

HIGH GRADE PIPE FITTINGS

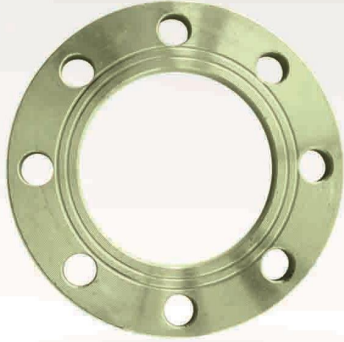


RISER

PT. SUMBER BAJA MURNI

Jln. Hayam Wuruk No.127 LTC Lt. Semi Basement Blok A1 No.29
Tamansari, Kota Jakarta Barat, Jakarta 11180 - Indonesia





HIGH GRADE PIPE FITTINGS

90° Elbow (Long)
90° Elbow (Short)
45° Elbow
Cap

Reducer (Concentric)
Reducer (Eccentric)
Equal (Tee)
T (Reducing)

SORF Flange
Plate Flange
Blind Flange
Welding Neck



HIGH GRADE PIPE FITTINGS



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90° Elbow (Long)	Reducer (Concentric)	SORF Flange
90° Elbow (Short)	Reducer (Eccentric)	Plate Flange
45° Elbow	Equal (Tee)	Blind Flange
Cap	T (Reducing)	Welding Neck





High Quality Flanges & Fittings

Sebagai salah satu produsen terbaik untuk stainless steel flanges dan fittings, kami menyediakan flange dan fitting dengan kualitas terbaik kepada pelanggan kami di berbagai industri, serta telah mendapatkan reputasi yang sangat baik dari para customer. Visi kami adalah menjadi "Pemimpin produsen untuk flanges dan fittings di wilayah Indonesia. Perusahaan telah menginvestasikan sejumlah dana yang cukup besar demi pengembangan dan inovasi produk.

Saat ini, kami telah mengembangkan jenis produk yang lebih banyak dan ukuran yang lebih lengkap. Di tengah pengembangan mutu yang selalu dijalani, kami terus berusaha menuju kesempurnaan untuk memberikan kualitas flanges & fittings yang terbaik bagi para customer.

Produk yang kami jual merupakan salah satu rangkaian pelengkap instansi suatu proyek yang meliputi Plumbing, Fire Fighting, Air Conditioning, Clean Water, Water Treatment, dan sebagainya. Umumnya produk kami dapat digunakan untuk perusahaan penghasil minyak dan gas bumi, apartemen, sekolah, gedung perkantoran, mall, hotel, rumah sakit, rumah pribadi, pabrik, dan lain-lain. Sasaran pemasaran produk kami adalah kontraktor, pabrik, dan toko-toko yang bergerak dalam bidang teknik mekanik.

Kami berkomitmen untuk menyediakan kualitas produk yang terbaik serta pengiriman tepat waktu. Mengejar kepuasan pelanggan tertinggi adalah misi kami. Sekarang ini, Riser Flanges & Fittings sedang menghadapi tantangan baru, yakni pengembangan produk yang lebih berkualitas dan memperluas bisnis kami ke pasar global.

Kepuasan customer menjadi motivasi dan penghargaan bagi kami untuk selalu berusaha memberikan layanan profesional dan produk-produk bermutu. Kami selalu siap memberi pelayanan yang maksimal terhadap setiap kebutuhan klien dan pada akhirnya selalu mendapat kepercayaan klien atas kepuasan pelayanan yang telah kami berikan. Karena pada dasarnya, kepuasan klien lah yang menjadi penghargaan terbesar dan motivasi bagi kami untuk selalu berusaha memberikan yang terbaik.

Kami memiliki misi utama yakni melayani customer dengan tingkat kepuasan terbaik. Untuk mencapai pengembangan perusahaan agar menjadi distributor berskala besar di pasar dalam negeri maupun di pasar internasional dalam bidang pemipaan. Di bawah ini terdapat beberapa project reference yang menjadi portfolio kami dalam menyuplai sistem pemipaan.



“ Kami menyediakan flange dan fitting dengan kualitas terbaik kepada pelanggan kami di berbagai industri, guna mendukung pembangunan Indonesia sebagai salah satu negara berkembang ”



Kami melewati beberapa sistem manajemen mutu yang dijalani untuk menjamin semua proses produksi telah dikendalikan, memastikan bahwa semua bahan yang digunakan dapat dilacak dan hanya produk yang berkualitas terbaik yang diserahkan kepada customer.

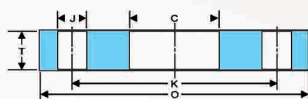
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No.	Project	Location	Year
1	Pabrik Pembuat Panel	Surabaya	2011
2	Apartemen Margonda Residence III	Depok	2011
3	Apartemen DR	Surabaya	2011
4	Hotel Hegar Sari	Bandung	2011
5	Hotel Amaris Cihampelas	Bandung	2011
6	Pabrik Novell	Jakarta	2012
7	Rumah Dinas Papua	Papua	2012
8	PD. Viking Protekindo	Jakarta	2012
9	Hotel Citadin Tahap I	Bali	2012
10	Hotel Citadin Tahap II	Bali	2012
11	Universitas Negeri(UNNAS)	Semarang	2012
12	Rumah Sakit Tugu Rejo	Semarang	2012
13	Bogor Trade Mall	Bogor	2012
14	Hotel Harmoni	Tasikmalaya	2012
15	Hotel Fave	Bandung	2012
16	Hotel Dadap	Jakarta	2012
17	Kantor Diklat Depnakers	Lombok	2012
18	UNS	Solo	2012
19	UNNES Kolam Renang	Semarang	2012
20	Siloam Hospital Bali	Bali	2012
21	Hotel Sultan Raja	Cirebon	2012
22	Gedung DPRD Bandung	Bandung	2012
23	Askes Kediri	Kediri	2012
24	Q - Hotel	Bali	2012
25	Aveda Hotel	Bali	2012
26	Hotel Grand Namaste	Bali	2012
27	PDAM Karangasem	Bali	2012
28	Apartement Pancoran Riverside	Jakarta	2012

No.	Project	Location	Year
29	Scientia Office Park I	Serpong	2012
30	Hotel Lorin Bali	Bali	2012
31	Hotel Sutan Raja	Jakarta	2012
32	Bank Permata Hayam Wuruk	Jakarta	2012
33	Kemang Village Infinity	Jakarta	2012
34	Pondok Ungu Bekasi	Jakarta	2012
35	Pembangunan BLKI	Lombok	2012
36	Scientia Office Park II	Serpong	2013
37	Al-Azhar International School	Bekasi	2013
38	Spring Sport Club	Serpong	2013
39	All Season Hotel	Jakarta	2013
40	Sampoerna Strategic	Jakarta	2013
41	Scientia Office Park III	Serpong	2013
42	Gaung OSBL	Lampung	2013
43	Aston TB Simatupang	Jakarta	2014
44	Fave Hotel Puri Indah	Jakarta	2014
45	Pahoa School	Serpong	2014
46	Hotel Widya Loka	Bandung	2014
47	Hotel Daffam Lampung	Lampung	2014
48	Hotel Neo	Bali	2014
49	Hotel Harper	Makassar	2014
50	Hotel Ara	Lampung	2014
51	Hotel Aston Simatupang	Jakarta	2014
52	Daya Grand Square Mall	Makassar	2014
53	Kinocare	Cikande	2014
54	Hotel Grace	Makassar	2014
55	The Sidji Hotel	Pekalongan	2014
56	Marunda Refinery	Jakarta	2014



