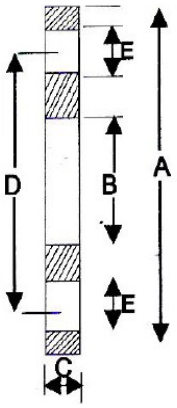
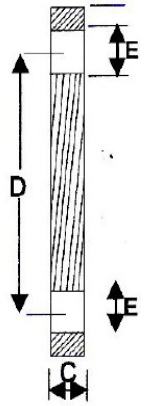
BS 10 PIPE FLANGES

N.B. Size	Table	Dia of Slip-on A	Bore of Flange B	Thickness of Flange C	Pitch circle Dia D	Dia of Bilt Holes E	No. of Bolts
6"	D	11	6.72	1/2	9 1/4	11/16	8
	E	11	6.72	11/16	9 1/4	7/8	8
	F	12	6.72	7/8	10 1/4	7/8	12
	H	12	6.72	1 1/8	10 1/4	7/8	12
8"	D	13 1/4	8.72	1/2	11 1/2	11/16	8
	E	13 1/4	8.72	3/4	11 1/2	7/8	8
	F	14 1/2	8.72	1	12 3/4	7/8	12
	H	14 1/2	8.72	1 1/4	12 3/4	7/8	12
0"	D	16	10.88	5/8	14	7/8	8
	E	16	10.88	7/8	14	7/8	12
	F	17	10.88	11/8	15	1	12
	H	17	10.88	13/8	15	1	12
2"	D	18	12.88	3/4	16	7/8	12
	E	18	12.88	1	16	1	12
	F	19 1/4	12.88	1 1/4	17 1/4	1	16
	H	21 3/4	12.88	1 7/8	19 1/2	1 1/8	16
4"	D	22 3/4	16.16	7/8	20 1/2	1	12
	E	22 3/4	16.16	1 1/4	20 1/2	1	12
	F	24	16.16	1 5/8	21 3/4	1 1/8	16
	H	24	16.16	2 1/8	21 3/4	1 1/4	16
6"	D	25 1/4	16.18	1	23	1	12
	E	22 3/4	16.16	1 1/4	21 3/4	1	12
	F	24	16.16	1 5/8	21 3/4	1 1/8	20
	H	24	16.16	2 1/8	21 3/4	1 1/8	20
8"	D	25 1/4	18.18	1	23	1	12
	E	25 1/4	18.18	1 3/4	23	1	16
	F	26 1/2	18.18	1 3/4	24	1 1/4	20
	H	26 1/2	18.18	2 3/8	24	1 1/4	20
0"	D	27 3/4	20.20	1 1/8	25 1/4	1	16
	E	27 3/4	20.20	1 1/2	25 1/4	1	16
	F	29	20.20	2	26 1/2	1 1/4	24
	H	29	20.20	2 5/8	26 1/2	1 1/4	24
2"	D	30	22.22	1 1/8	27 1/2	1 1/8	16
	E	30	22.22	1 3/4	27 1/2	1 1/8	16
	F	31	22.22	2 1/8	28 1/2	1 1/4	24
	H	31	22.22	2 3/4	28 1/2	1 1/4	24
4"	D	32 1/2	24.25	1 1/4	29 3/4	1 1/8	16
	E	32 1/2	24.25	1 7/8	29 3/4	1 1/4	16
	F	33 1/2	24.25	2 1/4	30 3/4	1 3/8	24
	H	33 1/2	24.25	3	30 3/4	1 3/8	24

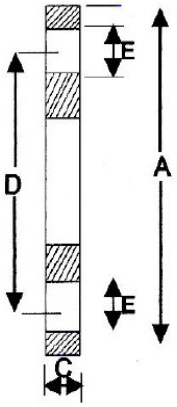
SLIP ON



BLIND

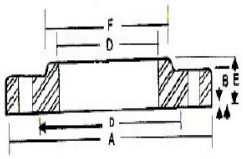


SCREWED



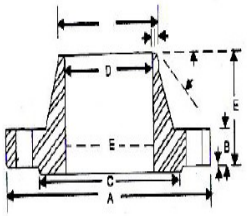
DIMENSIONAL TOLERANCES FOR FORGED STEEL FLANGES

Threaded, lap joint, slip-on and Blind Flanges
ANSI B 16.5



Outside Diameter (A)	When O.D. is 24" or less	±1/16"*	Outside Dia. of Hub (F)	12" and smaller +3/32"*-1/16"*
	When 0. D is over 24"	± 1/8"*		Over 12" ± 1/8"*
Inside Diameter (D)	Threaded	Within limits on Boring gauge	Drilling	Bolt Circle ± 1/16*
				Bolt hole spacing ±1/32*
	Slip on and Lap Joint	10" and smaller + 1/32", -0" 12" and larger + 1/16"-0"		Eccentricity between 2 ½" and smaller bolt circle diameter 1/32" Max. and machined facing 3" and larger Diameter 1/16" Max.
Diameter of Contact Face (C)	1/16 Raised Face	±1/32"	Overall Height (E)	On flanges 18" and smaller +1/8"*-1/32"*
				On flanges larger than 13" +3/15"*-1/16"*
	1/4 Raised Face, Tongue and Groove of male and Female	± 1/64"		13" and smaller 41/8"-0"
			Thickness (E)	Over 18" + 3/16"-0"
Diameter of Counter bore	Same as for inside diameter			Where allowance has been left On face for finish: All sizes + 1/8"*-1/16"*

