N PIPING SYSTEMS PVT LTD

TOTAL PIPING SYSTEMS

AN ISO 9001-2015 CERTIFIED COMPANY | (EIL & IBR APPROVED)

Manufacturers for: Pipe Fittings, Flanges & Piping Spools
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PRODUCT CATALOGUE - BUTT WELD PIPE FITTINGS

ABOUT US & MANUFACTURING STANDARDS

N PIPING SYSTEMS PRIVATE LIMITED is a leading global manufacturer and exporter of high-integrity piping products tailored for critical applications in the Oil & Gas, Petrochemical, Offshore, Power Generation, and Nuclear Industries. Our product range encompasses full encirclement split tees, butt-weld fittings (seamless and welded elbows, tees, reducers, caps, crosses), flanges, and prefabricated piping spools.

Manufacturing Standards & Specifications

- **ASTM Standards:** ASTM A234 (WPB, WPC, WP1, WP11, WP22, WP5, WP9, WP91), ASTM A403 (WP304/304L, WP316/316L, WP321, WP347), ASTM A420 (WPL6)
- **Dimensional Standards:** ASME/ANSI B16.9 (Factory-Made Wrought Buttwelding Fittings), ASME B16.28
- **Butt-Weld Fittings:** 45°/90°/180° Elbows (LR & SR), Equal & Reducing Tees, Concentric & Eccentric Reducers, End Caps, Stub Ends (ANSI/MSS Type A/B).
- **Pipe Standards:** ASME B36.10M (Welded and Seamless Wrought Steel Pipe) and ASME B36.19M (Stainless Steel Pipe).
- **Certifications:** ISO 9001:2015, EIL Approved, IBR Approved, EN 10204 3.1 / 3.2 Material Test Certificates

Material Grades & Availability

- **Carbon Steel:** ASTM A234 WPB / A420 WPL6
- **Stainless Steel:** Dual grades 304/304L, 316/316L, 321/321H, 347/347H
- **Alloy Steel:** Chrome-Moly grades WP11, WP22, WP5, WP9, P91
- **Duplex & Super Duplex:** UNS S31803, S32205, S32750, S32760
- **Special Alloys:** Inconel, Monel, Hastelloy, Alloy 20.
- **Schedules:** SCH 5S to SCH XXS / Heavy Wall Thicknesses

1. TECHNICAL DESCRIPTION: PIPE ELBOWS VS. PIPE BENDS

In piping systems, elbows and bends are essential directional change fittings. While often used interchangeably, they possess distinct design and manufacturing criteria: **Dimensional Standards:**

Pipe Elbows (ASME B16.9 / B16.28)

Standard fittings manufactured with specific, fixed center-to-end dimensions.

- **Long Radius (LR):** Radius $R = 1.5 \times D$ (where D is nominal pipe diameter). Offers optimum balance between flow resistance and compact footprint.
- **Short Radius (SR):** Radius $R = 1.0 \times D$. Used in tight space constraints where pressure drop is secondary.
- **Standard Angles:** 45°, 90°, and 180° Return Bends

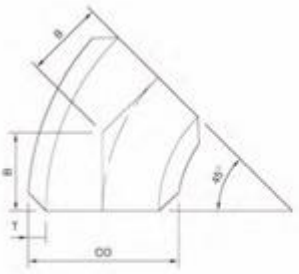
Pipe Bends (3D, 5D, Custom)

Custom-fabricated directional bends using induction heating or cold bending techniques.

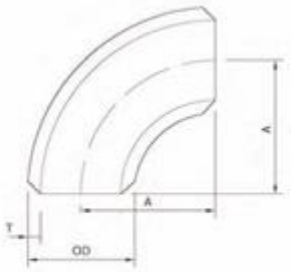
- **3D Bends:** Centerline radius $R = 3 \times D$. Smooth flow profile, ideal for piggable pipelines.
- **5D Bends** Centerline radius $R = 5 \times D$. Minimal pressure loss, high fatigue resistance in high-velocity systems.
- **Custom Angles:** Available in 15°, 30°, 60°, or any specified angle.

2. DIMENSIONAL SPECIFICATIONS (ANSI B16.9 & B16.28)

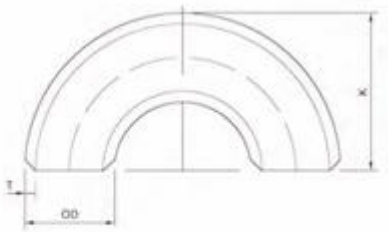
Dimensions for 45° Elbows, 90° Elbows, and 180° Return Bends (15NB to 1200NB / 1/2" to 48")



45D Elbow
ANSI B16.9 / B16.28



90D Elbow
ANSI B16.9 / B16.28



180D Elbow
ANSI B16.9 / B16.28

Nominal Size		Outside Diameter (OD)	Long Radius (LR) - ANSI B16.9			Short Radius (SR) - ANSI B16.28		
DN (mm)	NPS (inch)	(mm)	45° (B) mm	90° (A) mm	180° (K) mm	45° (B) mm	90° (A) mm	180° (K) mm
15	1/2"	21.30	16.00	38.00	48.00	---	---	---
20	3/4"	26.70	19.00	38.00	51.00	---	---	---
25	1"	33.40	22.00	38.00	56.00	---	25.40	41.10
32	1-1/4"	42.40	25.00	48.00	70.00	---	31.80	52.30
40	1-1/2"	48.30	29.00	57.00	83.00	---	38.10	62.00
50	2"	60.30	35.00	76.00	106.00	---	50.80	81.00
65	2-1/2"	73.00	44.00	95.00	132.00	---	63.50	100.10
80	3"	88.90	51.00	114.00	159.00	31.60	76.20	120.70
90	3-1/2"	101.60	57.00	133.00	184.00	36.80	88.90	139.70
100	4"	114.30	64.00	152.00	210.00	42.10	101.60	158.80
125	5"	141.30	79.00	190.00	262.00	52.60	127.00	196.90
150	6"	168.30	95.00	229.00	313.00	63.40	152.40	236.50
200	8"	219.10	127.00	305.00	414.00	84.20	203.20	312.70
250	10"	273.00	159.00	381.00	518.00	105.20	254.00	390.70
300	12"	323.80	190.00	457.00	619.00	126.30	304.80	466.90
350	14"	355.60	222.00	533.00	711.00	147.30	355.60	533.40
400	16"	406.40	254.00	610.00	813.00	168.30	406.40	609.60
450	18"	457.00	286.00	686.00	914.00	189.40	457.20	685.80
500	20"	508.00	318.00	762.00	1016.00	210.40	508.00	732.00
550	22"	559.00	343.00	838.00	1118.00	231.50	558.80	838.20
600	24"	610.00	381.00	914.00	1219.00	252.50	609.60	914.40
650	26"	660.40	406.00	991.00	---	273.50	660.00	---
700	28"	711.00	438.00	1067.00	---	294.60	711.20	---
750	30"	762.00	470.00	1143.00	---	315.60	762.00	---
800	32"	813.00	502.00	1219.00	---	378.10	812.80	---
850	34"	864.00	533.00	1295.00	---	357.70	863.60	---
900	36"	914.00	565.00	1372.00	---	378.80	614.40	---
1000	40"	1016.00	632.00	1524.00	---	420.80	1016.00	---
1100	44"	1117.60	695.00	1676.00	---	462.90	1117.60	---
1200	48"	1219.20	759.00	1829.00	---	505.00	1219.00	---

3. WEIGHT CHART: 90° LONG RADIUS (LR) ELBOWS (KG)

Approximate weights for 90° LR Elbows per ANSI B16.9 (15NB to 1200NB)