Mild Steel Flanges 5K

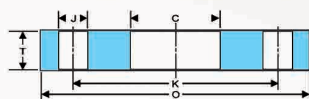
JIS - 5k Plate Flange (5kg/cm ²)								Unit mm
Nominal Pipe Size		Outer Diameter O (mm)	Internal Diameter C (mm)	Thickness T (mm)	Number of bolt holes	Diameter of bolt holes J (mm)	Diameter of bolt Circle K (mm)	Bolt
(mm)	(in)							
15	1/2	80	22.2	9	4	12	60	M 10
20	3/4	85	27.7	10	4	12	65	M 10
25	1	95	34.5	10	4	12	75	M 10
32	1 1/4	115	43.2	12	4	15	90	M 12
40	1 1/2	120	49.1	12	4	15	95	M 12
50	2	130	61.1	14	4	15	105	M 12
65	2 1/2	155	77.1	14	4	15	130	M 12
80	3	180	90.0	14	4	19	145	M 16
100	4	200	115.4	16	8	19	165	M 16
125	5	235	141.2	16	8	19	200	M 16
150	6	265	166.6	18	8	19	230	M 16
200	8	320	218.0	20	8	23	280	M 20
250	10	385	269.5	22	12	23	345	M 20
300	12	430	321.0	22	12	23	390	M 20
350	14	480	358.1	24	12	25	435	M 22
400	16	540	409.0	24	16	25	495	M 22
450	18	605	460.0	24	16	25	555	M 22
500	20	655	511.0	24	20	25	605	M 22
600	24	770	613.0	26	20	27	715	M 24

Mild Steel Flanges 10K

Plate & Blind Flange JIS-10K (STD & N.S) (10kg/cm ²)								Unit mm	
Nominal Pipe Size		Outer Diameter O (mm)	Internal Diameter C (mm)	Thickness T (mm)		Number of bolt holes	Diameter of bolt holes J (mm)	Diameter of bolt Circle K (mm)	Bolt
(mm)	(in)			STD	N.S				
15	1/2	95	22.2	12	9	4	15	70	M 12
20	3/4	100	27.2	14	10	4	15	75	M 12
25	1	125	34.5	14	10	4	19	90	M 16
32	1 1/4	135	43.2	16	12	4	19	100	M 16
40	1 1/2	140	49.1	16	16	4	19	105	M 16
50	2	155	61.1	16	14	4	19	120	M 16
65	2 1/2	175	77.1	18	14	4	19	140	M 16
80	3	185	90.0	18	14	8	19	150	M 16
100	4	210	115.4	18	16	8	19	175	M 16
125	5	250	141.2	20	16	8	23	210	M 20
150	6	280	166.6	22	18	8	23	240	M 20
200	8	330	218.0	22	20	12	23	290	M 20
250	10	400	269.5	24	22	12	25	355	M 20
300	12	445	321.0	24	22	16	25	400	M 22
350	14	490	358.1	26	24	16	25	445	M 22
400	16	560	409.0	28	24	16	27	510	M 24
450	18	620	460.0	30	24	20	27	565	M 24
500	20	675	511.0	30	24	20	27	620	M 24
600	24	795	613.0	32	26	24	33	730	M 30

Forged Steel Flanges 16K, 20K

Plate & Blind Flange JIS-10K (STD & N.S) (10kg/cm ²)								Unit mm	
Nominal Pipe Size		Outer Diameter O (mm)	Internal Diameter C (mm)	Thickness T (mm)		Number of bolt holes	Diameter of bolt holes J (mm)	Diameter of bolt Circle K (mm)	Bolt
(mm)	(in)			JIS-16k	JIS-20k				
15	1/2	95	22.2	12	14	4	15	70	M 12
20	3/4	100	27.2	14	16	4	15	75	M 12
25	1	125	34.5	14	16	4	19	90	M 16
32	1 1/4	135	43.2	16	18	4	19	100	M 16
40	1 1/2	140	49.1	16	18	8	19	105	M 16
50	2	155	61.1	16	18	8	19	120	M 16
65	2 1/2	175	77.1	18	20	8	19	140	M 16
80	3	185	90.0	20	22	8	23	160	M 20
100	4	210	115.4	22	24	8	23	185	M 20
125	5	250	141.2	22	26	8	25	225	M 22
150	6	280	166.6	24	28	12	25	260	M 22
200	8	330	218.0	26	30	12	25	305	M 24
250	10	400	269.5	28	34	12	27	380	M 24
300	12	445	321.0	30	36	16	27	430	M 24
350	14	490	358.1	34	40	16	33	480	M 30
400	16	560	409.0	38	46	16	33	540	M 30
450	18	620	460.0	40	48	20	33	605	M 30
500	20	675	511.0	42	50	20	33	660	M 30
600	24	795	613.0	46	54	24	39	770	M 36



Forged Steel Flanges PN 10

Plate & Blind Flange PN-10								Unit mm
Nominal Pipe Size		Outer Diameter O (mm)	Internal Diameter C (mm)	Thickness T (mm)	Number of bolt holes	Diameter of bolt holes J (mm)	Diameter of bolt Circle K (mm)	Bolt
(mm)	(in)							
15	1/2	95	22.0	14	4	14	65	M 12
20	3/4	105	27.6	16	4	14	75	M 12
25	1	115	34.4	16	4	14	85	M 12
32	1 1/4	140	43.1	16	4	18	100	M 16
40	1 1/2	150	49.0	18	4	18	110	M 16
50	2	165	61.1	20	4	18	125	M 16
65	2 1/2	185	77.1	22	4	18	145	M 16
80	3	200	90.3	22	4,8	18	160	M 16
100	4	220	115.9	24	8	18	180	M 16
125	5	250	144.6	26	8	18	220	M 16
150	6	340	170.5	26	8	22	240	M 20
200	8	385	221.8	26	8	22	295	M 20
250	10	395	276.2	28	12	22	350	M 20
300	12	445	327.6	28	12	22	400	M 20
350	14	505	359.7	30	16	22	460	M 20
400	16	565	411.0	32	16	26	515	M 24
450	18	615	462.3	32	20	26	565	M 24
500	20	670	513.0	34	20	26	620	M 24
600	24	780	613.0	36	20	30	725	M 24

Forged Steel Flanges PN 16

Plate & Blind Flange PN-16								Unit mm
Nominal Pipe Size		Outer Diameter O (mm)	Internal Diameter C (mm)	Thickness T (mm)	Number of bolt holes	Diameter of bolt holes J (mm)	Diameter of bolt Circle K (mm)	Bolt
(mm)	(in)							
15	1/2	95	22.0	14	4	14	65	M 12
20	3/4	105	27.6	16	4	14	75	M 12
25	1	115	34.4	16	4	14	85	M 12
32	1 1/4	140	43.1	16	4	18	100	M 16
40	1 1/2	150	49.0	18	4	18	110	M 16
50	2	165	61.1	20	4	18	125	M 16
65	2 1/2	185	77.1	20	4	18	145	M 16
80	3	200	90.3	22	8	18	160	M 16
100	4	220	115.9	24	8	18	180	M 16
125	5	250	144.6	26	8	18	210	M 16
150	6	285	170.5	26	8	22	240	M 20
200	8	340	221.8	30	12	22	295	M 20
250	10	405	276.2	32	12	26	355	M 24
300	12	460	327.6	32	12	26	410	M 24
350	14	520	359.7	36	16	26	470	M 24
400	16	580	411.0	38	16	30	525	M 27
450	18	640	462.3	40	20	30	585	M 27
500	20	715	513.0	42	20	33	650	M 30
600	24	840	613.0	48	20	36	770	M 33

