CAST STEEL VALVES

BONNEY FORGE

BONNEY FORGE

BONNEY FORGE (SHANGHAI) LIMITED
NO.118-28 XINDAN ROAD, QINGPU EXPORT PROCESSING ZONE
SHANGHAI, CHINA 201706

BONNEY FORGE CORPORATE HEADQUARTERS
MANUFACTURING/SALES CENTER/WAREHOUSE
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BONNEY FORGE CORPORATE HEADQUARTERS
MT. UNION, PA

BONNEY FORGE

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BONNEY FORGE

Bonney Forge – The Name You Can Trust for Cast Steel Valves

For decades, Bonney Forge forged steel valves and piping components have defined “state-of-the-art” in quality, design and manufacturing. Today, our extensive product line of cast steel valves leads the way.

Since 2002, Bonney Forge has been manufacturing its Cast Steel Valves in Shanghai, China. Bonney Forge Shanghai, manufactures a full line of Cast Steel Gate, Globe and Check Valves designed for ASME pressures 150# thru 1500# and temperature ratings as low as -50°F. Our technicians can also customize a configuration to fit your needs. Bonney Forge customers have a complete choice of trim and body materials, bypasses and connectors including: lift indicators, limit microswitches, pneumatic and electric actuators, bevel gearings, chain wheels, extension stems, floor stands, levers and dashpots.

A Single-Source Solution

Bonney Forge Shanghai also meets stringent design and quality guidelines set and directed by Bonney Forge’s corporate engineering department at its corporate location in Mt. Union, Pennsylvania, USA. Bonney Forge Shanghai has also earned the ISO 9001:2008, PED CE Mark, API 6D, and API 600 Certificates.

We’re Here for You

Bonney Forge is committed to manufacturing excellence and is focused on meeting our customers’ needs. This catalog offers a vast amount of product information and specifications. In the event that you need additional information or technical assistance please call our friendly and knowledgeable customer service team at (800) 231-0655 or visit our website at www.bonneyforge.com.

Our Mission

To be, today and in the future, the recognized leader in our industry, marketing and manufacturing forged steel valves, cast steel valves, forged fittings, branch connections and other related products to satisfy our customer’s expectations.

To be cost effective through Total Quality performance of these operations, and thus provide the resources required to support our commitment to improve our products, processes and customer services.

To be a law abiding corporate citizen respecting the rights of individuals, contributing to the needs of the community and conserving the state of the environment.

The Best Value - *Price, Quality, Service* All The Time.

Quality Assurance

BONNEY FORGE

Testing

Bonney Forge products are manufactured and tested in strict accordance to ASTM, ASME, API and other industry codes and specifications as applicable.

Material Certifications are available upon request to the applicable ASTM/ASME material specifications for all Bonney Forge Valve bodies and bonnets.

Modern machining equipment plus rigid inspection procedures of all parts assures dimensional accuracy of every part. Quality Assurance procedures include, 100% hydrostatic and pneumatic testing of all valves in full conformance to applicable API standards and industry codes.

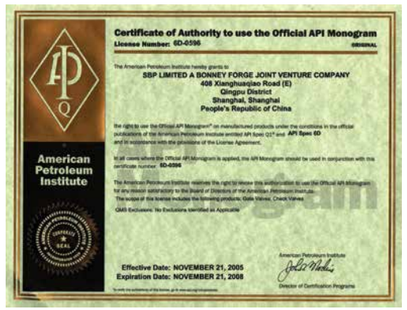
Chemical and mechanical properties of every Bonney Forge cast steel valve are fully traceable to the original casting heat lot.

Material Safety Data Sheets

Material Safety Data Sheets (MSDS) are required for hazardous chemicals under the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard 29 CFR 1910.1200. Bonney Forge Corporation has determined that its valve and fitting products are “articles”, as defined by this standard, and therefore do not require material safety data sheets.

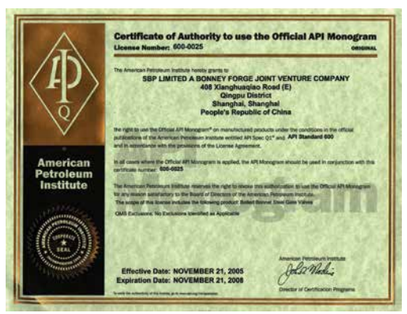
Certificates

Also, Bonney Forge Shanghai is fully qualified and maintains the ISO 9001 2008, PED CE Mark, API 6D and API 600 certifications, as indicated below.


Certificate of Authority to use the Official API Monogram
License Number: 6D-0596
ORIGINAL
The American Petroleum Institute hereby grants to
SBP LIMITED A BONNEY FORGE JOINT VENTURE COMPANY
408 Xianghuaqiao Road (E)
Qingpu District
Shanghai, Shanghai
People's Republic of China
the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and API Spec 6D and in accordance with the provisions of the License Agreement.
In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: 6D-0596
The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.
The scope of this license includes the following products: Gate Valves, Check Valves
QMS Exclusions: No Exclusions Identified as Applicable
American Petroleum Institute
Effective Date: NOVEMBER 21, 2005
Expiration Date: NOVEMBER 21, 2008
Director of Certification Programs


CERTIFICATE
Quality-Assurance System
acc. to European Directive 97/23/EC
Certificate No.: 01 202 CH03+04 0599
Name and address of manufacturer: SBP (Shanghai) LIMITED, No. 368 Xianghuajiao Road (E), Qingpu, Shanghai, P.R. China 201707
The TÜV CERT Certification Body for Pressure Equipment hereby certifies that the above-mentioned manufacturer operates a quality system according to the European Directive 97/23/EC. The manufacturer has the permission to affix the following CE marking to pressure equipment described and manufactured in accordance to the scope covered by this Quality-Assurance System.
CE 0035
Approved acc. to Directive 97/23/EC: QA-System (Module H)
Audit Report No.: CHEQ 03 0599
Scope: Design and Manufacturing of Industrial Valves.
Plant: SBP (Shanghai) LIMITED, No. 368 Xianghuajiao Road (E), Qingpu, Shanghai
Valid until: February 2007
Qingpu, February 16, 2004
TÜV CERT Certification Body for Pressure Equipment
Dr.-Ing. M. Winkler
Service of


