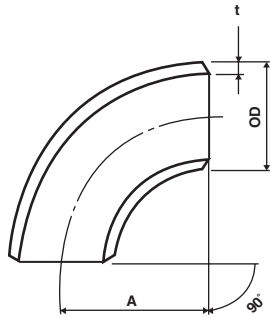


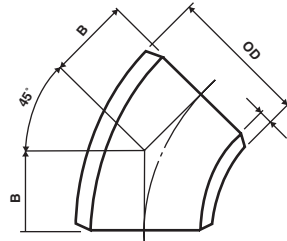
KT

FITTINGS

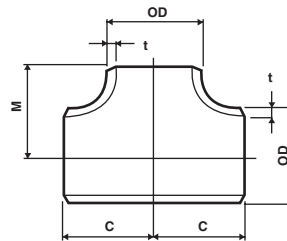
S E N D I R I A N B E R H A D



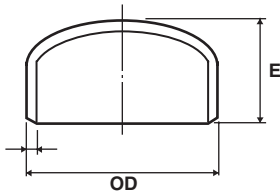
90° LONG
RADIUS ELBOW



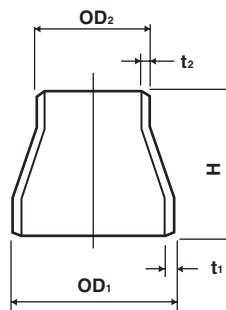
45° LONG
RADIUS ELBOW



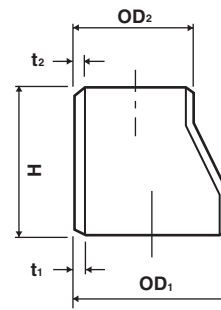
STRAIGHT TEE



END CAP



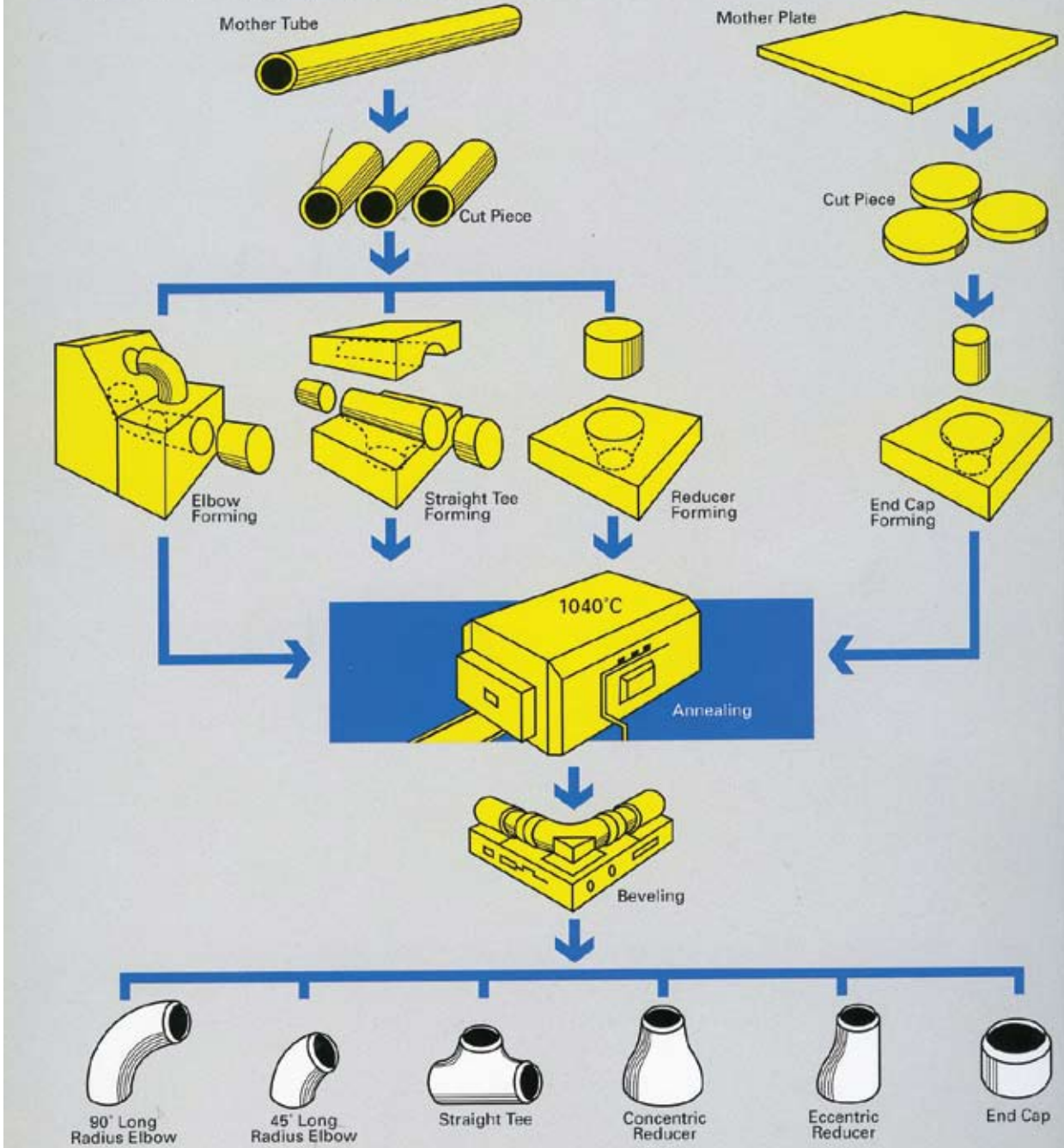
CONCENTRIC
REDUCER



ECCENTRIC
REDUCER

**AUSTENITIC
STAINLESS
STEEL
BUTT-WELD
PIPE
FITTINGS**

MANUFACTURING PROCESS FOR BUTT-WELD FITTINGS



DIMENSION TOLERANCE

Nominal Pipe Size (inch)	ASTM A 403			JIS B 2312 / JIS B 2313			
	Outside Diameter (mm)	Nominal Wall Thickness (mm)		Outside Diameter (mm)	Nominal Wall Thickness (mm)		
		10S	40S		10S	20S	40S
½	21.3	2.11	2.77	21.7	2.1	2.5	2.8
¾	26.7	2.11	2.87	27.2	2.1	2.5	2.9
1	33.4	2.77	3.38	34.0	2.8	3.0	3.4
1¼	42.2	2.77	3.56	42.7	2.8	3.0	3.6
1½	48.3	2.77	3.68	48.6	2.8	3.0	3.7
2	60.3	2.77	3.91	60.5	2.8	3.5	3.9
2½	73.0	3.05	5.16	76.3	3.0	3.5	5.2
3	88.9	3.05	5.49	89.1	3.0	4.0	5.5
4	114.3	3.05	6.02	114.3	3.0	4.0	6.0
5	141.3	3.40	6.55	139.8	3.4	5.0	6.6
6	168.3	3.40	7.11	165.2	3.4	5.0	7.1
8	219.1	3.76	8.18	216.3	4.0	6.5	8.2
10	273.1	4.19	9.27	267.4	4.0	6.5	9.3
12	323.9	4.57	9.52	318.5	4.0	6.5	10.3

**AUSTENITIC
STAINLESS
STEEL
BUTT-WELD
PIPE
FITTINGS**

**AUSTENITIC
STAINLESS
STEEL
BUTT-WELD
