

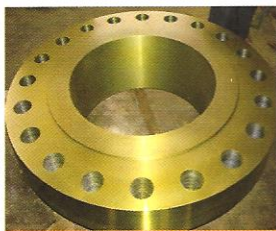


KALHOUR TRADING CO. (L.L.C.)

Piping Handbook



FORGED FITTINGS



FLANGES



BW FITTINGS



VALVES

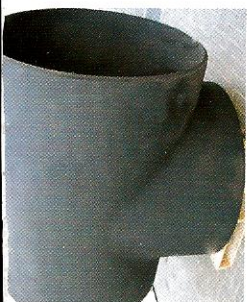
Suppliers of Pipes, Fittings, Flanges
Valves, Gaskets and Studbolts

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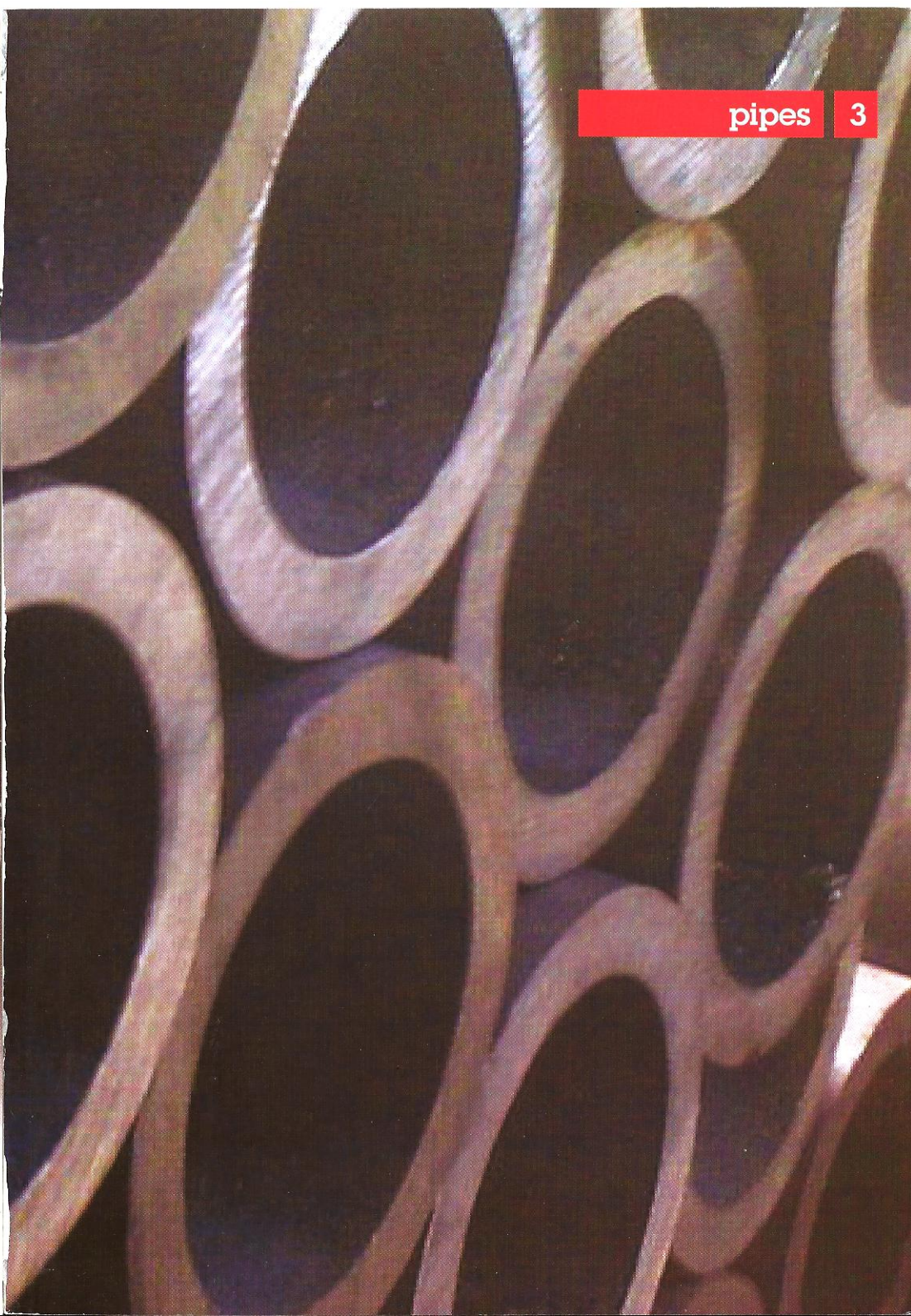
PIPES

WELDING FITTINGS

FLANGES

The purpose of this booklet is to provide a summary of technical standards for pipe and piping materials used by the oil and petrochemical industries.

We would apologize for any error which you may find as it is not our intention to replace or improve the existing standards.



Chemical analysis & mechanical test for carbon steel pipes

Spec.	ASTM Grade	C% Max	Min%	P% Max	S% Max	Cr%	Mo%	Ni%	Cu%	V%	Nb%	N%	Al%	Tensile strength Mpa	Yield point Mpa	Elong. 2%	Impact test (KCV)	Hardness (HB)
A106	B	0.300	0.29+ 1.06	0.035	0.035	0.10 min	0.40 max	0.150 max	0.40 max	0.080 max	///	///	///	415	240	30	///	///
A106	C	0.350	0.29+ 1.06	0.035	0.035	0.10 min	0.40 max	0.150 max	0.40 max	0.080 max	///	///	///	485	275	30	///	///
A333	6	0.300	0.29+ 1.06	0.025	0.025	0.10 min	///	///	///	///	///	///	///	415	240	30	-45° C 1814J	///
A333	3	0.190	0.31+ 0.64	0.025	0.025	0.18+ 0.37	///	///	///	///	///	///	///	450	240	30	-101° C 1814J	///
API 5L SEAMLESS	B	0.270	1.15 max	0.040	0.050	///	///	///	///	///	///	///	///	413	241	12.5	///	///
API 5L WELDED	B	0.260	1.15 max	0.040	0.050	///	///	///	///	///	///	///	///	413	241	12.5	///	///
API 5L SEAMLESS	X42	0.29	1.250 max	0.040	0.050	///	///	///	///	///	///	///	///	413	289	19	///	///
API 5L SEAMLESS	X46	0.31	1.350 max	0.040	0.050	///	///	///	///	///	///	///	///	434	317	18	///	///
API 5L SEAMLESS	X52	0.31	1.350 max	0.040	0.050	///	///	///	///	///	///	///	///	496	358	17.5	///	///
API 5L SEAMLESS	X60	0.26	1.350 max	0.040	0.050	///	///	///	///	///	///	///	///	517	413	15.5	///	///
API 5L WELDED	X42	0.280	1.250 max	0.040	0.050	///	///	///	///	///	///	///	///	413	289	19	///	///
API 5L WELDED	X46	0.300	1.350 max	0.040	0.050	///	///	///	///	///	///	///	///	434	317	18	///	///
API 5L WELDED	X52	0.300	1.350 max	0.040	0.050	///	///	///	///	///	///	///	///	496	358	17.5	///	///
API 5L WELDED	X60	0.260	1.350 max	0.040	0.050	///	///	///	///	///	///	///	///	517	413	15.5	///	///
API 5L WELDED	X65	0.260	1.400 max	0.040	0.050	///	///	///	///	///	///	///	///	551	448	15	///	///

for additional requirements please check the mentioned ASTM/ASME specifications

Chemical analysis & mechanical test for alloy steel pipes

Spec.	ASTM Grade	C% Max	Min%	P% Max	S% Max	Cr%	Mo%	Ni%	W%	V%	Nb%	N%	Al%	B%	Tensile strength Mpa	Yield point Mpa	Elong. 2%	Impact test (KCV)	Hardness (HB)
A335	P1	0.10+ 0.20	0.30 - 0.80	0.025	0.025	///	0.44 - 0.65	///	///	///	///	///	///	///	380 - 550	205	30 (L) 20 (T)	///	<197
A335	P12	0.05 - 0.15	0.30 - 0.61	0.025	0.025	0.50 max	0.80 - 1.25	///	///	///	///	///	///	///	415 - 585	220	30 (L) 20 (T)	///	<197
A335	P11	0.05 - 0.15	0.30 - 0.60	0.025	0.025	0.50 - 1.00	1.00 - 1.50	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<197
A335	P22	0.05 - 0.15	0.30 - 0.60	0.025	0.025	0.50 max	1.90 - 2.60	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<197
A335	P5	0.15 max	0.30 - 0.60	0.025	0.025	0.50 max	4.00 - 6.00	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<217
A335	P9	0.15 max	0.30 - 0.60	0.025	0.025	0.25 - 1.00	8.00 - 10.00	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<217
A335	P91	0.08 - 0.12	0.30 - 0.60	0.02	0.01	0.20 - 0.50	8.00 - 9.50	0.40 max	1.50 - 2.00	0.15 - 0.25	0.04 - 0.09	0.03 - 0.07	0.04 - max	0.001 - 0.006	585 - 760	415	20 (L)	///	<248

for additional requirements please check the mentioned ASTM/ASME specifications

Chemical analysis & mechanical test for stainless steel pipes

Spec.	ASTM Grade	C% Max	Min %	P% Max	S% Max	Si%	C%	Mo%	Ni%	Cu%	V%	Nb%	N2%	TT%	Nb + Ta %	Tensile strength Mpa	Yield point Mpa	Elongation 2%	Hardness (HB)
A312	TP 04	0.08	2.00	0.045	0.030	1.00	18.0 - 20.0		8.0 - 11.0							515	205	35	NOT REQUIRED
A312	TP304H	0.40 - 1.10	2.00	0.045	0.030	1.00	18.0 - 20.0		8.0 - 11.0							515	205	35	NOT REQUIRED
A312	PT304L	0.035	2.00	0.045	0.030	1.00	18.0 - 20.0		8.0 - 13.0							485	170	35	NOT REQUIRED
A312	TP316	0.080	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0							515	205	35	NOT REQUIRED
A312	TP316H	0.04 - 0.10	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0							515	205	35	NOT REQUIRED
A312	TP316L	0.035	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 16.0							485	240	35	NOT REQUIRED
A312	TP321	0.080	2.00	0.045	0.030	1.00	17.0 - 20.0		9.0 - 13.0					5 x C ÷ < 0.7		515	170	35	NOT REQUIRED
A312	TP321H	0.04 - 0.10	2.00	0.045	0.030	1.00	17.0 - 20.0		9.0 - 13.0					4 x C ÷ < 0.7		515	205	35	NOT REQUIRED
A312	TP347	0.080	2.00	0.045	0.030	1.00	17.0 - 20.0		9.0 - 13.0						10 x C ÷ < 1.10	515	205	35	NOT REQUIRED
A312	TP347H	0.04 - 0.10	2.00	0.045	0.030	1.00	17.0 - 20.0		9.0 - 13.0						8 x C ÷ < 1.00	515	205	35	NOT REQUIRED
A312	TP S31254	0.020	1.00	0.030	0.010	0.80	19.5 - 20.5	6.0 - 6.5	17.5 - 18.5	0.50 - 1.00						650	300	35	NOT REQUIRED
A790	UNS 31803	0.030	2.00	0.030	0.020	1.00	21.0 - 23.0	2.5 - 3.5	4.5 - 6.5							620	450	25	<290

for additional requirements please check the mentioned ASTM/ASME specifications

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W.T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
1/8	0.405	10.3	0.068	1.73	0.24	0.37	X			STD	40
	0.405	10.3	0.095	2.41	0.31	0.47	X			XS	80
1/4	0.540	13.7	0.088	2.24	0.42	0.63	X			STD	40
	0.540	13.7	0.119	3.02	0.54	0.80	X			XS	80
3/8	0.675	17.1	0.091	2.31	0.57	0.84	X			STD	40
	0.675	17.1	0.126	3.20	0.74	1.10	X			XS	80
1/2	0.840	21.3	0.109	2.77	0.85	1.27	X			STD	40
	0.840	21.3	0.147	3.73	1.09	1.62	X			XS	80
	0.840	21.3	0.188	4.78	1.31	1.95					160
	0.840	21.3	0.294	7.47	1.71	2.55	X			XXS	
3/4	1.050	26.7	0.113	2.87	1.13	1.69	X			STD	40
	1.050	26.7	0.154	3.91	1.47	2.20	X			XS	80
	1.050	26.7	0.219	5.56	1.94	2.90					160
	1.050	26.7	0.308	7.82	2.44	3.64	X			XXS	
1	1.315	33.4	0.133	3.38	1.68	2.50	X			STD	40
	1.315	33.4	0.179	4.55	2.17	3.24	X			XS	80
	1.315	33.4	0.250	6.35	2.84	4.24					160
	1.315	33.4	0.358	9.09	3.66	5.45	X			XXS	
1 1/4	1.660	42.2	0.140	3.56	2.27	3.39	X			STD	40
	1.660	42.2	0.191	4.85	3.00	4.47	X			XS	80
	1.660	42.2	0.250	6.35	3.76	5.61					160
	1.660	42.2	0.382	9.70	5.21	7.77	X			XXS	
1 1/2	1.900	48.3	0.145	3.68	2.72	4.05	X			STD	40
	1.900	48.3	0.200	5.08	3.63	5.41	X			XS	80
	1.900	48.3	0.281	7.14	4.86	7.25					160
	1.900	48.3	0.400	10.15	6.41	9.56	X			XXS	
2	2.375	60.3	0.083	2.11	2.03	3.03	X	X			
	2.375	60.3	0.109	2.77	2.64	3.93	X	X			
	2.375	60.3	0.125	3.18	3.00	4.48	X	X			
	2.375	60.3	0.141	3.58	3.36	5.01	X	X			
	2.375	60.3	0.154	3.91	3.65	5.44	X	X		STD	40
	2.375	60.3	0.172	4.37	4.05	6.03	X	X			
	2.375	60.3	0.188	4.78	4.39	6.54	X	X			
	2.375	60.3	0.218	5.54	5.02	7.48	X	X		XS	80
	2.375	60.3	0.250	6.35	5.67	8.45	X	X			
	2.375	60.3	0.281	7.14	6.28	9.36	X	X			
	2.375	60.3	0.344	8.74	7.46	11.11					160
	2.375	60.3	0.436	11.07	9.03	13.44	X	X		XXS	

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
							API Specifications			W. T. STD XS XXS	Schedule
	Inches	mm	Inches	mm	lbs/foot	kg/m	5L 3/82	5LX 3/82	5LS 3/82		
2 1/2	2.875	73.0	0.083	2.11	2.47	3.69	X	X			
	2.875	73.0	0.109	2.77	3.22	4.80	X	X			
	2.875	73.0	0.125	3.18	3.67	5.48	X	X			
	2.875	73.0	0.141	3.58	4.12	6.13	X	X			
	2.875	73.0	0.156	3.96	4.53	6.74	X	X			
	2.875	73.0	0.172	4.37	4.97	7.40	X	X			
	2.875	73.0	0.188	4.78	5.40	8.04	X	X			
	2.875	73.0	0.203	5.16	5.79	8.63	X	X		STD	40
	2.875	73.0	0.216	5.49	6.13	9.14	X	X			
	2.875	73.0	0.250	6.35	7.01	10.44	X	X			
	2.875	73.0	0.276	7.01	7.66	11.41	X	X		XS	80
	2.875	73.0	0.375	9.53	10.01	14.92					160
3	2.875	73.0	0.552	14.02	13.69	20.39	X	X		XXS	
	3.500	88.9	0.083	2.11	3.03	4.52	X	X			
	3.500	88.9	0.109	2.77	3.95	5.88	X	X			
	3.500	88.9	0.125	3.18	4.51	6.72	X	X			
	3.500	88.9	0.141	3.58	5.06	7.53	X	X			
	3.500	88.9	0.156	3.96	5.57	8.29	X	X			
	3.500	88.9	0.172	4.37	6.11	9.11	X	X			
	3.500	88.9	0.188	4.78	6.65	9.92	X	X			
	3.500	88.9	0.216	5.49	7.58	11.29	X	X		STD	40
	3.500	88.9	0.250	6.35	8.68	12.93	X	X			
	3.500	88.9	0.281	7.14	9.66	14.40	X	X			
	3.500	88.9	0.300	7.62	10.25	15.27	X	X		XS	80
3.500	88.9	0.438	11.13	14.32	21.35					160	
3.500	88.9	0.600	15.24	18.58	27.68	X	X		XXS		
2	4.000	101.6	0.083	2.11	3.47	5.18	X	X			
	4.000	101.6	0.109	2.77	4.53	6.75	X	X			
	4.000	101.6	0.125	3.18	5.17	7.72	X	X			
	4.000	101.6	0.141	3.58	5.81	8.65	X	X			
	4.000	101.6	0.156	3.96	6.40	9.53	X	X			
	4.000	101.6	0.172	4.37	7.03	10.48	X	X			
	4.000	101.6	0.188	4.78	7.65	11.41	X	X			
	4.000	101.6	0.226	5.74	9.11	13.57	X	X		STD	40
	4.000	101.6	0.250	6.35	10.01	14.92	X	X			
	4.000	101.6	0.281	7.14	11.16	16.63	X	X			
	4.000	101.6	0.318	8.08	12.50	18.63	X	X		XS	80

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification					
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W. T. STD XC XXS	Schedule	
							5L 3/82	5LX 3/82	5LS 3/82			
4	4.500	114.3	0.083	2.11	3.92	5.84	X	X	X			
	4.500	114.3	0.109	2.77	5.11	7.62	X		X			
	4.500	114.3	0.125	3.18	5.84	8.71	X	X	X			
	4.500	114.3	0.141	3.58	6.56	9.77	X	X	X			
	4.500	114.3	0.156	3.96	7.24	10.78	X	X	X			
	4.500	114.3	0.172	4.37	7.95	11.85	X	X	X			
	4.500	114.3	0.188	4.78	8.66	12.91	X	X	X			
	4.500	114.3	0.203	5.16	9.32	13.89	X	X	X			
	4.500	114.3	0.219	5.56	10.01	14.91	X	X	X			
	4.500	114.3	0.237	6.02	10.79	16.07	X	X	X	STD	40	
	4.500	114.3	0.250	6.35	11.35	16.90	X	X	X			
	4.500	114.3	0.281	7.14	12.66	18.87	X	X	X			
	4.500	114.3	0.312	7.92	13.96	20.78	X	X	X			
	4.500	114.3	0.337	8.56	14.98	22.32	X	X	X	XS	80	
	4.500	114.3	0.438	11.13	19.00	28.32	X	X	X		120	
	4.500	114.3	0.531	13.49	22.51	33.54	X	X	X		160	
5	4.500	114.3	0.674	17.12	27.54	41.03	X	X	X	XXS		
	5.563	141.3	0.083	2.11	4.86	7.24	X		X			
	5.563	141.3	0.125	3.18	7.26	10.83	X		X			
	5.563	141.3	0.156	3.96	9.01	13.41	X		X			
	5.563	141.3	0.188	4.78	10.79	16.09	X		X			
	5.563	141.3	0.219	5.56	12.50	18.61	X		X			
	5.563	141.3	0.258	6.55	14.62	21.77	X		X	STD	40	
	5.563	141.3	0.281	7.14	15.85	23.62	X		X			
	5.563	141.3	0.312	7.92	17.50	26.05	X		X			
	5.563	141.3	0.344	8.74	19.17	28.57	X		X			
	5.563	141.3	0.375	9.53	20.78	30.97	X			XS	80	
	5.563	141.3	0.500	12.70	27.04	40.28	X		X		120	
	5.563	141.3	0.625	15.88	32.96	49.11	X		X		160	
	5.563	141.3	0.750	19.05	38.55	57.43	X			XXS		
	6	6.625	168.3	0.083	2.11	5.80	8.65	X	X	X		
		6.625	168.3	0.109	2.77	7.59	11.31	X	X	X		
6.625		168.3	0.125	3.18	8.68	12.95	X	X	X			
6.625		168.3	0.141	3.58	9.76	14.54	X	X	X			
6.625		168.3	0.156	3.96	10.78	16.05	X	X	X			
6.625		168.3	0.172	4.37	11.85	17.67	X	X	X			
6.625		168.3	0.188	4.78	12.92	19.27	X	X	X			
6.625		168.3	0.203	5.16	13.92	20.76	X	X	X			

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W. T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
6	6.625	168.3	0.219	5.56	14.98	22.31	X	X	X		
	6.625	168.3	0.250	6.35	17.02	25.36	X	X	X		
	6.625	168.3	0.280	7.11	18.97	28.26	X	X	X	STD	40
	6.625	168.3	0.312	7.92	21.04	31.32	X	X	X		
	6.625	168.3	0.344	8.74	23.08	34.39	X	X	X		
	6.625	168.3	0.375	9.53	25.03	37.31	X	X	X		
	6.625	168.3	0.432	10.97	28.57	42.56	X	X	X	XS	80
	6.625	168.3	0.500	12.70	32.71	48.73	X	X	X		
	6.625	168.3	0.562	14.27	36.39	54.20	X	X	X		120
	6.625	168.3	0.625	15.88	40.05	59.69	X	X	X		
	6.625	168.3	0.719	18.26	45.35	67.56	X	X	X		160
	6.625	168.3	0.864	21.95	53.16	79.22	X			XXS	
8	8.625	219.1	0.125	3.18	11.35	16.93	X	X	X		
	8.625	219.1	0.156	3.96	14.11	21.01	X	X	X		
	8.625	219.1	0.188	4.78	16.94	25.26	X	X	X		
	8.625	219.1	0.203	5.16	18.26	27.22		X	X		
	8.625	219.1	0.219	5.56	19.66	29.28	X	X	X		
	8.625	219.1	0.250	6.35	22.36	33.31	X	X	X		20
	8.625	219.1	0.277	7.04	24.70	36.81	X	X	X		30
	8.625	219.1	0.312	7.92	27.70	41.24	X	X	X		
	8.625	219.1	0.322	8.18	28.55	42.55	X	X	X	STD	40
	8.625	219.1	0.344	8.74	30.42	45.34	X	X	X		
	8.625	219.1	0.375	9.53	33.04	49.25	X	X	X		
	8.625	219.1	0.406	10.31	35.64	53.08					60
	8.625	219.1	0.438	11.13	38.30	57.08	X	X	X		
	8.625	219.1	0.500	12.70	43.39	64.64	X	X	X	XS	80
	8.625	219.1	0.562	14.27	48.40	72.08	X	X	X		
	8.625	219.1	0.594	15.09	50.95	75.92					100
	8.625	219.1	0.625	15.88	53.40	79.58	X	X	X		
	8.625	219.1	0.719	18.26	60.71	90.44	X	X	X		120
		8.625	219.1	0.812	20.62	67.76	100.92				
	8.625	219.1	0.875	22.23	72.42	107.92	X			XXS	
	8.625	219.1	0.906	23.01	74.69	111.27					160
10	10.750	273.1	0.156	3.96	17.65	26.28	X	X	X		
	10.750	273.1	0.188	4.78	21.21	31.63	X	X	X		
	10.750	273.1	0.203	5.16	22.87	34.09		X	X		
	10.750	273.1	0.219	5.56	24.63	36.68	X	X	X		
	10.750	273.1	0.250	6.35	28.04	41.77	X	X	X		20

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
							API Specifications			W. T. STD XS XXS	Schedule
	Inches	mm	Inches	mm	lbs/foot	kg/m	5L 3/82	5LX 3/82	5LS 3/82		
10	10.750	273.1	0.279	7.09	31.20	46.51	X	X	X		
	10.750	273.1	0.307	7.80	34.24	51.03	X	X	X		30
	10.750	273.1	0.344	8.74	38.23	56.98	X	X	X		
	10.750	273.1	0.365	9.27	40.48	60.31	X	X	X	STD	40
	10.750	273.1	0.438	11.13	48.24	71.90	X	X	X		
	10.750	273.1	0.500	12.70	54.74	81.55	X	X	X	XS	60
	10.750	273.1	0.562	14.27	61.15	91.08	X	X	X		
	10.750	273.1	0.594	15.09	64.43	96.01					80
	10.750	273.1	0.625	15.88	67.58	100.73	X	X	X		
	10.750	273.1	0.719	18.26	77.03	114.75	X	X	X		100
	10.750	273.1	0.812	20.62	86.18	128.38	X		X		
	10.750	273.1	0.844	21.44	89.29	133.06					120
10.750	273.1	1.000	25.40	104.13	155.15				XXS	140	
10.750	273.1	1.125	28.58	115.64	172.33					160	
12	12.750	323.9	0.172	4.37	23.11	34.43	X	X	X		
	12.750	323.9	0.188	4.78	25.22	37.62	X	X	X		
	12.750	323.9	0.203	5.16	27.20	40.56		X	X		
	12.750	323.9	0.219	5.56	29.31	43.65	X	X	X		
	12.750	323.9	0.250	6.35	33.38	49.73	X	X	X		20
	12.750	323.9	0.281	7.14	37.42	55.77	X	X	X		
	12.750	323.9	0.312	7.92	41.45	61.71	X	X	X		
	12.750	323.9	0.330	8.38	43.77	65.20	X	X	X		30
	12.750	323.9	0.344	8.74	45.58	67.93	X	X	X		
	12.750	323.9	0.375	9.53	49.56	73.88	X	X	X	STD	
	12.750	323.9	0.406	10.31	53.52	79.73		X	X		40
	12.750	323.9	0.438	11.13	57.59	85.84	X	X	X		
	12.750	323.9	0.500	12.70	65.42	97.46	X	X	X	XS	
	12.750	323.9	0.562	14.27	73.15	108.96	X	X	X		60
	12.750	323.9	0.625	15.88	80.93	120.62	X	X	X		
	12.750	323.9	0.688	17.48	88.63	132.08	X	X	X		80
	12.750	323.9	0.750	19.05	96.12	143.21	X	X	X		
	12.750	323.9	0.812	20.62	103.53	154.21	X	X	X		
	12.750	323.9	0.844	21.44	107.32	159.91					100
	12.750	323.9	0.875	22.23	110.97	165.37	X	X	X		
12.750	323.9	1.000	25.40	125.49	186.97				XXS	120	
12.750	323.9	1.125	28.58	139.67	208.14					140	
12.750	323.9	1.312	33.32	160.27	238.76					160	
14	14.000	355.6	0.188	4.78	27.73	41.35	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W.T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
14	14.000	355.6	0.203	5.16	29.91	44.59	X		X		
	14.000	355.6	0.210	5.33	30.93	46.04		X	X		
	14.000	355.6	0.219	5.56	32.23	47.99		X	X		
	14.000	355.6	0.250	6.35	36.71	54.69	X	X	X		10
	14.000	355.6	0.281	7.14	41.17	61.35	X	X	X		
	14.000	355.6	0.312	7.92	45.61	67.90	X	X	X		20
	14.000	355.6	0.344	8.74	50.17	74.76	X	X	X		
	14.000	355.6	0.375	9.53	54.57	81.33	X	X	X	STD	30
	14.000	355.6	0.406	10.31	58.94	87.79		X	X		
	14.000	355.6	0.438	11.13	63.44	94.55	X	X	X		40
	14.000	355.6	0.469	11.91	67.78	100.94	X	X	X		
	14.000	355.6	0.500	12.70	72.09	107.39	X	X	X	XS	
	14.000	355.6	0.562	14.27	80.66	120.11	X	X	X		
	14.000	355.6	0.594	15.09	85.05	126.71					60
	14.000	355.6	0.625	15.88	89.28	133.03	X	X	X		
	14.000	355.6	0.688	17.48	97.81	145.75	X	X	X		
	14.000	355.6	0.750	19.05	106.13	158.10	X	X	X		80
	14.000	355.6	0.812	20.62	114.37	170.33	X	X	X		
	14.000	355.6	0.875	22.23	122.65	182.75	X	X	X		
	14.000	355.6	0.938	23.83	130.85	194.96	X	X	X		100
	14.000	355.6	1.094	27.79	150.79	224.65					120
	14.000	355.6	1.250	31.75	170.21	253.56					140
	14.000	355.6	1.406	35.71	189.11	281.70					160
	14.000	355.6	2.000	50.80	256.32	381.83					
	14.000	355.6	2.125	53.98	269.50	401.50					
	14.000	355.6	2.200	55.88	277.25	413.01					
	14.000	355.6	2.500	63.50	307.05	457.40					
14	16.000	406.4	0.188	4.78	31.75	47.34	X	X	X		
	16.000	406.4	0.203	5.16	34.25	51.06	X	X	X		
	16.000	406.4	0.219	5.56	36.91	54.96	X	X	X		
	16.000	406.4	0.250	6.35	42.05	62.64	X	X	X		10
	16.000	406.4	0.281	7.14	47.17	70.30	X	X	X		
	16.000	406.4	0.312	7.92	52.27	77.83	X	X	X		20
	16.000	406.4	0.344	8.74	57.52	85.71	X	X	X		
	16.000	406.4	0.375	9.53	62.58	93.27	X	X	X	STD	30
	16.000	406.4	0.406	10.31	67.62	100.70		X	X		
	16.000	406.4	0.438	11.13	72.80	108.49	X	X	X		
	16.000	406.4	0.469	11.91	77.79	115.86		X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W.T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
16	16.000	406.4	0.500	12.70	82.77	123.30	X	X	X	XS	40
	16.000	406.4	0.562	14.27	92.66	137.99	X	X	X		
	16.000	406.4	0.625	15.88	102.63	152.93	X	X	X		
	16.000	406.4	0.656	16.66	107.50	160.12					60
	16.000	406.4	0.688	17.48	112.51	167.65	X	X	X		
	16.000	406.4	0.750	19.05	122.15	181.97	X	X	X		
	16.000	406.4	0.812	20.62	131.71	196.16	X	X	X		
	16.000	406.4	0.844	21.44	136.61	203.53					80
	16.000	406.4	0.875	22.23	141.34	210.60	X	X	X		
	16.000	406.4	0.938	23.83	150.89	224.82	X	X	X		
	16.000	406.4	1.000	25.40	160.20	238.64	X	X	X		
	16.000	406.4	1.031	26.19	164.82	245.56					100
	16.000	406.4	1.062	26.97	169.43	252.35	X	X	X		
	16.000	406.4	1.125	28.58	178.72	266.28	X	X	X		
	16.000	406.4	1.219	30.96	192.433	286.64					120
	16.000	406.4	1.438	36.53	223.64	333.19					140
	16.000	406.4	1.594	40.49	245.25	365.35					160
18	18.000	457	0.188	4.78	35.76	53.31	X	X	X		
	18.000	457	0.219	5.56	41.59	61.90	X	X	X		
	18.000	457	0.250	6.35	47.39	70.57	X	X	X		10
	18.000	457	0.281	7.14	53.18	79.21	X	X	X		
	18.000	457	0.312	7.92	58.94	87.71	X	X	X		20
	18.000	457	0.344	8.74	64.87	96.61	X	X	X		
	18.000	457	0.375	9.53	70.59	105.16	X	X	X	STD	
	18.000	457	0.406	10.31	76.29	113.57		X	X		
	18.000	457	0.438	11.13	82.15	122.38	X	X	X		30
	18.000	457	0.459	11.91	87.81	130.72		X	X		
	18.000	457	0.500	12.70	93.45	139.15	X	X	X	XS	
	18.000	457	0.562	14.27	104.67	155.80	X	X	X		40
	18.000	457	0.625	15.88	115.98	172.74	X	X	X		
	18.000	457	0.688	17.48	127.21	189.46	X	X	X		
	18.000	457	0.750	19.05	138.17	205.74	X	X	X		60
	18.000	457	0.812	20.62	149.06	221.89	X	X	X		
	18.000	457	0.875	22.23	160.03	238.34	X	X	X		
	18.000	457	0.938	23.83	170.92	254.55	X	X	X		80
	18.000	457	1.000	25.40	181.56	270.34	X	X	X		
	18.000	457	1.062	26.97	192.11	286.00	X	X	X		
	18.000	457	1.125	28.58	202.75	301.94	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
							API Specifications			W. T. STD XS XXS	Schedule
	Inches	mm	Inches	mm	lbs/foot	kg/m	5L 3/82	5LX 3/82	5LS 3/82		
18	18.000	457	1.156	29.36	207.96	309.62		X	X		100
	18.000	457	1.188	30.18	213.31	317.66	X	X	X		
	18.000	457	1.250	31.75	223.61	332.95	X	X	X		
	18.000	457	1.375	34.93	244.14	363.56					120
	18.000	457	1.562	39.67	274.22	408.26					140
	18.000	457	1.781	45.24	308.50	459.37					160
20	20.000	508	0.219	5.56	46.27	68.89	X	X	X		
	20.000	508	0.250	6.35	52.73	78.55	X	X	X		10
	20.000	508	0.281	7.14	59.18	88.19	X	X	X		
	20.000	508	0.312	7.92	65.60	97.67	X	X	X		
	20.000	508	0.344	8.74	72.21	107.60	X	X	X		
	20.000	508	0.375	9.53	78.60	117.15	X	X	X	STD	20
	20.000	508	0.406	10.31	84.96	126.53		X	X		
	20.000	508	0.438	11.13	91.51	136.37	X	X	X		
	20.000	508	0.469	11.91	97.83	145.70		X	X		
	20.000	508	0.500	12.70	104.13	155.12	X	X	X	XS	30
	20.000	508	0.562	14.27	116.67	173.74	X	X	X		
	20.000	508	0.594	15.09	123.11	183.42					40
	20.000	508	0.625	15.88	129.33	192.71	X	X	X		
	20.000	508	0.688	17.48	141.90	211.44	X	X	X		
	20.000	508	0.750	19.05	154.19	229.70	X	X	X		
	20.000	508	0.812	20.62	166.40	247.83	X	X	X		60
	20.000	508	0.875	22.23	178.72	266.29	X	X	X		
	20.000	508	0.938	23.83	190.96	284.52	X	X	X		
	20.000	508	1.000	25.40	202.92	302.28	X	X	X		
	20.000	508	1.031	26.19	208.87	311.17					80
	20.000	508	1.062	26.97	214.80	319.92	X	X	X		
	20.000	508	1.125	28.58	226.78	337.89	X	X	X		
	20.000	508	1.188	30.18	238.68	355.61	X	X	X		
	20.000	508	1.250	31.75	250.31	372.88	X	X	X		
	20.000	508	1.281	32.54	256.10	381.53					100
	20.000	508	1.312	33.32	261.86	390.03	X	X	X		
	20.000	508	1.375	34.93	273.51	407.49	X	X	X		
	20.000	508	1.500	38.10	296.37	441.49					120
	20.000	508	1.750	44.45	341.09	508.11					140
	20.000	508	1.969	50.01	379.17	546.81					160
22	22.000	559	0.219	5.56	50.94	75.88	X	X	X		
	22.000	559	0.250	6.35	58.07	86.54	X	X	X		10

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W. T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
22	22.000	559	0.281	7.14	65.18	97.17	X	X	X		
	22.000	559	0.312	7.92	72.27	107.63	X	X	X		
	22.000	559	0.344	8.74	79.56	118.60	X	X	X		
	22.000	559	0.375	9.53	86.61	129.13	X	X	X	STD	20
	22.000	559	0.406	10.31	93.63	139.50		X	X		
	22.000	559	0.438	11.13	100.86	150.37	X	X	X		
	22.000	559	0.469	11.91	107.85	160.68		X	X		
	22.000	559	0.500	12.70	114.81	171.09	X	X	X	XS	30
	22.000	559	0.562	14.27	128.67	191.69	X	X	X		
	22.000	559	0.625	15.88	142.68	212.69	X	X	X		
	22.000	559	0.688	17.48	156.60	233.43	X	X	X		
	22.000	559	0.750	19.05	170.21	253.65	X	X	X		
	22.000	559	0.812	20.62	183.75	273.76	X	X	X		
	22.000	559	0.875	22.23	197.41	294.25	X	X	X		60
	22.000	559	0.938	23.83	211.00	314.49	X	X	X		
	22.000	559	1.000	25.40	224.28	334.23	X	X	X		
	22.000	559	1.062	26.97	237.48	353.84	X	X	X		
	22.000	559	1.125	28.58	250.81	373.83	X	X	X		80
	22.000	559	1.188	30.18	264.06	393.57	X	X	X		
	22.000	559	1.250	31.75	277.01	412.81	X	X	X		
	22.000	559	1.312	33.32	289.88	431.94	X	X	X		
	22.000	559	1.375	34.93	302.88	451.42	X	X	X		100
	22.000	559	1.438	36.53	315.79	470.66	X	X	X		
	22.000	559	1.500	38.10	328.41	489.41	X	X	X		
	22.000	559	1.625	41.28	353.61	527.02					120
	22.000	559	1.875	47.63	403.00	600.63					140
	22.000	559	2.125	53.98	451.06	672.26					160
24	24.000	610	0.250	6.35	63.41	94.53	X	X	X		10
	24.000	610	0.281	7.14	71.18	106.15	X	X	X		
	24.000	610	0.312	7.92	78.93	117.59	X	X	X		
	24.000	610	0.344	8.74	86.91	129.59	X	X	X		
	24.000	610	0.375	9.53	94.62	141.12	X	X	X	STD	20
	24.000	610	0.406	10.31	102.31	152.47		X	X		
	24.000	610	0.438	11.13	110.22	164.37	X	X	X		
	24.000	610	0.469	11.91	117.86	175.66		X	X		
	24.000	610	0.500	12.70	125.49	187.06	X	X	X	XS	
	24.000	610	0.562	14.27	140.68	209.64	X	X	X		30
	24.000	610	0.625	15.88	156.03	232.66	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
							API Specifications			W. T. STD XS XXS	Schedule
	Inches	mm	Inches	mm	lbs/foot	kg/m	5L 3/82	5LX 3/82	5LS 3/82		
24	24.000	610	0.688	17.48	171.29	255.41	X	X	X		40
	24.000	610	0.750	19.05	186.23	277.61	X	X	X		
	24.000	610	0.812	20.62	201.09	299.69	X	X	X		
	24.000	610	0.875	22.23	216.10	322.21	X	X	X		
	24.000	610	0.938	23.83	231.03	244.46	X	X	X		
	24.000	610	0.969	24.61	238.35	355.26					60
	24.000	610	1.000	25.40	245.64	366.17	X	X	X		
	24.000	610	1.062	26.97	260.17	387.76	X	X	X		
	24.000	610	1.125	28.58	274.84	409.77	X	X	X		
	24.000	610	1.188	30.18	289.44	431.52	X	X	X		
	24.000	610	1.219	30.96	296.58	442.08					80
	24.000	610	1.250	31.75	303.71	452.74	X	X	X		
	24.000	610	1.312	33.32	317.91	473.84	X	X	X		
	24.000	610	1.375	34.93	332.25	495.35	X	X	X		
	24.000	610	1.438	36.53	346.50	516.80	X	X	X		
	24.000	610	1.500	38.10	360.45	537.33	X	X	X		
	24.000	610	1.531	38.89	367.39	547.71					100
	24.000	610	1.562	39.67	374.31	557.43	X	X	X		
	24.000	610	1.812	46.02	429.39	640.03					120
	24.000	610	2.062	52.37	483.12	720.15					140
	24.000	610	2.344	59.54	542.13	808.22					160
26	26.000	660	0.250	6.35	68.75	102.36	X	X	X		
	26.000	660	0.281	7.14	77.18	114.95	X	X	X		
	26.000	660	0.312	7.92	85.60	127.36	X	X	X		10
	26.000	660	0.344	8.74	94.26	140.37	X	X	X		
	26.000	660	0.375	9.53	102.63	152.87	X	X	X	STD	
	26.000	660	0.406	10.31	110.98	165.18		X	X		
	26.000	660	0.438	11.13	119.57	178.09	X	X	X		
	26.000	660	0.469	11.91	127.88	190.34		X	X		
	26.000	660	0.500	12.70	136.17	202.72	X	X	X	XS	20
	26.000	660	0.562	14.27	152.68	227.23	X	X	X		
	26.000	660	0.625	15.88	169.338	252.24	X	X	X		
	26.000	660	0.688	17.48	185.99	276.96	X	X	X		
	26.000	660	0.750	19.05	202.25	301.10	X	X	X		
	26.000	660	0.812	20.62	218.43	325.12	X	X	X		
	26.000	660	0.875	22.23	234.79	349.62	X	X	X		
	26.000	660	0.938	23.83	251.07	373.84	X	X	X		
	26.000	660	1.000	25.40	267.00	397.49	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W.T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
28	28.000	711	0.250	6.35	74.09	110.34	X	X	X		
	28.000	711	0.281	7.14	83.19	123.93	X	X	X		
	28.000	711	0.312	7.92	92.26	137.32	X	X	X		
	28.000	711	0.344	8.74	101.61	151.36	X	X	X		
	28.000	711	0.375	9.53	110.64	164.85	X	X	X	STD	
	28.000	711	0.406	10.31	119.65	178.15		X	X		
	28.000	711	0.438	11.13	128.93	192.09	X	X	X		
	28.000	711	0.469	11.91	137.90	205.32		X	X		
	28.000	711	0.500	12.70	146.85	218.69	X	X	X	XS	20
	28.000	711	0.562	14.27	164.69	245.18	X	X	X		
	28.000	711	0.625	15.88	182.73	271.21	X	X	X		30
	28.000	711	0.688	17.48	200.68	298.95	X	X	X		
	28.000	711	0.750	19.05	218.27	325.06	X	X	X		
	28.000	711	0.812	20.62	235.78	351.05	X	X	X		
	28.000	711	0.875	22.23	253.48	377.58	X	X	X		
	28.000	711	0.938	23.83	271.10	403.81	X	X	X		
	28.000	711	1.000	25.40	288.36	429.44	X	X	X		
30	30.000	762	0.250	6.35	79.43	118.33	X	X	X		
	30.000	762	0.281	7.14	89.19	132.91	X	X	X		
	30.000	762	0.312	7.92	98.93	147.28	X	X	X		10
	30.000	762	0.344	8.74	108.95	162.35		X	X		
	30.000	762	0.375	9.53	118.65	176.84	X	X	X	STD	
	30.000	762	0.406	10.31	128.32	191.11		X	X		
	30.000	762	0.438	11.13	138.29	206.09	X	X	X		
	30.000	762	0.469	11.91	147.92	220.30		X	X		
	30.000	762	0.500	12.70	157.53	234.67	X	X	X	XS	20
	30.000	762	0.562	14.27	176.69	263.12	X	X	X		
	30.000	762	0.625	15.88	196.08	292.18	X	X	X		30
	30.000	762	0.688	17.48	215.38	320.93	X	X	X		
	30.000	762	0.750	19.05	234.29	349.02	X	X	X		
	30.000	762	0.812	20.62	253.12	376.98	X	X	X		
	30.000	762	0.875	22.23	272.17	405.54	X	X	X		
	30.000	762	0.938	23.83	291.14	433.78	X	X	X		
	30.000	762	1.000	25.40	309.72	461.38	X	X	X		
	30.000	762	1.062	26.97	328.22	488.85	X	X	X		
	30.000	762	1.125	28.58	346.93	516.90	X	X	X		
	30.000	762	1.188	30.18	365.56	544.65	X	X	X		
	30.000	762	1.250	31.75	383.81	571.75	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W. T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
32	32.000	813	0.250	6.35	84.77	126.31	X	X	X		
	32.000	813	0.281	7.14	95.19	141.89	X	X	X		
	32.000	813	0.312	7.92	105.59	157.24	X	X	X		10
	32.000	813	0.344	8.74	116.30	173.34		X	X		
	32.000	813	0.375	9.53	126.66	188.82	X	X	X	STD	
	32.000	813	0.406	10.31	136.99	204.08		X	X		
	32.000	813	0.438	11.13	147.64	220.08	X	X	X		
	32.000	813	0.469	11.91	157.94	235.28		X	X		
	32.000	813	0.500	12.70	168.21	250.64	X	X	X	XS	20
	32.000	813	0.562	14.27	188.70	281.07	X	X	X		
	32.000	813	0.625	15.88	209.43	312.15	X	X	X		30
	32.000	813	0.688	17.48	230.8	342.91	X	X	X		40
	32.000	813	0.750	19.05	250.31	372.98	X	X	X		
	32.000	813	0.812	20.62	270.47	402.92	X	X	X		
	32.000	813	0.875	22.23	290.86	433.49	X	X	X		
	32.000	813	0.938	23.83	311.17	463.75	X	X	X		
	32.000	813	1.000	25.40	331.08	493.32	X	X	X		
	32.000	813	1.062	26.97	350.90	522.77	X	X	X		
	32.000	813	1.125	28.58	370.96	552.85	X	X	X		
	32.000	813	1.188	30.18	390.94	582.61	X	X	X		
	32.000	813	1.250	31.75	410.51	611.68	X	X	X		
34	34.000	864	0.250	6.35	90.11	134.30	X	X	X		
	34.000	864	0.281	7.14	101.19	150.87	X	X	X		
	34.000	864	0.312	7.92	112.25	167.20	X	X	X		10
	34.000	864	0.344	8.74	123.65	184.33		X	X		
	34.000	864	0.375	9.53	134.67	200.31	X	X	X	STD	
	34.000	864	0.406	10.31	145.67	217.05		X	X		
	34.000	864	0.438	11.13	157.00	234.08	X	X	X		
	34.000	864	0.469	11.91	167.95	250.26		X	X		
	34.000	864	0.500	12.70	178.89	266.61	X	X	X	XS	20
	34.000	864	0.562	14.27	200.70	299.02	X	X	X		
	34.000	864	0.625	15.88	222.78	332.12	X	X	X		30
	34.000	864	0.688	17.48	244.77	364.90	X	X	X		40
	34.000	864	0.750	19.05	266.33	396.93	X	X	X		
	34.000	864	0.812	20.62	287.81	428.85	X	X	X		
	34.000	864	0.875	22.23	309.55	461.55	X	X	X		
	34.000	864	0.938	23.83	331.21	493.72	X	X	X		
	34.000	864	1.000	25.40	352.44	525.27	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W. T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
34	34.000	864	1.062	26.97	373.59	556.69	X	X	X		
	34.000	864	1.125	28.58	394.99	588.79	X	X	X		
	34.000	864	1.188	30.18	416.31	620.56	X	X	X		
	34.000	864	1.250	31.75	437.21	651.61	X	X	X		
36	36.000	914	0.250	6.35	95.45	142.13	X	X	X		
	36.000	914	0.281	7.14	107.20	159.67	X	X	X		
	36.000	914	0.312	7.92	118.92	176.96	X	X	X		10
	36.000	914	0.344	8.74	131.00	195.11		X	X		
	36.000	914	0.375	9.53	142.68	212.56	X	X	X	STD	
	36.000	914	0.406	10.31	154.34	229.76		X	X		
	36.000	914	0.438	11.13	166.35	247.31	X	X	X		
	36.000	914	0.469	11.91	177.97	264.94		X	X		
	36.000	914	0.500	12.70	189.57	282.27	X	X	X	XS	20
	36.000	914	0.562	14.27	212.70	316.11	X	X	X		
	36.000	914	0.625	15.88	236.133	351.70	X	X	X		30
	36.000	914	0.688	17.48	259.47	386.45	X	X	X		
	36.000	914	0.750	19.05	282.35	420.42	X	X	X		40
	36.000	914	0.812	20.62	305.16	454.27	X	X	X		
	36.000	914	0.875	22.23	328.24	488.86	X	X	X		
	36.000	914	0.938	23.83	351.25	523.11	X	X	X		
	36.000	914	1.000	25.40	373.80	556.59	X	X	X		
	36.000	914	1.062	26.97	396.27	589.95	X	X	X		
	36.000	914	1.125	28.58	419.02	624.03	X	X	X		
	36.000	914	1.188	30.18	441.69	657.77	X	X	X		
	36.000	914	1.250	31.75	463.91	690.76	X	X	X		
38	38.000	965	0.312	7.92	125.58	186.92	X	X	X		
	38.000	965	0.344	8.74	138.35	206.10	X	X	X		
	38.000	965	0.375	9.53	150.69	224.54	X	X	X	STD	
	38.000	965	0.406	10.31	163.01	242.72	X	X	X		
	38.000	965	0.438	11.13	175.71	261.80	X	X	X		
	38.000	965	0.469	11.91	187.99	279.92	X	X	X		
	38.000	965	0.500	12.70	200.25	298.24	X	X	X	XS	
	38.000	965	0.562	14.27	224.71	334.56	X	X	X		
	38.000	965	0.625	15.88	249.48	371.68	X	X	X		
	38.000	965	0.688	17.48	274.16	498.43	X	X	X		
	38.000	965	0.750	19.05	298.37	444.38	X	X	X		
	38.000	965	0.812	20.62	322.50	480.21	X	X	X		
	38.000	965	0.875	22.23	346.93	516.82	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				Schedule
							API Specifications			W. T. STD XS XXS	
	Inches	mm	Inches	mm	lbs/foot	kg/m	5L 3/82	5LX 3/82	5LS 3/82		
38	38.000	965	0.938	23.83	371.28	553.08	X	X	X		
	38.000	965	1.000	25.40	395.16	588.53	X	X	X		
	38.000	965	1.062	26.97	418.96	623.87	X	X	X		
	38.000	965	1.125	28.58	443.05	659.97	X	X	X		
	38.000	965	1.188	30.18	467.06	695.73	X	X	X		
	38.000	965	1.250	31.75	490.61	730.69	X	X	X		
40	40.000	1016	0.312	7.92	132.25	196.89	X	X	X		
	40.000	1016	0.344	8.74	145.69	217.09	X	X	X		
	40.000	1016	0.375	9.53	158.70	236.53	X	X	X	STD	
	40.000	1016	0.406	10.31	171.68	255.69	X	X	X		
	40.000	1016	0.438	11.13	185.06	275.80	X	X	X		
	40.000	1016	0.469	11.91	198.01	294.90	X	X	X		
	40.000	1016	0.500	12.70	210.93	314.22	X	X	X	XS	
	40.000	1016	0.562	14.27	236.71	352.51	X	X	X		
	40.000	1016	0.625	15.88	262.83	391.65	X	X	X		
	40.000	1016	0.688	17.48	288.86	430.42	X	X	X		
	40.000	1016	0.750	19.05	314.39	468.34	X	X	X		
	40.000	1016	0.812	20.62	339.84	506.14	X	X	X		
	40.000	1016	0.875	22.23	365.62	544.78	X	X	X		
	40.000	1016	0.938	23.83	391.32	583.05	X	X	X		
	40.000	1016	1.000	25.40	416.52	620.48	X	X	X		
	40.000	1016	1.062	26.97	441.64	657.78	X	X	X		
	40.000	1016	1.125	28.58	467.08	695.92	X	X	X		
	40.000	1016	1.188	30.18	492.44	733.68	X	X	X		
	40.000	1016	1.250	31.75	517.31	770.62	X	X	X		
	42	42.000	1067	0.344	8.74	153.04	228.09	X	X	X	
42.000		1067	0.375	9.53	166.71	248.52	X	X	X	STD	
42.000		1067	0.406	10.31	180.35	268.66	X	X	X		
42.000		1067	0.438	11.13	194.42	289.80	X	X	X		
42.000		1067	0.469	11.91	208.03	309.88	X	X	X		
42.000		1067	0.500	12.70	221.61	330.19	X	X	X	XS	
42.000		1067	0.562	14.27	248.72	370.45	X	X	X		
42.000		1067	0.625	15.88	276.18	411.62	X	X	X		
42.000		1067	0.688	17.48	303.55	452.40	X	X	X		
42.000		1067	0.750	19.05	330.41	492.30	X	X	X		
42.000		1067	0.812	20.62	357.19	532.07	X	X	X		
42.000		1067	0.875	22.23	384.31	572.73	X	X	X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification					
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W.T. STD XS XXS	Schedule	
							5L 3/82	5LX 3/82	5LS 3/82			
42	42.000	1067	1.000	25.40	437.88	652.42	X	X	X			
	42.000	1067	1.062	26.97	464.32	691.70	X	X	X			
	42.000	1067	1.125	28.58	491.11	731.86	X	X	X			
	42.000	1067	1.188	30.18	517.82	771.64	X	X	X			
	42.000	1067	1.250	31.75	554.01	810.55	X	X	X			
44	44.000	1118	0.344	8.74	160.39	239.08	X	X	X			
	44.000	1118	0.375	9.53	174.72	260.50	X	X	X	STD		
	44.000	1118	0.406	10.31	189.03	281.62	X	X	X			
	44.000	1118	0.438	11.13	203.78	303.80	X	X	X			
	44.000	1118	0.469	11.91	218.04	324.80	X	X	X			
	44.000	1118	0.500	12.70	232.29	346.16	X	X	X	XS		
	44.000	1118	0.562	14.27	260.72	388.40	X	X	X			
	44.000	1118	0.625	15.88	289.53	431.59	X	X	X			
	44.000	1118	0.688	17.48	318.25	474.37	X	X	X			
	44.000	1118	0.750	19.05	346.43	516.26	X	X	X			
	44.000	1118	0.812	20.62	374.53	558.00	X	X	X			
	44.000	1118	0.875	22.23	403.00	600.69	X	X	X			
	44.000	1118	0.938	23.83	431.39	642.99	X	X	X			
	44.000	1118	1.000	25.40	459.24	684.37	X	X	X			
	44.000	1118	1.062	26.97	487.01	725.62	X	X	X			
	44.000	1118	1.125	28.58	515.40	767.80	X	X	X			
	44.000	1118	1.188	30.18	543.19	809.60	X	X	X			
	44.000	1118	1.250	31.75	570.71	850.48	X	X	X			
	46	46.000	1168	0.344	8.74	167.74	249.85	X	X	X		
		46.000	1168	0.375	9.53	182.73	272.25	X	X	X	STD	
46.000		1168	0.406	10.31	197.70	294.34	X	X	X			
46.000		1168	0.438	11.13	213.13	317.52	X	X	X			
46.000		1168	0.469	11.91	228.06	339.54	X	X	X			
46.000		1168	0.500	12.70	242.97	351.82	X	X	X	XS		
46.000		1168	0.562	14.27	272.73	406.00	X	X	X			
46.000		1168	0.625	15.88	302.88	451.17	X	X	X			
46.000		1168	0.688	17.48	332.95	495.94	X	X	X			
46.000		1168	0.750	19.05	362.45	539.76	X	X	X			
46.000		1168	0.812	20.62	391.88	583.43	X	X	X			
46.000		1168	0.875	22.23	421.69	628.10	X	X	X			
46.000		1168	0.938	23.83	451.42	672.37	X	X	X			
46.000		1168	1.000	25.40	480.60	715.68	X	X	X			
46.000		1168	1.062	26.97	509.69	758.88	X	X	X			