DN	NPS	S5S	S10S	S20	S30	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS
15	1/2"	0.05	0.06	---	---	0.08	0.08	0.09	0.10	0.10	---	---	---	0.11	0.15
25	1"	0.05	0.08	---	---	0.15	0.15	0.17	0.19	0.19	---	---	---	0.25	0.33
40	1-1/2"	0.08	0.21	---	---	0.36	0.36	0.43	0.49	0.49	---	---	---	0.65	0.86
50	2"	0.05	0.06	---	---	0.65	0.65	0.80	0.89	0.89	---	---	---	1.32	1.61
80	3"	0.08	0.13	---	---	2.02	2.02	2.40	2.73	2.73	---	---	---	3.81	4.94
100	4"	0.17	0.28	---	---	3.82	3.82	4.48	5.35	5.35	---	---	---	8.01	9.78
150	6"	0.55	4.97	---	---	10.14	10.14	13.11	15.34	15.34	---	19.52	---	24.22	28.43
200	8"	0.80	9.66	16.07	17.52	20.41	20.41	25.40	30.95	30.95	36.37	43.18	48.29	53.26	51.62
250	10"	1.08	16.65	25.16	30.50	36.16	36.16	48.76	48.76	57.44	68.75	79.42	92.77	103.11	92.77
300	12"	1.39	25.98	35.93	46.86	52.81	57.11	78.31	69.61	94.33	114.50	134.10	149.38	171.16	134.10
350	14"	2.85	34.75	56.66	67.82	67.82	78.88	106.10	89.86	131.97	162.96	188.05	212.48	235.67	---
400	16"	4.11	45.53	74.32	89.01	89.01	118.03	153.70	118.08	194.58	235.25	274.02	318.86	349.98	---
450	18"	7.15	57.65	94.19	131.40	112.86	168.07	221.03	149.86	273.83	333.89	391.25	440.00	494.74	---
500	20"	13.52	81.54	139.65	185.50	139.65	219.48	296.21	185.57	372.40	455.91	528.17	607.26	675.59	---
600	24"	117.65	36.70	201.79	301.32	201.79	366.76	509.59	268.43	635.15	786.14	918.07	1033.93	1159.07	---
700	28"	---	---	366.20	456.37	275.19	---	---	366.35	---	---	1457.5	---	---	---
800	32"	---	---	479.48	597.89	360.10	656.74	---	479.68	---	---	---	---	---	---
900	36"	---	---	607.77	758.21	456.24	907.55	---	606.02	---	---	---	---	---	---
1000	40"	---	---	751.50	937.86	563.94	---	---	751.81	---	---	---	---	---	---
1200	48"	---	---	1084.57	1354.24	813.44	---	---	1085.01	---	---	---	---	---	---

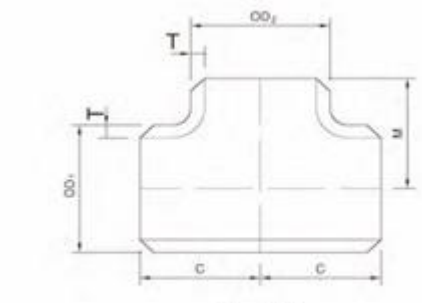
4. APPROX COMPARISON ACROSS ELBOW TYPES (STD & XS SCHEDULES)

Direct weight comparison for 45° LR, 45° SR, 90° LR, 90° SR, 180° LR, and 180° SR in Standard (STD) & Extra Strong (XS) schedules (in kg)

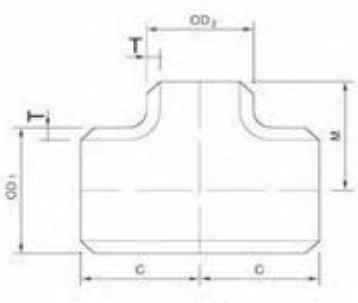
DN (mm)	NPS (inch)	45° LR Elbow		45° SR Elbow		90° LR Elbow		90° SR Elbow		180° LR Return		180° SR Return	
		STD	XS	STD	XS	STD	XS	STD	XS	STD	XS	STD	XS
25	1"	0.06	0.10	0.05	0.07	0.15	0.19	0.10	0.13	0.30	0.38	0.20	0.26
40	1-1/2"	0.18	0.25	0.12	0.16	0.36	0.49	0.24	0.32	0.72	0.98	0.48	0.64
50	2"	0.33	0.45	0.22	0.30	0.65	0.89	0.43	0.59	1.30	1.78	0.86	1.18
80	3"	1.01	1.37	0.68	0.91	2.02	2.73	1.35	1.82	4.04	5.46	2.70	3.64
100	4"	1.91	2.68	1.28	1.79	3.82	5.35	2.56	3.58	7.64	10.70	5.12	7.16
150	6"	5.07	7.67	3.38	5.11	10.14	15.34	6.75	10.21	20.28	30.68	13.50	20.42
200	8"	10.21	15.48	6.81	10.31	20.41	30.95	13.61	20.62	40.82	61.90	27.22	41.24
250	10"	18.08	24.38	12.06	16.26	36.16	48.76	24.12	32.51	72.32	97.52	48.24	65.02
300	12"	26.41	34.96	17.62	23.31	52.81	69.61	35.23	46.62	105.62	139.82	70.46	93.24
350	14"	33.91	44.93	22.64	29.98	67.82	89.86	45.27	59.95	135.64	179.72	90.54	119.90
400	16"	44.51	59.04	29.67	39.34	89.01	118.08	59.33	78.67	178.02	236.16	118.66	157.34
450	18"	56.43	74.93	37.63	49.94	112.86	149.86	75.25	99.88	225.72	299.72	150.50	199.76
500	20"	69.83	92.79	46.57	61.86	139.65	185.57	93.14	123.72	279.30	371.14	186.28	247.44
600	24"	100.90	134.22	67.32	89.52	201.79	268.43	134.64	179.03	403.58	536.86	269.28	358.06
800	32"	180.05	239.84	120.11	159.92	360.10	479.68	240.21	319.84	---	---	---	---
1000	40"	281.97	375.91	188.06	250.61	563.94	751.81	376.12	501.21	---	---	---	---
1200	48"	406.72	542.51	271.19	361.57	813.44	1085.01	542.37	723.14	---	---	---	---

5. DIMENSIONAL STANDARDS FOR EQUAL & UNEQUAL TEES (ASME B16.9)

Dimensions are in millimeters (mm) according to ASME B16.9 / MSS SP-75 for sizes 15NB (½") to 1200NB (48").



Straight



Reducing

NOMINAL SIZE (MM)	NOMINAL SIZE (INCHES)	OUTSIDE DIAMETER (OD)		CENTER-TO-END DIMENSIONS	
		RUN (OD1) MM	OUTLET (OD2) MM	RUN (C) MM	OUTLET (M) MM
15	½"	21.30	21.30	25.00	25.00
20	¾"	26.70	26.70	29.00	29.00
20 x 20 x 15	¾" x ¾" x ½"	26.70	21.30	29.00	29.00
25	1"	33.40	33.40	38.00	38.00
25 x 25 x 20	1" x 1" x ¾"	33.40	26.70	38.00	38.00
25 x 25 x 15	1" x 1" x ½"	33.40	21.30	38.00	38.00
32	1¼"	42.20	42.20	48.00	48.00
32 x 32 x 25	1¼" x 1¼" x 1"	42.20	33.40	48.00	48.00
32 x 32 x 20	1¼" x 1¼" x ¾"	42.20	26.70	48.00	48.00
40	1½"	48.30	48.30	57.00	57.00
40 x 40 x 32	1½" x 1½" x 1¼"	48.30	42.20	57.00	57.00
40 x 40 x 25	1½" x 1½" x 1"	48.30	33.40	57.00	57.00
50	2"	60.30	60.30	64.00	64.00
50 x 50 x 40	2" x 2" x 1½"	60.30	48.30	64.00	60.00
50 x 50 x 32	2" x 2" x 1¼"	60.30	42.20	64.00	57.00
50 x 50 x 25	2" x 2" x 1"	60.30	33.40	64.00	51.00
65	2½"	73.00	73.00	76.00	76.00
65 x 65 x 50	2½" x 2½" x 2"	73.00	60.30	76.00	70.00
80	3"	88.90	88.90	86.00	86.00
80 x 80 x 65	3" x 3" x 2½"	88.90	73.00	86.00	83.00
80 x 80 x 50	3" x 3" x 2"	88.90	60.30	86.00	76.00
90	3½"	101.60	101.60	95.00	95.00
100	4"	114.30	114.30	105.00	105.00
100 x 100 x 80	4" x 4" x 3"	114.30	88.90	105.00	98.00
100 x 100 x 50	4" x 4" x 2"	114.30	60.30	105.00	89.00
125	5"	141.30	141.30	124.00	124.00
150	6"	168.30	168.30	143.00	143.00
150 x 150 x 100	6" x 6" x 4"	168.30	114.30	143.00	130.00
200	8"	219.10	219.10	178.00	178.00
200 x 200 x 150	8" x 8" x 6"	219.10	168.30	178.00	168.00
250	10"	273.10	273.10	216.00	216.00
250 x 250 x 200	10" x 10" x 8"	273.10	219.10	216.00	203.00
300	12"	323.90	323.90	254.00	254.00
300 x 300 x 250	12" x 12" x 10"	323.90	273.10	254.00	241.00

