



Kasugai Co.,Ltd.
BUTT WELDING FITTINGS



株式会社 春日井

Production Standard

ASME B16.9

ASME B16.28

JIS B2312

JIS B2313

MSS SP-43

MSS SP-75

Available Material

ASTM A234

WPB WPC WP1 WP12CL1 WP12CL2 WP11CL1 WP11CL2 WP11CL3

WP22CL1 WP22CL3 WP5CL1 WP5CL3 WP9CL1 WP9CL3 WPR WP90 WP911

ASTM A403

WP304 (H/L/N/LN) WP309 WP310S WP316 (H/L/N/LN) WP317 WP321

WP321 WP321H WP347 WP347H WP348

ASTM A420

WPL6 WPL9 WPL3 WPL8

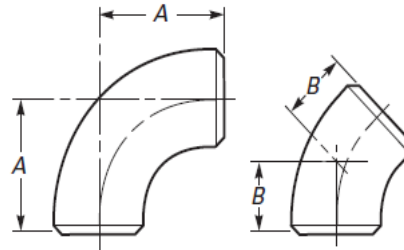
Available Size

1/2"~60" (Seamless 1/2"~24")

Thickness: Sch5S~SchXXS

ASME B16.9

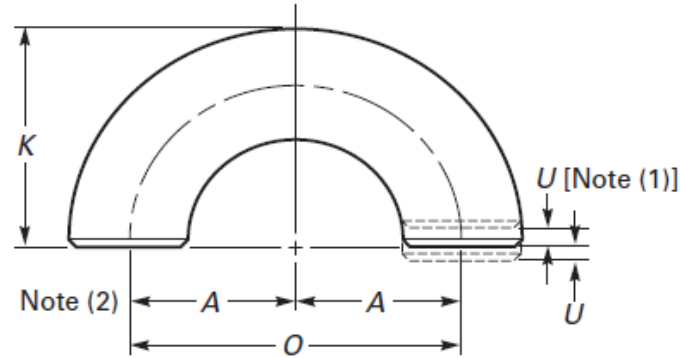
Table 1 Dimensions of Long Radius Elbows



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center-to-End	
		90-deg Elbows, A	45-deg Elbows, B
1/2	21.3	38	16
3/4	26.7	38	19
1	33.4	38	22
1 1/4	42.2	48	25
1 1/2	48.3	57	29
2	60.3	76	35
2 1/2	73.0	95	44
3	88.9	114	51
3 1/2	101.6	133	57
4	114.3	152	64
5	141.3	190	79
6	168.3	229	95
8	219.1	305	127
10	273.0	381	159
12	323.8	457	190
14	355.6	533	222
16	406.4	610	254
18	457.0	686	286
20	508.0	762	318
22	559.0	838	343
24	610.0	914	381
26	660.0	991	406
28	711.0	1 067	438
30	762.0	1 143	470
32	813.0	1 219	502
34	864.0	1 295	533
36	914.0	1 372	565
38	965.0	1 448	600
40	1 016.0	1 524	632
42	1 067.0	1 600	660
44	1 118.0	1 676	695
46	1 168.0	1 753	727
48	1 219.0	1 829	759

GENERAL NOTE: All dimensions are in millimeters.

Table 3 Dimensions of Long Radius Returns



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center- to- Center, O	Back- to- Face, K
$\frac{1}{2}$	21.3	76	48
$\frac{3}{4}$	26.7	76	51
1	33.4	76	56
$1\frac{1}{4}$	42.2	95	70
$1\frac{1}{2}$	48.3	114	83
2	60.3	152	106
$2\frac{1}{2}$	73.0	190	132
3	88.9	229	159
$3\frac{1}{2}$	101.6	267	184
4	114.3	305	210
5	141.3	381	262
6	168.3	457	313
8	219.1	610	414
10	273.0	762	518
12	323.8	914	619
14	355.6	1 067	711
16	406.4	1 219	813
18	457.0	1 372	914
20	508.0	1 524	1 016
22	559.0	1 676	1 118
24	610.0	1 829	1 219

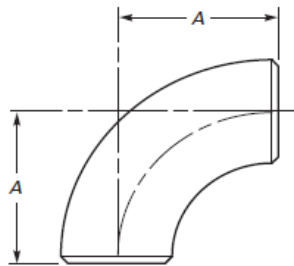
GENERAL NOTE: All dimensions are in millimeters.

NOTES:

(1) See Table 13 for tolerance for alignment of ends U .

(2) Dimension A is equal to one-half of dimension O .

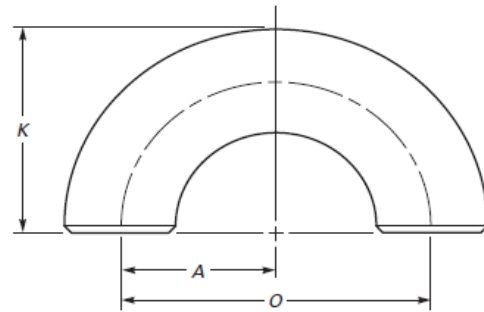
Table 4 Dimensions of Short Radius Elbows



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center- to- End, A
1	33.4	25
1 $\frac{1}{4}$	42.2	32
1 $\frac{1}{2}$	48.3	38
2	60.3	51
2 $\frac{1}{2}$	73.0	64
3	88.9	76
3 $\frac{1}{2}$	101.6	89
4	114.3	102
5	141.3	127
6	168.3	152
8	219.1	203
10	273.0	254
12	323.8	305
14	355.6	356
16	406.4	406
18	457.0	457
20	508.0	508
22	559.0	559
24	610.0	610

GENERAL NOTE: All dimensions are in millimeters.

Table 5 Dimensions of Short Radius 180-deg Returns

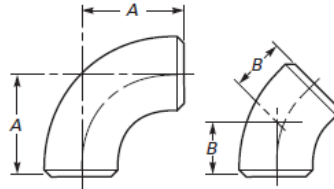


Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center- to- Center, O	Back- to- Face, K
1	33.4	51	41
1 $\frac{1}{4}$	42.2	64	52
1 $\frac{1}{2}$	48.3	76	62
2	60.3	102	81
2 $\frac{1}{2}$	73.0	127	100
3	88.9	152	121
3 $\frac{1}{2}$	101.6	178	140
4	114.3	203	159
5	141.3	254	197
6	168.3	305	237
8	219.1	406	313
10	273.0	508	391
12	323.8	610	467
14	355.6	711	533
16	406.4	813	610
18	457.0	914	686
20	508.0	1 016	762
22	559.0	1 118	838
24	610.0	1 219	914

GENERAL NOTES:

- (a) All dimensions are in millimeters.
- (b) Dimension A is equal to one-half of dimension O.

