 3/8	264	8.688	221	28.00	12.70
10	250	3 1/16	78	12 9/16	319	10.813	275	39.00	17.69
12	300	3 3/8	86	14 7/8	378	12.813	325	65.00	29.48
14	350	3 1/2	89	16 1/8	410	14.063	357	70.00	31.75
16	400	3 11/16	94	18 1/4	464	16.063	408	92.00	41.73
18	450	4 1/16	103	20 3/4	527	18.625	473	125.00	56.70
20	500	4 5/8	117	23 1/16	586	20.063	510	175.00	79.38
24	600	5 3/8	137	27 7/8	708	25.125	638	280.00	127.01

BUTTWELD Extra Strong



Outlet Size		Dimensions						Unit Weight	
		A		B		C			
NPS	DN	in	mm	in	mm	in	mm	lbs	kg
⅛	6	⅝	16	1	25	0.625	16	0.10	0.05
¼	8	⅝	16	1	25	0.625	16	0.10	0.05
⅜	10	¾	19	1	25	0.423	11	0.10	0.05
½	15	¾	19	1⅛	29	0.546	14	0.12	0.05
¾	20	⅞	22	1½	38	0.742	19	0.18	0.08
1	25	1⅙	27	2⅓⅙	71	1.062	27	0.36	0.16
1¼	32	1¼	32	2¼	57	1.278	32	0.55	0.25
1½	40	1⅙	33	2⅙	65	1.625	41	0.68	0.31
2	50	1½	38	3⅙	84	2.313	59	1.24	0.56
2½	65	1⅞	41	3⅒⅓	93	2.500	64	2.26	1.02
3	80	1¾	44	4⅑⅓	109	3.125	79	2.84	1.29
4	100	2	51	5⅜	137	4.145	105	4.56	2.07
6	150	3⅙	78	7⅒⅓	196	5.800	147	15.00	6.80
8	200	3⅞	98	10⅝	270	8.688	221	32.00	14.51
10	250	3½	89	12⅞	327	10.738	273	46.00	20.87
12	300	3⅙	100	15⅙	386	13.000	330	61.00	27.67
14	350	4⅛	105	16⅙	424	14.313	364	75.00	34.02
16	400	4⅙	113	18⅞	479	16.500	419	115.00	52.16
18	450	4⅙	119	21⅛	537	18.625	473	130.00	58.97
20	500	5	127	23⅜	594	20.813	529	187.00	84.82
24	600	5½	140	27⅞	708	25.125	638	316.00	143.34

Each outlet size listed is available to fit any run curvature. BW Ends per B16.9 and B16.25. Design per MSS-SP-97.

RUN PIPE SIZES Outlet sizes 6" and less fit a number of run pipe sizes, and the fittings are marked accordingly. See page 126 for run pipe size combination table(s).

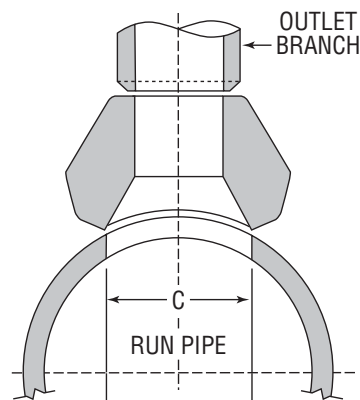
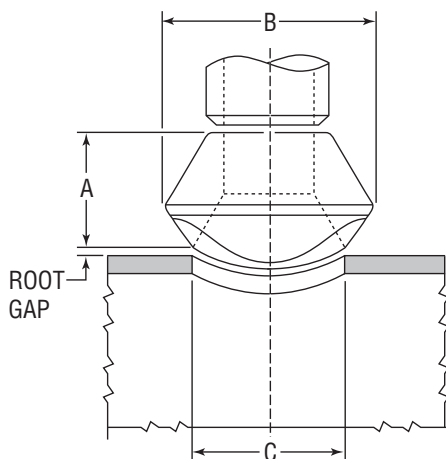
SCHEDULES Standard Weight Fittings are the same as schedule 40 fittings through 10". A schedule 40 butt-welded Universal Forged Steel Anvilet for sizes 12" and larger is available. Dimensions and prices on application. Extra Strong Fittings are the same as schedule 80 fittings through 8". A schedule 80 butt-welded Universal Forged Steel Anvilet for sizes 10" and larger is available. Dimensions and prices on application. Pipe schedule numbers and weight designations are in accordance with ASME B36.10.

FLATS Flat butt-welded Universal Forged Steel Anvilet fittings for use on welding caps, elliptical heads and flat surfaces is available.

The A,B and C dimensions given for the Branch Connections in the above Table are for reference only and to be used as a guideline. Dimensions B and C are subject to change depending upon the manufacturing process utilized. Although every attempt has been made to insure that the information contained in this table is correct, Anvil reserves the right to change the C dimension as deemed necessary.