350	14"	355.60	355.60	279.00	279.00
400	16"	406.40	406.40	305.00	305.00
450	18"	457.20	457.20	343.00	343.00
500	20"	508.00	508.00	381.00	381.00
600	24"	609.40	609.40	432.00	432.00
650	26"	660.40	660.40	495.00	495.00
700	28"	711.20	711.20	521.00	521.00
750	30"	762.00	762.00	559.00	559.00
800	32"	812.80	812.80	597.00	597.00
850	34"	863.60	863.60	635.00	635.00
900	36"	914.40	914.40	673.00	673.00
950	38"	965.20	965.20	711.00	711.00
1000	40"	1016.00	1016.00	749.00	749.00
1050	42"	1066.80	1066.80	762.00	711.00
1100	44"	1117.60	1117.60	813.00	762.00
1150	46"	1168.40	1168.40	851.00	800.00
1200	48"	1219.20	1219.20	889.00	838.00

6. COMPREHENSIVE WEIGHT CHART FOR BUTT-WELD TEES (IN KG)

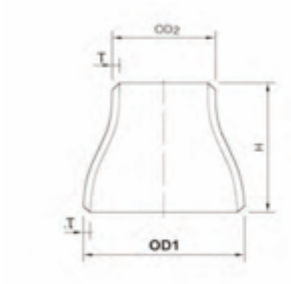
Weights are given in Kilograms (KG) based on carbon steel density (7.85 g/cm³). Applicable across Schedule 5S to XXS.

SIZE (MM)	SIZE (IN)	S5S	S10S	S20S / S20	STD / S40	S60	XS / S80	S100	S120	S140	S160	XXS
15	½"	0.05	0.06	0.07	0.08	0.09	0.10	—	—	—	0.12	0.16
20	¾"	0.08	0.09	0.11	0.13	0.14	0.16	—	—	—	0.21	0.27
20x20x15	¾"x¾"x½"	0.07	0.09	0.10	0.12	0.14	0.15	—	—	—	0.20	0.25
25	1"	0.13	0.21	0.22	0.24	0.28	0.31	—	—	—	0.41	0.53
25x25x20	1"x1"x¾"	0.12	0.19	0.20	0.23	0.26	0.29	—	—	—	0.39	0.49
25x25x15	1"x1"x½"	0.12	0.18	0.20	0.22	0.25	0.28	—	—	—	0.36	0.47
32	1¼"	0.20	0.33	0.36	0.42	0.51	0.55	—	—	—	0.69	0.96
32x32x25	1¼"x1¼"x1"	0.19	0.32	0.34	0.40	0.48	0.52	—	—	—	0.66	0.89
40	1½"	0.28	0.46	0.49	0.60	0.71	0.80	—	—	—	1.06	1.41
40x40x25	1½"x1½"x1"	0.26	0.43	0.46	0.55	0.65	0.72	—	—	—	0.96	1.27
50	2"	0.39	0.64	0.79	0.88	1.08	1.20	—	—	—	1.79	2.18
50x50x40	2"x2"x1½"	0.36	0.60	0.73	0.82	1.00	1.11	—	—	—	1.63	2.01
65	2½"	0.70	0.99	1.15	1.66	1.90	2.18	—	—	—	2.85	3.90
80	3"	0.96	1.36	1.79	2.42	2.86	3.25	—	—	—	4.55	5.90
80x80x50	3"x3"x2"	0.85	1.22	1.60	2.12	2.52	2.86	—	—	—	4.01	5.18
90	3½"	1.21	1.71	2.25	3.16	3.82	4.37	—	—	—	6.52	—
100	4"	1.50	2.12	2.81	4.13	4.84	5.78	—	7.28	—	8.65	10.57
100x100x80	4"x4"x3"	1.40	1.99	2.63	3.83	4.49	5.33	—	—	—	7.92	9.74
125	5"	2.88	3.48	5.06	6.61	8.02	9.30	—	12.14	—	14.82	17.27
150	6"	3.94	4.77	6.94	9.73	12.57	14.71	—	18.73	—	23.23	27.27
200	8"	6.34	8.56	14.46	18.10	22.51	27.44	32.24	38.27	42.80	47.21	45.75
250	10"	11.57	14.24	21.86	26.10	30.94	41.71	49.14	58.81	67.93	—	—
300	12"	18.93	21.73	30.53	39.22	47.80	58.48	78.92	95.79	112.19	—	—
350	14"	22.86	27.37	44.65	53.45	62.16	70.79	103.96	128.37	147.99	—	—
400	16"	29.65	33.84	55.26	66.18	87.76	87.76	144.62	174.85	203.67	—	—
450	18"	37.55	42.86	70.06	97.74	125.01	111.42	203.59	248.25	290.90	—	—
500	20"	52.95	60.59	86.61	137.90	163.17	137.90	276.73	338.79	392.49	—	—

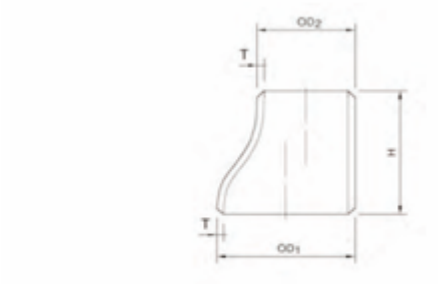
600	24"	81.19	94.34	—	208.03	253.21	185.25	438.32	542.50	633.54	—	—
650	26"	—	—	146.79	176.09	—	234.25	—	—	—	—	—
700	28"	—	—	165.43	198.48	—	264.13	—	—	—	—	—
750	30"	150.55	190.39	304.13	228.47	—	304.13	—	—	—	—	—
800	32"	175.20	218.40	345.10	262.10	—	345.10	—	—	—	—	—
900	36"	220.40	275.60	430.20	328.50	—	430.20	—	—	—	—	—
1000	40"	275.10	342.30	530.40	405.20	—	530.40	—	—	—	—	—
1100	44"	335.80	418.50	642.10	492.30	—	642.10	—	—	—	—	—
1200	48"	402.50	502.10	765.30	588.60	—	765.30	—	—	—	—	—

7. DIMENSIONAL TOLERANCES & DIMENSIONS (ASME B16.9) CONCENTRIC & ECENTRIC REDUCERS

Overall Height (H) and Outside Diameters (OD1 x OD2) for Concentric and Eccentric Reducers:



