

FORGED FITTINGS

WHAT ARE FORGED FITTINGS?

Forged fittings are formed via forging and machining from solid blocks of steel, stainless steel in our case to meet the final required shape set within the tolerances of the applicable specifications. These are split into two categories of forged fittings, namely Socket Weld Fittings and Threaded Fittings. These are further categorized in ratings of 3000#/6000#/9000#, the higher the class rating, the higher the pressure and temperature a fitting would be able to withstand.

Socket Weld Fittings are connected to pipes by fillet welds. It is typically used for when a strong and long-lasting connection is required. These are very reliable but also very time consuming due to welding of a small part.

Threaded fittings are screwed on fittings. It is typically used for less critical piping systems such as water distribution or for low pressure installations that are not subject to vibrations, elongations and bending forces. There are two types of common threading that one would find if they purchase threaded fittings and they are:

- **BSP** – BSP refers to British Standard Pipe and can be further divided into BSPT (Tapered) and BSPP (Parallel) as one of the few variations
- **NPT** – NPT refers to National Pipe Tapered.

Both these socket weld and threaded fittings are further categorized in ratings of 3000#/6000#/9000#, the higher the class rating, the higher the pressure and temperature a fitting would be able to withstand.

FORGED VS BUTTWELD FITTINGS

Forged fittings are typically used for piping systems that are smaller in nature as their manufacturing process does not allow for creation of larger fittings. Larger sized fittings are usually made via casting for butt weld fittings.

Forged fittings provides a higher tensile and fatigue strength as compared to butt weld fittings due to their superior casting process. This is not to say that forged fittings are superior but both types have their advantages. Casting provides one with a larger range of choices, as the tools used for casting are much cheaper and readily available.

In terms of application, the two types of forged fittings are in socket weld and threaded type. Socket weld fittings are connect to the pipes via fillet welds. Whereas threaded fittings are screwed onto the fitting itself. For butt weld fittings, these are connected via V weld (Butt weld).

TYPES OF FORGED FITTINGS & AVAILABILITY

FORGED FITTINGS	TYPES	NOMINAL BORE SIZE RANGE	304/L	316/L	31803/2205
SOCKET WELD FITTINGS	ELBOW 45 & 90 DEG	0.50 " - 2.00"	•	•	
	EQUAL TEE		•	•	
	HALF & FULL COUPLING		•	•	
	CAP		•	•	
	BOSS		•	•	
	UNION		•	•	
	NIPPLE		•	•	
THREADED FITTINGS	OLET	0.50 " - 2.00"	•	•	
	ELBOW 45 & 90 DEG		•	•	
	EQUAL TEE		•	•	
	HALF & FULL COUPLING		•	•	
	CAP		•	•	
	BOSS		•	•	
	UNION		•	•	
	NIPPLE		•	•	
	OLET		•	•	•
	HEX PLUGS & BUSHING		•	•	



THREADED ELBOW (LEFT), SOCKET WELD ELBOW (RIGHT)

FORGED ELBOWS (45° & 90°)

Forged elbows are used to change the direction of fluid in the piping system by 45° or 90°. Forged elbows are manufactured according to ASME B16.11 in various material grades, either with socket weld or threaded pipe connections.



THREADED EQUAL TEE (LEFT), SOCKET WELD EQUAL TEE (RIGHT)

FORGED TEE (EQUAL & REDUCING)

Forged tees are used to branch out a pipe at 90°. These tees are either available in equal or reducing types. Forged tees are manufactured to ASME B16.11 and are available in either socket weld or threaded connections (NPT or BSP). The dimensions of forged tees are covered by the MSS SP 75 and the ASME B16.11 specifications.



THREADED HALF COUPLING (LEFT), SOCKET WELD FULL COUPLING (RIGHT)

FORGED COUPLING (HALF, FULL & REDUCING)

Forged Couplings are forged fittings manufactured in accordance with ASME B16.11 and are used to join pipes. **Full Couplings** are used for connecting small bore pipes. It is used for connection between a pipe to pipe or pipe to swage or nipple. It can be threaded or socket ends types. **Half Couplings** are used for small bore branching from a vessel or large bore pipe. It can be threaded or socket type. It has a socket or thread end on only one side. **Reducing couplings** are used to connect pipes of dissimilar diameters. A reducing coupling has two different sizes of threads on each side. Reducing couplings are typically used where small process feeder lines are joined into large supply circuits or where small diameter fittings are installed.



THREADED UNION (LEFT), SOCKET WELD UNION (RIGHT)

UNION

Unions are used to connect pipes together in a way that requires only one pipe to be turned when removing the union to facilitate repairs. Pipe unions are also useful when connecting pipes of dissimilar metals against galvanic corrosion.



SOCKETOLET (LEFT), WELDOLET (TOP-RIGHT), THREAOLET (BOTTOM-RIGHT)

OLETS

Olet fittings are used to create a branch connection between the Run Pipe (header) to the branch pipe, an Outlet. Here at HH stainless, we commonly keep the following:

Weldolets are the mostly commonly used among all olets fittings, they are well suited for high pressure applications. Weldolets are used to create a 90-degrees pipe branch. The shape of the Weldolet ensures little stress concentration on the branched pipe, providing an integral reinforcement. **Socketlets** are similar to weldolets except that the branch pipe end will have a socket weld end. Socketlets are used to create a 90-degrees pipe branch and are typically used in lower pressure pipe lines in smaller diameters. **Threadolets** serve a similar purpose to both the olets introduced above in which its purpose is to create a 90-degrees pipe branch. The main difference is that it has a female threaded end. The threadolet end is generally a NPT type. **Other** types of olets include sweepolet / latrolet / elbolet / nipolet.



BARREL NIPPLE (LEFT), HEX NIPPLE (TOP-RIGHT), T.O.E NIPPLE (BOTTOM- RIGHT)

NIPPLE

A nipple is commonly fabricated from a short piece of pipe to be used as a fitting to connect between two pipes or fittings. Here at HH stainless, we commonly keep the following:

Barrel Nipples have both ends being NPT threaded. These are some of the most common types of pipe nipples due to their inherent strength and easy to remove design. **Hex Nipples** are similar to Barrel Nipples except that it has a hexagonal bolt shaped nut in the center. This allows for easy torquing, tightening or loosening using a wrench. **T.O.E Pipe Nipples** stands for Threaded-One-End. These are usually not used to link any pipes together but are commonly used as legs for oil tanks.