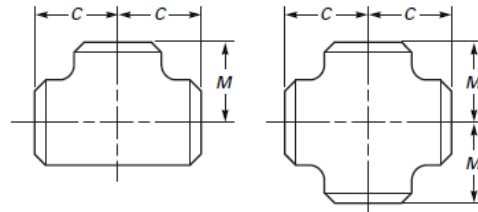
Table 6 Dimensions of 3D Elbows



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center-to-End	
		90-deg Elbows, A	45-deg Elbows, B
3/4	26.7	57	24
1	33.4	76	31
1 1/4	42.2	95	39
1 1/2	48.3	114	47
2	60.3	152	63
2 1/2	73.0	190	79
3	88.9	229	95
3 1/2	101.6	267	111
4	114.3	305	127
5	141.3	381	157
6	168.3	457	189
8	219.1	610	252
10	273.0	762	316
12	323.8	914	378
14	355.6	1 067	441
16	406.4	1 219	505
18	457.0	1 372	568
20	508.0	1 524	632
22	559.0	1 676	694
24	610.0	1 829	757
26	660.0	1 981	821
28	711.0	2 134	883
30	762.0	2 286	964
32	813.0	2 438	1 010
34	864.0	2 591	1 073
36	914.0	2 743	1 135
38	965.0	2 896	1 200
40	1 016.0	3 048	1 264
42	1 067.0	3 200	1 326
44	1 118.0	3 353	1 389
46	1 168.0	3 505	1 453
48	1 219.0	3 658	1 516

GENERAL NOTE: All dimensions are in millimeters.

Table 7 Dimensions of Straight Tees and Crosses



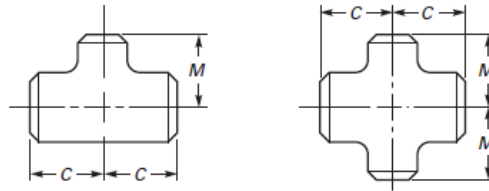
Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Center-to-End	
		Run, C	Outlet, M [Notes (1) and (2)]
1/2	21.3	25	25
3/4	26.7	29	29
1	33.4	38	38
1 1/4	42.2	48	48
1 1/2	48.3	57	57
2	60.3	64	64
2 1/2	73.0	76	76
3	88.9	86	86
3 1/2	101.6	95	95
4	114.3	105	105
5	141.3	124	124
6	168.3	143	143
8	219.1	178	178
10	273.0	216	216
12	323.8	254	254
14	355.6	279	279
16	406.4	305	305
18	457.0	343	343
20	508.0	381	381
22	559.0	419	419
24	610.0	432	432
26	660.0	495	495
28	711.0	521	521
30	762.0	559	559
32	813.0	597	597
34	864.0	635	635
36	914.0	673	673
38	965.0	711	711
40	1 016.0	749	749
42	1 067.0	762	711
44	1 118.0	813	762
46	1 168.0	851	800
48	1 219.0	889	838

GENERAL NOTE: All dimensions are in millimeters.

NOTES:

- (1) Outlet dimension *M* for NPS 26 and larger is recommended but not required.
- (2) Dimensions applicable to crosses NPS 24 and smaller.

Table 8 Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses



Nominal Pipe Size (NPS)	Outside Diameter at Bevel		Center-to-End		Nominal Pipe Size (NPS)	Outside Diameter at Bevel		Center-to-End	
	Run	Outlet	Run, C	Outlet, M [Note (1)]		Run	Outlet	Run, C	Outlet, M [Note (1)]
$\frac{1}{2} \times \frac{1}{2} \times \frac{3}{8}$	21.3	17.3	25	25	$4 \times 4 \times 3\frac{1}{2}$	114.3	101.6	105	102
$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{4}$	21.3	13.7	25	25	$4 \times 4 \times 3$	114.3	88.9	105	98
$\frac{3}{4} \times \frac{3}{4} \times \frac{1}{2}$	26.7	21.3	29	29	$4 \times 4 \times 2\frac{1}{2}$	114.3	73.0	105	95
$\frac{3}{4} \times \frac{3}{4} \times \frac{3}{8}$	26.7	17.3	29	29	$4 \times 4 \times 2$	114.3	60.3	105	89
$1 \times 1 \times \frac{3}{4}$	33.4	26.7	38	38	$4 \times 4 \times 1\frac{1}{2}$	114.3	48.3	105	86
$1 \times 1 \times \frac{1}{2}$	33.4	21.3	38	38					
					$5 \times 5 \times 4$	141.3	114.3	124	117
$1\frac{1}{4} \times 1\frac{1}{4} \times 1$	42.2	33.4	48	48	$5 \times 5 \times 3\frac{1}{2}$	141.3	101.6	124	114
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{4}$	42.2	26.7	48	48	$5 \times 5 \times 3$	141.3	88.9	124	111
$1\frac{1}{4} \times 1\frac{1}{4} \times \frac{1}{2}$	42.2	21.3	48	48	$5 \times 5 \times 2\frac{1}{2}$	141.3	73.0	124	108
					$5 \times 5 \times 2$	141.3	60.3	124	105
$1\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{4}$	48.3	42.2	57	57					
$1\frac{1}{2} \times 1\frac{1}{2} \times 1$	48.3	33.4	57	57	$6 \times 6 \times 5$	168.3	141.3	143	137
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{4}$	48.3	26.7	57	57	$6 \times 6 \times 4$	168.3	114.3	143	130
$1\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$	48.3	21.3	57	57	$6 \times 6 \times 3\frac{1}{2}$	168.3	101.6	143	127
					$6 \times 6 \times 3$	168.3	88.9	143	124
$2 \times 2 \times 1\frac{1}{2}$	60.3	48.3	64	60	$6 \times 6 \times 2\frac{1}{2}$	168.3	73.0	143	121
$2 \times 2 \times 1\frac{1}{4}$	60.3	42.2	64	57					
$2 \times 2 \times 1$	60.3	33.4	64	51	$8 \times 8 \times 6$	219.1	168.3	178	168
$2 \times 2 \times \frac{3}{4}$	60.3	26.7	64	44	$8 \times 8 \times 5$	219.1	141.3	178	162
					$8 \times 8 \times 4$	219.1	114.3	178	156
$2\frac{1}{2} \times 2\frac{1}{2} \times 2$	73.0	60.3	76	70	$8 \times 8 \times 3\frac{1}{2}$	219.1	101.6	178	152
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$	73.0	48.3	76	67					
$2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{4}$	73.0	42.2	76	64	$10 \times 10 \times 8$	273.0	219.1	216	203
$2\frac{1}{2} \times 2\frac{1}{2} \times 1$	73.0	33.4	76	57	$10 \times 10 \times 6$	273.0	168.3	216	194
					$10 \times 10 \times 5$	273.0	141.3	216	191
$3 \times 3 \times 2\frac{1}{2}$	88.9	73.0	86	83	$10 \times 10 \times 4$	273.0	114.3	216	184
$3 \times 3 \times 2$	88.9	60.3	86	76					
$3 \times 3 \times 1\frac{1}{2}$	88.9	48.3	86	73	$12 \times 12 \times 10$	323.8	273.0	254	241
$3 \times 3 \times 1\frac{1}{4}$	88.9	42.2	86	70	$12 \times 12 \times 8$	323.8	219.1	254	229
					$12 \times 12 \times 6$	323.8	168.3	254	219
$3\frac{1}{2} \times 3\frac{1}{2} \times 3$	101.6	88.9	95	92	$12 \times 12 \times 5$	323.8	141.3	254	216
$3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$	101.6	73.0	95	89					
$3\frac{1}{2} \times 3\frac{1}{2} \times 2$	101.6	60.3	95	83	$14 \times 14 \times 12$	355.6	323.8	279	270
$3\frac{1}{2} \times 3\frac{1}{2} \times 1\frac{1}{2}$	101.6	48.3	95	79	$14 \times 14 \times 10$	355.6	273.0	279	257
					$14 \times 14 \times 8$	355.6	219.1	279	248
					$14 \times 14 \times 6$	355.6	168.3	279	238