Concentric



Eccentric

SIZE		OUTSIDE DIAMETER (MM)		END-TO-END HEIGHT (H)
DN (MM)	NPS (INCH)	OD1 (LARGE END)	OD2 (SMALL END)	(MM)
mm	inch	OD1	OD2	H
20 x 8	¾ x ¼	26.70	13.70	38.00
20 x 15	¾ x ½	26.70	21.30	38.00
25 x 20	1 x ¾	33.40	26.70	51.00
25 x 15	1 x ½	33.40	21.30	51.00
32 x 25	1¼ x 1	42.20	33.40	51.00
32 x 20	1¼ x ¾	42.20	26.70	51.00
32 x 15	1¼ x ½	42.20	21.30	51.00
40 x 32	1½ x 1¼	48.30	42.20	64.00
40 x 25	1½ x 1	48.30	33.40	64.00
40 x 20	1½ x ¾	48.30	26..70	64.00
40 x 15	1½ x ½	48.30	21.30	64.00
50 x 40	2 x 1½	60.30	48.30	76.00
50 x 32	2 x 1¼	60.30	42.20	76.00
50 x 25	2 x 1	60.30	33.40	76.00
50 x 20	2 x ¾	60.30	26.70	76.00
50 x 15	2 x ½	60.30	21.30	76.00
65 x 50	2½ x 2	73.00	60.30	89.00
65 x 40	2½ x 1½	73.00	48.30	89.00
65 x 32	2½ x 1¼	73.00	42.20	89.00
65 x 25	2½ x 1	73.00	33.40	89.00
80 x 65	3 x 2½	88.90	73.00	89.00
80 x 50	3 x 2	88.90	60.30	89.00

80 x 40	3 x 1½	88.90	48.30	**89.00**
80 x 32	3 x 1¼	88.90	42.20	**89.00**
80 x 25	3 x 1	88.90	33.40	**89.00**
90 x 80	3½ x 3	101.60	88.90	**102.00**
90 x 65	3½ x 2½	101.60	73.00	**102.00**
90 x 50	3½ x 2	101.60	60.30	**102.00**
90 x 45	3½ x 1½	101.60	48.30	**102.00**
90 x 32	3½ x 1¼	101.60	42.40	**102.00**
100 x 90	4 x 3½	114.30	101.60	**102.00**
100 x 80	4 x 3	114.30	88.90	**102.00**
100 x 65	4 x 2½	114.30	73.00	**102.00**
100 x 50	4 x 2	114.30	60.30	**102.00**
100 x 40	4 x1½	114.30	48.30	**102.00**
125 x 100	5 x 4	141.30	114.30	**127.00**
125 x 90	50 x 3½	141.30	101.60	**127.00**
125 x 80	5 x 3	141.30	88.90	**127.00**
125 x 65	5 x 2½	141.30	73.00	**127.00**
125 x 50	5 x 2	141.30	60.30	**127.00**
150 x 125	6 x 5	168.30	141.30	**140.00**
150 x 100	6 x 4	168.30	114.30	**140.00**
150 x 90	6 x 3½	168.30	101.60	**140.00**
150 x 80	6 x 3	168.30	88.90	**140.00**
150 x 65	6 x 2½	168.30	73.00	**140.00**
150 x 50	6 x 2	168.30	60.30	**140.00**
200 x 150	8 x 6	219.10	168.30	**152.00**
200 x 125	8 x 5	219.10	141.30	**152.00**
200 x 100	8 x 4	219.10	114.30	**152.00**
200 x 90	8 x 3½	219.10	101.60	**152.00**
200 x 80	8 x 3	219.10	88.90	**152.00**
250 x 200	10 x 8	273.10	219.10	**178.00**
250 x 150	10 x 6	273.10	168.30	**178.00**
250 x 125	10 x 5	273.10	141.30	**178.00**
250 x 100	10 x 4	273.10	114.30	**178.00**
300 x 250	12 x 10	323.90	273.10	**203.00**
300 x 200	12 x 8	323.90	219.10	**203.00**
300 x 150	12 x 6	323.90	168.30	**203.00**
300 x 125	12 x 5	323.90	141.30	**203.00**
350 x 300	14 x 12	355.60	323.90	**330.00**
350 x 250	14 x 10	355.60	273.10	**330.00**
350 x 200	14 x 8	355.60	219.10	**330.00**
350 x 150	14 x 6	355.60	168.30	**330.00**
400 x 350	16 x 14	406.40	355.60	**356.00**
400 x 300	16 x 12	406.40	323.90	**356.00**
400 x 250	16 x 10	406.40	273.10	**356.00**
400 x 200	16 x 8	406.40	219.10	**356.00**

450 x 400	18 x 16	457.20	406.40	**381.00**
450 x 350	18 x 14	457.20	355.60	**381.00**
450 x 300	18 x 12	457.20	323.90	**381.00**
450 x 250	18 x 10	457.20	273.10	**381.00**
500 x 450	20 x 18	508.00	457.20	**508.00**
500 x 400	20 x 16	508.00	406.40	**508.00**
500 x 350	20 x 14	508.00	355.60	**508.00**
500 x 300	20 x 12	508.00	323.90	**508.00**
600 x 500	24 x 20	609.40	508.00	**508.00**
600 x 450	24 x 18	609.40	457.20	**508.00**
600 x 400	24 x 16	609.40	406.40	**508.00**
600 x 350	24 x 14	609.40	355.60	**508.00**
650 x 600	26 x 24	660.40	609.40	**610.00**
650 x 500	26 x 20	660.40	508.00	**610.00**
650 x 450	26 x 18	660.40	457.20	**610.00**
650 x 400	26 x 16	660.40	406.40	**610.00**
700 x 650	28 x 26	711.20	660.40	**610.00**
700 x 600	28 x 24	711.20	609.40	**610.00**
700 x 500	28 x 20	711.20	508.00	**610.00**
700 x 450	28 x 18	711.20	457.20	**610.00**
750 x 700	30 x 28	762.00	711.20	**610.00**
750 x 650	30 x 26	762.00	660.40	**610.00**
750 x 600	30 x 24	762.00	609.40	**610.00**
750 x 500	30 x 20	762.00	508.00	**610.00**
800 x 750	32 x 30	812.80	762.00	**610.00**
800 x 700	32 x 28	812.80	711.20	**610.00**
800 x 650	32 x 26	812.80	660.40	**610.00**
800 x 600	32 x 24	812.80	609.40	**610.00**
850 x 800	34 x 32	863.60	812.80	**610.00**
850 x 750	34 x 30	863.60	762.00	**610.00**
850 x 700	34 x 28	863.60	711.20	**610.00**
850 x 650	34 x 26	863.60	660.40	**610.00**
900 x 850	36 x 34	914.40	863.60	**610.00**
900 x 800	36 x 32	914.40	812.80	**610.00**
900 x 750	36 x 30	914.40	762.00	**610.00**
900 x 700	36 x 28	914.40	711.20	**610.00**
950 x 900	38 x 36	965.20	914.40	**610.00**
950 x 850	38 x 34	965.20	863.60	**610.00**
950 x 800	38 x 32	965.20	812.80	**610.00**
950 x 750	38 x 30	965.20	762.00	**610.00**
1000 x 950	40 x 38	1016.00	965.20	**610.00**
1000 x 900	40 x 36	1016.00	914.40	**610.00**
1000 x 850	40 x 34	1016.00	863.60	**610.00**
1000 x 800	40 x 32	1016.00	812.80	**610.00**
1050 x 1000	42 x 40	1066.80	1016.00	**610.00**

1050 x 950	42 x 38	1066.80	965.20	**610.00**
1050 x 900	42 x 36	1066.80	914.40	**610.00**
1050 x 850	42 x 34	1066.80	863.60	**610.00**
1100 x 1050	44 x 42	1117.60	1066.80	**610.00**
1100 x 1000	44 x 40	1117.60	1016.00	**610.00**
1100 x 950	44 x 38	1117.60	965.20	**610.00**
1100 x 900	44 x 36	1117.60	914.40	**610.00**
1150 x 1100	46 x 44	1168.40	1117.60	**711.00**
1150 x 1050	46 x 42	1168.40	1066.80	**711.00**
1150 x 1000	46 x 40	1168.40	1016.00	**711.00**
1150 x 950	46 x 38	1168.40	965.20	**711.00**
1200 x 1150	48 x 46	1219.20	1168.40	**711.00**
1200 x 1100	48 x 44	1219.20	1117.60	**711.00**
1200 x 1050	48 x 42	1219.20	1066.80	**711.00**
1200 x 1000	48 x 40	1219.20	1016.00	**711.00**

8. REDUCER WEIGHT CHART (KG / PIECE)

Comprehensive weight estimations for Concentric and Eccentric Butt Weld Reducers across wall thickness schedules (15 NB to 1200 NB):

