



Navkar

Fittings & Forgings Pvt. Ltd.

**QUALITY
PRODUCTS
IN PIPE
FITTINGS**

Trusted Quality Over 15 Years

COMPANY PROFILE

A team of well experienced Engineers and Staff at Navkar Fittings & Forgings having certification of ISO 9001- 2015. We would like to introduce ourselves as "Manufacturers & Exporters" of Buttweld Pipe Fittings in Seamless & Welded construction in various grades in Carbon Steel, Stainless Steel, Alloy Steel, Nickel Alloys, Copper Base Alloys with Nace, HIC, H2 & Various other special grades & as per your technical specification & requirement.

We manufacture fittings confirming to National & International standard and meeting stringent quality requirements keeping the same in mind we have installed latest plant and machinery. We have clients of various sectors like Oil & Gas, Chemicals, Petrochemicals, Fertilizer, Power Plant, Pulp and Paper, Atomic Research Centre, Environmental and water projects, Engineering Projects etc.



RANGE OF PRODUCTS

BUTTWELD SEAMLESS & WELDED PIPE FITTINGS IN STAINLESS STEEL, ALLOY STEEL, CARBON STEEL & NICKEL ALLOYS.

PRODUCTS	MATERIAL
Long Radius Bend, Special Bend, 45°,90°,180°,L.R/S.R.Elbow, Equal Tee, Unequal Tee, Cross, Barred Tee, Conc.Reducer, Ecc.Reducer, Stubend, Cap, Ecc.Swage Nipple, Conc.Swage Nipple.	Carbon Steel LTCS (Low Temp.) WPHY X42,X52,X60,X65,X70 Nace, HIC, H2 Alloy Steel P11,P22,P91,P5,P9 Stainless Steel High Nickel Alloys – Inconel 600,625,825 Monel SMO254,Alloy20,904L Titanium Gr.1, Gr.2

LONG RADIUS PIGGABLE BENDS

Seamless & Welded long radius piggable bends in 2D, 5D, 8D up to 22D, in Deg. of 45°, 90°, 180°, 360° size up to 32"NB with tangents length as per requirement. For L.R. Bends dimension tolerance, Flattening on any point max. 1.7%, ovality within 1% of the diameter of pipe, Deg. +/- 1.5, thinning max.5% of W.T., No flaring, wrinkle free bends, dummy pig pass test done with 96% ID of bend and 'J', 'S', 'U' special bends.

Polyster Melt transfer line special radius bends with inside electro polished. Very precise ID control also jacket bend having special radius tailor made bends as per client requirement.

Materials of Construction, Specification & Code

MATERIAL	SPECIFICATION	SIZE (mm)	SCHEDULE	METHOD	DIMENSION
Stainless Steel	A.403 WP304L, 316, 317L, 321H, 347H, 310S 904L UNS, DSGN	15 to 450NB 40 TO 800 NB	5s to XXS 5s to 80s	Seamless Welded	B.16.9 B.16.28 DIN
Alloy Steel Carbon Steel Low Temp, Carbon	A.234 WP5, WP11, WP22, P9, P91 WPHY 42, 46, 52, 60, 65, A234 WPB, A 234 WPBW, NACE, A 420 WPL6	15 to 500 NB 200 to 800 NB	40 TO XXS 10, 20, 30, 40, 80	Seamless Welded	B.16.9 B.16.28 DIN
Inconel, Monel, Titanium, Aluminium, UNS Dsgn	ASME, ASTM, UNS, API, ISO, BS, DIN, IS	15 to 250 NB 40 to 800 NB 1/2" to 8" OD	5s to XXS 5s to 80s	Seamless Welded	B.16.9 B.16.28 DIN

MANUFACTURING PROCESS

We have complete in house facilities for manufacturing of Butt-Weld Fittings & Long Radius, Piggable Bends. For producing above we have Hot Forging, Cold Forging, Bending, Pressing, Welding, Grinding, Gauging, Handling, Hydraulic Testing, Heat Treatment, Annealing, Shot Blasting Pickling & Passivation, Anti Rust Coating & Packing Facilities. We also have adopted the innovation process & latest technology machine to manufacture high quality pipe fittings. We have automatic elbow making machine also known as "Mandrel Plant". Our products also got through in burst testing as per ASTM standard & as per process design.

QUALITY POLICY

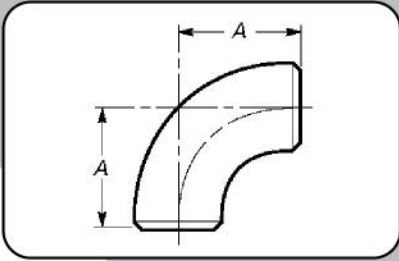
We at Navkar Fittings & Forgings Pvt Ltd are committed to manufacture and supply the quality products to satisfy the customer requirements as per Codes & Specifications in pipe fittings. We will focus on optimal work safety and appropriate environmental protection. We will sustain cost effectiveness by continually improving effectiveness of the quality management system.

QUALITY CONTROL

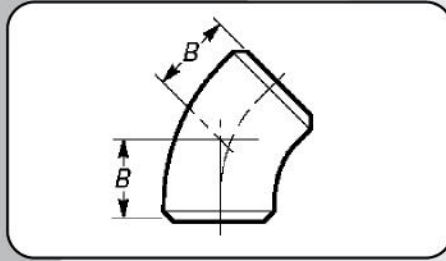
All our pipe fittings are manufactured under complete quality check guided by the codes & directed by the customers. Each of our product is checked right from the raw material stage upto final products as per quality manuals & quality assurance plan approved by the clients. We have our equipments & measuring instruments duly calibrated by approved agencies.