Forged Steel Flanges PN25

Plate & Blind Flange PN-25 N.P. 25kg/cm								Unit mm
Nominal Pipe Size		Outer Diameter O (mm)	Internal Diameter C (mm)	Thickness T (mm)	Number of bolt holes	Diameter of bolt holes J (mm)	Diameter of bolt Circle K (mm)	Bolt
mm	Inch							
15	1/2	95	22	16	4	14	65	M 12
20	3/4	105	27.6	18	4	14	75	M 12
25	1	115	34.4	18	4	14	85	M 12
32	1 1/4	140	43.10	18	4	18	100	M 16
40	1 1/2	150	49	18	4	18	110	M 16
50	2	165	61.10	20	4	18	125	M 16
65	2 1/2	185	77.10	22	8	18	145	M 16
80	3	200	90.30	24	8	18	160	M 16
100	4	235	115.90	24	8	22	190	M 20
125	5	270	144.60	26	8	26	220	M 24
150	6	300	170.50	28	8	26	250	M 24
200	8	360	221.80	30	12	26	310	M 24
250	10	425	276.20	32	12	30	370	M 27
300	12	485	327.60	34	16	30	430	M 27
350	14	550	359.70	38	16	33	490	M 30
400	16	620	411.0	40	16	36	550	M 33
450	18	-	462.30	-	-	-	-	-
500	20	730	513	44	20	36	660	M 33
600	24	845	613	66	20	39	770	M 36

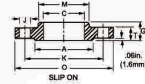
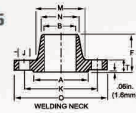
RISER Flanges & Fittings

PRODUCT SPECIFICATIONS



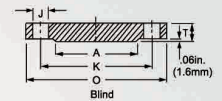
Forged Steel ASTM A-105 ANSI-B16.5

Class 150 Flanges



Forged Steel ASTM A-105 ANSI-B16.5

Class 150 Flanges



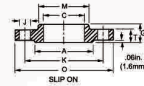
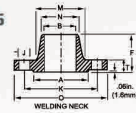
Nominal Size	Flange Outside Diameter	Flange ² Thickness Min.	Raised Face Dia.	Bore			Length Thru Hub 2			Drilling			Diameter Of Hub		Unit mm Bolt		
				Welding Neck & Socket Welding	Slip-On & Socket Weld Socket Min.	Lap Joint Min	Welding Neck	Slip On Threaded & Sock Weld	Lap Joint	No. Of Holes	Dia Of Holes	Dia Of Bolt Circle	Depth ¹ Of Socket	At Base		At Chamfer	
Inch	mm	O	T	A	B ³	C	D	F	G	H		J	K	L	M	N	
1/2	3.50	44	1.38	62	88	90	1.88	62	62	4	62	2.38	38	1.19	84	M 14	
15	89	11.5	34.9	15.8	22.2	22.9	47.6	16	16	4	16	60.3	10	30.2	21.5	M 14	
3/2	3.88	50	16.9	82	1.09	1.11	2.06	62	62	4	62	2.75	44	1.50	1.05	M 14	
20	98	13.0	42.9	20.8	27.8	28.2	52.4	16	16	4	16	69.8	11	38.1	26.6	M 14	
1	4.25	56	2.00	1.05	1.36	1.38	2.19	69	69	4	62	3.13	50	1.94	1.32	M 14	
25	108	14.5	50.8	26.7	34.5	34.9	55.6	17	17	4	16	79.4	13	49.2	33.5	M 14	
1 1/4	4.62	62	2.50	1.38	1.70	1.72	2.25	81	81	4	62	3.50	56	2.31	1.66	M 14	
32	117	16.0	63.5	35.1	43.2	43.7	57.1	21	21	4	16	88.9	14	58.7	42.1	M 14	
1 1/2	500	69	2.88	1.61	1.95	1.97	2.44	88	88	4	62	3.88	62	2.56	1.90	M 14	
40	127	17.5	73.0	40.9	49.5	50.0	61.9	22	22	4	16	98.4	16	65.1	48.3	M 14	
2	600	75	3.62	2.07	2.44	2.46	2.50	1.00	1.00	4	75	4.75	69	3.06	2.38	M 18	
50	152	19.5	92.1	52.6	61.9	62.5	63.5	25	25	4	20	120.6	17	77.6	60.4	M 18	
2 1/2	7.00	88	4.12	2.47	2.94	2.97	2.75	1.12	1.12	4	75	5.50	75	3.56	2.88	M 18	
65	178	22.5	104.8	62.7	74.6	75.4	69.8	29	29	4	20	139.7	19	90.5	73.0	M 18	
3	7.50	94	5.00	3.07	3.57	3.60	2.75	1.19	1.19	4	75	6.00	81	4.25	3.50	M 18	
80	191	24.0	127.0	78.0	90.7	91.4	69.8	30	30	4	20	152.4	21	107.9	88.9	M 18	
3 1/2	8.50	94	5.50	3.55	4.07	4.10	2.81	1.25	1.25	8	75	7.00	-	4.81	4.00	M 18	
90	216	24.0	139.7	90.2	103.4	104.1	71.4	32	32	8	20	177.8	-	122.2	101.6	M 18	
4	9.00	94	6.19	4.03	4.57	4.60	3.00	1.31	1.31	8	75	7.50	-	5.31	4.50	M 18	
100	229	24.0	157.2	102.4	116.1	116.8	76.2	33	33	8	20	190.5	-	134.9	114.3	M 18	
5	10.00	94	7.31	5.05	5.66	5.69	5.30	1.44	1.44	8	88	8.50	-	6.44	5.56	M 20	
125	254	24.0	185.7	128.3	143.7	144.5	88.9	36	36	8	23	215.9	-	163.5	141.3	M 20	
6	11.00	1.00	8.50	6.07	6.72	6.75	3.50	1.56	1.56	8	88	9.50	-	7.56	6.63	M 20	
150	270	25.5	215.9	154.2	170.7	171.4	88.9	40	40	8	23	241.3	-	192.1	168.3	M 20	
8	13.50	1.12	10.62	7.98	8.72	8.75	4.00	1.75	1.75	8	88	11.75	-	9.69	8.63	M 20	
200	343	29.0	269.9	202.7	221.5	222.2	101.6	44	44	8	23	298.4	-	246.1	219.1	M 20	
10	16.00	1.19	12.75	10.02	10.88	10.92	4.00	1.94	1.94	12	100	14.25	-	12.00	10.75	M 24	
250	406	30.5	323.8	254.5	276.2	277.4	101.6	49	49	12	26	361.9	-	304.8	273.0	M 24	
12	19.00	1.25	15.00	12.00	12.88	12.92	4.50	2.19	2.19	12	100	17.00	-	14.38	12.75	M 24	
300	483	32.0	381.0	304.8	327.0	328.2	114.3	56	56	12	26	431.8	-	365.1	323.8	M 24	
14	21.00	1.38	16.25	To be	14.14	14.18	5.00	2.25	3.12	12	1.12	18.75	-	15.75	14.00	M 27	
350	535	35.0	412.8	Specified	359.2	360.2	127.0	57	79	12	29	476.2	-	40.00	355.6	M 27	
16	23.50	1.44	18.50	by	16.16	16.19	5.00	2.50	3.44	16	1.12	21.25	-	18.00	16.00	M 27	
400	595	37.00	469.9	Purchaser	410.4	411.2	127.0	64	87	16	29	539.7	-	457.2	406.4	M 27	
18	25.00	1.56	21.00		18.18	18.20	5.50	2.69	3.81	16	1.25	22.75	-	19.88	18.00	M 30	
450	635	40.0	533.4		461.8	462.3	139.7	68	97	16	32	577.8	-	504.8	457.2	M 30	
20	27.50	1.69	23.00		20.20	20.25	5.69	2.88	4.06	20	1.25	25.00	-	22.00	20.00	M 30	
500	700	43.0	584.2		513.1	514.3	144.5	73	103	20	32	635.0	-	558.8	508.0	M 30	
24	32.00	1.88	27.25		24.25	24.25	6.00	3.25	4.38	20	1.38	29.50	-	26.12	24.00	M 33	
600	815	48.0	692.2		615.9	615.9	152.4	83	111	20	35	749.3	-	663.6	609.6	M 33	