CERTIFICATE
The TÜV CERT Certification Body of TÜV Anlagentechnik GmbH
Unterstellengruppe TÜV Rheinland Berlin-Brandenburg
certifies in accordance with TÜV CERT procedures that
SBP (Shanghai) LIMITED
No. 368 Xianghuajiao Road (E), Qingpu, Shanghai 201707, P. R. China
has established and applies a quality management system for
Design and Manufacturing of Industrial Valves
An audit was performed, Report No. 018559
Proof has been furnished that the requirements according to
DIN EN ISO 9001:2000
are fulfilled.
The certificate is valid until 16 March 2007
Certificate Registration No. 01 100 038606
TÜV Rheinland Berlin-Brandenburg


Certificate of Authority to use the Official API Monogram
License Number: 600-0025
ORIGINAL
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SBP LIMITED A BONNEY FORGE JOINT VENTURE COMPANY
408 Xianghuaqiao Road (E)
Qingpu District
Shanghai, Shanghai
People's Republic of China
the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and API Standard 600 and in accordance with the provisions of the License Agreement.
In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: 600-0025
The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.
The scope of this license includes the following product: Bolted Bonnet Steel Gate Valves
QMS Exclusions: No Exclusions Identified as Applicable
American Petroleum Institute
Effective Date: NOVEMBER 21, 2005
Expiration Date: NOVEMBER 21, 2008
Director of Certification Programs


ABS Quality Evaluations
CERTIFICATE OF CONFORMANCE
This is to certify that the Quality Management System of
Bonney Forge Corporation
14496 Croghan Pike
Mount Union, PA
U.S.A.
has been assessed by ABS Quality Evaluations, Inc. and found to be in conformance with the requirements set forth by:
ISO 9001:2000
The Quality Management System is applicable to:
DESIGN AND MANUFACTURE OF FORGED STEEL FITTINGS, UNIONS AND BRANCH CONNECTIONS; APPLICATION DESIGN AND MANUFACTURE OF FORGED STEEL VALVES; APPLICATION DESIGN AND DISTRIBUTION OF CAST STEEL VALVES; CUSTOM FORGING AND MACHINING TO ANSI/ASME, API AND OTHER INTERNATIONAL CODES AND STANDARDS.
Certificate No: 30116
Original Certification Date: 18 December 1992
Effective Date: 23 February 2005
Expiration Date: 17 November 2007
Issue Date: 30 August 2006
Charles D. Rizzo, President
ANAB
MGMT. SYS. RvA C 046
Printed on 2004-08-01 15:17 GMT
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Manufacturing Capabilities

The Bonney Forge Shanghai facilities are located in Shanghai, China and are in full accordance with ISO 9001 and CE Mark certifications.

ANAB ACCREDITED
MGMT. SYS. RvA C 046
ABS Quality Evaluations, Inc. Management System Certification
30116
ISO 9001:2008
Certificate Number: 30116

How to Order/Specify Cast Steel Valves

1. Specify valve size
2. Designate Bonnet Style and Pressure Class from Section A
3. Select Valve Type desired from Section B
4. Indicate Body/Bonnet and Trim Material from Section C
5. Select End Configuration from Section D
6. Select other Body/Bonnet/Trim from Section E
7. Select Special Requirement(s) from Section F
8. Specify as a Suffix String, after Section D or E, any Body/Bonnet Material, Trim Material or Special Requirements not listed below

Section A- Bonnet Style And Pressure Class

1	Bolted Bonnet	Class 150#
3	Bolted Bonnet	Class 300#
6	Bolted Bonnet	Class 600#
9	Bolted Bonnet	Class 900#
15	Bolted Bonnet	Class 1500#

Note: Pressure Seal Bonnet design available upon request

Section B- Type Of Valve

1	Gate Valve, Flexible Wedge
3	Globe Valve, T Pattern
6	Check Valve, Swing Type

Section C- Body/Bonnet And Trim Material

1	A216WCB	Body/Bonnet, Trim 13% Cr (F6/CA15) Hard Faced Seats (1/2 Stellite) API Trim #8
1N	A216WCB	Body/Bonnet, Trim 13% Cr (F6/CA15) API Trim #1
2	A216WCB	Body/Bonnet, Trim 13% Cr (F6/CA15) Hard Faced Seats & Disc (Full Stellite) API Trim #5
3	A216WCB	Body/Bonnet, Trim 18% Cr-8NI (316/CF8M) API Trim #12
4	A216WCB	Body/Bonnet, Trim Ni-Cu Alloy, (Monel Metal) API Trim #9
5	A217WC9	Body/Bonnet, 2 1/4% Cr 1% Mo, Trim 13% Cr (F6/CA15) Hard Faced Seats (1/2 Stellite) API Trim #8
6	A217C5	Body/Bonnet, 5% Cr 1/2 % Mo, Trim 13% Cr (F6/CA15) Hard Faced Seats (1/2 Stellite) API Trim #8
7	A351CF8	Body/Bonnet, Trim 18% Cr - 8 Ni(304/CF8) Trim 304 Stainless Steel API Trim #2
8	A351CF8M	Body/Bonnet, Trim 18% Cr - 8 Ni(316/CF8M) Trim 316 Stainless Steel API Trim #10
8S	A351CF8M	Body/Bonnet, Trim 18% Cr - 8 Ni(316/CF8M) Trim 316 Stainless Steel, Hard Faced Seats (1/2 Stellite) API Trim #12
9	A217WC6	Body/Bonnet, 1 1/4% Cr 1/2 Mo, Trim 13% Cr (F6/CA15) Hard Faced Seats (1/2 Stellite) API Trim #8
0	Other	Specify

Section D- End Configuration

RF	Raised Face, Flanged End, 125-250 AARH
RTJ	Ring Type Joint
BW	Butt Weld Ends (Specify Pipe Schedule)

Section E- Other Body/Bonnet Or Trim Materials

C12	A217C12	9% Cr 1% Moly Steel
CA15	A217CA15	13% Cr 1/2 Moly Steel
LCB/LCC	A352LCB	Low Temp Carbon Steel - 50° F
CF3	A351CF3	Stainless Steel, Type 304L

Note: Other body/bonnet/trim materials available upon request

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How to Order/Specify Cast Steel Valves

Section E- Available Trim Materials

TRIM												
API 600 TRIM No.		1	2	5	6	8	9	10	12	13	15	16
Seating Surface	Wedge – Check Disc	F6	F304	Stellite	F6	F6	Monel	F316	F316	ALLOY 20	Stellite	Stellite
	Seat Ring				Monel	Stellite			Stellite			
	Globe Disc				F6	F6			F316			
	Seat Ring				Monel	Stellite			Stellite			
Back Seat				F6	F6	F6			F316		F304	F316
Stem – Hinge Pin												