FORGED CAP

Forged caps are used to cover the endings of a pipe system either permanently or temporarily. Temporarily being for maintenance or for future expansion of connections.

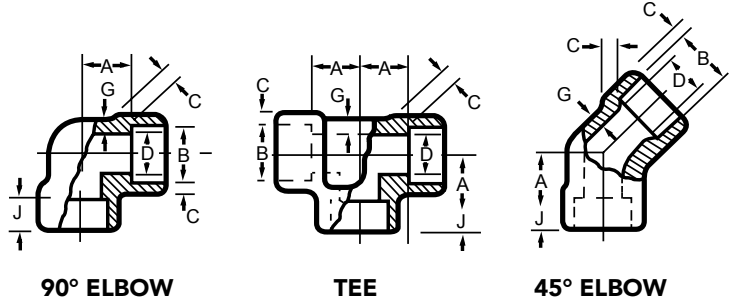


WELDING BOSS

Welding bosses serves a similar purpose to Olets whereby it is used as a branch connection between the run pipe (header) or a nozzle connection on the equipment. It is available in either socket weld or threaded end. A branch pipe is joined by socket welding or threaded connection of the boss. The boss is then welded onto the external surface of pipe header. Compared to a half coupling, the other end is bevelled at an angle.

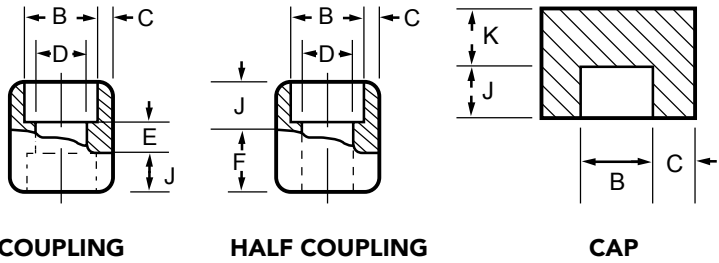
SOCKET - WELD FITTING

ASME B16.11-2001



SOCKET - WELD FITTING

ASME B16.11-2001



DN	Nom. Pipe Size	Socket Bore Dia. (2) B	Bore Diameter Fittings (2) D			Socket Wall Thickness (1) C						Body Wall Thickness G			Depth of Socket Min. J	
			Class Designation	Class Designation					Class Designation							
							3000		6000		9000		3000	6000		9000
				3000	6000	9000	Ave.	Min.	Ave.	Min.	Ave.	Min.	Min.	Min.		Min.
6	1/8	11.2	7.6	4.8		3.18	3.18	3.96	3.43			2.41	3.15		9.5	
		10.8	6.1	3.2												
8	1/4	14.6	10.0	7.1		3.78	3.30	4.60	4.01			3.02	3.68		9.5	
		14.2	8.5	5.6												
10	3/8	18.0	13.3	9.9		4.01	3.50	5.03	4.37			3.20	4.01		9.5	
		17.6	11.8	8.4												
15	1/2	22.2	16.6	12.5	7.2	4.67	4.09	5.97	5.18	9.35	8.18	3.73	4.78	7.47	9.5	
		21.8	15.0	11.0	5.6											
20	3/4	27.6	21.7	16.3	11.8	4.90	4.27	6.96	6.04	9.78	8.56	3.91	5.56	7.82	12.5	
		27.2	20.2	14.8	10.3											
25	1	34.3	27.4	21.5	16.0	5.69	4.98	7.92	6.93	11.38	9.96	4.55	6.35	9.09	12.5	
		33.9	25.9	19.9	14.4											
32	1-1/4	43.1	35.8	30.2	23.5	6.07	5.28	7.92	6.93	12.14	10.62	4.85	6.35	9.70	12.5	
		42.7	34.3	28.7	22.0											
40	1-1/2	49.2	41.6	34.7	28.7	6.35	5.54	8.92	7.80	12.70	11.12	5.08	7.14	10.15	12.5	
		48.8	40.1	33.2	27.2											
50	2	61.7	53.3	43.6	38.9	6.93	6.04	10.92	9.50	13.84	12.12	5.54	8.74	11.07	16.0	
		61.2	51.7	42.1	37.4											
65	2-1/2	74.4	64.2			8.76	7.67					7.01			16.0	
		73.9	61.2													
80	3	90.3	79.4			9.52	8.30					7.62			16.0	
		89.8	76.4													
100	4	115.7	103.8			10.69	9.35					8.56			19.0	
		115.2	100.7													

Dimensions in Millimeters.

We do not keep 4" and below 1/4", highlighted in grey.

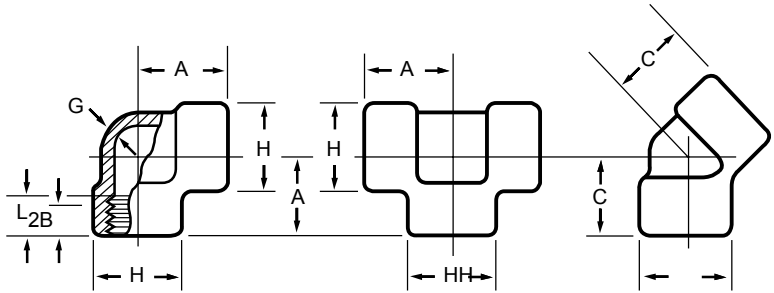
Nom. Pipe Size	DN	Center to Bottom of Socket-A						Laying Lengths					End Wall Thickness K Min.		
		90° Elbows Tees, Crosses			45° Elbows			Couplings	Half Couplings	Tolerances +/-					
		Class Designation			Class Designation					Class Designation					
		3000	6000	9000	3000	6000	9000			E	F	A	E	F	3000
1/8	6	11.0	11.0		8.0	8.0		6.5	16.0	1.0	1.5	1.0	4.8	6.4	
1/4	8	11.0	13.5		8.0	8.0		6.5	16.0	1.0	1.5	1.0	4.8	6.4	
3/8	10	13.5	15.5		8.0	11.0		6.5	17.5	1.5	3.0	1.5	4.8	6.4	
1/2	15	15.5	19.0	25.5	11.0	12.5	15.5	9.5	22.5	1.5	3.0	1.5	6.4	7.9	11.2
3/4	20	19.0	22.5	28.5	13.0	14.0	19.0	9.5	24.0	1.5	3.0	1.5	6.4	7.9	12.7
1	25	22.5	27.0	32.0	14.0	17.5	20.5	12.5	28.5	2.0	4.0	2.0	9.6	11.2	14.2
1-1/4	32	27.0	32.0	35.0	17.5	20.5	22.5	12.5	30.0	2.0	4.0	2.0	9.6	11.2	14.2
1-1/2	40	32.0	38.0	38.0	20.5	25.5	25.5	12.5	32.0	2.0	4.0	2.0	11.2	12.7	15.7
2	50	38.0	41.0	54.0	25.5	28.5	28.5	19.0	41.0	2.0	4.0	2.0	12.7	15.7	19.0
2-1/2	65	41.0			28.5			19.0	43.0	2.5	5.0	2.5	15.7	19.0	
3	80	57.0			32.0			19.0	44.5	2.5	5.0	2.5	19.0	22.4	
4	100	66.5			41.0			19.0	48.0	2.5	5.0	2.5	22.4	28.4	

Dimensions in Millimeters.

