

Isuka Valve

M f g . C o . , L t d .



FORGED STEEL VALVES
STAINLESS STEEL VALVES

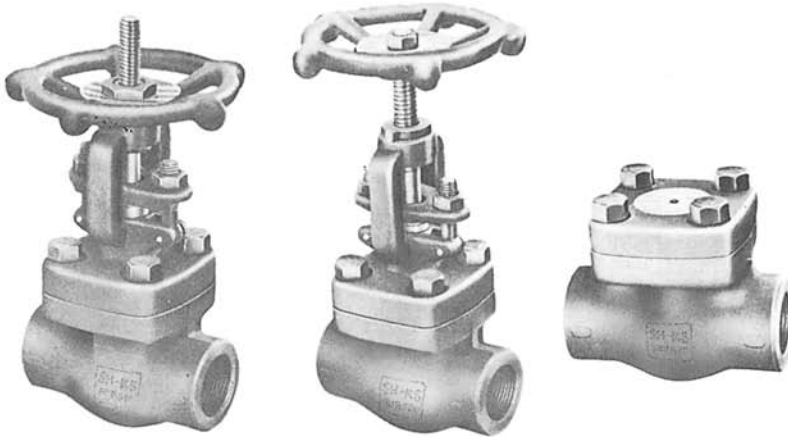
MANUFACTURING ITEMS

BOLTED BONNET, O.S & Y
800 LB, 1500 LB, 2500 LB

**SOCKET WELD
THREADED**

BOLTED BONNET, INSIDE SCREW
800 LB (800 p.s.i at 850°F)

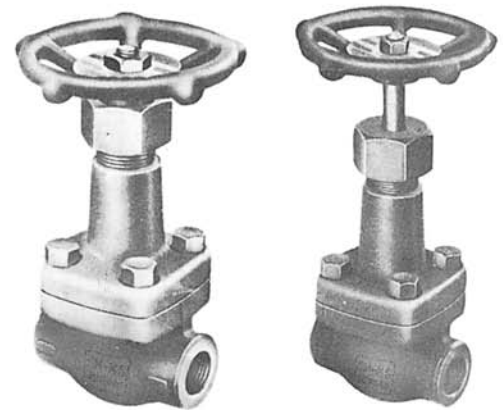
**SOCKET WELD
THREADED**



GATE VALVE

GLOBE VALVE

CHECK VALVE



GATE VALVE

GLOBE VALVE

BOLTED BONNET, O.S & Y
150 LB, 300 LB, 600 LB, 1500 LB, 2500 LB

**INTEGRAL
FLANGED VALVES**



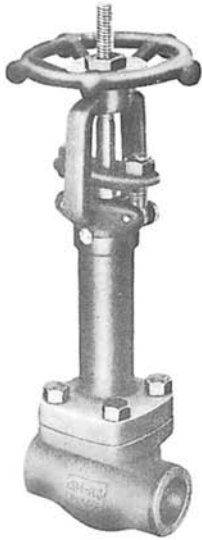
GATE VALVE

GLOBE VALVE

CHECK VALVE

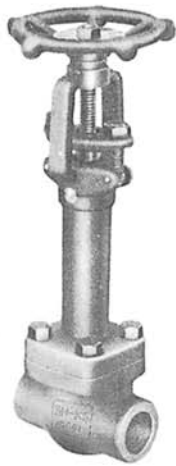
MANUFACTURING ITEMS

**EXTENDED BONNET TYPE
BOLTED BONNET, O.S & Y**



GATE VALVE

**SOCKET WELD
THREADED**



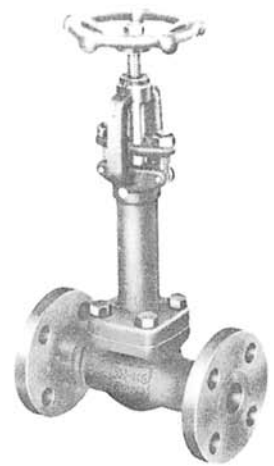
GLOBE VALVE

**EXTENDED BONNET TYPE
BOLTED BONNET, O.S & Y**



GATE VALVE

FLANGED



GLOBE VALVE

**PIPE FITTINGS
#3,000**

**SOCKET WELD
THREADED**



**BARSTOCK NEEDLE VALVE
#3,000 P.S.I**

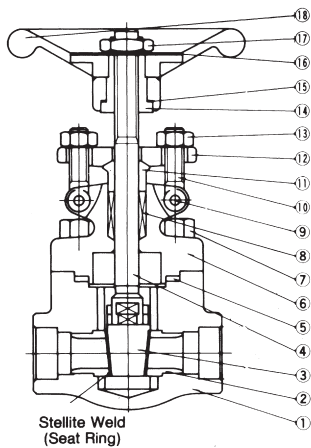
THREADED



TYPICAL VALVE PARTS DESCRIPTION AND STANDARD MATERIAL SPECIFICATION

Typical Gate

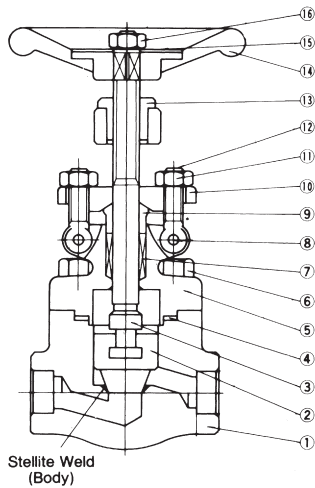
Based on API Standard 602 & BS 5352
Dimensions and Materials Confirm to API602



No.	Part Name	A105	182-F304	A182-F316
1	Body	ASTM A105	ASTM A182-F304	ASTM A182-F316
2	Seat Ring	AISI Type 410 S.T.L	AISI Type 304 S.T.L	AISI Type 316 S.T.L
3	Disc	AISI Type 410	AISI Type 304	AISI Type 316
4	Stem	AISI Type 410	AISI Type 304	AISI Type 316
5	Gasket	Spiral Wounded Gasket	Spiral Wounded Gasket	Spiral Wounded Gasket
6	Bonnet	ASTM A105	ASTM A182-F304	ASTM A182-F316
7	Bonnet Bolt	ASTM A193 Gr B7	ASTM A193 Gr B8	ASTM A193 Gr B8M
8	Gland Packing	Braided Asbestos + Monel Wire	Braided Asbestos + Monel Wire	Braided Asbestos + Monel Wire
9	Eye Bolt Pin	ASTM A276-304	ASTM A276-304	ASTM A276-304
10	Eye Bolt	ASTM A193 Gr B8	ASTM A193 Gr B8	ASTM A193 Gr B8
11	Gland	ASTM A276-304	ASTM A276-304	ASTM A276-304
12	Gland Flange	ASTM A105	ASTM A105	ASTM A105
13	Eye Bolt Nut	ASTM A194 Gr 2H	ASTM A194 Gr 8	ASTM A194 Gr 8M
14	Sleeve	ASTM A276-410	ASTM A276-410	ASTM A276-410
15	Sleeve Washer	ASTM A276-430	ASTM A276-430	ASTM A276-430
16	Name Plate	Etched Aluminum	Etched Aluminum	Etched Aluminum
17	Lock Nut	ASTM A108-1025	ASTM A108-1025	ASTM A108-1025
18	Hand Wheel	ASTM A47	ASTM A47	ASTM A47

Typical Globe

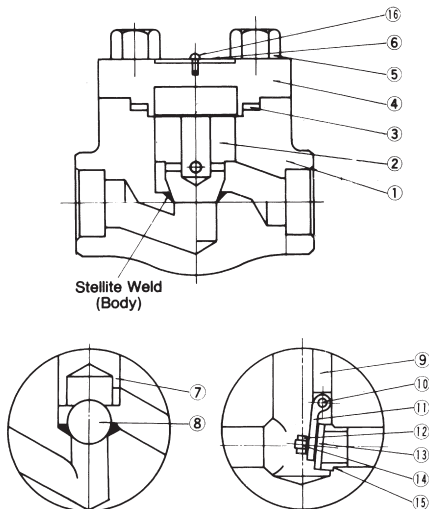
Based on BS 5352
Dimensions and Materials Confirm to API602



1	Body	ASTM A105	ASTM A182-F304	ASTM A182-F316
2	Disc	AISI Type 410 AISI Type 420	AISI Type 304	AISI Type 316
3	Stem	AISI Type 410	AISI Type 304	AISI Type 316
4	Gasket	Spiral Wounded Gasket	Spiral Wounded Gasket	Spiral Wounded Gasket
5	Bonnet	ASTM A105	ASTM A182-F304	ASTM A182-F316
6	Bonnet Bolt	ASTM A193 Gr B7	ASTM A193 Gr B8	ASTM A193 Gr B8M
7	Gland Packing	Braided Asbestos + Monel Wire	Braided Asbestos + Monel Wire	Braided Asbestos + Monel Wire
8	Eye Bolt Pin	ASTM A276-304	ASTM A276-304	ASTM A276-304
9	Gland	ASTM A276-304	ASTM A276-304	ASTM A276-304
10	Gland Flange	ASTM A105	ASTM A105	ASTM A105
11	Eye Bolt Nut	ASTM A194 Gr 2H	ASTM A194 Gr 8	ASTM A194 Gr 8M
12	Eye Bolt	ASTM A193 Gr B8	ASTM A193 Gr B8	ASTM A193 Gr B8
13	Sleeve	ASTM A276-410	ASTM A276-410	ASTM A276-410
14	Hand Wheel	ASTM A47	ASTM A47	ASTM A47
15	Name Plate	Etched Aluminum	Etched Aluminum	Etched Aluminum
16	Lock Nut	ASTM A194 Gr 2H	ASTM A194 Gr 2H	ASTM A194 Gr 2H