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification			
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			Schedule
							5L 3/82	5LX 3/82	5LS 3/82	
46	46.000	1168	1.125	28.58	539.17	803.04	X	X	X	
	46.000	1168	1.188	30.18	568.57	846.81	X	X	X	
	46.000	1168	1.250	31.75	597.41	889.63	X	X	X	
48	48.000	1219	0.344	8.74	175.08	260.85	X	X	X	
	48.000	1219	0.375	9.53	190.74	284.24	X	X	X	STD
	48.000	1219	0.406	10.31	206.37	307.30	X	X	X	
	48.000	1219	0.438	11.13	222.49	331.52	X	X	X	
	48.000	1219	0.469	11.91	238.08	354.52	X	X	X	
	48.000	1219	0.500	12.70	253.65	377.79	X	X	X	XS
	48.000	1219	0.562	14.27	284.73	423.94	X	X	X	
	48.000	1219	0.625	15.88	316.23	471.14	X	X	X	
	48.000	1219	0.688	17.48	347.64	517.92	X	X	X	
	48.000	1219	0.750	19.05	378.47	563.70	X	X	X	
	48.000	1219	0.812	20.62	409.22	609.36	X	X	X	
	48.000	1219	0.875	22.23	440.38	656.06	X	X	X	
	48.000	1219	0.938	23.83	471.46	702.34	X	X	X	
	48.000	1219	1.000	25.40	501.96	747.63	X	X	X	
	48.000	1219	1.062	26.97	532.38	792.80	X	X	X	
	48.000	1219	1.125	28.58	563.20	838.99	X	X	X	
	48.000	1219	1.188	30.18	593.94	884.77	X	X	X	
	48.000	1219	1.250	31.75	624.11	929.56	X	X	X	
52	52.000	1321	0.375	9.53	206.76	308.21	X	X	X	
	52.000	1321	0.406	10.31	223.72	333.24	X	X	X	
	52.000	1321	0.438	11.13	241.20	359.51	X	X	X	
	52.000	1321	0.469	11.91	258.11	384.48	X	X	X	
	52.000	1321	0.500	12.70	275.01	409.64	X	X	X	
	52.000	1321	0.562	14.27	308.74	459.84	X	X	X	
	52.000	1321	0.625	15.88	342.93	511.09	X	X	X	
	52.000	1321	0.688	17.48	377.03	561.89	X	X	X	
	52.000	1321	0.750	19.05	410.51	611.62	X	X	X	
	52.000	1321	0.812	20.62	443.91	661.23	X	X	X	
	52.000	1321	0.875	22.23	477.76	711.98	X	X	X	
	52.000	1321	0.938	23.83	511.53	762.28	X	X	X	
	52.000	1321	1.000	25.40	544.68	811.52	X	X	X	
	52.000	1321	1.062	26.97	577.75	860.63	X	X	X	
	52.000	1321	1.125	28.58	611.26	910.88	X	X	X	
	52.000	1321	1.188	30.18	644.69	960.68	X	X	X	
	52.000	1321	1.250	31.75	677.51	1009.42	X	X	X	

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification			
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			Schedule
							5L 3/82	5LX 3/82	5LS 3/82	
56	56.000	1422	0.375	9.53	222.78	331.94	X	X	X	
	56.000	1422	0.406	10.31	241.06	358.91	X	X	X	
	56.000	1422	0.438	11.13	259.91	387.24	X	X	X	
	56.000	1422	0.459	11.91	278.15	414.14	X	X	X	
	56.000	1422	0.500	12.70	296.37	441.37	X	X	X	
	56.000	1422	0.562	14.27	332.75	495.38	X	X	X	
	56.000	1422	0.625	15.88	369.63	550.54	X	X	X	
	56.000	1422	0.688	17.48	406.42	605.43	X	X	X	
	56.000	1422	0.750	19.05	442.55	659.07	X	X	X	
	56.000	1422	0.812	20.62	478.60	712.59	X	X	X	
	56.000	1422	0.875	22.23	515.14	767.34	X	X	X	
	56.000	1422	0.938	23.83	551.60	821.63	X	X	X	
	56.000	1422	1.000	25.40	587.40	875.78	X	X	X	
	56.000	1422	1.062	26.97	623.12	927.81	X	X	X	
	56.000	1422	1.125	28.58	659.32	982.06	X	X	X	
	56.000	1422	1.188	30.18	695.45	1035.85	X	X	X	
	56.000	1422	1.250	31.75	730.91	1088.50	X	X	X	
	60.000	1524	0.375	9.53	238.80	355.92	X	X	X	
60	60.000	1524	0.406	10.31	258.40	384.85	X	X	X	
	60.000	1524	0.438	11.13	278.62	415.23	X	X	X	
	60.000	1524	0.469	11.91	298.19	444.10	X	X	X	
	60.000	1524	0.500	12.70	317.73	473.31	X	X	X	
	60.000	1524	0.562	14.27	356.76	531.27	X	X	X	
	60.000	1524	0.625	15.88	369.33	590.58	X	X	X	
	60.000	1524	0.688	17.48	435.81	649.40	X	X	X	
	60.000	1524	0.750	19.05	474.59	706.98	X	X	X	
	60.000	1524	0.812	20.62	513.29	764.45	X	X	X	
	60.000	1524	0.875	22.23	552.52	823.26	X	X	X	
	60.000	1524	0.938	23.83	591.67	881.57	X	X	X	
	60.000	1524	1.000	25.40	630.12	938.67	X	X	X	
	60.000	1524	1.062	26.97	668.48	995.64	X	X	X	
	60.000	1524	1.125	28.58	707.38	1053.95	X	X	X	
	60.000	1524	1.188	30.18	746.20	1111.76	X	X	X	
	60.000	1524	1.250	31.75	784.31	1168.36	X	X	X	
	64.000	1626	0.375	9.53	254.82	379.89	X	X	X	
64	64.000	1626	0.406	10.31	275.75	410.78	X	X	X	
	64.000	1626	0.438	11.13	297.33	443.23	X	X	X	
	64.000	1626	0.469	11.91	318.22	474.06	X	X	X	

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification				
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W. T. STD XS XXS	Schedule
							5L 3/82	5LX 3/82	5LS 3/82		
64	64.000	1626	0.500	12.70	339.09	505.26	X	X	X		
	64.000	1626	0.562	14.27	380.76	567.16	X	X	X		
	64.000	1626	0.625	15.88	423.03	630.52	X	X	X		
	64.000	1626	0.688	17.48	465.21	693.36	X	X	X		
	64.000	1626	0.750	19.05	506.63	754.90	X	X	X		
	64.000	1626	0.812	20.62	547.98	816.32	X	X	X		
	64.000	1626	0.875	22.23	589.90	879.17	X	X	X		
	64.000	1626	0.938	23.83	631.74	941.51	X	X	X		
	64.000	1626	1.000	25.40	672.84	1002.56	X	X	X		
	64.000	1626	1.062	26.97	713.85	1063.48	X	X	X		
	64.000	1626	1.125	28.58	755.44	1125.83	X	X	X		
	64.000	1626	1.188	30.18	796.95	1187.67	X	X	X		
68	64.000	1626	1.250	31.75	837.71	1248.23	X	X	X		
	68.000	1727	0.469	11.91	338.26	503.72			X		
	68.000	1727	0.500	12.70	360.45	536.89			X		
	68.000	1727	0.562	14.27	404.77	602.71			X		
	68.000	1727	0.625	15.88	449.73	670.08			X		
	68.000	1727	0.688	17.48	494.60	736.90			X		
	68.000	1727	0.750	19.05	538.67	802.35			X		
	68.000	1727	0.812	20.62	582.66	867.68			X		
	68.000	1727	0.875	22.23	627.28	934.54			X		
	68.000	1727	0.938	23.83	671.82	1000.86			X		
	68.000	1727	1.000	25.40	715.56	1065.82			X		
	68.000	1727	1.062	26.97	759.22	1130.66			X		
	68.000	1727	1.125	28.58	803.50	1197.02			X		
	68.000	1727	1.188	30.18	847.70	1262.84			X		
	68.000	1727	1.250	31.75	891.11	1327.30			X		
	72	72.000	1829	0.500	12.70	381.81	568.83			X	
72.000		1829	0.562	14.27	428.78	638.60			X		
72.000		1829	0.625	15.88	476.43	710.02			X		
72.000		1829	0.688	17.48	523.99	780.87			X		
72.000		1829	0.750	19.05	570.71	850.29			X		
72.000		1829	0.812	20.62	617.35	919.54			X		
72.000		1829	0.875	22.23	664.66	990.46			X		
72.000		1829	0.938	23.83	711.89	1060.80			X		
72.000		1829	1.000	25.40	758.28	1129.71			X		
72.000		1829	1.062	26.97	804.59	1198.49			X		
72.000		1829	1.125	28.58	851.56	1268.91			X		

Dimensions and weights of steel pipes to ANSI B 36.10

Nominal Size Inches	Outside diameter		Wall thickness		Weight		Identification					
	Inches	mm	Inches	mm	lbs/foot	kg/m	API Specifications			W.T. STD XS XXS	Schedule	
							5L 3/82	5LX 3/82	5LS 3/82			
72	72.000	1829	1.188	30.18	898.45	1338.75			X			
	72.000	1829	1.250	31.75	944.51	1407.17			X			
76	76.000	1930	0.500	12.70	403.17	600.46			X			
	76.000	1930	0.562	14.27	452.79	674.14			X			
	76.000	1930	0.625	15.88	503.13	749.57			X			
	76.000	1930	0.688	17.48	553.38	824.40			X			
	76.000	1930	0.750	19.05	602.75	897.71			X			
	76.000	1930	0.812	20.62	652.04	970.90			X			
	76.000	1930	0.875	22.23	702.04	1045.82			X			
	76.000	1930	0.938	23.83	751.96	1120.16			X			
	76.000	1930	1.000	25.40	801.00	1192.97			X			
	76.000	1930	1.062	26.97	849.96	1265.67			X			
	76.000	1930	1.125	28.58	899.62	1340.09			X			
	76.000	1930	1.188	30.18	949.20	1413.92			X			
	76.000	1930	1.250	31.75	997.91	1486.24			X			
	80	80.000	2032	0.562	14.27	476.80	710.04			X		
		80.000	2032	0.625	15.88	529.83	789.51			X		
		80.000	2032	0.688	17.48	582.77	868.37			X		
80.000		2032	0.750	19.05	634.79	945.63			X			
80.000		2032	0.812	20.62	686.73	1022.76			X			
80.000		2032	0.875	22.23	739.42	1101.74			X			
80.000		2032	0.938	23.83	792.03	1180.10			X			
80.000		2032	1.000	25.40	843.72	1256.86			X			
80.000		2032	1.062	26.97	895.33	1333.50			X			
80.000		2032	1.125	28.58	947.68	1411.97			X			
80.000		2032	1.188	30.18	999.95	1489.83			X			
80.000		2032	1.250	31.75	1051.31	1566.11			X			



Chemical analysis & mechanical test for carbon steel Alloy steel fittings

Spec.	ASTM Grade	C% Max	Min%	P% Max	S% Max	Si%	Cr%	Mn%	NP%	Ca%	V%	Nb%	N%	Al%	Nb + Ta %	Tensile strength Mpa	Yield point Mpa	Elongation 2%	Impact test (KCV)	Hardness (HB)
A234	WPB	0.300	0.29 ÷ 1.06	0.050	0.058	0.10 min	0.40	0.150	0.40	0.40	0.080	0.020	///	///	///	415 - 585	240	30 (L) 20 (T)	///	<197
A234	WPC	0.350	0.29 ÷ 1.06	0.050	0.058	0.10 min	0.40	0.150	0.40	0.40	0.080	0.020	///	///	///	485 - 655	275	30 (L) 20 (T)	///	<197
A420	WPL6	0.300	0.6 ÷ 1.35	0.035	0.040	0.15 ÷ 0.30	0.300	0.120	0.40	0.40	0.050	0.020	///	///	///	415 - 585	240	30 (L) 16.5 (T)	-45° C 17.6/13.6 J	<197
A420	WPL3	0.200	0.31 ÷ 0.84	0.050	0.050	0.13 ÷ 0.37	///	///	3.20 ÷ 3.80	///	///	///	///	///	///	450 - 620	240	30 (L) 20 (T)	-101° C 17.6/13.6 J	<197
A234	WP1	0.28	0.30 - 0.90	0.045	0.045	0.10 - 0.50	///	0.44 - 0.65	///	///	///	///	///	///	///	380 - 550	205	30 (L) 20 (T)	///	<197
A234	WP 12 CL1	0.05 - 0.20	0.30 - 0.80	0.045	0.045	0.60 max	0.80 - 1.25	0.44 - 0.65	///	///	///	///	///	///	///	415 - 585	220	30 (L) 20 (T)	///	<197
A234	WP 12 CL2	0.05 - 0.20	0.30 - 0.80	0.045	0.045	0.60 max	0.80 - 1.25	0.44 - 0.65	///	///	///	///	///	///	///	485 - 655	275	30 (L) 20 (T)	///	<197
A234	WP 11 CL1	0.05 - 0.15	0.30 - 0.60	0.030	0.030	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<197
A234	WP 11 CL2	0.05 - 0.20	0.30 - 0.80	0.04	0.04	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	///	///	///	///	///	///	///	485 - 655	275	30 (L) 20 (T)	///	<197
A234	WP 11 CL3	0.05 - 0.20	0.30 - 0.80	0.04	0.04	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	///	///	///	///	///	///	///	520 - 690	310	30 (L) 20 (T)	///	<197
A234	WP 22 CL1	0.05 - 0.15	0.30 - 0.60	0.04	0.04	0.50 - 1.00	1.00 - 2.60	0.87 - 1.13	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<197
A234	WP 22 CL3	0.05 - 0.15	0.30 - 0.60	0.04	0.04	0.50 - 1.00	1.00 - 2.60	0.87 - 1.13	///	///	///	///	///	///	///	520 - 690	310	30 (L) 20 (T)	///	<197
A234	WP5	0.15	0.30 - 0.60	0.04	0.030	0.50 - 1.00 max	4.00 - 6.00	0.44 - 0.65	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<217
A234	WP9	0.15	0.30 - 0.60	0.030	0.030	0.25 - 1.00	8.00 - 10.00	0.90 - 1.10	///	///	///	///	///	///	///	415 - 585	205	30 (L) 20 (T)	///	<217
A234	WP91	0.08 - 0.12	0.30 - 0.60	0.02	0.01	0.20 - 0.50	8.00 - 9.50	0.85 - 1.05	0.040 max	///	0.18 - 0.25	0.06 - 0.10	0.03 - 0.07	0.04	///	585 - 760	415	20 (L)	///	<248

for additional requirements please check the mentioned ASTM/ASME specifications

Chemical analysis & mechanical test for stainless steel fittings

Spec.	ASTM Grade	C% Max	Min%	P% Max	S% Max	Si%	Cr%	Mo%	Ni%	Co%	V%	Nb%	N2%	Ti%	Nb + Ta %	Tensile strength Mpa	Yield point Mpa	Elongation 2%	Hardness (HB)
A403	WP304	0.08	2.00	0.045	0.030	1.00	18.0 - 20.0	///	8.0 - 11.0	///	///	///	///	///	///	515	205	L=28 T=20	NOT REQUIRED
A403	WP304H	0.04 - 0.10	2.00	0.045	0.030	1.00	18.0 - 20.0	///	8.0 - 11.0	///	///	///	///	///	///	515	205	L=28 T=20	NOT REQUIRED
A403	WP304L	0.035	2.00	0.045	0.030	1.00	18.0 - 20.0	///	8.0 - 13.0	///	///	///	///	///	///	550	240	L=28 T=20	NOT REQUIRED
A403	WP316	0.080	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0	///	///	///	///	///	///	515	205	L=28 T=20	NOT REQUIRED
A403	WP316H	0.04 - 0.10	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0	///	///	///	///	///	///	515	205	L=28 T=20	NOT REQUIRED
A403	WP316L	0.035	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 16.0	///	///	///	///	///	///	550	240	L=28 T=20	NOT REQUIRED
A403	WP321	0.080	2.00	0.045	0.030	1.00	17.0 - 20.0	///	9.0 - 13.0	///	///	///	5 x C ÷ <0.7	///	///	515	205	L=28 T=20	NOT REQUIRED
A403	WP321H	0.04 - 0.10	2.00	0.045	0.030	1.00	17.0 - 20.0	///	9.0 - 13.0	///	///	///	4 x C ÷ <0.7	///	///	515	205	L=28 T=20	NOT REQUIRED
A403	WP347	0.080	2.00	0.045	0.030	1.00	17.0 - 20.0	///	9.0 - 13.0	///	///	///	///	///	10 x C ÷ <1.10	515	205	L=28 T=20	NOT REQUIRED
A403	WP347H	0.04 - 0.10	2.00	0.045	0.030	1.00	17.0 - 20.0	///	9.0 - 13.0	///	///	///	///	///	8 x C ÷ <1.00	515	205	L=28 T=20	NOT REQUIRED
A403	WP S31254	0.020	1.00	0.030	0.010	0.80	19.5 - 20.5	6.0 - 6.5	17.5 - 18.5	0.50 - 1.00	///	///	0.18 - 0.22	///	///	650 ÷ 820	300	L=28 T=20	NOT REQUIRED
A815	UNS 31803	0.030	2.00	0.030	0.020	1.00	21.0 - 23.0	2.5 - 3.5	4.5 - 6.5	///	///	///	0.08 - 0.20	///	///	620	450	20.0	<290

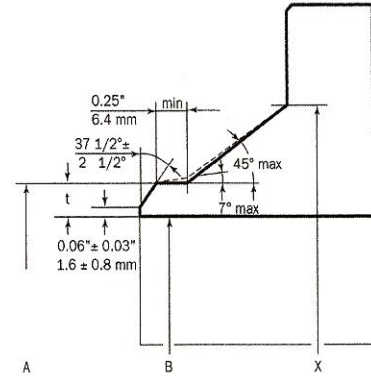
for additional requirements please check the mentioned ASTM/ASME specifications

Chemical analysis & mechanical test for carbon steel high yield fittings for gas pipelines

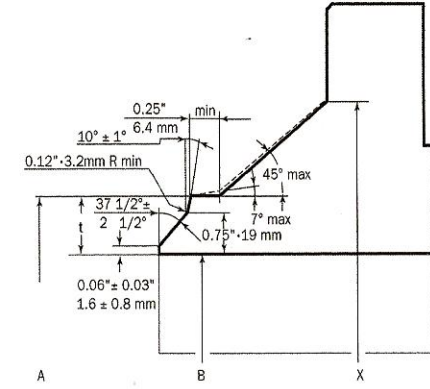
Spec.	ASTM Grade	C% Max	Mn% Max	P% Max	S% Max	Si% Max	Cr% Max	Mo% Max	Ni% Max	Cu% Max	V% Max	Nb% Max	Al% Max	Nb+V% Max	Tensile strength Mpa	Yield point Mpa	Elongation 2% min	Impact test (KCV)	Hardness (HB)
A660	WPHY 42	0.20	1.00 ± 1.45	0.030	0.010	0.15 - 0.40	0.30	0.25	0.50	0.350	0.10	0.04	0.06	0.120	415 - 585	290	32.0	-46° C J 40 - 34	< 235
A660	WPHY 46	0.20	1.00 ± 1.45	0.030	0.010	0.15 - 0.40	0.30	0.25	0.50	0.350	0.10	0.04	0.06	0.120	435 - 605	315	32.0	-46° C J 40 - 34	< 235
A660	WPHY 52	0.20	1.00 ± 1.45	0.030	0.010	0.15 - 0.40	0.30	0.25	0.50	0.350	0.10	0.04	0.06	0.120	455 - 625	360	32.0	-46° C J 40 - 34	< 235
A660	WPHY 60	0.20	1.00 ± 1.45	0.030	0.010	0.15 - 0.40	0.30	0.25	0.50	0.350	0.10	0.04	0.06	0.120	515 - 690	415	32.0	-46° C J 40 - 34	< 235
A660	WPHY 65	0.20	1.00 ± 1.45	0.030	0.010	0.15 - 0.40	0.30	0.25	0.50	0.350	0.10	0.04	0.06	0.120	530 - 705	450	32.0	-46° C J 40 - 34	< 235
MSS SP75	42	0.30	1.60 max	0.050	0.060	0.50 max	0.25 max	0.25 max	1.00 max	1.50 max	0.130 max	0.10 max	///	///	414	289	25.0	-70° C SHEAR AREA < 50%	
MSS SP75	46	0.30	1.60 max	0.050	0.060	0.50 max	0.25 max	0.25 max	1.00 max	1.50 max	0.130 max	0.10 max	///	///	434	317	25.0	-70° C SHEAR AREA > 50%	
MSS SP75	52	0.30	1.60 max	0.050	0.060	0.50 max	0.25 max	0.25 max	1.00 max	1.50 max	0.130 max	0.10 max	///	///	455	358	25.0	-70° C SHEAR AREA > 50%	
MSS SP75	60	0.30	1.60 max	0.050	0.060	0.50 max	0.25 max	0.25 max	1.00 max	1.50 max	0.130 max	0.10 max	///	///	517	414	20.0	-70° C SHEAR AREA > 50%	
MSS SP75	65	0.30	1.60 max	0.050	0.060	0.50 max	0.25 max	0.25 max	1.00 max	1.50 max	0.130 max	0.10 max	///	///	531	448	20.0	-70° C SHEAR AREA > 50%	

for additional requirements please check the mentioned ASTM/ASME specifications

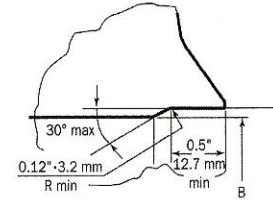
Welding ends



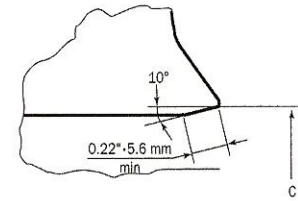
- FOR WALL THICKNESSES (t) 0.19" TO 0.88"



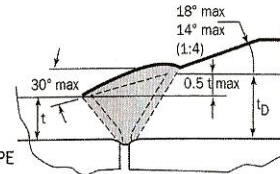
- FOR WALL THICKNESSES (t) GREATER THAN 0.88"



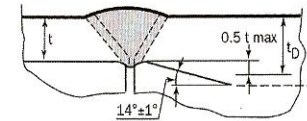
- INSIDE CONTOUR FOR USE WITH RECTANGULAR BACKING RING



- INSIDE CONTOUR FOR USE WITH TAPER BACKING RING



- DESIGNS FOR UNEQUAL THICKNESS WELDING TO HIGHER STRENGTH PIPE



NOTE: Neither t1, t2, nor t1+t2 shall exceed 0.5 t.

Standard sizes

LR elbows - tees - reducers - caps

ANSI 16-9

and addenda ANSI B 16-9a

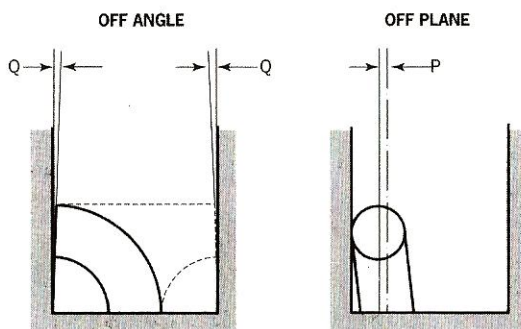
All fittings				90 - Deg and 45 - Deg LR elbows and tees	Reducers and lap-joint stud ends	Caps	180 - Deg LR Returns		
Nominal Pipe Size (NPS)	Outside (1) diameter at bevel D	Inside diameter at end (2) (3)	Wall (2) thickness t	Center to end dimension A - B - C - M	Over all length F - H	Over all length E	Center to center dimension O	Back to face dimension K	Alignment of ends U
1/2 to 2 1/2	+1,6 - 0,8	± 0,8	Not less than 87.5% of nominal thickness	± 2	± 2	± 3	± 6	± 6	± 1
3 to 3 1/2	± 1,6	± 1,6		± 2	± 2	± 3	± 6	± 6	± 1
4	± 1,6	± 1,6		± 2	± 2	± 3	± 6	± 6	± 1
5 to 8	+ 2,4 - 1,6	± 1,6		± 2	± 2	± 6	± 6	± 6	± 1
10 to 18	+ 4,0 - 3,2	± 3,2		± 2	± 2	± 6	± 10	± 6	± 2
20 to 24	+ 6,4 - 4,8	± 4,8		± 2	± 2	± 6	± 10	± 6	± 2
26 to 30	+ 6,4 - 4,8	± 4,8		± 3	± 5	± 10			
32 to 48	+ 6,4 - 4,8	± 4,8		± 5	± 5	± 10			

All dimensions are in millimeters (except nominal pipe size in inches).

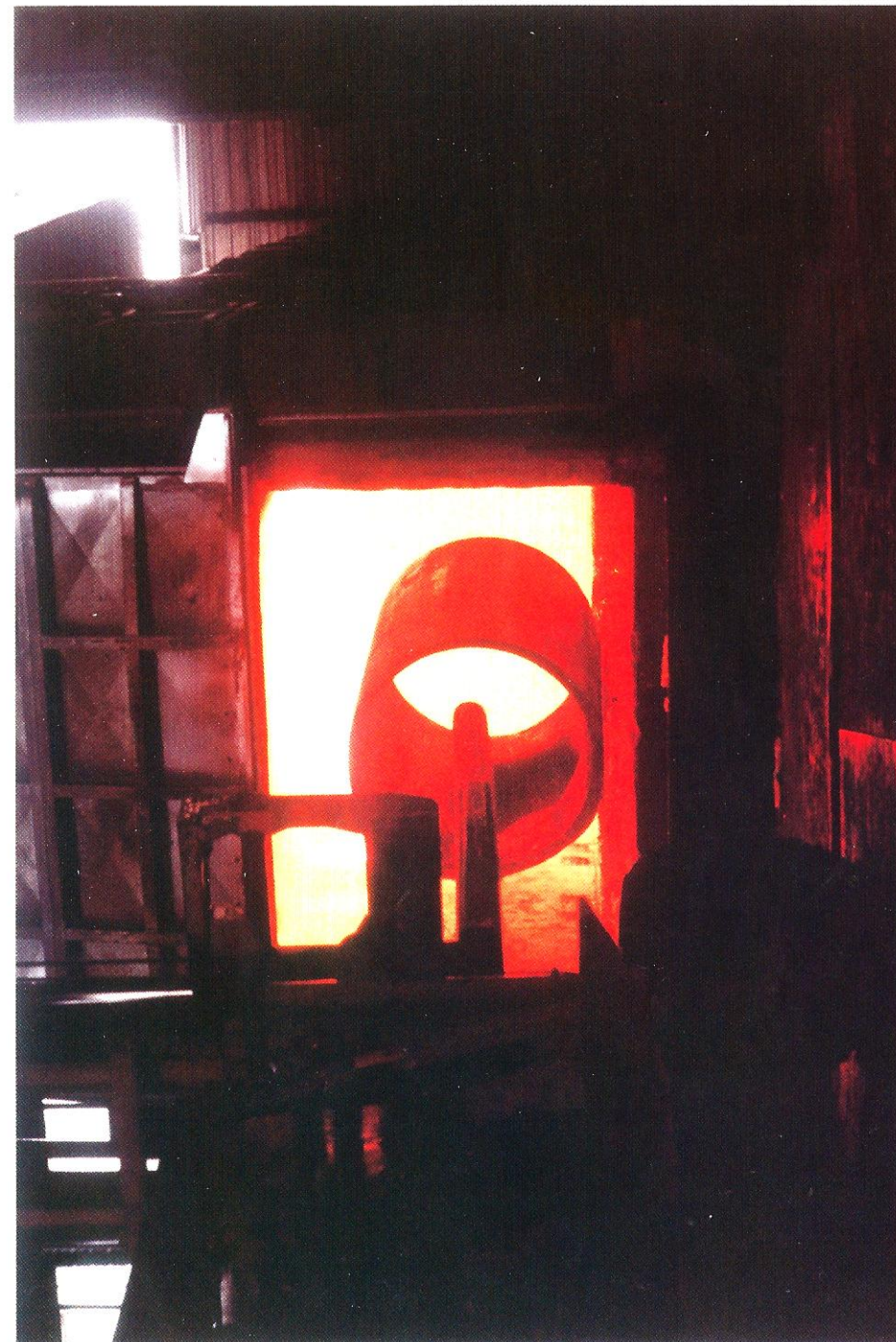
1) Out-of-round is the sum of absolute values of plus and minus tolerance.

2) The inside diameter at ends and the nominal wall thicknesses are to be specified by the purchaser.

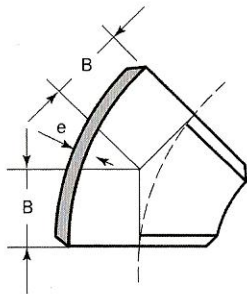
3) Unless otherwise specified by the purchaser, these tolerances apply to the nominal inside diameters, which equal the differences between the nominal outside diameter and twice the nominal wall thickness.



Nominal	Angularity tolerance	
	Off angle Q	Off plane P
1/2 to 4	1	2
5 to 8	2	4
10 to 12	2	5
14 to 16	3	6
18 to 24	4	10
26 to 30	5	10
32 to 42	5	13
44 to 48	5	19



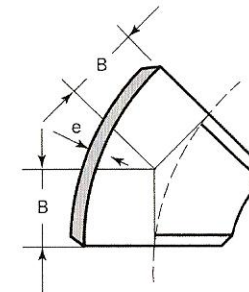
45° long radius elbows ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
Outside diameter at bevel D - mm		21	27	33	42	48	60	73	89	102	114
Center to end B - mm		16	11	22	25	29	35	44	51	57	64
STD	W.T. in mm	2,77	2,87	3,38	3,56	3,68	3,91	5,16	5,49	5,74	6,02
	Weight in Kg	0,04	0,04	0,08	0,12	0,18	0,32	0,64	1,02	1,43	1,95
X.S	W.T. in mm	3,73	3,91	4,55	4,85	5,08	5,54	7,01	7,62	8,08	8,56
	Weight in Kg	0,08	0,08	0,10	0,18	0,25	0,47	0,85	1,37	1,97	2,70
X.X.S.	W.T. in mm			9,09	9,70	10,16	11,07	14,02	15,24	16,15	17,12
	Weight in Kg			0,19	0,30	0,45	0,84	1,60	2,60	3,75	5,20
SCH. 10	W.T. in mm										
	Weight in Kg										
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm					Refer to Standard					
	Weight in Kg					Refer to Standard					
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm					Refer to Standard					
	Weight in Kg					Refer to Standard					
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm										11,09
	Weight in Kg										3,47
SCH. 140	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm	4,78	5,56	6,35	6,35	7,13	8,71	9,52	11,09		13,50
	Weight in Kg	0,12	0,12	0,14	0,22	0,33	0,70	1,20	2		4

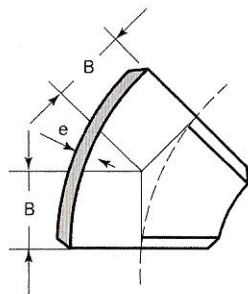
45° long radius elbows ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		5"	6"	8"	10"	12"	14"	16"	18"	20"	22"
Outside diameter at bevel D - mm		141	168	219	273	324	356	406	457	508	559
Center to end B - mm		79	95	127	159	190	222	254	286	318	343
STD	W.T. in mm	6,55	7,11	8,18	9,27	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	3,25	5,10	11,15	20,50	27	34	48	60	71,20	89
X.S	W.T. in mm	9,52	10,97	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	4,42	7,67	14,95	24,30	35	47,17	62,37	79	97,16	118
X.X.S.	W.T. in mm	19,05	21,95	22,23							
	Weight in Kg	9,08	15	27							
SCH. 10	W.T. in mm						6,35	6,35	6,35	6,35	6,35
	Weight in Kg						25	32	41	50	60
SCH. 20	W.T. in mm			6,35	6,35	6,35	7,92	7,92	7,92	Refer to Standard	
	Weight in Kg			9	18,50	24,75	32	46,50	56	Refer to Standard	
SCH. 30	W.T. in mm			7,03	7,80	8,38	Refer to Standard		11,10	12,70	12,70
	Weight in Kg			10,35	19,65	26,03	Refer to Standard		69,91	97,16	128,10
SCH. 40	W.T. in mm			Refer to Standard		10,31	11,09	Ref. to X.S.	14,27	15,06	
	Weight in Kg			Refer to Standard		29,57	39,98	88,53	114		
SCH. 60	W.T. in mm			10,31	Ref. to X.S.	14,22	15,06	16,74	19,05	20,62	22,22
	Weight in Kg			13,34	41,31	41,31	55,84	80,81	115,77	155,72	205,35
SCH. 80	W.T. in mm			Ref. to X.S.	15,06	17,44	19,05	21,41	23,80	26,18	28,58
	Weight in Kg			Ref. to X.S.	30	49,94	69,92	102,15	143,92	195,67	256,70
SCH. 100	W.T. in mm			15,06	18,23	21,41	23,80	26,19	29,36	32,54	34,92
	Weight in Kg			19,07	37,55	61,50	94	130	195	238	329
SCH. 120	W.T. in mm	12,70	14,22	18,23	21,41	25,40	27,76	30,94	34,92	38,10	41,27
	Weight in Kg	6,31	9,81	21,59	41,77	70,82	95	137	202,50	254	365
SCH. 140	W.T. in mm			20,64	25,40	28,57	31,75	36,53	39,67	44,45	47,62
	Weight in Kg			26	48,50	79	112	161,50	211	303,50	425
SCH. 160	W.T. in mm	15,87	18,23	23,01	28,57	33,32	35,71	39,70	45,24	49,99	53,97
	Weight in Kg	7,50	14	29	61	90,34	123,94	183	272	385	510

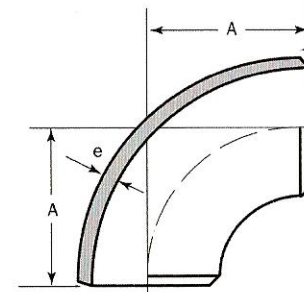
45° long radius elbows ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		24"	26"	28"	30"	32"	34"	36"	40"	42"	48"
Outside diameter at bevel D - mm		610	660	711	762	813	864	914	1016	1067	1219
Center to end B - mm		381	406	438	470	502	533	565	632	660	759
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	102,95	124,90	150	167	215	241	290	327	443	
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	141,20	165,71	202	220	280	312	372	420	533	
X.X.S.	W.T. in mm										
	Weight in Kg										
SCH. 10	W.T. in mm	6,35									
	Weight in Kg	73									
SCH. 20	W.T. in mm	Ref. to Std.									
	Weight in Kg										
SCH. 30	W.T. in mm	14,27									
	Weight in Kg	159,35									
SCH. 40	W.T. in mm	17,44									
	Weight in Kg	192,04									
SCH. 60	W.T. in mm	24,59									
	Weight in Kg	266,95									
SCH. 80	W.T. in mm	31									
	Weight in Kg	333,70									
SCH. 100	W.T. in mm	38,89									
	Weight in Kg	410									
SCH. 120	W.T. in mm	46,02									
	Weight in Kg	477									
SCH. 140	W.T. in mm	52,37									
	Weight in Kg	545									
SCH. 160	W.T. in mm	59,51									
	Weight in Kg	635									

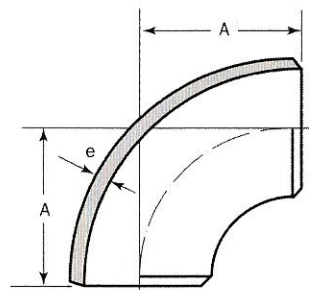
90° long radius elbows ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
Outside diameter at bevel D - mm		21	27	33	42	48	60	73	89	102	114
Center to end B - mm		38	29	38	48	57	76	95	114	133	152
STD	W.T. in mm	2,77	2,87	3,38	3,56	3,68	3,91	5,16	5,49	5,74	6,02
	Weight in Kg	0,08	0,08	0,15	0,25	0,36	0,65	1,28	2,03	2,87	3,90
X.S	W.T. in mm	3,73	3,91	4,55	4,85	5,08	5,54	7,01	7,62	8,08	8,56
	Weight in Kg	0,18	0,20	0,20	0,35	0,60	0,94	1,70	2,75	3,95	5,40
X.X.S.	W.T. in mm			9,09	9,70	10,16	11,07	14,02	15,24	16,15	17,12
	Weight in Kg			0,40	0,61	0,90	1,80	3,21	5,20	7,49	10,30
SCH. 10	W.T. in mm										
	Weight in Kg										
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm						Refer to Standard				
	Weight in Kg										
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm						Refer to Extra-Strong				
	Weight in Kg										
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm										11,09
	Weight in Kg										6,95
SCH. 140	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm	4,78	5,56	6,35	6,35	7,13	8,71	9,52	11,09		13,50
	Weight in Kg	0,22	0,25	0,30	0,44	0,80	1,50	2,35	4		9