Table 8 Dimensions of Reducing Outlet Tees and Reducing Outlet Crosses (Cont'd)

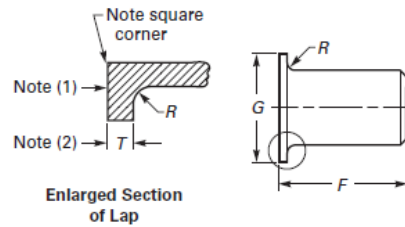
Nominal Pipe Size (NPS)	Outside Diameter at Bevel		Center-to-End		Nominal Pipe Size (NPS)	Outside Diameter at Bevel		Center-to-End	
	Run	Outlet	Run, C	Outlet, M [Note (1)]		Run	Outlet	Run, C	Outlet, M [Note (1)]
36 × 36 × 34	914	864.0	673	660	42 × 42 × 24	1 067	610.0	762	660
36 × 36 × 32	914	813.0	673	648	42 × 42 × 22	1 067	559.0	762	660
36 × 36 × 30	914	762.0	673	635	42 × 42 × 20	1 067	508.0	762	660
36 × 36 × 28	914	711.0	673	622	42 × 42 × 18	1 067	457.0	762	648
36 × 36 × 26	914	660.0	673	622	42 × 42 × 16	1 067	406.4	762	635
					44 × 44 × 42	1 118	1 067.0	813	762
36 × 36 × 24	914	610.0	673	610	44 × 44 × 40	1 118	1 016.0	813	749
36 × 36 × 22	914	559.0	673	597	44 × 44 × 38	1 118	965.0	813	737
36 × 36 × 20	914	508.0	673	584	44 × 44 × 36	1 118	914.0	813	724
36 × 36 × 18	914	457.0	673	572	44 × 44 × 34	1 118	864.0	813	724
36 × 36 × 16	914	406.4	673	559	44 × 44 × 32	1 118	813.0	813	711
					44 × 44 × 30	1 118	762.0	813	711
38 × 38 × 36	965	914.0	711	711	44 × 44 × 28	1 118	711.0	813	698
38 × 38 × 34	965	864.0	711	698	44 × 44 × 26	1 118	660.0	813	698
38 × 38 × 32	965	813.0	711	686	44 × 44 × 24	1 118	610.0	813	698
38 × 38 × 30	965	762.0	711	673	44 × 44 × 22	1 118	559.0	813	686
38 × 38 × 28	965	711.0	711	648	44 × 44 × 20	1 118	508.0	813	686
					46 × 46 × 44	1 168	1 118.0	851	800
38 × 38 × 26	965	660.0	711	648	46 × 46 × 42	1 168	1 067.0	851	787
38 × 38 × 24	965	610.0	711	635	46 × 46 × 40	1 168	1 016.0	851	775
38 × 38 × 22	965	559.0	711	622	46 × 46 × 38	1 168	965.0	851	762
38 × 38 × 20	965	508.0	711	610	46 × 46 × 36	1 168	914.0	851	762
38 × 38 × 18	965	457.0	711	597	46 × 46 × 34	1 168	864.0	851	749
					46 × 46 × 32	1 168	813.0	851	749
40 × 40 × 38	1 016	965.0	749	749	46 × 46 × 30	1 168	762.0	851	737
40 × 40 × 36	1 016	914.0	749	737	46 × 46 × 28	1 168	711.0	851	737
40 × 40 × 34	1 016	864.0	749	724	46 × 46 × 26	1 168	660.0	851	737
40 × 40 × 32	1 016	813.0	749	711	46 × 46 × 24	1 168	610.0	851	724
40 × 40 × 30	1 016	762.0	749	698	46 × 46 × 22	1 168	559.0	851	724
					48 × 48 × 46	1 219	1 168.0	889	838
40 × 40 × 28	1 016	711.0	749	673	48 × 48 × 44	1 219	1 118.0	889	838
40 × 40 × 26	1 016	660.0	749	673	48 × 48 × 42	1 219	1 067.0	889	813
40 × 40 × 24	1 016	610.0	749	660	48 × 48 × 40	1 219	1 016.0	889	813
40 × 40 × 22	1 016	559.0	749	648					
40 × 40 × 20	1 016	508.0	749	635	48 × 48 × 38	1 219	965.0	889	813
40 × 40 × 18	1 016	457.0	749	622	48 × 48 × 36	1 219	914.0	889	787
					48 × 48 × 34	1 219	864.0	889	787
42 × 42 × 40	1 067	1 016.0	762	711	48 × 48 × 32	1 219	813.0	889	787
42 × 42 × 38	1 067	965.0	762	711					
42 × 42 × 36	1 067	914.0	762	711	48 × 48 × 30	1 219	762.0	889	762
42 × 42 × 34	1 067	864.0	762	711	48 × 48 × 28	1 219	711.0	889	762
					48 × 48 × 26	1 219	660.0	889	762
42 × 42 × 32	1 067	813.0	762	711	48 × 48 × 24	1 219	610.0	889	737
42 × 42 × 30	1 067	762.0	762	711	48 × 48 × 22	1 219	559.0	889	737
42 × 42 × 28	1 067	711.0	762	698					
42 × 42 × 26	1 067	660.0	762	698					