Typical Check

Based on BS 5352
Dimensions and Materials Confirm to API602



1	Body	ASTM A105	ASTM A182-F304	ASTM A182-F316
2	Disc	AISI Type 410	AISI Type 304	AISI Type 316
3	Gasket	Spiral Wounded Gasket	Spiral Wounded Gasket	Spiral Wounded Gasket
4	Bonnet (Cap)	ASTM A105	ASTM A182-F304	ASTM A182-F316
5	Bonnet Bolt	ASTM A193 Gr B7	ASTM A193 Gr B8	ASTM A193 Gr B8M
6	Name Plate	Etched Aluminum	Etched Aluminum	Etched Aluminum
7	Bonnet & Ball Guide	ASTM A105	ASTM A182-F304	ASTM A182-F316
8	Ball	AISI Type 420	AISI Type 304	AISI Type 316
9	Hinge Support	AISI Type 410	AISI Type 304	AISI Type 316
10	Hinge Pin	AISI Type 410	AISI Type 304	AISI Type 316
11	Hinge	AISI Type 410	AISI Type 304	AISI Type 316
12	Disc Lock Nut	AISI Type 410	AISI Type 304	AISI Type 316
13	Disc	AISI Type 420	AISI Type 304	AISI Type 316
14	Disc Nut Pin	AISI Type 410	AISI Type 304	AISI Type 316
15	Seat	AISI Type 410 S.T.L	AISI Type 304	AISI Type 316
16	Rivet	ASTM B134-260	ASTM B134-260	ASTM B134-260

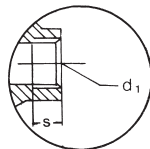
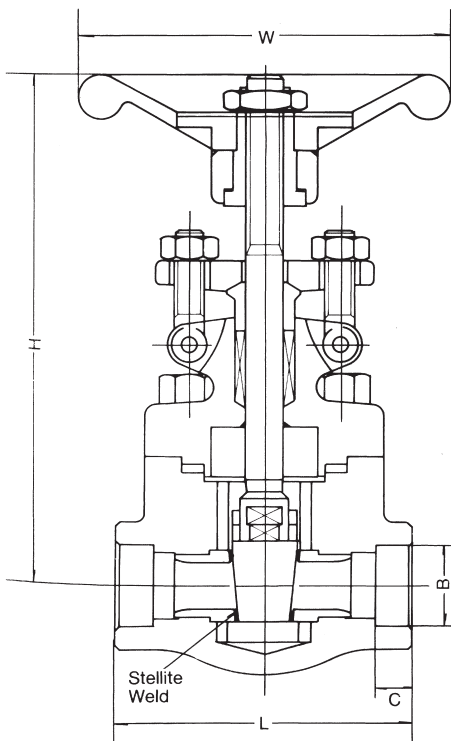
GATE VALVE

800-2500LBS

FORGED STEEL

**BOLTED BONNET
O.S & Y, BOLTED GLAND**

**SOCKET WELD ENDS
SCREWED ENDS**



Ratings:	Test Pressure
Carbon Steel – ASTM A105 800 p.s.i at 850°F 2,000 p.s.i at –20°F to 100°F	Hydraulic : Body – 3,000 p.s.i Seat – 2,200 p.s.i Air : Seat – 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L
	13% Cr. S.S Full S.T.L
	304 S.S
	316 S.S
	Monel Metal
Type 304 Stainless Steel	304 S.S
Type 316 Stainless Steel	316 Cr. S.S
1 ¼ % Cr. ½ % Moly Steel	13% Cr. S.S
2 ¼ % Cr. 1% Moly Steel	13% Cr. S.S

To order: Add suffix S/E for screwed end or S/W for socket weld end.

Valve Dimensions

() inch

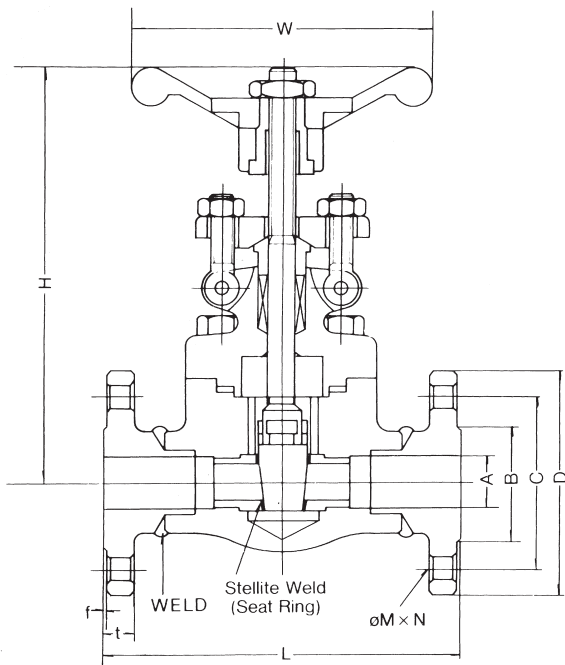
Size	Center to Top(Open) H	End to End L	Hand Wheel Dia. W	Socket Weld		Threaded Depth S	Thread d_1	Approx. Weight (kg)
				Bore B	Depth C			
¼	155 (6.10)	79(3.11)	100(3.94)	14.10-14.35(0.555-0.565)	10(0.38)	10.0(0.40)	¼(N)PT	2.00
⅜	155 (6.10)	79(3.11)	100(3.94)	17.55-17.80(0.690-0.700)	10(0.38)	10.5(0.41)	⅜(N)PT	1.98
½	155 (6.10)	79(3.11)	100(3.94)	21.70-21.95(0.855-0.865)	10(0.38)	13.5(0.53)	½(N)PT	1.90
¾	155 (6.10)	92(3.62)	100(3.94)	27.05-27.30(1.065-1.075)	13(0.50)	14.0(0.55)	¾(N)PT	2.20
1	193 (7.60)	111(4.37)	130(5.12)	33.80-34.05(1.330-1.340)	13(0.50)	17.5(0.68)	1 (N)PT	4.10
1¼	248 (9.76)	120(4.72)	170(6.69)	42.55-42.80(1.675-1.685)	13(0.50)	18.0(0.71)	1¼(N)PT	7.30
1½	248 (9.76)	120(4.72)	170(6.69)	48.65-48.90(1.915-1.925)	13(0.50)	18.5(0.72)	1½(N)PT	7.28
2	286(11.26)	140(5.51)	170(6.69)	61.10-61.35(2.406-2.416)	16(0.62)	19.0(0.76)	2 (N)PT	10.80

GATE VALVE FLANGED

FORGED STEEL

BOLTED BONNET O.S & Y, BOLTED GLAND

**KS 10 K
(JIS) 20 K
30 K**



Ratings (ASTM A105):	Test Pressure:
1) 10K 150 p.s.i at 550°F 285 p.s.i at -20°F to 100°F	Hydraulic : Body - 425 p.s.i Seat - 300 p.s.i Air : Seat - 80 p.s.i
2) 20K 300 p.s.i at 850°F 740 p.s.i at -20°F to 100°F	Hydraulic : Body - 1,100 p.s.i Seat - 750 p.s.i Air : Seat - 80 p.s.i
3) 30K - 40K 600 p.s.i at 850°F 1,480 p.s.i at -20°F to 100°F	Hydraulic : Body - 2,175 p.s.i Seat - 1,500 p.s.i Air : Seat - 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L
	13% Cr. S.S Full S.T.L
	304 S.S
	316 S.S
	Monel Metal
Type 304 S.S	304 S.S
Type 316 S.S	316 S.S

Valve Dimensions

mm

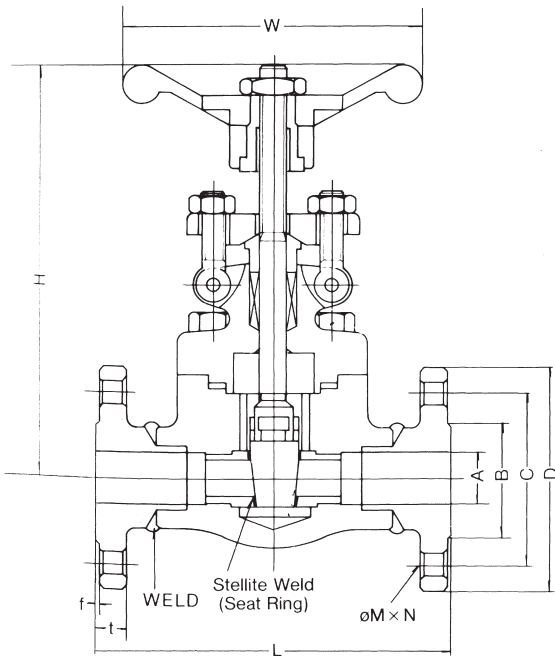
	Size	Center to Top(O pen) H	Face to Face L	Hand Wheel Dia. W	Flange							Approx. Weight (kg)
					D	C	B	f	t	A	øMxN	
10K	1/2	155	108	100	95	70	52	1	12	15	15x4	2.54
	3/4	155	118	100	100	75	58	1	14	20	15x4	3.04
	1	193	127	130	125	90	70	1	14	25	19x4	5.30
	1 1/4	248	140	170	135	100	80	2	16	32	19x4	8.99
	1 1/2	248	165	170	140	105	85	2	16	40	19x4	8.95
	2	286	178	170	155	120	100	2	16	50	19x4	13.28
20K	1/2	155	140	100	95	70	52	1	14	15	15x4	2.66
	3/4	155	152	100	100	75	58	1	16	20	15x4	3.18
	1	193	165	130	125	90	70	1	16	25	19x4	5.46
	1 1/4	248	178	170	135	100	80	2	18	32	19x4	9.16
	1 1/2	248	190	170	140	105	85	2	18	40	19x4	9.06
	2	286	216	170	155	120	100	2	18	50	19x8	13.30
30K	1/2	155	140	100	115	80	55	1	18	15	19x4	3.17
	3/4	155	152	100	120	85	60	1	18	20	19x4	3.60
	1	193	165	130	130	95	70	1	20	25	19x4	5.90
	1 1/4	248	178	170	140	105	80	2	22	32	19x4	9.59
	1 1/2	248	190	170	160	120	90	2	22	40	23x4	10.12
	2	286	216	170	165	130	105	2	22	50	19x8	13.87