Universal Forged Steel Anvilets

XXS, SCH. 160 Butt weld



BUTTWELD XXS, Sch. 160	Outlet Size		Dimensions						Unit Weight	
			A		B		C			
	NPS	DN	in	mm	in	mm	in	mm	lbs	kg
	½	15	1⅛	29	1⅜	35	0.563	14	0.25	0.11
	¾	20	1¼	32	1⅝	44	0.750	19	0.70	0.32
	1	25	1½	38	2	51	1.000	25	0.85	0.39
	1¼	32	1¾	44	2⅞	62	1.313	33	1.25	0.57
	1½	40	2	51	2¾	70	1.500	38	1.75	0.79
	2	50	2⅞	56	3⅝	81	1.688	43	2.15	0.98
	2½	65	2⅞	62	3⅝	97	2.125	54	3.40	1.54
	3	80	2⅞	73	4¾	121	2.875	73	6.30	2.86
4	100	3⅝	84	6	152	3.875	98	4.56	4.76	

Each outlet size listed is available to fit any run curvature. BW Ends per B16.9 and B16.25. Design per MSS-SP-97.

RUN PIPE SIZES Outlet sizes 6" and less fit a number of run pipe sizes, and the fittings are marked accordingly. See page 126 for run pipe size combination table(s).

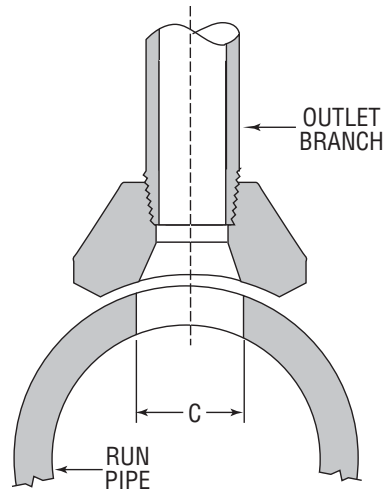
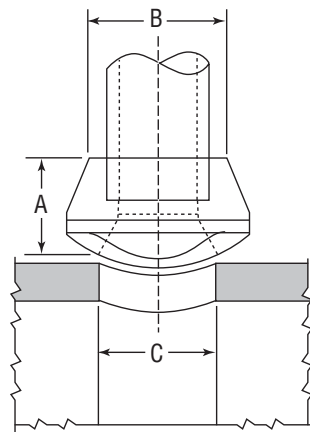
SCHEDULES Standard Weight Fittings are the same as schedule 40 fittings through 10". A schedule 40 butt-welded Universal Forged Steel Anvilet for sizes 12" and larger is available. Dimensions and prices on application. Extra Strong Fittings are the same as schedule 80 fittings through 8". A schedule 80 butt-welded Universal Forged Steel Anvilet for sizes 10" and larger is available. Dimensions and prices on application. Pipe schedule numbers and weight designations are in accordance with ASME B36.10.

FLATS Flat butt-welded Universal Forged Steel Anvilet fittings for use on welding caps, elliptical heads and flat surfaces is available.

The A,B and C dimensions given for the Branch Connections in the above Table are for reference only and to be used as a guideline. Dimensions B and C are subject to change depending upon the manufacturing process utilized. Although every attempt has been made to insure that the information contained in this table is correct, Anvil reserves the right to change the C dimension as deemed necessary.

Universal Forged Steel Anvilets

Class 3000 & 6000 Threaded



THREADED Class 3000



Outlet Size		Dimensions						Unit Weight	
		A		B		C			
NPS	DN	in	mm	in	mm	in	mm	lbs	kg
1/8	6	3/4	19	1	25	0.625	16	0.10	0.05
1/4	8	3/4	19	1 1/16	27	0.437	11	0.14	0.06
3/8	10	13/16	21	1 1/16	27	0.578	15	0.14	0.06
1/2	15	1	25	1 15/32	37	0.718	18	0.28	0.13
3/4	20	1 1/16	27	1 45/64	43	0.922	23	0.39	0.18
1	25	1 5/16	33	2 3/32	53	1.156	29	0.73	0.33
1 1/4	32	1 5/16	33	2 17/32	64	1.500	38	0.96	0.44
1 1/2	40	1 3/8	35	2 25/32	71	1.734	44	1.12	0.51
2	50	1 1/2	38	3 5/16	84	2.218	56	1.66	0.75
2 1/2	65	1 13/16	46	3 29/32	99	2.625	67	2.73	1.24
3	80	2	51	4 21/32	118	3.250	83	3.88	1.76
4	100	2 1/4	57	5 13/16	148	4.250	108	6.18	2.80

THREADED Class 6000



Outlet Size		Dimensions						Unit Weight	
		A		B		C			
NPS	DN	in	mm	in	mm	in	mm	lbs	kg
½	15	1¼	32	1¾	44	0.718	19	0.28	0.13
¾	20	1⅞	37	2⅛	52	0.922	24	0.39	0.18
1	25	1⅞	40	2⅞	64	1.156	31	0.73	0.33
1¼	32	1⅞	41	2½	64	1.500	40	0.96	0.44
1½	40	1⅞	43	3⅞	84	1.734	46	1.12	0.51
2	50	2⅞	52	3⅞	101	2.218	59	1.66	0.75

Each outlet size listed is available to fit any run curvature. Threaded ends are in accordance with ANSI/ASME B1.20.1. Design per MSS-SP-97.