GENERAL NOTE: All dimensions are in millimeters.

NOTE:

(1) Outlet dimension *M* for run sizes NPS 14 and larger is recommended but not required.

Table 9 Dimensions of Lap Joint Stub Ends



Nominal Pipe Size (NPS)	Outside Diameter of Barrel		Long Pattern Length, <i>F</i> [Notes (3), (4)]	Short Pattern Length, <i>F</i> [Notes (3), (4)]	Radius of Fillet, <i>R</i> [Note (5)]	Diameter of Lap, <i>G</i> [Note (6)]
	Max.	Min.				
1/2	22.8	20.5	76	51	3	35
3/4	28.1	25.9	76	51	3	43
1	35.0	32.6	102	51	3	51
1 1/4	43.6	41.4	102	51	5	64
1 1/2	49.9	47.5	102	51	6	73
2	62.4	59.5	152	64	8	92
2 1/2	75.3	72.2	152	64	8	105
3	91.3	88.1	152	64	10	127
3 1/2	104.0	100.8	152	76	10	140
4	116.7	113.5	152	76	11	157
5	144.3	140.5	203	76	11	186
6	171.3	167.5	203	89	13	216
8	222.1	218.3	203	102	13	270
10	277.2	272.3	254	127	13	324
12	328.0	323.1	254	152	13	381
14	359.9	354.8	305	152	13	413
16	411.0	405.6	305	152	13	470
18	462.0	456.0	305	152	13	533
20	514.0	507.0	305	152	13	584
22	565.0	558.0	305	152	13	641
24	616.0	609.0	305	152	13	692

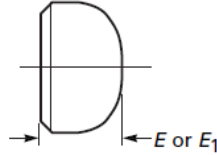
GENERAL NOTES:

- All dimensions are in millimeters.
- See Table 13 for tolerances.
- Service conditions and joint construction often dictate stub end length requirements. Therefore, the purchaser must specify long or short pattern fitting when ordering.

NOTES:

- Gasket face finish shall be in accordance with ASME B16.5 for raised face flanges.
- The lap thickness, *T*, shall not be less than nominal pipe wall thickness. See Table 13 for maximum tolerance.
- When short pattern stub ends are used with larger flanges in Classes 300 and 600, with most sizes in Classes 900 and higher, and when long pattern stub ends are used with larger flanges in Classes 1500 and 2500, it may be necessary to increase the length of the stub ends in order to avoid covering the weld with the flange. Such increases in length shall be a matter of agreement between the manufacturer and purchaser.
- When special facings such as tongue and groove, male and female, etc., are employed, additional lap thickness must be provided and such additional thickness shall be in addition to (not included in) the basic length, *F*.
- These dimensions conform to the radius established for lap joint flanges in ASME B16.5.
- This dimension conforms to standard machined facings shown in ASME B16.5. The back face of the lap shall be machined to conform to the surface on which it sits. Where ring joint facings are to be applied, use dimension *K* as given in ASME B16.5.

Table 10 Dimensions of Caps



Nominal Pipe Size (NPS)	Outside Diameter at Bevel	Length, E [Note (1)]	Limiting Wall Thickness for Length, E	Length, E_1 [Note (2)]
$\frac{1}{2}$	21.3	25	4.57	25
$\frac{3}{4}$	26.7	25	3.81	25
1	33.4	38	4.57	38
$1\frac{1}{4}$	42.2	38	4.83	38
$1\frac{1}{2}$	48.3	38	5.08	38
2	60.3	38	5.59	44
$2\frac{1}{2}$	73.0	38	7.11	51
3	88.9	51	7.62	64
$3\frac{1}{2}$	101.6	64	8.13	76
4	114.3	64	8.64	76
5	141.3	76	9.65	89
6	168.3	89	10.92	102
8	219.1	102	12.70	127
10	273.0	127	12.70	152
12	323.8	152	12.70	178
14	355.6	165	12.70	191
16	406.4	178	12.70	203
18	457.0	203	12.70	229
20	508.0	229	12.70	254
22	559.0	254	12.70	254
24	610.0	267	12.70	305
26	660.0	267	...	...
28	711.0	267	...	...
30	762.0	267	...	...
32	813.0	267	...	...
34	864.0	267	...	...
36	914.0	267	...	...
38	965.0	305	...	...
40	1 016.0	305	...	...
42	1 067.0	305	...	...
44	1 118.0	343	...	...
46	1 168.0	343	...	...
48	1 219.0	343	...	...

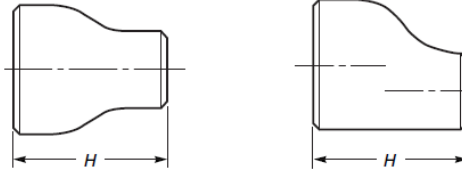
GENERAL NOTES:

- All dimensions are in millimeters.
- The shape of these caps shall be ellipsoidal and shall conform to the requirements given in the ASME Boiler and Pressure Vessel Code.