GATE VALVE FLANGED

FORGED STEEL

BOLTED BONNET O.S & Y, BOLTED GLAND

**ANSI 150 lbs
300 lbs
600 lbs**



Ratings (ASTM A105):	Test Pressure:
1) 150 lbs 150 p.s.i at 550°F 285 p.s.i at -20°F to 100°F	Hydraulic : Body - 425 p.s.i Seat - 300 p.s.i Air : Seat - 80 p.s.i
2) 300 lbs 300 p.s.i at 850°F 740 p.s.i at -20°F to 100°F	Hydraulic : Body - 1,100 p.s.i Seat - 750 p.s.i Air : Seat - 80 p.s.i
3) 600 lbs 600 p.s.i at 850°F 1,480 p.s.i at -20°F to 100°F	Hydraulic : Body - 2,175 p.s.i Seat - 1,500 p.s.i Air : Seat - 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L
	13% Cr. S.S Full S.T.L
	304 S.S
	316 S.S
	Monel Metal
Type 304 S.S	304 S.S
Type 316 S.S	316 S.S

Valve Dimensions

() inch

	Size	Center to Top (Open) H	Face to Face L	Hand Wheel Dia W	Flange							Approx. Weight
					D	C	B	f	t	A	øMxN	
150LBS	1/2	155 (6.10)	108 (4.3)	100(3.94)	88.9(3.50)	60.5(2.38)	35.1(1.38)	1.6(0.06)	11.2(0.44)	15.8	5/8 x 4	2.41
	3/4	155 (6.10)	118. (4.6)	100(3.94)	98.6(3.88)	69.9(2.75)	43.0(1.69)	1.6(0.06)	12.7(0.50)	20.9	5/8 x 4	2.93
	1	193 (7.60)	127 (5.0)	130(5.12)	108.0(4.25)	79.3(3.12)	50.8(2.00)	1.6(0.06)	14.3(0.56)	26.7	5/8 x 4	5.06
	1 1/4	248 (9.76)	140 (5.5)	170(6.69)	117.4(4.62)	88.9(3.50)	63.5(2.50)	1.6(0.06)	15.8(0.62)	35.1	5/8 x 4	8.7
	1 1/2	248 (9.76)	165 (6.5)	170(6.69)	127.0(5.0)	98.6(3.88)	73.2(2.88)	1.6(0.06)	17.6(0.69)	40.9	5/8 x 4	8.86
	2	286(11.26)	178 (7.0)	170(6.69)	152.4(6.0)	120.7(4.75)	92.0(3.62)	1.6(0.06)	19.1(0.75)	52.6	3/4 x 4	13.32
300LBS	1/2	155 (6.10)	140 (5.5)	100(3.94)	95.3(3.75)	66.6(2.62)	35.1(1.38)	1.6(0.06)	14.3(0.56)	15.8	5/8 x 4	2.63
	3/4	155 (6.10)	152 (6.0)	100(3.94)	117.4(4.62)	82.6(3.25)	43.0(1.69)	1.6(0.06)	15.8(0.62)	20.9	3/4 x 4	3.34
	1	193 (7.60)	165 (6.5)	130(5.12)	124.0(4.88)	88.9(3.50)	50.8(2.00)	1.6(0.06)	17.6(0.69)	26.7	3/4 x 4	5.52
	1 1/4	248 (9.76)	178 (7.0)	170(6.69)	133.4(5.25)	98.6(3.88)	63.5(2.50)	1.6(0.06)	19.1(0.75)	35.1	3/4 x 4	9.23
	1 1/2	248 (9.76)	190 (7.5)	170(6.69)	155.5(6.12)	114.3(4.50)	73.2(2.88)	1.6(0.06)	20.6(0.81)	40.9	7/8 x 4	9.85
	2	286(11.76)	216 (8.5)	170(6.69)	165.1(6.50)	127.0(5.00)	92.0(3.62)	1.6(0.06)	22.4(0.88)	52.6	3/4 x 8	13.96
600LBS	1/2	155 (6.10)	165 (6.5)	100(3.94)	95.3(3.75)	66.6(2.62)	35.1(1.38)	6.4(0.25)	20.6(0.81)	15.8	5/8 x 4	2.74
	3/4	155 (6.10)	190 (7.5)	100(3.94)	117.4(4.62)	82.6(3.25)	43.0(1.69)	6.4(0.25)	22.2(0.87)	20.9	3/4 x 4	3.56
	1	193 (7.60)	216 (8.5)	130(5.12)	124.0(4.88)	88.9(3.50)	50.8(2.00)	6.4(0.25)	23.9(0.94)	26.7	3/4 x 4	5.84
	1 1/4	248 (9.76)	229 (9.0)	170(6.69)	133.4(5.25)	98.6(3.88)	63.5(2.50)	6.4(0.25)	27.0(1.06)	35.1	3/4 x 4	9.82
	1 1/2	248 (9.76)	241 (9.5)	170(6.69)	155.5(6.12)	114.3(4.50)	73.2(2.88)	6.4(0.25)	28.8(1.13)	40.9	7/8 x 4	10.48
	2	286(11.26)	292 (11.5)	170(6.69)	165.1(6.50)	127.0(5.00)	92.0(3.62)	6.4(0.25)	31.8(1.25)	52.6	3/4 x 8	15.13

GATE VALVE

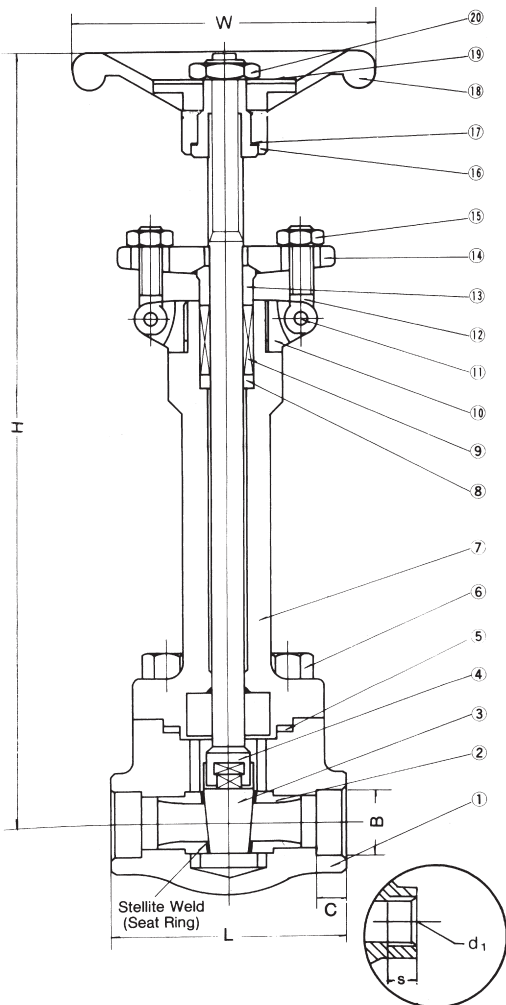
800-2500LBS

FORGED STEEL

EXTENDED BONNET TYPE B.B, O.S & Y, BOLTED GLAND

SOCKET WELD ENDS SCREWED ENDS

Type No: EAB08151



Ratings:	Test Pressure:
Carbon Steel – ASTM A105 800 p.s.i at 850°F 2,000 p.s.i at –20°F to 100°F	Hydraulic : Body – 3,000 p.s.i Seat – 2,200 p.s.i Air : Seat – 80 p.s.i

Valve Parts

No.	Part Name	Material
1	Body	ASTM A105
2	Seat Ring	AISI Type 410 S.T.L.
3	Disc	AISI Type 410 or 420
4	Stem	AISI Type 410
5	Gasket	Spiral Wounded Gasket
6	Bonnet Bolt	ASTM A193-Gr B7
7	Bonnet Extension	ASTM A105
8	Packing Ring	ASTM A276-304
9	Gland Packing	Graphited Asbestos + Monel Wire
10	Bonnet	ASTM A105
11	Eye Bolt Pin	ASTM A276-304
12	Eye Bolt	ASTM A193 Gr B8
13	Gland	ASTM A276-304
14	Gland Flange	ASTM A105
15	Eye Bolt Nut	ASTM A194-Gr 2H
16	Sleeve	AISI Type 410
17	Sleeve Washer	ASTM A276-430
18	Hand Wheel	ASTM A47
19	Name Plate	Aluminum
20	Lock Nut	ASTM A108-1025

This valve can be used in LIQUIFIED AIR, OXYGEN, NITROGEN and HEAT MEDIA TRANSFER PIPE line. Bonnet extension allows use on highly insulated lines; the expansion chamber assures heat less so that packing and other valve control components can operate at room temperature.