PIPE
FITTINGS**

WEIGHTS

(unit : kg)

Nominal Pipe Size (inch)	SCH 10S				SCH 20S				SCH 40S			
	90°	45°	Straigh Tee	Cap	90°	45°	Straigh Tee	Cap	90°	45°	Straigh Tee	Cap
	Long	Long			Long	Long			Long	Long		
	Radius	Radius	Radius	Radius	Radius	Radius						
Elbow	Elbow	Elbow	Elbow	Elbow	Elbow							
½	0.061	0.030	0.090	0.040	0.071	0.035	0.077	0.043	0.078	0.039	0.181	0.046
¾	0.078	0.039	0.129	0.052	0.082	0.046	0.110	0.056	0.103	0.052	0.258	0.059
1	0.128	0.064	0.223	0.090	0.137	0.068	0.223	0.096	0.154	0.077	0.262	0.109
1¼	0.206	0.103	0.356	0.113	0.219	0.110	0.357	0.121	0.260	0.130	0.463	0.145
1½	0.283	0.142	0.497	0.130	0.303	0.151	0.497	0.139	0.368	0.184	0.648	0.171
2	0.478	0.239	0.681	0.168	0.590	0.294	0.788	0.210	0.652	0.326	0.893	0.234
2½	0.812	0.406	1.200	0.242	0.941	0.468	1.200	0.280	1.370	0.683	1.980	0.420
3	1.140	0.571	1.570	0.362	1.500	0.750	1.780	0.480	2.040	1.020	2.610	0.664
4	1.970	0.985	2.460	0.585	2.600	1.300	2.800	0.780	3.840	1.920	4.760	1.170
5	3.420	1.710	4.040	0.978	4.970	2.480	5.010	1.440	6.480	3.240	7.840	1.900
6	4.870	2.430	5.500	1.350	7.090	3.540	6.840	1.990	9.940	4.970	9.540	2.830
8	10.000	5.010	11.070	2.490	16.100	8.040	14.300	4.050	20.100	10.100	19.560	5.110
10	15.500	7.770	19.870	3.840	25.000	12.450	23.880	6.240	35.400	17.700	32.610	8.920
12	25.900	12.500	27.860	6.150	35.900	17.900	30.100	8.890	56.200	28.100	56.650	14.100