RISER Flanges & Fittings

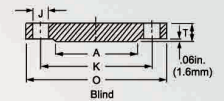
PRODUCT SPECIFICATIONS



Forged Steel ASTM A-105 ANSI-B16.5 Class 300 Flanges



Forged Steel ASTM A-105 ANSI-B16.5 Class 300 Flanges



Nominal Size	Flange Outside Diameter	Flange ² Thickness Min.	Raised Face Dia.	Bore			Length Thru Hub 2		Drilling				Diameter Of Hub		Unit mm Bolt
				Welding Neck & Socket Welding	Slip-On & Socket Weld Socket Min.	Lap Joint Min	Welding Neck	Slip On Threaded & Sock Weld	No. Of Holes	Dia Of Holes	Dia Of Bolt Circle	Depth ¹ Of Socket	At Base	At Chamfer	
	O	T	A	B ³	C	E	F	G		J	K	L	M	N	
1/2	3.75	56	1.38	62	88	93	1.88	88	4	62	2.38	38	1.19	84	M 14
15	95	14.5	34.9	15.8	22.2	23.5	47.6	22	4	16	60.3	10	30.2	21.5	M 14
3/2	4.62	62	1.69	82	1.09	1.14	2.06	1.00	4	62	2.75	44	1.50	1.05	M 18
20	117	16.0	42.9	20.8	27.8	29.0	52.4	25	4	16	69.8	11	38.1	26.6	M 18
1	4.88	69	2.00	1.05	1.36	1.41	2.19	1.06	4	62	3.13	50	1.94	1.32	M 18
25	124	17.5	50.8	26.6	34.5	36.0	55.6	27	4	16	79.4	13	49.2	33.5	M 18
1 1/4	5.25	75	2.50	1.38	1.70	1.75	2.25	1.06	4	62	3.50	56	2.31	1.66	M 18
32	133	19.5	63.5	35.1	43.3	44.5	57.1	27	4	16	88.9	14	58.7	42.1	M 18
1 1/2	6.12	81	2.88	1.61	1.95	1.99	2.44	1.19	4	62	3.88	62	2.56	1.90	M 18
40	156	21.0	73.0	40.9	49.6	50.5	61.9	30	4	16	98.4	16	65.1	48.3	M 18
2	6.50	88	3.62	2.07	2.44	2.50	2.50	1.31	4	75	4.75	69	3.06	2.38	M 18
50	165	22.5	92.1	52.6	61.9	63.5	63.5	33	4	20	120.6	17	77.6	60.4	M 18
2 1/2	7.50	1.00	4.12	2.47	2.94	3.00	2.75	1.50	4	75	5.50	75	3.56	2.88	M 20
65	191	25.5	104.8	62.7	74.6	76	69.8	38	4	20	139.7	19	90.5	73.0	M 20
3	8.25	1.12	5.00	3.07	3.57	3.63	2.75	1.69	4	75	6.00	81	4.25	3.50	M 20
80	210	29.0	127.0	77.9	90.7	92	69.8	43	4	20	152.4	21	107.9	88.9	M 20
3 1/2	9.0	1.19	5.50	3.55	4.07	4.13	2.81	1.75	8	75	7.00	-	4.81	4.00	M 20
90	229	30.5	139.7	90.1	103.4	105	71.4	44	8	20	177.8	-	122.2	101.6	M 20
4	10.0	1.25	6.19	4.03	4.57	4.63	3.00	1.88	8	75	7.50	-	5.31	4.50	M 20
100	254	32.0	157.2	102.3	116.1	118	76.2	48	8	20	190.5	-	134.9	114.3	M 20
5	11.0	1.38	7.31	5.05	5.66	5.69	5.30	2.00	8	88	8.50	-	6.44	5.56	M 20
125	279	35.0	185.7	128.2	143.7	145	88.9	51	8	23	215.9	-	163.5	141.3	M 20
6	12.5	1.44	8.50	6.07	6.72	6.75	3.50	2.06	8	88	9.50	-	7.56	6.63	M 20
150	318	37.0	215.9	154.1	170.7	171	88.9	52	8	23	241.3	-	192.1	168.3	M 20
8	15.0	1.62	10.62	7.98	8.72	8.75	4.00	2.44	8	88	11.75	-	9.69	8.63	M 24
200	381	41.5	269.9	202.7	221.5	222	101.6	62	8	23	298.4	-	246.1	219.1	M 24
10	17.5	1.88	12.75	10.02	10.88	10.88	4.00	2.62	12	1.00	14.25	-	12.00	10.75	M 27
250	445	48.0	323.8	254.5	276.2	276	101.6	67	12	26	361.9	-	304.8	273.0	M 27
12	20.5	2.00	15.00	12.00	12.88	12.94	4.50	2.88	12	1.00	17.00	-	14.38	12.75	M 30
300	520	51.0	381.0	304.8	327.0	329	114.3	73	12	26	431.8	-	365.1	323.8	M 30
14	23.0	2.12	16.25	To be	14.14	14.19	5.00	3.00	12	1.12	18.75	-	15.75	14.00	M 30
350	585	54.0	412.8	Specified	359.2	360	127.0	76	12	29	476.2	-	40.00	355.6	M 30
16	25.5	2.25	18.50	by	16.16	16.19	5.00	3.25	16	1.12	21.25	-	18.00	16.00	M 32
400	650	57.5	469.9	Purchaser	410.4	411	127.0	83	16	29	539.7	-	457.2	406.4	M 32
18	28.0	2.38	21.00		18.18	18.19	5.50	3.50	16	1.25	22.75	-	19.88	18.00	M 32
450	710	60.5	533.4		461.8	462	139.7	88	16	32	577.8	-	504.8	457.2	M 32
20	30.5	2.50	23.00		20.20	20.19	5.69	3.75	20	1.25	25.00	-	22.00	20.00	M 32
500	775	63.5	584.2		513.1	513	144.5	95	20	32	635.0	-	558.8	508.0	M 32
24	36.0	2.75	27.25		24.25	24.19	6.00	4.19	20	1.38	29.50	-	26.12	24.00	M 40
600	915	70.0	692.2		615.9	614	152.4	106	20	35	749.3	-	663.6	609.6	M 40

MATERIAL SPECIFICATIONS FOR BUTT-WELDING FITTING (ASTM)

ASTM A234/A234M-00a

Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

Grade	Composition, %										
	C	Mn	P	S	Si	Cr	Mo	Ni	Cu	V	Nb
WPB(1)(2)(3)(4)	0.30	0.29-1.06	0.050	0.058	0.10	0.40	0.15	0.40	0.40	0.08	0.02
WPB(1)(2)(3)(4)	0.35	0.29-1.06	0.050	0.058	0.10	0.40	0.15	0.40	0.40	0.08	0.02
WP11CL1	0.05-0.15	0.30-0.60	0.030	0.030	0.50-1.00	1.00-1.50	0.44-0.65	-	-	-	-
WP11CL2	0.05-0.20	0.30-0.80	0.040	0.040	0.50-1.0	1.00-1.50	0.44-0.65	-	-	-	-
WP11CL3											

GENERAL NOTE:

All values are maximum unless otherwise indicated, NOTES:

(1) For each reduction of 0.01% below the specified C maximum, an increase

of 0.06% Mn above the specified maximum will be permitted, up to a

(3) The sum of Cr and Mo shall not exceed 0.32%.