We do not keep 4" and below 1/4", highlighted in grey.
We do not keep duplex, only 304/L & 316/L.

THREADED FITTING

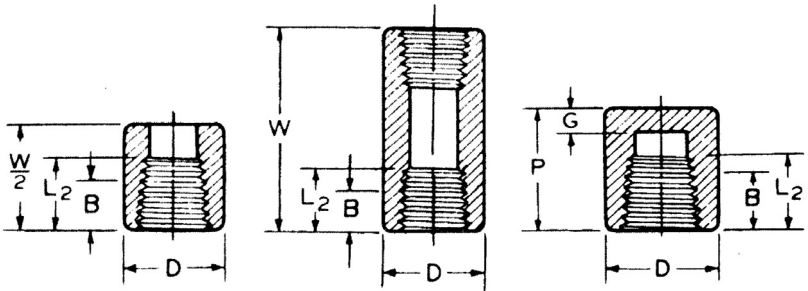
ASME B16.11-2001



90° ELBOW TEE 45° ELBOW

Dimensions in Millimeters.

DN	Nom. Pipe Size	Center to End Elbows, Tees, Cross A		Center to End 45° Elbows C		Outside of Diameter of Band H		Minimum Wall Thickness G		Length of Thread Min. (1)	
		3000	6000	3000	6000	3000	6000	3000	6000	B	L2
6	1/8	21	25	17	19	22	25	3.18	6.35	6.4	6.7
8	1/4	25	28	19	22	25	33	3.30	6.60	8.1	10.2
10	3/8	28	33	22	25	33	38	3.51	6.98	9.1	10.4
15	1/2	33	38	25	28	38	46	4.09	8.15	10.9	13.6
20	3/4	38	44	28	33	46	56	4.32	8.53	12.7	13.9
25	1	44	51	33	35	56	62	4.98	9.93	14.7	17.3
32	1-1/4	51	60	35	43	62	75	5.28	10.59	17.0	18.0
40	1-1/2	60	64	43	44	75	84	5.56	11.07	17.8	18.4
50	2	64	83	43	52	84	102	7.14	12.09	19.0	19.2
65	2-1/2	83	95	52	64	102	121	7.65	15.29	23.6	28.9
80	3	95	106	64	79	121	146	8.84	16.64	25.9	30.5
100	4	114	114	79	79	152	152	11.18	18.67	27.7	33.0



HALF COUPLING COUPLING CAP

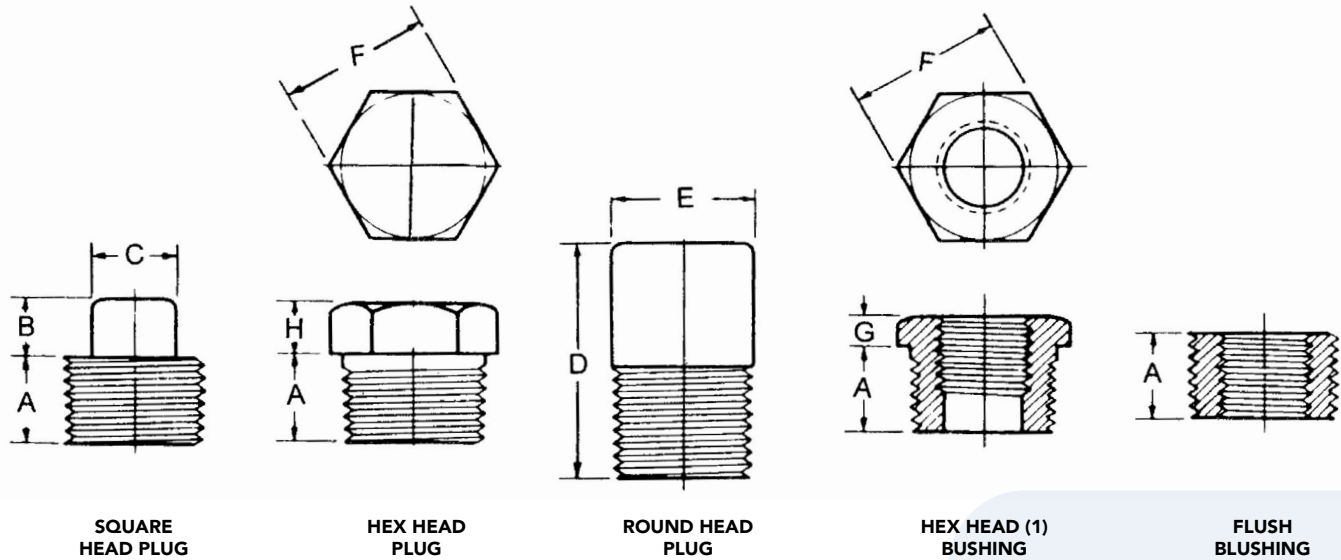
Dimensions in Millimeters.

DN	Nom. Pipe Size	End to End Couplings W		End to End Caps P		Outside Diameter D		End Wall Thickness G Min.		Length of Thread Min. (1)	
		3000 & 6000		3000	6000	3000	6000	3000	6000	B	L2
6	1/8	32	19		16	22	4.8	...	6.4	6.7	6.7
8	1/4	35	25	27	19	25	4.8	6.4	8.1	10.2	10.2
10	3/8	38	25	27	22	32	4.8	6.4	9.1	10.4	10.4
15	1/2	48	32	33	28	38	6.4	7.9	10.9	13.6	13.6
20	3/4	51	37	38	35	44	6.4	7.9	12.7	13.9	13.9
25	1	60	41	43	44	57	9.7	11.2	14.7	17.3	17.3
32	1-1/4	67	44	46	57	64	9.7	11.2	17.0	18.0	18.0
40	1-1/2	79	44	48	64	76	11.2	12.7	17.8	18.4	18.4
50	2	86	48	51	76	92	12.7	15.7	19.0	19.2	19.2
65	2-1/2	92	60	64	92	108	15.7	19.0	23.6	28.9	28.9
80	3	108	65	68	108	127	19.0	22.4	25.9	30.5	30.5
100	4	121	68	75	140	159	22.4	28.4	27.7	33.0	33.0

We don't keep cross tee.
We don't keep 4" and below 1/4". Highlighted in grey.
We do not keep duplex, only 304/L & 316/L.