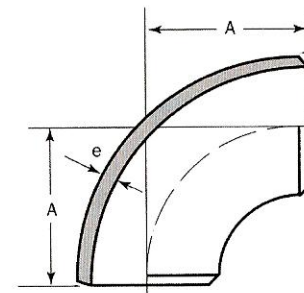
90° long radius elbows ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		5"	6"	8"	10"	12"	14"	16"	18"	20"	22"
Outside diameter at bevel D - mm		141	168	219	273	324	356	406	457	508	559
Center to end B - mm		190	229	305	381	457	533	610	686	762	838
STD	W.T. in mm Weight in Kg	6,55 6,50	7,11 10,20	8,18 20,30	9,27 37	9,52 54	9,52 68	9,52 89,20	9,52 112,90	9,52 142,40	9,52 178
X.S	W.T. in mm Weight in Kg	9,52 8,85	10,97 15,35	12,70 29,90	12,70 48,60	12,70 70	12,70 94,35	12,70 124,75	12,70 157,50	12,70 194,30	12,70 236
X.X.S.	W.T. in mm Weight in Kg	19,05 18,11	21,95 30	22,23 54,50							
SCH. 10	W.T. in mm Weight in Kg						6,35 57,47	6,35 63,20	6,35 82	6,35 100	6,35 120
SCH. 20	W.T. in mm Weight in Kg			6,35 16,57	6,35 25,79	6,35 37,23	7,92 59,93	7,92 78,09	7,92 99,43	Refer to Standard	
SCH. 30	W.T. in mm Weight in Kg			7,03 17,50	7,80 31,30	8,38 46,06	Refer to Standard		11,10 139,83	12,70 194,30	12,70 250,20
SCH. 40	W.T. in mm Weight in Kg			Refer to Standard		10,31 58,15	11,09 79,96	Ref. to X.S.	14,27 177,06	15,06 230	
SCH. 60	W.T. in mm Weight in Kg			10,31 26,30	Ref. to X.S.	14,22 82,62	15,06 111,26	16,74 161,17	19,05 231,54	20,62 311,44	22,22 412,70
SCH. 80	W.T. in mm Weight in Kg			Ref. to X.S.	15,06 57,11	17,44 94,82	19,05 132,16	21,41 204,30	23,80 287,84	26,18 390,90	28,58 523,40
SCH. 100	W.T. in mm Weight in Kg			15,06 38	18,23 75	21,41 123	23,80 188	26,19 260	29,36 390	32,54 476	34,92 638
SCH. 120	W.T. in mm Weight in Kg	12,70 12,62	14,22 23	18,23 40,50	21,41 85	25,40 140	27,76 190	30,94 274	34,92 405	38,10 508	41,27 700
SCH. 140	W.T. in mm Weight in Kg			20,64 52	25,40 97	28,57 157	31,75 224	36,53 323	39,67 422	44,45 607	47,62 850
SCH. 160	W.T. in mm Weight in Kg	15,87 15,44	18,23 27	23,01 58	28,57 123	33,32 180	35,71 247,50	39,70 367	45,24 545	49,99 770	53,97 1020

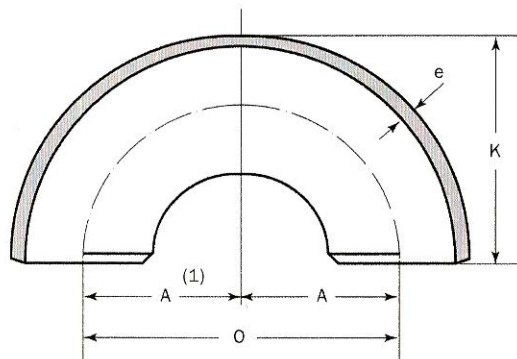
90° long radius elbows ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		24"	26"	28"	30"	32"	34"	36"	40"	42"	48"
Outside diameter at bevel D - mm		610	660	711	762	813	864	914	1015	1067	1219
Center to end B - mm		914	991	1067	1143	1219	1295	1372	1524	1600	1829
STD	W.T. in mm Weight in Kg	9,52 202	9,52 270	9,52 300	9,52 333	9,52	9,52 430	9,52 482	9,52 580	9,52 655	9,52 885
X.S	W.T. in mm Weight in Kg	12,70 268,50	12,70 348	12,70 404	12,70 441	12,70	12,70 560	12,70 625	12,70 745	12,70 840	12,70 1067
X.X.S.	W.T. in mm Weight in Kg										
SCH. 10	W.T. in mm Weight in Kg	6,35 146									
SCH. 20	W.T. in mm Weight in Kg	Ref. to Std.									
SCH. 30	W.T. in mm Weight in Kg	14,27 318,70									
SCH. 40	W.T. in mm Weight in Kg	17,44 384									
SCH. 60	W.T. in mm Weight in Kg	24,59 533,90									
SCH. 80	W.T. in mm Weight in Kg	31 667,40									
SCH. 100	W.T. in mm Weight in Kg	38,89 820									
SCH. 120	W.T. in mm Weight in Kg	46,02 954									
SCH. 140	W.T. in mm Weight in Kg	52,37 1100									
SCH. 160	W.T. in mm Weight in Kg	59,51 1270									

180° long radius returns ANSI B 16-9

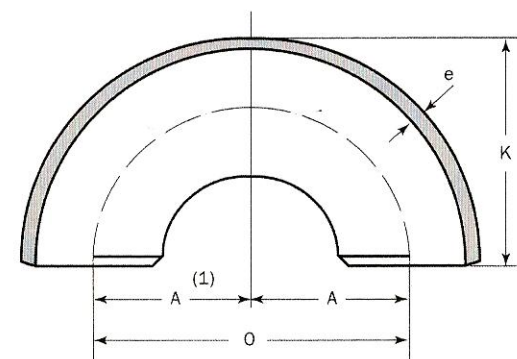


(1) Dimension "A" is equal to 1/2 of dimension "O"

"Weights are approximate"

Nominal pipe size (NPS)		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"
Outside diameter at bevel D - mm		21	27	33	42	48	60	73	89	102	114	141
Center to center O - mm		76	57	76	95	114	152	191	229	267	305	381
Back to face K - mm		48	43	56	70	83	106	132	159	184	210	262
STD	W.T. in mm	2,77	2,87	3,38	3,56	3,68	3,91	5,16	5,49	5,74	6,02	6,55
	Weight in Kg	0,16	0,16	0,31	0,50	0,73	1,30	2,57	4,07	5,74	7,80	13
X.S	W.T. in mm	3,73	3,91	4,55	4,85	5,08	5,54	7,01	7,62	8,08	8,56	9,52
	Weight in Kg	0,35	0,35	0,40	0,70	1,20	1,88	3,40	5,50	7,90	10,80	17,70
X.X.S.	W.T. in mm			9,09	9,70	10,16	11,07	14,02	15,24	16,15	17,12	19,05
	Weight in Kg			0,69	1,22	1,80	3,40	6,40	10,35	14,98	20,60	36,23
SCH. 10	W.T. in mm											
	Weight in Kg											
SCH. 20	W.T. in mm											
	Weight in Kg											
SCH. 30	W.T. in mm											
	Weight in Kg											
SCH. 40	W.T. in mm						Refer to Standard					
	Weight in Kg											
SCH. 60	W.T. in mm											
	Weight in Kg											
SCH. 80	W.T. in mm						Refer to Standard					
	Weight in Kg											
SCH. 100	W.T. in mm											
	Weight in Kg											
SCH. 120	W.T. in mm										11,09	12,70
	Weight in Kg										13,90	25,24
SCH. 140	W.T. in mm											
	Weight in Kg											
SCH. 160	W.T. in mm	4,78	5,56	6,35	6,35	7,13	8,71	9,52	11,09		13,50	15,87
	Weight in Kg	0,43	0,43	0,53	0,88	1,36	3	4,67	8,03		17	30,87

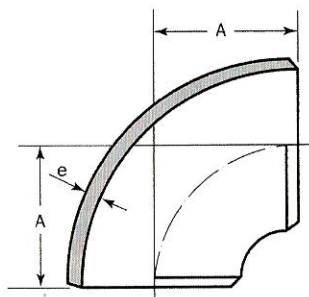
180° long radius returns ANSI B 16-9



(1) Dimension "A" is equal to 1/2 of dimension "O"

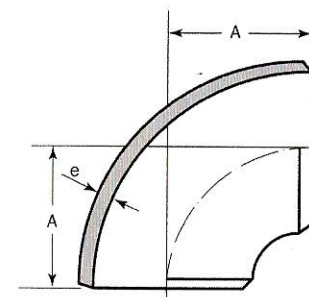
"Weights are approximate"

Nominal pipe size (NPS)		6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Outside diameter at bevel D - mm		168	219	273	324	356	406	457	508	559	610
Center to center O - mm		457	610	762	914	1067	1219	1372	1524	1676	1829
Back to face K - mm		313	414	518	619	711	813	914	1016	1118	1219
STD	W.T. in mm	7,11	8,18	9,27	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	20,40	40,60	74	108	136	178,40	225,80	284,80	346	411,80
X.S	W.T. in mm	10,97	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	30,70	59,80	97,20	140	188,70	249,50	315,08	388,62	466	564,78
X.X.S.	W.T. in mm	21,95	22,23								
	Weight in Kg	59,50	109								
SCH. 10	W.T. in mm					6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg					114,94	165,24	164	200	240	292
SCH. 20	W.T. in mm		6,35	6,35	6,35	7,92	7,92	7,92	Refer to Standard		
	Weight in Kg		33,14	51,58	74,46	199,86	156,18	198,86			
SCH. 30	W.T. in mm		7,03	7,80	8,38	Refer to Standard		11,10	12,70	12,70	14,27
	Weight in Kg		34,98	62,62	92,12			279,66	388,62	510,40	637,42
SCH. 40	W.T. in mm		Refer to Standard		10,31	11,12	Ref. to X.S.	14,27	15,06		17,44
	Weight in Kg				116,30	159,93	354,12	460			768,17
SCH. 60	W.T. in mm		10,31	Ref. to X.S.	14,22	15,06	16,66	19,05	20,62	22,22	24,58
	Weight in Kg		53,12	119,86	165,25	222,46	322,34	463,08	622,89	825,40	1067,80
SCH. 80	W.T. in mm		Ref. to X.S.	15,06	17,44	19,05	21,41	23,80	26,18	28,58	31,00
	Weight in Kg			119,86	198,85	270	404	581	781	1046	1335
SCH. 100	W.T. in mm		15,06	18,23	21,41	23,80	26,19	29,36	32,54	34,92	38,89
	Weight in Kg		76	150	246	376	520	780	952	1316	1640
SCH. 120	W.T. in mm	14,22	18,23	21,41	25,40	27,76	30,94	34,92	38,10	41,27	46,02
	Weight in Kg	39,26	81	190	280	380	548	810	1016	1400	1908
SCH. 140	W.T. in mm		20,62	25,40	28,57	31,75	36,53	39,67	44,45	47,62	52,37
	Weight in Kg		104	194	314	448	646	844	1214	1700	2170
SCH. 160	W.T. in mm	18,23	23,01	28,57	33,32	35,71	39,70	45,24	49,99	53,97	59,51
	Weight in Kg	54	110	218	360	495	734	1090	1540	2040	2540

**90° short radius
elbows
ANSI B 16-9**


"Weights are approximate"

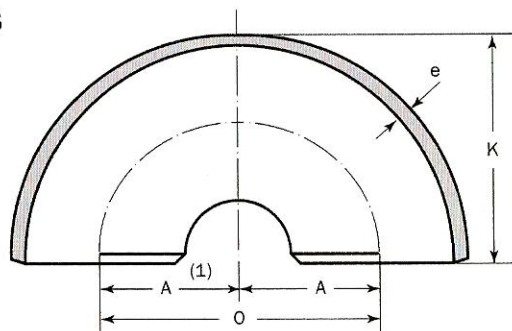
Nominal pipe size (NPS)		1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"
Outside diameter at bevel D - mm		33	42	48	60	73	89	102	114	141	168
Center to end A - mm		25	32	38	51	64	76	89	102	127	152
STD	W.T. in mm	3,38	3,56	3,68	3,91	5,16	5,49	5,74	6,02	6,55	7,11
	Weight in Kg	0,10	0,16	0,24	0,43	0,82	1,35	1,90	2,60	4,35	6,45
X.S	W.T. in mm			5,08	5,54	7,01	7,62	8,08	8,56	9,52	10,97
	Weight in Kg			0,30	0,60	1,15	1,85	2,60	3,55	6,20	10,20
X.X.S.	W.T. in mm										
	Weight in Kg										
SCH. 10	W.T. in mm										
	Weight in Kg										
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm					Refer to Standard					
	Weight in Kg										
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm					Refer to Extra-Strong					
	Weight in Kg										
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm								11,09	12,70	14,22
	Weight in Kg								4,72	8,44	13,62
SCH. 140	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm										
	Weight in Kg										

**90° short radius
elbows
ANSI B 16-9**


"Weights are approximate"

Nominal pipe size (NPS)		8"	10"	12"	14"	16"	18"	20"	22"	24"
Outside diameter at bevel D - mm		219	273	324	356	406	457	508	559	610
Center to end B - mm		203	254	305	356	406	457	508	559	610
STD	W.T. in mm	8,18	9,27	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	16,50	31,15	45	52,50	71,25	90	110	132	165
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	22,50	31,15	49,03	63,11	82,63	104,87	129,54	157	188,41
X.X.S.	W.T. in mm									
	Weight in Kg									
SCH. 10	W.T. in mm				6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg				30,50	39	48,50	67,50	84,50	96,50
SCH. 20	W.T. in mm	6,35	6,35	6,35	7,92	7,92	7,92	Refer to Standard		
	Weight in Kg	11,10	17,35	25	39,50	52,20	65,35			
SCH. 30	W.T. in mm	7,03	7,80	8,38	Refer to Standard		11,10	12,70	12,70	14,27
	Weight in Kg	12,26	21,25	32,78			93,07	129,84	171,50	213,38
SCH. 40	W.T. in mm	Refer to Standard		10,31	11,12	Ref. to X.S.	14,27	15,06		17,44
	Weight in Kg			40	55,39		117,59	153,45		256
SCH. 60	W.T. in mm	10,31	Ref. to X.S.	14,22	15,06	16,66	19,05	20,62	22,22	24,58
	Weight in Kg	17,75		59,93	74	107,14	154,36	207,48	281,50	355,48
SCH. 80	W.T. in mm	Ref. to X.S.	15,06	17,44	19,05	21,41	23,80	26,18	28,58	31
	Weight in Kg	40	66,23	93,07	136,20	191,60	260,14	350,50	443,55	
SCH. 100	W.T. in mm	15,06	18,23	21,41	23,80	26,19	29,36	32,54	34,92	38,89
	Weight in Kg	26,40	50	81	120	166	257	332	430	530
SCH. 120	W.T. in mm	18,23	21,41	25,40	27,76	30,94	34,92	338,10	41,27	46,02
	Weight in Kg	30	53	92	124	171,50	283	376	497	621
SCH. 140	W.T. in mm	20,64	25,40	28,57	31,75	36,53	39,67	44,45	47,62	52,37
	Weight in Kg	32	62	99	139	198	387	430	555	680
SCH. 160	W.T. in mm									
	Weight in Kg									

180° short radius returns ANSI B 16-9

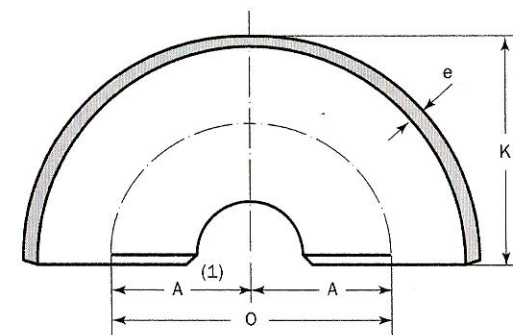


(1) Dimension "A" is equal to 1/2 of dimension "O"

"Weights are approximate"

Nominal pipe size (NPS)		1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"
Outside diameter at bevel D - mm		33	42	48	60	73	89	102	114	141	168
Center to center O - mm		51	64	76	102	127	152	178	203	254	305
Back to face K - mm		41	52	62	81	100	121	140	159	197	237
STD	W.T. in mm	3,38	3,56	3,68	3,91	5,16	5,49	5,74	6,02	6,55	7,11
	Weight in Kg	0,20	0,33	0,48	0,86	1,64	2,70	3,80	5,20	8,70	12,90
X.S	W.T. in mm		4,85	5,08	5,54	7,01	7,62	8,08	8,56	9,52	10,97
	Weight in Kg		0,50	0,60	1,20	2,30	3,70	5,20	7,10	12,40	20,40
X.X.S.	W.T. in mm										
	Weight in Kg										
SCH. 10	W.T. in mm										
	Weight in Kg										
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm					Refer to Standard					
	Weight in Kg										
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm					Refer to Extra-Strong					
	Weight in Kg										
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm							11,09	12,70	14,22	
	Weight in Kg							9,45	18	27	
SCH. 140	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm										
	Weight in Kg										

180° short radius returns ANSI B 16-9



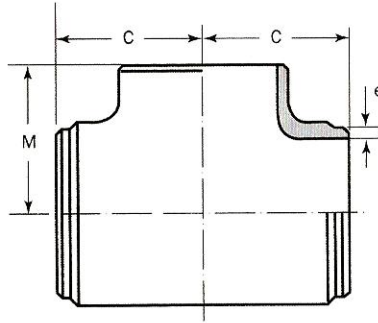
(1) Dimension "A" is equal to 1/2 of dimension "O"

"Weights are approximate"

Nominal pipe size (NPS)		8"	10"	12"	14"	16"	18"	20"	22"	24"
Outside diameter at bevel D - mm		219	273	324	356	406	457	508	559	610
Center to center O - mm		406	508	610	711	813	914	1016	1118	1219
Back to face K - mm		313	391	467	533	610	686	762	838	914
STD	W.T. in mm	8,18	9,27	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	33	62,30	90	106	142,50	180	219	264	330
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	45	62,30	98,06	126,21	165,26	209,75	259,70	314	376,82
X.X.S.	W.T. in mm									
	Weight in Kg									
SCH. 10	W.T. in mm				6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg				60	79,35	97,5	130	160	192
SCH. 20	W.T. in mm	6,35	6,35	6,35	7,92	7,92	7,92	Refer to Standard		
	Weight in Kg	22,25	34,70	50	79	104,45	130,75			
SCH. 30	W.T. in mm	7,03	7,80	8,38	Refer to Standard		11,10	12,70	12,70	14,27
	Weight in Kg	24,51	42,38	65,83			186,14	259,68	348	426,76
SCH. 40	W.T. in mm	Refer to Standard		10,31	11,12	Ref. to X.S.	14,27	15,06		17,44
	Weight in Kg			79,20	109,80		233,10	304,20		507,60
SCH. 60	W.T. in mm	10,31	Ref. to X.S.	14,22	15,06	16,66	19,05	20,62	22,22	24,58
	Weight in Kg	35,10		108,90	146,70	212,40	306	411,30	563	704,70
SCH. 80	W.T. in mm	Ref. to X.S.	15,06	17,44	19,05	21,41	23,80	26,18	28,58	31,00
	Weight in Kg		81	136	187	276	386	522	676	887
SCH. 100	W.T. in mm	15,06	18,23	21,41	23,80	26,19	29,36	32,54	34,92	38,89
	Weight in Kg	52,65	100	162	240	332	515	664	840	1060
SCH. 120	W.T. in mm	18,23	21,41	25,40	27,76	30,94	34,92	33,10	41,27	46,02
	Weight in Kg	58	106	184	248	343	566	752	984	1242
SCH. 140	W.T. in mm	20,62	25,40	28,57	31,75	36,53	39,67	44,45	47,62	52,37
	Weight in Kg	64	124	198	276	396	774	860	1110	1360
SCH. 160	W.T. in mm									
	Weight in Kg									

Straight tees

ANSI B 16-9

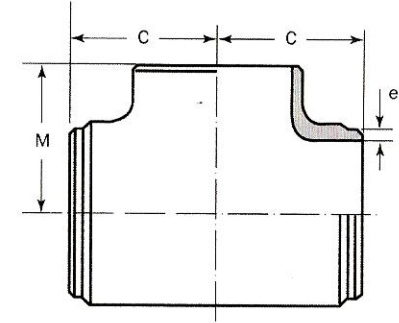


"Weights are approximate"

Nominal pipe size (NPS)		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
Outside diameter at bevel D - mm		21	27	33	42	48	60	73	89	102	114
Center to end - mm	C	25	29	38	48	57	64	76	86	95	105
	M	25	29	38	48	57	64	76	86	95	105
STD	W.T. in mm Weight in Kg	2,77 0,16	2,87 0,20	3,38 0,29	3,56 0,53	3,68 0,77	3,91 1,88	5,16 2,69	5,49 3,82	5,74 5,18	6,02 6
X.S	W.T. in mm Weight in Kg	3,73 0,25	3,91 0,27	4,55 0,35	4,85 0,65	5,08 0,96	5,54 1,90	7,01 3,07	7,62 4,50	8,08 6,17	8,56 8,44
X.X.S.	W.T. in mm Weight in Kg		7,82 0,38	9,09 0,58	9,70 1,05	10,16 1,56	11,07 2,69	14,02 4,54	15,24 7,63	16,15 9,62	17,12 17
SCH. 10	W.T. in mm Weight in Kg										
SCH. 20	W.T. in mm Weight in Kg										
SCH. 30	W.T. in mm Weight in Kg										
SCH. 40	W.T. in mm Weight in Kg						Refer to Standard				
SCH. 60	W.T. in mm Weight in Kg										
SCH. 80	W.T. in mm Weight in Kg						Refer to Extra-Strong				
SCH. 100	W.T. in mm Weight in Kg										
SCH. 120	W.T. in mm Weight in Kg										
SCH. 140	W.T. in mm Weight in Kg										
SCH. 160	W.T. in mm Weight in Kg	4,78 0,28	5,56 0,29	6,35 0,45	6,35 0,77	7,13 1,21	8,71 2,25	9,52 3,42	11,09 6,21	11,09 9	13,50 15,53

Straight tees

ANSI B 16-9

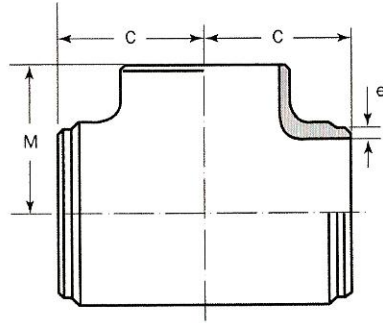


"Weights are approximate"

Nominal pipe size (NPS)		5"	6"	8"	10"	12"	14"	16"	18"	20"	22"
Outside diameter at bevel D - mm		141	168	219	273	324	356	406	457	508	559
Center to end - mm	C	124	143	178	216	254	279	305	343	381	419
	M	124	143	178	216	254	27	305	343	381	419
STD	W.T. in mm Weight in Kg	6,55 9,44	7,11 16,48	8,18 33	9,27 49,35	9,52 65	9,52 93	9,52 115	9,52 135	9,52 168	9,52 200
X.S	W.T. in mm Weight in Kg	9,52 12,94	10,97 19,30	12,70 34,50	12,70 58,57	12,70 84,90	12,70 127,12	12,70 167,52	12,70 190	12,70 245	12,70 280
X.X.S.	W.T. in mm Weight in Kg	19,05 25	21,95 39	22,23 69							
SCH. 10	W.T. in mm Weight in Kg						6,35 87,16	6,35 90,80	6,35 94,50	6,35 120	6,35 143
SCH. 20	W.T. in mm Weight in Kg			6,35 29	6,35 34,7	6,35 59	7,92 90	7,92 100	7,92 127,12	Refer to Standard	
SCH. 30	W.T. in mm Weight in Kg			7,03 31	7,80 36,77	8,38 61,74	Refer to Standard		11,10 181,14	12,70 265	12,70 355
SCH. 40	W.T. in mm Weight in Kg			Refer to Standard		10,31 70,50	11,09 114,41	Ref. to X.S.	14,27 238,35	15,06 320,52	
SCH. 60	W.T. in mm Weight in Kg			10,31 34,50	12,70 58,57	14,22 102,60	15,06 141,20	16,74 207,93	18,23 277,85	20,62 378,64	22,22 510
SCH. 80	W.T. in mm Weight in Kg			Ref. to X.S.	15,06 68	17,44 115	19,05 165	21,41 249	23,80 322	26,18 459,05	28,58 600
SCH. 100	W.T. in mm Weight in Kg			15,06 43,65	18,23 74	21,41 136	23,80 206	26,19 305	29,36 380	32,54 540	34,92 725
SCH. 120	W.T. in mm Weight in Kg	12,70 18	14,22 24	18,23 50	21,41 93	25,40 150	27,76 240	30,94 330	34,92 450	38,10 590	41,27 840
SCH. 140	W.T. in mm Weight in Kg			20,64 54	25,40 99	28,57 177	31,75 275	36,53 385	39,67 500	44,45 720	47,62 950
SCH. 160	W.T. in mm Weight in Kg	15,87 23,93	18,23 38,59	23,01 71	28,57 120	33,32 184	35,71 300	40,46 425	45,24 590	49,99 790	53,97 1100

Straight tees

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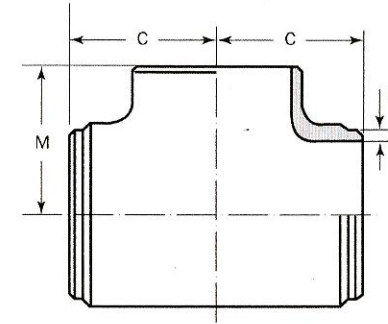


"Weights are approximate"

Nominal pipe size (NPS)		24"	26"	28"	30"	32"	34"	36"	40"	42"	48"
Outside diameter at bevel D - mm		610	660	711	762	813	864	914	1016	1067	1219
Center to end - mm	C	432	495	521	559	597	635	673	749	762	889
	M	432	495	521	559	597	635	673	749	711	838
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	240	208		388,50		516	581,50	690	831	1112,50
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	350	360,50		483,50		645	731	894,50	1112,50	1498,50
X.X.S.	W.T. in mm										
	Weight in Kg										
SCH. 10	W.T. in mm	6,35									
	Weight in Kg	170									
SCH. 20	W.T. in mm	Ref. to Std									
	Weight in Kg										
SCH. 30	W.T. in mm	14,27									
	Weight in Kg	443,55									
SCH. 40	W.T. in mm	17,44									
	Weight in Kg	570,68									
SCH. 60	W.T. in mm	23,80									
	Weight in Kg	656,48									
SCH. 80	W.T. in mm	31									
	Weight in Kg	748									
SCH. 100	W.T. in mm	38,89									
	Weight in Kg	910									
SCH. 120	W.T. in mm	46,02									
	Weight in Kg	1100									
SCH. 140	W.T. in mm	52,37									
	Weight in Kg	1180									
SCH. 160	W.T. in mm	59,51									
	Weight in Kg	1310									

Reducing outlet tees

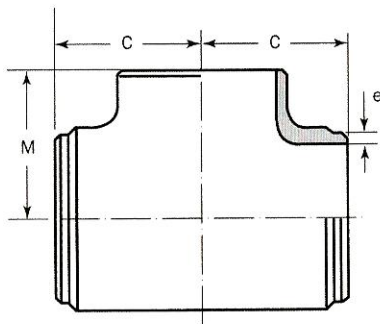
ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		1/2" x 3/8"	1/2" x 1/4"	3/4" x 1/2"	3/4" x 3/8"	1" x 3/4"	1" x 1/2"	1 1/4" x 1"	1 1/4" x 3/4"	1 1/4" x 1/2"	1 1/2" x 1 1/4"	1 1/2" x 1"
Outside diameter at bevel D - mm		21	21	27	27	33	33	42	42	42	48	48
		17	14	21	17	27	21	33	27	21	42	33
Center to end - mm	C	25	25	29	29	38	38	48	48	48	57	57
	M	25	25	29	29	38	38	48	48	48	57	57
STD	W.T. in mm	2,77	2,77	2,87	2,87	3,38	3,38	3,56	3,56	3,56	3,68	3,68
	Weight in Kg	0,16	0,16	0,25	0,25	0,35	0,34	0,60	0,60	0,60	0,80	0,73
X.S	W.T. in mm	3,73	3,73	3,91	3,91	4,55	4,55	4,85	4,85	4,85	5,08	5,08
	Weight in Kg	0,25	0,25	0,34	0,34	0,40	0,40	0,60	0,59	0,58	0,99	0,96
X.X.S.	W.T. in mm			7,82		9,09	9,09	9,70	9,70	9,70	10,16	10,16
	Weight in Kg			0,40		0,57	0,55	1,09	1,02	1	1,62	1,55
SCH. 10	W.T. in mm											
	Weight in Kg											
SCH. 20	W.T. in mm											
	Weight in Kg											
SCH. 30	W.T. in mm											
	Weight in Kg											
SCH. 40	W.T. in mm							Refer to Standard				
	Weight in Kg											
SCH. 60	W.T. in mm											
	Weight in Kg											
SCH. 80	W.T. in mm							Refer to Extra-Strong				
	Weight in Kg											
SCH. 100	W.T. in mm											
	Weight in Kg											
SCH. 120	W.T. in mm											
	Weight in Kg											
SCH. 140	W.T. in mm											
	Weight in Kg											
SCH. 160	W.T. in mm			5,53		6,35	6,35	6,35	6,35	6,35	7,13	7,13
	Weight in Kg			0,27		0,46	0,44	0,80	0,78	0,76	1,25	1,25

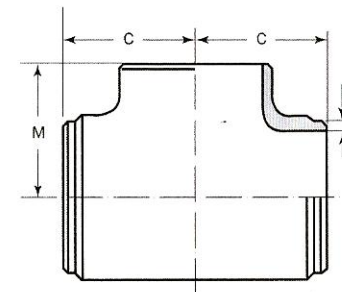
Reducing outlet tees ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		1" 1/2 x 3/4"	1" 1/2 x 1/2"	2" x 1 1/2"	2" x 1 1/4"	2" x 1"	2" x 3/4"	2 1/2" x 2"	2 1/2" x 1 1/2"	2 1/2" x 1 1/4"	2 1/2" x 1"
Outside diameter at bevel D - mm		48	48	60	60	60	60	73	73	73	73
Center to end - mm		C	57	57	64	64	64	76	76	76	76
		M	57	57	60	57	51	44	70	67	64
STD	W.T. in mm	3,68	3,68	3,91	3,91	3,91	3,91	5,16	5,16	5,16	5,16
	Weight in Kg	2,87	2,77	3,68	3,56	3,38	2,87	3,91	3,68	3,56	3,38
X.S	W.T. in mm	5,08	5,08	5,54	5,54	5,54	5,54	7,01	7,01	7,01	7,01
	Weight in Kg	3,91	3,13	5,08	4,85	4,55	3,91	5,54	5,08	4,85	4,55
X.X.S.	W.T. in mm	10,16		11,07	11,07	11,07	11,07	14,02	14,02	14,02	14,02
	Weight in Kg	7,82		10,16	9,70	9,09	7,82	11,07	10,16	9,70	9,09
SCH. 10	W.T. in mm										
	Weight in Kg										
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm					Refer to Standard					
	Weight in Kg										
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm					Refer to Extra-Strong					
	Weight in Kg										
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm										
	Weight in Kg										
SCH. 140	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm	7,13	7,13	8,71	8,71	8,71	8,71	9,52	9,52	9,52	9,52
	Weight in Kg	5,53	4,78	7,13	6,35	6,35	5,53	8,71	7,13	6,35	6,35

Reducing outlet tees ANSI B 16-9

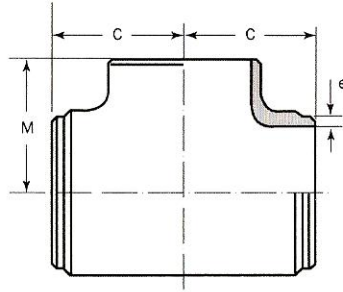


"Weights are approximate"

Nominal pipe size (NPS)		3" x 2 1/2"	3" x 2"	3" x 1 1/2"	3" x 1 1/4"	3 1/2" x 3"	3 1/2" x 2 1/2"	3 1/2" x 2"	3 1/2" x 1 1/2"	4" x 3 1/2"
Outside diameter at bevel D - mm		89	89	89	89	102	102	102	102	114
Center to end - mm		C	86	86	86	95	95	95	95	105
		M	83	76	73	70	92	89	83	79
STD	W.T. in mm	5,49	5,49	5,49	5,49	5,74	5,74	5,74	5,74	6,02
	Weight in Kg	5,16	3,91	3,68	3,56	5,49	5,16	3,91	3,68	5,74
X.S	W.T. in mm	7,62	7,62	7,62	7,62	8,08	8,08	8,08	8,08	8,56
	Weight in Kg	7,01	5,54	5,08	4,85	7,62	7,01	5,54	5,08	8,08
X.X.S.	W.T. in mm	15,24	15,24	15,24	15,24	16,15	16,15	16,15	16,15	17,12
	Weight in Kg	14,02	11,07	10,16	9,70	15,24	14,02	11,07	10,16	16,15
SCH. 10	W.T. in mm									
	Weight in Kg									
SCH. 20	W.T. in mm									
	Weight in Kg									
SCH. 30	W.T. in mm									
	Weight in Kg									
SCH. 40	W.T. in mm					Refer to Standard				
	Weight in Kg									
SCH. 60	W.T. in mm									
	Weight in Kg									
SCH. 80	W.T. in mm					Refer to Extra-Strong				
	Weight in Kg									
SCH. 100	W.T. in mm									
	Weight in Kg									
SCH. 120	W.T. in mm									11,09
	Weight in Kg									
SCH. 140	W.T. in mm									
	Weight in Kg									
SCH. 160	W.T. in mm	11,09	11,09	11,09	11,09					
	Weight in Kg	9,52	8,71	7,13	6,35					

* Since schedule 120 starts with the 4" size, the thickness of smaller branches must be specified by customers.

Reducing outlet tees ANSI B 16-9

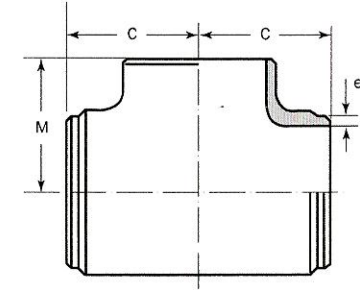


"Weights are approximate"

Nominal pipe size (NPS)		4"	4"	4"	4"	5"	5"	5"	5"	5"
		3"	2 1/2"	2"	1 1/2"	4"	3 1/2"	3"	2 1/2"	2"
Outside diameter at bevel D - mm		114	114	114	114	141	141	141	141	141
		89	73	60	48	114	102	89	73	60
Center to end - mm	C	105	105	105	105	124	124	124	124	124
	M	98	95	89	86	117	114	111	108	105
STD	W.T. in mm	6,02	6,02	6,02	6,02	6,55	6,55	6,55	6,55	6,55
	Weight in Kg	5,49	5,16	3,91	3,68	6,02	5,74	5,49	5,16	3,91
	W.T. in mm	5,18	5,13	4,99	4,95	8,22	8,08	7,99	7,90	7,81
	Weight in Kg	5,18	5,13	4,99	4,95	8,22	8,08	7,99	7,90	7,81
X.S	W.T. in mm	8,56	8,56	8,56	8,56	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	7,62	7,01	5,54	5,08	8,56	8,08	7,62	7,01	5,54
	W.T. in mm	7,5	7,5	7,5	7,5	12,1	12,1	12,1	12,1	12,1
	Weight in Kg	7,5	7,5	7,5	7,5	12,1	12,1	12,1	12,1	12,1
X.X.S.	W.T. in mm	17,12	17,12	17,12	17,12	19,05	19,05	19,05	19,05	19,05
	Weight in Kg	15,24	14,02	11,07	10,16	17,12	16,15	15,24	14,20	11,07
	W.T. in mm	17	17	17	17	26,2	26,2	26,2	26,2	22,2
	Weight in Kg	17	17	17	17	26,2	26,2	26,2	26,2	22,2
SCH. 10	W.T. in mm									
SCH. 20	W.T. in mm									
SCH. 30	W.T. in mm									
SCH. 40	W.T. in mm									
SCH. 60	W.T. in mm									
SCH. 80	W.T. in mm									
SCH. 100	W.T. in mm									
SCH. 120	W.T. in mm	11,09	11,09	11,09	11,09	12,70	12,70	12,70	12,70	12,70
SCH. 140	W.T. in mm									
SCH. 160	W.T. in mm	13,50	13,50	13,50	13,50	15,87	15,87	15,87	15,87	15,87
	Weight in Kg	11,09	9,52	8,71	7,13	13,50	11,09	9,52	8,71	7,13
	Weight in Kg	15,9	15,5	15,5	15,5	23,0	23,0	23,0	23,0	23,0

* Since schedule 120 starts with the 4" size, the thickness of smaller branches must be specified by customers.

Reducing outlet tees ANSI B 16-9

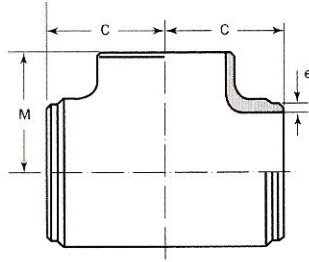


"Weights are approximate"

Nominal pipe size (NPS)		6"	6"	6"	6"	6"	8"	8"	8"	8"
		5"	4"	3 1/2"	3"	2 1/2"	6"	5"	4"	3 1/2"
Outside diameter at bevel D - mm		168	168	168	168	168	219	219	219	219
		141	114	102	89	73	168	141	114	89
Center to end - mm	C	143	143	143	143	143	178	178	178	178
	M	137	130	127	124	121	168	162	156	152
STD	W.T. in mm	7,11	7,11	7,11	7,11	7,11	8,18	8,18	8,18	8,18
	Weight in Kg	6,55	6,02	5,74	5,49	5,16	7,11	6,55	6,02	5,74
	W.T. in mm	16	16	16	16	16	28	28	28	28
	Weight in Kg	16	16	16	16	16	28	28	28	28
X.S	W.T. in mm	10,97	10,97	10,97	10,97	10,97	12,70	12,70	12,70	12,70
	Weight in Kg	9,52	8,56	8,08	7,62	7,01	10,97	9,52	8,56	8,08
	W.T. in mm	18	18	18	18	18	34	34	34	34
	Weight in Kg	18	18	18	18	18	34	34	34	34
X.X.S.	W.T. in mm	21,94	21,94	21,94	21,94	21,94	22,22	22,22	22,22	22,22
	Weight in Kg	19,05	17,12	16,15	15,24	14,02	21,94	19,05	17,12	15,24
	W.T. in mm	38	29	29	29	29	51	51	51	51
	Weight in Kg	38	29	29	29	29	51	51	51	51
SCH. 10	W.T. in mm									
SCH. 20	W.T. in mm						6,35	6,35	6,35	6,35
SCH. 30	W.T. in mm						*	*	*	*
SCH. 40	W.T. in mm									
SCH. 60	W.T. in mm						10,31	10,31	10,31	10,31
SCH. 80	W.T. in mm						*	*	*	*
SCH. 100	W.T. in mm									
SCH. 120	W.T. in mm									
SCH. 140	W.T. in mm									
SCH. 160	W.T. in mm									
	Weight in Kg									

* Since schedule 120 starts with the 4" size, the thickness of smaller branches must be specified by customers.

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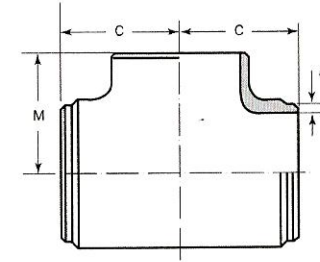


"Weights are approximate"

Nominal pipe size (NPS)		10" x 8"	10" x 6"	10" x 5"	10" x 4"	12" x 10"	12" x 8"	12" x 6"	12" x 5"
Outside diameter at bevel D - mm		273 219	273 168	273 141	273 114	324 273	324 219	324 168	324 141
Center to end - mm	C	216	216	216	216	254	254	254	254
	M	203	194	191	184	241	229	219	216
STD	W.T. in mm	9,27	9,27	9,27	9,27	9,52	9,52	9,52	9,52
	Weight in Kg	8,18 41	7,11 41	6,55 41	6,02 41	9,27 63	8,18 63	7,11 63	6,55 63
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	12,70 58	10,97 52	9,52 52	8,56 52	12,70 85	12,70 82	10,97 82	9,52 82
X.X.S.									
SCH. 10									
SCH. 20	W.T. in mm	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg	6,35 29	**	**	**	6,35 43	6,35 41	**	**
SCH. 30	W.T. in mm	7,80	7,80	7,80	7,80	8,38	8,38	8,38	8,38
	Weight in Kg	7,03 35	**	**	**	7,80 62	7,03 60	**	**
SCH. 40	W.T. in mm		Refer to Standard				10,31	10,31	10,31
	Weight in Kg						9,27 67	8,18 64	7,11 64
SCH. 60	W.T. in mm	12,70	12,70	12,70	12,70	14,22	14,22	14,22	14,22
	Weight in Kg	10,31 53	**	**	**	12,70 103	10,31 82	**	**
SCH. 80	W.T. in mm	15,06	15,06	15,06	15,06	17,44	17,44	17,44	17,44
	Weight in Kg	12,70 71	10,97 54	9,52 53	8,56 53	16,06 103	12,70 82	10,97 82	9,52 82
SCH. 100	W.T. in mm	18,23	18,23	18,23	18,23	21,41	21,41	21,41	21,41
	Weight in Kg	15,06 73	**	**	**	18,23 126	15,06 122	**	**
SCH. 120	W.T. in mm	21,41	21,41	21,41	21,41	25,40	25,40	25,40	25,40
	Weight in Kg	18,23 89	14,22 82	12,70 71	11,09 71	21,41 149	18,23 133	14,22 111	12,70 103
SCH. 140	W.T. in mm	25,4	25,4	25,4	25,4	28,57	28,57	28,57	28,57
	Weight in Kg	20,62 99	**	**	**	25,4 160	20,62 144	**	**
SCH. 160	W.T. in mm	28,57	28,57	28,57	28,57	33,32	33,32	33,32	33,32
	Weight in Kg	23,01 109	18,23 101	15,87 89	13,50 85	28,57 171	23,01 155	18,23 144	15,87 144

** Since schedule 20, 30, 60, 100 and 140 start with the 8" size, the thickness of smaller branches must be specified by customers.

Reducing outlet tees ANSI B 16-9



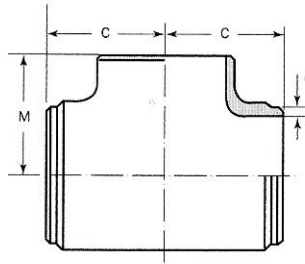
"Weights are approximate"

Nominal pipe size (NPS)		14" x 12"	14" x 10"	14" x 8"	14" x 6"	16" x 14"	16" x 12"	16" x 10"	16" x 8"	16" x 6"	18" x 16"	18" x 14"
Outside diameter at bevel D - mm		356 324	356 273	356 219	356 168	406 356	406 324	406 273	406 219	406 168	457 406	457 356
Center to end - mm	C	279	279	279	279	305	305	305	305	305	343	343
	M	270	257	248	238	305	295	283	273	264	330	330
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	9,52 111	9,27 107	8,18 107	7,11 107	9,52 119	9,52 119	9,52 116	9,52 116	9,52 116	9,52 135	9,52 135
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	12,70 127	12,70 127	12,70 122	10,97 122	12,70 167	12,70 167	12,70 160	12,70 160	12,70 160	12,70 190	12,70 190
X.X.S.												
SCH. 10	W.T. in mm	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg	**	**	**	**	6,35 84,00	**	**	**	**	6,35 105	6,35 105
SCH. 20	W.T. in mm	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92	7,92
	Weight in Kg	6,35 95	6,35 90	6,35 90	**	7,92 100	6,35 100	6,35 98	6,35 98	**	7,92 125	7,92 125
SCH. 30	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	11,12	11,12
	Weight in Kg	8,38 103	7,80 99	7,03 99	**	9,52 119	8,38 110	7,80 107	7,03 107	**	9,52 164	9,52 164
SCH. 40	W.T. in mm	11,12	11,12	11,12	11,12	12,70	12,70	12,70	12,70	12,70	14,27	14,27
	Weight in Kg	10,31 114	9,27 109	8,18 109	7,11 109	11,12 167	10,31 161	9,27 160	8,18 160	7,11 160	12,70 238	11,12 194
SCH. 60	W.T. in mm	15,06	15,06	15,06	15,06	16,66	16,66	16,66	16,66	16,66	19,05	19,05
	Weight in Kg	14,27 141	12,70 136	10,31 136	**	15,06 208	14,27 181	12,70 163	10,31 161	**	16,66 257	15,06 212
SCH. 80	W.T. in mm	19,05	19,05	19,05	19,05	21,41	21,41	21,41	21,41	21,41	23,80	23,80
	Weight in Kg	17,45 143	15,06 141	12,70 122	10,97 122	19,05 200	17,45 181	15,06 163	12,70 163	10,97 163	23,80 279	19,05 258
SCH. 100	W.T. in mm	23,80	23,80	23,80	23,80	26,19	26,19	26,19	26,19	26,19	29,36	26,19
	Weight in Kg	21,41 206	18,24 195	15,06 195	**	23,80 260	21,41 250	18,24 210	15,06 210	**	26,19 380	23,80 370
SCH. 120	W.T. in mm	27,76	27,76	27,76	27,76	30,94	30,94	30,94	30,94	30,94	34,92	34,92
	Weight in Kg	23,80 235	21,41 230	18,24 220	14,27 205	27,76 320	23,80 310	21,41 295	18,24 280	14,27 250	30,94 440	27,76 420
SCH. 140	W.T. in mm	31,75	31,75	31,75	31,75	36,53	36,53	36,53	36,53	36,53	39,67	39,67
	Weight in Kg	28,75 275	25,40 265	20,62 250	**	31,75 360	28,57 340	25,40 310	20,62 295	**	36,53 475	31,75 455
SCH. 160	W.T. in mm	35,71	35,71	35,71	35,71	40,46	40,46	40,46	40,46	40,46	45,24	45,24
	Weight in Kg	33,32 330	28,57 285	23,01 270	18,24 270	35,71 410	33,32 360	28,57 385	23,01 360	18,24 295	40,46 550	35,71 520

* Since schedules 10 starts with the 14" size, the thickness of smaller branches must be specified by customers.