Section F- Modifications/Special Requirements

BG	Bevel Gear Operator
BYP	Bypass
CWO	Chainwheel Operated
CRY	Cryogenic Bonnet
EMO	Electric Motor Operator
GD	Guided Disc (Globe Valves)
NACE	NACE Requirements to MR-01-03, latest edition
PMI	Positive Material Identification required

List as a suffix, by abbreviation if possible,
any other requirement not shown on this list

Example: 3" 150# RF Flanged Gate Valve, Bolted Bonnet,
ASTM A216WCB Body/Bonnet with 1/2 Stellite Trim

1	11	RF
Sec A	Sec. B, Sec. C	Sec. D

AS: 3" 1-11-RF

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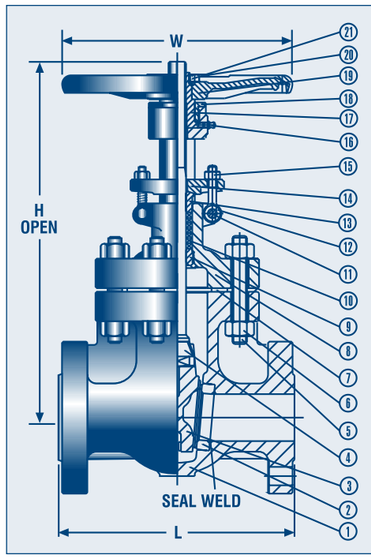
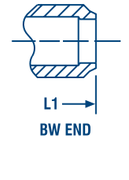
Gate Valves - Class 150

Design construction:
API 600, ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598

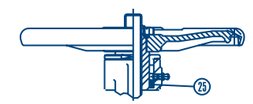


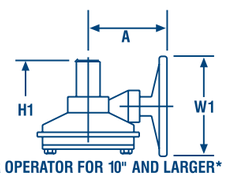
MATERIALS OF CONSTRUCTION

ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite
3	Wedge	A216 WCB / 13% CR.
4	Stem	A182 F6
5	Bonnet Bolt	A193 B7
6	Bonnet Nut	A194 2H
7	Gasket	316 Graphite Corrugated
8	Bonnet	A216 WCB
9	Back Seat	A182 F6
10	Packing	Graphite
11	Eye Bolt Pin	Steel
12	Gland Eye Bolt	A193 GR. B7
13	Packing Gland	A182 F6a
14	Flange Gland	A216 WCB
15	Eye Bolt Nut	A194 GR 2H
16	Grease Nipple	Steel
17	Yoke Sleeve	A439 GR D2
18	Sleeve Nut	Steel
19	Handwheel	Ductile Iron
20	Handwheel Nut	Steel
21	Set Screw	Steel
22	Yoke	A216 WCB
23	Yoke Nut	A194 GR. 2H
24	Yoke Bolt	A193 GR B7
25	Bearing	Steel



** When requested*





DIMENSIONAL SPECIFICATIONS

SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250	12 / 300	14 / 350	16 / 400	18 / 450	20 / 500	24 / 600
L	inch	7.00	7.50	8.00	9.00	10.00	10.50	11.5	13.00	14.00	15.00	16.00	17.00	18.00	20.00
	mm	177.80	190.50	203.20	228.60	254.00	266.70	292.10	330.20	355.60	381.00	406.40	431.80	457.20	508.00
L1	inch	8.50	9.50	11.12	12.00	15.00	15.88	16.50	18.00	19.75	22.50	24.00	26.00	28.00	32.00
	mm	215.90	241.30	282.45	304.80	381.00	403.35	419.10	457.20	501.65	571.50	609.60	660.40	711.20	812.80
L2	inch	7.50	8.00	8.50	9.50	10.50	11.00	12.00	13.50	14.50	15.50	16.50	17.50	18.50	20.50
	mm	190.50	203.20	215.90	241.30	266.7	279.40	304.80	342.90	368.30	393.70	419.10	444.50	469.90	520.70
W	inch	8	8	10	10	10	12	14	16	20	20	24	25	26	30
	mm	200	200	250	250	250	300	350	400	500	500	600	640	650	750
W1	inch	-	-	-	-	-	-	12.0	12.2	12.2	12.2	12.2	18.1	18.1	18.1
	mm							305	305	305	305	310	460	460	460
H (OPEN)	inch	16.65	19.50	20.50	23.50	28.00	29.80	39.00	26.50	56.00	60.50	71.30	79.00	87.80	104.00
	mm	423	495	520	596	711	759	995	1180	1432	1535	1811	2009	2230	2641
H1 (GEAR)	inch	-	-	-	-	-	-	42.13	50.75	59.41	63.54	72.44	79.21	85.83	100.79
	mm							1070	1289	1509	1614	1840	2012	2180	2560
A	inch	-	-	-	-	-	-	8.66	8.66	8.66	14.17	14.17	14.17	16.18	16.18
	mm							220	220	220	360	360	360	411	411
WT (RF)	lb	47	62	80	118	133	187	309	447	711	956	1218	1653	2482	3258
	kg	21	28	36	53	60	84	139	201	320	430	548	744	1117	1466
WT (BW)	lb	40	47	67	98	120	169	280	398	673	884	1131	1578	2393	3169
	kg	18	21	30	44	54	76	126	179	303	398	509	710	1077	1426
WT (RF & GO)	lb	-	-	-	-	-	-	358	496	760	1000	1262	1720	2549	3324
	kg							161	223	342	450	568	774	1147	1496
WT (BW & GO)	lb	-	-	-	-	-	-	329	447	722	929	1176	1644	2460	3236
	kg							148	201	325	418	529	740	1107	1456
CV Factors		-	410	710	1300	-	3110	5720	8935	13350	-	21560	36091	47615	67862