NOTES:

- Length E applies for thickness not exceeding that given in column "Limiting Wall Thickness for Length, E ."
- Length E_1 applies for thickness greater than that given in column "Limiting Wall Thickness" for NPS 24 and smaller. For NPS 26 and larger, length E_1 shall be by agreement between the manufacturer and purchaser.

Table 11 Dimensions of Reducers



Nominal Pipe Size (NPS)	Outside Diameter at Bevel		End-to-End, H	Nominal Pipe Size (NPS)	Outside Diameter at Bevel		End-to-End, H
	Large End	Small End			Large End	Small End	
$\frac{3}{4} \times \frac{1}{2}$	26.7	21.3	38	5 × 4	141.3	114.3	127
$\frac{3}{4} \times \frac{3}{8}$	26.7	17.3	38	5 × $3\frac{1}{2}$	141.3	101.6	127
$1 \times \frac{3}{4}$	33.4	26.7	51	5 × 3	141.3	88.9	127
$1 \times \frac{1}{2}$	33.4	21.3	51	5 × $2\frac{1}{2}$	141.3	73.0	127
				5 × 2	141.3	60.3	127
$1\frac{1}{4} \times 1$	42.2	33.4	51	6 × 5	168.3	141.3	140
$1\frac{1}{4} \times \frac{3}{4}$	42.2	26.7	51	6 × 4	168.3	114.3	140
$1\frac{1}{4} \times \frac{1}{2}$	42.2	21.3	51	6 × $3\frac{1}{2}$	168.3	101.6	140
				6 × 3	168.3	88.9	140
$1\frac{1}{2} \times 1\frac{1}{4}$	48.3	42.2	64	6 × $2\frac{1}{2}$	168.3	73.0	140
$1\frac{1}{2} \times 1$	48.3	33.4	64				
$1\frac{1}{2} \times \frac{3}{4}$	48.3	26.7	64	8 × 6	219.1	168.3	152
$1\frac{1}{2} \times \frac{1}{2}$	48.3	21.3	64	8 × 5	219.1	141.3	152
				8 × 4	219.1	114.3	152
$2 \times 1\frac{1}{2}$	60.3	48.3	76	8 × $3\frac{1}{2}$	219.1	101.6	152
$2 \times 1\frac{1}{4}$	60.3	42.2	76				
2×1	60.3	33.4	76	10 × 8	273.0	219.1	178
$2 \times \frac{3}{4}$	60.3	26.7	76	10 × 6	273.0	168.3	178
				10 × 5	273.0	141.3	178
$2\frac{1}{2} \times 2$	73.0	60.3	89	10 × 4	273.0	114.3	178
$2\frac{1}{2} \times 1\frac{1}{2}$	73.0	48.3	89				
$2\frac{1}{2} \times 1\frac{1}{4}$	73.0	42.2	89	12 × 10	323.8	273.0	203
$2\frac{1}{2} \times 1$	73.0	33.4	89	12 × 8	323.8	219.1	203
				12 × 6	323.8	168.3	203
$3 \times 2\frac{1}{2}$	88.9	73.0	89	12 × 5	323.8	141.3	203
3×2	88.9	60.3	89				
$3 \times 1\frac{1}{2}$	88.9	48.3	89	14 × 12	355.6	323.8	330
$3 \times 1\frac{1}{4}$	88.9	42.2	89	14 × 10	355.6	273.0	330
				14 × 8	355.6	219.1	330
$3\frac{1}{2} \times 3$	101.6	88.9	102	14 × 6	355.6	168.3	330
$3\frac{1}{2} \times 2\frac{1}{2}$	101.6	73.0	102				
$3\frac{1}{2} \times 2$	101.6	60.3	102	16 × 14	406.4	355.6	356
$3\frac{1}{2} \times 1\frac{1}{2}$	101.6	48.3	102	16 × 12	406.4	323.8	356
$3\frac{1}{2} \times 1\frac{1}{4}$	101.6	42.2	102	16 × 10	406.4	273.0	356
				16 × 8	406.4	219.1	356
$4 \times 3\frac{1}{2}$	114.3	101.6	102				
4×3	114.3	88.9	102	18 × 16	457	406.4	381
$4 \times 2\frac{1}{2}$	114.3	73.0	102	18 × 14	457	355.6	381
4×2	114.3	60.3	102	18 × 12	457	323.8	381
$4 \times 1\frac{1}{2}$	114.3	48.3	102	18 × 10	457	273.0	381

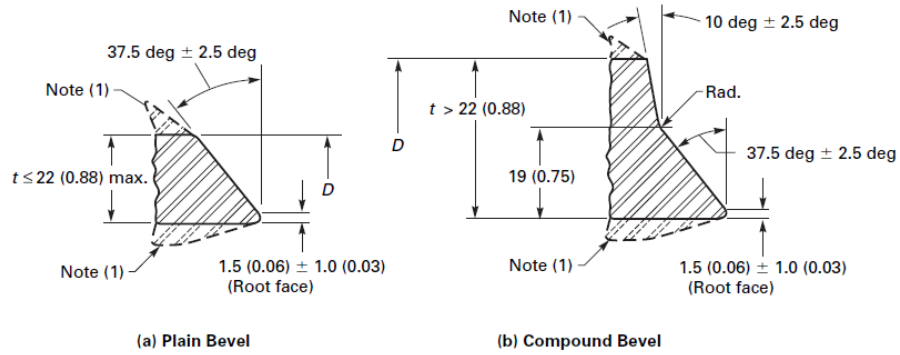
Table 11 Dimensions of Reducers (Cont'd)