SIZE		S5S	S10S	S20S	S20	S30S	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS
DN (MM)	**NPS (INCH)**	**WEIGHT IN KILOGRAMS (KG)**														
SIZE	SIZE	S5S	S10S	S20S	S20	S30S	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS
mm	inch	KG	KG	KG	KG	KG	KG	KG	KG	KG	KG	KG	KG	KG	KG	KG
20 x 8	¾ x ⅛	0.03	0.03	0.04	---	---	0.04	0.04	0.05	0.06	0.06	---	---	---	---	---
20 x 15	¾ x ½	0.03	0.04	0.05	---	---	0.06	0.06	0.06	0.07	0.07	---	---	---	0.09	0.12
25 x 20	1 x ¾	0.06	0.09	0.10	---	---	0.11	0.11	0.12	0.14	0.14	---	---	---	0.18	0.21
25 x 15	1 x ½	0.05	0.08	0.09	---	---	0.10	0.10	0.11	0.12	0.12	---	---	---	0.16	0.19
32 x 35	1¼ x 1	0.08	0.12	0.13	---	---	0.15	0.15	0.18	0.20	0.20	---	---	---	0.25	0.34
32 x 20	1¼ x ¾	0.07	0.10	0.11	---	---	0.13	0.13	0.16	0.17	0.17	---	---	---	0.22	0.29
32 x 15	1¼ x ½	0.06	0.09	0.10	---	---	0.12	0.12	0.14	0.16	0.16	---	---	---	0.19	0.26
40 x 32	1½ x 1¼	0.11	0.19	0.20	---	---	0.24	0.24	0.29	0.32	0.32	---	---	---	0.41	0.56
40 x 25	1½ x 1	0.10	0.17	0.18	---	---	0.21	0.21	0.25	0.28	0.28	---	---	---	0.67	0.48
40 x 20	1½ x ¾	0.09	0.14	0.15	---	---	0.18	0.18	0.22	0.24	0.24	---	---	---	0.32	0.42
40 x 15	1½ x ½	0.09	0.13	0.14	---	---	0.17	0.17	0.20	0.23	0.23	---	---	---	0.29	0.39
50 x 40	2 x 1½	0.16	0.27	0.31	---	---	0.36	0.36	0.44	0.49	0.49	---	---	---	0.69	0.88
50 x 32	2 x 1¼	0.15	0.25	0.30	---	---	0.34	0.34	0.41	0.45	0.45	---	---	---	0.64	0.81
50 x 25	2 x 1	0.14	0.23	0.27	---	---	0.30	0.30	0.36	0.40	0.40	---	---	---	0.58	0.73
50 x 20	2 x ¾	0.13	0.20	0.24	---	---	0.27	0.27	0.33	0.37	0.37	---	---	---	0.53	0.65
50 x 15	2 x ½	0.12	0.19	0.23	---	---	0.25	0.25	0.31	0.34	0.34	---	---	---	0.49	0.61
65 x 50	2½ x 2	0.27	0.41	0.49	---	---	0.63	0.63	0.74	0.84	0.84	---	---	---	1.15	1.51
65 x 40	2½ x 1½	0.25	0.37	0.42	---	---	0.57	0.57	0.66	0.75	0.75	---	---	---	0.98	1.33
65 x 32	2½ x 1¼	0.24	0.35	0.40	---	---	0.54	0.54	0.63	0.71	0.71	---	---	---	0.91	1.25
65 x 25	2½ x 1	0.22	0.32	0.37	---	---	0.50	0.50	0.57	0.65	0.65	---	---	---	0.85	1.15
80 x 65	3 x 2½	0.36	0.51	0.64	---	---	0.89	0.89	1.04	1.19	1.19	---	---	---	1.61	2.14

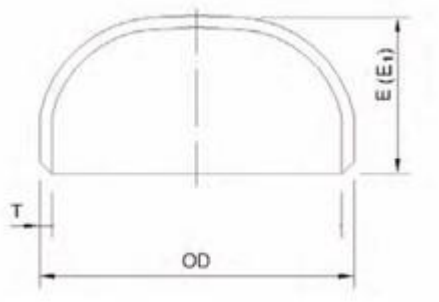
80 x 50	3 x 2	0.31	0.46	0.59	---	---	0.74	0.74	0.89	1.01	1.01	---	---	---	1.44	1.83
80 x 40	3 x 1½	0.28	0.42	0.52	---	---	0.68	0.68	0.81	0.92	0.92	---	---	---	1.27	1.66
80 x 32	3 x 1¼	0.27	0.40	0.50	---	---	0.66	0.66	0.78	0.88	0.88	---	---	---	1.20	1.58
80 x 25	3 x 1	0.26	0.38	0.47	---	---	0..62	0.62	0.72	0.82	0.82	---	---	---	1.14	1.47
90 x 80	3½ x 3	0.49	0.70	0.92	---	---	1.26	1.26	1.52	1.73	1.73	---	---	---	2.51	---
90 x 65	3½ x 2½	0.45	0.64	0.80	---	---	1.13	1.13	1.34	1.53	1.53	---	---	---	2.18	---
90 x 50	3½ x 2	0.38	0.57	0.74	---	---	0.96	0.96	1.17	1.33	1.33	---	---	---	1.98	---
90 x 45	3½ x 1½	0.36	0.53	0.66	---	---	0.90	0.90	1.08	1.23	1.23	---	---	---	1.79	---
90 x 32	3½ x 1¼	0.35	0.51	0.64	---	---	0.86	0.86	1.05	1.18	1.18	---	---	---	1.71	---
100 x 90	4 x 3½	0.56	0.79	1.05	---	---	1.50	1.50	1.79	2.10	2.10	---	---	---	3.13	---
100 x 80	4 x 3	0.53	0.74	0.98	---	---	1.39	1.39	1.64	1.92	1.92	---	---	---	2.80	3.50
100 x 65	4 x 2½	0.48	0.68	0.86	---	---	1.26	1.26	1.46	1.72	1.72	---	---	---	2.47	3.13
100 x 50	4 x 2	0.42	0.62	0.80	---	---	1.09	1.09	1.30	1.52	1.52	---	---	---	2.28	2.78
100 x 40	4 x 1½	0.39	0.58	0.73	---	---	1.02	1.02	1.21	1.42	1.42	---	---	---	2.08	2.58
125 x 100	5 x 4	0.98	1.26	1.76	---	---	2.41	2.41	2.88	3.38	3.38	---	4.35	---	5.25	6.24
125 x 90	5 x 3½	0.93	1.20	1.68	---	---	2.25	2.25	2.73	3.15	3.15	---	---	---	4.89	---
125 x 80	5 x 3	0.89	1.14	1.60	---	---	2.11	2.11	2.54	2.93	2.93	---	---	---	4.47	5.39
125 x 65	5 x 2½	0.84	1.06	1.45	---	---	1.94	1.94	2.32	2.68	2.68	---	---	---	4.07	4.93
125 x 50	5 x 2	0.76	0.99	1.38	---	---	1.74	1.74	2.11	2.43	2.43	---	---	---	3.83	4.49
150 x 125	6 x 5	1.47	1.78	2.59	---	---	3.51	3.51	4.41	5.15	5.15	---	6.62	---	8.16	9.55
150 x 100	6 x 4	1.21	1.54	2.17	---	---	3.10	3.10	3.87	4.56	4.56	---	5.78	---	7.06	8.40
150 x 90	6 x 3½	1.16	1.48	2.08	---	---	2.92	2.92	3.70	4.29	4.29	---	---	---	6.66	---
150 x 80	6 x 3	1.11	1.41	2.00	---	---	2.77	2.77	3.49	4.05	4.05	---	---	---	6.21	7.47
150 x 65	6 x 2½	1.06	1.33	1.83	---	---	2.58	2.58	3.25	3.78	3.78	---	---	---	5.76	6.96
150 x 50	6 x 2	0.97	1.25	1.75	---	---	2.36	2.36	3.02	3.51	3.51	---	---	---	5.49	6.48
200 x150	8 x 6	2.00	2.58	4.12	---	---	5.39	5.39	6.80	8.16	8.16	---	10.98	---	13.57	14.20
200 x 125	8 x 5	1.86	2.41	3.87	---	---	4.91	4.91	6.05	7.26	7.26	---	9.91	---	12.19	12.55
200 x 100	8 x 4	1.58	2.16	3.42	---	---	4.46	4.46	5.46	6.62	6.62	7.11	9.00	---	11.00	11.31
200 x 90	8 x 3½	1.53	2.09	3.32	---	---	4.27	4.27	5.27	6.33	6.33	---	---	---	10.57	---
200 x 80	8 x 3	1.48	2.02	3.23	---	---	4.10	4.10	5.05	6.07	6.07	---	---	---	10.07	10.29
250 x 200	10 x 8	3.34	4.27	6.84	6.73	7.80	9.18	9.18	11.98	13.01	14.30	16.99	19.85	22.78	25.25	23.40
250 x 150	10 x 6	3.03	3.71	5.60	---	---	7.90	7.90	10.50	11.06	12.35	---	16.65	---	21.34	20.85
250 x 125	10 x 5	2.86	3.51	5.30	---	---	7.34	7.34	9.63	10.01	11.30	---	15.41	---	19.72	18.91
250 x 100	10 x 4	2.53	3.21	4.77	---	---	6.81	6.81	8.93	9.25	10.55	---	14.34	---	18.33	17.46
300 x 250	12 x 10	5.50	6.50	9.50	9.36	11.81	13.62	14.23	19.36	18.17	23.10	27.87	32.46	36.89	41.72	34.73
300 x 200	12 x 8	4.72	5.72	8.62	8.49	10.35	11.80	12.41	16.46	16.45	19.91	23.91	28.13	31.37	35.51	29.92
300 x 150	12 x 6	4.36	5.08	7.21	---	---	10.34	10.95	14.78	14.22	17.68	---	24.49	---	31.06	27.00
300 x 125	12 x 5	4.17	4.85	6.87	---	---	9.70	10.31	13.78	13.03	16.48	---	23.07	---	29.21	24.79
350 x 300	14 x 12	10.93	12.83	19.57	---	19.44	24.16	25.53	28.70	38.93	33.80	47.72	58.47	67.93	76.26	85.84
350 x 250	14 x 10	9.45	11.45	18.23	---	18.12	21.80	23.36	25.54	34.38	31.18	41.87	51.10	59.00	67.50	74.92
350 x 200	14 x 8	8.19	10.18	16.80	---	16.72	19.42	20.42	22.60	29.67	28.39	36.69	44.67	51.96	58.53	64.82
350 x 150	14 x 6	7.61	9.13	14.50	---	---	---	18.04	20.22	26.94	24.76	33.06	---	46.04	---	57.58
400 x 350	16 x 14	13.59	15.85	25.88	21.05	25.88	30.98	30.98	38.73	51.14	41.06	64.24	78.39	90.93	104.46	115.18
400 x 300	16 x 12	13.03	14.91	22.87	---	22.74	28.18	29.66	36.13	48.00	39.30	59.57	72.14	84.21	96.34	107.52
400 x 250	16 x 10	11.44	13.42	21.43	---	21.31	25.63	27.32	32.72	43.08	36.46	53.27	64.19	74.57	86.88	95.74