(4) The maximum carbon equivalent (C.E.) shall be 0.50, based on heat

Tensile Requirements	WPB	WPC, WP11CL2	WP11CL1	WP11CL3
Tensile Strength, min, ksi[MPa]	60-85	70-95	60-85	75-100
(0.2% offset or 0.5% Extension under-load)	[415-585]	[485-655]	[415-585]	[520-690]
Yield Strength, min, ksi[MPa]	32	40	30	45
	[240]	[275]	[205]	[310]

	Wall Thickness		Elongation Requirements	
	in	mm	Longitudinal	Transverse
Standard round specimen, or small proportional specimen, min% in 4D			22	14
Rectangular Specimen for wall thickness 0.312in [7.94mm] and over, and for all small sizes tested in	≥ 0.312	≥ 7.94	30	20
Rectangular Specimen for wall thickness less than 0.312in [7.94mm], min% in 2 in [50mm] (0.5in	0.281	7.14	28.5	19
	0.250	6.35	27.0	18
	0.219	5.56	25.5	-
	0.188	4.76	24.0	-
	0.156	3.97	22.5	-
	0.125	3.17	21.0	-
	0.094	2.38	19.5	-
0.062	1.59	18.0	-	

Where the wall thickness lies between two values above, the min elongation value is determined by the following equations:

$$\text{Longitudinal } E = 48t + 15.00$$

$$\text{Transverse } E = 32t + 10.00$$

$$E = \text{elongation in } 2\text{in [50mm], \%}$$

$$t = \text{actual thickness of specimen, in[mm].}$$

MATERIAL SPECIFICATIONS FOR BUTT-WELDING FITTING (JIS dan DIN)

JIS B2311 Steel Butt-Welding Pipe Fittings for Ordinary Use

JIS G3452 Carbon Steel Pipes for Ordinary Piping

JIS G3457 Arc Welded Carbon Steel Pipes

Steel Grade	Chemical Composition %			Tensile	Yield	Elongation%(1)	
	C	P	S	Strength	Point	Longitudinal	Transverse
	Max			N/mm ² Min			
SGP	-	0.040	0.040	290	-	30(2)	25(2)
PY400	0.25	0.040	0.040	400	255	-	18

Notes :

- (1) The Minimum Si content is allowed to fall below 0.10% when the steel is aluminium-killed or vacuum-deoxidized.
- (2) A content in excess of the maximum value stated is permitted if a P content less than the maximum specified by 0.005% P per 0.001% N is observed. However the N content shall not exceed a value of 0.012% in the case analysis and 0.014% in the product analysis.
- (3) The specified value does not apply if the steels are supplied with the RR (instead of R) type of deoxidization.

R=killed, including semi-killed / RR=fully killed.

Amounts by which the chemical composition in the product/sample analysis may deviate from the limiting values applicable to the cast analysis.

Element	St 37.0 Allowable Deviation Amount %	St 35.8	
		Limits Quoted in Cast Analysis	Allowable Deviation Amount(2)%
C	0.02	≤ 0.24	± 0.02
Si	-	≤ 0.35	± 0.03
Mn	-	≤ 1.00	± 0.04
P	0.010	≤ 0.040	± 0.010
S	0.010	≤ 0.040	± 0.010
N	0.001(1)	-	-

Notes :

- (1) A content in excess of the maximum value stated is permitted if a P content less than the maximum specified by 0.0005% P per 0.001% N is observed. However the N content shall not exceed a value of 0.012% in the case analysis and 0.014% in the product analysis (this does not apply to the RR type of deoxidization).
- (2) In a cast the deviation of an element in a sample analysis is permitted to be below the minimum value or only above the maximum value of the range stipulated for the cast analysis, though not both at the same time.

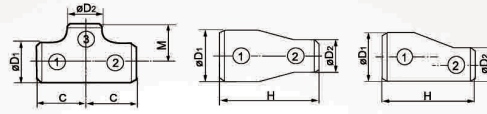
Steel Grade Symbol	Upper Yield Stress ReH for Wall Thicknesses, in mm			Tensile Strength Rm	Elongation after Fracture A5		Impact Strength Transverse Min J
	ReH 16 ≤	16<ReH 40 ≤	40<ReH 60 ≤		Longitudinal	Transverse	
	Min N/mm ²				Min%		
St 37.0	235	225	215	350(1)-480	25	23	-
St 35.8	235	225	215	360-480	25	23	34

Note:

(1) For cold finished tubes in the NB K condition, minimum values of tensile strength lower than this value by 10N/mm² is permitted.

Steel Butt-Welding Pipe Fittings (JIS)

Reducing Tees, Concentric & Eccentric Reducers



JIS B2311

Nominal Pipe Size(NPS)		Outside Diameter		Reducing Tees		Reducers
A	B	D1	D2	Center-to-End	M	End-to-End
A	B	D1	D2	C	M	H
20 x 15	3/4 x 1/2	27.2	21.7	28.6	28.6	38.1
25 x 20	1 x 3/4	34.0	27.2	38.1	38.1	50.8
25 x 15	1 x 1/2	34.0	21.7	38.1	38.1	50.8
32 x 25	1 1/4 x 1	42.7	34.0	47.6	47.6	50.8
32 x 20	1 1/4 x 3/4	42.7	27.2	47.6	47.6	50.8
32 x 15	1 1/4 x 1/2	42.7	21.7	47.6	47.6	50.8
40 x 32	1 1/2 x 1 1/4	48.6	42.7	57.2	57.2	63.5
40 x 25	1 1/2 x 1	48.6	34.0	57.2	57.2	63.5
40 x 20	1 1/4 x 3/4	48.6	27.2	57.2	57.2	63.5
50 x 40	2 x 1 1/2	60.5	48.6	63.5	60.3	76.2
50 x 32	2 x 1 1/4	60.5	42.7	63.5	57.2	76.2
50 x 25	2 x 1	60.5	34.0	63.5	50.8	76.2
50 x 20	2 x 3/4	60.5	27.2	63.5	44.5	76.2
65 x 50	2 1/2 x 2	76.3	60.5	76.2	69.9	88.9
65 x 40	2 1/2 x 1 1/2	76.3	48.6	76.2	66.7	88.9
65 x 32	2 1/2 x 1 1/4	76.3	42.7	76.2	63.5	88.9
65 x 25	2 1/2 x 1	76.3	34.0	76.2	57.2	88.9
80 x 65	3 x 2 1/2	89.1	76.3	85.7	82.6	88.9
80 x 50	3 x 2	89.1	60.5	85.7	76.2	88.9
80 x 40	3 x 1 1/2	89.1	48.6	85.7	73.0	88.9
80 x 32	3 x 1 1/4	89.1	42.7	85.7	69.9	88.9
100 x 80	4 x 3	114.3	89.1	104.8	98.4	101.6
100 x 65	4 x 2 1/2	114.3	76.3	104.8	95.3	101.6
100 x 50	4 x 2	114.3	60.5	104.8	88.9	101.6
100 x 40	4 x 1 1/2	114.3	48.6	104.8	85.7	101.6
125 x 100	5 x 4	139.8	114.3	123.8	117.5	127.0
125 x 80	5 x 3	139.8	89.1	123.8	111.1	127.0
125 x 65	5 x 2 1/2	139.8	76.3	123.8	108.0	127.0
125 x 50	5 x 2	139.8	60.5	123.8	104.8	127.0
150 x 125	6 x 5	165.2	139.8	142.9	136.5	139.7
150 x 100	6 x 4	165.2	114.3	142.9	130.2	139.7
150 x 80	6 x 4	165.2	89.1	142.9	123.8	139.7
150 x 85	6 x 2 1/2	165.2	76.3	142.9	120.7	139.7
200 x 150	6 x 6	216.3	165.2	177.8	168.3	152.4
200 x 125	8 x 5	216.3	139.8	177.8	161.9	152.4
200 x 100	8 x 4	216.3	114.3	177.8	155.6	152.4
200 x 80	8 x 3	216.3	89.1	177.8	152.4	152.4
250 x 200	10 x 8	267.4	216.3	215.9	203.2	177.8
250 x 150	10 x 6	267.4	165.2	215.9	193.7	177.8
250 x 125	10 x 5	267.4	139.8	215.9	190.5	177.8
250 x 100	10 x 4	267.4	114.3	215.9	184.2	177.8
300 x 250	12 x 10	318.5	267.4	254.0	241.3	203.2
300 x 200	12 x 8	318.5	216.3	254.0	228.6	203.2