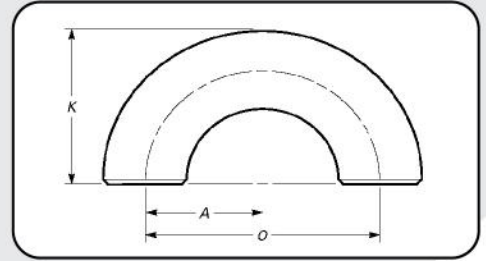
BUTT WELD PIPE FITTINGS



90 Deg. LR ELBOW



45 Deg. LR ELBOW

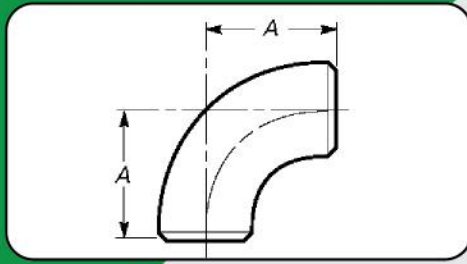


180 Deg. LR RETURN BEND

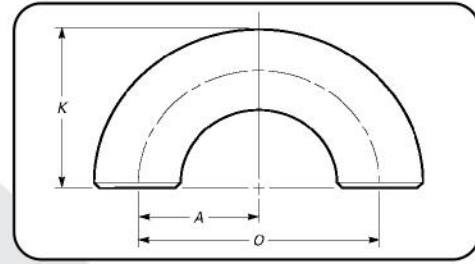
AS PER B 16.9

Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)	Dimension		Center to Center	Back to Face
		A	B	O	K
1/2"	21.3	38	16	76	48
3/4"	26.7	38	19	76	51
1"	33.4	38	22	76	56
1 1/4"	42.2	48	25	95	70
1 1/2"	48.3	57	29	114	83
2"	60.3	76	35	152	106
2 1/2"	73.0	95	44	190	132
3"	88.9	114	51	229	159
3 1/2"	101.6	133	57	267	184
4"	114.3	152	64	305	210
5"	141.3	190	79	381	262
6"	168.3	229	95	457	313
8"	219.1	305	127	610	414
10"	273.0	381	159	762	518
12"	323.8	457	190	914	619
14"	355.6	533	222	1067	711
16"	406.4	610	254	1219	813
18"	457.0	686	286	1372	914
20"	508.0	762	318	1524	1016
22"	559.0	838	343	1676	1118
24"	610.0	914	381	1829	1219
26"	660.0	991	406	1981	1321
28"	711.0	1067	438	2134	1422
30"	762.0	1143	470	2286	1524
32"	813.0	1219	502	2438	1626
34"	864.0	1295	533	2591	1727
36"	914.0	1372	565	2743	1829
38"	965.0	1448	600	2896	1930
40"	1016.0	1524	632	3048	2032
42"	1067.0	1600	660	3200	2134
44"	1118.0	1676	695	3353	2235
46"	1168.0	1753	727	3505	2337
48"	1219.0	1829	759	3658	2438

BUTT WELD PIPE FITTINGS



90 Deg. SR ELBOW

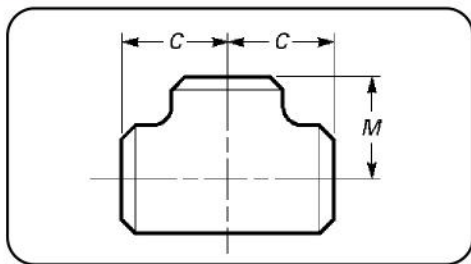


180 Deg. SR RETURN

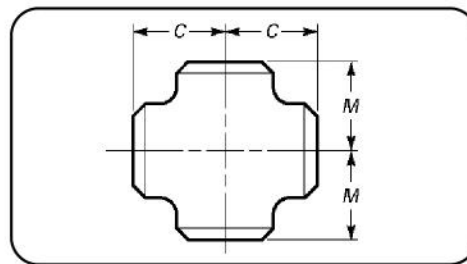
AS PER B 16.28

Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)	Dimension A	Center to Center O	Back to Face K
1/2"	21.3
3/4"	26.7
1"	33.4	25	51	41
1 1/4"	42.2	32	64	52
1 1/2"	48.3	38	76	62
2"	60.3	51	102	81
2 1/2"	73.0	64	127	100
3"	88.9	76	152	121
3 1/2"	101.6	89	178	140
4"	114.3	102	203	159
5"	141.3	127	254	197
6"	168.3	152	305	237
8"	219.1	203	406	313
10"	273.0	254	508	391
12"	323.8	305	610	467
14"	355.6	356	711	533
16"	406.4	406	813	610
18"	457.0	457	914	686
20"	508.0	508	1016	762
22"	559.0	559	1118	838
24"	610.0	610	1219	914

BUTT WELD PIPE FITTINGS



EQUAL TEE



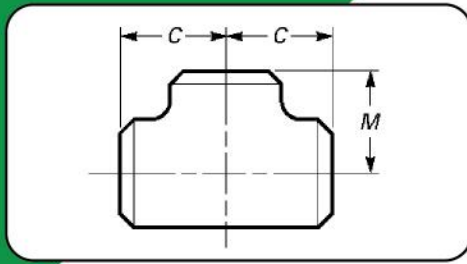
CROSS

AS PER B 16.9

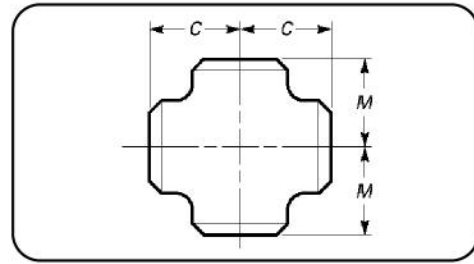
NOMINAL PIPE SIZE (NPS)	OUT SIDE DIAMETER AT BEVEL END	RUN 'C'	OUTLET 'M'
1/2"	21.3	25	25
3/4"	26.7	29	29
1"	33.4	38	38
1 1/4"	42.2	48	48
1 1/2"	48.3	57	57
2"	60.3	64	64
2 1/2"	73.0	76	76
3"	88.9	86	86
3 1/2"	101.6	95	95
4"	114.3	105	105
5"	141.3	124	124
6"	168.3	143	143
8"	219.1	178	178
10"	273.0	216	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	1016.0	749	749
42	1067.0	762	711
44	1118.0	813	762
46	1168.0	851	800
48	1219.0	889	838

NOTE : ALL DIMENSIONS ARE IN MM.