400 x 200	16 x 8	10.07	12.05	19.88	---	19.79	23.07	24.14	29.54	38.01	33.45	47.67	57.25	66.98	77.21	84.85
450 x 400	18 x 16	16.87	19.26	31.46	25.58	31.46	40.97	37.69	53.24	69.69	50.01	87.16	105.88	123.74	141.29	157.10
450 x 350	18 x 14	15.54	18.11	29.58	24.05	29.58	38.71	35.43	47.72	63.27	46.98	78.50	96.18	112.05	126.24	141.13
450 x 300	18 x 12	14.95	17.10	26.37	---	26.22	35.71	34.01	44.93	59.91	45.09	73.51	89.50	104.85	117.54	132.94
450 x 250	18 x 10	13.25	15.51	24.82	---	24.69	32.98	31.51	41.28	54.65	42.06	66.76	80.99	94.54	107.42	120.33
500 x 450	20 x 18	27.05	30.91	46.98	38.18	51.90	70.42	56.30	86.29	115.04	74.73	143.68	175.58	204.45	232.75	260.08
500 x 400	20 x 16	25.71	29.39	44.47	36.14	49.38	63.02	53.28	77.94	103.65	70.72	130.67	159.19	184.82	213.50	236.26
500 x 350	20 x 14	23.94	27.86	41.95	34.11	46.87	59.99	50.26	70.57	95.09	66.68	119.13	146.26	169.22	193.43	214.97
500 x 300	20 x 12	23.14	26.51	37.67	---	42.39	56.00	48.37	66.85	90.62	64.16	112.47	137.34	159.63	181.83	204.05
600 x 500	24 x 20	35.93	41.48	---	44.28	65.36	92.70	65.36	111.50	153.00	86.87	191.38	235.80	274.47	311.75	348.38
600 x 450	24 x 18	32.72	37.77	---	42.24	57.93	84.32	62.34	104.55	142.26	82.83	176.92	217.79	254.65	266.63	321.58
600 x 400	24 x 16	31.39	36.25	---	40.21	55.42	76.92	59.31	96.20	130.87	78.78	163.92	201.40	235.01	267.38	297.76
600 x 350	24 x 14	29.61	34.72	---	38.17	52.90	73.90	56.29	88.83	122.31	74.74	152.37	188.47	219.41	247.31	276.47
650 x 600	26 x 24	---	---	---	67.80	104.73	---	89.37	---	---	118.87	---	---	---	---	---
650 x 500	26 x 20	---	---	---	62.92	97.49	---	82.13	---	---	109.18	---	---	---	---	---
650 x 450	26 x 18	---	---	---	60.47	88.57	---	78.50	---	---	104.33	---	---	---	---	---
650 x 400	26 x 16	---	---	---	58.02	85.55	---	74.87	---	---	99.48	---	---	---	---	---
700 x 650	28 x 26	---	---	---	80.56	128.59	---	96.65	---	---	128.59	---	---	---	---	---
700 x 600	28 x 24	---	---	---	70.82	109.59	147.16	93.00	---	---	123.72	---	---	---	---	---
700 x 500	28 x 20	---	---	---	65.93	102.34	130.46	85.76	---	---	114.03	---	---	---	---	---
700 x 450	28 x 18	---	---	---	63.49	93.42	125.61	82.13	---	---	109.18	---	---	---	---	---
750 x 700	30 x 28	---	---	---	86.60	138.29	172.38	103.91	---	---	138.29	---	---	---	---	---
750 x 650	30 x 26	---	---	---	83.58	133.44	---	100.28	---	---	133.44	---	---	---	---	---
750 x 600	30 x 24	---	---	---	73.83	114.44	153.23	96.63	---	---	128.57	---	---	---	---	---
750 x 500	30 x 20	---	---	---	68.95	107.19	136.54	89.39	---	---	118.88	---	---	---	---	---
800 x 750	32 x 30	---	---	---	92.63	148.00	184.53	111.17	---	---	148.00	---	---	---	---	---
800 x 700	32 x 28	---	---	---	89.61	143.15	178.45	107.54	---	---	143.15	---	---	---	---	---
800 x 650	32 x 26	---	---	---	86.60	138.29	---	103.91	---	---	138.29	---	---	---	---	---
800 x 600	32 x 24	---	---	---	76.85	119.29	159.31	100.26	182.60	---	133.42	---	---	---	---	---
850 x 800	34 x 32	---	---	---	98.67	157.70	196.68	118.43	216.10	---	157.70	---	---	---	---	---
850 x 750	34 x 30	---	---	---	95.65	152.85	190.60	114.80	---	---	152.85	---	---	---	---	---
850 x 700	34 x 28	---	---	---	92.63	148.00	184.53	111.17	---	---	148.00	---	---	---	---	---
850 x 650	34 x 26	---	---	---	89.61	143.15	---	107.54	---	---	143.15	---	---	---	---	---
900 x 850	36 x 34	---	---	---	104.71	167.41	208.83	125.68	240.00	---	167.41	---	---	---	---	---
900 x 800	36 x 32	---	---	---	101.69	162.56	202.75	122.05	233.30	---	162.56	---	---	---	---	---
900 x 750	36 x 30	---	---	---	98.67	157.70	196.68	118.43	---	---	157.70	---	---	---	---	---
900 x 700	36 x 28	---	---	---	95.65	152.85	190.60	114.80	---	---	152.85	---	---	---	---	---
950 x 900	38 x 36	---	---	---	---	---	---	132.94	---	---	177.11	---	---	---	---	---
950 x 850	38 x 34	---	---	---	---	---	---	129.31	---	---	172.26	---	---	---	---	---
950 x 800	38 x 32	---	---	---	---	---	---	125.68	---	---	167.41	---	---	---	---	---
950 x 750	38 x 30	---	---	---	---	---	---	122.05	---	---	162.56	---	---	---	---	---
1000 x 950	40 x 38	---	---	---	---	---	---	140.20	---	---	186.82	---	---	---	---	---
1000 x 900	40 x 36	---	---	---	---	---	---	136.57	---	---	181.97	---	---	---	---	---
1000 x 850	40 x 34	---	---	---	---	---	---	132.94	---	---	177.11	---	---	---	---	---
1000 x 800	40 x 32	---	---	---	---	---	---	129.31	---	---	172.26	---	---	---	---	---