Gate Valves - Class 300

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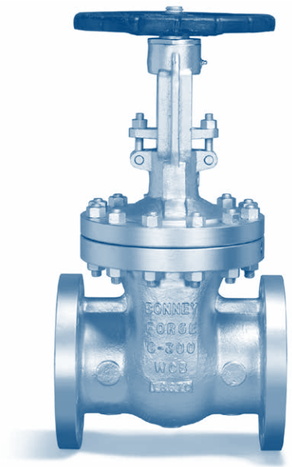
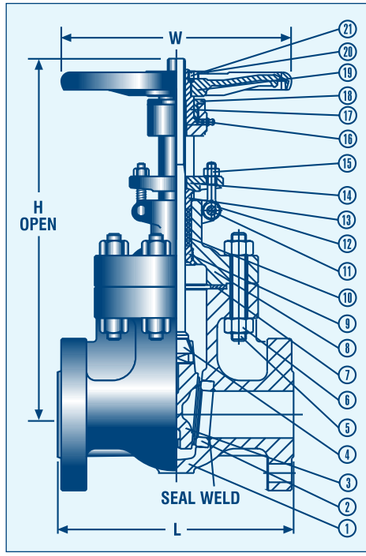
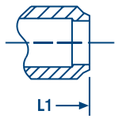




MATERIALS OF CONSTRUCTION		
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite
3	Wedge	A216 WCB / 13% CR.
4	Stem	A182 F6
5	Bonnet Bolt	A193 B7
6	Bonnet Nut	A194 2H
7	Gasket	Spiral S.S. Graphite
8	Bonnet	A216 WCB
9	Back Seat	A182 F6
10	Packing	Graphite
11	Eye Bolt Pin	Steel
12	Gland Eye Bolt	A193 GR. B7
13	Packing Gland	A182 F6
14	Flange Gland	A216 WCB
15	Eye Bolt Nut	A194 2H
16	Grease Nipple	Steel
17	Yoke Sleeve	A439 GR. D2
18	Sleeve Nut	Steel
19	Handwheel	Ductile Iron
20	Handwheel Nut	Steel
21	Set Screw	Steel
22	Yoke	A216 WCB
23	Yoke Nut	A194 GR. 2H
24	Yoke Bolt	A193 GR. B7
25	Bearing	Steel

Design construction:
API 600, ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



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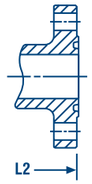

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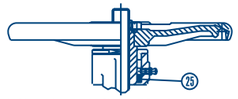
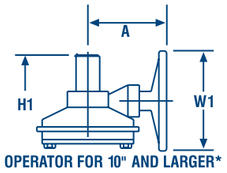


THRUST BALL BEARINGS FOR 8" AND LARGER*



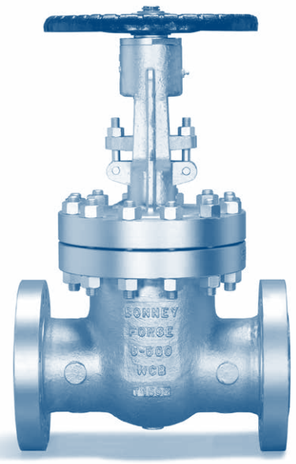
GEAR OPERATOR FOR 10" AND LARGER*

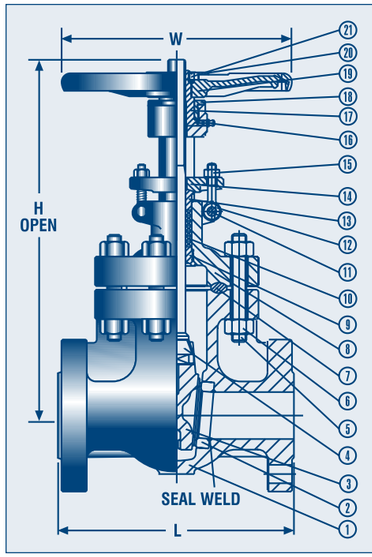
** When requested*

DIMENSIONAL SPECIFICATIONS																
SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250	12 / 300	14 / 350	16 / 400	18 / 450	20 / 500	24 / 600
L	inch	8.50	9.50	11.12	12.00	15.00	15.88	16.50	18.00	19.75	30.00	33.00	36.00	39.00	45.00
	mm	215.90	241.30	282.45	304.80	381.00	403.35	419.10	457.20	501.65	762.00	838.20	914.40	990.60	1143.00
L1	inch	8.50	9.50	11.12	12.00	15.00	15.88	16.50	18.00	19.75	30.00	33.00	36.00	39.00	45.00
	mm	215.90	241.30	282.45	304.80	381.00	403.35	419.10	457.20	501.65	762.00	838.20	914.40	990.60	1143.00
L2	inch	9.12	10.12	11.75	12.62	15.62	16.5	17.12	18.62	20.37	30.62	33.62	36.62	39.75	45.88
	mm	231.65	257.05	298.45	320.55	396.75	419.10	434.85	472.95	517.40	777.75	853.95	930.15	1009.65	1165.35
W	inch	8	8	10	10	14	14	16	18	20	25	25	27	30	35
	mm	200	200	250	250	350	350	400	450	500	640	640	680	760	900
W1	inch	-	-	-	-	-	12	12	12	18	18	18	21	21	24
	mm						305	305	305	460	460	460	540	540	610
H (OPEN)	inch	16.93	20.67	21.85	24.41	31.10	31.69	39.57	48.43	57.68	62.01	69.21	77.72	85.31	111.69
	mm	430	525	555	620	790	805	1005	1230	1465	1575	1758	1974	2167	2837
H1 (GEAR)	inch	-	-	-	-	-	32.87	40.75	50.08	58.23	64.17	71.46	79.17	87.60	105.00
	mm						835	1035	1272	1479	1630	1815	2011	2225	2667
A	inch	-	-	-	-	-	8.66	8.66	8.66	10.51	14.17	14.17	14.17	16.18	16.18
	mm						220	220	220	267	360	360	360	411	411
WT (RF)	lb	62.22	80.00	113.33	173.33	237.78	320.00	506.67	711.11	1000.00	1542.22	2400.00	2744.44	3677.78	5155.56
	kg	28	36	51	78	107	144	228	320	450	694	1080	1235	1655	2320
WT (BW)	lb	48.89	60.00	88.89	133.33	191.11	251.11	406.67	564.44	795.56	1280.00	2077.78	2342.22	3184.44	4364.44
	kg	22	27	40	60	86	113	183	254	358	576	935	1054	1433	1964
WT (RF & GO)	lb	-	-	-	-	-	368.89	555.56	760.00	1066.67	1904.44	2604.44	3295.56	4113.33	5853.33
	kg						166	250	342	480	857	1172	1483	1851	2634
WT (BW & GO)	lb	-	-	-	-	-	300.00	455.56	613.33	862.22	1642.22	2282.22	2893.33	3620.00	5062.22
	kg						135	205	276	388	739	1027	1302	1629	2278
CV Factors		-	410	710	1300	-	3110	5720	8935	13350	-	21560	36091	47615	67862