Nominal Pipe Size (NPS)	Outside Diameter at Bevel		End-to-End, <i>H</i>	Nominal Pipe Size (NPS)	Outside Diameter at Bevel		End-to-End, <i>H</i>
	Large End	Small End			Large End	Small End	
20 × 18	508	457.0	508	36 × 34	914	864	610
20 × 16	508	406.4	508	36 × 32	914	813	610
20 × 14	508	355.6	508	36 × 30	914	762	610
20 × 12	508	323.8	508	36 × 26	914	660	610
				36 × 24	914	610	610
22 × 20	559	508.0	508	38 × 36	965	914	610
22 × 18	559	457.0	508	38 × 34	965	864	610
22 × 16	559	406.4	508	38 × 32	965	813	610
22 × 14	559	355.4	508	38 × 30	965	762	610
				38 × 28	965	711	610
24 × 22	610	559.0	508	38 × 26	965	660	610
24 × 20	610	508.0	508				
24 × 18	610	457.0	508	40 × 38	1 016	965	610
24 × 16	610	406.4	508	40 × 36	1 016	914	610
				40 × 34	1 016	864	610
26 × 24	660	610.0	610	40 × 32	1 016	813	610
26 × 22	660	559.0	610	40 × 30	1 016	762	610
26 × 20	660	508.0	610				
26 × 18	660	457.0	610	42 × 40	1 067	1 016	610
				42 × 38	1 067	965	610
28 × 26	711	660.0	610	42 × 36	1 067	914	610
28 × 24	711	610.0	610	42 × 34	1 067	864	610
28 × 20	711	508.0	610	42 × 32	1 067	813	610
28 × 18	711	457.0	610	42 × 30	1 067	762	610
30 × 28	762	711.0	610	44 × 42	1 118	1 067	610
30 × 26	762	660.0	610	44 × 40	1 118	1 016	610
30 × 24	762	610.0	610	44 × 38	1 118	965	610
30 × 20	762	508.0	610	44 × 36	1 118	914	610
32 × 30	813	762.0	610	46 × 44	1 168	1 118	711
32 × 28	813	711.0	610	46 × 42	1 168	1 067	711
32 × 26	813	660.0	610	46 × 40	1 168	1 016	711
32 × 24	813	610.0	610	46 × 38	1 168	965	711
34 × 32	864	813.0	610	48 × 46	1 219	1 168	711
34 × 30	864	762.0	610	48 × 44	1 219	1 118	711
34 × 26	864	660.0	610	48 × 42	1 219	1 067	711
34 × 24	864	610.0	610	48 × 40	1 219	1 016	711

GENERAL NOTES:

- (a) All dimensions are in millimeters.
(b) While the figure illustrates a bell-shaped reducer, the use of a conical reducer is not prohibited.

Table 12 Welding Bevels and Root Face



Nominal Wall Thickness, t	End Preparation
Less than x [Note (2)]	Cut square or slightly chamfer, at manufacturer's option (not illustrated)
x to 22 (0.88), inclusive	Plain bevel as in illustration (a) above
More than 22 (0.88)	Compound bevel as in illustration (b) above

GENERAL NOTES:

(a) Dimensions in parentheses are in inches.

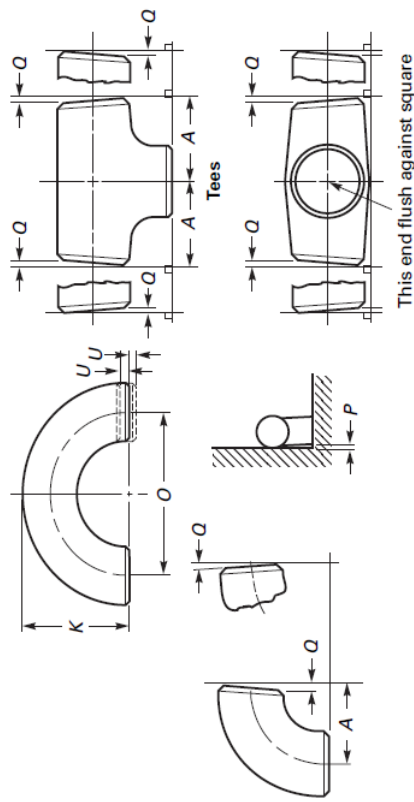
(b) Other dimensions are in millimeters.

NOTES:

(1) See section 8 and Fig. 1 for transition contours.

(2) $x = 5$ (0.19) for carbon steel or ferritic alloy steel and 3 (0.12) for austenitic alloy steel.

Table 13 Tolerances



All Fittings [Notes (1) and (2)]			Center-to-End Dimensions				Overall Length of Reducers and Lap Joint Stub Ends, F, H, E				180-deg Returns	
Nominal Pipe Size (NPS)	DN	Outside Diameter at Bevel, D [Notes (3) and (4)]	Inside Diameter at End [Notes (3) and (5)]	90-deg and 45-deg Long and Short Radius Elbows and Tees, A, B, C, M		30 Radius Elbows, A, B	Overall Length of Reducers and Lap Joint Stub Ends, F, H, E		Center-to-Center Dimension, O	Back-to-Face Dimension, K	Alignment of Ends, U	
$\frac{1}{2}$ to $2\frac{1}{2}$	15-65	+1.6, -0.8	0.8	2	2	3	2	2	6	6	1	1
3 to $3\frac{1}{2}$	80-90	1.6	1.6	2	2	3	2	3	6	6	1	1
4	100	1.6	1.6	2	2	3	2	3	6	6	1	1
5 to 8	125-200	+2.4, -1.6	1.6	2	2	3	2	6	6	6	1	1
10 to 18	250-450	+4.0, -3.2	3.2	2	2	3	2	6	10	6	2	2
20 to 24	500-600	+6.4, -4.8	4.8	2	2	3	2	6	10	6	2	2
26 to 30	650-750	+6.4, -4.8	4.8	3	3	6	5	10	...	...	...	...
32 to 48	800-1 200	+6.4, -4.8	4.8	5	5	6	5	10	...	...	...	...