THREADED FITTING

ASME B16.11-2001



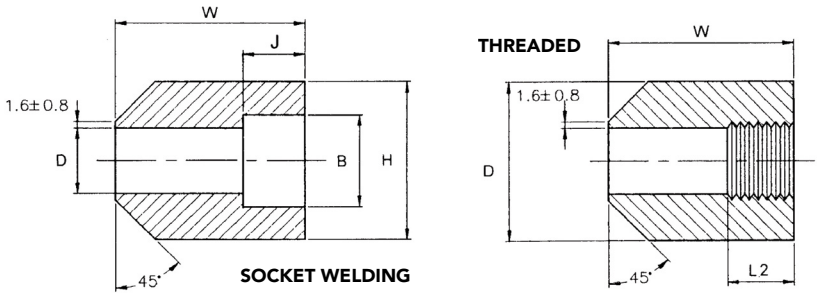
SQUARE HEAD PLUG HEX HEAD PLUG ROUND HEAD PLUG HEX HEAD (1) BUSHING FLUSH BLUSHING

DN	Nom. Pipe Size	Plugs Square Head			Plugs Round Head		Hex Plugs & Bushings		
		Length (Min.) A	Height of Square (Min.) B	Width Flats (Min.) C	Nominal Diameter of Head E	Length (Min.) D	Width Flats (Nom.) F	Hex Height Bushing G	Plug (Min.) 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

We don't keep 3" and above, and below 1/4".
We only keep Hex head Plug, Hex head Bushing.
3k/6k, one type.

Dimensions in Millimeters.

BOSSSES



SOCKET WELDING

Size (in)	B	D	J (Min.)	W	H
3000 LBS					
1/4	14.3	9.3	9.9	39.9	22.3
3/8	17.7	12.6	10.9	50.0	26.5
1/2	21.9	15.8	13.0	50.0	34.2
3/4	27.3	21.0	14.0	50.0	39.5
1	34.0	26.7	16.0	50.0	46.3
1-1/4	42.8	35.1	18.0	50.0	55.2
1-1/2	48.9	40.9	19.1	50.0	65.1
2	61.4	52.5	22.1	59.9	80.2
6000 LBS					
1/2	21.9	11.8	14.0	50.0	43.3
3/4	27.3	15.6	16.0	50.0	49.1
1	34.0	20.7	18.0	50.0	56.0
1-1/4	42.8	29.5	19.1	50.0	65.2
1-1/2	48.9	34.0	22.0	50	80.1
2	61.4	42.9	25.9	59.9	95.1

THREADED

Size (in)	D	W	L2 (Min.)
3000 Lbs			
1/4	22.1	39.9	10.0
3/8	25.9	50.0	10.5
1/2	34.0	50.0	13.5
3/4	39.1	50.0	14.0
1	48.0	50.0	17.5
1-1/4	59.9	50.0	18.0
1-1/2	65.0	50.0	18.5
2	80.0	59.9	19.0
6000 Lbs			
1/4	25.9	39.9	10.0
3/8	36.0	50.0	10.5
1/2	43.9	50.0	13.5
3/4	50.0	50.0	14.0
1	59.9	50.0	17.5
1-1/4	65.0	50.0	18.0
1-1/2	80.0	50.0	18.5
2	95.0	59.9	19.0

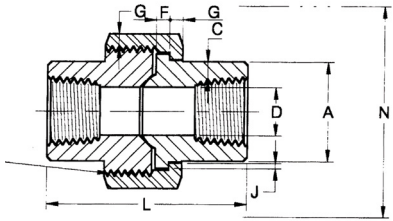
We don't keep 6000 LBS.

Dimensions in Millimeters.

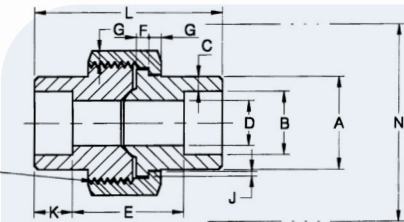
UNIONS

THREADED END MSS-SP-83-2001

H-Thrd's
Minimum 4 Full Thrd's
Engagement Class 2A/2B Fit
ANS1 B1.1



Nom. Pipe Size	Pipe End Min. A	Wall Min. C	Water Way Bore D	Male Flange Min. F	Nut Min. G	Thrds. Per 25.4mm Max H	Bearing Min. J	Length Assem. Nom. L	Clear Assem. Nut N
1/8	14.7	2.41	8.43 6.43	3.18	3.18	16	1.24	41.4	50.8
1/4	19.0	3.02	11.13 9.45	3.18	3.18	16	1.24	41.4	50.8
3/8	22.9	3.20	14.27 13.51	3.43	3.43	14	1.37	46.0	55.9
1/2	27.7	3.73	17.86 17.07	3.68	3.68	14	1.50	49.0	58.4
3/4	33.5	3.91	23.01 21.39	4.06	4.06	11	1.68	56.9	66.0
1	41.4	4.55	28.98 27.74	4.57	4.45	11	1.85	62.0	78.7
1-1/4	50.5	4.85	37.69 35.36	5.33	5.21	11	2.13	71.1	94.0
1-1/2	57.2	5.08	43.54 41.20	5.84	5.59	10	2.31	76.5	111.8
2	70.1	5.54	55.58 52.12	6.60	6.35	10	2.69	86.1	132.1
2-1/2	85.3	7.01	66.27 64.31	7.49	7.11	8	3.07	102.4	149.9
3	102.4	7.62	88.25 77.27	8.26	8.00	8	3.53	109.0	175.3