BUTT WELD PIPE FITTINGS



UNEQUAL TEE



CROSS UNEQUAL

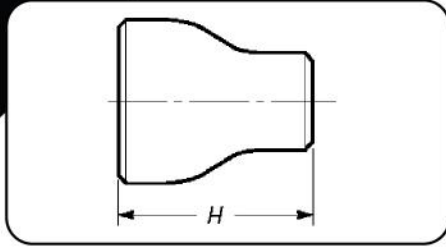
AS PER B 16.9

Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		Center to Center		Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		Center to Center	
	Run	Outlet	Run 'C'	Outlet 'M'		Run	Outlet	Run 'C'	Outlet 'M'
1/2" x 3/8"	21.3	17.3	25	25	8" x 6"	219.1	168.3	178	168
1/2" x 1/4"	21.3	13.7	25	25	8" x 5"	219.1	141.3	178	162
3/4" x 1/2"	26.7	21.3	29	29	8" x 4"	219.1	114.3	178	156
3/4" x 3/8"	26.7	17.3	29	29	8" x 3 1/2"	219.1	101.6	178	152
1" x 3/4"	33.4	26.7	38	38	10" x 8"	273.0	219.1	216	203
1" x 1/2"	33.4	21.3	38	38	10" x 6"	273.0	168.3	216	194
1 1/4" x 1"	42.2	33.4	48	48	10" x 5"	273.0	141.3	216	191
1 1/4" x 3/4"	42.2	26.7	48	48	10" x 4"	273.0	114.3	216	184
1 1/4" x 1/2"	42.2	21.3	48	48	12" x 10"	323.8	273.0	254	241
1 1/2" x 1 1/4"	48.3	42.2	57	57	12" x 8"	323.8	219.1	254	229
1 1/2" x 1"	48.3	33.4	57	57	12" x 6"	323.8	168.3	254	219
1 1/2" x 3/4"	48.3	26.7	57	57	12" x 5"	323.8	141.3	254	216
1 1/2" x 1/2"	48.3	21.3	57	57	14" x 12"	355.6	323.8	279	270
2" x 1 1/2"	60.3	48.3	64	60	14" x 10"	355.6	273.0	279	257
2" x 1 1/4"	60.3	42.2	64	57	14" x 8"	355.6	219.1	279	248
2" x 1"	60.3	33.4	64	51	14" x 6"	355.6	168.3	279	238
2" x 3/4"	60.3	26.7	64	44	16" x 14"	406.4	355.6	305	305
2 1/2" x 2"	73.0	60.3	76	70	16" x 12"	406.4	323.8	305	295
2 1/2" x 1 1/2"	73.0	48.3	76	67	16" x 10"	406.4	273.0	305	283
2 1/2" x 1 1/4"	73.0	42.2	76	64	16" x 8"	406.4	219.1	305	273
2 1/2" x 1"	73.0	33.4	76	57	16" x 6"	406.4	168.3	305	264
3" x 2 1/2"	88.9	73.0	86	83	18" x 16"	457.0	406.4	343	330
3" x 2"	88.9	60.3	86	76	18" x 14"	457.0	355.6	343	330
3" x 1 1/2"	88.9	48.3	86	73	18" x 12"	457.0	323.8	343	321
3" x 1 1/4"	88.9	42.2	86	70	18" x 10"	457.0	273.0	343	308
3 1/2" x 3"	101.6	88.9	95	92	18" x 8"	457.0	219.1	343	298
3 1/2" x 2 1/2"	101.6	73.0	95	89	20" x 18"	508.0	457.0	381	368
3 1/2" x 2"	101.6	60.3	95	83	20" x 16"	508.0	406.4	381	356
3 1/2" x 1 1/2"	101.6	48.3	95	79	20" x 14"	508.0	355.6	381	356
4" x 3 1/2"	114.3	101.6	105	102	20" x 12"	508.0	323.8	381	346
4" x 3"	114.3	88.9	105	98	20" x 10"	508.0	273.0	381	333
4" x 2 1/2"	114.3	73.0	105	95	20" x 8"	508.0	219.1	381	324
4" x 2"	114.3	60.3	105	89	22" x 20"	559.0	508.0	419	406
4" x 1 1/2"	114.3	48.3	105	86	22" x 18"	559.0	457.0	419	394
5" x 4"	141.3	114.3	124	117	22" x 16"	559.0	406.4	419	381
5" x 3 1/2"	141.3	101.6	124	114	22" x 14"	559.0	355.6	419	381
5" x 3"	141.3	88.9	124	111	22" x 12"	559.0	323.8	419	371
5" x 2 1/2"	141.3	73.0	124	108	22" x 10"	559.0	273.0	419	359
5" x 2"	141.3	60.3	124	105	24" x 22"	610.0	559.0	432	432
6" x 5"	168.3	141.3	143	137	24" x 20"	610.0	508.0	432	432
6" x 4"	168.3	114.3	143	130	24" x 18"	610.0	457.0	432	419
6" x 3 1/2"	168.3	101.6	143	127	24" x 16"	610.0	406.4	432	406
6" x 3"	168.3	88.9	143	124	24" x 14"	610.0	355.6	432	406
6" x 2 1/2"	168.3	73.0	143	121	24" x 12"	610.0	323.8	432	397
					24" x 10"	610.0	273.0	432	384