** Since schedules 20, 30, 60, 100 and 140 start with the 8" size, the thickness of smaller branches must be specified by customers.

Reducing outlet tees ANSI B 16-9



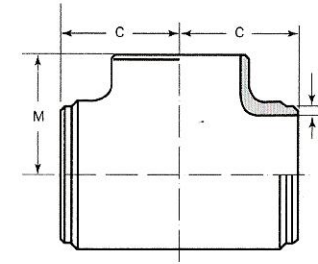
"Weights are approximate"

Nominal pipe size (NPS)		18"	18"	18"	20"	20"	20"	20"	20"	20"	22"	22"
		12"	10"	8"	18"	16"	14"	12"	10"	8"	20"	18"
Outside diameter at bevel D - mm		457	457	457	508	508	508	508	508	508	559	559
Center to end - mm	C	343	343	343	381	381	381	381	381	381	419	419
	M	321	308	298	368	356	356	346	333	324	406	394
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	135	129	129	168	168	163	163	163	163	220	209
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	164	164	154	218	218	214	214	214	214	280	260
X.X.S.	W.T. in mm											
	Weight in Kg											
SCH. 10	W.T. in mm	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg	**	**	**	6,35	6,35	6,35			**	6,35	6,35
SCH. 20	W.T. in mm	7,92	7,92	7,92	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	6,35	6,35	6,35	7,92	7,92	7,92	7,92	6,35	6,35	9,52	7,92
SCH. 30	W.T. in mm	11,12	11,12	11,12	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	8,38	7,80	7,03	11,12	9,52	9,52	8,38	7,80	7,03	12,70	11,12
SCH. 40	W.T. in mm	14,27	14,27	14,27	15,06	15,06	15,06	15,06	15,06	15,06		
	Weight in Kg	10,31	9,27	8,18	14,27	12,70	11,12	10,31	9,27	8,18		
SCH. 60	W.T. in mm	19,05	19,05	19,05	20,62	20,62	20,62	20,62	20,62	20,62	22,22	22,22
	Weight in Kg	14,27	12,70	10,31	19,05	16,66	15,06	14,27	12,70	10,31	20,62	19,05
SCH. 80	W.T. in mm	23,80	23,80	23,80	26,18	26,18	26,18	26,18	26,18	26,18	28,58	28,58
	Weight in Kg	17,45	15,06	12,70	23,80	21,41	19,05	17,45	15,06	12,70	26,18	23,80
SCH. 100	W.T. in mm	29,36	29,36	29,36	32,54	32,54	32,54	32,54	32,54	32,54	34,92	34,92
	Weight in Kg	21,41	18,24	15,06	29,36	26,19	23,80	21,41	18,24	15,06	32,54	29,36
SCH. 120	W.T. in mm	34,92	34,92	34,92	38,10	38,10	38,10	38,10	38,10	38,10	41,27	41,27
	Weight in Kg	23,80	21,41	18,24	34,92	30,94	27,76	23,80	21,41	18,24	38,10	34,92
SCH. 140	W.T. in mm	39,67	39,67	39,67	44,45	44,45	44,45	44,45	44,45	44,45	47,62	47,62
	Weight in Kg	28,57	25,40	20,62	39,67	36,53	31,75	28,57	25,40	20,62	44,45	39,67
SCH. 160	W.T. in mm	45,24	45,24	45,24	49,99	49,99	49,99	49,99	49,99	49,99	53,97	53,97
	Weight in Kg	33,32	28,57	23,01	45,24	40,46	35,71	33,32	28,57	23,01	49,99	45,24

* Since schedules 10 starts with the 14" size, the thickness of smaller branches must be specified by customers.

** Since schedule 20, 30, 60, 100 and 140 start with the 8" size, the thickness of smaller branches must be specified by customers.

Reducing outlet tees ANSI B 16-9

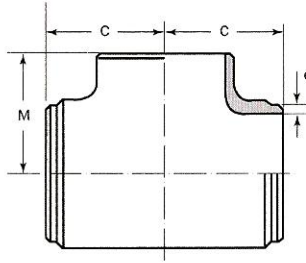


"Weights are approximate"

Nominal pipe size (NPS)		22"	22"	22"	22"	24"	24"	24"	24"	24"	24"	24"
		16"	14"	12"	10"	22"	20"	18"	16"	14"	12"	10"
Outside diameter at bevel D - mm		559	559	559	559	610	610	610	610	610	610	610
Center to end - mm	C	419	419	419	419	432	432	432	432	432	432	432
	M	381	381	371	359	432	432	419	406	406	397	384
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	209	172	172	172	227	227	227	222	222	218	204
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	260	245	245	245	350	350	320	320	300	300	300
X.X.S.	W.T. in mm											
	Weight in Kg											
SCH. 10	W.T. in mm	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35	6,35
	Weight in Kg	6,35	6,35	*	*	6,35	6,35	6,35	6,35	6,35	*	*
SCH. 20	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	7,92	7,92	6,35	6,35	7,92	7,92	7,92	7,92	7,92	6,35	6,35
SCH. 30	W.T. in mm	12,70	12,70	12,70	12,70	14,27	14,27	14,27	14,27	14,27	14,27	14,27
	Weight in Kg	260	245	245	245	373	373	340	340	320	320	320
SCH. 40	W.T. in mm						17,48	17,48	17,48	17,48	17,48	17,48
	Weight in Kg						15,06	14,27	14,27	14,27	10,31	9,27
SCH. 60	W.T. in mm	22,22	22,22	22,22	22,22	24,59	24,59	24,59	24,59	24,59	24,59	24,59
	Weight in Kg	16,66	15,06	14,27	12,70	22,22	20,62	19,05	16,66	15,06	14,27	12,70
SCH. 80	W.T. in mm	28,58	28,58	28,58	28,58	30,94	30,94	30,94	30,94	30,94	30,94	30,94
	Weight in Kg	21,41	19,05	17,45	15,06	28,58	26,19	23,80	21,41	19,05	17,45	15,06
SCH. 100	W.T. in mm	34,92	34,92	34,92	34,92	38,89	38,89	38,89	38,89	38,89	38,89	38,89
	Weight in Kg	26,19	23,80	21,41	18,24	34,92	33,54	29,36	26,19	23,80	21,41	18,24
SCH. 120	W.T. in mm	41,27	41,27	41,27	41,27	46,02	46,02	46,02	46,02	46,02	46,02	46,02
	Weight in Kg	30,94	27,76	23,80	21,41	41,27	38,10	34,92	30,94	27,76	23,80	21,41
SCH. 140	W.T. in mm	47,62	47,62	47,62	47,62	52,37	52,37	52,37	52,37	52,37	52,37	52,37
	Weight in Kg	36,53	31,75	28,57	25,40	47,62	44,45	39,67	36,53	31,75	28,57	25,40
SCH. 160	W.T. in mm	53,97	53,97	53,97	53,97	59,51	59,51	59,51	59,51	59,51	59,51	59,51
	Weight in Kg	40,46	35,71	33,32	28,57	53,97	49,90	45,24	40,46	35,71	33,32	28,57

* Since schedule 10 starts with the 14" size, the thickness of smaller branches must be specified by customers.

Reducing outlet tees ANSI B 16-9



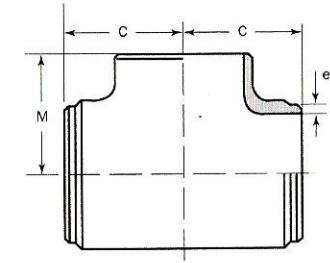
"Weights are approximate"

Nominal pipe size (NPS)		26"	26"	26"	26"	26"	26"	26"	28"	28"	28"	28"	28"
		24"	22"	20"	18"	16"	14"	12"	26"	24"	22"	20"	18"
Outside diameter at bevel D - mm		660 610	660 559	660 508	660 457	660 406	660 356	660 324	711 660	711 610	711 559	711 508	711 457
Center to end - mm	C	495	495	495	495	495	495	495	521	521	521	521	521
	M	483	470	457	444	432	432	422	521	508	495	483	470
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	280	272	264	255	247	239	23	9,52	9,52	9,52	9,52	9,52
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	350	340	330	323	309	300	293	12,70	12,70	12,70	12,70	12,70

Nominal pipe size (NPS)		28"	28"	28"	30"	30"	30"	30"	30"	30"	30"	30"
		16"	14"	12"	28"	26"	24"	22"	20"	18"	16"	14"
Outside diameter at bevel D - mm		711 406	711 356	711 324	762 711	762 660	762 610	762 559	762 508	762 457	762 406	762 356
Center to end - mm	C	521	521	521	559	559	559	559	559	559	559	559
	M	457	457	448	546	546	533	521	508	495	483	483
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70

Nominal pipe size (NPS)		30"	30"	32"	32"	32"	32"	32"	32"	32"	32"	32"
		12"	10"	30"	28"	26"	24"	22"	20"	18"	16"	14"
Outside diameter at bevel D - mm		762 324	762 273	813 762	813 711	813 660	813 610	813 559	813 508	813 457	813 406	813 356
Center to end - mm	C	559	559	597	597	597	597	597	597	597	597	597
	M	473	460	584	572	572	559	546	533	521	508	508
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	304	296	506	493	482	472	460	448	436	425	415
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	385	377	628	616	605	591	577	562	547	535	523

Reducing outlet tees ANSI B 16-9



"Weights are approximate"

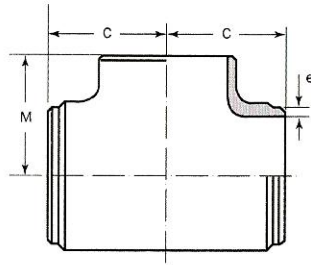
Nominal pipe size (NPS)		34"	34"	34"	34"	34"	34"	34"	34"	34"	36"
		32"	30"	28"	26"	24"	22"	20"	18"	16"	34"
Outside diameter at bevel D - mm		864 813	864 762	864 711	864 660	864 610	864 559	864 508	864 457	864 406	914 864
Center to end - mm	C	635	635	635	635	635	635	635	635	635	673
	M	622	610	597	597	584	572	559	546	533	660
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	506	493	482	472	460	448	436	425	415	574
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	628	616	605	591	577	562	547	535	523	715

Nominal pipe size (NPS)		36"	36"	36"	36"	36"	36"	36"	36"	36"	40"
		32"	30"	28"	26"	24"	22"	20"	18"	16"	38"
Outside diameter at bevel D - mm		914 813	914 762	914 711	914 660	914 610	914 559	914 508	914 457	914 406	1016 965
Center to end - mm	C	673	673	673	673	673	673	673	673	673	749
	M	648	635	622	622	610	597	584	572	559	749
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	561	548	537	526	513	502	493	483	472	664
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	700	685	670	654	643	622	621	611	602	875

Nominal pipe size (NPS)		40"	40"	40"	40"	40"	40"	40"	40"	40"	40"
		36"	34"	32"	30"	28"	26"	24"	22"	20"	18"
Outside diameter at bevel D - mm		1016 914	1016 864	1016 813	1016 762	1016 711	1016 660	1016 610	1016 559	1016 508	1016 457
Center to end - mm	C	749	749	749	749	749	749	749	749	749	749
	M	737	724	711	698	673	673	660	648	635	622
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	659	659	643	627	611	595	580	565	552	540
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	840	840	802	763	740	723	700	682	665	650

Reducing outlet tees

ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		42" x 40"	42" x 38"	42" x 36"	42" x 34"	42" x 32"	42" x 30"	42" x 28"	42" x 26"	42" x 24"
Outside diameter at bevel D - mm		1067 1016	1067 965	1067 914	1067 864	1067 813	1067 762	1067 711	1067 660	1067 610
Center to end - mm	C	762	762	762	762	762	762	762	762	762
	M	711	711	711	711	711	711	698	698	660
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	9,52	9,52	9,52	818	772	772	750	750	728
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	12,70	12,70	12,70	1045	999	999	955	955	915

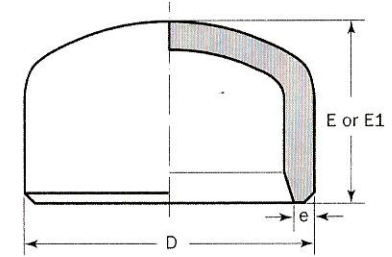
Nominal pipe size (NPS)		42" x 22"	42" x 20"	42" x 18"	42" x 16"	48" x 46"	48" x 44"	48" x 42"	48" x 40"	48" x 38"
Outside diameter at bevel D - mm		1067 559	1067 508	1067 457	1067 406	1219 1168	1219 1118	1219 1067	1219 1016	1219 965
Center to end - mm	C	762	762	762	762	889	889	889	889	889
	M	660	660	648	635	838	838	813	8133	813
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	728	708	708	700	1090	1090	1067	1067	1044
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	915	875	875	847	1307	1307	1272	1272	1238

Nominal pipe size (NPS)		48" x 36"	48" x 34"	48" x 32"	48" x 30"	48" x 28"	48" x 26"	48" x 24"	48" x 22"
Outside diameter at bevel D - mm		1219 914	1219 864	1219 813	1219 762	1219 711	1219 660	1219 610	1219 559
Center to end - mm	C	889	889	889	889	889	889	889	889
	M	787	787	787	762	762	762	737	737
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	1022	1022	1000	1000	980	980	960	960
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	1203	1203	1170	1170	1140	1140	1115	1115

Caps

ANSI B 16-9

Note: The shape of these caps shall be ellipsoidal and shall conform to the shape requirements as given in ASME Boiler and Pressure Vessel Code.
 Length E applies for thickness not exceeding that given in column "Limiting wall thickness for length E"
 (*) Length E1 applies for thickness greater than that given in column "Limiting wall thickness" for sizes 24 in. and smaller.
 For sizes 26 in. and larger, length E1 shall be by agreement between manufacturer and purchaser.



Weights are approximate"

Nominal pipe size (NPS)		1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"
Outside diameter at bevel D - mm		21	27	33	42	48	60	73	89	102	114
Length E - mm		25	25	38	38	38	38	38	51	64	64
Limiting W.T. for length E		3,73	3,91	4,55	4,85	5,08	5,54	7,01	7,62	8,08	8,56
Length E 1 (*) mm		25	25	38	38	38	44	51	64	76	76
STD	W.T. in mm	2,76	2,87	3,37	3,55	3,68	3,91	5,15	5,48	5,74	6,01
	Weight in Kg	0,03	0,06	0,10	0,14	0,20	0,30	0,50	0,70	1,40	1,60
X.S	W.T. in mm	3,73	3,91	4,55	4,85	5,08	5,54	7,01	7,62	8,07	8,56
	Weight in Kg	0,05	0,10	0,13	0,20	0,23	0,30	0,50	0,90	1,70	2,00
X.X.S.	W.T. in mm			9,09	9,70	10,16	11,07	14,02	15,24	16,15	17,12
	Weight in Kg			0,20	0,28	0,36	0,59	1,00	1,78	2,63	3,17
SCH. 10	W.T. in mm										
	Weight in Kg										
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm										
	Weight in Kg										
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm										
	Weight in Kg										
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm										11,09
	Weight in Kg										2,31
SCH. 140	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm			6,35	6,35	7,13	8,71	9,52	11,09		13,50
	Weight in Kg			0,15	0,23	0,30	0,55	0,90	1,40		2,75

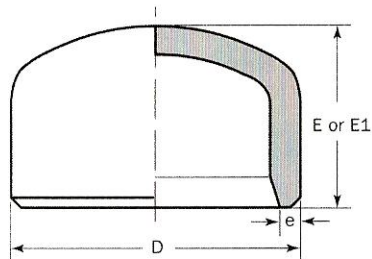
Caps

ANSI B 16-9

Note: The shape of these caps shall be ellipsoidal and shall conform to the shape requirements as given in ASME Boiler and Pressure Vessel Code.

Length E applies for thickness not exceeding that given in column "Limiting wall thickness for length E"

(*) Length E1 applies for thickness greater than that given in column "Limiting wall thickness" for sizes 24 in. and smaller. For sizes 26 in. and larger, length E1 shall be by agreement between manufacturer and purchaser.



Weights are approximate"

Nominal pipe size (NPS)		5"	6"	8"	10"	12"	14"	16"	18"	20"	22"
Outside diameter at bevel D - mm		141	168	219	273	324	356	406	457	508	559
Length E - mm		76	89	102	127	152	165	178	203	229	254
Limiting W.T. for length E		9.53	10.97	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
Length E1 (*) mm		89	102	127	152	178	191	203	229	254	254
STD	W.T. in mm	6,55	7,11	8,18	9,27	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	2,30	3,60	5,50	10	15	17	23	29	36	42
X.S	W.T. in mm	9,52	10,97	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	3	4	8,40	13,60	22	27	30	32	49	51
X.X.S.	W.T. in mm	19,05	21,95	22,23							
	Weight in Kg	5,50	8,10	19,50							
SCH. 10	W.T. in mm						6,35	6,35	6,35	6,35	6,35
	Weight in Kg						14	18	22	31	35,50
SCH. 20	W.T. in mm			6,35	6,35	6,35	7,92	7,92	7,92	Refer to Standard	
	Weight in Kg			4,50	7	9	15,50	20	25		
SCH. 30	W.T. in mm			7,03	7,80	8,38	Refer to Standard		11,10	12,70	12,70
	Weight in Kg			5	7,63	13			30,30	49	59
SCH. 40	W.T. in mm		Refer to Standard			10,31	11,09	R.X.S.	14,27	15,06	
	Weight in Kg					19	23		39	66,70	
SCH. 60	W.T. in mm			10,31	12,70	14,22	15,06	16,74	18,23	20,62	22,22
	Weight in Kg			7	13,60	22	32	37	66	94,50	107
SCH. 80	W.T. in mm		Refer to Standard		15,06	17,44	19,05	21,41	23,90	26,18	28,58
	Weight in Kg				16,20	26,90	34,70	43,50	72,50	98,50	120
SCH. 100	W.T. in mm			15,06	18,23	21,41	23,80	26,19	29,36	32,54	34,92
	Weight in Kg			11	21	32,50	42	54	75	100	135
SCH. 120	W.T. in mm	12,70	14,22	18,23	21,41	25,40	27,76	30,94	34,92	338,10	41,27
	Weight in Kg	3,89	6,02	15,50	24	41	47	64	88	105	150
SCH. 140	W.T. in mm			20,64	25,40	28,57	31,75	36,53	39,67	44,45	47,62
	Weight in Kg			18,50	27	42	52	73	93	153	198
SCH. 160	W.T. in mm	15,87	18,23	23,02	28,57	33,32	35,71	40,46	45,24	49,99	53,97
	Weight in Kg	5	7,50	20	30	44,50	60	79	104	170	220

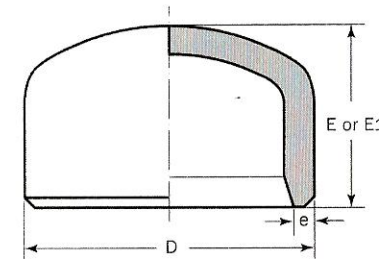
Caps

ANSI B 16-9

Note: The shape of these caps shall be ellipsoidal and shall conform to the shape requirements as given in ASME Boiler and Pressure Vessel Code.

Length E applies for thickness not exceeding that given in column "Limiting wall thickness for length E"

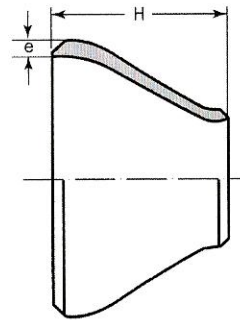
(*) Length E1 applies for thickness greater than that given in column "Limiting wall thickness" for sizes 24 in. and smaller. For sizes 26 in. and larger, length E1 shall be by agreement between manufacturer and purchaser.



Weights are approximate"

Nominal pipe size (NPS)		24"	26"	28"	30"	32"	34"	36"	40"	42"	48"
Outside diameter D - mm		610	660	711	762	813	864	914	1016	1067	1219
Length E - mm		267	267	267	267	267	267	267	305	305	343
Limiting W.T. for length E		12,70									
Length E1 (*) mm		305									
STD	W.T. in mm	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52	9,52
	Weight in Kg	52	46,50		57		73	79,50	91	104,25	116
X.S	W.T. in mm	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70	12,70
	Weight in Kg	69	66		79,50		95,50	107	122,50	136,50	154,50
X.X.S.	W.T. in mm										
	Weight in Kg										
SCH. 10	W.T. in mm	6,35			7,92		7,92	7,92			
	Weight in Kg	44			51		58	62			
SCH. 20	W.T. in mm	Refer to Std									
	Weight in Kg										
SCH. 30	W.T. in mm	14,27									
	Weight in Kg	74,50									
SCH. 40	W.T. in mm	17,48									
	Weight in Kg	93									
SCH. 60	W.T. in mm	24,61									
	Weight in Kg	120									
SCH. 80	W.T. in mm	30,90									
	Weight in Kg	150									
SCH. 100	W.T. in mm	38,89									
	Weight in Kg	180									
SCH. 120	W.T. in mm	46,02									
	Weight in Kg	200									
SCH. 140	W.T. in mm	52,37									
	Weight in Kg	250									
SCH. 160	W.T. in mm	59,51									
	Weight in Kg	285									

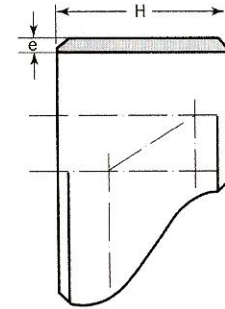
Concentric and eccentric reducers ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		3/4" x 1/2"	3/4" x 3/8"	1" x 3/4"	1" x 1/2"	1 1/4" x 1"	1 1/4" x 3/4"	1 1/4" x 1/2"
Outside diameter at bevel D - mm		27	27	33	33	42	42	42
		21	17	27	21	33	27	21
End to end length H - mm		38	38	51	51	51	51	51
STD	W.T. in mm	2,87	2,87	3,38	3,38	3,56	3,56	3,56
	Weight in Kg	2,77 0,07	2,31 0,07	2,87 0,13	2,77 0,13	3,38 0,17	2,87 0,17	2,77 0,17
X.S	W.T. in mm	3,91	3,91	4,55	4,55	4,85	4,85	4,85
	Weight in Kg	3,73 0,10	3,20 0,10	3,91 0,16	3,73 0,16	4,55 0,23	3,91 0,23	3,73 0,23
X.X.S.	W.T. in mm	7,82		9,09	9,09	9,70	9,70	9,70
	Weight in Kg	7,47 0,19		7,82 0,28	7,47 0,28	9,09 0,39	7,82 0,39	7,47 0,39
SCH. 10	W.T. in mm							
	Weight in Kg							
SCH. 20	W.T. in mm							
	Weight in Kg							
SCH. 30	W.T. in mm							
	Weight in Kg							
SCH. 40	W.T. in mm				Refer to Standard			
	Weight in Kg							
SCH. 60	W.T. in mm							
	Weight in Kg							
SCH. 80	W.T. in mm				Refer to Extra-Strong			
	Weight in Kg							
SCH. 100	W.T. in mm							
	Weight in Kg							
SCH. 120	W.T. in mm							
	Weight in Kg							
SCH. 140	W.T. in mm							
	Weight in Kg							
SCH. 160	W.T. in mm	5,53		6,35	6,35	6,35	6,35	6,35
	Weight in Kg	4,74 0,14		5,53 0,21	4,74 0,21	6,35 0,29	5,53 0,29	4,74 0,29

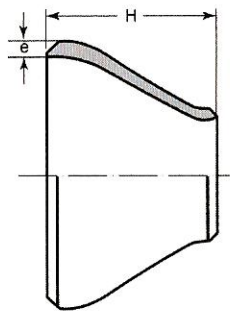
Concentric and eccentric reducers ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		1 1/2" x 1 1/4"	1 1/2" x 1"	1 1/2" x 3/4"	1 1/2" x 1/2"	2" x 1 1/2"	2" x 1 1/4"	2" x 1"	2 1/2" x 3/4"
Outside diameter at bevel D - mm		48	48	48	48	60	60	60	60
		42	33	27	21	48	42	33	27
End to end Length H - mm		64	64	64	64	76	76	76	76
STD	W.T. in mm	3,68	3,68	3,68	3,68	3,91	3,91	3,91	3,91
	Weight in Kg	3,56 0,26	3,38 0,26	2,87 0,26	2,77 0,26	3,68 0,41	3,56 0,41	3,38 0,41	2,87 0,41
X.S	W.T. in mm	5,08	5,08	5,08	5,08	5,54	5,54	5,54	5,54
	Weight in Kg	4,85 0,35	4,55 0,35	3,91 0,35	3,73 0,35	5,08 0,57	4,85 0,57	4,55 0,57	3,91 0,57
X.X.S.	W.T. in mm	10,16	10,16	10,16	10,16	11,07	11,07	11,07	11,07
	Weight in Kg	9,70 0,61	9,09 0,61	7,82 0,61	7,47 0,61	10,16 1,03	9,70 1,03	9,09 1,03	7,82 1,03
SCH. 10	W.T. in mm								
	Weight in Kg								
SCH. 20	W.T. in mm								
	Weight in Kg								
SCH. 30	W.T. in mm								
	Weight in Kg								
SCH. 40	W.T. in mm				Refer to Standard				
	Weight in Kg								
SCH. 60	W.T. in mm								
	Weight in Kg								
SCH. 80	W.T. in mm				Refer to Extra-Strong				
	Weight in Kg								
SCH. 100	W.T. in mm								
	Weight in Kg								
SCH. 120	W.T. in mm								
	Weight in Kg								
SCH. 140	W.T. in mm								
	Weight in Kg								
SCH. 160	W.T. in mm	7,13	7,13	7,13	7,13	8,71	8,71	8,71	8,71
	Weight in Kg	6,36 0,46	6,35 0,46	5,53 0,46	4,74 0,46	7,13 0,84	6,35 0,84	6,35 0,84	5,53 0,84

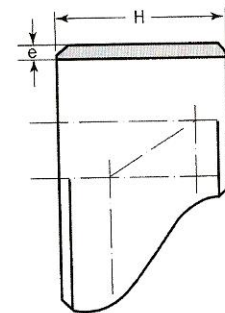
Concentric and eccentric reducers ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		2" 1/2 x 2"	2" 1/2 x 1" 1/2	2" 1/2 x 1" 1/4	2" 1/2 x 1"	3" x 2" 1/2	3" x 2"	3" x 1" 1/2	3" x 1" 1/4
Outside diameter at bevel D - mm		73 60	73 48	73 42	73 33	89 73	89 60	89 48	89 42
End to end Length H - mm		89	89	89	89	89	89	89	89
STD	W.T. in mm	5,16	5,16	5,16	5,16	5,49	5,49	5,49	5,49
	Weight in Kg	3,91 0,77	3,68 0,77	3,56 0,77	3,38 0,77	5,16 1	3,91 1	3,68 1	3,56 1
X.S	W.T. in mm	7,01	7,01	7,01	7,01	7,62	7,62	7,62	7,62
	Weight in Kg	5,54 1,01	5,08 1,01	4,85 1,01	4,55 1,01	7,01 1,36	5,54 1,36	5,08 1,36	4,85 1,36
X.X.S.	W.T. in mm	14,02	14,02	14,02	14,02	15,24	15,24	15,24	15,24
	Weight in Kg	11,07 1,81	10,16 1,81	9,70 1,81	9,09 1,81	14,02 2,47	11,07 2,47	10,16 2,47	9,70 2,47
SCH. 10	W.T. in mm Weight in Kg								
SCH. 20	W.T. in mm Weight in Kg								
SCH. 30	W.T. in mm Weight in Kg								
SCH. 40	W.T. in mm Weight in Kg				Refer to Standard				
SCH. 60	W.T. in mm Weight in Kg								
SCH. 80	W.T. in mm Weight in Kg				Refer to Extra-Strong				
SCH. 100	W.T. in mm Weight in Kg								
SCH. 120	W.T. in mm Weight in Kg								
SCH. 140	W.T. in mm Weight in Kg								
SCH. 160	W.T. in mm Weight in Kg	9,52 8,71 1,33	9,52 7,13 1,33	9,52 6,35 1,33	9,52 6,35 1,33	11,09 9,52 1,89	11,09 8,71 1,89	11,09 7,13 1,89	11,09 6,35 1,89

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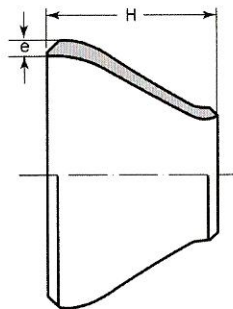


"Weights are approximate"

Nominal pipe size (NPS)		3" 1/2 x 3"	3" 1/2 x 2" 1/2	3" 1/2 x 2"	3" 1/2 x 1" 1/2	3" 1/2 x 1" 1/4	4" x 3" 1/2	4" x 3"	4" x 2" 1/2	4" x 2"	4" x 1" 1/2
Outside diameter at bevel D - mm		102 89	102 73	102 60	102 48	102 42	114 102	114 89	114 73	114 60	114 48
End to end Length H - mm		102	102	102	102	102	102	102	102	102	102
STD	W.T. in mm	5,74	5,74	5,74	5,74	5,74	6,02	6,02	6,02	6,02	6,02
	Weight in Kg	5,49 1,40	5,16 1,40	3,91 1,40	3,68 1,40	3,56 1,40	5,74 1,60	5,49 1,60	5,16 1,60	3,91 1,60	3,68 1,60
X.S	W.T. in mm	8,08	8,08	8,08	8,08	8,08	8,56	8,56	8,56	8,56	8,56
	Weight in Kg	7,62 1,89	7,01 1,89	5,54 1,89	5,08 1,89	4,85 1,89	8,08 2,27	7,62 2,27	7,01 2,27	5,54 2,27	5,08 2,27
X.X.S.	W.T. in mm	16,15	16,15	16,15	16,15	16,15	17,12	17,12	17,12	17,12	17,12
	Weight in Kg	15,24 3,45	14,02 3,45	11,07 3,45	10,16 3,45	9,70 3,45	16,15 4,18	15,24 4,18	14,02 4,18	11,07 4,18	10,16 4,18
SCH. 10	W.T. in mm Weight in Kg										
SCH. 20	W.T. in mm Weight in Kg										
SCH. 30	W.T. in mm Weight in Kg										
SCH. 40	W.T. in mm Weight in Kg						Refer to Standard				
SCH. 60	W.T. in mm Weight in Kg										
SCH. 80	W.T. in mm Weight in Kg						Refer to Extra-Strong				
SCH. 100	W.T. in mm Weight in Kg										
SCH. 120	W.T. in mm Weight in Kg						11,09 *	11,09 *	11,09 *	11,09 *	11,09 *
SCH. 140	W.T. in mm Weight in Kg										
SCH. 160	W.T. in mm Weight in Kg							13,50 11,09 3,41	13,50 9,52 3,41	13,50 8,71 3,41	13,50 7,13 3,41

* Since schedule 120 starts with the 4" size, the thickness of smaller branches must be specified by customers

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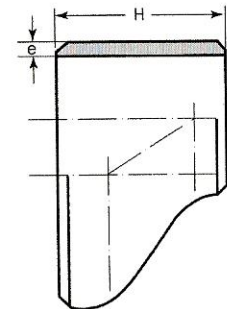


"Weights are approximate"

Nominal pipe size (NPS)		5"	5"	5"	5"	5"	6"	6"	6"	6"	6"
		4"	3 1/2"	3"	2 1/2"	2"	5"	4"	3 1/2"	3"	2 1/2"
Outside diameter at bevel D - mm		141	141	141	141	141	168	168	168	168	168
		114	102	89	73	60	141	114	102	89	73
End to end Length H - mm		127	127	127	127	127	140	140	140	140	140
STD	W.T. in mm	6.35	6.35	6.35	6.35	6.35	7.11	7.11	7.11	7.11	7.11
	Weight in Kg	6.02	5.74	5.49	5.16	3.91	6.55	6.02	5.74	5.49	5.16
X.S	W.T. in mm	9.52	9.52	9.52	9.52	9.52	10.97	10.97	10.97	10.97	10.97
	Weight in Kg	8.56	8.08	7.62	7.01	5.54	9.52	8.56	8.08	7.62	7.01
X.X.S.	W.T. in mm	19.05	19.05	19.05	19.05	19.05	21.94	21.94	21.94	21.94	21.94
	Weight in Kg	17.12	16.15	15.24	14.02	11.07	19.05	17.12	16.15	15.24	14.02
SCH. 10	W.T. in mm	7.31	7.31	7.31	7.31	7.31	11.08	11.08	11.08	11.08	11.08
	Weight in Kg	7.31	7.31	7.31	7.31	7.31	11.08	11.08	11.08	11.08	11.08
SCH. 20	W.T. in mm										
	Weight in Kg										
SCH. 30	W.T. in mm										
	Weight in Kg										
SCH. 40	W.T. in mm						Refer to Standard				
	Weight in Kg										
SCH. 60	W.T. in mm										
	Weight in Kg										
SCH. 80	W.T. in mm						Refer to Extra-Strong				
	Weight in Kg										
SCH. 100	W.T. in mm										
	Weight in Kg										
SCH. 120	W.T. in mm	17.70	12.70	12.70	12.70	12.70	14.22	14.22	14.22	14.22	14.22
	Weight in Kg	11.09	*	*	*	*	12.70	11.09	*	*	*
SCH. 140	W.T. in mm	5.68					7.58	7.58			
	Weight in Kg										
SCH. 160	W.T. in mm										
	Weight in Kg										
SCH. 160	W.T. in mm	15.87	15.87	15.87	15.87	15.87	18.23	18.23	18.23	18.23	18.23
	Weight in Kg	13.50	11.09	9.52	8.71	15.87	13.50	13.50	11.09	9.52	9.52
SCH. 160	W.T. in mm	6.26	6.26	6.26	6.26	6.26	9.40	9.40	9.40	9.40	9.40
	Weight in Kg	6.26	6.26	6.26	6.26	6.26	9.40	9.40	9.40	9.40	9.40

* Since schedule 120 starts with the 4" size, the thickness of smaller branches must be specified by customers

Concentric and eccentric reducers ANSI B 16-9

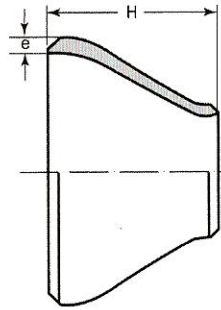


"Weights are approximate"

Nominal pipe size (NPS)		8"	8"	8"	8"	10"	10"	10"	10"
		6"	5"	4"	3 1/2"	8"	6"	5"	4"
Outside diameter at bevel D - mm		219	219	219	219	273	273	273	273
		168	141	114	102	219	168	141	114
End to end Length H - mm		152	152	152	152	178	178	178	178
STD	W.T. in mm	8.18	8.18	8.18	8.18	9.27	9.27	9.27	9.27
	Weight in Kg	7.11	6.55	6.50	6.50	8.18	7.11	6.55	6.02
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	10.97	9.52	8.56	8.08	12.70	10.97	9.52	8.56
X.X.S.	W.T. in mm	22.22	22.22	22.22	22.22				
	Weight in Kg	21.94	19.05	17.12	16.43				
SCH. 10	W.T. in mm								
	Weight in Kg								
SCH. 20	W.T. in mm	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
	Weight in Kg	**	**	**	**	6.35	**	**	**
SCH. 30	W.T. in mm	7.03	7.03	7.03	7.03	7.80	7.80	7.80	7.80
	Weight in Kg	**	**	**	**	7.03	**	**	**
SCH. 40	W.T. in mm					Refer to Standard			
	Weight in Kg								
SCH. 60	W.T. in mm	10.31	10.31	10.31	10.31	12.70	12.70	12.70	12.70
	Weight in Kg	**	**	**	**	10.31	**	**	**
SCH. 80	W.T. in mm		Refer to Extra-Strong				15.06	15.06	15.06
	Weight in Kg						12.70	9.52	8.56
SCH. 100	W.T. in mm	15.06	15.06	15.06	15.06	18.23	18.23	18.23	18.23
	Weight in Kg	**	**	**	**	15.06	**	**	**
SCH. 120	W.T. in mm	18.23	18.23	18.23	18.23	21.41	21.41	21.41	21.41
	Weight in Kg	14.22	12.70	11.09	*	18.23	14.22	12.70	11.09
SCH. 140	W.T. in mm	20.62	20.62	20.62	20.62	25.40	25.40	25.40	25.40
	Weight in Kg		**	**	**	20.62	**	**	**
SCH. 160	W.T. in mm	23.01	23.01	23.01	23.01	28.57	28.57	28.57	28.57
	Weight in Kg	18.23	15.87	13.50	11.09	23.01	18.23	15.87	13.50
SCH. 160	W.T. in mm	16.90	16.90	16.90	16.90	30.60	30.60	30.60	30.60
	Weight in Kg								

** Since schedule 20, 100 and 140 starts with the 8" size, the thickness of smaller branches must be specified by customers

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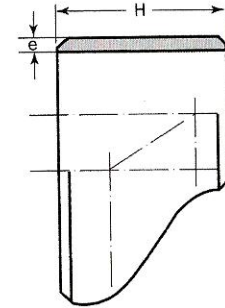
"Weights are approximate"

Nominal pipe size (NPS)		12" x 10"	12" x 8"	12" x 6"	12" x 5"	14" x 12"	14" x 10"	14" x 8"	14" x 6"
Outside diameter at bevel D - mm		324 273	324 219	324 168	324 141	356 324	356 273	356 219	356 168
End to end Length H - mm		203	203	203	203	330	330	330	330
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	9.27 15.00	8.18 15.00	7.11 15.00	6.55 15.00	9.52 26.90	9.27 26.90	8.18 26.90	7.11 26.90
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	12.70 19.80	12.70 19.80	10.97 19.80	9.52 19.80	12.70 35.50	12.70 35.50	12.70 35.50	12.70 35.50
X.X.S.									
SCH. 10	W.T. in mm					6.35	6.35	6.35	6.35
	Weight in Kg					**	**	**	**
SCH. 20	W.T. in mm	6.35	6.35	6.35	6.35	7.92	7.92	7.92	7.92
	Weight in Kg	6.35 10.16	6.35 10.16	*	*	6.35 22.60	6.35 22.60	6.35 22.60	7.92 11.12
SCH. 30	W.T. in mm	8.38	8.38	8.38	8.38	9.52	9.52	9.52	9.52
	Weight in Kg	7.80 13.20	7.03 13.20	**	**	8.38 26.80	7.80 26.80	7.03 26.80	**
SCH. 40	W.T. in mm	10.31	10.31	10.31	10.31	11.12	11.12	11.12	11.12
	Weight in Kg	9.28 16.30	8.18 16.30	7.11 16.30	6.55 16.30	10.31 31.10	9.27 31.10	8.18 31.10	7.11 31.10
SCH. 60	W.T. in mm	14.27	14.27	14.27	14.27	15.06	15.06	15.06	15.06
	Weight in Kg	12.70 22.20	10.31 22.20	**	**	14.27 42	12.70 42	10.31 42	**
SCH. 80	W.T. in mm	17.44	17.44	17.44	17.44	19.05	19.05	19.05	19.05
	Weight in Kg	15.06 26.80	12.70 26.80	10.97 26.80	9.52 26.80	17.45 52.20	15.06 52.20	12.70 52.20	10.97 52.20
SCH. 100	W.T. in mm	21.41	21.41	21.41	21.41	23.80	23.80	23.80	23.80
	Weight in Kg	18.23 32.40	15.06 32.40	**	**	21.41 64	18.24 64	15.06 64	**
SCH. 120	W.T. in mm	25.40	25.40	25.40	25.40	27.76	27.76	27.76	27.76
	Weight in Kg	21.41 38	18.23 38	14.22 38	12.70 38	23.80 73	21.41 73	18.24 73	14.27 73
SCH. 140	W.T. in mm	28.57	28.57	28.57	28.57	31.75	31.75	31.75	31.75
	Weight in Kg	25.40 42.30	20.62 42.30	**	**	28.57 78	25.40 78	20.62 78	**
SCH. 160	W.T. in mm	33.32	33.32	33.32	33.32	35.71	35.71	35.71	35.71
	Weight in Kg	28.57 48.60	23.01 48.60	18.23 48.60	15.87 48.60	33.32 86	28.57 86	23.01 86	18.24 86

* Since schedule 10 starts with the 14" size, the thickness of smaller branches must be specified by customers

* Since schedule 20, 30, 60, 100 and 140 starts with the 8" size, the thickness of smaller branches must be specified by customers

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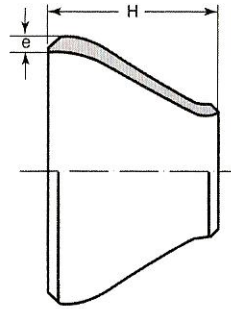


"Weights are approximate"

Nominal pipe size (NPS)		16" x 14"	16" x 12"	16" x 10"	16" x 8"	18" x 16"	18" x 14"	18" x 12"	18" x 10"
Outside diameter at bevel D - mm		406 356	406 324	406 273	406 219	457 406	457 356	457 324	457 273
End to end Length H - mm		356	356	356	356	381	381	381	381
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	9.52 33	9.52 33	9.27 33	8.18 33	9.52 40	9.52 40	9.52 40	9.27 40
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	12.70 44	12.70 44	12.70 44	12.70 44	12.70 53	12.70 53	12.70 53	12.70 53
X.X.S.									
SCH. 10	W.T. in mm	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
	Weight in Kg	6.35 28	*	*	*	6.35 34	6.35 34	*	*
SCH. 20	W.T. in mm	7.92	7.92	7.92	7.92	7.92	7.92	7.92	7.92
	Weight in Kg	7.92 27.90	6.35 27.90	6.35 27.90	6.35 27.90	7.92 33.30	7.92 33.30	6.35 33.30	6.35 33.30
SCH. 30	W.T. in mm	9.52	9.52	9.52	9.52	11.12	11.12	11.12	11.12
	Weight in Kg	9.52 33.10	8.38 33.10	7.80 33.10	7.03 33.10	9.52 48	9.52 48	8.38 48	7.80 48
SCH. 40	W.T. in mm	12.70	12.70	12.70	12.70	14.27	14.27	14.27	14.27
	Weight in Kg	11.12 43.80	10.31 43.80	9.27 43.80	8.18 43.80	12.70 59	11.12 59	10.31 59	9.27 59
SCH. 60	W.T. in mm	16.66	16.66	16.66	16.66	19.05	19.05	19.05	19.05
	Weight in Kg	15.06 57	14.27 57	12.70 57	10.31 57	16.66 79	15.06 79	14.27 79	12.70 79
SCH. 80	W.T. in mm	21.41	21.41	21.41	21.41	23.80	23.80	23.80	23.80
	Weight in Kg	19.05 72.20	17.45 72.20	15.06 72.20	12.70 72.20	21.41 96.70	19.05 96.70	17.45 96.70	15.06 96.70
SCH. 100	W.T. in mm	26.19	26.19	26.19	26.19	29.36	29.36	29.36	29.36
	Weight in Kg	23.80 83	21.41 83	18.24 83	15.06 83	26.19 116	23.80 116	21.41 116	18.24 116
SCH. 120	W.T. in mm	30.94	30.94	30.94	30.94	34.92	34.92	34.92	34.92
	Weight in Kg	27.76 97	23.80 97	21.41 97	18.24 97	30.94 136	27.76 136	23.80 136	21.41 136
SCH. 140	W.T. in mm	36.53	36.53	36.53	36.53	39.67	39.67	39.67	39.67
	Weight in Kg	31.75 112	28.57 112	25.40 112	20.62 112	36.53 145	31.75 145	28.57 145	25.40 145
SCH. 160	W.T. in mm	40.46	40.46	40.46	40.46	45.24	45.24	45.24	45.24
	Weight in Kg	35.31 121	33.32 121	28.57 121	23.01 121	40.46 159	35.71 159	33.32 159	28.57 159

* Since schedule 10 starts with the 14" size, the thickness of smaller branches must be specified by customers

Concentric and eccentric reducers ANSI B 16-9

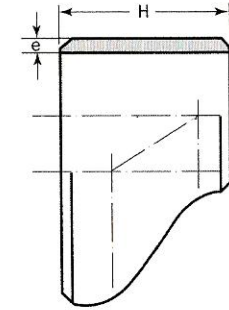


"Weights are approximate"