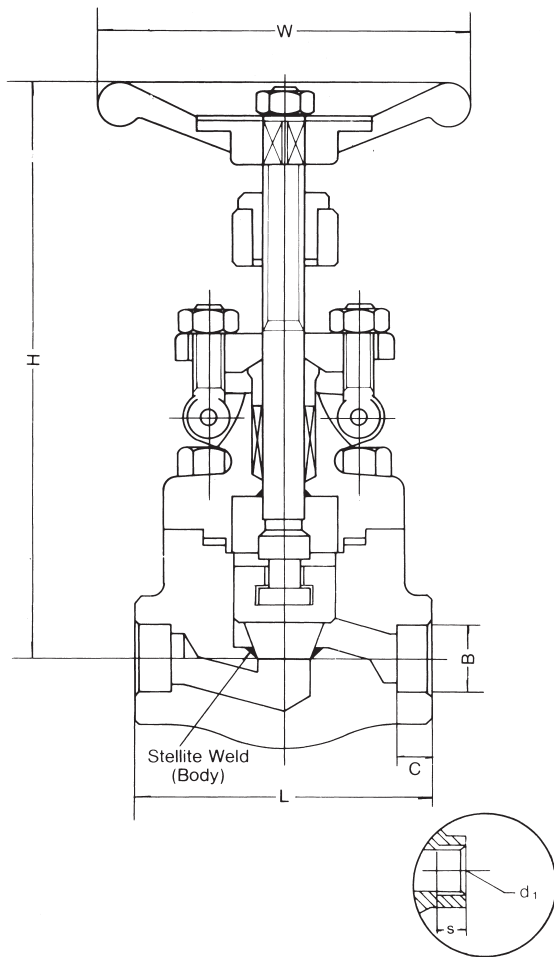
Valve Dimensions

() inch

Size	Center to Top(Open) H	End to End L	Hand Wheel Dia. W	Socket Weld		Threaded Depth S	Thread d ₁	Approx. Weight (kg)
				Bore B	Depth C			
1/2	277(10.90)	79(3.11)	100(3.94)	21.70-21.95(0.855-0.865)	10(0.38)	13.5(0.53)	1/2(N)PT	4.14
3/4	277(10.90)	92(3.62)	100(3.94)	27.05-27.30(1.065-1.075)	13(0.50)	14.0(0.55)	3/4(N)PT	5.32
1	331(13.03)	111(4.37)	130(5.12)	33.80-34.05(1.330-1.340)	13(0.50)	17.5(0.68)	1 (N)PT	8.31
1 1/4	385(15.16)	120(4.72)	170(6.69)	42.55-42.80(1.675-1.685)	13(0.50)	18.0(0.71)	1 1/4(N)PT	11.68
1 1/2	385(15.16)	120(4.72)	170(6.69)	48.65-48.90(1.915-1.925)	13(0.50)	18.5(0.72)	1 1/2(N)PT	11.46
2	431(16.97)	140(5.51)	170(6.69)	61.10-61.35(2.406-2.416)	16(0.62)	19.0(0.76)	2 (N)PT	18.9

BOLTED BONNET O.S & Y, BOLTED GLAND

SOCKET WELD ENDS SCREWED ENDS



Ratings:	Test Pressure:
Carbon Steel – ASTM A105 800 p.s.i at 850°F 2,000 p.s.i at –20°F to 100°F	Hydraulic : Body – 3,000 p.s.i Seat – 2,200 p.s.i Air : Seat – 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L
	13% Cr. S.S Full S.T.L
	304 S.S
	316 S.S
	Monel Metal
Type 304 Stainless Steel	304 S.S
Type 316 Stainless Steel	316 Cr. S.S
1 ¼ % Cr. ½ % Moly Steel	13% Cr. S.S
2 ¼ % Cr. 1% Moly Steel	13% Cr. S.S

Valve Dimensions

() Inch

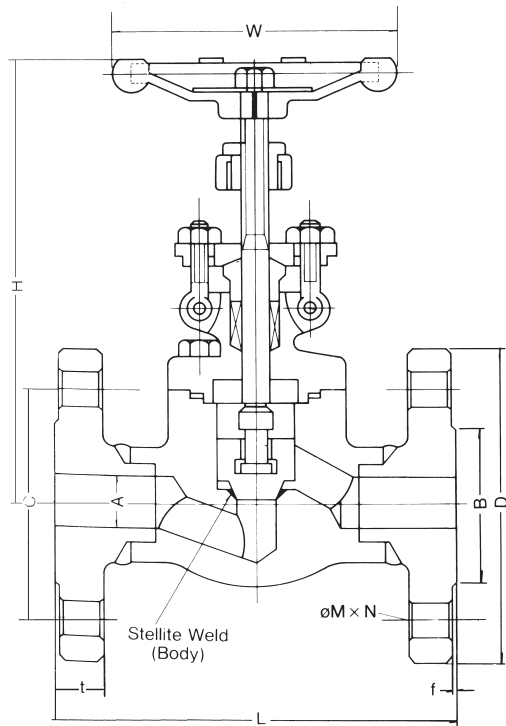
Size	Center to Top(Open) H	End to End L	Hand Wheel Dia. W	Socket Weld		Threaded Depth S	Threaded d ₁	Approx. Weight (kg)
				Bore B	Depth C			
¼	164 (6.46)	79(3.11)	100(3.94)	14.10-14.35(0.555-0.565)	10(0.38)	10.0(0.40)	¼(N)PT	2.2
⅜	164 (6.46)	79(3.11)	100(3.94)	17.55-17.80(0.690-0.700)	10(0.38)	10.5(0.41)	⅜(N)PT	2.1
½	164 (6.46)	79(3.11)	100(3.94)	21.70-21.95(0.855-0.865)	10(0.38)	13.5(0.53)	½(N)PT	2.0
¾	164 (6.46)	92(3.62)	100(3.94)	27.05-27.30(1.065-1.075)	13(0.50)	14.0(0.55)	¾(N)PT	2.3
1	201 (7.91)	111(4.37)	130(5.12)	33.80-34.05(1.330-1.340)	13(0.50)	17.5(0.68)	1 (N)PT	4.2
1¼	260(10.24)	152(5.98)	170(6.69)	42.55-42.80(1.675-1.685)	13(0.50)	18.0(0.71)	1¼(N)PT	8.5
1½	260(10.24)	152(5.98)	170(6.69)	48.65-48.90(1.915-1.925)	13(0.50)	18.5(0.72)	1½(N)PT	8.2
2	289(11.38)	172(6.77)	170(6.69)	61.10-61.35(2.406-2.416)	16(0.62)	19.0(0.76)	2 (N)PT	12.3

GLOBE VALVE FLANGED TYPE

FORGED STEEL

BOLTED BONNET O.S & Y, BOLTED GLAND

**KS (JIS) 10K
20K
30K**



Ratings (ASTM A105):	Test Pressure:
1) 10K 150 p.s.i at 550°F 285 p.s.i at -20°F to 100°F	Hydraulic : Body – 425 p.s.i Seat – 300 p.s.i Air : Seat – 80 p.s.i
2) 20K 300 p.s.i at 850°F 740 p.s.i at -20°F to 100°F	Hydraulic : Body – 1,100 p.s.i Seat – 750 p.s.i Air : Seat – 80 p.s.i
3) 30K – 40K 600 p.s.i at 850°F 1,480 p.s.i at -20°F to 100°F	Hydraulic : Body – 2,175 p.s.i Seat – 1,500 p.s.i Air : Seat – 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L
	13% Cr. S.S Full S.T.L.
	304 S.S
	316 S.S
	Monel Metal
Type 304 S.S	304 S.S
Type 316 S.S	316 S.S