Welding neck flanges
ANSI B 16.5

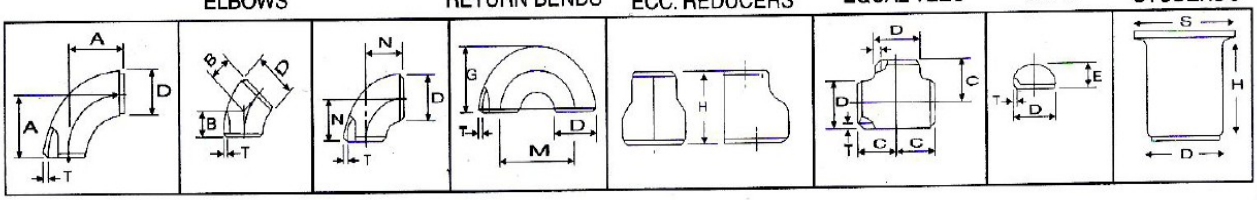


This tolerance not covered by
ANSI B 16.5

Outside Diameter (A)	When O. D. is 24: or less	± 1/16"*	Drilling	Bolt Circle ± 1/16"
	When O. D. is over 24"	± 1/8"*		Bolt hole spacing ± 1/32"
smaller Inside Diameter (D)	10" and smaller	± 1/32"		Eccentricity between ½" and smaller2½" and bolt circle diameter 1/32" max and machined facing 3" and larger diameter 1/16" max
	12" to 18"	± 1/16		
	Over 18"	+ 1/8-1/16"	Width of Land	All sizes ± 1/32"
Diameter of Contact Face (C)	1/16" Raised Face	± 1/32"	Angle of Hub Bevel	All Sizes ± 2½"
	1/4" Raised face, Tongue and Groove, or Male and Female	± 1/64"		18" and smaller ± 1/16
Diameter of Hub at Point of Welding (G)	5" and smaller	+3/32"-1/32"	Overall Height (E)	12" and larger ± ± 1/8"
				10" and smaller + 1/8"-0"
	5" and larger	+5/32"-1/32	Thickness (E)	Over 18" + 3/16"-0"
Diameter of Hub at Base (F)	When "F" is 24" and smaller	± 1/8"*		Where allowance has been left on face for Finish, All size +1/8"*-1/16"*
	When "F" is over 24"	± 1/8		