Nominal pipe size (NPS)		20" x 18"	20" x 16"	20" x 14"	20" x 12"	22" x 20"	22" x 18"	22" x 16"	22" x 14"
Outside diameter at bevel D - mm		508 457	508 406	508 356	508 324	559 508	559 457	559 406	559 356
End to end Length H - mm		508	508	508	508	508	508	508	508
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	59	59	59	59	65	65	65	65
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	79	79	79	79	87	87	87	87
X.X.S.									
SCH. 10	W.T. in mm	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
	Weight in Kg	50	50	50	*	57	57	57	57
SCH. 20	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	58	58	58	58	61	61	61	61
SCH. 30	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	79	79	79	79	92	92	92	92
SCH. 40	W.T. in mm	15.06	15.06	15.06	15.06				
	Weight in Kg	93	93	93	103				
SCH. 60	W.T. in mm	20.62	20.62	20.62	20.62	22.22	22.22	22.22	22.22
	Weight in Kg	126	126	126	126	150	150	150	150
SCH. 80	W.T. in mm	26.18	26.18	26.18	26.18	28.58	28.58	28.58	28.58
	Weight in Kg	158	158	158	158	188	188	188	188
SCH. 100	W.T. in mm	32.54	32.54	32.54	32.54	34.92	34.92	34.92	34.92
	Weight in Kg	163	163	163	163	201	201	201	201
SCH. 120	W.T. in mm	38.10	38.10	38.10	38.10	41.27	41.27	41.27	41.27
	Weight in Kg	178	178	178	178	233	233	233	233
SCH. 140	W.T. in mm	44.45	44.45	44.45	44.45	47.62	47.62	47.62	47.62
	Weight in Kg	305	305	305	305	415	415	415	415
SCH. 160	W.T. in mm	49.95	49.95	49.95	49.95	53.97	53.97	53.97	53.97
	Weight in Kg	340	340	340	340	460	460	460	460

* Since schedule 10 starts with the 14" size, the thickness of smaller branches must be specified by customers

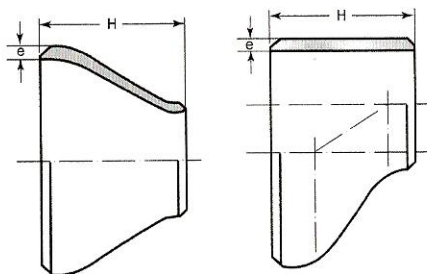
Concentric and eccentric reducers ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		24" x 22"	24" x 20"	24" x 18"	24" x 16"	26" x 24"	26" x 22"	26" x 20"	26" x 18"
Outside diameter at bevel D - mm		610 559	610 508	610 457	610 406	660 610	660 559	660 508	660 457
End to end Length H - mm		508	508	508	508	610	610	610	610
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	72	72	72	72	91	91	91	91
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	95	95	95	95	125	125	125	125
X.X.S.									
SCH. 10	W.T. in mm	6.35	6.35	6.35	6.35				
	Weight in Kg	63	63	63	63				
SCH. 20	W.T. in mm	9.52	9.52	9.52	9.52				
	Weight in Kg	72	72	72	72				
SCH. 30	W.T. in mm	14.27	14.27	14.27	14.27				
	Weight in Kg	107	107	107	107				
SCH. 40	W.T. in mm		17.45	17.45	17.45				
	Weight in Kg		129	129	129				
SCH. 60	W.T. in mm	24.58	24.58	24.58	24.58				
	Weight in Kg	180	180	180	180				
SCH. 80	W.T. in mm	30.93	30.93	30.93	30.93				
	Weight in Kg	228	228	228	228				
SCH. 100	W.T. in mm	38.89	38.89	38.89	38.89				
	Weight in Kg	241	241	241	241				
SCH. 120	W.T. in mm	46.02	46.02	46.02	46.02				
	Weight in Kg	295	295	295	295				
SCH. 140	W.T. in mm	52.37	52.37	52.37	52.37				
	Weight in Kg	540	540	540	540				
SCH. 160	W.T. in mm	59.51	59.51	59.51	59.51				
	Weight in Kg	610	610	610	610				

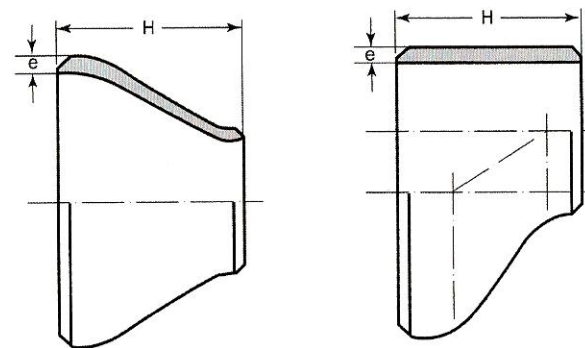
Concentric and eccentric reducers ANSI B 16-9



"Weights are approximate"

Nominal pipe size (NPS)		28" x 26"	28" x 24"	28" x 20"	28" x 18"	30" x 28"	30" x 26"	30" x 24"	30" x 20"	32" x 30"	32" x 28"	32" x 26"	32" x 24"
Outside diameter at bevel D - mm		711 660	711 610	711 508	711 457	762 711	762 660	762 610	762 508	813 762	813 711	813 660	813 610
End to end Length H- mm		610	610	610	610	610	610	610	610	610	610	610	610
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
X.X.S.	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
10	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
20	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm							15.88	15.88				
	Weight in Kg							14.27	12.70	165	165		
SCH.	W.T. in mm												
	Weight in Kg												
40	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
60	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
80	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
100	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
120	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
140	W.T. in mm												
	Weight in Kg												
SCH.	W.T. in mm												
	Weight in Kg												
160	W.T. in mm												
	Weight in Kg												

Concentric and eccentric reducers ANSI B 16-9

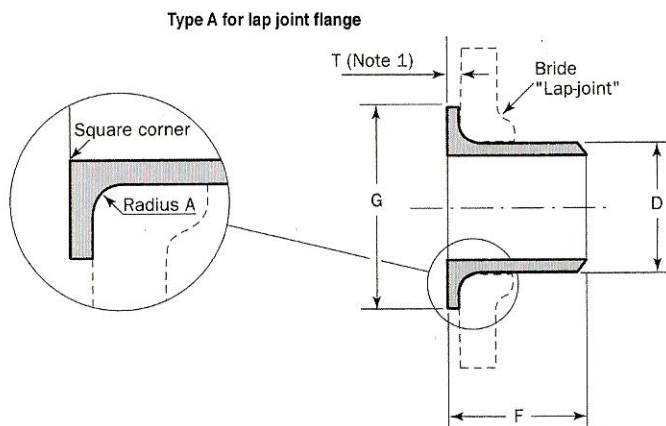


"Weights are approximate"

Nominal pipe size (NPS)		34" x 32"	34" x 30"	34" x 28"	34" x 24"	36" x 34"	36" x 32"	36" x 30"	36" x 26"	36" x 24"	40" x 38"	40" x 36"	40" x 34"
Outside diameter at bevel D - mm		864 813	864 762	864 711	864 610	914 864	914 813	914 762	914 660	914 610	1016 965	1016 914	1016 864
End to end Length H- mm		610	610	610	610	610	610	610	610	610	610	610	610
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	123	123	123	123	154	154	154	150	145	177	177	168
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	162	162	162	162	165	165	165	160	160	196	196	175

Nominal pipe size (NPS)		40" x 32"	40" x 30"	42" x 40"	42" x 38"	42" x 36"	42" x 34"	42" x 32"	42" x 30"	48" x 46"	48" x 44"	48" x 42"	48" x 40"
Outside diameter at bevel D - mm		1016 813	1016 762	1067 1016	1067 965	1067 914	1067 864	1067 813	1067 762	1168 1168	1219 1118	1219 1067	1219 1016
End to end Length H- mm		610	610	610	610	610	610	610	610	711	711	711	711
STD	W.T. in mm	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52	9.52
	Weight in Kg	168	168	202	202	202	191	191	191	241	241	241	241
X.S	W.T. in mm	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70
	Weight in Kg	175	175	222	222	222	209	209	209	266	266	266	266

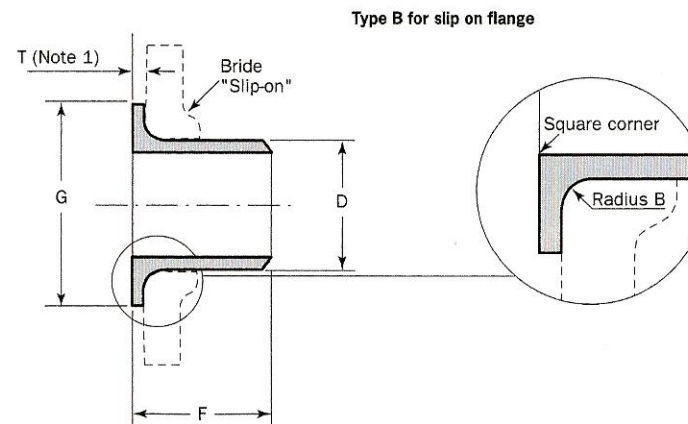
Lap joint stub ends Types A and B ANSI B 16-9 MSS SP-43



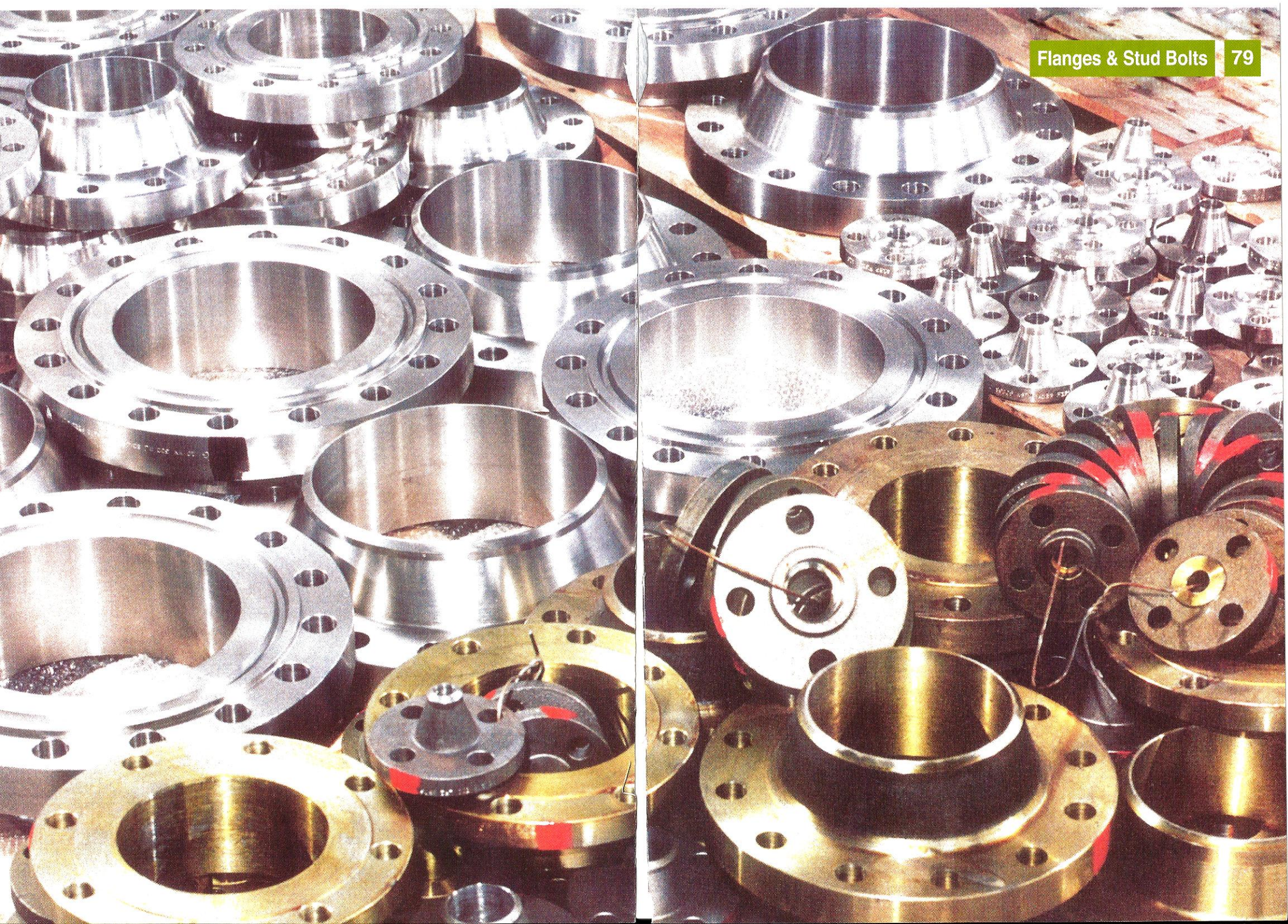
Note 1: The minimum lap thickness T shall not be less than nominal pipe wall thickness.

Normal Pipe Size (NPS)		1/2"	3/4"	1"	1"1/4	1"1/2	
Nominal outside diameter at bevel D – mm		21	27	33	42	48	
Length F - mm	Short to MSS SP-43	51	51	51	51	51	
	Long to ANSI B 16.9	76	76	102	102	102	
Diameter of lap G – mm		35	43	51	64	73	
Radius of fillet mm to MSS SP 43		A mm. & max	3	3	3	5	6
		B max	0.8	0.8	0.8	0.8	0.8
Weights for short length	SCH. 5 S	Wall thickness T mm	1.65	1.65	1.65	1.65	1.65
		Weight kg	0.05	0.06	0.08	0.11	0.13
	SCH. 10 S	Wall thickness T mm	2.11	2.11	2.77	2.77	2.77
		Weight kg	0.06	0.07	0.13	0.18	0.20
	SCH. 40 S	Wall thickness T mm	2.77	2.87	3.38	3.56	3.68
		Weight kg	0.08	0.10	0.16	0.23	0.28

Lap joint stub ends Types A and B ANSI B 16-9 MSS SP-43



2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	24"
60	73	89	102	114	141	168	219	273	324	356	406	457	508	610
64	64	64	76	76	76	89	102	127	152	152	152	152	152	152
152	152	152	152	152	203	203	203	254	254	305	305	305	305	305
92	106	127	140	157	185	218	270	324	381	413	470	533	584	692
8	8	10	10	11	11	13	13	13	13	13	13	13	13	13
0.8	0.8	0.8	0.8	0.8	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
1.65	2.11	2.11	2.11	2.11	2.77	2.77	2.77	3.40	3.96	3.96	4.19	4.19	4.78	5.54
0.20	0.31	0.40	0.55	0.65	1.00	1.30	2.00	3.60	5.90	6.40	7.90	9.20	11.7	16.5
2.77	3.05	3.05	3.05	3.05	3.40	3.40	3.76	4.19	4.57	4.78	4.78	4.78	5.54	6.35
0.34	0.45	0.57	0.75	0.90	1.25	1.60	2.70	4.40	6.70	7.70	9.00	10.5	13.5	18.9
3.91	5.16	5.49	5.74	6.02	6.55	7.11	8.18	9.27	9.53					
0.47	0.75	1.00	1.40	1.70	2.30	3.40	5.70	9.60	13.8					



Chemical analysis & mechanical test for carbon steel - Alloy steel forgings

STEEL TYPE	Grade	C % Max	Min %	P % Max	S % Max	Si %	Cr %	Mo %	Ni %	Cu %	V %	Nb %	Ti %	N %	Al %	Nb + Ta %	Tensile strength Mpa	Yield point Mpa	Elongation 2 %	Red. of Area %	Impact Test (Jou)	Hardness (HB)
A105		0.350	0.60 - 1.05	0.035	0.040	0.10 - 0.35	0.30 max	0.12	0.40	0.40	0.050	0.02	///	///	///	///	485 min	250	330	30	///	<187
A350	LF2	0.350	0.60 - 1.35	0.035	0.040	0.15 - 0.30	0.30 max	0.12	0.40	0.40	0.050	0.02	///	///	///	///	485 - 635	250 min	30	30	-46 20/16J	<197
A350	LF3	0.20	0.90 max	0.035	0.040	0.20 - 0.35	0.30 max	0.12	3.30 - 3.70	0.40	0.030	0.02	///	///	///	///	485 - 635	260 min	30	35	-101.1 20/16J	<197
A182	F1	0.280	0.60 - 0.90	0.045	0.045	0.15 - 0.35	///	0.44 - 0.65	///	///	///	///	///	///	///	///	485 min	275 min	20.0	30.0	///	143 - 192
A182	F5	0.150	0.30 - 0.60	0.030	0.030	0.50 - 0.60	4.0 - 6.0	0.44 - 0.65	0.50 max	///	///	///	///	///	///	///	485 min	275 min	20.0	35.0	///	143 - 217
A182	F6a	0.250	0.60 max	0.040	0.030	0.50 - 0.60	4.0 - 6.0	0.44 - 0.65	0.50 max	///	///	///	///	///	///	///	620 min	450 min	22.0	50.0	///	187 - 248
A182	F9	0.150	0.30 - 0.60	0.030	0.030	0.50 - 1.00	8.00 - 10.00	0.90 - 1.10	///	///	///	///	///	///	///	///	585	380	20.0	40.0	///	179 - 217
A182	F91	0.08 - 0.12	0.30 - 0.60	0.020	0.010	0.20 - 0.50	8.0 - 9.5	0.85 - 1.05	0.40 max	///	0.18 - 0.25	0.060 - 0.10	///	0.030 - 0.07	0.040 max	///	585	415	20.0	40.0	///	<248
A182	F11 CL.1	0.05 - 0.150	0.30 - 0.60	0.030	0.030	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	///	///	///	///	///	///	///	///	415	205	20.0	45.0	///	121 - 174
A182	F11 CL.2	0.10 - 0.20	0.30 - 0.80	0.040	0.040	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	///	///	///	///	///	///	///	///	485	275	20.0	30.0	///	143 - 207
A182	F11 CL.3	0.10 - 0.20	0.30 - 0.80	0.040	0.040	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	///	///	///	///	///	///	///	///	515	310	20.0	30.0	///	156 - 207
A182	F12 CL.1	0.05 - 0.15	0.30 - 0.60	0.045	0.045	0.50 - 1.00	1.25	0.85 - 1.05	///	///	///	///	///	///	///	///	415	220	20.0	45.0	///	121 - 174
A182	F12 CL.2	0.10 - 0.20	0.30 - 0.80	0.040	0.040	0.10 - 0.60	1.25	0.85 - 1.05	///	///	///	///	///	///	///	///	485	275	20.0	30.0	///	143 - 207
A182	F22 CL.1	0.05 - 0.15	0.60	0.040	0.040	0.50 - 0.60	2.00 - 2.50	0.87 - 1.13	///	///	///	///	///	///	///	///	415	205	20.0	35.0	///	<170
A182	F22 CL.3	0.05 - 0.15	0.60	0.040	0.040	0.50 - 0.60	2.00 - 2.50	0.87 - 1.13	///	///	///	///	///	///	///	///	515	310	20.0	30.0	///	156 - 207
A694	F42	0.26 max	1.40 max	0.025 max	0.025	0.15 - 0.35	///	///	///	///	///	///	///	///	///	///	415	290	20.0	///	///	///
A694	F52	0.26 max	1.40 max	0.025 max	0.025	0.15 - 0.35	///	///	///	///	///	///	///	///	///	///	455	360	20.0	///	///	///
A694	F60	0.26 max	1.40 max	0.025 max	0.025	0.15 - 0.35	///	///	///	///	///	///	///	///	///	///	515	415	20.0	///	///	///
A694	F65	0.26 max	1.40 max	0.025 max	0.025	0.15 - 0.35	///	///	///	///	///	///	///	///	///	///	530	450	20.0	///	///	///

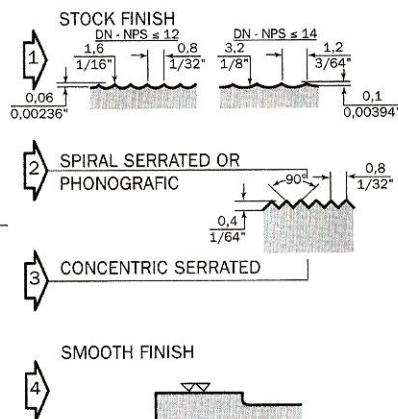
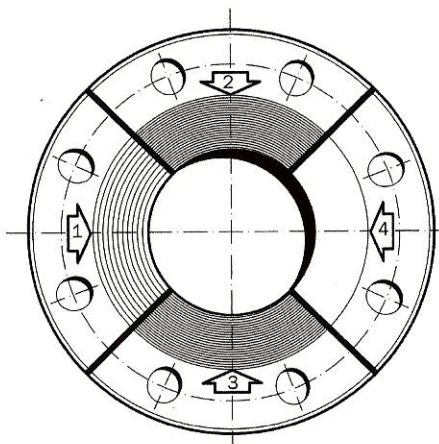
for additional requirements please check the mentioned ASTM/ASME specifications

Chemical analysis & mechanical test for stainless steel forgings

SPEC.	ASTM Grade	C % Max	Min %	P % Max	S % Max	Si %	Cr %	Mo %	Ni %	Cu %	V %	Nb %	N2 %	TP %	Nb + V %	Tensile strength Mpa	Yield point Mpa	Elongation 2 %	Red. of Area %	Hardness (HB)
A182	F304	0.08	2.00	0.45	0.030	1.00	18.0 - 20.0	///	8.0 - 11.0	///	///	///	///	///	///	515	205	30.0	50.0	NOT REQUIRED
A182	F304H	0.04 - 0.10	2.00	0.45	0.030	1.00	18.0 - 20.0	///	8.0 - 11.0	///	///	///	///	///	///	515	205	30.0	50.0	NOT REQUIRED
A182	F304L	0.035	2.00	0.45	0.030	1.00	18.0 - 20.0	///	8.0 - 13.0	///	///	///	///	///	///	485	170	30.0	50.0	NOT REQUIRED
A182	F316	0.080	2.00	0.45	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0	///	///	///	///	///	///	515	205	30.0	50.0	NOT REQUIRED
A182	F316H	0.04 - 0.10	2.00	0.45	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0	///	///	///	///	///	///	515	205	30.0	50.0	NOT REQUIRED
A182	F316L	0.035	2.00	0.45	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 15.0	///	///	///	///	///	///	485	170	30.0	50.0	NOT REQUIRED
A182	F321	0.080	2.00	0.45	0.030	1.00	17.0 min	///	9.0 - 12.0	///	///	///	5 x C ÷ < 0.7	///	///	515	205	30.0	50.0	NOT REQUIRED
A182	F321H	0.04 - 0.10	2.00	0.45	0.030	1.00	17.0 min	///	9.0 - 12.0	///	///	///	4 x C ÷ < 0.7	///	///	515	205	30.0	50.0	NOT REQUIRED
A182	F347	0.080	2.00	0.45	0.030	1.00	17.0 - 20.0	///	9.0 - 13.0	///	///	///	///	///	10 x C ÷ < 1.10	515	205	30.0	50.0	NOT REQUIRED
A182	F347H	0.04 - 0.10	2.00	0.45	0.030	1.00	17.0 - 20.0	///	9.0 - 13.0	///	///	///	///	///	8 x C ÷ < 1.10	515	205	30.0	50.0	NOT REQUIRED
A182	F44	0.020	1.00	0.030	0.010	0.80	19.5 - 20.0	6.0 - 6.5	17.5 - 18.5	0.50 - 1.00	///	///	0.18 - 0.22	///	///	650	300	35.0	50.0	NOT REQUIRED
A182	F51	0.030	2.00	0.030	0.020	1.00	21.0 - 23.0	2.5 - 3.5	4.5 - 6.5	///	///	///	0.08 - 0.20	///	///	620	450	25.0	45.0	NOT REQUIRED

for additional requirements please check the mentioned ASTM/ASME specifications

Gasket surface finishes



Gasket Surface Finishes

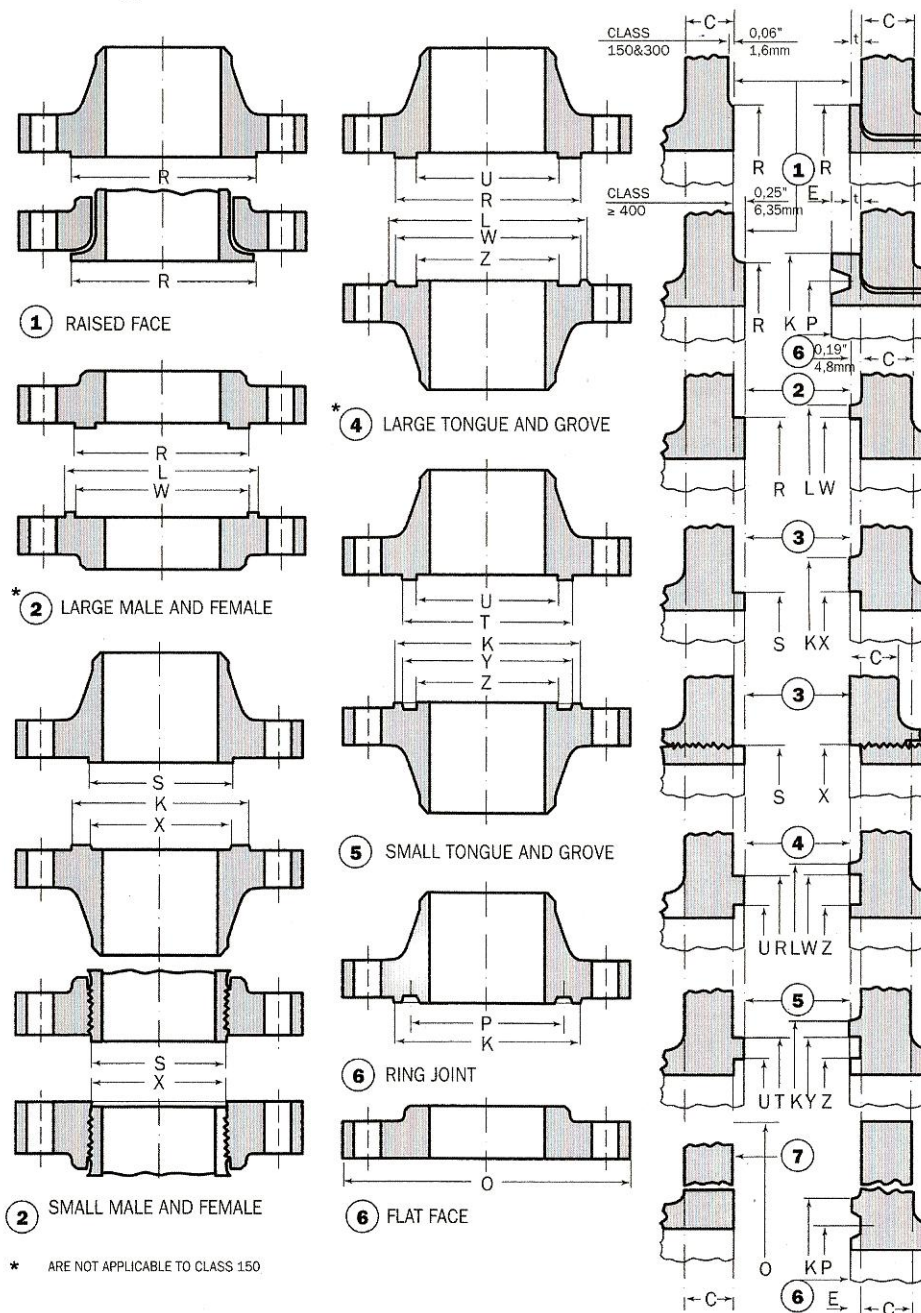
Flanges, Orifice Flanges, Long Welding Necks, and other fittings designed for bolted connection, when supplied with raised or flat face, may have any type of gasket surface finish required.

Gasket surface, unless otherwise specified by the purchaser, will be machined with a Stock Finish.

This surface, together with other gasket surface finishes which can be furnished to order, is described as follows :

- 1) **Stock Finish:** The most widely used of any gasket finish, because, practically, is suitable for all ordinary service conditions. This is a continuous spiral groove. Flanges sizes 12" and smaller, are produced with a 1/16" round-nosed tool at a feed of 1/32" per revolution. Forsized 14" and larger, the finish is made with a 1/8" round-nosed tool at a feed of 3/64" per revolution.
- 2) **Spiral serrated or phonographic:** This finish is produced by using a 90° included-angle «V» tool, making a spiral groove 1/64" deep with a feed of 1/32".
- 3) **Concentric serrated:** This finish is produced by using a 90° included-angle «V» tool, making concentric groove 1/64" deep and 1/32" apart.
- 4) **Smooth finish:** This finish is produced by several shapes of tools cutting at speeds and feeds which leave no definite toolmarks apparent to the naked eye.

ANSI flange facings



* ARE NOT APPLICABLE TO CLASS 150

ANSI flange facing dimensions

Nominal Pipe		Outside diameter			Outside diameter			Inside Diameter	Minimum outside diameter of raised portion		
		Raised face, lapped large male and large tongue	Small male	Small tongue	Large female and large groove	Large and small tongue	Small female	Small groove	Large and small groove	Small female and groove	Large female and groove
Size	Dimension	R	S	T	U	W	X	Y	Z	K	L
2 1/2	mm	35.0	18.3	35.0	25.4	36.5	19.8	36.5	23.8	44.5	46.0
	inc.	1.38	0.72	1.38	1.00	1.44	0.78	1.44	0.94	1.75	1.81
3/4	mm	42.9	23.8	42.9	33.3	44.5	25.4	44.5	31.8	52.4	54.0
	inc.	1.69	0.94	1.69	1.31	1.75	1.00	1.75	1.25	2.06	2.12
1	mm	50.8	30.2	47.7	38.1	52.4	31.8	49.2	36.5	57.2	61.9
	inc.	2.00	1.19	1.88	1.50	2.06	1.25	1.94	1.44	2.25	2.44
1 1/4	mm	63.5	38.1	57.2	47.7	65.1	39.7	58.7	46.0	66.7	74.6
	inc.	2.50	1.50	2.25	1.88	2.56	1.56	2.31	1.81	2.62	2.94
1 1/2	mm	73.0	44.5	63.5	54.0	74.6	46.0	65.1	52.4	73.0	84.1
	inc.	2.88	1.75	2.50	2.12	2.94	1.81	2.56	2.06	2.88	3.31
2	mm	92.1	57.2	82.6	73.0	93.7	58.7	84.1	71.4	92.1	103.2
	inc.	3.62	2.25	3.25	2.88	3.69	2.31	3.31	2.81	3.62	4.06
2 1/2	mm	104.8	68.3	95.3	85.7	106.4	69.9	96.8	84.1	104.8	115.9
	inc.	4.12	2.69	3.75	3.38	4.19	2.75	3.81	3.31	4.12	4.56
3	mm	127.0	84.1	117.5	108.0	128.6	85.7	119.1	106.4	127.0	138.1
	inc.	5.00	3.31	4.62	4.25	5.06	3.38	4.69	4.19	5.00	5.44
3 1/2	mm	139.7	96.8	130.2	120.7	141.3	98.4	131.8	119.1	139.7	150.8
	inc.	5.50	3.81	5.12	4.75	5.56	3.88	5.19	4.69	5.50	5.94
4	mm	157.2	109.5	144.5	131.8	158.8	111.1	146.1	130.2	157.2	168.3
	inc.	6.19	4.31	5.69	5.19	6.25	4.38	5.75	5.12	6.19	6.62
5	mm	185.7	136.5	173.0	160.3	187.3	138.1	174.6	158.8	185.7	196.9
	inc.	7.31	5.38	6.81	6.31	7.38	5.44	6.88	6.25	7.31	7.75
6	mm	215.9	161.9	203.2	190.5	217.5	163.5	204.8	188.9	215.9	227.0
	inc.	8.50	6.38	8.00	7.50	8.56	6.44	8.06	7.44	8.50	8.94
8	mm	269.9	212.7	254.0	238.1	271.5	214.3	255.6	236.5	269.9	281.0
	inc.	10.62	8.38	10.00	9.38	10.69	8.44	10.06	9.31	10.62	11.06
10	mm	323.9	266.7	304.8	285.8	325.4	268.3	306.4	284.2	323.9	335.0
	inc.	12.75	10.50	12.00	11.25	12.81	10.56	12.06	11.19	12.75	13.19
12	mm	381.0	317.5	362.0	342.9	382.6	319.1	363.5	341.3	381.0	392.1
	inc.	15.00	12.50	14.25	13.50	15.06	12.56	14.31	13.44	15.00	15.44
14	mm	412.8	349.3	393.7	374.7	414.3	350.8	395.3	373.1	412.8	423.9
	inc.	16.25	13.75	15.50	14.75	16.31	13.81	15.56	14.69	16.25	16.69
16	mm	469.9	400.1	447.7	425.5	471.5	401.6	449.3	423.9	469.9	481.0
	inc.	18.50	15.75	17.62	16.75	18.56	15.81	17.69	16.69	18.50	18.94
18	mm	533.4	450.9	511.2	489.0	535.0	452.4	512.8	487.4	533.4	544.5
	inc.	21.00	17.75	20.12	19.25	21.06	17.81	20.19	19.19	21.00	21.44
20	mm	584.2	501.7	558.8	533.4	585.8	503.2	560.4	531.8	584.2	595.3
	inc.	23.00	19.75	22.00	21.00	23.06	19.81	22.06	20.94	23.00	23.44
24	mm	692.2	603.3	666.8	641.4	693.7	604.8	668.3	639.8	692.2	703.3
	inc.	27.25	23.75	26.25	25.25	27.31	23.81	26.31	25.19	27.25	27.69

Dimensional tolerances for ANSI flanges

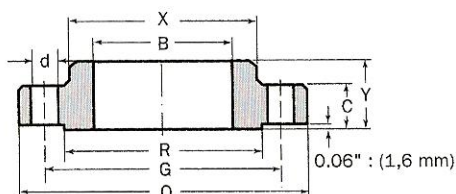
THREADED, SOCKET-WELDING SLIP-ON, LAP JOINT AND BLIND FLANGES		
* Outside diameter	When O.D. is 24" or less	±0.06"
	When O.D. is over 24"	± 0.12"
Inside diameter	Threaded	To Standard Gauge Limits
	Socket-welding Slip-on and Lap Joint Sizes 10" and smaller	+ 0.03", - 0"
	Sizes 12" and larger	+ 0.06", - 0"
Diameter of counterbore	Same as for Inside Diameter	
Diameter of contact face	1/6" Raised Face	± 0.03"
	1/4" Raised Face Tongue and Groove, or Male and Female	± 0.016"
* Outside diameter of hub	Size 12" and smaller	+ 0.09", - 0.06"
	Sizes 14" and larger	± 0.12"
* Drilling	Bolt Circle ≤ 24" > 24"	± 0.03" ± 0.06"
	Bolt hole spacing	± 0.016"
Length thru hub	Eccentricity of Bolt Circle and Facing (with respect to bore)	0.03" max
	Sizes 18" and smaller	+ 0.12", -0.03"
Thickness	Sizes 20" and larger	+ 0.19", - 0.06"
	Sizes 18" and larger	+ 0.12", - 0"
Thickness	Sizes 20" and larger	+ 0.19", - 0"
	Sizes 18" and larger	+ 0.12", - 0"

* Tolerance for these dimensions not covered by ANSI B16-5.

Dimensions in inches

WELDING NECK FLANGES		
* Outside diameter	When O.D. is 24" or less	±0.06"
	When O.D. is over 24"	± 0.12"
Inside diameter	Sizes 10" and smaller	± 0.03"
	Sizes 12" through 18"	± 0.06"
	Sizes 20" and larger	+ 0.12", - 0.06"
Diameter of contact face	1/6" Raised Face	± 0.016"
	1/4" Raised Face	
Diameter of hub at point of welding	Tongue and Groove, or Male and Female	± 0.016"
* Diameter of hub at base	Size 5" and smaller	+ 0.09", - 0.03"
	Size 6" and larger	+ 0.16", - 0.03"
* Drilling	When Hub Base is	± 0.06"
	When Hub Base is over 24"	± 0.12"
Length thru hub	Bolt Circle ≤ 24" > 24"	± 0.03" ± 0.06"
	Bolt hole spacing	± 0.016"
Thickness	Eccentricity of Bolt Circle and Facing (with respect to bore)	0.03" max
	Sizes 10" and smaller	± 0.06"
Thickness	Sizes 12" and larger	± 0.12"
	Sizes 18" and smaller	+ 0.12", - 0"
Thickness	Sizes 20" and larger	+ 0.19", - 0"
	Sizes 18" and larger	+ 0.12", - 0"

Slip on class 150 raised face

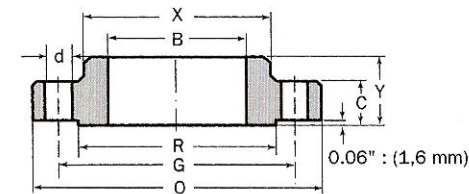


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	B min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	89	22,4	11,2	16	30	34,9	4	60,3	15,8	0,8
20	3/4	99	27,7	12,7	16	38	42,9	4	69,8	15,8	0,9
25	1	108	34,5	14,3	17	49	50,8	4	79,4	15,8	1,0
32	1 1/4	117	43,2	15,9	21	59	63,5	4	88,9	15,8	1,3
40	1 1/2	127	49,5	17,5	22	65	73,0	4	98,4	15,8	1,5
50	2	152	62,0	19,1	25	78	92,1	4	120,6	19,0	2,3
65	2 1/2	178	74,7	22,3	29	90	104,8	4	139,7	19,0	3,7
80	3	190	90,7	23,9	30	108	127,0	4	152,4	19,0	4,2
-	3 1/2	216	103,4	23,9	32	122	139,7	8	177,8	19,0	5,3
100	4	229	116,1	23,9	33	135	157,2	8	190,5	19,0	5,9
125	5	254	143,8	23,9	37	164	185,7	8	215,9	22,2	7,0
150	6	279	170,7	25,4	40	192	215,9	8	241,3	22,2	8,5
200	8	343	221,5	28,6	44	246	269,9	8	298,4	22,2	13,5
250	10	406	276,4	30,2	49	305	323,8	12	362,0	25,4	19,5
300	12	483	327,2	31,8	56	365	381,0	12	431,8	25,4	29
350	14	533	359,2	35,0	57	400	412,8	12	476,2	28,5	39
400	16	597	410,5	36,6	63	457	469,9	16	539,8	28,5	47
450	18	635	461,8	42,9	68	505	533,4	16	577,8	31,8	54
500	20	698	513,3	42,9	73	559	584,2	20	635,0	31,8	70
600	24	813	616,0	47,7	83	664	692,2	20	749,3	35,0	95

Slip on class 300 raised face

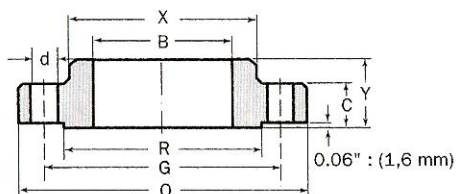


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	B min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,4	14,2	22	38	34,9	4	66,7	15,8	1,2
20	3/4	117	27,7	15,7	25	48	42,9	4	82,6	19,0	1,3
25	1	124	34,5	17,5	27	54	50,8	4	88,9	19,0	1,4
32	1 1/4	133	43,2	19,0	27	63	63,5	4	98,4	19,0	1,8
40	1 1/2	156	49,5	20,6	30	70	73,0	4	114,3	22,2	2,5
50	2	165	62,0	22,4	33	84	92,1	8	127,0	19,0	3,0
65	2 1/2	190	74,7	25,4	38	100	104,8	8	149,2	22,2	4,5
80	3	210	90,7	28,4	43	117	127,0	8	168,3	22,2	6,0
-	3 1/2	229	103,4	30,2	44	133	139,7	8	184,2	22,2	7,5
100	4	254	116,1	31,8	48	146	157,2	8	200,0	22,2	10,1
125	5	279	143,8	35,0	51	178	185,7	8	235,0	22,2	12,5
150	6	318	170,7	36,6	52	206	215,9	12	269,9	22,2	17,5
200	8	381	221,5	41,1	62	260	269,9	12	330,2	25,4	26
250	10	444	276,4	47,8	66	320	323,8	16	387,4	28,5	38
300	12	521	327,2	50,8	73	375	381,0	16	450,8	31,8	52
350	14	584	359,2	53,8	76	425	412,8	20	514,4	31,8	74
400	16	648	410,5	57,2	83	483	469,9	20	571,5	35	100
450	18	711	461,8	60,5	89	533	533,4	24	628,6	35,0	127
500	20	775	513,1	63,5	95	587	584,2	24	685,8	35,0	147
600	24	914	616,0	69,9	106	701	692,2	24	812,8	41,1	208

Slip on class 400 raised face

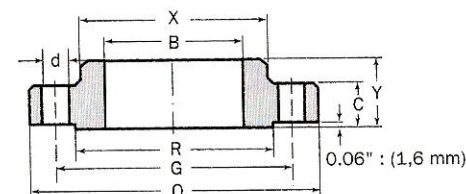


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	B min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,4	14,2	22	38	34,9	4	66,7	15,8	1,3
20	3/4	117	27,7	15,7	25	48	42,9	4	82,6	19,0	1,4
25	1	124	34,5	17,5	27	54	50,8	4	88,9	19,0	1,8
32	1 1/4	133	43,2	20,6	29	64	63,5	4	98,4	19,0	2,1
40	1 1/2	156	49,5	22,4	32	70	73,0	4	114,3	22,2	3,1
50	2	165	62,0	25,4	37	84	92,1	8	127,0	19,0	4,0
65	2 1/2	190	74,7	28,4	41	100	104,8	8	149,2	22,2	5,4
80	3	210	90,7	31,8	46	118	127,0	8	168,3	22,2	7,0
-	3 1/2	229	103,4	35,0	49	133	139,7	8	184,0	25,4	8,9
100	4	254	116,1	35,0	51	146	157,2	8	200,1	25,4	13,0
125	5	279	143,8	38,1	54	178	185,7	8	235,0	25,4	18,5
150	6	318	170,7	41,1	57	206	215,9	12	269,8	25,4	25
200	8	381	221,5	47,8	68	260	269,9	12	330,2	28,5	34
250	10	444	276,4	53,8	73	321	323,8	16	387,4	31,8	54
300	12	521	327,2	57,2	79	375	381,0	16	450,8	35,0	70
350	14	584	359,2	60,5	84	425	412,8	20	514,4	35,0	85
400	16	648	410,5	63,5	94	483	469,9	20	571,5	38,1	120
450	18	711	461,8	66,5	98	533	533,4	24	628,6	38,1	150
500	20	775	513,1	69,9	102	587	584,2	24	685,8	41,1	185
600	24	914	616,0	76,2	114	702	692,2	24	812,8	47,8	260

Slip on class 600 raised face

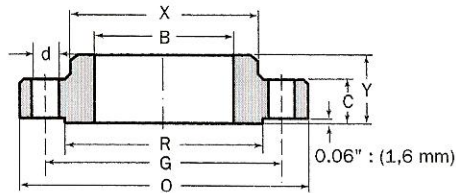


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	B min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,4	14,2	22	38	34,9	4	66,7	15,8	1,3
20	3/4	117	27,7	15,7	25	48	42,9	4	82,6	19,0	1,4
25	1	124	34,5	17,5	27	54	50,8	4	88,9	19,0	1,8
32	1 1/4	133	43,2	20,6	29	64	63,5	4	98,4	19,0	2,1
40	1 1/2	156	49,5	22,4	32	70	73,0	4	114,3	22,2	3,1
50	2	165	62,0	25,4	37	84	92,1	8	127,0	19,0	4,0
65	2 1/2	190	74,7	28,4	41	100	104,8	8	149,2	22,2	5,4
80	3	210	90,7	31,8	46	118	127,0	8	168,3	22,2	7,0
-	3 1/2	229	103,4	35,0	49	133	139,7	8	184,0	25,4	8,9
100	4	273	116,1	31,8	54	152	157,2	8	215,9	25,4	16,0
125	5	330	143,8	44,5	60	189	185,7	8	266,7	28,5	25
150	6	356	170,7	47,8	67	222	215,9	12	292,1	28,5	30
200	8	419	221,5	55,6	76	273	269,9	12	349,2	31,8	43
250	10	508	276,4	63,5	86	343	323,8	16	431,8	35,0	70
300	12	559	327,2	66,5	92	400	381,0	20	489,0	35,0	86
350	14	603	359,2	69,9	94	432	412,8	20	527,0	38,1	100
400	16	686	410,5	76,2	106	495	469,9	20	603,2	41,1	142
450	18	743	461,8	82,6	117	546	533,4	20	654,0	44,5	175
500	20	813	513,1	88,9	127	610	584,2	24	723,9	44,5	221
600	24	940	616,0	101,6	140	718	692,2	24	838,2	50,8	315

Slip on class 900 raised face

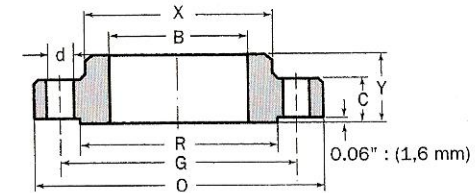


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	B min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22,4	22,4	32	38	34,9	4	82,6	22,2	1,7
20	3/4	130	27,7	25,4	35	44	42,9	4	88,9	22,2	2,3
25	1	149	34,5	28,4	41	52	50,8	4	101,6	25,4	3,4
32	1 1/4	159	43,2	28,4	41	63	63,5	4	111,1	25,4	3,9
40	1 1/2	178	49,5	31,8	44	70	73,0	4	123,8	28,5	5,4
50	2	216	62,0	38,1	57	105	92,1	8	165,1	25,4	9,8
65	2 1/2	244	74,7	41,1	63	124	104,8	8	190,5	28,5	13,7
80	3	241	90,7	31,8	54	127	127,0	8	190,5	25,4	11,6
100	4	292	116,1	44,5	70	159	157,2	8	235,0	31,8	19,8
125	5	349	143,8	50,8	79	190	185,7	8	279,4	35,0	32
150	6	381	170,7	55,6	86	235	215,9	12	317,5	31,8	41
200	8	470	221,5	63,5	102	298	269,9	12	393,7	38,1	71
250	10	546	276,4	69,9	108	368	323,8	16	469,9	38,1	100
300	12	610	327,2	79,2	117	419	381,0	20	533,4	38,1	133
350	14	641	359,2	85,9	130	451	412,8	20	558,8	41,1	152
400	16	705	410,5	88,9	133	508	469,9	20	616,0	44,5	184
450	18	787	461,8	101,6	152	565	533,4	20	685,8	50,8	258
500	20	857	513,1	108,0	159	622	584,2	20	749,3	53,8	317
600	24	1041	616,0	139,7	203	749	692,2	20	901,7	66,5	608