Wall Thickness Schedules

ASME B36.10 ASME B36.19

Nominal Pipe Size (NPS)		Outside Diameter		Nominal Wall Thickness									
				Sch5s		Sch10s		Sch40s		Sch80s		Sch5	
A	B	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN
8	1/4	13.7	0.540	-	-	1.65	0.065	2.24	0.088	3.02	0.119	-	-
10	3/8	17.1	0.675	-	-	1.65	0.065	2.31	0.091	3.20	0.126	-	-
15	1/2	21.3	0.840	1.65	0.065	2.11	0.083	2.77	0.109	3.73	0.147	1.65	0.065
20	3/4	26.7	1.05	1.65	0.065	2.11	0.083	2.87	0.113	3.91	0.154	1.65	0.065
25	1	33.4	1.32	1.65	0.065	2.77	0.109	3.38	0.133	4.55	0.179	1.65	0.065
32	1 1/4	42.2	1.66	1.65	0.065	2.77	0.109	3.56	0.140	4.85	0.191	1.65	0.065
40	1 1/2	48.3	1.9	1.65	0.065	2.77	0.109	3.68	0.145	5.08	0.200	1.65	0.065
50	2	60.3	2.38	1.65	0.065	2.77	0.109	3.91	0.154	5.54	0.218	1.65	0.065
65	2 1/2	73.0	2.88	2.11	0.083	3.05	0.120	5.16	0.203	7.01	0.276	2.11	0.083
80	3	88.9	3.5	2.11	0.083	3.05	0.120	5.49	0.216	7.62	0.300	2.11	0.083
90	3 1/2	101.6	4	2.11	0.083	3.05	0.120	5.74	0.226	8.08	0.318	2.11	0.083
100	4	114.3	4.5	2.11	0.083	3.05	0.120	6.02	0.237	8.56	0.337	2.11	0.083
125	5	141.3	5.56	2.77	0.109	3.40	0.134	6.55	0.258	9.53	0.375	2.77	0.109
150	6	168.3	6.62	2.77	0.109	3.40	0.134	7.11	0.280	10.97	0.432	2.77	0.109
200	8	219.1	8.62	2.77	0.109	3.76	0.148	8.18	0.322	12.70	0.500	2.77	0.109
250	10	273.0	10.75	3.40	0.134	4.19	0.165	9.27	0.365	12.70	0.500	3.40	0.134
300	12	323.8	12.75	3.96	0.156	4.57	0.180	9.53	0.375	12.70	0.500	3.96	0.156
350	14	355.6	14	3.96	0.156	4.78	0.188	9.53	0.375	12.70	0.500	3.96	0.156
400	16	406.4	16	4.19	0.165	4.78	0.188	9.53	0.375	12.70	0.500	4.19	0.165
450	18	457	18	4.19	0.165	4.78	0.188	9.53	0.375	12.70	0.500	4.19	0.165
500	20	508	20	4.78	0.188	5.54	0.218	9.53	0.375	12.70	0.500	4.78	0.188
550	22	559	22	4.78	0.188	5.54	0.218	9.53	0.375	12.70	0.500	4.78	0.188
600	24	610	24	5.54	0.218	6.35	0.250	9.53	0.375	12.70	0.500	5.54	0.218
650	26	660	26	-	-	-	-	-	-	-	-	-	-
700	28	711	28	-	-	-	-	-	-	-	-	-	-
750	30	762	30	6.35	0.250	7.92	0.312	9.53	0.375	12.70	0.500	6.35	0.250
800	32	813	32	-	-	-	-	-	-	-	-	-	-
850	34	864	34	-	-	-	-	-	-	-	-	-	-
900	36	914	36	-	-	-	-	-	-	-	-	-	-
950	38	965	38	-	-	-	-	-	-	-	-	-	-
1000	40	1016	40	-	-	-	-	-	-	-	-	-	-
1050	42	1067	42	-	-	-	-	-	-	-	-	-	-
1100	44	1118	44	-	-	-	-	-	-	-	-	-	-
1150	46	1168	46	-	-	-	-	-	-	-	-	-	-
1200	48	1219	48	-	-	-	-	-	-	-	-	-	-
1250	50	1270	50	-	-	-	-	-	-	-	-	-	-
1300	52	1321	52	-	-	-	-	-	-	-	-	-	-
1350	54	1372	54	-	-	-	-	-	-	-	-	-	-
1400	56	1422	56	-	-	-	-	-	-	-	-	-	-
1450	58	1473	58	-	-	-	-	-	-	-	-	-	-
1500	60	1524	60	-	-	-	-	-	-	-	-	-	-
1650	66	1676	66	-	-	-	-	-	-	-	-	-	-
1800	72	1829	72	-	-	-	-	-	-	-	-	-	-
2000	80	2032	80	-	-	-	-	-	-	-	-	-	-

Nominal Pipe Size (NPS)		Outside Diameter		Nominal Wall Thickness													
				Sch10		Sch20		Sch30		STD		Sch40		Sch60		XS	
A	B	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN
8	1/4	13.7	0.540	1.65	0.065	-	-	1.85	0.073	2.24	0.088	2.24	0.088	-	-	3.02	0.119
10	3/8	17.1	0.675	1.65	0.065	-	-	1.85	0.073	2.31	0.091	2.31	0.091	-	-	3.20	0.126
15	1/2	21.3	0.840	2.11	0.083	-	-	2.41	0.095	2.77	0.109	2.77	0.109	-	-	3.73	0.147
20	3/4	26.7	1.05	2.11	0.083	-	-	2.41	0.095	2.87	0.113	2.87	0.113	-	-	3.91	0.154
25	1	33.4	1.32	2.77	0.109	-	-	2.90	0.114	3.38	0.133	3.38	0.133	-	-	4.55	0.179
32	1 1/4	42.2	1.66	2.77	0.109	-	-	2.97	0.117	3.56	0.140	3.56	0.140	-	-	4.85	0.191
40	1 1/2	48.3	1.9	2.77	0.109	-	-	3.18	0.125	3.68	0.145	3.68	0.145	-	-	5.08	0.200
50	2	60.3	2.38	2.77	0.109	-	-	3.18	0.125	3.91	0.154	3.91	0.154	-	-	5.54	0.218
65	2 1/2	73.0	2.88	3.05	0.120	-	-	4.78	0.188	5.16	0.203	5.16	0.203	-	-	7.01	0.276
80	3	88.9	3.5	3.05	0.120	-	-	4.78	0.188	5.49	0.216	5.49	0.216	-	-	7.62	0.300
90	3 1/2	101.6	4	3.05	0.120	-	-	4.78	0.188	5.74	0.226	5.74	0.226	-	-	8.08	0.318
100	4	114.3	4.5	3.05	0.120	-	-	4.78	0.188	6.02	0.237	6.02	0.237	-	-	8.56	0.337
125	5	141.3	5.56	3.40	0.134	-	-	-	-	6.55	0.258	6.55	0.258	-	-	9.53	0.375
150	6	168.3	6.62	3.40	0.134	-	-	-	-	7.11	0.280	7.11	0.280	-	-	10.97	0.432
200	8	219.1	8.62	3.76	0.148	6.35	0.250	7.04	0.277	8.18	0.322	8.18	0.322	10.31	0.406	12.70	0.500
250	10	273.0	10.75	4.19	0.165	6.35	0.250	7.80	0.307	9.27	0.365	9.27	0.365	12.70	0.500	12.70	0.500
300	12	323.8	12.75	4.57	0.180	6.35	0.250	8.38	0.330	9.53	0.375	10.31	0.406	14.27	0.562	12.70	0.500
350	14	355.6	14	6.35	0.250	7.92	0.312	9.53	0.375	9.53	0.375	11.13	0.438	15.09	0.594	12.70	0.500
400	16	406.4	16	6.35	0.250	7.92	0.312	9.53	0.375	9.53	0.375	12.70	0.500	16.66	0.656	12.70	0.500
450	18	457	18	6.35	0.250	7.92	0.312	11.13	0.438	9.53	0.375	14.27	0.562	19.05	0.750	12.70	0.500
500	20	508	20	6.35	0.250	9.53	0.375	12.70	0.500	9.53	0.375	15.09	0.594	20.62	0.812	12.70	0.500
550	22	559	22	6.35	0.250	9.53	0.375	12.70	0.500	9.53	0.375	-	-	22.23	0.875	12.70	0.500
600	24	610	24	6.35	0.250	9.53	0.375	14.27	0.562	9.53	0.375	17.48	0.688	24.61	0.969	12.70	0.500
650	26	660	26	7.92	0.312	12.70	0.500	-	-	9.53	0.375	-	-	-	-	12.70	0.500
700	28	711	28	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	-	-	-	-	12.70	0.500
750	30	762	30	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	-	-	-	-	12.70	0.500
800	32	813	32	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	17.48	0.688	-	-	12.70	0.500
850	34	864	34	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	17.48	0.688	-	-	12.70	0.500
900	36	914	36	7.92	0.312	12.70	0.500	15.88	0.625	9.53	0.375	19.05	0.750	-	-	12.70	0.500
950	38	965	38	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1000	40	1016	40	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1050	42	1067	42	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1100	44	1118	44	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1150	46	1168	46	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1200	48	1219	48	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1250	50	1270	50	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1300	52	1321	52	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1350	54	1372	54	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1400	56	1422	56	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1450	58	1473	58	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1500	60	1524	60	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1650	66	1676	66	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
1800	72	1829	72	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500
2000	80	2032	80	-	-	-	-	-	-	9.53	0.375	-	-	-	-	12.70	0.500