Valve Dimensions

() inch

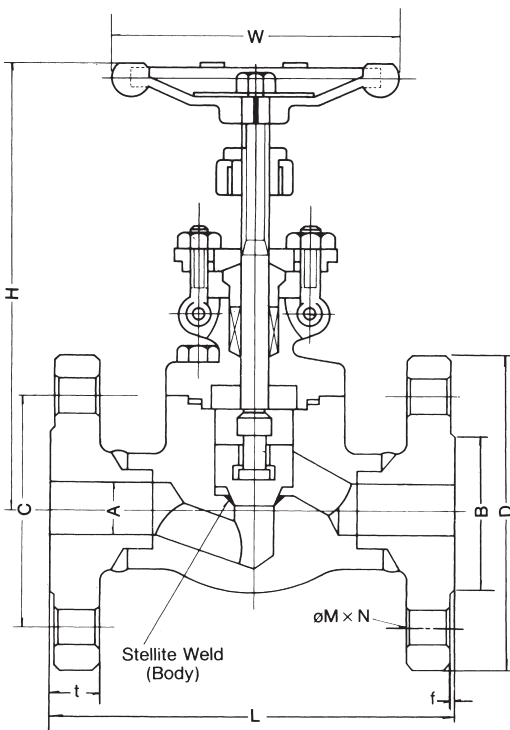
Rating	Size	Center to Top(Open) H	Face to Face L	Hand Wheel Dia. W	Flange							Approx Weight
					D	C	B	f	t	A	øM x N	
10K	1/2	164	108	100	95	70	52	1	12	15	15x4	2.7
	3/4	164	118	100	100	75	58	1	14	20	15x4	3.33
	1	201	127	130	125	90	70	1	14	25	19x4	5.63
	1 1/4	260	140	170	135	100	80	2	16	32	19x4	10.19
	1 1/2	260	165	170	140	105	85	2	16	40	19x4	10.08
20K	2	289	203	170	155	120	100	2	16	50	19x4	14.81
	1/2	164	152	100	95	70	52	1	14	15	15x4	2.8
	3/4	164	178	100	100	75	58	1	16	20	15x4	3.35
	1	201	203	130	125	90	70	1	16	25	19x4	5.75
	1 1/4	260	216	170	135	100	80	2	18	32	19x4	10.37
	1 1/2	260	229	170	140	105	85	2	18	40	19x4	10.24
30K	2	289	267	170	155	120	100	2	18	50	19x8	14.92
	1/2	164	152	100	115	80	55	1	18	15	19x4	3.3
	3/4	164	178	100	120	85	60	1	18	20	19x4	3.8
	1	201	203	130	130	95	70	1	20	25	19x4	6.19
	1 1/4	260	216	170	140	105	80	2	22	32	19x4	10.85
	1 1/2	260	229	170	160	120	90	2	22	40	23x4	11.2
2	289	267	170	165	130	105	2	22	50	19x8	15.52	

GLOBE VALVE FLANGED TYPE

FORGED STEEL

BOLTED BONNET O.S & Y, BOLTED GLAND

**ANSI 150 lbs
300 lbs
600 lbs**



Ratings (ASTM A105):	Test Pressure:
1) 150 lbs 150 p.s.i at 550°F 285 p.s.i at -20°F to 100°F	Hydraulic : Body - 425 p.s.i Seat - 300 p.s.i Air : Seat - 80 p.s.i
2) 300 lbs 300 p.s.i at 850°F 740 p.s.i at -20°F to 100°F	Hydraulic : Body - 1,100 p.s.i Seat - 750 p.s.i Air : Seat - 80 p.s.i
3) 600 lbs 600 p.s.i at 850°F 1,480 p.s.i at -20°F to 100°F	Hydraulic : Body - 2,175 p.s.i Seat - 1,500 p.s.i Air : Seat - 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L.
	13% Cr. S.S Full S.T.L.
	304 S.S
	316 S.S
Type 304 S.S	304 S.S
Type 316 S.S	316 S.S

Valve Dimensions

() Inch

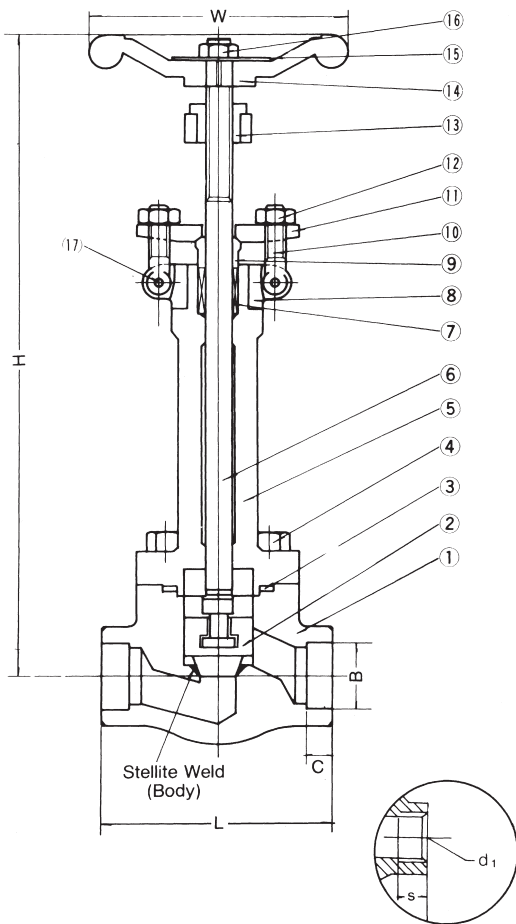
Rating	Size	Center to Top(Open) H	Face to Face L	Hand Wheel Dia. W	Flange							Approx. Weight
					D	C	B	f	t	A	φM x N	
150LBS	1/2	164 (6.46)	108(4.25)	100(3.94)	88.9(3.50)	60.5(2.38)	35.1(1.38)	1.6(0.06)	11.2(0.44)	15.8	5/8 x 4	2.54
	3/4	164 (6.46)	118(4.65)	100(3.94)	98.6(3.88)	69.9(2.75)	43.0(1.69)	1.6(0.06)	12.7(0.50)	20.9	5/8 x 4	3.14
	1	201 (7.91)	127(5.0)	130(5.12)	108.0(4.25)	79.3(3.12)	50.8(2.00)	1.6(0.06)	14.3(0.56)	26.7	5/8 x 4	5.37
	1 1/4	260(10.24)	140(5.5)	170(6.69)	117.4(4.62)	88.9(3.50)	63.5(2.50)	1.6(0.06)	15.8(0.62)	35.1	5/8 x 4	9.96
	1 1/2	260(10.24)	165(6.5)	170(6.69)	127.0(5.00)	98.6(3.88)	73.2(2.88)	1.6(0.06)	17.6(0.69)	40.9	5/8 x 4	9.91
300LBS	2	289(11.38)	203(8.0)	170(6.69)	152.4(6.00)	120.7(4.75)	92.0(3.62)	1.6(0.06)	19.1(0.75)	52.6	3/4 x 4	15.03
	1/2	164 (6.46)	152(6.0)	100(3.94)	95.3(3.75)	66.6(2.62)	35.1(1.38)	1.6(0.06)	14.3(0.56)	15.8	5/8 x 4	2.76
	3/4	164 (6.46)	178(7.0)	100(3.94)	117.4(4.62)	82.6(3.25)	43.0(1.69)	1.6(0.06)	15.8(0.62)	20.9	3/4 x 4	3.55
	1	201 (7.91)	203(8.0)	130(5.12)	124.0(4.88)	88.9(3.50)	50.8(2.00)	1.6(0.06)	17.6(0.69)	26.7	3/4 x 4	5.82
	1 1/4	260(10.24)	216(8.5)	170(6.69)	133.4(5.25)	98.6(3.88)	63.5(2.50)	1.6(0.06)	19.1(0.75)	35.1	3/4 x 4	10.49
600LBS	1 1/2	260(10.24)	229(9.0)	170(6.69)	155.5(6.12)	114.3(4.50)	73.2(2.88)	1.6(0.06)	20.6(0.81)	40.9	7/8 x 4	10.9
	2	289(11.38)	267(10.5)	170(6.69)	165.1(6.50)	127.0(5.00)	92.0(3.62)	1.6(0.06)	22.4(0.88)	52.6	3/4 x 8	15.68
	1/2	164 (6.46)	165(6.5)	100(3.94)	95.3(3.75)	66.6(2.62)	35.1(1.38)	6.4(0.25)	20.6(0.81)	15.8	5/8 x 4	2.84
	3/4	164 (6.46)	191(7.5)	100(3.94)	117.4(4.62)	82.6(3.75)	43.0(1.69)	6.4(0.25)	22.2(0.87)	20.9	3/4 x 4	3.66
	1	201 (7.91)	216(8.5)	130(5.12)	124.0(4.88)	88.9(3.50)	50.8(2.00)	6.4(0.25)	23.9(0.94)	26.7	3/4 x 4	5.94
600LBS	1 1/4	260(10.24)	229(9.0)	170(6.69)	133.4(5.25)	98.6(3.88)	63.5(2.50)	6.4(0.25)	27.0(1.06)	35.1	3/4 x 4	10.74
	1 1/2	260(10.24)	241(9.5)	170(6.69)	155.5(6.12)	114.3(4.50)	73.2(2.88)	6.4(0.25)	28.8(1.13)	40.9	7/8 x 4	11.25
600LBS	2	289(11.38)	292(11.5)	170(6.69)	165.1(6.50)	127.0(5.00)	92.0(3.62)	6.4(0.25)	31.8(1.25)	52.6	3/4 x 8	16.28

EXTENDED BONNET TYPE O.S & Y, BOLTED GLAND

SOCKET WELD ENDS SCREWED ENDS

Type No: EAB08151

Ratings:	Test Pressure:
Carbon Steel – ASTM A105 800 p.s.i at 850°F 2,000 p.s.i at –20°F to 100°F	Hydraulic : Body – 3,000 p.s.i Seat – 2,200 p.s.i Air : Seat – 80 p.s.i



Valve Parts

No.	Part Name	Materials
1	Body	ASTM A105
2	Disc	AISI Type 410 or 420
3	Gasket	Spiral Wounded Gasket
4	Bonnet Bolt	ASTM 193 Gr B7
5	Bonnet Extension	ASTM A105
6	Stem	AISI Type 410
7	Gland Packing	Graphited Asbestos + Monel Wire
8	Bonnet	ASTM A105
9	Gland	ASTM A276-304
10	Eye Bolt	ASTM A193 Gr B8
11	Gland Flange	ASTM A105
12	Eye Bolt Nut	ASTM A194 Gr 2H
13	Sleeve	ASTM A276-410
14	Hand Wheel	ASTM A47
15	Name Plate	Aluminum
16	Lock Nut	ASTM A 194 Gr 2H
17	Eye Bolt Pin	ASTM A276-304

This valve can be used in LIQUIFIED AIR, OXYGEN, NITROGEN and HEAT MEDIA TRANSFER PIPE line.