SOCKET WELD END MSS-SP-83-2001

H-Thrd's
Minimum 4 Full Thrd's
Engagement Class 2A/2B Fit
ANS1 B1.1

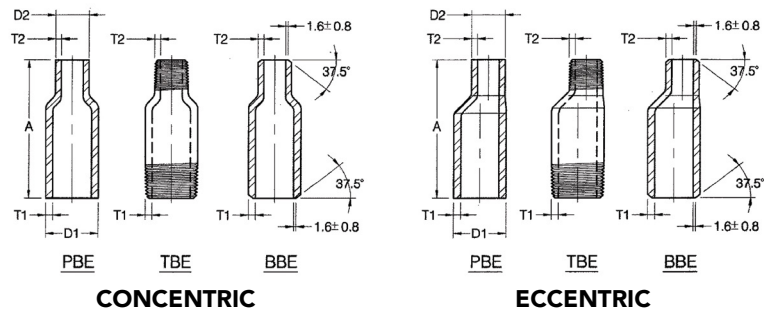
Nom. Pipe Size	Pipe End Min. A	Socket Bore Dia. B	Socket Wall Min. C	Water Way Bore D	Laying Length E	Male Flange Min. F	Nut Min. G	Thrds. Per 25.4mm H	Beaning Min. J	Depth of Socket Min. K	Length Assem. Nom. L	Clear Assem. Nut N	SW 3000 lbs	SW 6000 lbs
1/8	21.8	11.18 10.67	3.18	7.59 6.07	22.4 19.1	3.18	3.18	16	1.24	9.7	41.4	50.8		
1/4	21.8	14.61 14.10	3.30	10.01 8.48	22.4 19.1	3.18	3.18	16	1.24	9.7	41.4	50.8		
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	46.0	55.9		
1/2	31.2	22.23 21.73	4.09	16.56 15.04	26.9 20.6	3.68	3.68	14	1.50	9.7	49.0	58.4	●	●
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	66.0	●	●
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	62.0	78.7	●	●
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	94.0	●	
1-1/2	61.5	49.15 48.64	5.54	41.66 40.13	42.2 34.0	5.84	5.59	10	2.31	12.7	76.5	111.8	●	
2	75.2	61.62 61.11	6.05	53.26 51.74	45.5 37.3	6.60	6.35	10	2.69	15.7	86.1	132.1	●	
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		
3	109.2	90.42 89.79	8.31	79.45 76.40	63.8 53.6	8.26	8.00	8	3.53	15.7	109.0	175.3		

We keep 3000lbs and 6000lbs. We don't keep above 2" and below 1/2".

Dimensions in Millimeters.

SWAGED NIPPLE

MSS-SP-95-2000



Nominal Pipe Size (NPS)	Outside Diameter		End to End "A"	Wall Thickness							
	Large End D1	Small End D2		T1				T2			
				Sch40 (STD)	Sch80 (XS)	Sch160	XXS	Sch40 (STD)	Sch80 (XS)	Sch160	XXS
1/4x1/8	13.7	10.3	57	2.2	3.0	3.7	6.1	1.7	2.4	3.2	4.8
3/8x1/8	17.1	10.3	64	2.3	3.2	4.0	6.4	1.7	2.4	3.2	4.8
3/8x1/4	17.1	13.7	64	2.3	3.2	4.0	6.4	2.2	3.0	3.7	6.1
1/2x1/8	21.3	10.3	70	2.8	3.7	4.7	7.5	1.7	2.4	3.2	4.8
1/2x1/4	21.3	13.7	70	2.8	3.7	4.7	7.5	2.2	3.0	3.7	6.1
1/2x3/8	21.3	17.1	70	2.8	3.7	4.7	7.5	2.3	3.2	4.0	6.4
3/4x1/8	26.7	10.3	76	2.9	3.9	5.5	7.8	1.7	2.4	3.2	4.8
3/4x1/4	26.7	13.7	76	2.9	3.9	5.5	7.8	2.2	3.0	3.7	6.1
3/4x3/8	26.7	17.1	76	2.9	3.9	5.5	7.8	2.3	3.2	4.0	6.4
3/4x1/2	26.7	21.3	76	2.9	3.9	5.5	7.8	2.8	3.7	4.7	7.5
1x1/8	33.4	10.3	89	3.4	4.5	6.4	9.1	1.7	2.4	3.2	4.8
1x1/4	33.4	13.7	89	3.4	4.5	6.4	9.1	2.2	3.0	3.7	6.1
1x3/8	33.4	17.1	89	3.4	4.5	6.4	9.1	2.3	3.2	4.0	6.4
1x1/2	33.4	21.3	89	3.4	4.5	6.4	9.1	2.8	3.7	4.7	7.5
1x3/4	33.4	26.7	89	3.4	4.5	6.4	9.1	2.9	3.9	5.5	7.8
1-1/4x1/8	42.2	10.3	102	3.6	4.9	6.4	9.7	1.7	2.4	3.2	4.8
1-1/4x1/4	42.2	13.7	102	3.6	4.9	6.4	9.7	2.2	3.0	3.7	6.1
1-1/4x3/8	42.2	17.1	102	3.6	4.9	6.4	9.7	2.3	3.2	4.0	6.4
1-1/4x1/2	42.2	21.3	102	3.6	4.9	6.4	9.7	2.8	3.7	4.7	7.5
1-1/4x3/4	42.2	26.7	102	3.6	4.9	6.4	9.7	2.9	3.9	5.5	7.8
1-1/4x1	42.2	33.4	102	3.6	4.9	6.4	9.7	3.4	4.5	6.4	9.1
1-1/2x1/8	48.3	10.3	114	3.7	5.1	7.1	10.2	1.7	2.4	3.2	4.8
1-1/2x1/4	48.3	13.7	114	3.7	5.1	7.1	10.2	2.2	3.0	3.7	6.1
1-1/2x3/8	48.3	17.1	114	3.7	5.1	7.1	10.2	2.3	3.2	4.0	6.4
1-1/2x1/2	48.3	21.3	114	3.7	5.1	7.1	10.2	2.8	3.7	4.7	7.5
1-1/2x3/4	48.3	26.7	114	3.7	5.1	7.1	10.2	2.9	3.9	5.5	7.8
1-1/2x1	48.3	33.4	114	3.7	5.1	7.1	10.2	3.4	4.5	6.4	9.1
1-1/2x1-1/4	48.3	42.2	114	3.7	5.1	7.1	10.2	3.6	4.9	6.4	9.7
2x1/8	60.3	10.3	165	3.9	5.5	8.7	11.1	1.7	2.4	3.2	4.8
2x1/4	60.3	13.7	165	3.9	5.5	8.7	11.1	2.2	3.0	3.7	6.1
2x3/8	60.3	17.1	165	3.9	5.5	8.7	11.1	2.3	3.2	4.0	6.4
2x1/2	60.3	21.3	165	3.9	5.5	8.7	11.1	2.8	3.7	4.7	7.5
2x3/4	60.3	26.7	165	3.9	5.5	8.7	11.1	2.9	3.9	5.5	7.8
2x1	60.3	33.4	165	3.9	5.5	8.7	11.1	3.4	4.5	6.4	9.1
2x1-1/4	60.3	42.2	165	3.9	5.5	8.7	11.1	3.6	4.9	6.4	9.7
2x1-1/2	60.3	48.3	165	3.9	5.5	8.7	11.1	3.7	5.1	7.1	10.2
2-1/2x1/8	73.0	10.3	178	5.2	7.0	9.5	14.0	1.7	2.4	3.2	4.8
2-1/2x1/4	73.0	13.7	178	5.2	7.0	9.5	14.0	2.2	3.0	3.7	6.1
2-1/2x3/8	73.0	17.1	178	5.2	7.0	9.5	14.0	2.3	3.2	4.0	6.4
2-1/2x1/2	73.0	21.3	178	5.2	7.0	9.5	14.0	2.8	3.7	4.7	7.5
2-1/2x3/4	73.0	26.7	178	5.2	7.0	9.5	14.0	2.9	3.9	5.5	7.8