Slip on class 1500 raised face

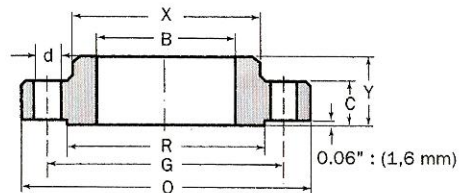


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	B min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22,4	22,4	32	38	34,9	4	82,6	22,2	1,7
20	3/4	130	27,7	25,4	35	44	42,9	4	88,9	22,2	2,3
25	1	149	34,5	28,4	41	52	50,8	4	101,6	25,4	3,4
32	1 1/4	159	43,2	28,4	41	63	63,5	4	111,1	25,4	3,9
40	1 1/2	178	49,5	31,8	44	70	73,0	4	123,8	28,5	5,4
50	2	216	62,0	38,1	57	105	92,1	8	165,1	25,4	9,8
65	2 1/2	244	74,7	41,1	63	124	104,8	8	190,5	28,5	13,7

Slip on class 150 raised face

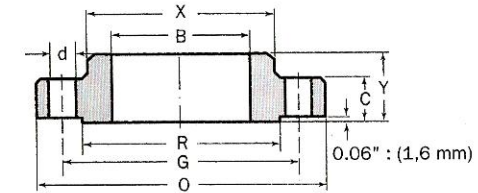


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r	X	B	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	kg
26"	869,9	50,8	742,9	85,7	24	34,9	806,4	6,4	723,9	666,7	107
28"	927,1	52,4	793,7	87,3	28	34,9	863,6	6,4	781,0	717,5	126
30"	984,2	54,0	857,2	88,9	28	34,9	914,4	6,4	831,8	768,3	140
32"	1060,4	57,1	908,0	92,1	28	41,3	977,9	8,0	889,0	819,1	168
34"	1111,2	58,7	958,8	93,7	32	41,3	1028,7	8,0	939,8	869,9	179
36"	1168,4	60,3	1022,3	95,2	32	41,3	1085,8	8,0	996,9	920,7	205
38"	1238,2	60,3	1073,1	95,2	32	41,3	1149,3	9,5	1060,4	971,5	230
40"	1289,0	63,5	1123,9	98,4	36	41,3	1200,1	9,5	1111,2	1022,3	270
42"	1346,2	66,7	1193,8	101,6	36	41,3	1257,3	9,5	1168,4	1073,1	310
44"	1403,3	66,7	1244,6	101,6	40	41,3	1314,4	11,1	1219,2	1123,9	340
46"	1454,1	68,3	1295,4	103,2	40	41,3	1365,2	11,1	1270,0	1174,7	375
48"	1511,3	69,8	1358,9	104,8	44	41,3	1422,4	11,1	1327,1	1225,5	426

Slip on class 300 raised face

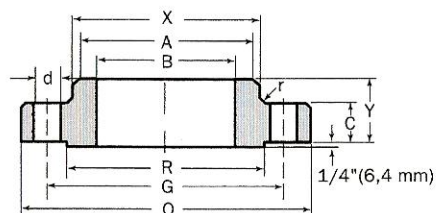


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r	X	A	B	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	mm	kg
26"	971,5	79,4	749,3	184,1	28	44,4	876,3	9,5	720,7	687,4	666,7	255
28"	1035,0	85,7	800,1	196,8	28	44,4	939,8	11,1	774,7	739,8	717,5	321
30"	1092,2	92,1	857,2	209,5	28	47,6	996,9	11,1	827,1	792,2	768,3	362
32"	1149,3	98,4	914,4	222,2	28	50,8	1054,1	11,1	881,1	844,6	819,1	398
34"	1206,5	101,6	965,2	231,8	28	50,8	1104,9	12,7	936,6	897,0	869,9	480
36"	1270,0	104,8	1022,3	241,3	32	54,0	1168,4	12,7	990,6	949,3	920,7	540

Slip on class 400 raised face



26" to 36" BS 3293

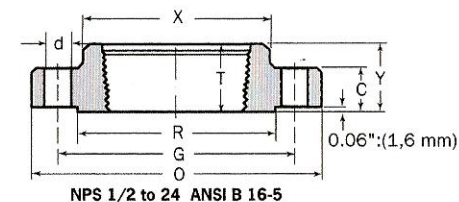
Weights are approximate

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r	X	A	B	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	mm	kg
26"	971,5	88,9	749,3	193,7	28	47,6	876,3	11,1	727,1	693,8	666,7	295
28"	1035,0	95,2	800,1	206,4	28	50,8	939,8	12,7	782,6	746,1	717,5	354
30"	1092,2	101,6	857,2	219,1	28	54,0	996,9	12,7	836,6	800,1	768,3	408
32"	1149,3	108,0	914,4	231,8	28	54,0	1054,1	12,7	889,0	852,5	819,1	465
34"	1206,5	111,1	965,2	241,3	28	54,0	1104,9	14,3	944,6	904,9	869,9	522
36"	1270,0	114,3	1022,3	250,8	32	54,0	1168,4	14,3	1000,2	958,9	920,7	601

class 600

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r	X	A	B	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	mm	kg
26"	1016,0	108,0	749,3	222,2	28	50,8	914,4	14,3	747,7	706,4	666,7	425
28"	1073,1	111,1	800,1	234,9	28	54,0	965,2	15,9	803,3	760,4	717,5	470
30"	1130,3	114,33	857,2	247,6	28	54,0	1022,3	17,5	862,0	814,4	768,3	533
32"	1193,8	117,5	914,4	260,3	28	60,3	1079,5	17,5	917,6	868,4	819,1	624
34"	1244,6	120,7	965,2	269,9	28	60,3	1130,3	19,0	973,2	922,4	869,9	681
36"	1314,4	123,8	1022,3	282,6	28	66,7	1193,8	19,0	1031,9	976,3	920,7	726

Threaded class 150 raised face

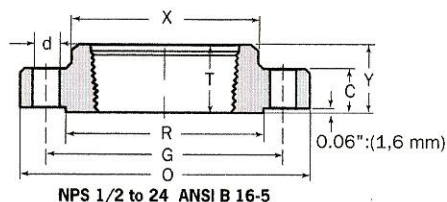


NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	T min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	89	16	11,2	16	30	34,9	4	60,3	15,8	0,8
20	3/4	99	16	12,7	16	38	42,9	4	69,8	15,8	0,9
25	1	108	18	14,3	17	49	50,8	4	79,4	15,8	1,0
32	1 1/4	117	21	15,9	21	59	63,5	4	88,9	15,8	1,3
40	1 1/2	127	22	17,5	22	65	73,0	4	98,4	15,8	1,5
50	2	152	25	19,1	25	78	92,1	4	120,6	19,0	2,3
65	2 1/2	178	29	22,3	29	90	104,8	4	139,7	19,0	3,7
80	3	190	30	23,9	30	108	127,0	4	152,4	19,0	4,2
-	3 1/2	216	32	23,9	32	122	139,7	8	177,8	19,0	5,3
100	4	229	33	23,9	33	135	157,2	8	190,5	19,0	5,9
125	5	254	37	23,9	37	164	185,7	8	215,9	22,2	7,0
150	6	279	40	25,4	40	192	215,9	8	241,3	22,2	8,5
200	8	343	44	28,6	44	246	269,9	8	298,4	22,2	13,5
250	10	406	49	30,2	49	305	323,8	12	362,0	25,4	19,5
300	12	483	56	31,8	56	365	381,0	12	431,8	25,4	29
350	14	533	57	35,0	57	400	412,8	12	476,2	28,5	39
400	16	597	64	36,6	63	457	469,9	16	539,8	28,5	47
450	18	635	68	93,7	68	505	533,4	16	577,8	31,8	54
500	20	698	73	42,9	73	559	584,2	20	635,0	31,8	70
600	24	813	83	47,7	83	664	692,2	20	749,3	35,0	95

Threaded class 300 raised face

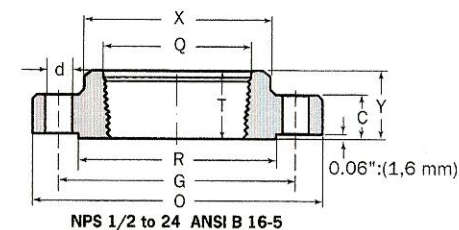


Q: counterbore
T: thread length

Weights are approximate

Size		O	T min.	Q min.	C	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	16	23,5	14,2	22	38	34,9	4	66,7	15,8	1,2
20	3/4	117	16	29,0	15,7	25	48	42,9	4	82,6	19,0	1,3
25	1	124	18	36,0	17,5	27	54	50,8	4	88,9	19,0	1,4
32	1 1/4	133	21	44,5	19,0	27	63	63,5	4	98,4	19,0	1,9
40	1 1/2	156	22	50,5	20,6	30	70	73,0	4	114,3	22,2	2,8
50	2	165	29	63,5	22,4	33	84	92,1	8	127,0	19,0	3,3
65	2 1/2	190	32	76,0	25,4	38	100	104,8	8	149,2	22,2	4,6
80	3	210	32	92,0	28,4	43	117	127,0	8	168,3	22,2	6,3
-	3 1/2	229	37	105	30,2	44	133	139,7	8	184,2	22,2	7,8
100	4	254	37	118	31,8	48	146	157,2	8	200,0	22,2	10,2
125	5	279	43	145	35,0	51	178	185,7	8	235,0	22,2	12,9
150	6	318	46	171	36,6	52	206	215,9	12	269,9	22,2	18,0
200	8	381	51	222	41,1	62	260	269,9	12	330,2	25,4	26
250	10	444	56	276	47,8	66	320	323,8	16	387,4	28,5	38
300	12	521	61	329	50,8	73	375	381,0	16	450,8	31,8	52
350	14	584	64	360	53,8	76	425	412,8	20	514,4	31,8	74
400	16	648	68	411	57,2	83	483	469,9	20	571,5	35	100
450	18	711	70	462	60,5	89	533	533,4	24	628,6	35,0	127
500	20	775	73	513	63,5	95	587	584,2	24	685,8	35,0	147
600	24	914	83	614	69,9	106	701	692,2	24	812,8	41,1	213

Threaded class 400 raised face

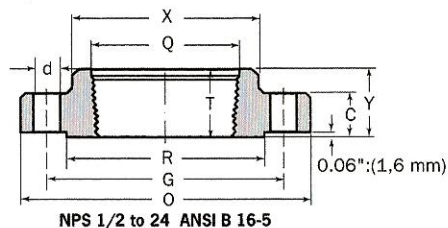


Q: counterbore
T: thread length

Weights are approximate

Size		O	T min.	Q min.	C	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	16	23,5	14,2	22	38	34,9	4	66,7	15,8	1,4
20	3/4	117	16	29,0	15,7	25	48	42,9	4	82,6	19,0	1,6
25	1	124	18	36,0	17,5	27	54	50,8	4	88,9	19,0	2,1
32	1 1/4	133	21	44,5	20,6	29	64	63,5	4	98,4	19,0	2,6
40	1 1/2	156	22	50,5	22,4	32	70	73,0	4	114,3	22,2	3,3
50	2	165	29	63,5	25,4	37	84	92,1	8	127,0	19,0	4,4
65	2 1/2	190	32	76,0	28,4	41	100	104,8	8	149,2	22,2	6,0
80	3	210	35	92,0	31,8	46	118	127,0	8	168,3	22,2	7,4
-	3 1/2	229	40	105	35,0	49	133	139,7	8	184,0	25,4	9,5
100	4	254	37	118	35,0	51	146	157,2	8	200,1	25,4	15,0
125	5	279	43	145	38,1	54	178	185,7	8	235,0	25,4	20
150	6	318	46	171	41,1	57	206	215,9	12	269,8	25,4	28
200	8	381	51	222	47,8	68	260	269,9	12	330,2	28,5	37
250	10	444	56	276	53,8	73	321	323,8	16	387,4	31,8	60
300	12	521	60	329	57,2	79	375	381,0	16	450,8	35,0	76
350	14	584	64	360	60,5	84	425	412,8	20	514,4	35,0	93
400	16	684	68	411	63,5	94	483	469,9	20	571,5	38,1	132
450	18	711	70	462	66,5	98	533	533,4	24	628,6	38,1	165
500	20	775	73	513	69,9	102	587	584,2	24	685,6	41,1	205
600	24	914	83	614	76,2	114	702	692,2	24	812,8	47,8	285

Threaded class 600 raised face

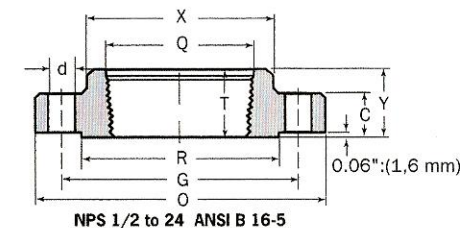


Q: counterbore
T: thread length

Weights are approximate

Size		O	T min.	Q min.	C	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	16	23,5	14,2	22	38	34,9	4	66,7	15,8	1,4
20	3/4	117	16	29,0	15,7	25	48	42,9	4	82,6	19,0	1,6
25	1	124	18	36,0	17,5	27	54	50,8	4	88,9	19,0	2,1
32	1 1/4	133	21	44,5	20,6	29	64	63,5	4	98,4	19,0	2,6
40	1 1/2	156	22	50,5	22,4	32	70	73,0	4	114,3	22,2	3,3
50	2	165	29	63,5	25,4	37	84	92,1	8	127,0	19,0	4,4
65	2 1/2	190	32	76,0	28,4	41	100	104,8	8	149,2	22,2	6,0
80	3	210	35	92,0	31,8	46	118	127,0	8	168,3	22,2	7,4
-	3 1/2	229	40	105	35,0	49	133	139,7	8	184,0	25,4	9,5
100	4	273	41	118	38,1	54	152	157,2	8	215,9	25,4	17,0
125	5	330	48	145	44,5	60	189	185,7	8	266,7	28,5	27
150	6	356	51	171	47,8	67	222	215,9	12	292,1	28,5	32
200	8	419	57	222	55,6	76	273	269,9	12	349,2	31,8	46
250	10	508	65	276	63,5	86	343	323,8	16	431,8	35,0	74
300	12	559	70	329	66,5	92	400	381,0	20	489,0	35,0	90
350	14	603	73	360	69,9	94	432	412,8	20	527,0	38,1	108
400	16	686	78	411	76,2	106	495	469,9	20	603,2	41,1	150
450	18	743	79	462	82,6	117	546	533,4	20	654,0	44,5	188
500	20	813	82	513	89,9	127	610	584,2	24	723,9	44,5	230
600	24	940	92	614	101,6	140	718	692,2	24	838,2	50,8	325

Threaded class 900 raised face

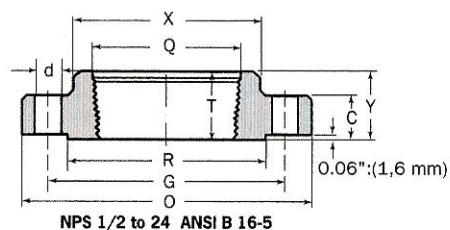


Q: counterbore
T: thread length

Weights are approximate

Size		O	T min.	Q min.	C min	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22	23,5	22,4	32	38	34,9	4	82,6	22,2	1,8
20	3/4	130	25	29,0	25,4	35	44	42,9	4	88,9	22,2	2,4
25	1	149	29	36,0	28,4	41	52	50,8	4	101,6	25,4	3,5
32	1 1/4	159	30	44,5	28,4	41	63	63,5	4	111,1	25,4	4,0
40	1 1/2	178	32	50,5	31,8	44	70	73,0	4	123,8	28,5	5,5
50	2	216	38	63,5	38,1	57	105	92,1	8	165,1	25,4	10,0
65	2 1/2	244	48	76,0	41,1	63	124	104,8	8	190,5	28,5	13,9
80	3	241	41	92,0	38,1	54	127	127,0	8	190,5	25,4	11,9
100	4	292	48	118	44,5	70	159	157,2	8	235,0	31,8	20
125	5	349	54	145	50,8	79	190	185,7	8	279,4	35,0	33
150	6	381	57	171	55,6	86	235	215,9	12	317,5	31,8	42
200	8	470	64	222	63,5	102	298	269,9	12	393,7	38,1	72
250	10	546	71	276	69,9	108	368	323,8	16	469,9	38,1	101
300	12	610	76	329	79,2	117	419	381,0	16	533,4	38,1	134
350	14	641	83	360	85,9	130	451	412,8	20	558,8	41,1	154
400	16	705	86	411	89,9	133	508	469,9	20	616,0	44,5	186
450	18	787	89	462	101,6	152	565	533,4	20	685,8	50,8	260
500	20	857	92	513	108,0	159	622	584,2	20	749,3	53,8	320
600	24	1041	102	614	139,7	203	749	692,2	20	901,7	66,5	611

Threaded class 1500 raised face

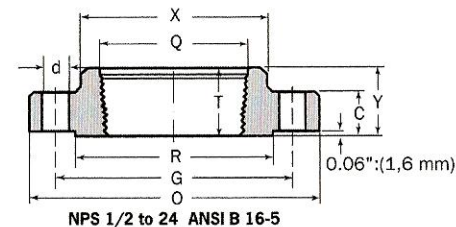


Q: counterbore
T: thread length

Weights are approximate

Size		O	T min.	Q min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22	23,5	22,4	32	38	34,9	4	82,6	22,2	1,8
20	3/4	130	25	29,0	25,4	35	44	42,9	4	88,9	22,2	2,0
25	1	149	29	36,0	28,4	41	52	50,8	4	101,6	25,4	3,5
32	1 1/4	159	30	44,5	28,4	41	63	63,5	4	111,1	25,4	4,0
40	1 1/2	178	32	50,5	31,8	44	70	73,0	4	123,8	28,5	5,5
50	2	216	38	63,5	38,1	57	105	92,1	8	165,1	25,4	10,0
65	2 1/2	244	48	76,0	41,1	63	124	104,8	8	190,5	28,5	13,9
80	3	267	51	92,0	47,8	73	133	127,0	8	203,2	31,8	18,1
100	4	311	57	118	53,8	90	162	157,2	8	241,3	35,0	28,9
125	5	375	63	145	73,2	105	197	185,7	8	292,1	41,1	52
150	6	394	70	171	82,6	119	229	215,9	12	317,5	38,1	61
200	8	483	76	222	91,9	143	292	269,9	12	393,7	44,5	105
250	10	584	84	276	108,0	159	368	323,8	12	482,6	50,8	176
300	12	673	92	329	124,0	181	451	381,0	16	571,5	53,8	266

Threaded class 2500 raised face

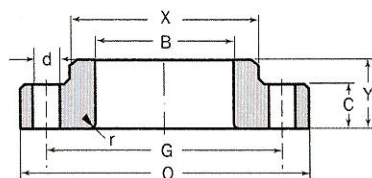


Q: counterbore
T: thread length

Weights are approximate

Size		O	T min.	Q min.	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	133	29	23,5	30,2	40	43	34,9	4	88,9	22,2	3
20	3/4	140	32	29,0	31,8	43	51	42,9	4	95,3	22,2	4
25	1	159	35	36,0	35,0	48	57	50,8	4	108,0	25,4	5
32	1 1/4	184	38	44,5	38,1	52	73	63,5	4	130,0	28,5	8
40	1 1/2	203	44	50,5	44,5	60	79	73,0	4	146,0	31,8	11
50	2	235	51	63,5	50,8	70	95	92,1	8	171,5	28,5	17
65	2 1/2	267	57	76,0	57,2	79	114	104,8	8	196,9	31,8	25
80	3	305	63	92,0	66,5	92	133	127,0	8	228,6	35,0	38
100	4	356	70	118	76,2	108	165	157,2	8	273,0	41,1	58
125	5	419	76	145	91,9	130	203	185,7	8	323,9	47,8	95
150	6	483	82	171	108,6	152	235	215,9	8	368,3	53,8	146
200	8	552	95	222	127,0	178	305	269,9	12	438,2	53,8	220
250	10	673	108	276	165,1	229	375	323,8	12	539,8	66,5	420
300	12	762	121	329	184,2	254	441	381,0	12	619,3	73,2	590

Lapped class 150



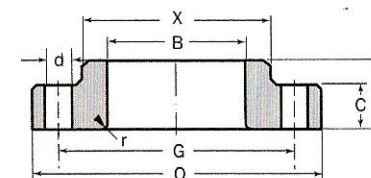
NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	89	22,9	11,2	16	30	3	4	60,3	15,8	0,8
20	3/4	99	28,2	12,7	16	38	3	4	69,8	15,8	0,9
25	1	108	35,0	14,3	17	49	3	4	79,4	15,8	1,0
32	1 1/4	117	43,7	15,9	21	59	5	4	88,9	15,8	1,3
40	1 1/2	127	50,0	17,5	22	65	6	4	98,4	15,8	1,5
50	2	152	62,5	19,1	25	78	8	4	120,6	19,0	2,3
65	2 1/2	178	75,4	22,3	29	90	8	4	139,7	19,0	3,7
80	3	190	91,4	23,9	30	108	10	4	152,4	19,0	4,2
—	3 1/2	216	104,1	23,9	32	122	10	8	177,8	19,0	5,3
100	4	229	116,8	23,9	33	135	11	8	190,5	19,0	5,9
125	5	254	144,5	23,9	37	164	11	8	215,9	22,2	7,0
150	6	279	171,4	25,4	40	192	13	8	241,3	22,2	8,5
200	8	343	222,2	28,5	44	246	13	8	298,4	22,2	13,5
250	10	406	277,4	30,2	49	305	13	12	362,0	25,4	19,5
300	12	483	328,2	31,8	56	365	13	12	431,8	25,4	29
350	14	533	360,2	35,0	79	400	13	12	476,2	28,5	39
400	16	597	411,2	36,6	87	457	13	16	539,8	28,5	47
450	18	635	462,3	39,7	97	505	13	16	577,8	31,8	54
500	20	698	514,4	42,9	103	559	13	20	635,0	31,8	70
600	24	813	616,0	47,7	111	664	13	20	749,3	35,0	95

Lapped class 300

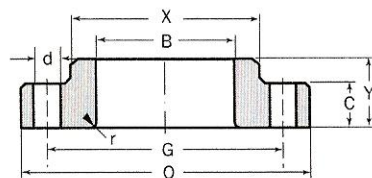


NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,9	14,2	22	38	3	4	66,7	15,8	1,2
20	3/4	117	28,2	15,7	25	48	3	4	82,6	19,0	1,3
25	1	124	35,0	17,5	27	54	3	4	88,9	19,0	1,4
32	1 1/4	133	43,7	19,0	27	63	5	4	98,4	19,0	1,8
40	1 1/2	156	50,0	20,6	30	70	6	4	114,3	22,2	2,5
50	2	165	62,5	22,4	33	84	8	8	127,0	19,0	3,0
65	2 1/2	190	75,4	25,4	38	100	8	8	149,2	22,2	4,5
80	3	210	91,4	28,4	43	117	10	8	168,3	22,2	6,0
—	3 1/2	229	104,1	30,2	44	133	10	8	184,2	22,2	7,5
100	4	254	116,8	31,8	48	146	11	8	200,0	22,2	10,1
125	5	279	144,5	35,0	51	178	11	8	235,0	22,2	12,5
150	6	318	171,4	36,6	52	206	13	12	269,9	22,2	17,5
200	8	281	222,2	41,1	62	260	13	12	330,2	25,4	26
250	10	444	277,4	47,8	95	320	13	16	387,4	28,5	38
300	12	521	328,2	50,8	102	375	13	16	450,8	31,8	52
350	14	584	360,2	53,8	111	425	13	20	514,4	31,8	74
400	16	648	411,2	57,2	121	483	13	20	571,5	35,0	100
450	18	711	462,3	60,5	130	533	13	24	628,6	35,0	127
500	20	775	514,4	63,5	140	587	13	24	685,8	35,0	147
600	24	914	616,0	69,9	152	701	13	24	812,8	41,1	208

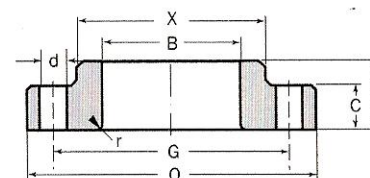
Lapped
class 400

NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,9	14,2	22	38	3	4	66,7	15,8	1,3
20	3/4	117	28,2	15,7	25	48	3	4	82,6	19,0	1,4
25	1	124	35,0	17,5	27	54	3	4	88,9	19,0	1,8
32	1 1/4	133	43,7	20,6	29	64	5	4	98,4	19,0	2,1
40	1 1/2	156	50,0	22,4	32	70	6	4	114,3	22,2	3,1
50	2	165	62,5	25,4	37	84	8	8	127,0	19,0	4,0
65	2 1/2	190	75,4	28,4	41	100	8	8	149,2	22,2	5,4
80	3	210	91,4	31,8	46	118	10	8	168,3	22,2	7,0
-	3 1/2	229	104,1	35,0	49	133	10	8	184,0	25,4	8,9
100	4	254	116,8	35,0	51	146	11	8	200,1	25,4	13,0
125	5	279	144,5	38,1	54	178	11	8	235,0	25,4	18,5
150	6	318	171,4	41,1	57	206	13	12	269,8	25,4	25
200	8	381	222,2	47,8	68	260	13	12	330,2	28,5	34
250	10	444	277,4	53,8	102	321	13	16	387,4	31,8	54
300	12	521	328,2	57,2	108	375	13	16	450,8	35,0	70
350	14	584	360,2	60,5	117	425	13	20	514,4	35,0	85
400	16	648	411,2	63,5	127	483	13	20	571,5	38,1	120
450	18	711	462,3	66,5	137	533	13	24	628,6	38,1	150
500	20	775	514,4	69,9	146	587	13	24	685,8	41,1	185
600	24	914	616,0	76,2	159	702	13	24	812,8	47,8	260

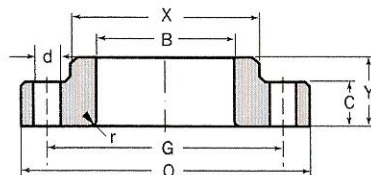
Lapped
class 600

NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,9	14,2	22	38	3	4	66,7	15,8	1,3
20	3/4	117	28,2	15,7	25	48	3	4	82,6	19,0	1,4
25	1	124	35,0	17,5	27	54	3	4	88,9	19,0	1,8
32	1 1/4	133	43,7	20,6	29	64	5	4	98,4	19,0	2,1
40	1 1/2	156	50,0	22,4	32	70	6	4	114,3	22,2	3,1
50	2	165	62,5	25,4	37	84	8	8	127,0	19,0	4,0
65	2 1/2	190	75,4	28,4	41	100	8	8	149,2	22,2	5,4
80	3	210	91,4	31,8	46	118	10	8	168,3	22,2	7,0
-	3 1/2	229	104,1	35,0	49	133	10	8	184,0	25,4	8,9
100	4	273	116,8	38,1	54	152	11	8	215,9	25,4	16,0
125	5	330	144,5	44,5	60	189	11	8	266,7	28,5	25
150	6	356	171,4	47,8	67	222	13	12	292,1	28,5	30
200	8	419	222,2	55,6	76	273	13	12	349,2	31,8	43
250	10	508	277,4	63,5	111	343	13	16	431,1	35,0	70
300	12	559	328,2	66,5	117	400	13	20	489,0	35,0	86
350	14	603	360,2	69,9	127	432	13	20	527,0	38,1	100
400	16	686	411,2	76,2	140	495	13	20	603,2	41,1	142
450	18	743	462,3	82,6	152	546	13	20	654,0	44,5	175
500	20	813	514,4	88,9	165	610	13	24	723,9	44,5	221
600	24	940	616,0	101,6	184	718	13	24	838,2	50,8	315

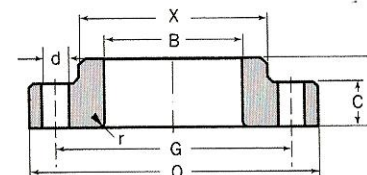
Lapped
class 900

NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22,9	22,4	32	38	3	4	82,6	22,2	1,7
20	3/4	130	28,2	25,4	35	44	3	4	88,9	22,2	2,3
25	1	149	35,0	28,4	41	52	3	4	101,6	25,4	3,4
32	1 1/4	159	43,7	28,4	41	63	5	4	111,1	25,4	3,9
40	1 1/2	178	50,0	31,8	44	70	6	4	123,8	28,5	5,4
50	2	216	62,5	38,1	57	105	8	8	165,1	25,4	9,8
65	2 1/2	244	75,4	41,1	63	124	8	8	190,5	28,5	13,7
80	3	241	91,4	38,1	54	127	10	8	190,5	25,4	11,6
100	4	292	116,8	44,5	70	159	11	8	235,0	31,8	19,8
125	5	349	144,5	50,8	79	190	11	8	279,4	35,0	32
150	6	381	171,4	55,6	86	235	13	12	317,5	31,8	41
200	8	470	222,2	63,5	114	298	13	12	393,7	38,1	71
250	10	546	277,4	69,9	127	368	13	16	469,9	38,1	100
300	12	610	328,2	79,2	143	419	13	20	533,4	38,1	133
350	14	641	360,2	85,9	155	451	13	20	558,8	41,1	152
400	16	705	411,2	88,9	165	508	13	20	616,0	44,5	184
450	18	787	462,3	101,6	190	565	13	20	685,8	50,8	258
500	20	857	514,4	108,0	210	622	13	20	749,3	53,8	317
600	24	1041	616,0	139,7	267	749	13	20	901,7	66,5	608

Lapped
class 1500

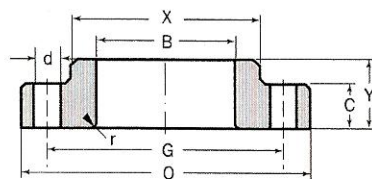
NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22,9	22,4	32	38	3	4	82,6	22,2	1,7
20	3/4	130	28,2	25,4	35	44	3	4	88,9	22,2	2,3
25	1	149	35,0	28,4	41	52	3	4	101,6	25,4	3,4
32	1 1/4	159	43,7	28,4	41	63	5	4	111,1	25,4	3,9
40	1 1/2	178	50,0	31,8	44	70	6	4	123,8	28,5	5,4
50	2	216	62,5	38,1	57	105	8	8	165,1	25,4	9,8
65	2 1/2	244	75,4	41,1	63	124	8	8	190,5	28,5	13,7
80	3	267	91,4	47,8	73	133	10	8	203,2	31,8	18
100	4	311	116,8	53,8	90	162	11	8	241,3	35,0	28
125	5	375	144,5	73,2	105	197	11	8	292,1	41,1	52
150	6	394	171,4	82,6	119	229	13	12	317,5	38,1	61
200	8	483	222,2	91,9	143	292	13	12	393,7	44,5	104
250	10	584	277,4	198,0	178	368	13	12	482,6	50,8	175
300	12	673	328,2	124,0	219	451	13	16	571,5	53,8	264

Lapped class 2500



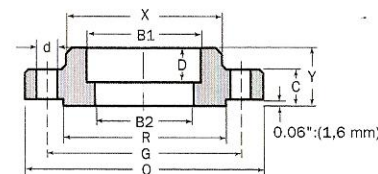
NPS 1/2 to 24 ANSI B 16-5

r: corner radius of bore

Weights are approximate

Size		O	B min.	C min.	Y	X	r	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	133	22,9	30,2	40	43	3	4	88,9	22,2	3
20	3/4	140	28,2	31,8	43	51	3	4	95,3	22,2	4
25	1	159	35,0	35,0	48	57	3	4	108,0	25,4	5
32	1 1/4	184	43,7	38,1	52	73	5	4	130,0	28,5	8
40	1 1/2	203	50,0	44,5	60	79	6	4	146,0	31,8	11
50	2	235	62,5	50,8	70	95	8	8	171,5	28,5	17
65	2 1/2	267	75,4	57,2	79	114	8	8	196,9	31,8	24
80	3	305	91,4	66,5	92	133	10	8	228,6	35,0	36
100	4	356	116,8	76,2	108	165	13	8	273,0	41,1	55
125	5	419	144,4	91,9	130	203	13	8	323,9	47,8	93
150	6	483	171,4	108,0	152	235	13	8	368,3	53,8	142
200	8	552	222,2	127,0	178	305	13	12	438,2	53,8	214
250	10	673	277,4	165,1	229	375	13	12	539,8	66,5	407
300	12	762	328,2	184,2	254	441	13	12	619,3	73,2	573

Socket welding raised face



NPS 1/2 to 3 ANSI B 16-5

Weights are approximate

class 150

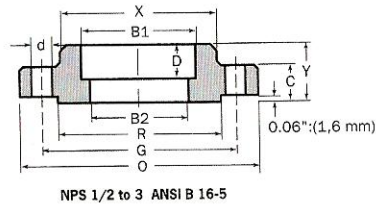
Size		O	B1 min.	B2 (1)	D	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	89	22,4	15,8	10	11,2	16	30	34,9	4	60,3	15,8	0,8
20	3/4	99	27,7	20,8	11	12,7	16	38	42,9	4	69,8	15,8	0,9
25	1	108	34,5	26,7	13	14,3	17	49	50,8	4	79,4	15,8	1,0
32	1 1/4	117	43,2	35,0	14	15,9	21	59	63,5	4	88,9	15,8	1,3
40	1 1/2	127	49,5	40,9	16	17,5	22	65	73,0	4	98,4	15,8	1,4
50	2	152	62,0	52,0	17	19,1	25	78	92,1	4	120,6	19,0	2,3
65	2 1/2	178	74,7	62,7	19	22,3	29	90	104,8	4	139,7	19,0	3,0
80	3	190	90,7	78,0	21	23,9	30	108	127,0	4	152,4	19,0	3,5

class 300

Size		O	B1 min.	B2 (1)	D	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	22,4	15,8	10	14,2	22	38	34,9	4	66,7	15,8	1,2
20	3/4	117	27,7	20,8	11	15,7	25	48	42,9	4	82,6	19,0	1,3
25	1	124	34,5	26,7	13	17,5	27	54	50,8	4	88,9	19,0	1,4
32	1 1/4	133	43,2	35,0	14	19,0	27	63	63,5	4	98,4	19,0	1,8
40	1 1/2	156	49,5	40,9	16	20,6	30	70	73,0	4	114,3	22,2	2,5
50	2	165	62,0	52,6	17	22,4	33	84	92,1	8	127,0	19,0	3,0
65	2 1/2	190	74,7	62,7	19	25,4	38	100	104,8	8	149,2	22,2	4,5
80	3	210	90,7	78,0	21	28,4	43	117	127,0	8	168,3	22,2	6,0

(1) Dimension B2 correspond to inside diameter of pipe as given in ANSI B 36-10 for standard wall pipe. Thickness of standard wall is the same as schedule 40.

Socket welding raised face



NPS 1/2 to 3 ANSI B 16-5

(1) Dimension B2 to be specified by purchaser

Weights are approximate

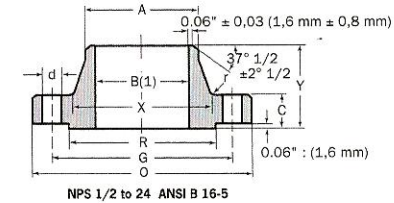
class 600

Size		O	B1 min.	B2 (1)	D	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	14,2		10	14,2	22	38	34,9	4	15,8	22,2	1,3
20	3/4	117	27,7		11	15,7	25	48	44,9	4	84,6	19,0	1,4
25	1	124	34,5		13	17,5	27	54	50,8	4	88,9	19,0	1,8
32	1 1/4	133	43,2		14	20,6	29	64	63,5	4	98,4	19,0	2,6
40	1 1/2	156	49,5		16	22,4	32	70	73,0	4	114,3	22,2	3,1
50	2	165	62,0		17	25,4	37	84	92,1	8	127,0	19,0	4,0
65	2 1/2	190	74,7		9	28,4	41	100	104,8	8	149,2	22,2	5,5
80	3	210	90,7		21	31,8	46	118	127,0	8	168,3	22,2	7,0

class 1500

Size		O	B1 min.	B2 (1)	D	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22,4		10	22,4	32	38	34,9	4	82,6	22,2	1,7
20	3/4	130	27,7		11	25,4	35	44	42,9	4	88,9	22,2	2,3
25	1	149	34,5		13	28,4	41	52	50,8	4	101,6	25,4	3,4
32	1 1/4	159	43,2		14	28,4	41	63	63,5	4	111,1	25,4	3,9
40	1 1/2	178	49,5		16	31,8	44	70	73,0	4	123,8	28,5	5,4
50	2	216	62,0		17	38,1	57	105	92,1	8	165,1	25,4	9,8
65	2 1/2	244	74,7		19	41,1	63	124	104,8	8	190,5	28,5	13,7

Welding neck class 150 raised face



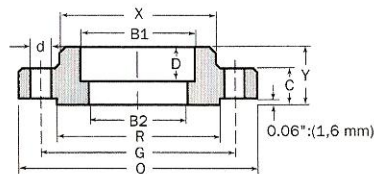
NPS 1/2 to 24 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	89	21,3	11,2	48	30	34,9	4	60,3	15,8	0,6
20	3/4	99	26,9	12,7	52	38	42,9	4	69,8	15,8	0,8
25	1	108	33,7	14,3	56	49	50,8	4	79,4	15,8	1,1
32	1 1/4	117	42,4	15,9	57	59	63,5	4	88,9	15,8	1,4
40	1 1/2	127	48,3	17,5	62	65	73,0	4	98,4	15,8	1,8
50	2	152	60,3	19,1	63	78	92,1	4	120,6	19,0	2,7
65	2 1/2	178	73,0	22,3	70	90	104,8	4	139,7	19,0	4,0
80	3	190	88,9	23,9	70	108	127,0	4	152,4	19,0	4,5
-	3 1/2	216	101,6	23,9	71	122	139,7	8	177,8	19,0	6,2
100	4	229	114,3	23,9	76	135	157,2	8	190,5	19,0	7,0
125	5	254	141,3	23,9	89	164	185,7	8	215,9	22,2	8,6
150	6	279	168,3	25,4	89	192	215,9	8	241,3	22,2	10,8
200	8	343	219,1	28,5	102	246	269,9	8	298,4	22,2	18,0
250	10	406	273,0	30,2	102	305	323,8	12	362,0	25,4	24
300	12	483	323,9	31,8	114	365	381,0	12	431,8	25,4	37
350	14	533	355,6	35,0	127	400	412,8	12	476,2	28,5	47
400	16	597	406,4	36,6	127	457	469,9	16	539,8	28,5	58
450	18	635	457,0	39,7	140	505	533,4	16	577,8	31,8	64
500	20	698	508,0	42,9	144	559	584,2	20	635,0	31,8	77
600	24	813	610,0	47,7	152	664	692,2	20	749,3	35,0	118

Welding neck class 300 raised face



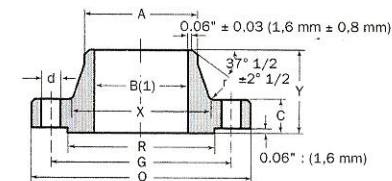
NPS 1/2 to 3 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	21,3	14,2	52	38	34,9	4	66,7	15,8	1,5
20	3/4	117	26,9	15,7	57	48	42,9	4	82,6	19,0	1,8
25	1	124	33,7	17,5	62	54	50,8	4	88,9	19,0	2,0
32	1 1/4	133	42,4	19,0	65	63	63,5	4	98,4	19,0	2,5
40	1 1/2	156	48,3	20,6	68	70	73,0	4	114,3	22,0	3,5
50	2	165	60,3	22,4	70	84	92,1	8	127,0	19,0	4,0
65	2 1/2	190	73,0	25,4	76	100	104,8	8	149,2	22,2	5,0
80	3	210	88,9	28,4	79	117	127,0	8	168,3	22,2	7,0
-	3 1/2	229	101,6	30,2	81	133	139,7	8	184,2	22,2	9,2
100	4	254	114,3	31,8	86	146	157,2	8	200,0	22,2	11,0
125	5	279	141,3	35,0	98	178	185,7	8	235,0	22,2	14,0
150	6	318	168,3	36,6	98	206	215,9	12	269,9	22,2	19,0
200	8	381	219,1	41,1	111	260	269,9	12	330,2	25,4	30
250	10	444	273,0	47,8	117	320	323,8	16	387,4	28,5	41
300	12	521	323,9	50,8	130	375	381,0	16	450,8	31,8	62
350	14	584	355,6	53,8	143	425	412,8	20	514,4	31,8	84
400	16	648	406,4	57,2	146	483	469,9	20	571,5	35,0	111
450	18	711	457,0	60,5	159	533	533,4	24	628,6	35,0	138
500	20	775	508,0	63,5	162	587	584,2	24	685,8	35,0	171
600	24	914	610,0	69,9	168	701	692,2	24	812,8	41,1	247

Welding neck class 400 raised face



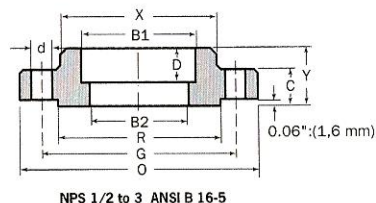
NPS 1/2 to 24 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	21,3	14,2	52	38	34,9	4	66,7	15,8	1,5
20	3/4	117	26,9	15,7	57	48	42,9	4	82,6	19,0	2,0
25	1	124	33,7	17,5	62	54	50,8	4	88,9	19,0	2,5
32	1 1/4	133	42,4	20,6	67	64	63,5	4	98,4	19,0	3,2
40	1 1/2	156	48,3	22,4	70	70	73,0	4	114,3	22,2	4,5
50	2	165	60,3	25,4	73	84	92,1	8	127,0	19,0	5,5
65	2 1/2	190	73,0	28,4	79	100	104,8	8	149,2	22,2	8,0
80	3	210	88,9	31,8	83	118	127,0	8	168,3	22,2	10,5
-	3 1/2	229	101,6	35,0	86	133	139,7	8	184,0	25,4	15,6
100	4	254	114,3	35,0	89	146	157,2	8	200,1	25,4	16
125	5	279	141,3	38,1	102	178	185,7	8	235,0	25,4	19
150	6	318	168,3	41,1	103	206	215,9	12	269,8	25,4	26
200	8	381	219,1	47,8	117	260	269,9	12	330,2	28,5	40
250	10	444	273,0	53,8	124	321	323,8	16	387,4	31,8	57
300	12	521	323,9	57,2	137	375	381,0	16	450,8	35,0	80
350	14	584	355,6	60,5	149	425	412,8	20	514,4	35,0	105
400	16	648	406,4	63,5	152	483	469,9	20	571,5	38,1	131
450	18	711	457,0	66,5	165	533	533,4	24	628,6	38,1	159
500	20	775	508,0	69,9	168	587	584,2	24	685,8	41,1	190
600	24	914	610,0	76,2	175	702	692,2	24	812,8	47,8	275

Welding neck class 600 raised face



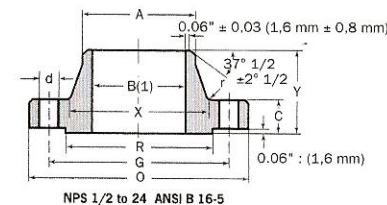
NPS 1/2 to 3 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	21,3	14,2	52	38	34,9	4	66,7	15,8	1,5
20	3/4	117	26,9	15,7	57	48	42,9	4	82,6	19,0	2,0
25	1	124	33,7	17,5	62	54	50,8	4	88,9	19,0	2,5
32	1 1/4	133	42,4	20,6	67	64	63,5	4	98,4	19,0	3,2
40	1 1/2	156	48,3	22,4	70	70	73,0	4	114,3	22,2	4,5
50	2	165	60,3	25,4	73	84	92,1	8	127,0	19,0	5,5
65	2 1/2	190	73,0	28,4	79	100	104,8	8	149,2	22,2	8,0
80	3	210	88,9	31,8	83	118	127,0	8	168,3	22,2	10,5
-	3 1/2	229	101,6	35,0	86	133	139,7	8	184,0	25,4	15,6
100	4	273	114,3	38,1	102	152	157,2	8	215,9	25,4	19
125	5	330	141,3	44,5	114	189	185,7	8	266,7	28,5	31
150	6	356	168,3	47,8	117	222	215,9	12	292,1	28,5	37
200	8	419	219,1	55,6	133	273	269,9	12	349,2	31,8	53
250	10	508	273,0	63,5	152	343	323,8	16	431,8	35,0	86
300	12	559	323,9	66,5	156	400	381,0	20	489,0	35,0	102
350	14	603	355,6	69,9	165	432	412,8	20	527,0	38,1	150
400	16	686	406,4	76,2	178	495	469,9	20	603,2	41,1	190
450	18	743	547,0	82,6	184	546	533,4	20	654,0	44,5	240
500	20	813	508,0	88,9	190	610	584,2	24	723,9	44,5	295
600	24	940	610,0	101,6	203	718	692,2	24	838,2	50,8	365