Bonnet extension allows use on highly insulated lines; the expansion chamber assures heat less so that packing and other valve control components can operate at room temperature.

Valve Dimensions

() inch

Size	Center to Top(Open) H	End to End L	Hand Wheel Dia. W	Socket Weld		Threaded Depth S	Threaded d ₁	Approx. Weight, (kg)
				Bore B	Depth C			
1/2	282	79(3.11)	100(3.94)	21.70-21.95(0.855-0.865)	10(0.38)	13.5(0.53)	1/2(N)PT	4.28
3/4	282	92(3.62)	100(3.94)	27.05-27.30(1.065-1.075)	13(0.50)	14.0(0.55)	3/4(N)PT	5.66
1	335	111(4.37)	130(5.12)	33.80-34.05(1.330-1.340)	13(0.50)	17.5(0.68)	1 (N)PT	8.64
1 1/4	395	152(5.98)	170(6.69)	42.55-42.80(1.675-1.685)	13(0.50)	18.0(0.71)	1 1/4(N)PT	12.91
1 1/2	395	152(5.98)	170(6.69)	48.65-48.90(1.915-1.925)	13(0.50)	18.5(0.72)	1 1/2(N)PT	12.56
2	435	172(6.77)	170(6.69)	61.10-61.35(2.406-2.416)	16(0.62)	19.0(0.76)	2 (N)PT	21.3

CHECK VALVE

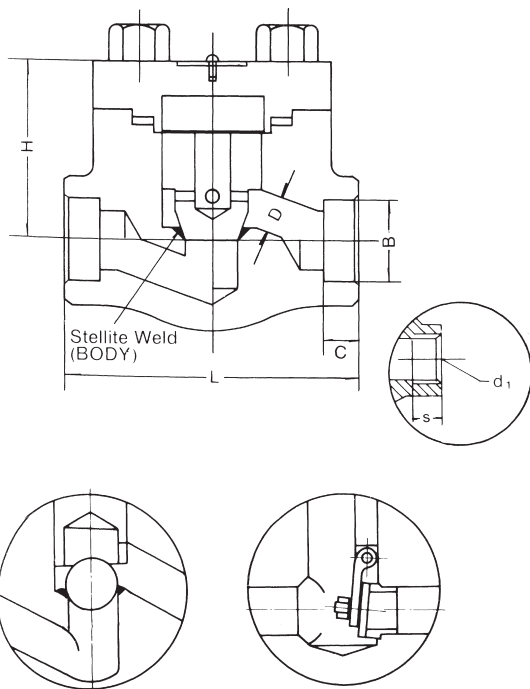
800-2500LBS

FORGED STEEL

BOLTED CAP

**LIFT TYPE
BALL TYPE
SWING TYPE**

**SOCKET WELD ENDS
SCREWED ENDS**



Ratings:	Test Pressure:
Carbon Steel – ASTM A105 800 p.s.i at 850°F 2,000 p.s.i at – 20°F to 100°F	Hydraulic : Body – 3,000 p.s.i Seat – 2,200 p.s.i Air : Seat – 80 p.s.i

Materials	
Forging Material Body & Bonnet	Trim Material
Carbon Steel ASTM A105	13% Cr. S.S Half S.T.L
	13% Cr. S.S Full S.T.L
	304 S.S
	316 S.S
	Monel Metal
Type 304 S.S	304 S.S
Type 316 S.S	316 S.S
1 ¼ % Cr. ½ % Moly Steel	13% Cr. S.S
2 ¼ % Cr. 1 % Moly Steel	13% Cr. S.S

Valve Dimensions

() inch

Size	Center to Top H	End to End L	Seat Port Dia. D	Socket Weld		Threaded Depth S	Thread d ₁	Approx. Weight (kg)
				Bore B	Depth C			
¼	48	79(3.11)	14	14.10-14.35(0.555-0.565)	10(0.38)	10.0(0.40)	¼(N)PT	1.5
⅜	48	79(3.11)	14	17.55-17.80(0.690-0.700)	10(0.38)	10.5(0.41)	⅜(N)PT	1.4
½	48	79(3.11)	14	21.70-21.95(0.855-0.865)	10(0.38)	13.5(0.53)	½(N)PT	1.3
¾	48	92(3.62)	14	27.05-27.30(1.065-1.075)	13(0.50)	14.0(0.55)	¾(N)PT	1.6
1	63	111(4.37)	18	33.80-34.05(1.330-1.340)	13(0.50)	17.5(0.68)	1 (N)PT	2.9
1¼	85	152(5.98)	30	42.55-42.80(1.675-1.685)	13(0.50)	18.0(0.71)	1¼(N)PT	6.2
1½	85	152(5.98)	30	48.65-48.90(1.915-1.925)	13(0.50)	18.5(0.72)	1½(N)PT	6.0
2	104	172(6.77)	37	61.10-61.35(2.406-2.416)	16(0.62)	19.0(0.76)	2 (N)PT	9.7

COMPARISON LIST FOR CASTING & FORGING

ANSI B16.34

Group Materials	Material Group No.	Nominal Designation steel	Forgings			Castings		
			ASTM (Spec-Grade)	JIS Equiv	Notes	ASTM (Spec-Grade)	JIS Equiv	Notes
1	1.1	Carbon	A105 A350-LF2	G3202-SFVC 2A G3205-SFL2	(1)(3)(5)(10)	A216-WCB	G5151-SCPH2	(1)
	1.2	Carbon				A216-WCC	G5102-SCW49	(1)
		2 1/2Ni				A352-LC2	G5152-SCPL21	(10)
		3 1/2Ni	A350-LF3	G3205-SFL3	(10)	A352-LC3	G5152-SCPL31	(10)
	1.3	Carbon				A352-LCB	G5152-SCPL1	(10)
	1.4	Carbon	A350-LF1	G3205-SFL1	(10)			
	1.5	C- 1/2 Mo	A182-F1	G3203-SFVA F1	(2)(11)	A217-2WC1 A352-LCI	G5151-SCPH11 G5152-SCPL11	(2)(11)(10)
	1.7	1/2 Cr-1/2Mo	A182-F2	G3203-SFVA F2	(12)			
		Ni-Cr-1/2Mo				A217-WC4		(4)(12)
		Ni-Cr-1Mo				A217-WC5		(4)(13)
	1.9	1 Cr-1/2Mo	A182-F12	G3203-SFVA12	(4)(14)			
		1 1/4 Cr-1/2Mo	A182-F11	G3203-SFVA11A	(4)(14)	A217-WC6	G5151-SCPH21	(4)(15)
	1.10	2 1/4 Cr-1/2Mo	A182-F22	GS203-SFVA22B	(14)	A217-WC9	G5151-SCPH32	(4)(15)
	1.11	3Cr-1Mo	A182-F21	G3203-SFVA21B	(14)			
1.13	5Cr-1/2Mo	A182-F5a A182-F5	G3203-SFVA F5D G3203-SFVA F5B		A217-C5	G5151-SCPH61	(4)	
1.14	9Cr-1Mo	A182-F9	G3203-SFVA F9		A217-C12		(4)	
2	2.1	18Cr-8Ni	A182-F304 A182-F304H	G3214-SUS F304 G3214-SUS F304H	(6)			
		18Cr-8Ni				A351-CF3 A351-CF8	G5121-SCS19A G5121-SCS13A	(16)(6)
	2.2	16Cr-2Ni-2Mo	A182-F316 A182-F316H	G3214-SUS F316 G3214-SUS F316H	(6)			
		18Cr-8Ni				A351-CF3A A351-CF8A		(10)(10)
		18Cr-9Ni-sMo				A351-CF3M A351-CF8M	G5121-SCS16A G5121-SCS14A	(17)(6)
	2.3	18Cr-8Ni	A182-F304L	G3214-SUS F304L	(16)			
		16Cr-2Ni-2Mo	A182-F316L	G3214-SUS F316L				
	2.4	18Cr-10Ni-Ti	A182-F321 A182-F321H	G3214-SUS F321 G3214-SUS F321H	(6)(12)			
	2.5	18Cr-10Ni-Cb	A182-F347	G3214-SUS F347				
			A182-F347H	G3214-SUS F347H	(6)(12)	A351-CF8C	G5121-SCS21	(6)
			A182-F348 A182-F348H		(6)(12)			
	2.6	25Cr-12Ni				A351-CH8 A351-CH20	G5121-SCS17	(6)(6)
	2.7	25Cr-20Ni	A182-F310	G3214-SUS F310	(6)(7)	A351-CK20	G5121-SCS18	(6)

Note

- (1) Upon prolonged exposure to temperatures above about 800°F(425°C). The carbide phase of carbon steel may be converted to graphite.
- (2) Upon prolonged exposure to temperatures above about 875°F(470°C). The carbide phase of carbon molybdenum steel may be converted to graphite.
- (3) Only killed steel shall be used above 850°F(455°C).
- (4) Use normalized and tempered material only.
- (5) Permissible, but not recommended for prolonged usage above about 800°F(425°C).
- (6) At temperatures over 1000°F(540°C) use only when the carbon is 0.04% or higher.
- (7) For service temperatures of 1050°F(565°C) and above, assurance must be provided that grain size is not finer than ASTM No. 6.
- (8) Use annealed material only.
- (9) Use solution annealed material only.
- (10) Not to be used over 650°F(345°C).
- (11) Permissible, but not recommended for prolonged upon above about 850°F(455°C).
- (12) Not to be used over 1000°F(540°C).
- (13) Not to be used over 1050°F(565°C).
- (14) Permissible, but not recommended for prolonged upon above about 1100°F(595°C).
- (15) Not to be used over 1100°F(595°C).
- (16) Not to be used over 800°F(425°C).
- (17) Not to be used over 850°F(455°C).