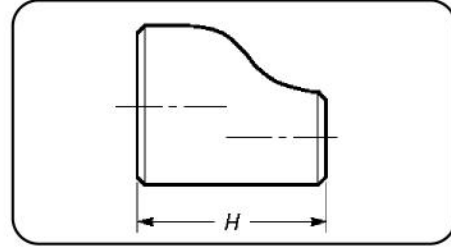
UNEQUAL TEE					CROSS UNEQUAL				
AS PER B 16.9									
Nominal Pipe Size (NPS)	Outside Diameter		Center to Center		Nominal Pipe Size (NPS)	Outside Diameter		Center to Center	
	Run	Outlet	Run 'C'	Outlet 'M'		Run	Outlet	Run 'C'	Outlet 'M'
26" x 24"	660.0	610.0	495	483					
26" x 22"	660.0	559.0	495	470	38" x 18"	965.0	457.0	711	597
26" x 20"	660.0	508.0	495	457	40" x 38"	1016.0	965.0	749	749
26" x 18"	660.0	457.0	495	444	40" x 36"	1016.0	914.0	749	737
26" x 16"	660.0	406.4	495	432	40" x 34"	1016.0	864.0	749	724
26" x 14"	660.0	355.6	495	432					
26" x 12"	660.0	323.8	495	422	40" x 32"	1016.0	813.0	749	711
					40" x 30"	1016.0	762.0	749	698
28" x 26"	711.0	660.0	521	521	40" x 28"	1016.0	711.0	749	673
28" x 24"	711.0	610.0	521	508	40" x 26"	1016.0	660.0	749	673
28" x 22"	711.0	559.0	521	495	40" x 24"	1016.0	610.0	749	660
28" x 20"	711.0	508.0	521	483	40" x 22"	1016.0	559.0	749	648
28" x 18"	711.0	457.0	521	470	40" x 20"	1016.0	508.0	749	635
28" x 16"	711.0	406.4	521	457	40" x 18"	1016.0	457.0	749	622
28" x 14"	711.0	355.6	521	457					
28" x 12"	711.0	323.8	521	448	42" x 40"	1067.0	1016.0	762	711
					42" x 38"	1067.0	965.0	762	711
30" x 28"	762.0	711.0	559	546	42" x 36"	1067.0	914.0	762	711
30" x 26"	762.0	660.0	559	546	42" x 34"	1067.0	864.0	762	711
30" x 24"	762.0	610.0	559	533	42" x 32"	1067.0	813.0	762	711
30" x 22"	762.0	559.0	559	521	42" x 30"	1067.0	762.0	762	711
30" x 20"	762.0	508.0	559	508	42" x 28"	1067.0	711.0	762	698
30" x 18"	762.0	457.0	559	495	42" x 26"	1067.0	660.0	762	698
30" x 16"	762.0	406.4	559	483	42" x 24"	1067.0	610.0	762	660
30" x 14"	762.0	355.6	559	483	42" x 22"	1067.0	559.0	762	660
30" x 12"	762.0	323.8	559	473	42" x 20"	1067.0	508.0	762	660
30" x 10"	762.0	273.0	559	460	42" x 18"	1067.0	457.0	762	648
					42" x 16"	1067.0	406.4	762	635
32" x 30"	813.0	762.0	597	584					
32" x 28"	813.0	711.0	597	572	44" x 42"	1118.0	1067.0	813	762
32" x 26"	813.0	660.0	597	572	44" x 40"	1118.0	1016.0	813	749
32" x 24"	813.0	610.0	597	559	44" x 38"	1118.0	965.0	813	737
32" x 22"	813.0	559.0	597	546	44" x 36"	1118.0	914.0	813	724
32" x 20"	813.0	508.0	597	533	44" x 34"	1118.0	864.0	813	724
32" x 18"	813.0	457.0	597	521	44" x 32"	1118.0	813.0	813	711
32" x 16"	813.0	406.4	597	508	44" x 30"	1118.0	762.0	813	711
32" x 14"	813.0	355.6	597	508	44" x 28"	1118.0	711.0	813	698
					44" x 26"	1118.0	660.0	813	698
34" x 32"	864.0	813.0	635	622	44" x 24"	1118.0	610.0	813	698
34" x 30"	864.0	762.0	635	610	44" x 22"	1118.0	559.0	813	686
34" x 28"	864.0	711.0	635	597	44" x 20"	1118.0	508.0	813	686
34" x 26"	864.0	660.0	635	597					
34" x 24"	864.0	610.0	635	584	46" x 44"	1168.0	1118.0	851	800
34" x 22"	864.0	559.0	635	572	46" x 42"	1168.0	1067.0	851	787
34" x 20"	864.0	508.0	635	559	46" x 40"	1168.0	1016.0	851	775
34" x 18"	864.0	457.0	635	546	46" x 38"	1168.0	965.0	851	762
34" x 16"	864.0	406.4	635	533	46" x 36"	1168.0	914.0	851	762
					46" x 34"	1168.0	864.0	851	749
36" x 34"	914.0	864.0	673	660	46" x 32"	1168.0	813.0	851	749
36" x 32"	914.0	813.0	673	648	46" x 30"	1168.0	762.0	851	737
36" x 30"	914.0	762.0	673	635	46" x 28"	1168.0	711.0	851	737
36" x 28"	914.0	711.0	673	622	46" x 26"	1168.0	660.0	851	737
36" x 26"	914.0	660.0	673	622	46" x 24"	1168.0	610.0	851	724
36" x 24"	914.0	610.0	673	610	46" x 22"	1168.0	559.0	851	724
36" x 22"	914.0	559.0	673	597					
36" x 20"	914.0	508.0	673	584	48" x 46"	1219.0	1168.0	889	838
36" x 18"	914.0	457.0	673	572	48" x 44"	1219.0	1118.0	889	838
36" x 16"	914.0	406.4	673	559	48" x 42"	1219.0	1067.0	889	813
					48" x 40"	1219.0	1016.0	889	813
38" x 36"	965.0	914.0	711	711	48" x 38"	1219.0	965.0	889	813
38" x 34"	965.0	864.0	711	698	48" x 36"	1219.0	914.0	889	787
38" x 32"	965.0	813.0	711	686	48" x 34"	1219.0	864.0	889	787
38" x 30"	965.0	762.0	711	673	48" x 32"	1219.0	813.0	889	787
38" x 28"	965.0	711.0	711	648	48" x 30"	1219.0	762.0	889	762
38" x 26"	965.0	660.0	711	648	48" x 28"	1219.0	711.0	889	762
38" x 24"	965.0	610.0	711	635	48" x 26"	1219.0	660.0	889	762
38" x 22"	965.0	559.0	711	622	48" x 24"	1219.0	610.0	889	737
38" x 20"	965.0	508.0	711	610	48" x 22"	1219.0	559.0	889	737

NOTE : ALL DIMENSIONS ARE IN MM.