Welding neck class 900 raised face



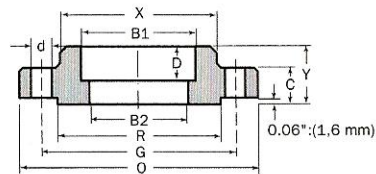
NPS 1/2 to 24 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	21,3	22,4	60	38	34,9	4	82,6	22,2	2,0
20	3/4	130	26,9	25,4	70	44	42,9	4	88,9	22,2	3,0
25	1	149	33,7	28,4	73	52	50,8	4	101,6	25,4	4,0
32	1 1/4	159	42,4	28,4	73	63	63,5	4	111,1	25,4	4,6
40	1 1/2	178	48,3	31,8	83	70	73,0	4	123,8	28,5	6,5
50	2	216	60,3	38,1	102	105	92,1	8	165,1	25,4	11,5
65	2 1/2	244	73,0	41,1	105	124	104,8	8	190,5	28,5	15,8
80	3	241	88,9	38,1	102	127	127,0	8	190,5	25,4	14,5
100	4	292	114,3	44,5	114	159	157,2	8	235,0	31,8	23
125	5	349	141,3	50,8	127	190	185,7	8	279,4	35,0	37
150	6	381	168,3	55,6	140	235	215,9	12	317,5	31,8	50
200	8	470	219,1	63,5	162	298	269,9	12	393,7	38,1	85
250	10	546	273,0	69,9	184	368	323,8	16	469,9	38,1	118
300	12	610	323,9	79,2	200	419	381,0	20	533,4	38,1	163
350	14	641	355,6	85,9	213	451	412,8	20	558,8	41,1	186
400	16	705	406,4	88,9	216	508	469,9	20	616,0	44,5	224
450	18	787	457,0	101,6	229	565	533,4	20	685,8	50,8	300
500	20	857	508,0	108,0	248	622	584,2	20	749,3	53,8	373
600	24	1041	610,0	139,7	292	749	692,2	20	901,7	66,5	680

Welding neck class 1500 raised face



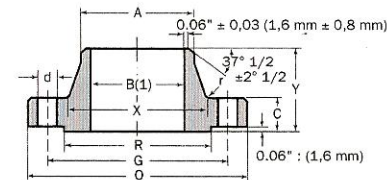
NPS 1/2 to 3 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	21,3	22,4	60	38	34,9	4	82,6	22,2	2,0
20	3/4	130	26,9	25,4	70	44	42,9	4	88,9	22,2	3,0
25	1	149	33,7	28,4	73	52	50,8	4	101,6	25,4	4,0
32	1 1/4	159	42,4	28,4	73	63	63,5	4	111,1	25,4	4,6
40	1 1/2	178	48,3	31,8	83	70	73,0	4	123,8	28,5	6,5
50	2	216	60,3	38,1	102	105	92,1	8	165,1	25,4	11,5
65	2 1/2	244	73,0	41,1	105	124	104,8	8	190,5	28,5	15,8
80	3	267	88,9	47,8	118	133	127,0	8	203,2	31,8	22
100	4	311	114,3	53,8	124	162	157,2	8	241,3	35,0	30
125	5	375	141,3	73,2	155	197	185,7	8	292,1	41,1	58
150	6	394	168,3	82,6	171	229	215,9	12	317,5	38,1	70
200	8	483	219,1	91,9	213	292	269,9	12	393,7	44,5	119
250	10	584	273,0	108,0	254	368	323,8	12	482,6	50,8	204
300	12	673	323,9	124,0	283	451	381,0	16	571,5	53,8	303
350	14	749	355,6	133,4	298	495	412,8	16	635,0	60,4	400
400	16	826	406,4	146,0	311	552	469,9	16	704,8	66,5	510
450	18	914	457,0	162,0	327	597	533,4	16	774,7	73,2	-
500	20	984	508,0	177,6	356	641	584,2	16	831,8	79,2	-
600	24	1168	610,0	203,2	406	762	692,2	16	990,6	91,9	-

Welding neck class 2500 raised face



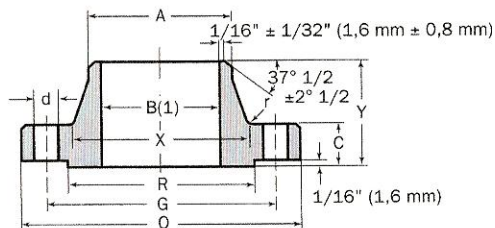
NPS 1/2 to 24 ANSI B 16-5

(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	133	21,3	30,2	73	43	34,9	4	88,9	22,2	3,6
20	3/4	140	26,9	31,8	79	51	42,9	4	95,3	22,2	4,0
25	1	159	33,7	35,0	89	57	50,8	4	108,0	25,4	6,0
32	1 1/4	184	42,4	38,1	95	73	63,5	4	130,0	28,5	9,0
40	1 1/2	203	48,3	44,5	111	79	73,0	4	146,0	31,8	13,0
50	2	235	60,3	50,8	127	95	92,1	8	171,5	28,5	19,0
65	2 1/2	267	73,0	57,2	143	114	104,8	8	196,9	31,8	24
80	3	305	88,9	66,5	168	133	127,0	8	228,6	35,0	43
100	4	356	114,3	76,2	190	165	157,2	8	273,0	41,1	66
125	5	419	141,3	91,9	229	203	185,7	8	323,9	47,8	111
150	6	483	168,3	108,0	273	235	215,9	8	368,3	53,8	172
200	8	552	219,1	127,0	317	305	269,9	12	438,2	53,8	261
250	10	673	273,0	165,1	419	375	323,8	12	539,8	66,5	485
300	12	762	323,9	184,2	464	441	381,0	12	619,3	73,2	730

Welding neck class 150 raised face



26" to 48" BS 3293

(1) Dimension B to be specified by purchaser

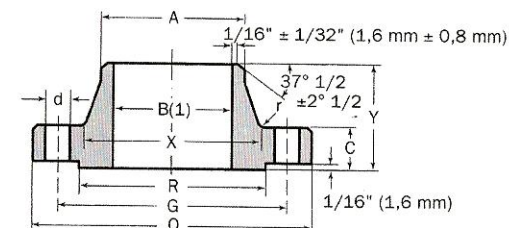
Weights are approximate

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r	X	B	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	kg
26"	869,9	50,8	742,9	127,0	24	34,9	806,4	6,4	723,9	660,4	136
28"	927,1	52,4	793,7	128,6	28	34,9	863,6	6,4	781,0	711,2	143
30"	984,2	54,0	857,2	130,2	28	34,9	914,4	6,4	831,8	762,0	163
32"	1060,4	57,1	908,0	133,3	28	41,3	977,9	8,0	889,0	812,8	197
34"	1111,2	58,7	958,8	134,9	32	41,3	1028,7	8,0	939,8	863,6	211
36"	1168,4	60,3	1022,3	136,5	32	41,3	1085,8	8,0	996,9	914,4	236
38"	1238,2	60,3	1073,1	136,5	32	41,3	1149,3	9,5	1060,4	965,2	270
40"	1289,0	63,5	1123,9	139,7	36	41,3	1200,1	9,5	1111,2	1016,0	310
42"	1346,2	66,7	1193,8	142,9	36	41,3	1257,3	9,5	1168,4	1066,8	340
44"	1403,3	66,7	1244,6	142,9	40	41,3	1314,4	11,1	1219,0	1117,4	395
46"	1454,1	68,3	1295,4	144,5	40	41,3	1365,2	11,1	1270,0	1168,4	470
48"	1511,3	69,8	1358,9	146,0	44	41,3	1422,4	11,1	1327,1	1219,2	563

class 300

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	kg
26"	971,5	79,4	749,3	184,1	28	44,4	876,3	9,5	720,7	666,7	304
28"	1035,0	85,7	800,1	196,8	28	44,4	939,8	11,1	774,7	717,5	367
30"	1092,2	92,1	857,2	209,5	28	47,6	996,9	11,1	827,1	768,3	422
32"	1149,3	98,4	914,4	222,2	28	50,8	1054,1	11,1	881,1	819,1	465
34"	1206,5	101,6	965,2	231,8	28	50,8	1104,9	12,7	936,6	871,6	545
36"	1270,0	104,8	1022,3	241,3	32	54,0	1168,4	12,7	990,6	922,4	590

Welding neck class 400 raised face



26" to 48" BS 3293

(1) Dimension B to be specified by purchaser

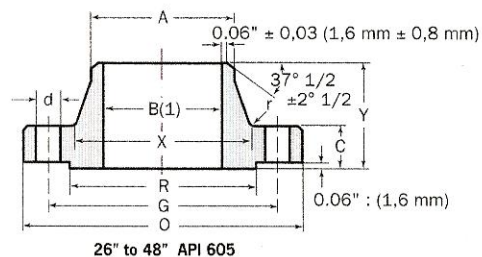
Weights are approximate

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	kg
26"	971,5	88,9	749,3	193,7	28	47,6	876,3	11,1	727,1	668,4	340
28"	1035,0	95,2	800,1	206,4	28	50,8	939,8	12,7	782,6	719,2	400
30"	1092,2	101,6	857,2	219,1	28	54,0	996,9	12,7	836,6	770,0	454
32"	1149,3	108,0	914,4	231,8	28	54,0	1054,1	12,7	889,0	822,3	522
34"	1206,5	111,1	965,2	241,3	28	54,0	1104,9	14,3	944,6	873,1	590
36"	1270,0	114,3	1022,3	250,8	32	54,0	1168,4	14,3	1000,2	925,5	670

class 600

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A	Weight
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm	kg
26"	1016,0	108,0	749,3	222,2	28	50,8	914,4	14,3	747,7	671,5	404
28"	1073,1	111,1	800,1	234,9	28	54,0	965,2	15,9	803,3	723,9	480
30"	1130,3	114,3	857,2	247,6	28	54,0	1022,3	17,5	862,0	774,7	560
32"	1193,8	117,5	914,4	260,3	28	60,3	1079,5	17,5	917,6	825,5	680
34"	1244,6	120,7	965,2	269,9	28	60,3	1130,3	19,0	973,2	877,9	750
36"	1314,4	123,8	1022,3	282,6	28	66,7	1193,8	19,0	1031,9	928,7	795

Welding neck class 150 raised face



26" to 48" API 605

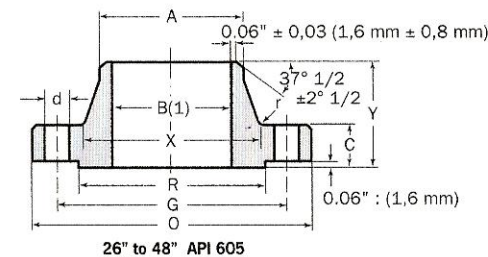
- (1) Dimension A shall vary according to the yield strength of the steel
 (2) Dimension B to be specified by purchaser

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm
26"	870	68,5	749	121	24	35	806	10	675
28"	925	71,5	800	125	28	35	863	11	725
30"	985	74,5	857	137	28	35	914	11	780
32"	1060	81	914	144	28	41	978	11	830
34"	1110	82,5	965	149	32	41	1029	13	880
36"	1170	90,5	1022	157	32	41	1086	13	935
38"	1240	87,5	1073	157	32	41	1150	13	990
40"	1290	90,5	1124	164	36	41	1200	13	1040
42"	1345	97,0	1194	171	36	41	1257	13	1090
44"	1405	102	1245	178	40	41	1314	13	1145
46"	1455	103	1295	186	40	41	1365	13	1195
48"	1510	108	1359	192	44	41	1422	13	1250

class 300

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm
26"	970	79,5	749	184	28	44	876	10	720
28"	1035	85,5	800	197	28	44	940	11	775
30"	1090	92	857	210	28	48	997	11	825
32"	1150	98,5	914	222	28	51	1054	11	880
34"	1205	102	965	232	28	51	1105	13	935
36"	1270	105	1022	241	32	54	1168	13	990
38"	1170	108	1029	181	32	41	1092	13	995
40"	1240	114	1086	194	32	44	1156	13	1050
42"	1290	119	1137	200	32	44	1206	13	1100
44"	1355	124	1194	206	32	48	1264	13	1150
46"	1415	129	1245	216	28	51	1321	13	1205
48"	1465	133	1308	224	32	51	1372	13	1255

Welding neck class 400 raised face



26" to 48" API 605

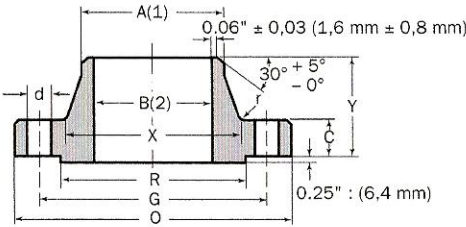
- (1) Dimension A shall vary according to the yield strength of the steel
 (2) Dimension B to be specified by purchaser

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm
26"	970	89	749	194	28	48	876	11	725
28"	1035	95	800	206	28	51	940	13	785
30"	1090	102	857	219	28	54	997	13	835
32"	1150	108	914	232	28	54	1054	13	890
34"	1205	111	965	241	28	54	1105	14	945
36"	1270	114	1022	251	32	54	1168	14	1000
38"	1205	124	1035	206	32	48	1118	14	1005
40"	1270	130	1092	216	32	51	1175	14	1055
42"	1320	133	1143	224	32	51	1226	14	1110
44"	1385	140	1200	233	32	54	1283	14	1160
46"	1440	146	1257	244	36	54	1340	14	1215
48"	1510	152	1308	257	28	60	1403	14	1265

class 600

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm
26"	1015	108	749	222	28	51	914	11	750
28"	1075	111	800	235	28	54	965	13	805
30"	1130	114	857	248	28	54	1022	13	860
32"	1195	117	914	260	28	60	1080	13	920
34"	1245	121	965	270	28	60	1130	14	975
36"	1315	124	1022	283	28	60	1194	14	1030
38"	1270	152	1054	254	28	60	1162	14	1020
40"	1320	159	1111	264	32	60	1213	14	1075
42"	1405	168	1168	279	28	67	1283	14	1125
44"	1455	173	1226	289	32	67	1334	14	1180
46"	1510	179	1276	300	32	67	1391	14	1235
48"	1595	189	1334	316	32	73	1460	14	1290

Welding neck
class 900
raised face

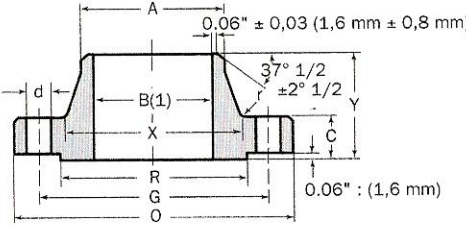


26" to 48" MSS SP 44

(1) Dimension A shall vary according to the yield strength of the steel
(2) Dimension B to be specified by purchaser

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r	X
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm
26"	1085	140	749	286	20	73	952	11	775
28"	1170	143	800	298	20	79	1022	13	830
30"	1230	149	857	311	20	79	1086	13	890
32"	1315	159	914	330	20	86	1156	13	945
34"	1395	165	965	349	20	92	1226	14	1005
36"	1460	171	1022	362	20	92	1289	14	1065
38"	1460	171	1099	352	20	92	1289	19	1075
40"	1510	197	1162	364	24	92	1340	21	1125
42"	1560	206	1213	371	24	92	1391	21	1175
44"	1650	214	1270	391	24	98	1464	22	1235
46"	1735	225	1334	411	24	105	1537	22	1290
48"	1785	233	1384	419	24	105	1588	24	1345

Welding neck
class 150
raised face



26" to 48" API 605

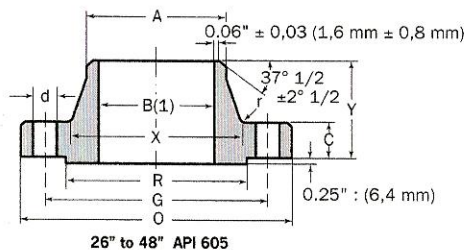
(1) Dimension B to be specified by purchaser

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm
26"	786	41,3	711,2	88,9	36	22,2	744,5	9,5	684,2	662,0
28"	837	44,4	762,0	95,2	40	22,2	795,3	9,5	735,0	712,8
30"	887	44,4	812,8	100,0	44	22,2	846,1	9,5	787,4	763,6
32"	941	46,0	863,6	108,0	48	22,2	900,1	9,5	839,8	814,4
34"	1005	49,2	920,8	110,3	40	25,4	957,3	9,5	892,2	865,2
36"	1057	52,4	971,6	117,5	44	25,4	1009,6	9,5	944,6	916,0
38"	1124	54,0	1022,4	123,8	40	28,6	1070,0	9,5	997,0	968,4
40"	1175	55,6	1079,5	128,6	44	28,6	1120,8	9,5	1049,3	1019,2
42"	1226	58,7	1130,3	133,4	48	28,6	1171,6	11,1	1101,7	1070,0
44"	1276	60,3	1181,1	136,5	52	28,6	1222,4	11,1	1152,5	1120,8
46"	1341	61,9	1235,1	144,5	40	31,8	1284,3	11,1	1204,9	1171,6
48"	1392	65,1	1289,0	149,2	44	31,8	1335,1	11,1	1257,3	1222,4

class 300

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm
26"	867	88,9	736,6	144,5	32	34,9	803,3	14,3	701,7	665,2
28"	921	88,9	787,4	149,2	36	34,9	857,2	14,3	755,6	716,0
30"	991	93,7	844,6	158,0	36	38,1	920,8	14,3	812,8	768,4
32"	1054	103,2	901,7	168,3	32	41,3	977,9	15,9	863,6	819,2
34"	1108	103,2	952,5	173,0	36	41,3	1031,9	15,9	917,6	870,0
36"	1172	103,2	1009,6	181,0	32	44,4	1089,0	15,9	965,2	920,8
38"	1222	111,1	1060,4	192,1	36	44,4	1139,8	15,9	1016,0	971,6
40"	1273	115,9	1114,4	198,4	40	44,4	1190,6	15,9	1066,8	1022,4
42"	1334	119,1	1168,4	204,8	36	47,6	1244,6	15,9	1117,6	1074,7
44"	1384	127,0	1219,2	214,3	40	47,6	1295,4	15,9	1173,2	1125,5
46"	1460	128,6	1270,0	222,2	36	50,8	1365,2	15,9	1228,7	1176,3
48"	1511	128,6	1327,2	223,8	40	50,8	1416,0	15,9	1277,9	1227,1

Welding neck class 400 raised face



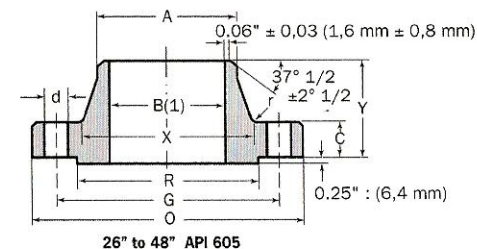
(1) Dimension B to be specified by purchaser

Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm
26"	851	88,9	711,2	149,2	28	38,1	781,0	11,1	689,0	660,4
28"	914	95,2	762,0	158,8	24	41,3	838,2	12,7	739,8	711,2
30"	972	101,6	819,2	169,9	28	41,3	895,4	12,7	793,8	762,0
32"	1035	108,0	873,1	179,4	28	44,4	952,5	12,7	844,6	812,8
34"	1086	111,1	927,1	187,3	32	44,4	1003,3	14,3	898,5	863,6
36"	1156	119,1	981,1	200,0	28	47,6	1066,8	14,3	952,5	914,4
38"	1206	123,8	1035,0	206,4	32	47,6	1117,6	14,3	1003,3	965,2
40"	1270	130,2	1092,2	215,9	32	50,8	1174,8	14,3	1054,1	1016,0
42"	1321	133,4	1143,0	223,8	32	50,8	1225,6	14,3	1108,1	1066,8
44"	1384	139,7	1200,2	233,4	32	54,0	1282,7	14,3	1158,9	1117,6
46"	1441	146,0	1257,3	244,5	36	54,0	1339,8	14,3	1212,8	1168,4
48"	1511	152,4	1308,1	257,2	28	60,3	1403,4	14,3	1266,8	1219,2

class 600

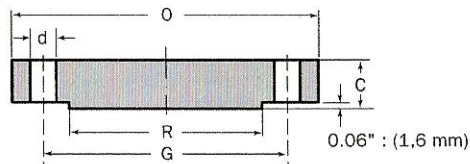
Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm
26"	889	111,1	727,1	181,0	28	44,4	806,4	12,7	698,5	660,4
28"	952	115,9	784,2	190,5	28	47,6	863,6	12,7	752,5	711,2
30"	1022	125,4	841,4	204,8	28	50,8	927,1	12,7	806,4	762,0
32"	1086	130,2	895,4	215,9	28	54,0	984,2	12,7	860,4	812,8
34"	1162	141,3	952,5	233,4	24	60,3	1054,1	14,3	914,4	863,6
36"	1213	146,0	1009,6	242,9	28	60,3	1104,9	14,3	968,4	914,4
38"	1270	152,4	1054,1	254,0	28	60,3	1162,0	14,3	1022,4	965,2
40"	1321	158,8	1111,2	263,5	32	60,3	1212,8	14,3	1073,2	1016,0
42"	1403	168,3	1168,4	279,4	28	66,7	1287,7	14,3	1127,1	1066,8
44"	1454	173,0	1225,6	288,9	32	66,7	1333,5	14,3	1181,1	1117,6
46"	1511	179,4	1276,4	300,0	32	66,7	1390,6	14,3	1235,1	1168,4
48"	1594	188,9	1333,5	315,9	32	73,0	1460,5	14,3	1289,0	1219,2

Welding neck class 900 raised face



(1) Dimension B to be specified by purchaser

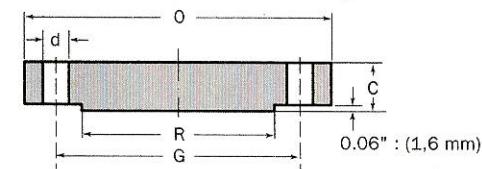
Nominal Pipe Size	O	C	R	Y	Drilling			Radius r (min.)	X	A
	mm	mm	mm	mm	Number	d mm	G mm	mm	mm	mm
26"	1022	134,9	762,0	258,8	20	66,7	901,7	11,1	743,0	660,4
28"	1105	147,6	819,2	276,2	20	73,0	971,6	12,7	796,9	711,2
30"	1181	155,6	876,3	288,9	20	79,4	1035,0	12,7	850,9	762,0
32"	1238	160,3	927,1	303,2	20	79,4	1092,2	12,7	908,0	812,8
34"	1314	171,4	990,6	319,1	20	85,7	1155,7	14,3	962,0	863,6
36"	1346	173,0	1028,7	325,4	24	79,4	1200,2	14,3	1016,0	914,4
38"	1460	190,5	1099,0	352,4	20	92,1	1289,0	19,0	1073,2	965,2
40"	1511	196,8	1162,0	363,5	24	92,1	1339,8	20,6	1127,1	1016,0
42"	1562	206,4	1212,8	371,5	24	92,1	1390,6	20,6	1176,3	1066,8
44"	1648	214,3	1270,0	390,5	24	98,4	1463,7	22,2	1235,1	1117,6
46"	1734	225,4	1333,5	411,2	24	104,8	1536,7	22,2	1292,2	1168,4
48"	1784	233,4	1384,3	419,7	24	104,8	1587,5	23,8	1343,0	1219,2

**Blind
class 150
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

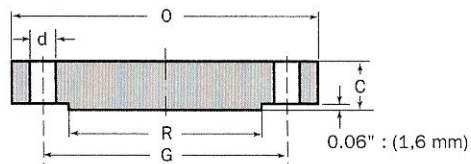
Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	89	11,2	34,9	4	60,3	15,8	1,2
20	3/4	99	12,7	42,9	4	69,8	15,8	1,3
25	1	108	14,3	50,8	4	79,4	15,8	1,4
32	1 1/4	117	15,9	63,5	4	88,9	15,8	1,8
40	1 1/2	127	17,5	73,0	4	98,4	15,8	2,2
50	2	152	19,1	92,1	4	120,6	19,0	2,8
65	2 1/2	178	22,3	104,8	4	139,7	19,0	4,7
80	3	190	23,9	127,0	4	152,4	19,0	5,5
-	3 1/2	216	23,9	139,7	8	177,8	19,0	6,8
100	4	229	23,9	157,2	8	190,5	19,0	8,0
125	5	254	23,9	185,7	8	215,9	22,2	9,0
150	6	279	25,4	215,9	8	241,3	22,2	12,0
200	8	343	28,6	269,9	8	298,4	22,2	20
250	10	406	30,2	323,8	12	362,0	25,4	32
300	12	483	31,8	381,0	12	431,8	25,4	40
350	14	533	35,0	412,8	12	476,2	28,5	59
400	16	597	36,6	469,9	16	539,8	28,5	77
450	18	635	39,7	533,4	16	577,8	31,8	95
500	20	698	42,9	584,2	20	635,0	31,8	123
600	24	813	47,7	692,2	20	749,3	35,0	186

**Blind
class 300
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

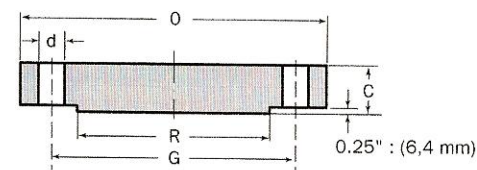
Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	14,2	34,9	4	66,7	15,8	1,5
20	3/4	117	15,7	42,9	4	82,6	19,0	1,6
25	1	124	17,5	50,8	4	88,9	19,0	2,0
32	1 1/4	133	19,0	63,5	4	98,4	19,0	2,5
40	1 1/2	156	20,6	73,0	4	114,3	22,2	3,0
50	2	165	22,4	92,1	8	127,0	19,0	3,5
65	2 1/2	190	25,4	104,8	8	149,2	22,2	5,5
80	3	210	28,4	127,0	8	168,3	22,2	7,0
-	3 1/2	229	30,2	139,7	8	184,2	22,2	9,0
100	4	254	31,8	157,2	8	200,0	22,2	12,0
125	5	279	35,0	185,7	8	235,0	22,2	15,8
150	6	318	36,6	215,9	12	269,9	22,2	23
200	8	381	41,1	269,9	12	330,2	25,4	37
250	10	444	47,8	323,8	16	387,4	28,5	58
300	12	521	50,8	381,0	16	450,8	31,8	83
350	14	584	53,8	412,8	20	514,4	31,8	107
400	16	648	57,2	469,9	20	571,5	35,0	139
450	18	711	60,5	533,4	24	628,6	35,0	177
500	20	775	63,5	584,2	24	685,8	35,0	223
600	24	914	69,9	692,2	24	812,8	41,1	342

**Blind
class 400
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

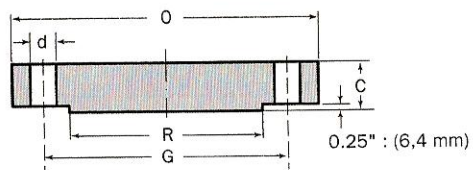
Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	14,2	34,9	4	66,7	15,8	1,5
20	3/4	117	15,7	42,9	4	82,6	19,0	1,6
25	1	124	17,5	50,8	4	88,9	19,0	2,0
32	1 1/4	133	20,6	63,5	4	98,4	19,0	2,8
40	1 1/2	156	22,4	73,0	4	114,3	22,2	3,5
50	2	165	25,4	92,1	8	127,0	19,0	4,5
65	2 1/2	190	28,4	104,8	8	149,2	22,2	6,5
80	3	210	31,8	127,0	8	168,3	22,2	9,0
-	3 1/2	229	35,0	139,7	8	184,2	25,4	11,2
100	4	254	35,0	157,2	8	200,1	25,4	15,0
125	5	279	38,1	185,7	8	235,0	25,4	21
150	6	318	41,1	215,9	12	269,8	25,4	28
200	8	381	47,8	269,9	12	330,2	28,5	43
250	10	444	53,8	323,8	16	387,4	31,8	65
300	12	521	57,2	381,0	16	450,8	35,0	95
350	14	584	60,5	412,8	20	514,4	35,0	126
400	16	648	63,5	469,9	20	571,5	38,1	163
450	18	711	66,5	533,4	24	628,6	38,1	206
500	20	775	69,9	584,2	24	685,8	41,1	256
600	24	914	76,2	692,2	24	812,8	47,8	387

**Blind
class 600
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

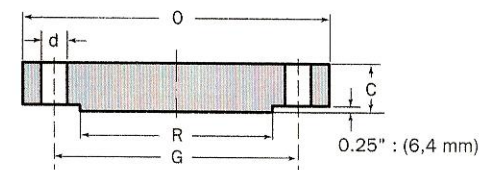
Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	95	14,2	34,9	4	66,7	15,8	1,5
20	3/4	117	15,7	42,9	4	82,6	19,0	1,6
25	1	124	17,5	50,8	4	88,9	19,0	2,0
32	1 1/4	133	20,6	63,5	4	98,4	19,0	2,8
40	1 1/2	156	22,4	73,0	4	114,3	22,2	3,5
50	2	165	25,4	92,1	8	127,0	19,0	4,5
65	2 1/2	190	28,4	104,8	8	149,2	22,2	6,5
80	3	210	31,8	127,0	8	168,3	22,2	9,0
-	3 1/2	229	35,0	139,7	8	184,0	25,4	11,2
100	4	273	38,1	157,2	8	215,9	25,4	18,5
125	5	330	44,5	185,7	8	266,7	28,5	30
150	6	356	47,8	215,9	12	292,1	28,5	39
200	8	419	55,6	269,9	12	349,2	31,8	63
250	10	508	63,5	323,8	16	431,8	35,0	105
300	12	559	66,5	381,0	20	489,0	35,0	134
350	14	603	69,9	412,8	20	527,0	38,1	163
400	16	686	76,2	469,9	20	603,2	41,1	239
450	18	743	82,6	533,4	20	654,0	44,5	298
500	20	813	88,9	584,2	24	723,9	44,5	375
600	24	940	101,6	692,2	24	838,2	50,8	573

**Blind
class 900
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

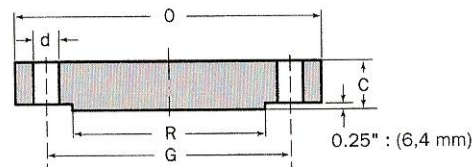
Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1 1/2	121	22,4	34,9	4	82,6	22,2	1,8
20	3/4	130	25,4	42,9	4	88,9	22,2	2,7
25	1	149	28,4	50,8	4	101,6	25,4	4,0
32	1 1/4	159	28,4	63,5	4	111,1	25,4	5,8
40	1 1/2	178	31,8	73,0	4	123,8	28,5	6,5
50	2	216	38,1	92,1	8	165,1	25,4	11,5
65	2 1/2	244	41,1	104,8	8	190,5	28,5	15,5
80	3	241	38,1	127,0	8	190,5	25,4	14,5
100	4	292	44,5	157,2	8	235,0	31,8	24
125	5	349	50,8	185,7	8	279,4	35,0	39
150	6	381	55,6	215,9	12	317,5	31,8	51
200	8	470	63,5	269,9	12	393,7	38,1	89
250	10	546	69,9	323,8	16	469,9	38,1	130
300	12	610	79,2	381,0	20	533,4	38,1	175
350	14	641	85,9	412,8	20	558,8	41,1	206
400	16	705	88,9	469,9	20	616,0	44,5	259
450	18	787	101,6	533,4	20	685,8	50,8	367
500	20	857	108,0	584,2	20	749,3	53,8	463
600	24	1041	139,7	692,2	20	901,7	66,5	875

**Blind
class 1500
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

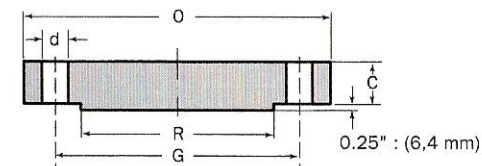
Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1/2	121	22,4	34,9	4	82,6	22,2	1,8
20	3/4	130	25,4	42,9	4	88,9	22,2	2,7
25	1	149	28,4	50,8	4	101,6	25,4	4,0
32	1 1/4	159	28,4	63,5	4	111,1	25,4	5,8
40	1 1/2	178	31,8	73,0	4	123,8	28,5	6,5
50	2	216	38,1	92,1	8	165,1	25,4	11,5
65	2 1/2	244	41,1	104,8	8	190,5	28,5	15,5
80	3	267	47,8	127,0	8	203,2	31,8	22
100	4	311	53,8	157,2	8	241,3	35,0	33
125	5	375	73,2	185,7	8	292,1	41,1	60
150	6	394	82,6	215,9	12	317,5	38,1	72
200	8	483	91,9	269,9	12	393,7	44,5	122
250	10	584	108,0	323,8	12	482,6	50,8	210
300	12	673	124,0	381,0	16	571,5	53,8	315
350	14	749	133,4	412,8	16	635,0	60,5	-
400	16	826	146,0	469,9	16	704,8	66,5	-
450	18	914	162,0	533,4	16	774,7	73,2	-
500	20	984	177,6	584,2	16	831,8	79,2	-
600	24	1168	203,2	692,2	16	990,6	91,9	-

**Blind
class 2500
raised face**

NPS 1/2 to 24 ANSI B 16-5

Weights are approximate

Size		O	C min.	R	Drilling			Weight
DN	NPS	mm	mm	mm	Number	G mm	d mm	kg
15	1 1/2	133	30,2	34,9	4	88,9	22,2	3,3
20	3/4	140	31,8	42,9	4	95,3	22,2	3,9
25	1	159	35,0	50,8	4	108,0	25,4	5,0
32	1 1/4	184	38,1	63,5	4	130,0	28,5	8,1
40	1 1/2	203	44,5	73,0	4	146,0	31,8	11,5
50	2	235	50,8	92,1	8	171,5	28,5	17,6
65	2 1/2	267	57,2	104,8	8	196,9	31,8	26
80	3	305	66,5	127,0	8	228,6	35,0	39
100	4	356	76,2	157,2	8	273,0	41,1	60
125	5	419	91,9	185,7	8	323,9	47,8	100
150	6	483	108,0	215,9	8	368,3	53,8	140
200	8	552	127,0	269,9	12	438,2	53,8	236
250	10	673	165,1	323,8	12	539,8	66,5	450
300	12	762	184,2	381,0	12	619,3	73,2	650

**Blind
class 150
raised face**

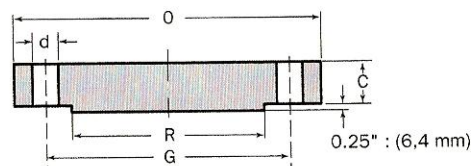
26" to 48" MSS SP 44

Weights are approximate

Nominal Pipe Size	O	C	R	Drilling			Weight
	mm	mm	mm	Number	d mm	G mm	kg
26"	870	68,5	749	24	35	806	323
28"	925	71,5	800	28	35	863	382
30"	985	74,5	857	28	35	914	450
32"	1060	81,0	914	28	41	978	560
34"	1110	82,5	965	32	41	1029	630
36"	1170	90,5	1022	32	41	1086	765
38"	1240	87,5	1073	32	41	1150	850
40"	1290	90,5	1124	36	41	1200	955
42"	1345	97,0	1194	36	41	1257	1075
44"	1405	102,0	1245	40	41	1314	1200
46"	1455	103,0	1295	40	41	1365	1380
48"	1510	108,0	1359	44	41	1422	1590

class 300

Nominal Pipe Size	O	C	R	Drilling			Weight
	mm	mm	mm	Number	d mm	G mm	kg
26"	970	84,0	749	28	44	876	505
28"	1035	90,5	800	28	44	940	615
30"	1090	95,0	857	28	48	997	705
32"	1150	100	914	28	51	1054	820
34"	1205	105	965	28	51	1105	950
36"	1270	111	1022	32	54	1168	1085
38"	1170	108	1029	32	41	1092	-
40"	1240	114	1086	32	44	1156	-
42"	1290	119	1137	32	44	1206	-
44"	1355	124	1194	32	48	1264	-
46"	1415	129	1245	28	51	1321	-
48"	1465	133	1308	32	51	1372	-

**Blind
class 400
raised face**

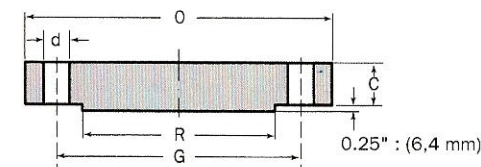
26" to 48" MSS SP 44

Weights are approximate

Nominal Pipe Size	O	C	R	Drilling			Weight
	mm	mm	mm	Number	d mm	G mm	kg
26"	970	98,5	749	28	48	876	565
28"	1035	105	800	28	51	940	715
30"	1090	111	857	28	54	997	830
32"	1150	116	914	28	54	1054	955
34"	1205	122	965	28	54	1105	1120
36"	1270	129	1022	32	54	1168	1290
38"	1205	124	1035	32	48	1118	-
40"	1270	130	1092	32	51	1175	-
42"	1320	133	1143	32	51	1226	-
44"	1385	140	1200	32	54	1283	-
46"	1440	146	1257	36	54	1340	-
48"	1510	152	1308	28	60	1403	-

class 600

Nominal Pipe Size	O	C	R	Drilling			Weight
	mm	mm	mm	Number	d mm	G mm	kg
26"	1015	125	749	28	51	914	800
28"	1075	132	800	28	54	965	945
30"	1130	140	857	28	54	1022	1115
32"	1195	148	914	28	60	1080	1315
34"	1245	154	965	28	60	1130	1495
36"	1315	162	1022	28	60	1194	1750
38"	1270	156	1054	28	60	1162	-
40"	1320	162	1111	32	60	1213	-
42"	1405	171	1168	28	67	1283	-
44"	1455	178	1226	32	67	1334	-
46"	1510	186	1276	32	67	1391	-
48"	1595	195	1334	32	73	1460	-

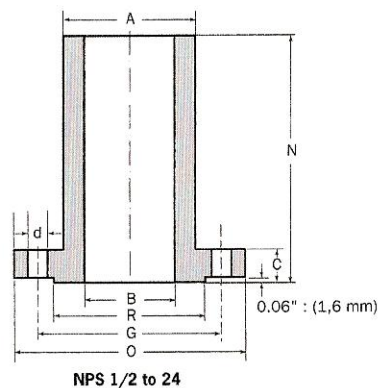
**Blind
class 900
raised face**

26" to 48" MSS SP 44

Weights are approximate

Nominal Pipe Size	O	C	R	Drilling			Weight
	mm	mm	mm	Number	d mm	G mm	kg
26"	1085	160	749	20	73	952	1140
28"	1170	171	800	20	79	1022	1400
30"	1230	183	857	20	79	1086	1690
32"	1315	194	914	20	86	1156	2025
34"	1395	205	965	20	92	1226	2410
36"	1460	214	1022	20	92	1289	2785
38"	1460	216	1099	20	92	1289	-
40"	1510	224	1162	24	92	1340	-
42"	1560	232	1213	24	92	1391	-
44"	1650	243	1270	24	98	1464	-
46"	1735	256	1334	24	105	1537	-
48"	1785	264	1384	24	105	1588	-

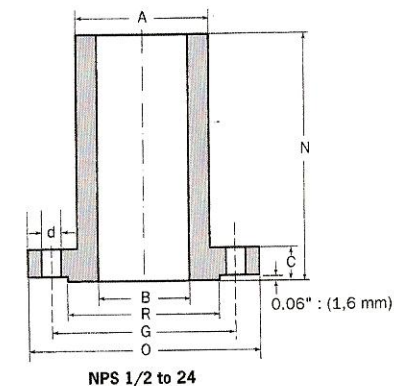
Long welding neck class 150 raised face



Dimensions, O, C, R and drilling according to ANSI B 16-5

Size		O	N	A	B	C min.	R	Drilling		
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm
15	1/2	89	Length to be specified by purchaser	30,5	12,7	11,2	34,9	4	60,3	15,8
20	3/4	99		38	19,0	12,7	42,9	4	69,8	15,8
25	1	108		51	25,4	14,3	50,8	4	79,4	15,8
32	1 1/4	117		60,5	31,8	15,9	63,5	4	88,9	15,8
40	1 1/2	127		67	38,1	17,5	73,0	4	98,4	15,8
50	2	152		82,5	50,8	19,1	92,1	4	12,6	19,0
65	2 1/2	178		95,5	63,5	22,3	104,8	4	139,7	19,0
80	3	190		108	76,2	23,9	127,0	4	152,4	19,0
-	3 1/2	216		124	88,9	23,9	139,7	8	177,8	19,0
100	4	229		140	101,6	23,9	157,2	8	190,5	19,0
125	5	254		165	127,0	23,9	185,7	8	215,9	22,2
150	6	279		197	152,4	25,4	215,9	8	241,3	22,2
200	8	343		248	203,2	28,6	269,9	8	298,4	22,2
250	10	406		305	254,0	30,2	323,8	12	362,0	25,4
300	12	483		365	304,8	31,8	381,0	12	431,8	25,4
350	14	533		406,5	355,6	35,0	412,8	12	476,2	28,5
400	16	597		457	406,4	36,6	469,9	16	539,8	28,5
450	18	635		508	457,2	39,7	533,4	16	577,8	31,8
500	20	698		559	508,0	42,9	584,2	20	635,0	31,8
600	24	813		667	609,6	47,7	692,2	20	749,3	35,0

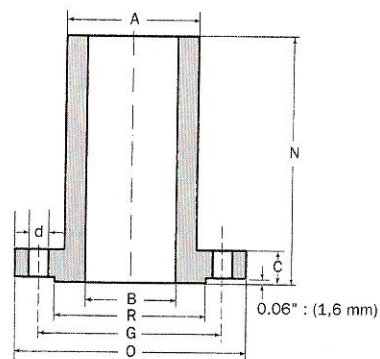
Long welding neck class 300 raised face



Dimensions, O, C, R and drilling according to ANSI B 16-5

Size		O	N	A	B	C	R	Drilling		
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm
15	1/2	95	Length to be specified by purchaser	38	12,7	14,2	34,9	4	66,7	15,8
20	3/4	117		47,5	19,0	15,7	42,9	4	82,6	19,0
25	1	124		54	25,4	17,5	50,8	4	88,9	19,0
32	1 1/4	133		63,5	31,8	19,0	63,5	4	98,4	19,0
40	1 1/2	156		70	38,1	20,6	73,0	4	114,3	22,2
50	2	165		84	50,8	22,4	92,1	8	127,0	19,0
65	2 1/2	190		100	63,5	25,4	104,8	8	149,2	22,2
80	3	210		117	76,2	28,4	127,0	8	168,3	22,2
-	3 1/2	229		133	88,9	30,2	139,7	8	184,2	22,2
100	4	254		146	101,6	31,8	157,2	8	200,0	22,2
125	5	279		184	127,0	35,0	185,7	8	235,0	22,2
150	6	318		206	152,4	36,6	215,9	12	269,9	22,2
200	8	381		260	203,2	41,1	269,9	12	330,2	25,4
250	10	444		321	254,0	47,8	323,8	16	387,4	28,5
300	12	521		375	304,8	50,8	381,0	16	450,8	31,8
350	14	584		425	355,6	53,8	412,8	20	514,4	31,8
400	16	648		483	406,4	57,2	469,9	20	571,5	35,0
450	18	711		533	457,2	60,5	533,4	24	628,6	35,0
500	20	775		587	508,0	63,5	584,2	24	685,8	35,0
600	24	914		702	609,6	69,9	692,2	24	812,8	41,1

Long welding neck class 600 raised face

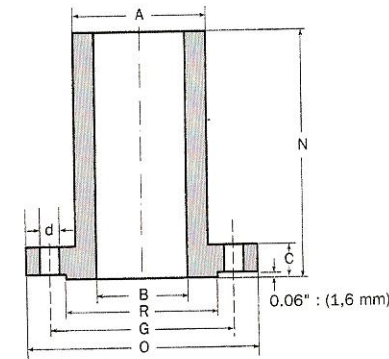


NPS 1/2 to 24

Dimensions, O, C, R and drilling according to ANSI B 16-5

Size		O	N	A	B	C	R	Drilling		
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm
15	1/2	95	Length to be specified by purchaser	38	12,7	14,2	34,9	4	66,7	15,8
20	3/4	117		48	19,0	15,7	42,9	4	82,6	19,0
25	1	124		54	25,4	17,5	50,8	4	88,9	19,0
32	1 1/4	133		63,5	31,8	20,6	63,5	4	98,4	19,0
40	1 1/2	156		70	38,0	22,4	73,0	4	114,3	22,2
50	2	165		84	50,8	25,4	92,1	8	127,0	19,0
65	2 1/2	190		100	63,5	28,4	104,8	8	149,2	22,2
80	3	210		117	76,2	31,8	127,0	8	168,3	22,2
-	3 1/2	229		133	88,9	35,1	139,7	8	184,0	25,4
100	4	273		152	101,6	38,1	157,2	8	215,9	25,4
125	5	330		190	127,0	44,5	185,7	8	266,7	28,5
150	6	356		222	152,4	47,8	215,9	12	292,1	28,5
200	8	419		273	203,2	55,6	269,9	12	349,2	31,8
250	10	508		373	254,0	63,5	323,8	16	431,8	35,0
300	12	559		400	304,8	66,5	381,0	20	489,0	35,0
350	14	603		432	355,6	69,9	412,8	20	527,0	38,1
400	16	686		495	406,4	76,2	469,9	20	603,2	41,1
450	18	743		546	457,2	82,6	533,4	20	654,0	44,5
500	20	813		610	508,0	88,9	584,2	24	723,9	44,5
600	24	940		718	609,6	101,6	692,2	24	838,2	50,8

Long welding neck class 900 raised face

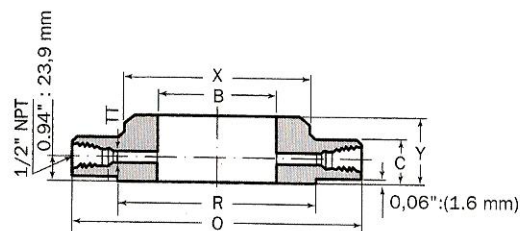


NPS 1/2 to 24

Dimensions, O, C, R and drilling according to ANSI B 16-5

Size		O	N	A	B	C min.	R	Drilling		
DN	NPS	mm	mm	mm	mm	mm	mm	Number	G mm	d mm
15	1/2	121	Length to be specified by purchaser	38	12,7	22,4	34,9	4	82,6	22,2
20	3/4	130		48	19,0	25,4	42,9	4	88,9	22,2
25	1	149		54	25,4	28,4	50,8	4	101,6	25,4
32	1 1/4	159		63,5	31,8	28,4	63,5	4	111,1	25,4
40	1 1/2	178		70	38,0	31,8	73,0	4	123,8	28,5
50	2	216		105	50,8	38,1	92,1	8	165,1	25,4
65	2 1/2	244		124	63,5	41,1	104,8	8	190,5	28,5
80	3	241		127	76,2	38,1	127,0	8	190,5	25,4
100	4	292		158,5	101,6	44,5	157,2	8	235,0	31,8
125	5	349		190	127,0	50,8	185,7	8	279,4	35,0
150	6	381		235	152,4	55,6	215,9	12	317,5	31,8
200	8	470		298,5	203,2	63,5	269,9	12	393,7	38,1
250	10	546		368,5	254,0	69,9	323,8	16	469,9	38,1
300	12	610		419	304,8	79,2	381,0	20	533,4	38,1
350	14	641		451	355,6	85,9	412,8	20	558,8	41,1
400	16	705		508	406,4	88,9	469,9	20	616,0	44,5
450	18	787		565	457,2	101,6	533,4	20	685,8	50,8
500	20	857		622,5	508,0	108	584,2	20	749,3	53,8
600	24	1041		749,5	609,6	139,7	692,2	20	901,7	66,5

Orifice slip on class 300 raised face

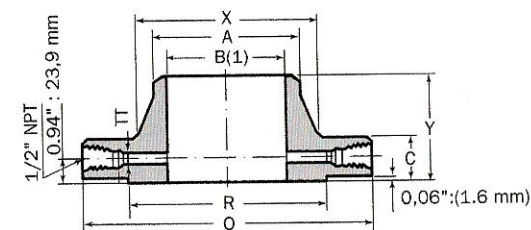


1" to 24" ANSI B 16-36 and ANSI B 16-36a

Weights are approximate

Size		O	B min.	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	124	34,5	6,4	38,1	48	54	50,8	4	88,9	19,0	3,0
40	1 1/2	156	49,5	6,4	38,1	48	70	73,0	4	114,3	22,2	5,0
50	2	165	62,0	6,4	38,1	49	84	92,1	8	127,0	19,0	5,5
65	2 1/2	190	74,7	6,4	38,1	51	100	104,8	8	149,2	22,2	6,2
80	3	210	90,7	9,5	38,1	52	117	127,0	8	168,3	22,2	8,0
100	4	254	116,1	12,7	38,1	54	146	157,2	8	200,0	22,2	12,1
150	6	318	170,7	12,7	38,1	54	206	215,9	12	269,9	22,2	18,5
200	8	381	221,5	12,7	41,1	62	260	269,9	12	330,2	25,4	26
250	10	444	276,4	12,7	47,8	67	320	323,8	16	387,4	28,5	38
300	12	521	327,2	12,7	50,8	73	375	381,0	16	450,8	31,8	52
350	14	584	359,2	12,7	53,8	76	425	412,8	20	514,4	31,8	74
400	16	648	410,5	12,7	57,2	83	483	469,9	20	571,5	35,0	100
450	18	711	461,8	12,7	60,5	89	533	533,4	24	628,6	35,0	127
500	20	775	513,1	12,7	63,5	95	587	584,2	24	685,8	35,0	147
600	24	914	616,0	12,7	69,9	106	701	692,2	24	812,8	41,1	208

Orifice welding neck class 300* raised face



1" to 24" ANSI B 16-36 and ANSI B 16-36a

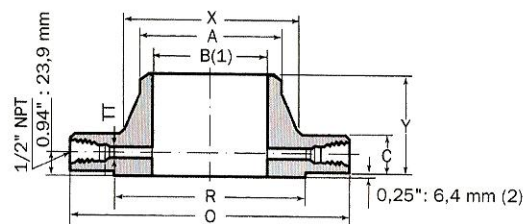
(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	124	33,7	6,4	38,1	82,6	54	50,8	4	88,9	19,0	4,5
40	1 1/2	156	48,3	6,4	38,1	85,9	70	73,0	4	114,3	22,2	6,5
50	2	165	60,3	6,4	38,1	85,9	84	92,1	8	127,0	19,0	7,0
65	2 1/2	190	73,0	6,4	38,1	88,9	100	104,8	8	149,2	22,2	7,5
80	3	210	88,9	9,5	38,1	88,9	117	127,0	8	168,3	22,2	9,4
100	4	254	114,3	12,7	38,1	91,9	146	157,2	8	200,0	22,2	13,2
150	6	318	168,3	12,7	38,1	100,1	206	215,9	12	269,9	22,2	14,6
200	8	381	219,1	12,7	41,1	111,3	260	269,9	12	330,2	25,4	30
250	10	444	273,0	12,7	47,8	117,3	320	323,8	16	387,4	28,5	41
300	12	521	323,9	12,7	50,8	130,0	375	381,0	16	450,8	31,8	62
350	14	584	355,6	12,7	53,8	142,7	425	412,8	20	514,4	31,8	84
400	16	648	406,4	12,7	57,2	146,0	483	469,9	20	571,5	35,0	111
450	18	711	457,0	12,7	60,5	158,8	533	533,4	24	628,6	35,0	138
500	20	775	508,0	12,7	63,5	162,1	587	584,2	24	685,3	35,0	171
600	24	914	610,0	12,7	69,9	168,1	701	692,2	24	812,8	41,1	247

* Orifice welding neck flanges class 300 size 3 in and smaller are identical to class 600 flanges and may so be marked.