MATERIAL SPECIFICATIONS

Body Materials

Specification	Carbon Steel ASTM A105	Alloy Steel per ASTM A182			Austenitic Stainless Steel per ASTM A182				Low Temp. Steel per ASTM A350 LF2(1)	
		F5	F11	F22	F304	F304L	F316	F316L		
Chem. Composition (°)	Carbon %	0.35max.	0.15max.	0.10 ÷ 0.20	0.15max.	0.08max.	0.035max.	0.08max.	0.035max.	0.30max.
	Manganese %	0.60 ÷ 1.05	0.30 ÷ 0.60	0.30 ÷ 0.80	0.30 ÷ 0.60	2.0max.	2.0max.	2.0max.	2.0max.	1.35max.
	Phosphor max. %	0.040	0.030	0.040	0.040	0.040	0.040	0.040	0.040	0.035
	Sulphur max. %	0.050	0.030	0.040	0.040	0.030	0.030	0.030	0.030	0.040
	Silicon %	0.35max.	0.50max.	0.50 ÷ 1.0	0.50max.	1.0max.	1.0max.	1.0max.	1.0max.	0.15 ÷ 0.30
	Nickel %	—	0.50max.	—	—	8.00 ÷ 11.00	8.00 ÷ 13.00	10.00 ÷ 14.00	10.00 ÷ 15.00	—
	Chromium %	—	4.0 ÷ 6.0	1.00 ÷ 1.50	2.00 ÷ 2.50	18.00 ÷ 20.0	18.00 ÷ 20.00	16.00 ÷ 18.00	16.00 ÷ 18.00	—
	Molybdenum %	—	0.44 ÷ 0.65	0.44 ÷ 0.65	0.87 ÷ 1.13	—	—	2.0 ÷ 3.0	2.0 ÷ 3.0	—
Mechanical Properties (°)	Tensile Strength min. k.s.i. / kg/mm ²	70 / 49.2	70 / 49.2	70 / 49.2	75 / 52.7	75 / 52.7	70 / 49.2	75 / 52.7	70 / 49.2	70 / 49.2
	Yield Strength min. k.s.i. / kg/mm ²	36 / 25.3	40 / 28.1	40 / 28.1	45 / 31.6	30 / 21.1	25 / 17.6	30 / 21.1	25 / 17.6	36 / 25.3
	Elongation in 2" min. %	22	20	20	20	30	30	30	30	22
	Reduction of area min. %	30	35	30	30	50	50	50	50	30
	Brinell Hardness	137 ÷ 187(2)	143 ÷ 217	143 ÷ 207	156 ÷ 207	—	—	—	—	—

(°) Values shown are referred to ASTM specs. 1980 edition.

Tensile properties shown, apply to room temperature tests. Low temperature steel impact tested according to ASTM A370; 10 × 10 "V" notch specimen, obtained from representative test bar. At minus 50°F average value of three specimen set is 15 ft. Lb. with a minimum of 12 ft. Lb. for one specimen only.

(2) Applicable on small forgings where no test specimen or representative test bar are available or when forgings have been liquid quenched and tempered.

Trim Materials and Bolting Materials

Specification	Trim Materials					Bolting Materials					
	AISI 410	AISI 416	AISI 420	Monel ASTM B164	Stellite Gr. 6	ASTM A193		AISI 430	ASTM A194		
	B7	B8	—	—	—	—	—	2H	G8		
Chemical Composition (°)	Carbon %	0.15max.	0.15max.	0.15min.	0.3max.	1.00	0.37 ÷ 0.49	0.08max.	0.12max.	0.40min.	0.08max.
	Manganese %	1.00max.	1.25max.	1.00max.	2.0max.	1.00max.	0.65 ÷ 1.10	2.0max.	1.00max.	—	2.00max.
	Phosphor. max. %	0.040	0.060max.	0.040	—	—	0.04	0.045	0.040	0.040max.	0.045
	Sulphur max. %	0.030	0.15min.	0.030	0.024	—	0.04	0.030	0.030	0.050max.	0.030
	Silicon %	1.00max.	1.00max.	1.00max.	0.5max.	1.00	0.15 ÷ 0.35	1.00max.	1.00max.	—	1.00max.
	Chromium %	11.50 ÷ 13.50	12.00 ÷ 14.00	12.00 ÷ 14.00	—	28.00	0.75 ÷ 1.20	18.00 ÷ 20.00	14.00 ÷ 18.00	—	18.00 ÷ 20.00
	Nickel %	—	—	—	63.0min.	3.0max.	—	8.00 ÷ 10.50	—	—	8.00 ÷ 10.5
	Molybdenum %	—	0.60max.	—	—	—	0.15 ÷ 0.25	—	—	—	—
	Copper %	—	—	—	28.0 ÷ 34.0	—	—	—	—	—	—
	Other elem. %	—	—	—	Fe: 2.5max.	Fe: 3.0max. W: 4.0 Co: balance	—	—	—	—	—
Mechanical Properties (°)	Tensile Strength min. k.s.i. / kg/mm ²	99/185 / 70/130	85/170 / 60/120	149/298 / 105/210	70(2) / 49.2	—	125 / 87.8	75 / 52.7	75.4 / 53	—	—
	Yield Strength min. k.s.i. / kg/mm ²	59/170 / 42/120	59/128 / 42/90	119/199 / 84/140	25(2) / 17.6	—	105 / 73.8	30 / 21	40 / 28	—	—
	Elongation in 2" min. %	(15)(1)	(10)(1)	(8)(1)	(35)(2)	—	16	30	28	—	—
	Reduction of area min. %	50/75	8/60	5/40	—	—	50	50	65	—	—
	Brinell Hardness	180 ÷ 375	180 ÷ 375	300 ÷ 600	—	HRC min.37	—	—	160	248 ÷ 352	126 ÷ 300

(°) Values shown are referred to ASTM, AISI and AMS specs.

(°) These values refer to material in the heat treated condition (quenched and tempered or solution annealed) as suggested by manufact, practice or required by related specifications.

(1) Indicative only.

(2) Age-hardened material available with higher tensile values.

PRESSURE-TEMPERATURE RATINGS

Threaded & S.W. Valves

Temp. °F	Carbon Steel(A105)			F 5			F 11			F 22		
	800LB	1500LB	2500LB	800LB	1500LB	2500LB	800LB	1500LB	2500LB	800LB	1500LB	2500LB
-20 +100	2000	3705	6170	2000	3085	5145	2000	3750	6250	2000	3750	6250
200	1940	3375	5625	1940	2880	4800	1940	3560	5390	1940	3580	5965
300	1895	3280	5470	1895	2765	4610	1895	3365	5605	1895	3385	5640
400	1850	3170	5280	1850	2695	4490	1850	3290	5485	1850	3240	5400
500	1735	2995	4990	1735	2645	4405	1735	3210	5350	1735	3200	5330
600	1540	2735	4560	1540	2570	4285	1540	3025	5040	1540	3200	5330
650	1430	2685	4475	1430	2490	4150	1430	2940	4905	1430	3180	5295
700	1305	2665	4440	1340	2405	4010	1340	2840	4730	1340	3170	5228
750	1180	2520	4200	1245	2245	3745	1245	2655	4430	1245	3000	5000
800	1015	2055	3430	1155	2195	3655	1155	2535	4230	1155	2915	4855
850	800	1500	2500	1060	2055	3430	1060	2435	4060	1060	2710	4515
900	600	855	1430	970	1765	2945	970	2245	3745	970	2400	4000
950	425	515	855	880	1305	2170	880	1885	3145	880	1885	3145
975	330	370	600	800	1150	1850	800	1500	2500	800	1500	2500
1000	—	255	430	695	960	1600	740	1115	1855	740	1335	2230
1050	—	—	—	495	705	1170	520	685	1145	535	995	1655
1100	—	—	—	325	515	855	380	440	800	300	565	945
1125	—	—	—	260	425	700	310	335	560	285	550	915
1150	—	—	—	210	345	570	235	255	430	275	515	855
1200	—	—	—	140	225	370	115	170	285	145	345	570

Threaded & S.W. Valves

Temp. °F	F 304			F 316			F 304L / F 316L		
	800LB	1500LB	2500LB	800LB	1500LB	2500LB	800LB	1500LB	2500LB
-20 +100	1715	3085	5145	2000	3085	5145	1480	2570	4285
200	1520	2570	4285	1940	2655	4425	1310	2190	3650
330	1370	2315	3855	1895	2395	3995	1180	1965	3275
400	1245	2130	3550	1850	2200	3670	1080	1800	3000
500	1140	1995	3325	1735	2045	3410	980	1675	2795
600	1060	1870	3120	1540	1935	3225	915	1595	2655
650	1020	1840	3070	1430	1905	3170	880	1565	2605
700	985	1820	3035	1370	1860	3105	860	1535	2540
750	950	1780	2965	1305	1830	3050	800	1500	2500
800	915	1730	2880	1240	1810	3015	790	1480	2410
850	885	1695	2830	1180	1790	2985	760	1460	2370
900	860	1665	2775	1115	1780	2965	—	—	—
950	845	1635	2725	1055	1760	2930	—	—	—
975	840	1630	2700	1020	1755	2920	—	—	—
1000	800	1625	2675	990	1750	2915	—	—	—
1050	790	1595	2620	925	1750	2915	—	—	—
1100	715	1500	2500	865	1750	2915	—	—	—
1125	630	1420	2360	800	1680	2780	—	—	—
1150	545	1320	2200	780	1595	2655	—	—	—
1200	425	1030	1715	645	1270	2115	—	—	—

Note

- 1) Following grades permissible but no recommended for prolonged use:
 - 1.1 Carbon steel A105, over 850°F (do not use A181 for any class listed)
 - 1.2 F11 & F22 over 1100°F
 - 1.3 F304L over 800°F
 - 1.4 F316L over 850°
- 2) Temperature limitation for material grades not listed, see B16.34 and API602.
- 3) Types and grades of material used for bolting and grades, also influence temperature limitation.