BUTT WELD PIPE FITTINGS



CONC. REDUCER



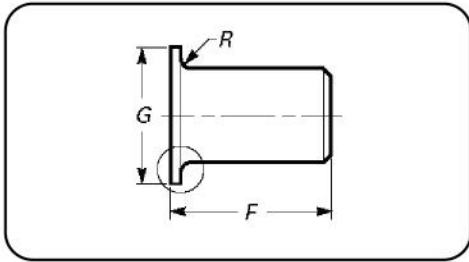
ECC. REDUCER

AS PER B 16.9

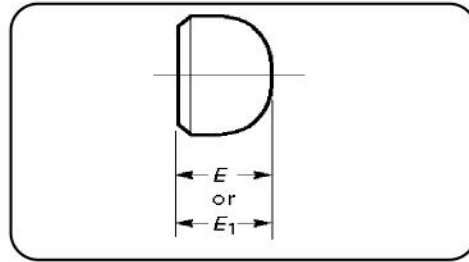
Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		End-to-End H	Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		End-to-End H	Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)		End-to-End H
	Run	Outlet			Run	Outlet			Run	Outlet	
3/4" x 1/2"	26.7	21.3	38								
3/4" x 3/8"	26.7	17.3	38	8" x 4"	219.1	114.3	152	30" x 24"	762.0	610.0	610
				8" x 3.1/2"	219.1	101.6	152	30" x 20"	762.0	508.0	610
1" x 3/4"	33.4	26.7	51								
1" x 1/2"	33.4	21.3	51	10" x 8"	273.0	219.1	178	32" x 30"	813.0	762.0	610
				10" x 6"	273.0	168.3	178	32" x 28"	813.0	711.0	610
1.1/4" x 1"	42.2	33.4	51	10" x 5"	273.0	141.3	178	32" x 26"	813.0	660.0	610
1.1/4" x 3/4"	42.2	26.7	51	10" x 4"	273.0	114.3	178	32" x 24"	813.0	610.0	610
1.1/4" x 1/2"	42.2	21.3	51								
				12" x 10"	323.8	273.0	203	34" x 32"	864.0	813.0	610
1.1/2" x 1.1/4"	48.3	42.2	64	12" x 8"	323.8	219.1	203	34" x 30"	864.0	762.0	610
1.1/2" x 1"	48.3	33.4	64	12" x 6"	323.8	168.3	203	34" x 28"	864.0	711.0	610
1.1/2" x 3/4"	48.3	26.7	64	12" x 5"	323.8	141.3	203	34" x 26"	864.0	660.0	610
1.1/2" x 1/2"	48.3	21.3	64					34" x 24"	864.0	610.0	610
				14" x 12"	355.6	323.8	330				
2" x 1.1/2"	60.3	48.3	76	14" x 10"	355.6	273.0	330	36" x 34"	914.0	864.0	610
2" x 1.1/4"	60.3	42.2	76	14" x 8"	355.6	219.1	330	36" x 32"	914.0	813.0	610
2" x 1"	60.3	33.4	76	14" x 6"	355.6	168.3	330	36" x 30"	914.0	762.0	610
2" x 3/4"	60.3	26.7	76					36" x 28"	914.0	711.0	610
				16" x 14"	406.4	355.6	356	36" x 26"	914.0	660.0	610
2.1/2" x 2"	73.0	60.3	89	16" x 12"	406.4	323.8	356	36" x 24"	914.0	610.0	610
2.1/2" x 1.1/2"	73.0	48.3	89	16" x 10"	406.4	273.0	356				
2.1/2" x 1.1/4"	73.0	42.2	89	16" x 8"	406.4	219.1	356	38" x 36"	965.0	914.0	610
2.1/2" x 1"	73.0	33.4	89					38" x 34"	965.0	864.0	610
				18" x 16"	457.0	406.4	381	38" x 32"	965.0	813.0	610
3" x 2.1/2"	88.9	73.0	89	18" x 14"	457.0	356.6	381	38" x 30"	965.0	762.0	610
3" x 2"	88.9	60.3	89	18" x 12"	457.0	323.8	381	38" x 28"	965.0	711.0	610
3" x 1.1/2"	88.9	48.3	89	18" x 10"	457.0	273.0	381	38" x 26"	965.0	660.0	610
3" x 1.1/4"	88.9	42.2	89								
				20" x 18"	508.0	457.0	508	40" x 38"	1016.0	965.0	610
3.1/2" x 3"	101.6	88.9	102	20" x 16"	508.0	406.4	508	40" x 36"	1016.0	914.0	610
3.1/2" x 2.1/2"	101.6	73.0	102	20" x 14"	508.0	355.6	508	40" x 34"	1016.0	864.0	610
3.1/2" x 2"	101.6	60.3	102	20" x 12"	508.0	323.8	508	40" x 32"	1016.0	813.0	610
3.1/2" x 1.1/2"	101.6	48.3	102					40" x 30"	1016.0	762.0	610
3.1/2" x 1.1/4"	101.6	42.2	102	22" x 20"	559.0	508.0	508				
				22" x 18"	559.0	457.0	508	42" x 40"	1067.0	1016.0	610
4" x 3.1/2"	114.3	101.6	102	22" x 16"	559.0	406.4	508	42" x 38"	1067.0	965.0	610
4" x 3"	114.3	88.9	102	22" x 14"	559.0	355.6	508	42" x 36"	1067.0	914.0	610
4" x 2.1/2"	114.3	73.0	102					42" x 34"	1067.0	864.0	610
4" x 2"	114.3	60.3	102	24" x 22"	610.0	559.0	508	42" x 32"	1067.0	813.0	610
4" x 1.1/2"	114.3	48.3	102	24" x 20"	610.0	508.0	508	42" x 30"	1067.0	762.0	610
				24" x 18"	610.0	457.0	508				
5" x 4"	141.3	114.3	127	24" x 16"	610.0	406.4	508	44" x 42"	1118.0	1067.0	610
5" x 3.1/2"	141.3	101.6	127					44" x 40"	1118.0	1016.0	610
5" x 3"	141.3	88.9	127	26" x 24"	660.0	610.0	610	44" x 38"	1118.0	965.0	610
5" x 2.1/2"	141.3	73.0	127	26" x 22"	660.0	559.0	610	44" x 36"	1118.0	914.0	610
5" x 2"	141.3	60.3	127	26" x 20"	660.0	508.0	610				
				26" x 18"	660.0	457.0	610	46" x 44"	1168.0	1118.0	711
6" x 5"	168.3	141.3	140					46" x 42"	1168.0	1067.0	711
6" x 4"	168.3	114.3	140	28" x 26"	711.0	660.0	610	46" x 40"	1168.0	1016.0	711
6" x 3.1/2"	168.3	101.6	140	28" x 24"	711.0	610.0	610	46" x 38"	1168.0	965.0	711
6" x 3"	168.3	88.9	140	28" x 20"	711.0	508.0	610				
6" x 2.1/2"	168.3	73.0	140	28" x 18"	711.0	457.0	610	48" x 46"	1219.0	1168.0	711
								48" x 44"	1219.0	1118.0	711
8" x 6"	219.1	168.3	152					48" x 42"	1219.0	1067.0	711
8" x 5"	219.1	141.3	152	30" x 28"	762.0	711.0	610	48" x 40"	1219.0	1016.0	711
				30" x 26"	762.0	660.0	610				

NOTE: ALL DIMENSIONS ARE IN MM.