Nominal Pipe Size (NPS)	Outside Diameter		End to End "A"	Wall Thickness							
	Large End D1	Small End D2		T1				T2			
				Sch40 (STD)	Sch80 (XS)	Sch160	XXS	Sch40 (STD)	Sch80 (XS)	Sch160	XXS
2-1/2x1	73.0	33.4	178	5.2	7.0	9.5	14.0	3.4	4.5	6.4	9.1
2-1/2x1-1/4	73.0	42.2	178	5.2	7.0	9.5	14.0	3.6	4.9	6.4	9.7
2-1/2x1-1/2	73.0	48.3	178	5.2	7.0	9.5	14.0	3.7	5.1	7.1	10.2
2-1/2x2	73.0	60.3	178	5.2	7.0	9.5	14.0	3.9	5.5	8.7	11.1
3x1/8	88.9	10.3	203	5.5	7.6	11.5	15.2	1.7	2.4	3.2	4.8
3x1/4	88.9	13.7	203	5.5	7.6	11.5	15.2	2.2	3.0	3.7	6.1
3x3/8	88.9	17.1	203	5.5	7.6	11.5	15.2	2.3	3.2	4.0	6.4
3x1/2	88.9	21.3	203	5.5	7.6	11.5	15.2	2.8	3.7	4.7	7.5
3x3/4	88.9	26.7	203	5.5	7.6	11.5	15.2	2.9	3.9	5.5	7.8
3x1	88.9	33.4	203	5.5	7.6	11.5	15.2	3.4	4.5	6.4	9.1
3x1-1/4	88.9	42.2	203	5.5	7.6	11.5	15.2	3.6	4.9	6.4	9.7
3x1-1/2	88.9	48.3	203	5.5	7.6	11.5	15.2	3.7	5.1	7.1	10.2
3x2	88.9	60.3	203	5.5	7.6	11.5	15.2	3.9	5.5	8.7	11.1
3x2-1/2	88.9	73.0	203	5.5	7.6	11.5	15.2	5.2	7.0	9.5	14.0
3-1/2x1/8	101.6	10.3	203	5.7	8.1	-	-	1.7	2.4	3.2	4.8
3-1/2x1/4	101.6	13.7	203	5.7	8.1	-	-	2.2	3.0	3.7	6.1
3-1/2x3/8	101.6	17.1	203	5.7	8.1	-	-	2.3	3.2	4.0	6.4
3-1/2x1/2	101.6	21.3	203	5.7	8.1	-	-	2.8	3.7	4.7	7.5
3-1/2x3/4	101.6	26.7	203	5.7	8.1	-	-	2.9	3.9	5.5	7.8
3-1/2x1	101.6	33.4	203	5.7	8.1	-	-	3.4	4.5	6.4	9.1
3-1/2x1-1/4	101.6	42.2	203	5.7	8.1	-	-	3.6	4.9	6.4	9.7
3-1/2x1-1/2	101.6	48.3	203	5.7	8.1	-	-	3.7	5.1	7.1	10.2
3-1/2x2	101.6	60.3	203	5.7	8.1	-	-	3.9	5.5	8.7	11.1
3-1/2x2-1/2	101.6	73.0	203	5.7	8.1	-	-	5.2	7.0	9.5	14.0
3-1/2x3	101.6	88.9	203	5.7	8.1	-	-	5.5	7.6	11.5	15.2
4x1/4	114.3	13.7	229	6.0	8.6	13.5	17.1	2.2	3.0	3.7	6.1
4x3/8	114.3	17.1	229	6.0	8.6	13.5	17.1	2.3	3.2	4.0	6.4
4x1/2	114.3	21.3	229	6.0	8.6	13.5	17.1	2.8	3.7	4.7	7.5
4x3/4	114.3	26.7	229	6.0	8.6	13.5	17.1	2.9	3.9	5.5	7.8
4x1	114.3	33.4	229	6.0	8.6	13.5	17.1	3.4	4.5	6.4	9.1
4x1-1/4	114.3	42.2	229	6.0	8.6	13.5	17.1	3.6	4.9	6.4	9.7
4x1-1/2	114.3	48.3	229	6.0	8.6	13.5	17.1	3.7	5.1	7.1	10.2
4x2	114.3	60.3	229	6.0	8.6	13.5	17.1	3.9	5.5	8.7	11.1
4x2-1/2	114.3	73.0	229	6.0	8.6	13.5	17.1	5.2	7.0	9.5	14.0
4x3	114.3	88.9	229	6.0	8.6	13.5	17.1	5.5	7.6	11.5	15.2
4x3-1/2	114.3	101.6	229	6.0	8.6	13.5	17.1	5.7	8.1	-	

Dimensions in Millimeters.