Gate Valves - Class 600

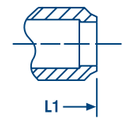
BONNEY FORGE





MATERIALS OF CONSTRUCTION		
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite
3	Wedge	A216 WCB / 13% CR.
4	Stem	A182 F6
5	Bonnet Bolt	A193 B7
6	Bonnet Nut	A194 2H
7	Gasket	Soft Iron
8	Bonnet	A216 WCB
9	Back Seat	A182 F6
10	Packing	Graphite
11	Eye Bolt Pin	Steel
12	Gland Eye Bolt	A193 GR. B7
13	Packing Gland	A182 F6
14	Flange Gland	A216 WCB
15	Eye Bolt Nut	A194 2H
16	Grease Nipple	Steel
17	Yoke Sleeve	A439 GR. D2
18	Sleeve Nut	Steel
19	Handwheel	Ductile Iron
20	Handwheel Nut	Steel
21	Set Screw	Steel
22	Yoke	A216 WCB
23	Yoke Nut	A194 GR. 2H
24	Yoke Bolt	A193 GR. B7
25	Bearing	Steel

Design construction:
API 600, ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



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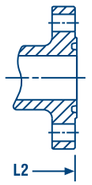

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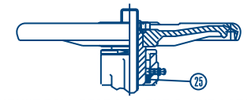
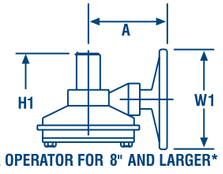


THRUST BALL BEARINGS FOR 8" AND LARGER



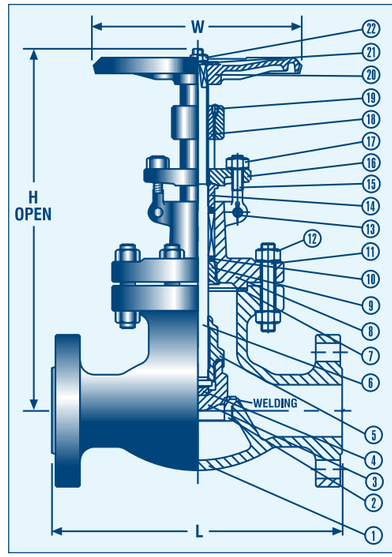
GEAR OPERATOR FOR 8" AND LARGER*

** When requested*

DIMENSIONAL SPECIFICATIONS									
SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250
L	inch	11.50	13.00	14.00	17.00	20.00	22.00	26.00	31.00
	mm	292.10	330.20	355.60	431.80	508.00	558.80	660.40	787.40
L1	inch	11.50	13.00	14.00	17.00	20.00	22.00	26.00	31.00
	mm	292.10	330.20	355.60	431.80	508.00	558.80	660.40	787.40
L2	inch	11.62	13.12	14.12	17.12	20.12	22.12	26.12	31.12
	mm	295.15	333.25	358.65	435.85	511.05	561.85	663.45	790.45
W	inch	10	10	10	14	16	18	20	24
	mm	250	250	250	350	400	450	500	600
W1	inch	-	-	-	-	-	12	18	24
	mm						305	460	610
H (OPEN)	inch	18.31	20.94	21.85	26.97	31.30	35.83	45.08	49.92
	mm	465	532	555	685	795	910	1145	1268
H1 (GEAR)	inch	-	-	-	-	-	45.47	46.26	52.36
	mm						1155	1175	1330
A	inch	-	-	-	-	-	9.45	10.24	12.60
	mm						240	260	320
WT (RF)	lb	91.11	126.67	160.00	284.44	444.44	591.11	931.11	1675.56
	kg	41	57	72	128	200	266	419	754
WT (BW)	lb	75.56	104.44	128.89	220.00	344.44	464.44	746.67	1368.89
	kg	34	47	58	99	155	209	336	616
WT (RF & GO)	lb	-	-	-	-	-	640.00	997.78	1786.67
	kg						288	449	804
WT (BW & GO)	lb	-	-	-	-	-	513.33	813.33	1480.00
	kg						231	366	666
CV Factors		-	390	561	1235	-	3406	6761	10565

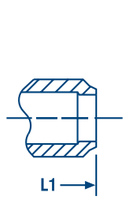
Globe Valves - Class 150

BONNEY FORGE



MATERIALS OF CONSTRUCTION		
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite #6
3	Disc	A105 / 13% CR.
4	Disc Thrust Plate	A182 F6
5	Disc Stem Nut	A182 F6
6	Stem	A182 F6
7	Gasket	Spiral S.S. Graphite
8	Bonnet	A216 WCB
9	Back Seat	A182 F6
10	Packing	Graphite
11	Bonnet Bolt	A193 B7
12	Bonnet Nut	A194 2H
13	Eye Bolt Pin	Steel
14	Packing Gland	A182 F6
15	Gland Eye Bolt	A193 B7
16	Gland Flange	A216 WCB
17	Eye Bolt Nut	A194 2H
18	Yoke Sleeve	A439 GR. D2
19	Set Screw	Steel
20	Handwheel	Ductile Iron
21	Washer	Steel
22	Handwheel Nut	Steel

Design construction:
ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



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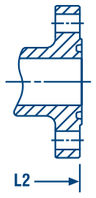

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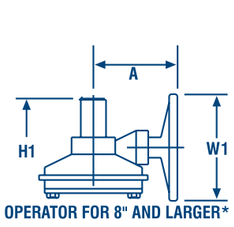