BUTT WELD PIPE FITTINGS



Stub End

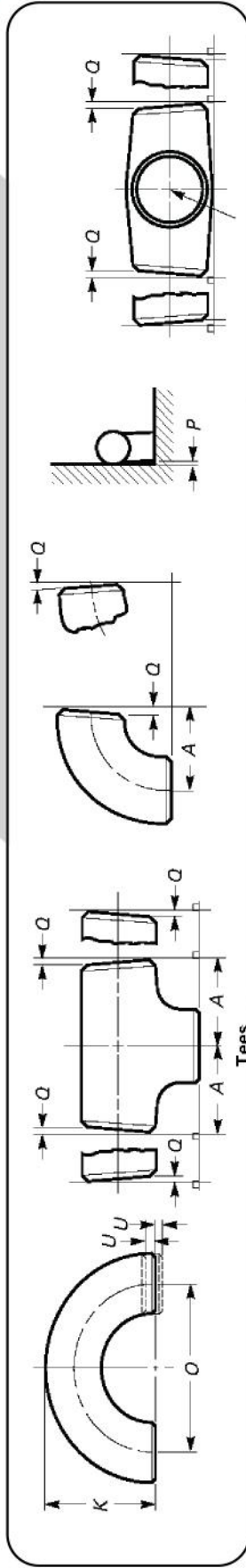


Cap

AS PER B 16.9

Nominal Pipe Size (NPS)	Outside Diameter at Bevel (O/D)	Long Pattern Length "F"	Short Pattern "F"	Radius of Follet "R"	Dia of Lap "G"	Length "E"	Limiting Wall Thk For Length "E"	Length "E1"
1/2"	21.3	76	51	3	35	25	4.57	25
3/4"	26.7	76	51	3	43	25	3.81	25
1"	33.4	102	51	3	51	38	4.57	38
1 1/4"	42.2	102	51	5	64	38	4.83	38
1 1/2"	48.3	102	51	6	73	38	5.08	38
2"	60.3	152	64	8	92	38	5.59	44
2 1/2"	73.0	152	64	8	105	38	7.11	51
3"	88.9	152	64	10	127	51	7.62	64
3 1/2"	101.6	152	76	10	140	64	8.13	76
4"	114.3	152	76	11	157	64	8.64	76
5"	141.3	203	76	11	186	76	9.65	89
6"	168.3	203	89	13	216	89	10.92	102
8"	219.1	203	102	13	270	102	12.7	127
10"	273.0	254	127	13	324	127	12.7	152
12"	323.8	254	152	13	381	152	12.7	178
14"	355.6	305	152	13	413	165	12.7	191
16"	406.4	305	152	13	470	178	12.7	203
18"	457.0	305	152	13	533	203	12.7	229
20"	508.0	305	152	13	584	229	12.7	254
22"	559.0	305	152	13	641	254	12.7	254
24"	610.0	305	152	13	692	267	12.7	305

NOTE : ALL DIMENSIONS ARE IN MM.



Nominal Pipe Size (NPS)		ALL FITTINGS										180 Deg Returns								
Nominal Pipe Size (NPS)	DN	Outside Diameter at Bewel (1), (2) D mm	Inside Diameter at End, mm (1), (2), (3)	Wall Thickness (3)	Center-to-End Dimension, mm		Overall Length	Caps, E, mm	Center-to-Center Dimension, O, mm	Back To Face Dimension, K, mm	Alignment of Ends, U, mm	Overall Length	Reducers & Lap Joints Stub Ends, F, H, mm	3D Radius Elbows, A, B	90 Deg. and 45 Deg. Elbows & Tees, A, B, C, M	Outside Diameter of Barrel	Nominal Pipe Size (NPS)	DN	Off Angle, Q	Off Plane, P
					90 Deg. and 45 Deg. Elbows & Tees, A, B, C, M	3D Radius Elbows, A, B														
1/2 to 2 1/2	15 to 65	+1.6, -0.8	0.8	Not Less Than 87.5% of Nominal Thickness	2		2	3	6	6	1	2	3	3	2	2	1/2 to 4	15 to 100	1	2
3 to 3 1/2	80 to 90	1.6	1.6		2		2	3	6	6	1	2	3	3	3	2	5 to 8	125 to 200	2	4
4	100	1.6	1.6	87.5% of Nominal Thickness	2		2	3	6	1	1	2	3	3	2	10 to 12	250 to 300	3	5	
5 TO 8	125 to 200	+2.4, -1.6	1.6		2		2	6	6	6	1	1	2	6	2	14 to 16	350 to 400	3	6	
10 TO 18	250 to 450	+4.0, -3.2	3.2		2		2	6	10	6	2	2	2	6	2	18 to 24	450 to 600	4	10	
20 TO 24	500 to 600	+6.4, -4.8	4.8		2		2	6	10	6	2	2	2	6	2	26 to 30	650 to 750	5	10	
26 TO 30	650 to 750	+6.4, -4.8	4.8		3		3	10	--	--	--	--	5	10	6	32 to 42	800 to 1050	5	13	
32 TO 48	800 to 1200	+6.4, -4.8	4.8		5		5	10	--	--	--	--	5	10	6	44 to 48	1100 to 1200	5	19	
Lap Joint Stub Ends																				
Nominal Pipe Size (NPS)	DN	Outside Diameter of Lap, G, mm	Fillet Radius of Lap, R, mm	Lap Thk, mm	Outside Diameter of Barrel	Angularity Tolerances, mm														
1/2 to 2 1/2	15 to 65	+0, -1	+0, -1	+1.6, -0	See Table 6.1-9 For Limiting Dimension	1/2 to 4														
3 to 3 1/2	80 to 90	+0, -1	+0, -1	+1.6, -0	See Table 6.1-9 For Limiting Dimension	5 to 8														
4	100	+0, -1	+0, -2	+1.6, -0	See Table 6.1-9 For Limiting Dimension	10 to 12														
5 TO 8	125 to 200	+0, -1	+0, -2	+1.6, -0	See Table 6.1-9 For Limiting Dimension	14 to 16														
10 TO 18	250 to 450	+0, -2	+0, -2	+3.2, -0	See Table 6.1-9 For Limiting Dimension	18 to 24														
20 TO 24	500 to 600	+0, -2	+0, -2	+3.2, -0	See Table 6.1-9 For Limiting Dimension	26 to 30														
26 TO 30	650 to 750	--	--	--	See Table 6.1-9 For Limiting Dimension	32 to 42														
32 TO 48	800 to 1200	--	--	--	See Table 6.1-9 For Limiting Dimension	44 to 48														