The above weight - list is applicable for 304 grade only

WEIGHTS

(unit : kg)

Concentric Reducer and Eccentric Reducer				Concentric Reducer and Eccentric Reducer			
Nominal Pipe Size (inch)	SCH10S	SCH20S	SCH40S	Nominal Pipe Size (inch)	SCH10S	SCH20S	SCH40S
¾ x ½	0.090	0.088	0.105	3 x 2	0.478	0.629	0.846
1 x ½	0.090	0.094	0.105	3 x 2-1/2	0.548	0.692	0.983
1 x ¾	0.098	0.104	0.116	4 x 1-1/2	0.630	0.791	1.241
1¼ x 1½	0.112	0.114	0.120	4 x 2	0.656	0.864	1.270
1¼ x 1¾	0.117	0.126	0.126	4 x 2-1/2	0.706	0.931	1.370
1¼ x 1	0.125	0.133	0.157	4 x 3	0.748	0.987	1.450
1½ x 1½	0.154	0.160	0.204	5 x 2	1.050	1.320	2.230
1½ x ¾	0.156	0.166	0.210	5 x 2-1/2	1.180	1.660	2.250
1½ x 1	0.170	0.181	0.219	5 x 3	1.200	1.740	2.270
1½ x 1¼	0.195	0.201	0.263	5 x 4	1.320	1.920	2.500
2 x ¾	0.214	0.288	0.298	6 x 2-1/2	1.350	1.960	2.740
2 x 1	0.237	0.292	0.322	6 x 3	1.500	2.180	3.040
2 x 1¼	0.258	0.318	0.352	6 x 4	1.620	2.360	3.300
2 x 1½	0.273	0.337	0.372	6 x 5	1.750	2.550	3.570
2½ x 1	0.349	0.435	0.630	8 x 4	2.560	4.100	5.100
2½ x 1¼	0.394	0.450	0.640	8 x 5	2.700	4.330	5.400
2½ x 1½	0.396	0.458	0.661	8 x 6	2.850	4.570	5.710
2½ x 2	0.432	0.500	0.680	10 x 5	3.300	5.960	8.210
3 x 1	0.408	0.570	0.716	10 x 6	3.870	6.220	8.780
3 x 1¼	0.430	0.576	0.775	10 x 8	4.210	6.770	9.580
3 x 1½	0.444	0.583	0.783	12 x 6	5.730	8.190	12.400

The above weight - list is applicable for 304 grade only

**AUSTENITIC
STAINLESS
STEEL
BUTT-WELD
PIPE
FITTING**

**TOLERANCE OF BUTT-WELD PIPE FITTINGS
DIMENSIONAL TOLERANCE ACCORDING TO ANSI B 16.9**

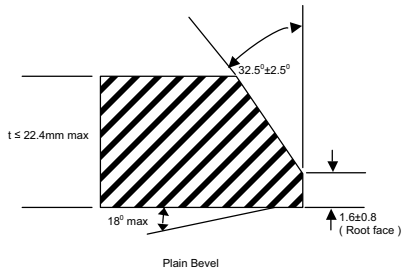
(unit : mm)

**AUSTENITIC
STAINLESS
STEEL
BUTT-WELD
PIPE
FITTINGS**

Dimension	Type of pipe fittings	Nominal Diameter			
		1/2" to 2-1/2"	3" to 4"	5" to 8"	10" to 12"
Outside diameter at Bevel (OD)	All types of pipe fittings	+ 1.6 - 0.8	+ 1.6 - 1.6	+ 2.4 - 1.6	+ 4.0 - 3.0
Inside diameter at End (ID)		± 0.8	± 1.6	± 1.6	± 3.0
Wall Thickness (t)		Not less than 87.5% of nominal thickness			
Bevel Angle		<p style="text-align: center;">Plain Bevel</p>			
Height of Root Face					
Distance from Center to End Face (A,B)	90° Long Radius Elbow, 45° Long Radius Elbow	± 1.6		± 2.4	
Distance from End Face to End Face (H)	Concentric Reducer, Eccentric Reducer	± 1.6		± 2.4	
Distance from Center to End Face (C.M)	Straight Tee	± 1.6		± 2.4	
Distance from Back Arch to End Face (E)	Cap	± 3.0		± 6.4	