Nominal Pipe Size (NPS)		Outside Diameter		Nominal Wall Thickness											
				Sch80		Sch100		Sch120		Sch140		Sch160		XXS	
A	B	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN
8	1/4	13.7	0.540	3.02	0.119	-	-	-	-	-	-	-	-	-	-
10	3/8	17.1	0.675	3.20	0.126	-	-	-	-	-	-	-	-	-	-
15	1/2	21.3	0.840	3.73	0.147	-	-	-	-	-	-	4.78	0.188	7.47	0.294
20	3/4	26.7	1.05	3.91	0.154	-	-	-	-	-	-	5.56	0.219	7.82	0.308
25	1	33.4	1.32	4.55	0.179	-	-	-	-	-	-	6.35	0.250	9.09	0.358
32	1 1/4	42.2	1.66	4.85	0.191	-	-	-	-	-	-	6.35	0.250	9.70	0.382
40	1 1/2	48.3	1.9	5.08	0.200	-	-	-	-	-	-	7.14	0.281	10.15	0.400
50	2	60.3	2.38	5.54	0.218	-	-	-	-	-	-	8.74	0.344	11.07	0.436
65	2 1/2	73.0	2.88	7.01	0.276	-	-	-	-	-	-	9.53	0.375	14.02	0.552
80	3	88.9	3.5	7.62	0.300	-	-	-	-	-	-	11.13	0.438	15.24	0.600
90	3 1/2	101.6	4	8.08	0.318	-	-	-	-	-	-	-	-	-	-
100	4	114.3	4.5	8.56	0.337	-	-	11.13	0.438	-	-	13.49	0.531	17.12	0.674
125	5	141.3	5.56	9.53	0.375	-	-	12.70	0.500	-	-	15.88	0.625	19.05	0.750
150	6	168.3	6.62	10.97	0.432	-	-	14.27	0.562	-	-	18.26	0.719	21.95	0.864
200	8	219.1	8.62	12.70	0.500	15.09	0.594	18.26	0.719	20.62	0.812	23.01	0.906	22.23	0.875
250	10	273.0	10.75	15.09	0.594	18.26	0.719	21.44	0.844	25.40	1.000	28.58	1.125	25.40	1.000
300	12	323.8	12.75	17.48	0.688	21.44	0.844	25.40	1.000	28.58	1.125	33.32	1.312	25.40	1.000
350	14	355.6	14	19.05	0.750	23.83	0.938	27.79	1.094	31.75	1.250	35.71	1.406	-	-
400	16	406.4	16	21.44	0.844	26.19	1.031	30.96	1.219	36.53	1.438	40.49	1.594	-	-
450	18	457	18	23.83	0.938	29.36	1.156	34.93	1.375	39.67	1.562	45.24	1.781	-	-
500	20	508	20	26.19	1.031	32.54	1.281	38.10	1.500	44.45	1.750	50.01	1.969	-	-
550	22	559	22	28.58	1.125	34.93	1.375	41.28	1.625	47.63	1.875	53.98	2.125	-	-
600	24	610	24	30.96	1.219	38.89	1.531	46.02	1.812	52.37	2.062	59.54	2.344	-	-
650	26	660	26	-	-	-	-	-	-	-	-	-	-	-	-
700	28	711	28	-	-	-	-	-	-	-	-	-	-	-	-
750	30	762	30	-	-	-	-	-	-	-	-	-	-	-	-
800	32	813	32	-	-	-	-	-	-	-	-	-	-	-	-
850	34	864	34	-	-	-	-	-	-	-	-	-	-	-	-
900	36	914	36	-	-	-	-	-	-	-	-	-	-	-	-

株式会社 春日井

〒550-0013 大阪市西区新町4丁目14番2号
TEL (06) 6538-7281 FAX (06) 6538-2273
URL <http://www.kasugai-group.co.jp/>
Kasugai Co., Ltd.
4-14-2 Shinmachi Nishi-Ku, Osaka, 5500013, Japan