MATERIALS CHEMICAL COMPOSITION & MECHANICAL PROPERTIES

Steel Type	ASTM Grade	Chemical Composition											Mechanical Properties			
		C% max	Mn%	P% max	S% max	Si%	Cr%	Mo%	Ni%	Others	R.min. Tensile Strength Mpa	S.min Yield Strength Mpa	A% min. (2" /4D) Elongation		Impact Test KCV (2) J	
													Long.	Transv.		
A234	WPB ^{B,C,D,E}	0.30	0.29 - 1.06	0.050	0.058	0.10 min	0.40	0.15	0.40	Cu=0.4 V=0.08	415	240	30	20	-	
	WPC ^{D,E}	0.35	0.29 - 1.06	0.050	0.058	0.10 min	0.40	0.15	0.40	Cu=0.4 V=0.08	485	275	30	20	-	
	WPL6	0.30	0.50 - 1.35	0.035	0.040	0.15 - 0.40	0.30	0.12	0.40	Cu=0.4 V=0.08 Cb=0.02	415-655	240	30	16.5	-45°C-17.6/13.6	
A420	WPL3	0.20	0.31 - 0.64	0.05	0.05	0.13 - 0.37	-	-	3.2 - 3.8	-	450-620	240	30	20	-10°C-17.6/13.6	
	WP11 CL.1	0.05 - 0.15	0.30 - 0.60	0.030	0.030	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	-	415	205	30	20	-		
	WP11 CL.2	0.05 - 0.20	0.30 - 0.80	0.04	0.04	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	-	485	275	30	20	-		
A234	WP11 CL.3	0.05 - 0.15	0.30 - 0.60	0.04	0.04	0.50 - 1.00	1.00 - 1.50	0.44 - 0.65	-	520	310	30	20	-		
	WP22 CL.1	0.05 - 0.15	0.30 - 0.60	0.04	0.04	0.50	1.90 - 2.60	0.87 - 1.13	-	415	205	30	20	-		
	WP22 CL.3	0.15	0.30 - 0.60	0.04	0.03	0.50	4.0 - 6.0	0.44 - 0.65	-	520	310	30	20	-		
	WP5 CL.1	0.15	0.30 - 0.60	0.04	0.03	1.00	8.0 - 10.0	0.90 - 1.10	-	415	205	30	20	-		
	WP5 CL.3	0.15	0.30 - 0.60	0.030	0.030	0.20 - 0.50	8.0 - 9.5	0.85 - 1.05	-	620	415	20	13	-		
	WP9	0.08 - 0.12	0.30 to 0.60	0.020	0.010	1.00	18.0 - 20.0	-	8.0 - 11.0	-	515	205	28	20	-	
A403	WP304	0.08	2.00	0.045	0.030	1.00	18.0 - 20.0	-	8.0 - 11.0	Ti=5xC-N max 0.70%	515	205	28	20	-	
	WP304L	0.030	2.00	0.045	0.030	1.00	18.0 - 20.0	-	8.0 - 12.0	Ti=4xC-N max 0.70%	515	205	28	20	-	
	WP304H	0.04 - 0.10	2.00	0.045	0.030	1.00	18.0 - 20.0	-	8.0 - 11.0	Nb=8xC-1.0 max.	515	205	28	20	-	
	WP316	0.08	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0	Nb=8xC-1.0 max.	515	205	28	20	-	
	WP316L	0.030	2.00	0.045	0.030	1.00	16.0 - 18.0	2.00 - 3.00	10.0 - 14.0	Nb=8xC-1.0 max.	485	170	28	20	-	
	WP321	0.08	2.00	0.045	0.030	1.00	17.0 - 19.0	-	9.0 - 12.0	N=0.18-0.25 Cu=0.5-1.0	515	205	28	20	-	
	WP321H	0.04 - 0.10	2.00	0.045	0.030	1.00	17.0 - 19.0	-	9.0 - 12.0	N=0.10 Cu=10-20	515	205	28	20	-	
	WP347	0.08	2.00	0.045	0.030	1.00	17.0 - 19.0	-	9.0 - 12.0	N=0.08-0.20 N=0.24-0.32 Cu=0.5	515	205	28	20	-	
	WP347H	0.04 - 0.10	2.00	0.045	0.030	1.00	17.0 - 19.0	-	9.0 - 12.0	Nb=8xC-1.0 max.	515	205	28	20	-	
	WPS 31254	0.020	1.00	0.030	0.01	0.80	19.5 - 20.5	6.0 - 6.5	17.5 - 18.5	-	650-820	300	28	20	-	
A815	WP904L	0.020	2.00	0.045	0.035	1.00	19.0 - 23.0	4.0 - 5.0	23.0 - 28.0	N=0.10 Cu=10-20	490	220	28	20	-	
	S31803	0.030	2.00	0.030	0.020	1.00	21.0 - 23.0	2.5 - 3.5	4.5 - 6.5	N=0.08-0.20	620	450	20	-	-	
	S32750	0.030	1.20	0.035	0.020	0.80	24.0 - 26.0	3.0 - 5.0	6.0 - 8.0	N=0.24-0.32 Cu=0.5	800	550	15	-	-	
B366	WPNIC10	0.05-0.10	1.50	-	0.015	1.00	19.0-23.0	-	30.0-35.0	Cu=0.75	450	170	30	-	-	
	WPNIC11	0.06-0.10	1.50	-	0.050	1.00	19.0-23.0	-	30.0-35.0	Al=0.60-60 Ti=0.15-0.60 Fe=39.5min. Al+Ti=0.85-1.20	450	170	30	-	-	
	UNS N08825	0.050	1.00	-	0.030	0.50	19.5 - 23.5	2.5 - 3.5	38.0 - 46.0	Fe=22.00 Min Cu=150-3.00 Ti=0.60-1.20	517	172	30	-	-	
UNS N06625	UNS N06625	0.10	0.50	0.015	0.015	0.50	20.0 - 23.0	8.0 - 10.0	58.0 Min	Fe=5.00 Al=0.40 Ti=0.40	827	414	30	-	-	
	UNS N06600	0.15	1.00	-	0.015	0.50	14.0 - 17.0	-	72.0 Min	Cb=3.15-4.45 Cu=0.50 Fe=6.0-10.0	690	276	30	-	-	
											550	205	35	-	-	