DIMENSION TOLERANCE ACCORDING TO JIS B2312 AND JIS B2313

(unit : mm)

Dimension	Type of pipe fittings	Nominal Diameter			
		½" to 2½"	3" to 4"	5" to 8"	10" to 12"
Outside diameter at Bevel (OD)	All types of pipe fittings	+ 1.6 - 0.8	+ 1.6 - 1.6	+ 2.4 - 1.6	+ 4.0 - 3.0
Inside diameter at End (ID)		+0.8 -0.8	+1.6 -1.6	+1.6 -1.6	+3.2 -3.2
Wall Thickness (t)		+ Not specified - 12.5%			
Bevel Angle		 <p style="text-align: center;">Plain Bevel</p>			
Height of Root Face					
Distance from Center to End Face (A,B)		90° Long Radius Elbow, 45° Long Radius Elbow	± 1.6		± 2.4
Distance from End Face to End Face (H)	Concentric Reducer, Eccentric Reducer	± 1.6		± 2.4	
Distance from Center to End Face (C.M)	Straight Tee	± 1.6		± 2.4	
Distance from Back Arch to End Face (E)	Cap	± 3.2		± 6.4	

**AUSTENITIC
STAINLESS
STEEL
BUTT-WELD
PIPE
FITTINGS**

CHEMICAL COMPOSITION

**CHEMICAL
COMPOSITION
OF
PRODUCTS**

Chemical Composition (%) - Weight.									
Standard Specification	Type of Grades Available	Carbon (max)	Manganese (max)	Phosphorous (max)	Sulfur (max)	Silicon (max)	Nickel	Chromium	Molybdenum
ASTM A312	TP 304	0.080	2.00	0.045	0.030	1.00	8.00-11.00	18.00-20.00	-
	TP 304L	0.035	2.00	0.045	0.030	1.00	8.00-13.00	18.00-20.00	-
	TP 316	0.080	2.00	0.045	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
	TP 316L	0.035	2.00	0.045	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
ASTM A778	TP 304L	0.030	2.00	0.045	0.030	1.00	8.00-13.00	18.00-20.00	-
	TP 316L	0.030	2.00	0.045	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
ASTM A403	WP 304	0.080	2.00	0.045	0.030	1.00	8.00-11.00	18.00-20.00	-
	WP 304L	0.030	2.00	0.045	0.030	1.00	8.00-12.00	18.00-20.00	-
	WP 316	0.080	2.00	0.045	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
	WP 316L	0.030	2.00	0.045	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
JIS G3459	SUS 304 TP	0.080	2.00	0.040	0.030	1.00	8.00-11.00	18.00-20.00	-
	SUS 304L TP	0.030	2.00	0.040	0.030	1.00	9.00-13.00	18.00-20.00	-
	SUS 316 TP	0.080	2.00	0.040	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
	SUS 316L TP	0.030	2.00	0.040	0.030	1.00	12.00-16.00	16.00-18.00	2.00-3.00
JIS B2312	SUS 304	0.080	2.00	0.040	0.030	1.00	8.00-11.00	18.00-20.00	-
	SUS 304L	0.030	2.00	0.040	0.030	1.00	9.00-13.00	18.00-20.00	-
	SUS 316	0.080	2.00	0.040	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
	SUS 316L	0.030	2.00	0.040	0.030	1.00	12.00-16.00	16.00-18.00	2.00-3.00
JIS B2313	SUS 304 W	0.080	2.00	0.040	0.030	1.00	8.00-11.00	18.00-20.00	-
	SUS 304L W	0.030	2.00	0.040	0.030	1.00	9.00-13.00	18.00-20.00	-
	SUS 316 W	0.080	2.00	0.040	0.030	1.00	10.00-14.00	16.00-18.00	2.00-3.00
	SUS 316L W	0.030	2.00	0.040	0.030	1.00	12.00-16.00	16.00-18.00	2.00-3.00
DIN 2463	W.Nr. 1.4301	0.070	2.00	0.045	0.030	1.00	8.50-10.50	17.00-19.00	-
	W.Nr. 1.4306	0.030	2.00	0.045	0.030	1.00	10.00-12.50	18.00-20.00	-
	W.Nr. 1.4401	0.070	2.00	0.045	0.030	1.00	10.50-13.50	16.50-18.50	2.00-2.50
	W.Nr. 1.4404	0.030	2.00	0.045	0.030	1.00	11.00-14.00	16.50-18.50	2.00-2.50
DIN 2463	TS Z 6 CN 18-09	0.070	2.04	0.045	0.035	1.05	8.00-11.10	17.00-20.20	-
	TS Z 2 CN 18-10	0.030	2.04	0.045	0.035	1.05	9.00-12.50	17.00-20.20	-
	TS Z 6 CND 17-1 1	0.070	2.04	0.045	0.035	1.05	10.00-12.65	16.00-18.20	1.90-2.50
	TS Z 2 CND 17-12	0.030	2.04	0.045	0.035	1.05	10.50-13.15	16.00-18.20	1.90-2.50