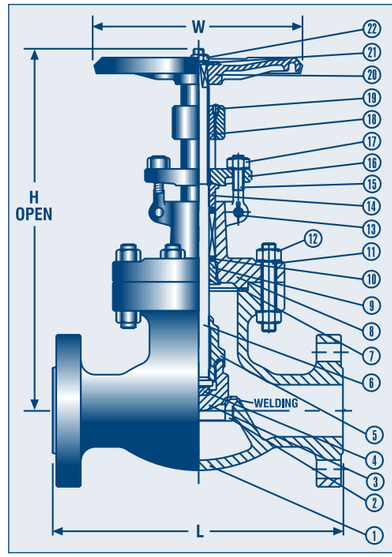
GEAR OPERATOR FOR 8" AND LARGER*

** When requested*

DIMENSIONAL SPECIFICATIONS											
SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250	12 / 300
L	inch	8.00	8.50	9.50	11.50	14.00	16.00	19.50	24.50	27.50
	mm	203.20	215.90	241.30	292.10	355.60	406.40	495.30	622.30	698.50
L1	inch	8.00	8.50	9.50	11.50	14.00	16.00	19.50	24.50	27.50
	mm	203.20	215.90	241.30	292.10	355.60	406.40	495.30	622.30	698.50
L2	inch	8.50	9.00	10.00	12.00	14.50	16.50	20.00	25.00	28.00
	mm	215.90	228.60	254.00	304.80	368.30	419.10	508.00	635.00	711.20
W	inch	8	10	10	12	14	16	18	18	25
	mm	200	250	250	300	350	400	450	450	640
W1	inch	-	-	-	-	-	12	18	18	18
	mm						305	460	460	460
H (OPEN)	inch	14.02	16.54	16.18	18.70	21.26	21.65	24.21	29.49	36.30
	mm	356	420	411	475	540	550	615	749	922
H1 (GEAR)	inch	-	-	-	-	-	22.83	21.93	26.34	33.86
	mm						580	557	669	860
A	inch	-	-	-	-	-	9.45	14.17	14.17	14.17
	mm						240	360	360	360
WT (RF)	lb	46.67	66.67	82.22	126.67	173.33	222.22	346.67	580.00	684.44
	kg	21	30	37	57	78	100	156	261	308
WT (BW)	lb	37.78	48.89	64.44	102.22	148.89	191.11	297.78	504.44	604.44
	kg	17	22	29	46	67	86	134	227	272
WT (RF & GO)	lb	-	-	-	-	-	271.11	357.78	684.44	988.89
	kg						122	161	308	445
WT (BW & GO)	lb	-	-	-	-	-	240	353.33	608.89	908.89
	kg						108	159	274	409
CV Factors		-	80	110	185	-	440	830	1035	2065

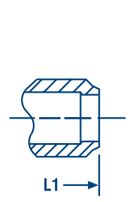
Globe Valves - Class 300

BONNEY FORGE



MATERIALS OF CONSTRUCTION		
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite #6
3	Disc	A105 / 13% CR.
4	Disc Thrust Plate	A182 F6
5	Disc Stem Nut	A182 F6
6	Stem	A182 F6
7	Gasket	Spiral S.S. Graphite
8	Bonnet	A216 WCB
9	Back Seat	A182 F6
10	Packing	Graphite
11	Bonnet Bolt	A193 B7
12	Bonnet Nut	A194 2H
13	Eye Bolt Pin	Steel
14	Packing Gland	A182 F6
15	Gland Eye Bolt	A193 B7
16	Gland Flange	A216 WCB
17	Eye Bolt Nut	A194 2H
18	Yoke Sleeve	A439 GR. D2
19	Set Screw	Steel
20	Handwheel	Ductile Iron
21	Washer	Steel
22	Handwheel Nut	Steel

Design construction:
ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



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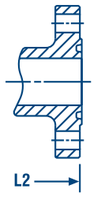

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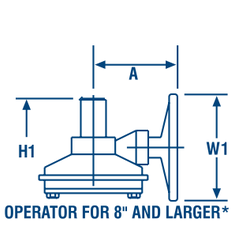


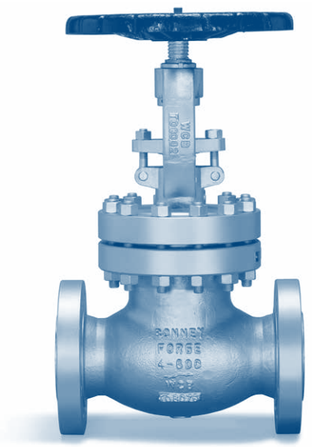
GEAR OPERATOR FOR 8" AND LARGER*

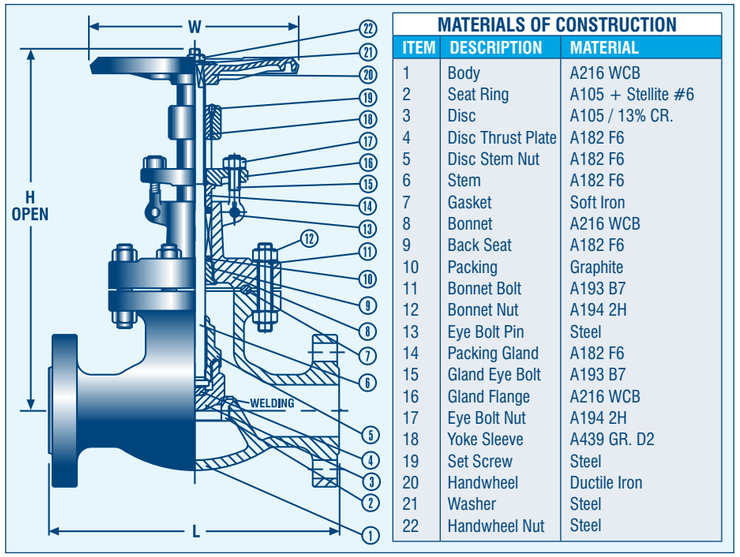
** When requested*

DIMENSIONAL SPECIFICATIONS									
SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250
L	inch	10.50	11.50	12.50	14.00	15.75	17.50	21.00	24.50
	mm	266.70	292.10	317.50	355.60	400.05	444.50	533.40	622.30
L1	inch	10.50	11.50	12.50	14.00	15.75	17.50	22.00	24.50
	mm	266.70	292.10	317.50	355.60	400.05	444.50	558.80	622.30
L2	inch	11.12	12.12	13.12	14.62	16.37	18.12	22.62	25.12
	mm	282.45	307.85	333.25	371.35	415.80	460.25	574.55	638.05
W	inch	8	10	12	14	16	18	20	24
	mm	200	250	300	350	400	450	500	610
W1	inch	-	-	12	12	-	12	18	24
	mm			305	305		305	460	610
H (OPEN)	inch	15.12	18.11	17.72	20.28	22.44	24.33	29.13	41.30
	mm	384	460	450	515	570	618	740	1049
H1 (GEAR)	inch	-	--	18.90	21.46	-	25.51	30.31	42.44
	mm			480	545		648	770	1078
A	inch	-	-	9.45	9.45	-	9.45	14.17	16.18
	mm			240	240		240	360	411
WT (RF)	lb	68.89	97.78	122.22	186.67	244.44	333.33	500.00	855.56
	kg	31	44	55	84	110	150	225	385
WT (BW)	lb	55.56	77.78	102.22	168.89	220.00	264.44	400.00	731.11
	kg	25	35	46	76	99	119	180	329
WT (RF & GO)	lb	-	-	171.11	235.56	-	382.22	566.67	1333.33
	kg			77	106		172	255	600
WT (BW & GO)	lb	-	-	151.11	217.78	-	313.33	466.67	1186.67
	kg			68	98		141	210	534
CV Factors		-	80	100	185	-	440	830	1305