Nominal Pipe Size(NPS)		Outside Diameter		Reducing Tees		Reducers
A	B	D1	D2	Center-to-End	M	End-to-End
A	B	D1	D2	C	M	H
300 x 150	12 x 6	318.5	165.2	254.0	29.1	203.2
300 x 125	12 x 5	318.5	139.8	254.0	215.9	203.2
350 x 300	14 x 12	355.6	318.5	279.4	269.9	330.2
350 x 250	14 x 10	355.6	267.4	279.4	257.2	330.2
350 x 200	14 x 8	355.6	216.3	279.4	247.7	330.2
350 x 150	14 x 6	355.6	165.2	279.4	238.1	330.2
400 x 350	16 x 14	406.4	355.6	304.8	304.8	355.6
400 x 300	16 x 12	406.4	318.5	304.8	295.3	355.6
400 x 250	16 x 10	406.4	267.4	304.8	282.6	355.6
400 x 200	16 x 8	406.4	216.3	304.8	273.1	355.6
450 x 400	18 x 16	457.2	406.4	342.9	330.2	381.0
450 x 350	18 x 14	457.2	355.6	342.9	330.2	381.0
450 x 300	18 x 12	457.2	318.5	342.9	320.7	381.0
450 x 250	18 x 10	457.2	267.4	342.9	308.0	381.0
500 x 450	20 x 18	508.0	457.2	381.0	368.3	508.0
500 x 400	20 x 16	508.0	406.4	381.0	355.6	508.0
500 x 350	20 x 14	508.0	355.6	381.0	355.6	508.0
500 x 300	20 x 12	508.0	318.5	381.0	346.1	508.0
500 x 250	20 x 10	508.0	267.4	381.0	333.4	508.0
550 x 500	22 x 20	558.8	508.0	419.1	406.4	508.0
550 x 450	22 x 18	558.8	457.2	419.1	393.7	508.0
550 x 400	22 x 16	558.8	406.4	419.1	381.0	508.0
550 x 350	22 x 14	558.8	355.6	419.1	381.0	508.0
600 x 550	24 x 22	609.6	558.8	431.8	431.8	508.0
600 x 500	24 x 20	609.6	508.0	431.8	431.8	508.0
600 x 450	24 x 18	609.6	457.2	431.8	419.1	508.0
600 x 400	24 x 16	609.6	406.4	431.8	406.4	508.0
650 x 600	26 x 24	660.4	609.6	495.3	482.6	609.6
650 x 550	26 x 22	660.4	558.8	495.3	469.9	609.6
650 x 500	26 x 20	660.4	508.0	495.3	457.2	609.6
650 x 450	26 x 18	660.4	457.2	495.3	440.0	609.6
700 x 650	28 x 26	711.2	660.4	520.7	520.7	609.6
700 x 600	28 x 24	711.2	609.6	520.7	508.0	609.6
700 x 550	28 x 22	711.2	558.8	520.7	495.3	609.6
700 x 500	28 x 20	711.2	508.0	520.7	483.0	609.6
750 x 700	30 x 28	762.0	711.2	558.8	546.1	609.6
750 x 650	30 x 26	762.0	660.4	558.8	546.1	609.6
750 x 600	30 x 24	762.0	609.6	558.8	533.4	609.6
750 x 560	30 x 22	762.0	558.8	558.8	520.7	609.6
800 x 750	32 x 30	812.8	762.0	596.9	584.2	609.6
800 x 700	32 x 28	812.8	711.2	596.9	571.5	609.6
800 x 650	32 x 26	812.8	660.4	596.9	571.5	609.6
800 x 600	32 x 24	812.8	609.6	596.9	559.0	609.6

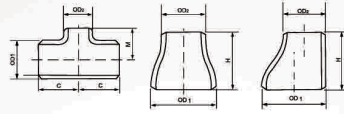
RISER Flanges & Fittings

PRODUCT SPECIFICATIONS



Wrought Steel Buttwelding Fittings (ASME)

Reducing Tees, Concentric & Eccentric Reducers



ASME B16.9

Nominal Pipe Size (NPS)	Outside Diameter at Bevel				Center-to-End				End-to-End	
	OD1		OD2		C		M		H	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
3/4 x 1/2	1.05	26.7	0.84	21.3	1.12	29	1.5	29	1.5	38
1 x 3/4	1.32	33.4	1.05	26.7	1.5	38	2	38	2	51
1 x 1/2	1.32	33.4	0.84	21.3	1.5	38	2	38	2	51
1 1/4 x 1	1.66	42.2	1.32	33.4	1.88	48	2	48	2	51
1 1/2 x 3/4	1.66	42.2	1.05	26.7	1.88	48	2	48	2	51
1 1/4 x 1/2	1.66	42.2	0.84	21.3	1.88	48	2	48	2	51
1 1/2 x 1 1/4	1.9	48.3	1.66	42.2	2.25	57	2.5	57	2.5	64
1 1/2 x 1	1.9	48.3	1.32	33.4	2.25	57	2.5	57	2.5	64
1 1/2 x 3/4	1.9	48.3	1.05	26.7	2.25	57	2.5	57	2.5	64
1 1/2 x 1/2	1.9	48.3	0.84	21.3	2.25	57	2.5	57	2.5	64
2 x 1 1/2	2.38	60.3	1.9	48.3	2.5	60	3	60	3	76
2 x 1 1/4	2.38	60.3	1.66	42.2	2.5	57	3	57	3	76
2 x 1	2.38	60.3	1.32	33.4	2.5	51	3	51	3	76
2 x 3/4	2.38	60.3	1.05	26.7	2.5	44	3	44	3	76
2 1/2 x 2	2.88	73	2.38	60.3	3	70	3.5	70	3.5	89
2 1/2 x 1 1/2	2.88	73	1.9	48.3	3	67	3.5	67	3.5	89
2 1/2 x 1 1/4	2.88	73	1.66	42.2	3	64	3.5	64	3.5	89
2 1/2 x 1	2.88	73	1.32	33.4	3	57	3.5	57	3.5	89
3 x 2 1/2	3.5	88.9	2.88	73	3.38	83	3.5	83	3.5	89
3 x 2	3.5	88.9	2.38	60.3	3.38	76	3.5	76	3.5	89
3 x 1 1/2	3.5	88.9	1.9	48.3	3.38	73	3.5	73	3.5	89
3 x 1 1/4	3.5	88.9	1.66	42.2	3.38	70	3.5	70	3.5	89
4 x 3	4.5	114.3	3.5	88.9	4.12	98	4	98	4	102
4 x 2 1/2	4.5	114.3	2.88	73	4.12	95	4	95	4	102
4 x 2	4.5	114.3	2.88	60.3	4.12	89	4	89	4	102
4 x 1 1/2	4.5	114.3	1.9	48.3	4.12	86	4	86	4	102
5 x 3 1/2	5.56	141.3	4	101.6	4.88	124	4.5	114	5	127
5 x 3	5.56	141.3	3.5	88.9	4.88	124	4.38	111	5	127
5 x 2 1/2	5.56	141.3	2.88	73	4.88	124	4.25	108	5	127
5 x 2	5.56	141.3	2.38	60.3	4.88	124	4.12	105	5	127
6 x 5	6.62	168.3	4.56	114.3	5.62	143	5.38	137	5.5	140
6 x 4	6.62	168.3	4.5	114.3	5.62	143	5.12	130	5.5	140
6 x 3	6.62	168.3	3.5	88.9	5.62	143	4.88	124	5.5	140
6 x 2 1/2	6.62	168.3	2.88	73	5.62	143	4.75	121	5.5	140
8 x 6	8.62	219.1	6.62	168.3	7	178	6.62	168	6	152
8 x 5	8.62	219.1	5.56	141.3	7	178	6.38	162	6	152
8 x 4	8.62	219.1	4.5	114.3	7	178	6.12	156	6	152
8 x 3	8.62	219.1	3.5	88.9	7	178	-	-	6	152
10 x 8	10.75	273	8.62	219.1	8.5	216	8	203	7	178
10 x 6	10.75	273	6.62	168.3	8.5	216	7.62	194	7	178
10 x 5	10.75	273	5.56	141.3	8.5	216	7.5	191	7	178
10 x 4	10.75	273	4.5	114.3	8.5	216	7.25	184	7	178
12 x 10	12.75	323.8	10.75	273	10	254	9.5	241	8	203
12 x 8	12.75	323.8	8.62	219.1	10	254	9	229	8	203