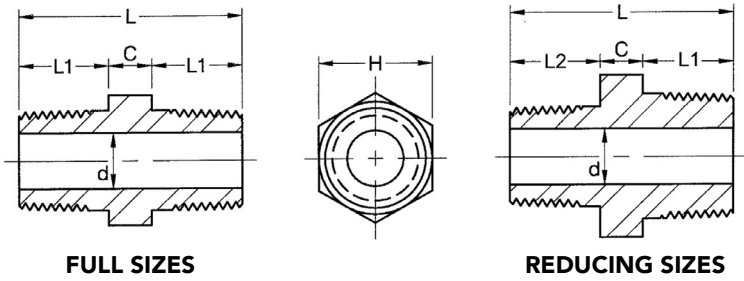
DIMENSIONAL TOLERANCES OF SWAGED NIPPLE

Nominal Pipe Size (Inch)	Overall Length	Outside Diameter at End		Wall Thickness (see Note 1)
		Square Cut Ends	Other End Connections	
1/8~3/8	±2	+0.40 -0.80	±0.80	Not less than 87.5% nominal wall thickness
1/2~1-1/2	±2	+0.40 -0.80	+1.50 -0.80	
2~2-1/2	±3	±0.80	+1.50 -0.80	
3~4	±3	±0.80	±1.50	

MSS-SP-95-2000 (latest 2018) - covers nipples of forging or seamless pipe which accordance with ASTM A182, A403.

HEX NIPPLE

ANSI/ASME B1.20.1-1983NPT



Dimensions in Millimeters.

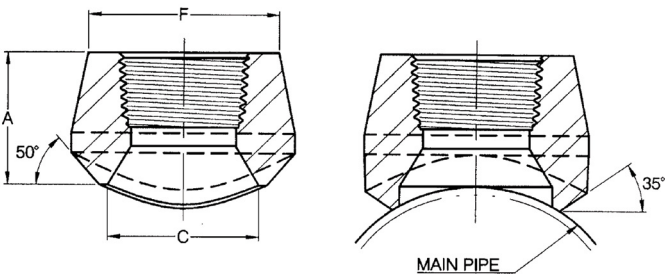
Size NPS	C	L1	L	d		H
				3M	6M	
1/8	6.0	10.0	26.0	4.0	--	12.0
1/4	8.0	14.0	36.0	6.4	--	17.0
3/8	8.0	14.0	36.0	9.2	4.3	19.0
1/2	9.0	19.0	47.0	11.8	6.4	24.0
3/4	10.0	19.0	48.0	15.6	11.1	30.0
1	11.0	24.0	59.0	20.7	15.2	35.0
1-1/4	12.0	24.0	60.0	29.5	22.8	46.0
1-1/2	14.0	24.0	62.0	34.0	28.0	50.0
2	16.0	26.0	68.0	42.9	38.2	65.0
2-1/2	18.0	38.0	94.0	53.8	--	80.0
3	20.0	40.0	100.0	66.5	--	95.0
4	24.5	40.0	105	87.3	--	125.5

We don't keep below 1/2" and above 2".

Size NPS	C	L1	L2	L	d		h
					3M	6M	
3/8x1/4	8.0	14.0	14.0	36.0	6.4	--	19.0
1/2x1/4	9.0	19.0	14.0	42.0	6.4	--	24.0
1/2x3/8	9.0	19.0	14.0	42.0	9.2	4.3	24.0
3/4x1/4	10.0	19.0	14.0	43.0	6.4	--	30.0
3/4x3/8	10.0	19.0	14.0	43.0	9.2	4.3	30.0
3/4x1/2	10.0	19.0	19.0	48.0	11.8	6.4	30.0
1x3/8	11.0	24.0	14.0	49.0	9.2	4.3	35.0
1x1/2	11.0	24.0	19.0	54.0	11.8	6.4	35.0
1x3/4	11.0	24.0	19.0	54.0	15.6	11.1	35.0
1-1/4x1/2	12.0	24.0	19.0	55.0	11.8	6.4	46.0
1-1/4x3/4	12.0	24.0	19.0	55.0	15.6	11.1	46.0
1-1/4x1	12.0	24.0	24.0	60.0	20.7	15.2	46.0
1-1/2x3/4	14.0	24.0	19.0	57.0	15.6	11.1	50.0
1-1/2x1	14.0	24.0	24.0	62.0	20.7	15.2	50.0
1-1/2x1-1/4	14.0	24.0	24.0	62.0	29.5	22.8	50.0
2x1	16.0	26.0	24.0	66.0	20.7	15.2	65.0
2x1-1/4	16.0	26.0	24.0	66.0	29.5	22.8	65.0
2x1-1/2	16.0	26.0	24.0	66.0	34.0	28.0	65.0
2-1/2x1-1/4	18.0	38.0	24.0	80.0	29.5	22.8	80.0
2-1/2x1-1/2	18.0	38.0	24.0	80.0	34.0	29.0	80.0
2-1/2x2	18.0	38.0	26.0	82.0	42.9	38.2	80.0
3x1-1/2	20.0	40.0	24.0	84.0	34.0	28.0	95.0
3x2	20.0	40.0	26.0	86.0	42.9	38.2	95.0
3x2-1/2	20.0	40.0	38.0	98.0	53.8	--	95.0

THREADOLET

REDUCING SIZES MSS-SP-97-2001



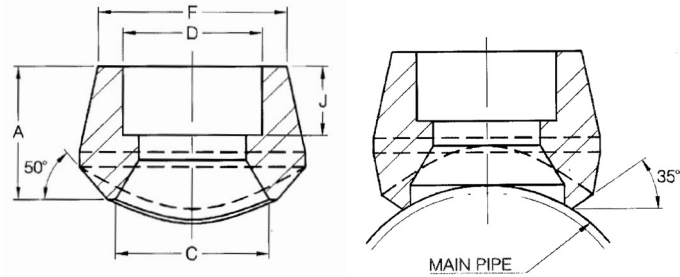
Dimensions in Millimeters.

Out-Let Pipe NPS (in)	A	C	F
3000 LB STANDARD AND EXTRA STRONG			
1/8	19.0	13.7	17.3
1/4	19.0	13.7	22.0
3/8	21.0	17.1	25.8
1/2	25.0	21.3	31.3
3/4	27.0	26.7	37.1
1	33.0	33.4	45.5
1-1/4	33.0	42.2	54.9
1-1/2	35.0	48.3	61.6
2	38.0	60.3	75.3
2-1/2	46.0	73.0	91.7
3	51.0	88.9	109.1
4	57.0	114.3	137.2
6000 LB SCHEDULE 160 AND DOUBLE EXTRA STRONG			
1/2	32.0	16.6	33.9
3/4	37.0	21.2	41.2
1	40.0	27.0	49.9
1-1/4	41.0	35.8	58.6
1-1/2	43.0	41.2	66.7
2	52.0	51.6	83.2

We do not keep 6000lbs.
NPT thread accordance to ASME b1.20.1-2013(R2018).
MSS-SP-97-2001(R2018) - Forge Branch outlets SW, NPT, BW.