Globe Valves - Class 600

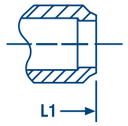
BONNEY FORGE





MATERIALS OF CONSTRUCTION		
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite #6
3	Disc	A105 / 13% CR.
4	Disc Thrust Plate	A182 F6
5	Disc Stem Nut	A182 F6
6	Stem	A182 F6
7	Gasket	Soft Iron
8	Bonnet	A216 WCB
9	Back Seat	A182 F6
10	Packing	Graphite
11	Bonnet Bolt	A193 B7
12	Bonnet Nut	A194 2H
13	Eye Bolt Pin	Steel
14	Packing Gland	A182 F6
15	Gland Eye Bolt	A193 B7
16	Gland Flange	A216 WCB
17	Eye Bolt Nut	A194 2H
18	Yoke Sleeve	A439 GR. D2
19	Set Screw	Steel
20	Handwheel	Ductile Iron
21	Washer	Steel
22	Handwheel Nut	Steel

Design construction:
ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



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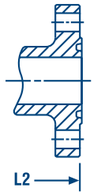

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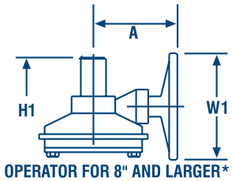


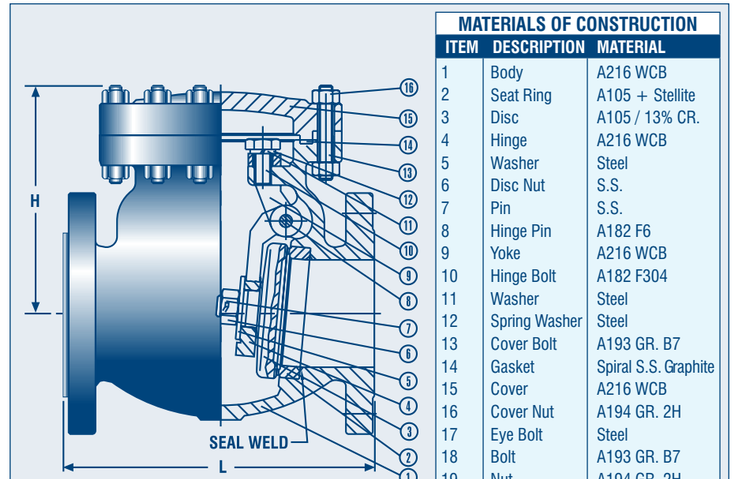
GEAR OPERATOR FOR 8" AND LARGER*

** When requested*

DIMENSIONAL SPECIFICATIONS									
SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200
L	inch	11.50	13.00	14.00	17.00	20.00	22.00	26.00
	mm	292.10	330.20	355.60	431.80	508.00	558.80	660.40
L1	inch	11.50	13.00	14.00	17.00	20.00	22.00	26.00
	mm	292.10	330.20	355.60	431.80	508.00	558.80	660.40
L2	inch	11.62	13.12	14.12	17.12	20.12	22.12	26.12
	mm	295.15	333.25	358.65	434.85	511.05	561.85	663.45
W	inch	10	12	14	16	20	22	-
	mm	250	300	350	400	500	560	
W1	inch	-	-	-	12	-	18	24
	mm				305		460	610
H (OPEN)	inch	17.83	21.50	22.17	25.91	28.15	31.02	-
	mm	453	546	563	658	715	788	
H1 (GEAR)	inch	-	-	-	27.09	-	34.25	37.01
	mm				688		870	940
A	inch	-	-	-	9.45	-	9.45	16.26
	mm				240		240	413
WT (RF)	lb	100.00	142.22	173.33	300.00	471.11	726.67	-
	kg	45	64	78	135	212	327	
WT (BW)	lb	84.44	120.00	142.22	235.56	348.89	580.00	-
	kg	38	54	64	106	157	261	
WT (RF & GD)	lb	-	-	-	348.89	-	926.67	1204.44
	kg				157		417	542
WT (BW & GD)	lb	-	-	-	284.44	-	800.00	1020.00
	kg				128		360	459
CV Factors		-	100	153	263	-	513	882

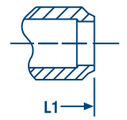
Check Valves - Class 150

BONNEY FORGE

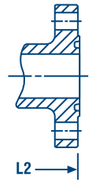


MATERIALS OF CONSTRUCTION		
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite
3	Disc	A105 / 13% CR.
4	Hinge	A216 WCB
5	Washer	Steel
6	Disc Nut	S.S.
7	Pin	S.S.
8	Hinge Pin	A182 F6
9	Yoke	A216 WCB
10	Hinge Bolt	A182 F304
11	Washer	Steel
12	Spring Washer	Steel
13	Cover Bolt	A193 GR. B7
14	Gasket	Spiral S.S. Graphite
15	Cover	A216 WCB
16	Cover Nut	A194 GR. 2H
17	Eye Bolt	Steel
18	Bolt	A193 GR. B7
19	Nut	A194 GR. 2H
20	Cap	A105
21	Gasket	S.W. + Graphite

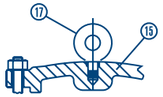
Design construction:
ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