Nominal Pipe Size (NPS)	Outside Diameter at Bevel				Center-to-End				End-to-End	
	OD1		OD2		C		M		H	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
12 x 6	12.75	323.8	6.62	168.3	10	254	8.62	219	8	203
12 x 5	12.75	323.8	5.56	141.3	10	254	8.5	216	8	203
14 x 12	14	355.6	12.75	323.8	11	279	10.62	270	13	330
14 x 10	14	355.6	10.75	273	11	279	10.12	257	13	330
14 x 8	14	355.6	8.62	219.1	11	279	9.75	248	13	330
14 x 6	14	355.6	6.62	168.3	11	279	9.38	238	13	330
16 x 14	16	406.4	14	355.6	12	305	12	305	14	356
16 x 12	16	406.4	12.75	323.8	12	305	11.62	295	14	356
16 x 10	16	406.4	10.75	273	12	305	11.12	283	14	356
16 x 8	16	406.4	8.62	219.1	12	305	10.75	273	14	356
18 x 16	18	457	16	406.4	13.5	343	13	330	15	381
18 x 14	18	457	14	355.6	13.5	343	13	330	15	381
18 x 12	18	457	12.75	323.8	13.5	343	12.62	321	15	381
18 x 10	18	457	10.75	273	13.5	343	12.12	308	15	381
20 x 18	20	508	18	457.2	15	381	14.5	368	20	508
20 x 16	20	508	16	406.4	15	381	14	356	20	508
20 x 14	20	508	14	355.6	15	381	14	356	20	508
20 x 12	20	508	12.75	323.8	15	381	13.62	346	20	508
20 x 10	20	508	10.75	273	15	381	13.12	333	20	508
22 x 20	22	559	20	508	16.5	419	16	406	20	508
22 x 18	22	559	18	457.2	16.5	419	15.5	394	20	508
22 x 16	22	559	16	406.4	16.5	419	15	381	20	508
22 x 14	22	559	14	355.6	16.5	419	15	381	20	508
22 x 12	22	559	12.75	323.8	16.5	419	14.62	371	20	508
24 x 22	24	610	22	558.8	17	432	17	432	20	508
24 x 20	24	610	20	508	17	432	17	432	20	508
24 x 18	24	610	18	457.2	17	432	16.5	419	20	508
24 x 16	24	610	16	406.4	17	432	16	406	20	508
24 x 14	24	610	14	355.6	17	432	16	406	20	508
24 x 12	24	610	12.75	323.8	17	432	15.62	397	20	508
26 x 24	26	660	24	609.6	19.5	495	19	483	24	610
26 x 22	26	660	22	558.6	19.5	495	18.5	470	24	610
26 x 20	26	660	20	508	19.5	495	18	457	24	610
26 x 18	26	660	18	457.2	19.5	495	17.5	444	24	610
26 x 16	26	660	16	406.4	19.5	495	17	432	24	610
26 x 14	26	660	14	355.6	19.5	495	17	432	24	610
28 x 26	28	711	26	660.4	20.5	52	20.5	521	24	610
28 x 24	28	711	24	609.6	20.5	52	20	508	24	610
28 x 22	28	711	22	558.8	20.5	52	19.5	495	24	610
28 x 20	28	711	20	508	20.5	521	19	483	24	610
28 x 18	28	711	18	457.2	20.5	521	18.5	470	24	610
28 x 16	28	711	16	406.4	20.5	521	18	457	24	610
28 x 14	28	711	14	355.6	20.5	521	18	457	24	610
30 x 28	30	762	28	711.2	22	559	21.5	546	24	610

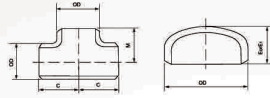
RISER Flanges & Fittings

PRODUCT SPECIFICATIONS



Wrought Steel Butt-welding Fittings (ASME)

Straight Tees & Caps

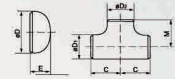


ASME B16.9

Nominal Pipe Size (NPS)	Outside Diameter at Bevel OD		Center-to-End						End-to-End					
			Straight Tees						Caps					
			C		M(1)		Length(2)		Limiting Wall Thickness for Length "E"		Length(3)			
			IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
1/2	0.84	21.3	1	25	1	25	1	25	0.18	4.57	1	25		
3/4	1.05	26.7	1.12	29	1.12	29	1	25	0.15	3.81	1	25		
1	1.32	33.4	1.5	38	2.5	38	1.5	38	0.18	4.57	1.5	38		
1 1/4	1.66	42.2	1.88	48	2.88	48	1.5	38	0.19	4.83	1.5	38		
1 1/2	1.9	48.3	2.25	57	2.25	57	1.5	38	0.2	5.08	1.5	38		
2	2.38	60.3	2.5	64	2.5	64	1.5	38	0.22	5.59	1.75	44		
2 1/2	2.88	73.0	3	76	3	76	1.5	38	0.28	7.11	2	51		
3	3.5	88.9	3.38	86	3.38	86	2	51	0.3	7.62	2.5	64		
3 1/2	4	101.6	3.75	95	3.75	95	2.5	64	0.32	8.13	3	76		
4	4.5	114.3	4.12	105	4.12	105	2.5	64	0.34	8.64	3	76		
5	5.56	141.3	4.88	124	4.88	124	3	76	0.38	9.65	3.5	89		
6	6.62	168.3	5.62	143	5.62	143	3.5	89	0.43	10.92	4	102		
8	8.62	219.1	7	178	7	178	4	102	0.5	12.7	5	127		
10	10.75	273.0	8.5	216	8.5	216	5	127	0.5	12.7	6	152		
12	12.75	323.8	10	254	10	254	6	152	0.5	12.7	7	178		
14	14	355.6	11	279	11	279	6.5	165	0.5	12.7	7.5	191		
16	16	406.4	12	305	12	305	7	178	0.5	12.7	8	203		
18	18	457.2	13.5	343	13.5	343	8	203	0.5	12.7	9	229		
20	20	508	15	381	15	381	9	229	0.5	12.7	10	254		
22	22	558.8	16.5	419	16.5	419	10	254	0.5	12.7	10	254		
24	24	609.6	17	432	17	432	10.5	267	0.5	12.7	12	305		
26	26	660.4	19.5	495	19.5	495	10.5	267	-	-	-	-		
28	28	711.2	20.2	521	20.2	521	10.5	267	-	-	-	-		
30	30	762	22	559	22	559	10.5	267	-	-	-	-		
32	32	812.8	23.5	597	23.5	597	10.5	267	-	-	-	-		
34	34	863.6	25	635	25	635	10.5	267	-	-	-	-		
36	36	914.4	26.5	673	26.5	673	10.5	267	-	-	-	-		
38	38	965.2	28	711	28	711	12	305	-	-	-	-		
40	40	1016	29.5	749	29.5	749	12	305	-	-	-	-		
42	42	1066.8	30	762	30	762	12	305	-	-	-	-		
44	44	1117.6	32	813	30	762	13.5	343	-	-	-	-		
46	46	1168.4	33.5	851	31.5	800	13.5	343	-	-	-	-		
48	48	1219.2	35	889	33	838	13.5	343	-	-	-	-		