1050 x 1000	42 x 40	---	---	---	---	---	---	147.46	---	---	196.52	---	---	---	---	---
1050 x 950	42 x 38	---	---	---	---	---	---	143.83	---	---	191.67	---	---	---	---	---
1050 x 900	42 x 36	---	---	---	---	---	---	140.20	---	---	186.82	---	---	---	---	---
1050 x 850	42 x 34	---	---	---	---	---	---	136.57	---	---	181.97	---	---	---	---	---
1100 x 1050	44 x 42	---	---	---	---	---	---	154.72	---	---	206.23	---	---	---	---	---
1100 x 1000	44 x 40	---	---	---	---	---	---	151.09	---	---	201.38	---	---	---	---	---
1100 x 950	44 x 38	---	---	---	---	---	---	147.46	---	---	196.52	---	---	---	---	---
1100 x 900	44 x 36	---	---	---	---	---	---	143.83	---	---	191.67	---	---	---	---	---
1150 x 1100	46 x 44	---	---	---	---	---	---	188.80	---	---	251.69	---	---	---	---	---
1150 x 1050	46 x 42	---	---	---	---	---	---	184.57	---	---	246.03	---	---	---	---	---
1150 x 1000	46 x 40	---	---	---	---	---	---	180.34	---	---	240.37	---	---	---	---	---
1150 x 950	46 x 38	---	---	---	---	---	---	176.11	---	---	234.72	---	---	---	---	---
1200 x 1150	48 x 46	---	---	---	---	---	---	197.26	---	---	263.00	---	---	---	---	---
1200 x 1100	48 x 44	---	---	---	---	---	---	193.03	---	---	257.34	---	---	---	---	---
1200 x 1050	48 x 42	---	---	---	---	---	---	188.80	---	---	251.69	---	---	---	---	---
1200 x 1000	48 x 40	---	---	---	---	---	---	184.57	---	---	246.03	---	---	---	---	---

9. PIPE CAP DIMENSIONAL CHART (ASME B16.9)

Outer Diameter (OD) and Overall Height (E / E1) for Sizes 15 NB to 1200 NB



NOMINAL SIZE		OUTSIDE DIAMETER (OD)	HEIGHT (E) [STD / SCH 40]	HEIGHT (E1) [XS / SCH 80 / XXS]
DN (MM)	NPS (INCH)	MM	MM	MM
15	1/2"	21.30	25.40	25.40
20	3/4"	26.90	25.40	25.40
25	1"	33.70	38.10	38.10
32	1-1/4"	42.40	38.10	38.10
40	1-1/2"	48.30	38.10	38.10
50	2"	60.30	38.10	44.40
65	2-1/2"	73.00	38.10	50.80
80	3"	88.90	50.80	63.50
90	3-1/2"	101.60	63.50	76.20
100	4"	114.30	63.50	76.20
125	5"	139.70	76.20	88.90
150	6"	168.30	88.90	101.60
200	8"	219.10	101.60	127.00
250	10"	273.00	127.00	152.40
300	12"	323.90	152.40	177.80
350	14"	355.60	165.10	190.50
400	16"	406.40	177.80	203.20
450	18"	457.00	203.20	228.60
500	20"	508.00	228.60	254.00
550	22"	558.80	254.00	254.00
600	24"	610.00	266.70	304.80
650	26"	660.40	266.70	—
700	28"	711.00	266.70	—
750	30"	762.00	266.70	—
800	32"	813.00	266.70	—
850	34"	863.60	266.70	—
900	36"	914.00	266.70	—
950	38"	965.20	304.80	—
1000	40"	1016.00	304.80	—
1050	42"	1067.00	304.80	—
1100	44"	1117.60	342.90	—

1150	46"	1168.40	342.90	—
1200	48"	1219.20	342.90	—

10. PIPE CAP WEIGHT CHART

Weights in Kilograms (KG) across Schedules

SIZE		S5S	S10S	S20S	S20	S30S	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS
MM	INCH	WEIGHT IN KG														
15	1/2"	0.02	0.03	0.03	—	—	—	0.04	0.04	0.04	0.05	0.05	—	—	—	0.06
20	3/4"	0.03	0.04	0.04	—	—	—	0.05	0.05	0.06	0.07	0.07	—	—	—	0.09
25	1"	0.05	0.09	0.10	—	—	—	0.11	0.11	0.12	0.14	0.14	—	—	—	0.20
32	1-1/4"	0.07	0.11	0.12	—	—	—	0.14	0.14	0.18	0.20	0.20	—	—	—	0.26
40	1-1/2"	0.08	0.13	0.14	—	—	—	0.17	0.17	0.21	0.23	0.23	—	—	—	0.33
50	2"	0.10	0.17	0.21	—	—	—	0.23	0.23	0.29	0.33	0.33	—	—	—	0.52
65	2-1/2"	0.16	0.23	0.27	—	—	—	0.40	0.40	0.46	0.53	0.53	—	—	—	0.72
80	3"	0.25	0.36	0.48	—	—	—	0.66	0.66	0.79	0.91	0.91	—	—	—	1.34
90	3-1/2"	0.35	0.50	0.67	—	—	—	0.96	0.96	1.18	1.36	1.36	—	—	—	2.13
100	4"	0.41	0.58	0.78	—	—	—	1.17	1.17	1.38	1.68	1.68	—	2.16	—	2.63
125	5"	0.80	0.98	1.44	—	—	—	1.90	1.90	2.33	2.73	2.73	—	3.65	—	4.57
150	6"	1.14	1.39	2.04	—	—	—	2.90	2.90	3.79	4.49	4.49	—	5.83	—	7.42
200	8"	1.78	2.41	4.12	—	4.06	4.44	5.20	5.20	6.53	8.05	8.05	9.57	11.54	13.06	14.58
250	10"	3.35	4.14	6.41	—	6.31	7.69	9.17	9.17	12.53	12.53	14.90	18.05	21.11	25.06	28.21
300	12"	5.59	6.43	9.09	—	8.95	11.75	13.29	14.41	20.00	17.76	24.34	29.93	35.53	40.00	46.58
350	14"	6.69	8.02	13.21	10.70	13.21	15.88	15.88	18.55	25.24	21.23	31.76	39.78	46.47	53.16	59.68
400	16"	8.84	10.10	16.62	13.47	16.62	19.99	19.99	26.72	35.14	26.72	45.03	55.13	65.02	76.80	85.22
450	18"	11.29	12.90	21.23	17.20	21.23	29.83	25.53	38.43	51.06	34.13	63.96	79.01	93.79	106.68	121.46
500	20"	16.06	18.40	26.43	21.41	31.78	42.48	31.78	50.51	68.91	42.48	87.64	108.72	127.45	148.53	167.26
550	22"	—	—	—	26.07	38.69	51.73	38.69	—	90.42	51.73	116.49	142.15	168.22	193.88	219.95
600	24"	26.06	30.33	—	30.33	45.02	67.76	45.02	82.93	116.57	60.18	146.90	184.34	217.98	248.31	281.95
650	26"	—	—	—	41.86	67.30	—	50.34	—	—	67.30	—	—	—	—	—
700	28"	—	—	—	46.56	74.85	93.71	55.98	—	—	74.85	—	—	—	—	—
750	30"	41.76	51.54	—	51.54	82.86	103.74	61.98	—	—	82.86	—	—	—	—	—
800	32"	—	—	—	56.78	91.28	114.28	68.28	125.78	—	91.28	—	—	—	—	—
850	34"	—	—	—	62.23	100.03	125.24	74.83	137.84	—	100.03	—	—	—	—	—
900	36"	—	—	—	67.90	109.15	136.66	81.65	164.16	—	109.15	—	—	—	—	—
950	38"	—	—	—	—	—	—	94.47	—	—	126.29	—	—	—	—	—
1000	40"	—	—	—	—	—	—	102.18	—	—	136.60	—	—	—	—	—
1050	42"	—	—	—	—	—	—	110.22	—	—	147.35	—	—	—	—	—
1100	44"	—	—	—	—	—	—	124.94	—	—	167.02	—	—	—	—	—
1150	46"	—	—	—	—	—	—	133.78	—	—	178.84	—	—	—	—	—
1200	48"	—	—	—	—	—	—	142.92	—	—	191.07	—	—	—	—	—