MECHANICAL PROPERTIES

Standard Specification	Type of Grades Available	Tensile Strength (N/mm ²)	Yield Strength (N/mm ²)	Elongation (%) in 2 inch or 50mm
ASTM A312	TP 304	515	205	35
	TP 304L	485	170	35
	TP 316	515	205	35
	TP 316L	485	170	35
ASTM A778	TP 304L	485	170	35
	TP 316L	485	170	35
ASTM A403	WP 304	515	205	28
	WP 304L	485	170	28
	WP 316	515	205	28
	WP 316L	485	170	28
JIS G 3459	SUS 304 TP	520	206	35
	SUS 304L TP	481	177	35
	SUS 316 TP	520	206	35
	SUS 316L TP	481	177	35
JIS B 2312	SUS 304	520	206	35
	SUS 304L	481	177	35
	SUS 316	520	206	35
	SUS 316L	481	177	35
JIS B 2313	SUS 304 W	520	206	35
	SUS 304L W	481	177	35
	SUS 316 W	520	206	35
	SUS 316L W	481	177	35
DIN 2463	W.Nr. 1.4301	515	205	35
	W.Nr. 1.4306	485	170	35
	W.Nr. 1.4401	515	205	35
	W.Nr. 1.4404	485	170	35
DIN 2463	TS Z 6 CN 18-09	510-710	195	35
	TS Z 2 CN 18-10	460-660	175	35
	TS Z 6 CND 17-11	510-710	205	35
	TS Z 2 CND 17-12	490-690	195	35

MECHANICAL PROPERTIES OF PRODUCTS

ASTM A312 INDUSTRIAL PIPE HYDROSTATIC TEST PRESSURE

Nominal Pipe Size (NPS) (inch)	Outside Diameter (OD) (mm)	TEST PRESSURE					
		SCH10S 304 / 304L / 316 / 316L			SCH40S 304 / 304L / 316 / 316L		
		Wall Thickness	PSI	Bar	Wall Thickness	PSI	Bar
3/8	17.15	1.65	2,500	172.4	2.31	2,500	172.4
1/2	21.34	2.11	2,500	172.4	2.77	2,500	172.4
3/4	26.67	2.11	2,400	165.5	2.87	2,500	172.4
1	33.40	2.77	2,500	172.4	3.38	2,500	172.4
1 1/4	42.16	2.77	2,000	137.9	3.56	2,500	172.4
1 1/2	48.26	2.77	1,800	124.1	3.68	2,300	158.6
2	60.33	2.77	1,400	96.5	3.91	2,000	137.9
2 1/2	73.03	3.05	1,300	89.6	5.16	2,200	151.7
3	88.90	3.05	1,100	75.8	5.49	1,900	131.0
3 1/2	101.60	3.05	900	62.1	5.74	1,700	117.2
4	114.30	3.05	800	55.2	6.02	1,600	110.3
5	141.30	3.40	750	51.7	6.55	1,400	96.5
6	168.28	3.40	650	44.8	7.11	1,300	89.6
8	219.08	3.76	550	37.9	8.18	1,200	82.7
10	273.05	4.19	500	34.5	9.27	1,100	75.8
12	323.85	4.57	450	31.0	9.52	900	62.1

Hydrostatic test pressure are in accordance to ASTM A999

Conversion factor

1 PSI	=	0.0689 Bar
1 PSI	=	0.00689 Mpa
1 Bar	=	0.1 Mpa
1 Bar	=	14.504 PSI
1 Mpa	=	10 Bars
1 Mpa	=	145.038 PSI



(633955-H)

S E N D I R I A N B E R H A D

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