PRESSURE-TEMPERATURE RATINGS

For Flanged Valves

Temp. °F	Carbon Steel(A105)				F5				F11				F22			
	150LB	300LB	600LB	1500LB	150LB	300LB	600LB	1500LB	150LB	300LB	600LB	1500LB	150LB	300LB	600LB	1500LB
-20+100	285	740	1480	3705	290	750	1500	3750	290	750	1500	3750	290	750	1500	3750
200	260	675	1350	3375	260	750	1500	3750	260	710	1425	3560	260	715	1430	3580
300	230	655	1315	3280	230	730	1455	3640	230	675	1345	3365	230	675	1355	3385
400	200	635	1270	3170	200	705	1410	3530	200	660	1315	3290	200	650	1295	3240
500	170	600	1200	2995	170	665	1330	3325	170	640	1285	3210	170	640	1280	3200
600	140	550	1095	2735	140	605	1210	3025	140	605	1210	3025	140	605	1210	3025
650	125	535	1075	2685	125	590	1175	2940	125	590	1175	2940	125	590	1175	2940
700	110	535	1065	2665	110	570	1135	2840	110	570	1135	2840	110	570	1135	2840
750	95	505	1010	2520	95	530	1065	2660	95	530	1065	2660	95	530	1065	2660
800	80	410	825	2060	80	500	995	2485	80	510	1015	2540	80	510	1015	2540
850	65	270	535	1340	65	440	880	2195	65	485	975	2435	65	485	975	2435
900	50	170	345	860	50	355	705	1765	50	450	900	2245	50	450	900	2245
950	35	105	205	515	35	260	520	1305	35	380	755	1885	35	380	755	1885
1000	20	50	105	260	20	190	385	960	20	225	445	1115	20	270	535	1340
1050	—	—	—	—	—	140	280	705	—	140	275	685	—	200	400	995
1100	—	—	—	—	—	105	205	515	—	95	190	480	—	115	225	565
1150	—	—	—	—	—	70	140	345	—	50	105	260	—	105	205	515
1200	—	—	—	—	—	45	90	225	—	35	70	170	—	55	110	275
1250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1300	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

For Flanged Valves

Temp. °F	F304				F316				F304L/316L			
	150LB	300LB	600LB	1500LB	150LB	300LB	600LB	1500LB	150LB	300LB	600LB	1500LB
-20+100	275	720	1440	3600	275	720	1440	3600	230	600	1200	3000
200	235	600	1200	3000	240	620	1240	3095	195	505	1015	2530
300	205	530	1055	2640	216	560	1120	2795	175	455	910	2270
400	180	470	940	2350	195	515	1030	2570	160	415	825	2065
500	170	435	875	2185	170	480	955	2390	145	380	765	1910
600	140	415	830	2075	140	450	905	2255	140	360	720	1800
650	125	410	815	2040	125	445	890	2220	125	350	700	1750
700	110	405	805	2015	110	430	865	2160	110	345	685	1715
750	95	400	795	1990	95	425	845	2110	95	335	670	1680
800	80	395	790	1970	80	415	830	2075	80	330	660	1645
850	65	390	780	1945	65	405	810	2030	65	320	645	1610
900	50	385	770	1920	50	395	790	1970	—	—	—	—
950	35	375	750	1870	35	385	775	1930	—	—	—	—
1000	20	325	645	1610	20	365	725	1820	—	—	—	—
1050	—	310	620	1545	—	360	720	1800	—	—	—	—
1100	—	260	515	1285	—	325	645	1610	—	—	—	—
1150	—	195	390	980	—	275	550	1370	—	—	—	—
1200	—	155	310	770	—	205	410	1030	—	—	—	—
1250	—	110	220	550	—	180	365	910	—	—	—	—
1300	—	85	165	410	—	140	275	685	—	—	—	—

Note

- Following grades permissible but not recommended for prolonged use:
 - 1.1 Carbon steel A105 over 850°F
 - 1.2 F11 & F22 over 1100°F
 - 1.3 F304L over 800°F
 - 1.4 F316L over 850°F
- Temperature limitation for material grades not listed see ANSI B16.5
- Types and grades of material used for bolting and grades, also influence temperature limitation.

STANDARDS IN THE VALVE & FITTINGS INDUSTRY

American Petroleum Institute Division of Refining 2101 L. Street, N.W. Washington, D.C. 20037

- API Std. 598 – Valve Inspection and Test.
- API Std. 600 – Flanged & Butt Welded End Steel Gate & Plug Valves for Refinery Use.
- API Std. 602 – Compact Design Carbon Steel Gate Valves for Refinery Use.
- API Std. 606 – Compact Carbon Steel Gate Valves Extended Body.

American Petroleum Institute Division of Production 300 Corrigan Tower Bldg., Dallas, Texas 75201

- API Std. 6D – Steel Gate, Plug & Check Valves for Pipe Line Service.

Manufacturers Standardization Society of the Valve & Fittings Industry 5203 Leesburg Pike, Suite 502 Arlington, Virginia 22209

- MSS SP-6 – Standard Finishes for Contact Faces of Pipe Flanges & Connecting End Flanges of Valves & Fittings.
- MSS SP-25 – Standard Marking System for Valves, Fittings, Flanges, & Unions.
- MSS SP-45 – Bypass & Drain Connection Standard.
- MSS SP-61 – Hydrostatic Testing of Steel Valves.
- MSS SP-65 – High Pressure Chemical Industry Flanges and Threaded Stubs for use with Lens Gaskets.
- MSS SP-79 – Socket Welding Reducer Inserts.
- MSS SP-83 – Carbon Steel Pipe Unions—Socket Welding & Threaded.
- MSS SP-84 – Steel Valves—Socket Welding & Threaded Ends.
- MSS SP-86 – MSS Guidelines for Metric Data in Standards for Valves, Flanges, & Fittings.

American Society for Testing Materials 1916 Race Street, Philadelphia, Pa. 19103

- ASTM A105 – Forgings, Carbon Steel, for Piping Components.
- ASTM A106 – Seamless Carbon Steel Pipe for High Temperature Service.
- ASTM A182 – Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings & Valves & Parts for High Temperature Service.
- ASTM A193 – Alloy Steel Bolting Materials for High Temperature Service.
- ASTM A194 – Carbon & Alloy Steel Nuts for Bolts for High Pressure & High Temperature Service.

The American National Standards Institute, Inc. 1430 Broadway, New York, N.Y. 10018

- ANSI B1.1 – Unified & American Screw Threads.
- ANSI B1.2 – Screw Thread Gauges & Gauging.
- ANSI B1.5 – Acme Screw Threads.
- ANSI B2.1 – Pipe Threads.
- ANSI B16.5 – Steel Pipe Flanges & Flanged Fittings.
- ANSI B16.9 – Steel Butt Welding Fittings.
- ANSI B16.10 – Face-to-Face Dimensions of Ferrous Flanged & Welding End Valves.
- ANSI B16.11 – Forged Steel Fittings, Socket-Welding and Threaded.
- ANSI B16.14 – Ferrous Plugs, Bushings & Lock Nuts with Pipe Threads.
- ANSI B16.20 – Ring Joint Gaskets in Grooves for Steel Pipe Flanges.
- ANSI B16.21 – Non-Metallic Gaskets for Pipe Flanges.
- ANSI B16.25 – Butt Welding Ends.
- ANSI B16.34 – Valves-Flanged and Butt Welding Ends.
- ANSI B18.2 – Square & Hexagon Bolts & Nuts.
- ANSI – Code for Pressure Piping
 - B31.1.0 – Power Piping (Section 1)
 - B31.2 – Fuel Gas Piping (Section 2)
 - B31.3 – Chemical Plant and Petroleum Refinery Piping (Section 3)
 - B31.4 – Liquid Petroleum Transportation Piping Systems (Section 4)
 - B31.5 – Refrigeration Piping (Section 5)
 - B31.8 – Gas Transmission and Distribution Piping Systems (Section 8)

American Society of Mechanical Engineers **United Engineering Center** 345 E. 47th Street, New York, N.Y. 10017

- ASME Boiler & Vessel Code.
 - Power Boilers (Section I)
 - Material Specifications (Section II)
 - Nuclear Power Plant Components (Section III)
 - Heating Boilers (Section IV)
 - Recommended Rules for care of Power Boilers (Section VII)
 - Pressure Vessels (Section VIII)
 - Welding Qualifications (Section IX)

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