11. WALL THICKNESS CHART (MM)

Standard Nominal Wall Thicknesses in millimeters per Pipe Schedule (ASME B36.10M / B36.19M)

DN	NPS	S5S	S10S	S20	S30	STD	S40	S60	XS	S80	S100	S120	S140	S160	XXS
15	1/2"	1.65	2.10	2.50	---	2.80	2.80	3.20	3.70	3.70	---	---	---	4.78	7.50
20	3/4"	1.65	2.10	2.50	---	2.90	2.90	3.40	3.90	3.90	---	---	---	5.50	7.80
25	1"	1.65	2.80	3.00	---	3.40	3.40	3.90	4.55	4.55	---	---	---	6.40	9.10
32	1-1/4"	1.65	2.80	3.00	---	3.60	3.60	4.50	4.90	4.90	---	---	---	6.40	9.70
40	1-1/2"	1.65	2.80	3.00	---	3.70	3.70	4.50	5.10	5.10	---	---	---	7.14	10.20
50	2"	1.85	2.80	3.50	---	3.90	3.90	4.90	5.54	5.54	---	---	---	8.70	11.10
65	2-1/2"	2.10	3.00	3.50	---	5.50	5.50	6.00	7.00	7.00	---	---	---	9.53	14.00
80	3"	2.10	3.00	4.00	---	5.74	5.74	6.60	7.60	7.60	---	---	---	11.13	15.24
100	4"	2.10	3.00	4.00	---	6.00	6.00	7.10	8.60	8.60	---	11.10	---	13.50	17.10
125	5"	2.80	3.40	5.00	---	6.60	6.60	8.10	9.50	9.50	---	12.70	---	15.90	19.00
150	6"	2.80	3.40	5.00	---	7.10	7.10	9.30	11.00	11.00	---	14.30	---	18.26	21.90
200	8"	2.80	3.80	6.50	7.00	8.20	8.20	10.30	12.70	12.70	15.10	18.26	20.60	23.00	22.20
250	10"	3.40	4.20	6.50	7.80	9.30	9.30	12.70	12.70	15.10	18.30	21.44	25.40	28.60	25.40
300	12"	4.00	4.60	6.50	8.40	9.50	10.30	14.30	12.70	17.48	21.44	25.40	28.80	33.30	25.40
350	14"	4.00	4.80	7.90	9.50	9.50	11.10	15.10	12.70	19.05	23.80	27.80	31.80	35.70	---
400	16"	4.20	4.80	7.90	9.50	9.50	12.70	16.70	12.70	21.44	26.20	30.96	36.50	40.50	---
450	18"	4.20	4.80	7.90	11.10	9.50	14.30	19.05	12.70	23.80	29.40	34.90	39.70	45.24	---
500	20"	4.80	5.50	7.90	12.70	9.50	15.10	20.60	12.70	26.20	32.54	38.10	44.45	50.00	---
600	24"	5.50	6.40	---	14.30	9.50	17.50	24.60	12.70	31.00	38.90	46.00	52.40	59.54	---
700	28"	---	---	12.70	15.90	9.50	---	---	12.70	---	---	---	---	---	---
800	32"	---	---	12.70	15.90	9.50	17.50	---	12.70	---	---	---	---	---	---
900	36"	---	---	12.70	15.90	9.50	19.10	---	12.70	---	---	---	---	---	---
1000	40"	---	---	12.70	15.90	9.50	---	---	12.70	---	---	---	---	---	---
1200	48"	---	---	12.70	15.90	9.50	---	---	12.70	---	---	---	---	---	---

12. DIMENSIONAL TOLERANCES (ASME B16.9 / MSS SP-75) (IN MM)

NOMINAL SIZE (NPS)	OUTSIDE DIA AT BEVEL	INSIDE DIA AT END	WALL THICKNESS	CENTER TO END (ELBOW/TEE)	OVERALL LENGTH (REDUCER/CAP)	OFF ANGLE / OFF PLANE
1/2" - 2-1/2"	+1.5 / -0.7	±0.7	Not less than 87.5% of nominal wall thickness	±1.5	±1.5 (H) / ±3.0 (E)	Off Angle: 0.7mm | Off Plane: 1.5mm
3" - 4"	+1.5 / -0.7	±1.5		±1.5	±1.5 (H) / ±3.0 (E)	Off Angle: 0.7mm | Off Plane: 1.5mm
5" - 8"	+2.2 / -1.5	±1.5		±2.2	±2.2 (H) / ±6.3 (E)	Off Angle: 1.5mm | Off Plane: 3.0mm
10" - 18"	+4.0 / -3.0	±3.0		±3.0	±3.0 (H) / ±6.3 (E)	Off Angle: 2.2mm | Off Plane: 4.8mm
20" - 24" (600NB)	+6.3 / -4.8	±4.8		±4.8	±4.8 (H) / ±9.6 (E)	Off Angle: 3.0mm | Off Plane: 9.6mm

13. QUALITY ASSURANCE & QUALITY CONTROL (QA/QC)

N PIPING SYSTEMS PVT LTD maintains rigorous quality control procedures to meet international oil & gas and nuclear standards:

- **Non-Destructive Testing (NDT):** 100% Radiographic Testing (RT) on welded fittings, Ultrasonic Testing (UT) for wall thickness, Magnetic Particle Testing (MT) & Liquid Penetrant Testing (PT) for surface integrity.
- **Destructive Testing:** Tensile Testing, Impact Testing (Charpy V-Notch down to -101°C / ASTM A420 WPL6), Hardness Testing, Microstructure Analysis & Intergranular Corrosion (IGC) Test per ASTM A262 Practice E.
- **Hydrostatic Testing:** Performed in accordance with ASME B16.9 and project requirements.
- **Third-Party Inspection:** Approved by leading inspection agencies including EIL, IBR, TUV, DNV, Lloyd's Register, Bureau Veritas, and SGS.
- **Value-Added Coating & Surface Treatments:**
- Black Rust-Preventive Paint, Hot Dip Galvanizing (HDG), 3LPE / 3LPP Coating, FBE (Fusion Bonded Epoxy), Polyurethane Coating, and Custom End Preparation (Beveling to ASME B16.25).