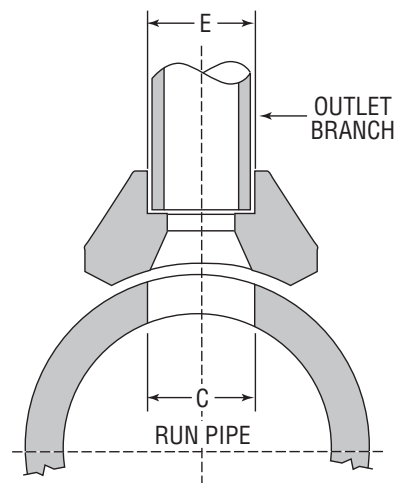
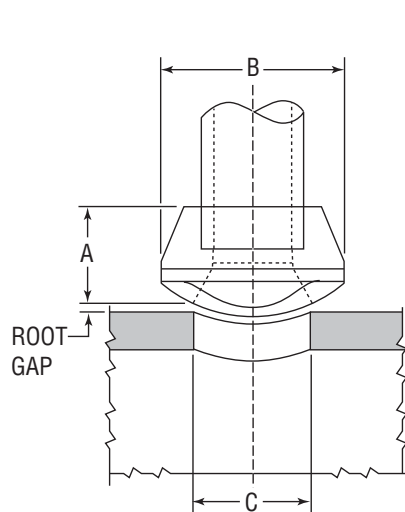
RUN PIPE SIZES Outlet sizes noted above fit a number of run pipe sizes, and the fittings are marked accordingly. See page 126 for run pipe size combination table(s).

FLATS A flat Threaded Universal Forged Steel Anvilet for use on welding caps, elliptical heads and flat surfaces is available.

The A,B and C dimensions given for the Branch Connections in the above Table are for reference only and to be used as a guideline. Dimensions B and C are subject to change depending upon the manufacturing process utilized. Although every attempt has been made to insure that the information contained in this table is correct, Anvil reserves the right to change the C dimension as deemed necessary.

Universal Forged Steel Anvilets

Standard & Extra Strong Socket-Weld



SOCKET-WELD Class 3000



Outlet Size		Dimensions								Unit Weight	
		A		B		C		E			
NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
1/8	6	3/4	19	1	25	0.625	16	9/32	7	0.10	0.05
1/4	8	3/4	19	1	25	0.364	9	3/8	10	0.14	0.06
3/8	10	13/16	21	1 1/16	27	0.493	13	7/16	11	0.14	0.06
1/2	15	1	25	1 15/32	37	0.622	16	9/16	14	0.28	0.13
3/4	20	1 1/16	27	1 45/64	43	0.824	21	9/16	14	0.39	0.18
1	25	1 5/16	33	2 3/32	53	1.049	27	25/32	20	0.73	0.33
1 1/4	32	1 5/16	33	2 17/32	64	1.380	35	23/32	18	0.96	0.44
1 1/2	40	1 3/8	35	2 25/32	71	1.610	41	3/4	19	1.12	0.51
2	50	1 1/2	38	3 5/16	84	2.067	53	13/16	21	1.66	0.75
2 1/2	65	1 13/16	46	3 29/32	99	2.469	63	3/4	19	2.73	1.24
3	80	2	51	4 21/32	118	3.068	78	15/16	24	3.88	1.76
4	100	2 1/4	57	5 13/16	148	4.026	102	1 1/16	27	6.60	2.99

SOCKET-WELD Class 6000



Outlet Size		Dimensions						Unit Weight			
		A		B		C				E	
NPS	DN	in	mm	in	mm	in	mm	in	mm	lbs	kg
½	15	1¼	32	1¾	44	0.464	12	1⅜	21	0.28	0.13
¾	20	1⅞	37	2⅛	52	0.612	16	1⅝	24	0.39	0.18
1	25	1⅞	40	2⅞	64	0.815	21	1⅝	26	0.73	0.33
1¼	32	1⅞	41	2½	64	1.160	29	1⅝	26	0.96	0.44
1½	40	1⅞	43	3⅞	84	1.338	34	1⅞	27	1.63	0.74
2	50	2⅞	52	3⅞	101	1.687	43	1⅞	35	1.66	0.75

Each outlet size listed is available to fit any run curvature. Socket dimensions are in accordance with ASME B16.11. Design per MSS-SP-97.

RUN PIPE SIZES Outlet sizes noted above fit a number of run pipe sizes, and the fittings are marked accordingly. See page 126 for run pipe size combination table(s).

FLATS A flat Socket-welded Universal Forged Steel Anvilet for use on welding caps, elliptical heads and flat surfaces is available.

The A,B and C dimensions given for the Branch Connections in the above Table are for reference only and to be used as a guideline. Dimensions B and C are subject to change depending upon the manufacturing process utilized. Although every attempt has been made to insure that the information contained in this table is correct, Anvil reserves the right to change the C dimension as deemed necessary.