Steel Butt-Welding Pipe Fittings (JIS)

Caps & Tees

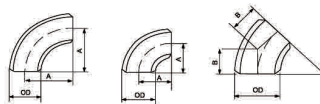


Unit mm

End-to-End	Center-to-End	
	Caps	Tees
	E(2)	C M
25.4	25.4	25.4
25.4	28.6	28.6
38.1	38.1	38.1
38.1	47.6	47.6
38.1	57.2	57.2
38.1	63.5	63.5
38.1	76.2	76.2
50.8	85.7	85.7
63.5	95.3	95.3
63.5	104.8	104.8
76.2	123.8	123.8
88.9	142.9	142.9
101.6	177.8	177.8
127.0	215.9	215.9
152.4	254.0	254.0
165.1	279.4	279.4
177.8	304.8	304.8
203.2	342.9	342.9
228.6	381.0	381.0
-	419.1	419.1
-	431.8	431.8
-	495.3	495.3
-	520.7	520.7
-	558.8	558.8
-	596.9	596.9
-	635.0	635.0
-	673.1	673.1
-	711.2	711.2
-	749.3	749.3
-	762.0	711.2
-	812.8	762.0
-	850.9	800.1
-	899.0	838.2

Wrought Steel Butt-welding Fittings (ASME)

Long and Short Radius Elbows

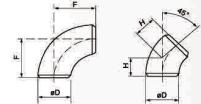


ASME B16.9, B16.28

Nominal Pipe Size (NPS)	Outside Diameter at Bevel OD		Center-to-End							
			90° Elbows A				45° Elbows B			
			Long Radius		Short Radius		Long Radius		Short Radius	
			IN	MM	IN	MM	IN	MM	IN	MM
1/2	0.84	21.3	1.5	38	-	-	0.62	0.62	-	-
3/4	1.05	26.7	1.12	29	-	-	0.44	0.44	-	-
1	1.32	33.4	1.5	38	1	25	0.88	0.88	0.41	10
1 1/4	1.66	42.2	1.88	48	1.25	32	1	1	0.52	13
1 1/2	1.9	48.3	2.25	57	1.5	38	1.12	1.12	0.62	16
2	2.38	60.3	3	76	2	51	1.38	1.38	0.83	21
2 1/2	2.88	73.0	3.75	95	2.5	64	1.75	1.75	1.04	26
3	3.5	88.9	4.5	114	3	76	2	2	1.24	32
4	4.5	114.3	6	152	4	102	2.5	2.5	1.66	42
5	5.56	141.3	7.5	190	5	127	3.12	3.12	2.07	53
6	6.62	168.3	9	229	6	152	3.75	3.75	2.50	63
8	8.62	219.1	12	305	8	203	6	6	3.31	84
10	10.75	273.0	15	381	10	254	6.25	6.25	4.14	105
12	12.75	323.8	18	457	12	305	7.5	7.5	4.97	126
14	14	355.6	21	533	14	356	8.75	8.75	5.80	147
16	16	406.4	24	610	16	406	10	10	6.63	168
18	18	457.2	27	686	18	457	11.25	11.25	7.46	189
20	20	508	30	762	20	508	12.5	12.5	8.28	210
22	22	559	33	838	22	559	13.5	13.5	9.11	232
24	24	610	36	914	24	610	15	15	9.94	253
26	26	660	39	991	26	660	16	16	10.77	274
28	28	711	42	1067	28	711	17.25	17.25	11.60	295
30	30	762	45	1143	30	762	18.5	18.5	12.43	316
32	32	813	48	1219	32	813	19.75	19.75	14.89	378
34	34	864	51	1295	34	864	21	21	14.08	358
36	36	914	54	1372	36	914	22.25	22.25	14.91	379
38	38	965	57	1448	38	965	23.62	23.62	15.74	400
40	40	1016	60	1524	40	1016	24.88	24.88	16.57	421
42	42	1067	63	1600	42	1067	26	26	17.40	442
44	44	1118	66	1676	44	1118	27.38	27.38	18.23	463
46	46	1168	69	1753	46	1168	28.62	28.62	19.05	484
48	48	1219	72	1829	48	1219	29.88	29.88	19.88	505

Steel Butt-Welding Pipe Fittings (JIS)

90° & 45° Elbows



JIS B2311

Nominal Pipe Size (NPS)	Outside Diameter D	Center-to-End				
		90° Elbows (F)		45° Elbows (F)		
		Long		Short		
		A	B	Long	Short	
15	1/2	21.7	38.1	-	15.8	-
20	3/4	27.2	38.1	-	15.8	-
25	1	34.0	38.1	25.4	15.8	10.5
32	1 1/2	42.7	47.6	32.8	19.7	13.2
40	1 1/4	48.6	57.2	38.1	23.7	15.8
50	2	60.5	76.2	50.8	31.6	21.0
65	2 1/2	76.3	95.3	63.5	39.5	26.3
80	3	89.1	114.3	76.2	47.3	31.6
100	4	114.3	152.4	101.6	63.1	42.1
125	5	139.8	190.5	127.0	78.9	52.6
150	6	165.2	228.6	152.4	94.7	63.1
200	8	216.3	304.8	203.2	126.3	84.2
250	10	267.4	381.0	254.0	157.8	105.2
300	12	318.5	457.2	304.8	189.4	126.3
350	14	355.6	533.4	355.6	220.9	147.3
400	16	406.4	609.6	406.4	252.5	168.4
450	18	457.2	685.8	457.2	284.1	189.4
500	20	508.0	762.0	508.0	315.6	210.4
550	22	558.8	838.2	558.8	347.2	231.5
600	24	609.6	914.4	609.6	378.7	252.5
650	26	660.4	990.6	660.4	410.3	273.6
700	28	711.2	1066.8	711.2	441.9	294.6
750	30	762.0	1143.0	762.0	473.4	315.7
800	32	812.8	1219.2	812.8	505.0	336.7
850	34	863.6	1295.4	863.6	536.6	357.7
900	36	914.4	1371.6	914.4	568.1	378.8
950	38	965.2	1447.8	965.2	599.7	399.8
1000	40	1016.0	1524.0	1016.0	631.2	420.9
1050	42	1066.8	1600.2	1056.8	662.8	441.9
1100	44	1117.6	1676.4	1117.6	694.4	463.0
1150	46	1168.4	1752.6	1168.4	725.9	484.0
1200	48	1219.2	1828.8	1219.2	757.5	505.1