SOCKOLET

REDUCING SIZES MSS-SP-97-2001

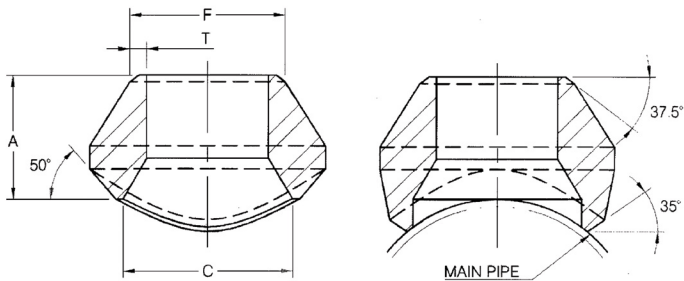


Dimensions in Millimeters.

Out-Let Pipe NPS (in)	A	C	D	F	J (Min)
3000 LB STANDARD AND EXTRA STRONG					
1/8	19.0	13.7	10.9	17.3	10.0
1/4	19.0	13.7	14.4	22.0	10.0
3/8	21.0	17.1	17.8	25.8	10.0
1/2	25.0	21.3	22.0	31.3	10.0
3/4	27.0	26.7	27.3	37.1	13.0
1	33.0	33.4	34.1	45.5	13.0
1-1/4	33.0	42.2	42.8	54.9	13.0
1-1/2	35.0	48.3	48.9	61.6	13.0
2	38.0	60.3	61.4	75.3	16.0
2-1/2	46.0	73.0	74.2	91.7	16.0
3	51.0	88.9	90.1	109.1	16.0
4	57.0	114.3	115.8	137.2	19.0
6000 LB SCHEDULE 160 AND DOUBLE EXTRA STRONG					
1/2	32.0	16.6	22.0	33.9	10.0
3/4	37.0	21.2	27.3	41.2	13.0
1	40.0	27.0	34.1	49.9	13.0
1-1/4	41.0	35.8	42.8	58.6	13.0
1-1/2	43.0	41.2	48.9	66.7	13.0
2	52.0	51.6	61.4	83.2	16.0

WELDOLET

REDUCING SIZES MSS-SP-97-2001



STANDARD WEIGHT

Out-Let Pipe NPS (in)	A	C	F	T
1/8	16.0	13.7	10.3	1.73
1/4	16.0	13.7	13.7	2.24
3/8	19.0	17.1	17.1	2.31
1/2	19.0	21.3	21.3	2.77
3/4	22.0	26.7	26.7	2.87
1	27.0	33.4	33.4	3.38
1-1/4	32.0	42.2	42.2	3.56
1-1/2	33.0	48.3	48.3	3.68
2	38.0	60.3	60.3	3.91
2-1/2	41.0	73.0	73.0	5.16
3	44.0	88.9	88.9	5.49
3-1/2	48.0	101.6	101.6	5.74
4	51.0	114.3	114.3	6.02
5	57.0	141.3	141.3	6.55
6	60.0	168.3	168.3	7.11
8	70.0	219.3	219.3	8.11
10	78.0	273.1	273.1	9.27
12	86.0	323.9	323.9	9.53
14	89.0	355.6	355.6	9.53
16	94.0	406.4	406.4	9.53
18	97.0	457.2	457.2	9.53
20	102.0	508.0	508.0	9.53
24	116.0	609.6	609.6	9.53

We do not keep below 1/2".
Weld Bevel in accordance to ASME B16.25.
MSS-SP-97-2001(R2018) - Forge Branch outlets SW, NPT, BW.

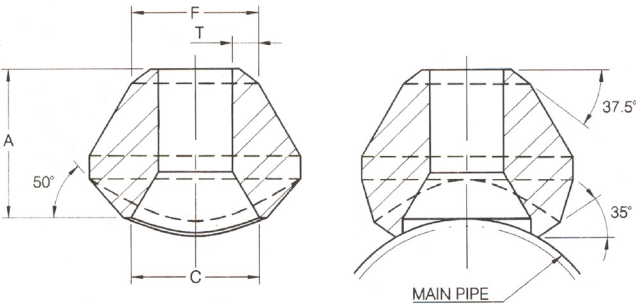
EXTRA STRONG

Out-Let Pipe NPS (in)	A	C	F	T
1/8	16.0	13.7	10.3	2.41
1/4	16.0	13.7	13.7	3.02
3/8	19.0	17.1	17.1	3.20
1/2	19.0	21.3	21.3	3.73
3/4	22.0	26.7	26.7	3.91
1	27.0	33.4	33.4	4.55
1-1/4	32.0	42.2	42.2	4.85
1-1/2	33.0	48.3	48.3	5.08
2	38.0	60.3	60.3	5.54
2-1/2	41.0	73.0	73.0	7.01
3	44.0	88.9	88.9	7.62
3-1/2	48.0	101.6	101.6	8.56
4	51.0	114.3	114.3	8.56
5	57.0	141.3	141.3	9.53
6	78.0	168.3	168.3	10.97
8	99.0	219.3	219.3	12.70
10	94.0	273.1	273.1	12.70
12	103.0	323.9	323.9	12.70
14	100.0	355.6	355.6	12.70
16	106.0	406.4	406.4	12.70
18	111.0	457.2	457.2	12.70
20	119.0	508.0	508.0	12.70
24	140.0	609.6	609.6	12.70

Dimensions in Millimeters.

WELDOLET

REDUCING SIZES MSS-SP-97-2001



SCHEDULE 160 AND DOUBLE EXTRA STRONG

Out-Let Pipe NPS (in)	A	C	F	S160	T	XXS
1/2	28.0	13.8	21.3	4.78		7.47
3/4	32.0	18.9	26.7	5.56		7.82
1	38.0	24.3	33.4	6.35		7.82
1-1/4	44.0	32.5	42.2	6.35		9.70
1-1/2	51.0	38.1	48.3	7.14		10.15
2	55.0	49.2	60.3	8.74		11.07
2-1/2	62.0	59.0	73.0	9.53		14.02
3	73.0	73.7	88.9	11.13		15.24
4	84.0	97.2	114.3	13.49		17.12
5	94.0	122.2	141.3	15.88		19.05
6	105.0	146.4	168.3	18.26		21.95

We do not keep thickness S160 and SXXS.

Dimensions in Millimeters.