Nominal Pipe size	O.D. mm	10	20	30	STD	40	60	XS	80	100	120	140	160	XXS	Nominal pipe size	Figures Based on Austenitic Steel				SHIPPING Vol/mm ³
																5S	10S	40S	80S	
1/8	10,30				1,73 0,37	1,73 0,37		2,41 0,47	2,41 0,47						1/8		1,24 0,28	1,73 0,36	2,41 0,48	0,0001
1/4	13,70				2,24 0,63	2,24 0,63		3,02 0,80	3,02 0,80						1/4		1,65 0,51	2,24 0,64	3,02 0,82	0,0002
3/8	17,10				2,31 0,84	2,31 0,84		3,20 1,10	3,20 1,10						3/8		1,65 0,64	2,31 0,86	3,20 1,12	0,0003
1/2	21,30				2,77 1,27	2,77 1,27		3,73 1,62	3,73 1,62				4,78 1,95	7,47 2,55	1/2	1,65 0,82	2,11 1,01	2,77 1,30	3,73 1,65	0,0004
3/4	26,70				2,87 1,69	2,87 1,69		3,91 2,20	3,91 2,20				5,56 2,90	7,82 3,64	3/4	1,65 1,04	2,11 1,31	2,87 1,71	3,91 2,24	0,0007
1	33,40				3,38 2,50	3,38 2,50		4,55 3,24	4,55 3,24				6,35 4,24	9,09 5,45	1	1,65 1,33	2,77 2,13	3,38 2,55	4,55 3,29	0,0011
1 1/4	42,20				3,56 3,39	3,56 3,39		4,85 4,47	4,85 4,47				6,35 5,61	9,70 7,77	1 1/4	1,65 1,68	2,77 2,76	3,56 3,46	4,85 4,56	0,0018
1 1/2	48,30				3,68 4,05	3,68 4,05		5,08 5,41	5,08 5,41				7,14 7,25	10,15 9,56	1 1/2	1,65 1,95	2,77 3,17	3,68 4,13	5,08 5,51	0,0023
2	60,30				3,91 5,44	3,91 5,44		5,54 7,48	5,54 7,48				8,74 11,11	11,07 13,44	2	1,65 2,24	2,77 4,01	3,91 5,54	5,54 7,63	0,0036
2 1/2	73,00				5,16 8,63	5,16 8,63		7,01 11,41	7,01 11,41				9,53 14,92	14,02 20,39	2 1/2	2,11 3,77	3,05 5,36	5,16 8,81	7,01 11,64	0,0053
3	88,90				5,49 11,29	5,49 11,29		7,62 15,27	7,62 15,27				11,13 21,35	15,24 27,68	3	2,11 4,60	3,05 6,59	5,49 11,52	7,62 15,59	0,0079
3 1/2	101,60				5,74 13,57	5,74 13,57		8,08 18,63	8,08 18,63				- -	- -	3 1/2	2,11 5,29	3,05 7,55	5,74 13,84	8,08 19,01	0,0103
4	114,30				6,02 16,07	6,02 16,07		8,56 22,32	8,56 22,32		11,13 28,32		13,49 33,54	17,12 41,03	4	2,11 5,96	3,05 8,52	6,02 16,40	8,56 22,77	0,0130
5	141,30				6,55 21,77	6,55 21,77		9,53 30,97	9,53 30,97		12,7 40,28		15,88 49,11	19,05 57,43	5	2,77 9,67	3,40 11,82	6,55 22,20	9,53 31,59	0,0199
6	168,30				7,11 28,26	7,11 28,26		10,97 42,56	10,97 42,56		14,27 54,20		18,26 67,56	21,95 79,22	6	2,77 11,55	3,40 14,13	7,11 28,83	10,97 43,42	0,028
8	219,10		6,35 33,31	7,04 36,81	8,18 42,55	8,18 42,55	10,30 53,10	12,70 64,64	12,70 64,64	15,09 75,92	18,26 90,44	20,62 100,92	23,01 111,27	22,23 107,92	8	2,77 15,09	3,76 20,37	8,18 43,39	12,70 65,95	0,048
10	273,10		6,35 41,77	7,80 51,03	9,27 60,31	9,27 60,31	12,70 81,50	12,70 81,55	15,09 96,01	18,26 114,75	21,44 133,06	25,40 155,15	28,58 172,33	25,40 155,15	10	3,40 23,08	4,19 28,34	9,27 61,52	12,70 83,19	0,074
12	323,90		6,35 49,73	8,38 65,20	9,53 73,88	10,31 79,73	14,30 109,00	12,70 97,46	17,48 132,08	21,44 159,91	25,40 186,97	28,58 208,14	33,32 238,76	25,40 186,97	12	3,96 31,89	4,57 36,73	9,53 75,32	12,70 99,43	0,104
14	355,60	6,35 54,69	7,92 67,90	9,53 81,33	9,53 81,33	11,13 94,55	15,10 126,40	12,70 107,39	19,05 158,10	23,83 194,96	27,79 224,65	31,75 253,56	35,71 281,70		14	3,96 35,06	4,78 42,14			0,126
16	406,40	6,35 62,64	7,92 77,83	9,53 93,27	9,53 93,27	12,70 123,30	16,70 160,00	12,70 123,30	21,44 203,53	26,19 245,56	30,96 286,64	36,33 333,19	40,49 365,35		16	4,19 42,41	4,78 48,26			0,165
18	457,00	6,35 70,57	7,92 87,71	11,13 122,38	9,53 105,16	14,27 155,80	19,00 206,00	12,70 139,15	23,83 254,55	29,36 309,62	34,93 363,56	39,67 408,26	45,24 459,37		18	4,19 47,77	4,78 54,36			0,208
20	508,00	6,35 78,55	9,53 117,15	12,70 155,12	9,53 117,15	15,09 183,42	20,60 248,5	12,70 155,12	26,19 311,17	32,54 381,53	38,10 441,49	44,45 508,11	50,01 564,81		20	4,78 60,46	5,54 70,00			0,258
22	559,00	6,35 86,54	9,53 129,13	12,70 171,09	9,53 129,13	- -	22,20 294,00	12,70 171,09	28,58 373,83	34,93 451,42	41,28 527,02	47,63 600,63	53,98 672,26		22	4,78 66,57	5,54 77,06			0,312
24	610,00	6,35 94,53	9,53 141,12	14,27 209,64	9,53 141,12	17,48 255,41	24,60 355,00	12,70 187,06	30,96 442,08	38,89 547,71	46,02 640,03	52,37 720,15	59,54 808,22		24	5,54 84,16	6,35 96,37			0,372
26	660,00	7,92 127,36	12,70 202,72	- -	9,53 152,87	- -	- -	12,70 202,72							26					0,435
28	711,00	7,92 137,32	12,70 218,69	15,88 271,21	9,53 164,85	- -	- -	12,70 218,69							28					0,505
30	762,00	7,92 147,28	12,70 234,67	15,88 292,18	9,53 176,84	- -	- -	12,70 234,67							30	6,35 120,72	7,92 150,36			0,580
32	813,00	7,92 157,24	12,70 250,64	15,88 312,15	9,53 188,82	17,48 342,91		12,70 250,64							32					0,660
34	864,00	7,92 167,20	12,70 266,61	15,88 332,12	9,53 200,31	17,48 364,90		12,70 266,61							34					0,746
36	914,00	7,92 176,96	12,70 282,27	15,88 351,70	9,53 212,56	19,05 420,42		12,70 282,27							36					0,835
38	965,00				9,53 224,54			12,70 298,24							38					0,931
40	1016,00				9,53 236,53			12,70 314,22							40					1,032
42	1067,00				9,53 248,52			12,70 330,19							42					1,138
44	1118,00				9,53 260,50			12,70 346,16							44					1,249
46	1168,00				9,53 272,25			12,70 351,82							46					1,364
48	1219,00				9,53 284,24			12,70 377,79							48					1,485

Value for information only


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