BUTT WELDING FITTINGS ANSI B 16.9

ELBOWS | RETURN BENDS | CONC AND ECC. REDUCERS | EQUAL TEES | CAPS | SHORT STUBENDS



BUTT WELDING PIPE FITTING DIMENSIONAL STANDARD ANSI B-16.9, B-16.28 & MSS SP 43

Nominal Paper Size		Outside Di. Center to Face			Back to Face				Center to Center			Dia fo Lap & Length		
			B16.9			B16.28	B16.9		B16.28	B16.9	B16.28	ALL	MSSSP43	B16.9
Inch.	mm	D	A	B	C	N	E	F	G	R	M	S	L	L
1/2	15	21.3	19.05	7.94	25.4	_	25.4	47.63	_	76.2		34.93	50.8	76.2
3/4	20	26.7	28.58	14.29	28.58	_	25.4	42.86	_	57.15		42.86	50.8	76.2
1	25	33.4	38.1	22.23	38.1	25.4	38.1	55.56	41.28	76.2	50.8	50.8	50.8	101.6
1.1/4	32	42.2	47.63	25.4	47.63	31.75	38.1	69.85	52.39	95.25	63.5	63.5	50.8	101.6
1.1/2	40	48.3	57.15	28.53	57.15	38.1	38.1	82.55	61.91	114.3	76.2	73.2	50.8	101.6
2	50	60.3	76.2	34.93	63.5	50.8	38.1	106.36	80.96	152.4	101.6	92.08	63.5	152.4
2.1/2	65	73	95.25	44.45	76.2	63.5	38.1	131.76	100.01	190.5	127	104.78	63.5	152.4
3	80	88.9	114.3	50.8	85.73	76.2	50.8	158.75	120.65	228.6	152.4	127	63.5	152.4
3.1/2	90	1016	133.35	57.15	95.25	88.9	63.5	184.15	139.7	266.7	177.8	139.7	76.2	152.4
4	100	114.3	152.4	63.5	104.78	101.6	63.5	209.55	158.75	304.8	203.2	157.16	76.2	152.4
5	125	141.3	190.5	79.37	123.83	127	76.2	261.94	196.85	381	254	185.74	76.2	203.2
6	150	168.3	228.6	95.25	142.88	152.4	88.9	312.74	236.54	457.2	304.8	215.9	88.9	203.2
8	200	219.1	304.8	127	177.8	203.2	101	414.34	312.74	609.6	406.4	269.88	101.6	203.2
10	250	273.1	381	158.7	215.9	254	127	514.53	390.53	762	508	323.85	127	254
12	300	323.9	457.2	190.5	254	304.8	152.4	619.13	466.73	914.4	609.5	381	152.4	254
14	350	355.6	533.4	222.25	279.4	355.6	165.1	711.2	533.4	1066.8	711.2	412.75	152.4	304.8
16	400	406.4	609.6	254	304.8	406.4	177.8	812.8	609.8	1219.2	812.8	469.9	152.4	304.8
18	450	457.2	685.8	285.75	342.9	457.2	203.2	914.4	685.8	1371.6	914.4	533.4	152.4	304.8
20	500	508	762	317.5	381	508	228.6	1016	762	1524	1016	584.2	152.4	304.8
22	550	559	838.2	342.9	419.1	558.8	254	1117.6	838.2	1676.4	1117	692.15	152.4	304.8
24	600	610	914.4	381	431.8	609.6	266.7	1219.2	914.4	1828.8	1219.2	692.15	152.4	304.8
26	650	660	990.6	406.4	495.3	_	266.7							
28	700	711	1066.8	438.15	520.7	_	266.7							
30	750	762	1143	469.9	588.8	_	266.7							
32	800	813	1219.2	501.65	596.9	_	266.7							
34	850	864	1295.4	533.4	635	_	266.7							
36	900	914	1371.6	565.15	673.1	_	266.7							
38	950	965	1447.8	600.08	711.2	_	304.8							
40	1000	1016	1524	631.83	749.3	_	304.8							
42	1050	1067	1600.2	660.4	762	_	304.8							
44	1100	1118	1676.4	695.33	812.8	_	342.9							
46	1150	1168	1752.6	727.09	850.9	_	342.9							
48	1200	1219	1828.8	758.83	889	_	342.9							

TABLE TOLERANCES (ANSI B 16.9)

All Fittings				90 deg. and 45 deg. elbows and Tees	Reducers & Lap Joints Stub Ends	Caps	180 deg Returns			Lap Joint Stub Ends		
Nominal Pipe size (NPS)	Outside Diameter at Bewel (1), (2) D	Inside diameter at End (1), (2), (3)	Wall Thickness (3)	Center to end Dimension A,B,C,M	Center to Overall Length F,H	Overall Length E	Center to Center Dimension O	Back to Face Dimension K	Alignment of ends U	Outside Diameter of Lap G	Fillet Radius of Lap R	Outside Diameter of Barrel
1/2 to 2/12	1	0.8	Not Less than 87.5% of nominal thickness	2	2	4	7	7	1	+0.1	+0-1	See Table 7 for limiting dimentsions
3 to 3/12	1	1.6		2	2	4	7	7	1	+0-1	+0-1	
4	+2 -1	1.6		2	2	4	7	7	1	+0-1	+0.1	
5 to 6	-3 -1	1.6		2	2	7	7	7	1	+0-1	+0.2	
8	+4 -3	1.6		2	2	7	7	7	1	+0-1	+0-2	
10	+4 -3	3.2		2	2	7	10	7	2	+0.2	+0-2	
12 to 18	+4 -3	3.2		2	2	7	10	7	2	+0-2	+0-2	
20 to 24	+6 -5	4.8		3	3	7	10	7	2	+0-2	+0-2	
26 to 30	+7 -5	4.8		3	3	10	--	--	--	--	--	
32 to 48	+7 -5	4.8		5	5	10	--	--	--	--	--	

Nominal Pipe Size (NPS)	Angularity - Tall	
	Off Angle Q	Off Plane P
1/2 to4	1	2
5to 8	2	4
10 to 12	3	5
14 to 16	3	7
18 to 24	4	10
26 to 30	5	10
32 to 42	5	13
44 to 48	5	20

GENERAL NOTE : Dimensions are in millimeters (expect NPS) tolerances are equal plus minus except as noted.

NOTES :

1) Out of round is the sum of absolute values of plus and minus tolerance.
2) This tolerance may be exceed in localized area of formed fittings where increased wall thickness is required to meet design require ments of para 2.2.
3) The inside diameter and the nominal wall thickness at ends are to be specified by the purchaser.
4) Unless otherwise specified by the purchaser, these tolerances apply to the nominal inside diameter, which equals the diffearence between the nominal outside diameter and twice the nominal wall thickness.