Orifice welding neck class 400 raised face



1" to 24" ANSI B 16-36 and ANSI B 16-36a

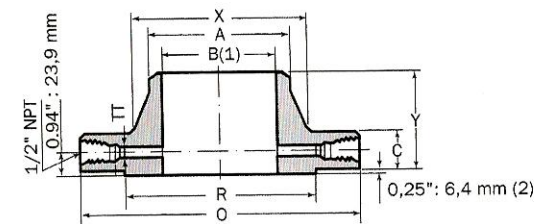
(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	124	33,7	6,4	38,1	82,6	54	50,8	4	88,9	19,0	5,5
40	1 1/2	156	48,3	6,4	38,1	85,9	70	73,0	4	114,3	22,2	7,8
50	2	165	60,3	6,4	38,1	85,9	84	92,1	8	127,0	19,0	8,3
65	2 1/2	190	73,0	6,4	38,1	88,9	100	104,8	8	149,2	22,2	10,8
80	3	210	88,9	9,5	38,1	88,9	118	127,0	8	168,3	22,2	12,6
100	4	254	114,3	12,7	35,0	88,9	146	157,2	8	200,1	25,4	16
150	6	318	168,3	12,7	41,1	103,2	206	215,9	12	269,8	25,4	26
200	8	381	219,1	12,7	47,8	117,4	260	269,9	12	330,2	28,5	40
250	10	444	273,0	12,7	53,8	123,9	321	323,8	16	387,4	31,8	57
300	12	521	323,9	12,7	57,2	136,6	375	381,0	16	450,8	35,0	80
350	14	584	355,6	12,7	60,7	149,3	425	412,8	20	514,4	35,0	105
400	16	648	406,4	12,7	63,5	152,4	483	469,9	20	571,5	38,1	131
450	18	711	457,0	12,7	66,5	165,1	533	533,4	24	628,6	38,1	159
500	20	775	508,0	12,7	69,9	168,1	587	584,2	24	685,8	41,1	190
600	24	914	610,0	12,7	76,2	174,8	702	692,2	24	812,8	47,8	275

(2) For size 3 in and smaller height of raised face is 0.06 in (1.6 mm) and included in dimensions C and Y

Orifice welding neck class 600 raised face



1" to 24" ANSI B 16-36 and ANSI B 16-36a

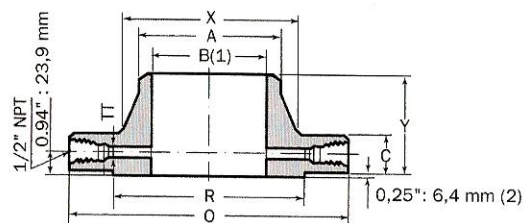
(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	124	33,7	6,4	38,1	82,6	54	50,8	4	88,9	19,0	5,5
40	1 1/2	156	48,3	6,4	38,1	85,9	70	73,0	4	114,3	22,2	7,8
50	2	165	60,3	6,4	38,1	85,9	84	92,1	8	127,0	19,0	8,3
65	2 1/2	190	73,0	6,4	38,1	88,9	100	104,8	8	149,2	22,2	10,8
80	3	210	88,9	9,5	38,1	88,9	118	127,0	8	168,3	22,2	12,6
100	4	273	114,3	12,7	38,1	101,6	152	157,2	8	215,9	25,4	19
150	6	356	168,3	12,7	47,8	117,3	222	215,9	12	292,1	28,5	37
200	8	419	219,1	12,7	55,6	133,4	273	269,9	12	349,2	31,8	53
250	10	508	273,0	12,7	63,5	152,4	343	323,8	16	431,8	35,0	86
300	12	559	323,9	12,7	66,5	155,4	400	381,0	20	489,0	35,0	102
350	14	603	355,6	12,7	69,9	165,1	432	412,8	20	527,0	38,1	150
400	16	686	406,4	12,7	76,2	177,8	495	469,9	20	603,2	41,1	190
450	18	743	457,0	12,7	82,6	184,2	546	533,4	20	654,0	44,5	240
500	20	813	508,0	12,7	88,9	190,5	610	584,2	24	723,9	44,5	295
600	24	940	610,0	12,7	101,6	203,2	718	692,2	24	838,2	50,8	365

(2) For size 3 in and smaller height of raised face is 0.06 in (1.6 mm) and included in dimensions C and Y

Orifice welding neck class 900 raised face



1" to 24" ANSI B 16-36 and ANSI B 16-36a

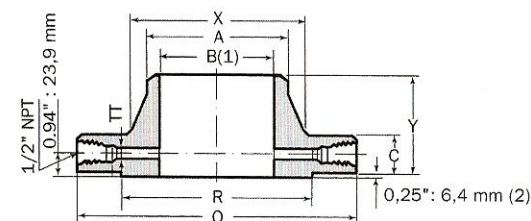
(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	149	33,7	6,4	38,1	82,6	52	50,8	4	101,6	25,4	5,4
40	1 1/2	178	48,3	6,4	38,1	88,9	70	73,0	4	123,8	28,5	7,8
50	2	216	60,3	6,4	38,1	101,6	105	92,1	8	165,1	25,4	11,5
65	2 1/2	244	73,0	6,4	41,1	104,6	124	104,8	8	190,5	28,5	15,8
80	3	241	88,9	9,5	38,1	101,6	127	127,0	8	190,5	25,4	14,5
100	4	292	114,3	12,7	44,5	114,3	159	157,2	8	235,0	31,8	23
150	6	381	168,3	12,7	55,6	139,7	235	215,9	12	317,5	31,8	50
200	8	470	219,1	12,7	63,5	162,0	298	269,9	12	393,7	38,1	85
250	10	546	273,0	12,7	69,9	184,1	368	323,8	16	469,9	38,1	118
300	12	610	323,9	12,7	79,2	200,1	419	381,0	20	533,4	38,1	163
350	14	641	355,6	12,7	85,9	212,8	451	412,8	20	558,8	41,1	186
400	16	705	406,4	12,7	88,9	215,9	508	469,9	20	616,0	44,5	224
450	18	787	457,0	12,7	101,6	228,6	565	533,4	20	685,8	50,8	300
500	20	857	508,0	12,7	108,0	247,6	622	584,2	20	749,3	53,8	373
600	24	1041	610,0	12,7	139,7	292,1	749	692,2	20	901,7	66,5	680

(2) 3/4" net pressure taps required for installation under jurisdiction of ANSI B 31-1 code for Power Piping, if operating pressure or temperature exceeds 900 psig (62.1 bar) or 800° F (427° C) respectively

Orifice welding neck class 1500 raised face



1" to 24" ANSI B 16-36 and ANSI B 16-36a

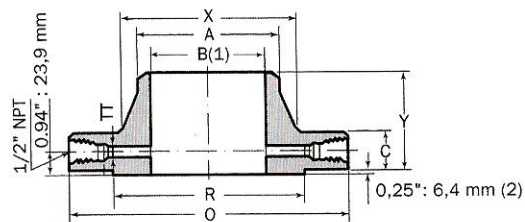
(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	149	33,7	6,4	38,1	82,6	52	50,8	4	101,6	25,4	5,4
40	1 1/2	178	48,3	6,4	38,1	88,9	70	73,0	4	123,8	28,5	7,8
50	2	216	60,3	6,4	38,1	101,6	105	92,1	8	165,1	25,4	11,5
65	2 1/2	244	73,0	6,4	41,1	104,6	124	104,8	8	190,5	28,5	15,8
80	3	267	88,9	9,5	47,8	117,3	133	127,0	8	203,2	31,8	22
100	4	311	114,3	12,7	53,8	123,9	162	157,2	8	241,3	35,0	30
150	6	394	168,3	12,7	82,6	171,5	229	215,9	12	317,5	38,1	70
200	8	483	219,1	12,7	91,9	212,8	292	269,9	12	393,7	44,5	119
250	10	584	273,0	12,7	108,0	254,0	368	323,8	12	482,6	50,8	204
300	12	673	323,9	12,7	124,0	282,4	451	381,0	16	571,5	53,8	303
350	14	749	355,6	12,7	133,4	298,4	495	412,8	16	635,0	60,5	400
400	16	826	406,4	12,7	146,0	311,1	552	469,9	16	704,8	66,5	510
450	18	914	457,0	12,7	162,0	327,1	597	533,4	16	774,7	73,2	-
500	20	984	508,0	12,7	177,6	355,6	641	584,2	16	831,8	79,2	-
600	24	1168	610,0	12,7	203,2	406,4	762	692,2	16	990,6	91,9	-

(2) 3/4" net pressure taps required for installation under jurisdiction of ANSI B 31-1 code for Power Piping, if operating pressure or temperature exceeds 900 psig (62.1 bar) or 800° F (427° C) respectively

Orifice welding neck class 2500 raised face



1" to 24" ANSI B 16-36 and ANSI B 16-36a

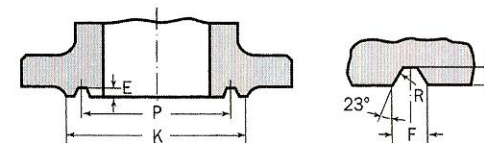
(1) Dimension B to be specified by purchaser

Weights are approximate

Size		O	A	TT	C min.	Y	X	R	Drilling			Weight
DN	NPS	mm	mm	mm	mm	mm	mm	mm	Number	G mm	d mm	kg
25	1	159	33,7	6,4	38,1	91,9	57	50,8	4	108,0	25,4	6,5
40	1 1/2	203	48,3	6,4	44,5	111,2	79	73,0	4	146,0	31,8	13,0
50	2	235	60,3	6,4	50,8	127,0	95	92,1	8	171,5	28,5	19,0
65	2 1/2	267	73,0	6,4	57,2	142,7	114	104,8	8	196,9	31,8	24
80	3	305	88,9	9,5	66,5	168,1	133	127,0	8	228,6	35,0	43
100	4	356	114,3	12,7	76,2	190,5	165	157,2	8	273,0	41,1	66
150	6	483	168,3	12,7	108,0	273,0	235	215,9	8	368,3	53,8	172
200	8	552	219,1	12,7	127,0	317,5	305	269,9	12	438,2	53,8	261
250	10	673	273,0	12,7	165,1	419,1	375	323,8	12	539,8	66,5	485
300	12	762	323,9	12,7	184,2	463,5	441	381,0	12	619,3	73,2	730

(2) 3/4" net pressure taps required for installation under jurisdiction of ANSI B 31-1 code for Power Piping, if operating pressure or temperature exceeds 900 psig (62.1 bar) or 800° F (427° C) respectively

Dimensions of class 150 ring joint facings



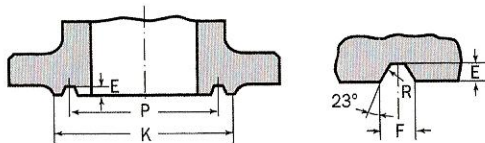
NPS 1" to 24" ANSI B 16-5

TOLERANCES :

Pitch diam.	P	± 0.005"
Depth	E	± 0.016" - 0.000"
Width	F	± 0.008"
Radius	R	max
Angle		23° ± 1/2°

Size		diameter of raised portion	Pitch diameter of groove	Depth of groove	Width of groove	Radius at bottom	Approximate distance between flanges	Ring
DN	NPS	K	P	E	F	R		Number
25	1	63,5	47,63	6,35	8,74	0,8	4	R 15
32	1 1/4	73,0	57,15	6,35	8,74	0,8	4	R 17
40	1 1/2	82,5	65,09	6,35	8,74	0,8	4	R 19
50	2	102	82,55	6,35	8,74	0,8	4	R 22
65	2 1/2	121	101,60	6,35	8,74	0,8	4	R 25
80	3	133	114,30	6,35	8,74	0,8	4	R 29
-	3 1/2	154	131,76	6,35	8,74	0,8	4	R 33
100	4	171	149,23	6,35	8,74	0,8	4	R 36
125	5	194	171,45	6,35	8,74	0,8	4	R 40
150	6	219	193,68	6,35	8,74	0,8	4	R 43
200	8	273	247,65	6,35	8,74	0,8	4	R 48
250	10	330	304,80	6,35	8,74	0,8	4	R 52
300	12	406	381,00	6,35	8,74	0,8	4	R 56
350	14	425	396,88	6,35	8,74	0,8	3	R 59
400	16	483	454,03	6,35	8,74	0,8	3	R 64
450	18	546	517,53	6,35	8,74	0,8	3	R 68
500	20	597	558,80	6,35	8,74	0,8	3	R 72
600	24	711	673,10	6,35	8,74	0,8	3	R 76

Dimensions of class 300 - 400 - 600 ring joint facings



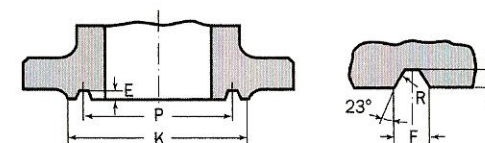
NPS 1" to 24" ANSI B 16-5

TOLERANCES :

Pitch diam.	P	$\pm 0.005"$
Depth	E	$\pm 0.016" - 0.000"$
Width	F	$\pm 0.008"$
Radius	R	max
Angle		$23^\circ \pm 1/2^\circ$

Size		diameter of raised portion	Pitch diameter of groove	Depth of groove	Width of groove	Radius at bottom	Approximate distance between flanges	Ring Number
DN	NPS	K	P	E	F	R		
15	1/2	51,0	34,11	5,56	7,14	0,8	3	R 11
20	3/4	63,5	42,86	6,35	8,74	0,8	4	R 13
25	1	70,0	50,80	6,35	8,74	0,8	4	R 16
32	1 1/4	79,5	60,33	6,35	8,74	0,8	4	R 18
40	1 1/2	90,5	68,26	6,35	8,74	0,8	4	R 20
50	2	108	82,55	7,92	11,91	0,8	6	R 23
65	2 1/2	127	101,60	7,92	11,91	0,8	6	R 26
80	3	146	123,83	7,92	11,91	0,8	6	R 31
-	3 1/2	158	131,76	7,92	11,91	0,8	6	R 34
100	4	175	149,23	7,92	11,91	0,8	6	R 37
125	5	210	180,98	7,92	11,91	0,8	6	R 41
150	6	241	211,13	7,92	11,91	0,8	6	R 45
200	8	302	269,88	7,92	11,91	0,8	6	R 49
250	10	356	323,85	7,92	11,91	0,8	6	R 53
300	12	413	381,00	7,92	11,91	0,8	6	R 57
350	14	457	419,10	7,92	11,91	0,8	6	R 61
400	16	508	469,90	7,92	11,91	0,8	6	R 65
450	18	575	533,40	7,92	11,91	0,8	6	R 69
500	20	635	584,20	9,52	13,49	1,5	6	R 73
600	24	749	692,15	11,13	16,66	1,5	6	R 77

Dimensions of class 900 ring joint facings



NPS 1" to 24" ANSI B 16-5

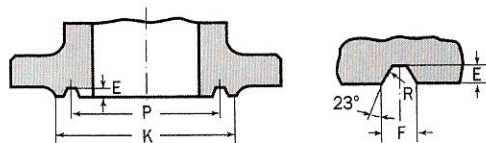
TOLERANCES :

Pitch diam.	P	$\pm 0.005"$
Depth	E	$\pm 0.016" - 0.000"$
Width	F	$\pm 0.008"$
Radius	R	max
Angle		$23^\circ \pm 1/2^\circ$

DN 15 to 600
NPS 1/2 to 24
ANSI B 16-5

Size		diameter of raised portion	Pitch diameter of groove	Depth of groove	Width of groove	Radius at bottom	Approximate distance between flanges	Ring Number
DN	NPS	K	P	E	F	R		
15	1/2	60,5	39,69	6,35	8,74	0,8	4	R 12
20	3/4	66,5	44,45	6,35	8,74	0,8	4	R 14
25	1	71,5	50,80	6,35	8,74	0,8	4	R 16
32	1 1/4	81,0	60,33	6,35	8,74	0,8	4	R 18
40	1 1/2	92,0	68,26	6,35	8,74	0,8	4	R 20
50	2	124	95,25	7,92	11,91	0,8	3	R 24
65	2 1/2	137	107,95	7,92	11,91	0,8	3	R 27
80	3	156	123,83	7,92	11,91	0,8	4	R 31
100	4	181	149,23	7,92	11,91	0,8	4	R 37
125	5	216	180,98	7,92	11,91	0,8	4	R 41
150	6	241	211,13	7,92	11,91	0,8	4	R 45
200	8	308	269,88	7,92	11,91	0,8	4	R 49
250	10	362	323,85	7,92	11,91	0,8	4	R 53
300	12	419	381,00	7,92	11,91	0,8	4	R 57
350	14	467	419,10	11,13	16,66	1,5	4	R 62
400	16	524	469,90	11,13	16,66	1,5	4	R 66
450	18	594	533,40	12,70	19,84	1,5	5	R 70
500	20	648	584,20	12,70	19,84	1,5	5	R 74
600	24	772	692,15	15,88	26,97	2,4	6	R 78

Dimensions of class 1500 ring joint facings



NPS 1" to 24" ANSI B 16-5

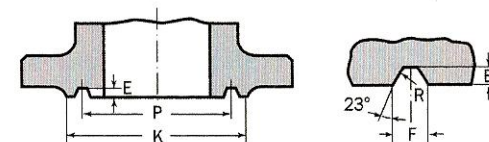
TOLERANCES :

Pitch diam.	P	$\pm 0.005"$
Depth	E	$\pm 0.016" - 0.000"$
Width	F	$\pm 0.008"$
Radius	R	max
Angle		$23^\circ \pm 1/2^\circ$

 DN 15 to 600
 NPS 1/2 to 24
 ANSI B 16-5

Size		diameter of raised portion	Pitch diameter of groove	Depth of groove	Width of groove	Radius at bottom	Approximate distance between flanges	Ring Number
DN	NPS	K	P	E	F	R		
15	1 1/2	60,5	39,69	6,35	8,74	0,8	4	R 12
20	3/4	66,5	44,45	6,35	8,74	0,8	4	R 14
25	1	71,5	50,80	6,35	8,74	0,8	4	R 16
32	1 1/4	81,0	60,33	6,35	8,74	0,8	4	R 18
40	1 1/2	92,0	68,26	6,35	8,74	0,8	4	R 20
50	2	124	95,25	7,92	11,91	0,8	3	R 24
65	2 1/2	137	107,95	7,92	11,91	0,8	3	R 27
80	3	168	136,53	7,92	11,91	0,8	3	R 35
100	4	194	161,93	7,92	11,91	0,8	3	R 39
125	5	229	193,68	7,92	11,91	0,8	3	R 44
150	6	248	211,14	9,52	13,49	1,5	3	R 46
200	8	318	269,88	11,13	16,66	1,5	4	R 50
250	10	371	323,85	11,13	16,66	1,5	4	R 54
300	12	438	381,00	14,27	23,01	1,5	5	R 58
350	14	489	419,10	15,88	26,97	2,4	6	R 63
400	16	546	469,90	17,48	30,18	2,4	8	R 67
450	18	613	533,40	17,48	30,18	2,4	8	R 71
500	20	673	584,20	17,48	33,32	2,4	10	R 75
600	24	794	692,15	20,62	36,53	2,4	11	R 79

Dimensions of class 2500 ring joint facings



NPS 1" to 24" ANSI B 16-5

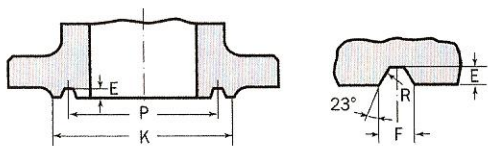
TOLERANCES :

Pitch diam.	P	$\pm 0.005"$
Depth	E	$\pm 0.016" - 0.000"$
Width	F	$\pm 0.008"$
Radius	R	max
Angle		$23^\circ \pm 1/2^\circ$

 DN 15 to 600
 NPS 1/2 to 24
 ANSI B 16-5

Size		diameter of raised portion	Pitch diameter of groove	Depth of groove	Width of groove	Radius at bottom	Approximate distance between flanges	Ring Number
DN	NPS	K	P	E	F	R		
15	1/2	65,0	42,86	6,35	8,74	0,8	4	R 13
20	3/4	73,0	50,80	6,35	8,74	0,8	4	R 16
25	1	82,5	60,33	6,35	8,74	0,8	4	R 18
32	1 1/4	102	72,23	7,92	11,91	0,8	3	R 21
40	1 1/2	114	82,55	7,92	11,91	0,8	3	R 23
50	2	133	101,60	7,92	11,91	0,8	3	R 26
65	2 1/2	149	111,13	9,52	13,49	0,8	3	R 28
80	3	168	127,00	9,52	13,49	1,5	3	R 32
100	4	203	157,16	11,13	16,66	1,5	4	R 38
125	5	241	190,50	12,70	19,84	1,5	4	R 42
150	6	279	228,60	12,70	19,84	1,5	4	R 47
200	8	340	279,40	14,27	23,01	1,5	5	R 51
250	10	425	342,90	17,48	30,18	2,4	6	R 55
300	12	495	406,40	17,48	33,32	2,4	8	R 60

Dimensions of ring joint facings

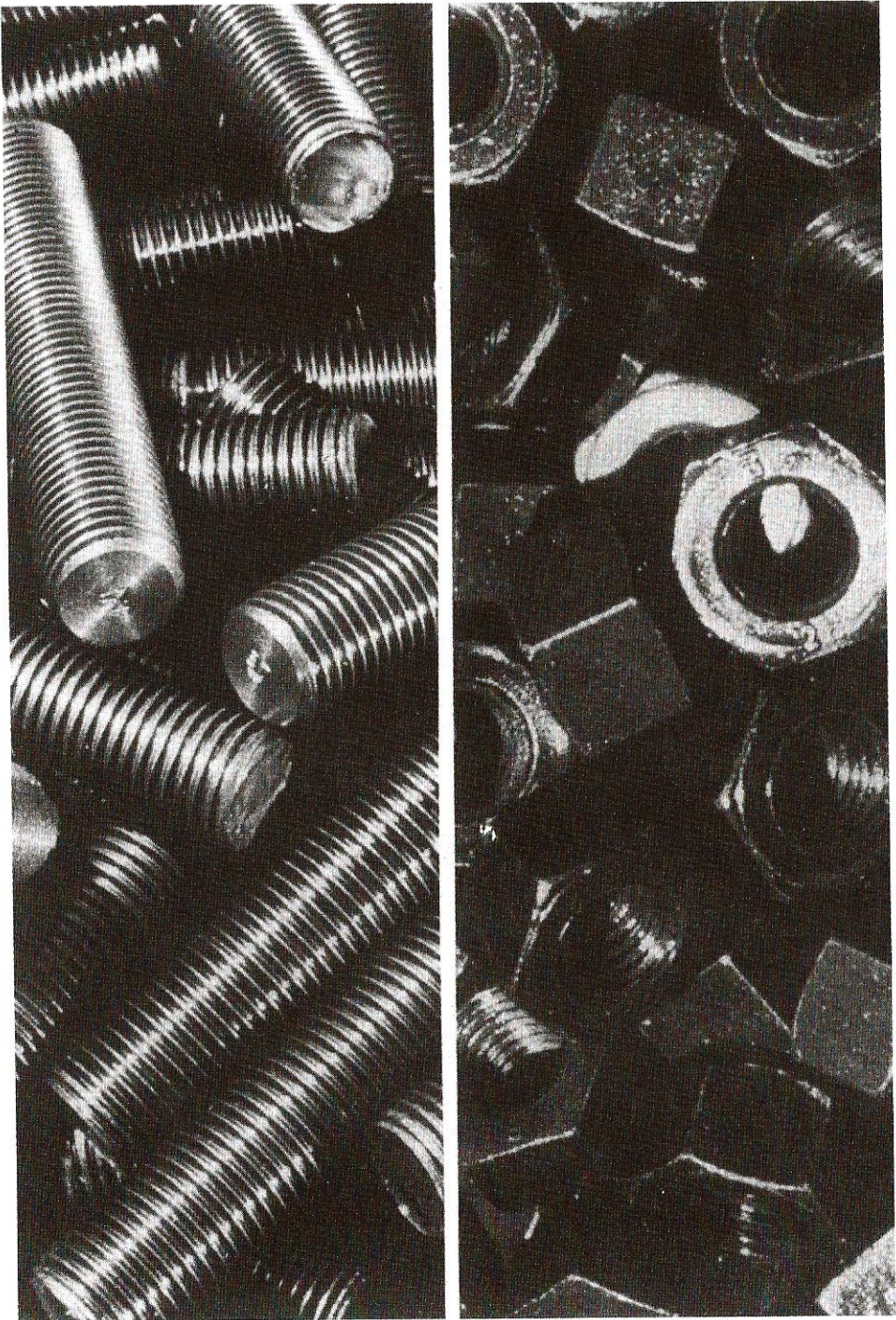


NPS 1" to 24" ANSI B 16-5

TOLERANCES :		
Pitch diam.	P	± 0.005"
Depth	E	± 0.016" - 0.000"
Width	F	± 0.008"
Radius	R	max
Angle		23° ± 1/2°

26" to 36"
MSS SP 44

Nominal Pipe Size	diameter of raised portion	Pitch diameter of groove	Depth of groove	Width of groove	Groove fillet radius	Ring Number
	K	P	E	F	r	
PN 50 - PN 64 PN 100 CLASSES 300 - 400 - 600						
26"	810	749,30	12,70	19,85	2	R 93
28"	860	800,10	12,70	19,85	2	R 94
30"	918	857,25	12,70	19,85	2	R 95
32"	984	914,40	14,30	23,00	2	R 96
34"	1035	965,20	14,30	23,00	2	R 97
36"	1092	1022,35	14,30	23,00	2	R 98
PN 150 CLASS 900						
26"	832	749,30	17,46	30,16	2	R 100
28"	889	800,10	17,46	33,34	2	R 101
30"	946	857,25	17,46	33,34	2	R 102
32"	1003	914,40	17,46	33,34	2	R 103
34"	1067	965,20	20,64	36,51	2	R 104
36"	1124	1022,35	20,64	36,51	2	R 105



Stud Bolts

STUD BOLTS in alloy steel according to ASTM A 193 grade B 7, B 16, a.s.o.

Nuts

STUD MACHINED for diameters $\leq 7/8"$ HOT of COLD FORGED for diameters $> 7/8"$ in carbon steel according to ASTM A 194 grade 2 H, a.s.o.

Method for calculating bolt lengths

The stud-bolt theoretical length can be calculated by means of the formula:

$$L = 2 (S + he + eb + i) + J$$

where

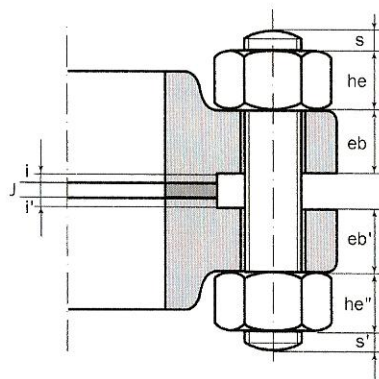
$S = S'$: free threads (equals 1/3 r.d. bolt diameter)

$he = he'$: nut thickness (equal nominal bolt diameter)

$eb = eb'$: flange thickness

$i = i'$: height of raised face
(for 150 and 300 rating height of raised face)
is included in eb height

J : gasket thickness I.E. approximately 3 mm



Stud bolts for raised face or ring joint flanges

ANSI B 16-5

Nominal pipe size		STUD BOLTS									
		For class 150 flanges					For class 300 flanges				
		Number of bolts	Diameter of bolts		Length of bolts (1)		Number of bolts	Diameter of bolts		Length of bolts (1)	
			UNC	ISO	1,6 mm RF	Ring joint		UNC	ISO	1,6 mm RF	Ring joint
DN	NPS		inches	mm	mm	mm		inches	mm	mm	mm
15	1 1/2	4	1/2	M 14	60	—	4	1/2	M 14	65	75
20	3/4	4	1/2	M 14	65	—	4	5/8	M 16	75	90
25	1	4	1/2	M 14	65	80	4	5/8	M 16	80	90
32	1 1/4	4	1/2	M 14	70	80	4	5/8	M 16	80	95
40	1 1/2	4	1/2	M 14	70	95	4	3/4	M 20	90	105
50	2	4	5/8	M 16	80	95	8	5/8	M 18	90	105
65	2 1/2	4	5/8	M 16	90	100	8	3/4	M 20	100	115
80	3	4	5/8	M 16	90	105	8	3/4	M 20	110	125
—	3 1/2	8	5/8	M 16	90	105	8	3/4	M 20	110	125
100	4	8	5/8	M 16	90	105	8	3/4	M 20	110	130
125	5	8	3/4	M 20	90	110	8	3/4	M 20	120	135
150	6	8	3/4	M 20	100	115	12	3/4	M 20	125	140
200	8	8	3/4	M 20	110	120	12	7/8	M 24	140	155
250	10	12	7/8	M 24	115	130	16	1	M 27	155	170
300	12	12	7/8	M 24	120	135	16	1 1/8	M 30	170	185
350	14	12	1	M 27	130	150	20	1 1/8	M 30	175	195
400	16	16	1	M 27	135	150	20	1 1/4	M 33	190	205
450	18	16	1 1/8	M 30	150	160	24	1 1/4	M 33	195	210
500	20	20	1 1/8	M 30	160	170	24	1 1/4	M 33	205	225
600	24	20	1 1/4	M 33	175	185	24	1 1/2	M 39	230	255

(1) The stud bolt length does not include the height of points (part beyond the thread may be chamfered, rounded...)

Stud bolts for raised face or ring joint flanges

ANSI B 16-5

Nominal pipe size		STUD BOLTS									
		For class 400 flanges					For class 600 flanges				
		Number of bolts	Diameter of bolts		Length of bolts (1)		Number of bolts	Diameter of bolts		Length of bolts (1)	
			UNC	ISO	6,4 mm RF	Ring joint		UNC	ISO	6,4 mm RF	Ring joint
DN	NPS		inches	mm	mm	mm		inches	mm	mm	mm
15	1 1/2	4	1/2	M 14	80	75	4	1/2	M 14	80	75
20	3/4	4	5/8	M 16	90	90	4	5/8	M 16	90	90
25	1	4	5/8	M 16	90	90	4	5/8	M 16	90	90
32	1 1/4	4	5/8	M 16	100	100	4	5/8	M 16	100	100
40	1 1/2	4	3/4	M 20	105	105	4	3/4	M 20	105	105
50	2	8	5/8	M 16	105	110	8	5/8	M 16	105	110
65	2 1/2	8	3/4	M 20	120	125	8	3/4	M 20	120	125
80	3	8	3/4	M 20	125	130	8	3/4	M 20	125	130
-	3 1/2	8	7/8	M 24	140	140	8	7/8	M 24	140	140
100	4	8	7/8	M 24	140	140	8	7/8	M 24	145	150
125	5	8	7/8	M 24	145	150	8	1	M 27	165	165
150	6	12	7/8	M 24	150	155	12	1	M 27	170	175
200	8	12	1	M 27	170	175	12	1 1/8	M 30	195	195
250	10	16	1 1/8	M 30	190	195	16	1 1/4	M 33	215	220
300	12	16	1 1/4	M 33	205	205	20	1 1/4	M 33	220	225
350	14	20	1 1/4	M 33	210	210	21	1 3/8	M 36	235	235
400	16	20	1 3/8	M 36	220	225	20	1 1/2	M 39	255	255
450	18	24	1 3/8	M 36	230	230	20	1 5/8	M 42	275	275
500	20	24	1 1/2	M 39	245	250	24	1 5/8	M 42	290	305
600	24	24	1 3/4	M 45	270	280	24	1 7/8	M 48	330	330

(1) The stud bolt length does not include the height of points (part beyond the thread may be chamfered, rounded...)

Stud bolts for raised face or ring joint flanges

ANSI B 16-5

Nominal pipe size		STUD BOLTS									
		For class 900 flanges					For class 1500 flanges				
		Number of bolts	Diameter of bolts		Length of bolts (1)		Number of bolts	Diameter of bolts		Length of bolts (1)	
			UNC	ISO	6,4 mm RF	Ring joint		UNC	ISO	6,4 mm RF	Ring joint
DN	NPS		inches	mm	mm	mm		inches	mm	mm	mm
15	1/2	4	3/4	M 20	105	105	4	3/4	M 20	105	105
20	3/4	4	3/4	M 20	115	115	4	3/4	M 20	115	115
25	1	4	7/8	M 24	125	125	4	7/8	M 24	125	125
32	1 1/4	4	7/8	M 24	125	125	4	7/8	M 24	125	125
40	1 1/2	4	1	M 27	140	140	4	1	M 27	140	140
50	2	8	7/8	M 24	145	145	8	7/8	M 24	145	145
65	2 1/2	8	1	M 27	160	160	8	1	M 27	160	160
80	3	8	7/8	M 24	145	150	8	1 1/8	M 30	180	180
100	4	8	1 1/8	M 30	170	175	8	1 1/4	M 33	195	200
125	5	8	1 1/4	M 33	190	195	8	1 1/2	M 39	250	250
150	6	12	1 1/8	M 30	195	195	12	1 3/8	M 36	260	265
200	8	12	1 3/8	M 36	220	225	12	1 5/8	M 42	290	300
250	10	16	1 3/8	M 36	235	235	12	1 7/8	M 48	335	345
300	12	20	1 3/8	M 36	255	255	16	2	M 52	375	390
350	14	20	1 1/2	M 39	275	280	16	2 1/4	M 56	405	425
400	16	20	1 5/8	M 42	285	295	16	2 1/2	M 64	445	470
450	18	20	1 7/8	M 48	325	340	16	2 3/4	M 70	495	515
500	20	20	2	M 52	345	360	16	3	M 76	540	565
600	24	20	2 1/2	M 64	435	455	16	3 1/2	M 90	615	645

(1) The stud bolt length does not include the height of points (part beyond the thread may be chamfered, rounded...)

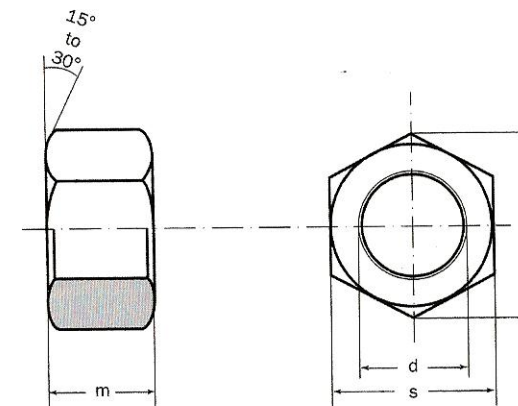
Stud bolts for raised face or ring joint flanges

ANSI B 16-5

Nominal pipe size		STUD BOLTS				
		For class 2500 flanges				
		Number of bolts	Diameter of bolts		Length of bolts (1)	
			UNC	ISO	UNC	ISO
DN	NPS		inches	mm	inches	mm
15	1/2	4	3/4	M 20	125	125
20	3/4	4	3/4	M 20	125	125
25	1	4	7/8	M 24	140	140
32	1 1/4	4	1	M 27	150	155
40	1 1/2	4	1 1/8	M 30	170	175
50	2	8	1	M 27	175	180
65	2 1/2	8	1 1/8	M 30	195	205
80	3	8	1 1/4	M 33	220	230
100	4	8	1 1/2	M 39	225	265
125	5	8	1 3/4	M 45	300	310
150	6	8	2	M 52	345	355
200	8	12	2	M 52	380	395
250	10	12	2 1/2	M 64	485	510
300	12	12	2 3/4	M 70	540	560

(1) The stud bolt length does not include the height of points (part beyond the thread may be chamfered, rounded...)

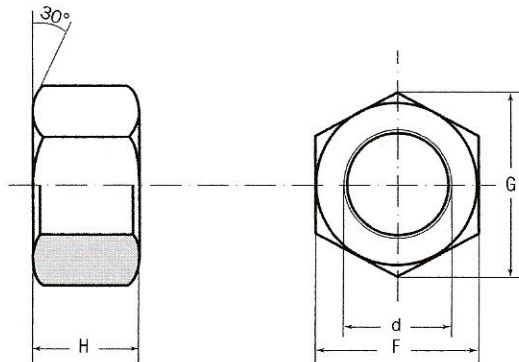
Dimensions of hex nuts symbol H


 Metric sizes (ISO)
 Dimensions in mm

Weights are approximate

Nominal size d	e	m		s		Pas ISO	Weight per 100 pieces
	mini	maxi	mini	maxi	mini		kg
M 8	14,38	6,8	6,44	13	12,73	1,25	0,6
M 10	17,77	8,4	8,04	16	15,73	1,5	1,3
M 12	20,03	10,8	10,37	18	17,73	1,75	1,9
M 14	23,35	12,8	12,1	21	20,67	2,0	3,0
M 16	26,75	14,8	14,1	24	23,67	2,0	3,9
M 18	29,56	15,8	15,1	27	26,16	2,5	6,1
M 20	32,95	18	16,9	30	29,16	2,5	7,5
M 22	37,29	19,4	17,8	34	33	2,5	9,8
M 24	39,55	21,5	20,2	36	35	3,0	12,5
M 27	45,20	23,8	22,2	41	40	3,0	19,1
M 30	50,85	25,6	24,3	46	45	3,5	27,0
M 33	55,37	28,7	27,1	50	49	3,5	33,5
M 36	60,79	31	29,4	55	53,8	4,0	45,8
M 39	66,44	32	30,4	60	58,8	4,0	57,0
M 42	71,30	34	32,4	65	63,1	4,5	75,0
M 45	76,95	36	34,4	70	68,1	4,5	92,5
M 48	82,60	38	36,4	75	73,1	5,0	115,0
M 52	88,25	42	40,4	80	78,1	5,0	138,0
M 56	93,56	45	43,4	85	82,8	5,5	166,0
M 60	99,21	48	46,4	90	87,8	5,5	200,0
M 64	104,86	51	49,1	95	92,8	6,0	230,0
M 68	110,51	54	52,1	100	97,8	6,0	287,5
M 72x6	116,16	58	56,1	105	102,8	6,0	344,0
M 76x6	121,81	61	59,1	110	107,8	6,0	380,0
M 80x6	127,46	64	62,1	115	112,8	6,0	430,0

Dimensions of heavy hex nuts

ANSI B 18-2


UNC sizes
Dimensions in mm

Weights are approximate

Nominal size d	e		m		s		Numbers of threads per inch	Weight per 100 pieces kg
	mini	mini	maxi	mini	maxi	mini		
3/8"	20,2	19,4	9,6	8,7	17,5	17,0	16	1,4
7/16"	22,0	21,1	11,2	10,2	19,0	18,5	14	1,9
1/2"	25,6	24,6	12,8	11,8	22,2	21,6	13	3,0
9/16"	27,5	26,3	14,4	13,4	23,8	23,1	12	3,7
5/8"	31,2	29,8	16,0	14,9	27,0	26,2	11	5,4
3/4"	37,6	35,1	19,3	18,0	31,8	30,8	10	8,8
7/8"	42,2	40,4	22,5	21,2	36,5	35,4	9	13,5
1"	47,7	45,6	25,7	24,3	41,3	40,0	8	19,3
1" 1/8	53,2	50,8	28,9	27,4	46,0	44,6	8	26,9
1" 1/4	58,6	56,1	31,8	30,1	50,8	49,2	8	35,7
1" 3/8	64,2	61,4	35,0	33,3	55,6	53,8	8	46,3
1" 1/2	69,6	66,6	38,2	36,4	60,3	58,4	8	59,5
1" 5/8	75,2	71,8	41,5	39,5	65,1	63,0	8	73,6
1" 3/4	80,6	77,1	44,7	42,6	69,9	67,6	8	92,7
1" 7/8	86,2	82,3	47,9	45,8	74,6	72,2	8	190,5
2"	91,6	87,6	51,1	48,9	79,4	76,8	8	135,8
2" 1/4	102,6	98,1	57,2	54,7	88,9	86,1	8	109,3
2" 1/2	113,6	108,6	63,6	61,0	98,4	95,2	8	256,0
2" 3/4	124,6	119,1	70,1	67,2	108,0	104,4	8	335,0
3"	135,6	129,6	76,5	73,5	117,5	113,7	8	432,0

Note - Threads in accordance with ANSI B 1-1-1982
 Serie UNCE up to 1"
 Serie 8 UN for sizes 1" 1/8 and over

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- Comply the needs and expectations of our customers
- Create a work environment that values people
- Disciplines and encourages employees to work as per quality systems
- Commit itself to meet demands of the Quality Management System and continuously improve it
- Undertakes to meet all legal and statutory requirements



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