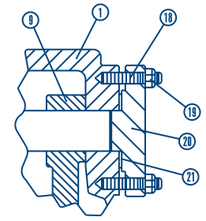
BW END



RTJ END



FOR 5" AND LARGER



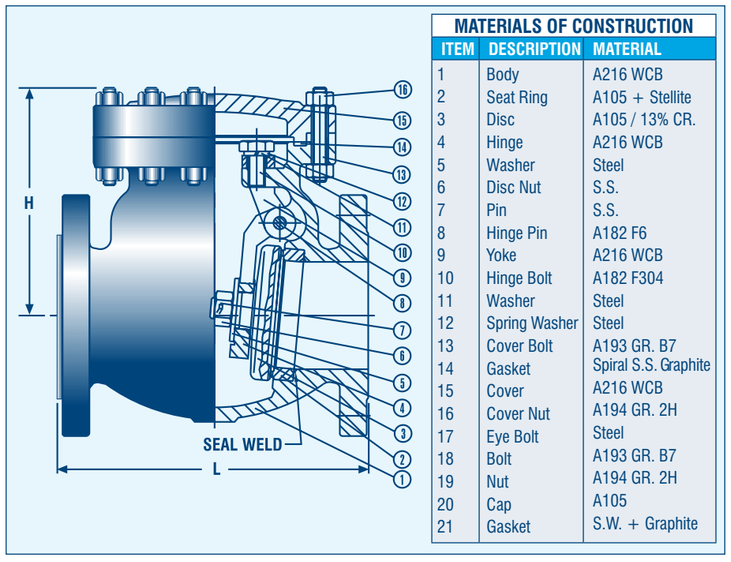
FOR 16" AND LARGER

DIMENSIONAL SPECIFICATIONS													
SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250	12 / 300	14 / 350	16 / 400
L	inch	8.00	8.50	9.50	11.50	13.00	14.00	19.50	24.50	27.50	31.00	34.00
	mm	203.20	215.90	241.30	292.10	330.20	355.60	495.30	622.30	698.50	787.40	863.60
L1	inch	8.00	8.50	9.50	11.50	13.00	14.00	19.50	24.50	27.50	31.00	34.00
	mm	203.20	215.90	241.30	292.10	330.20	355.60	495.30	622.30	698.50	787.40	863.60
L2	inch	8.50	9.00	10.00	12.00	13.50	14.50	20.00	25.00	28.00	31.50	34.50
	mm	215.90	228.60	254.00	304.80	342.90	368.30	508.00	635.00	711.20	800.10	876.30
H	inch	6.30	6.57	7.10	8.54	11.22	12.40	14.37	17.52	20.08	20.94	22.95
	mm	160	167	180	217	285	315	365	445	510	532	583
WT (RF)	lb	42.22	53.33	62.22	106.67	140.00	175.56	288.89	444.44	666.67	1002.22	1235.56
	kg	19	24	28	48	63	79	130	200	300	451	556
WT (BW)	lb	33.33	44.44	51.11	93.33	113.33	148.89	262.22	360.00	524.44	715.56	1042.22
	kg	15	20	23	42	51	67	118	162	236	322	469
CV Factors		-	246	356	620	-	1414	2370	3300	4000	-	7900

Check Valves - Class 300

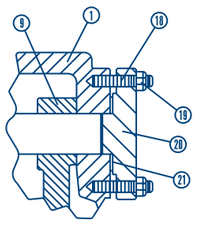
BONNEY FORGE

Design construction:
ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



MATERIALS OF CONSTRUCTION

ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite
3	Disc	A105 / 13% CR.
4	Hinge	A216 WCB
5	Washer	Steel
6	Disc Nut	S.S.
7	Pin	S.S.
8	Hinge Pin	A182 F6
9	Yoke	A216 WCB
10	Hinge Bolt	A182 F304
11	Washer	Steel
12	Spring Washer	Steel
13	Cover Bolt	A193 GR. B7
14	Gasket	Spiral S.S. Graphite
15	Cover	A216 WCB
16	Cover Nut	A194 GR. 2H
17	Eye Bolt	Steel
18	Bolt	A193 GR. B7
19	Nut	A194 GR. 2H
20	Cap	A105
21	Gasket	S.W. + Graphite



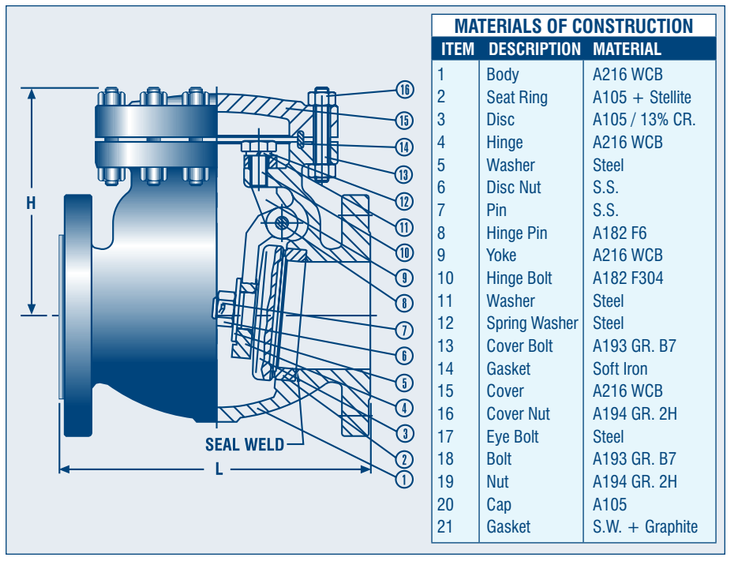
DIMENSIONAL SPECIFICATIONS

SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250	12 / 300
L	inch	10.50	11.50	12.50	14.00	15.75	17.50	21.00	24.50	28.00
	mm	266.70	292.10	317.50	355.60	400.05	444.50	558.80	622.30	711.20
L1	inch	10.50	11.50	12.50	14.00	15.75	17.50	21.00	24.50	28.00
	mm	266.70	292.10	317.50	355.60	400.05	444.50	558.80	622.30	711.20
L2	inch	11.12	12.12	13.12	14.62	16.37	18.12	21.62	25.12	28.62
	mm	282.45	307.85	333.25	371.35	415.80	460.25	549.15	638.05	726.95
H	inch	7.68	8.27	8.86	10.63	12.20	12.99	15.55	18.31	18.98
	mm	195	210	225	270	310	330	395	465	482
WT (RF)	lb	68.89	86.67	100.00	151.11	200.00	302.22	488.89	700.00	997.78
	kg	31	39	45	68	90	136	220	315	449
WT (BW)	lb	57.78	68.89	82.22	113.33	148.89	244.44	386.67	451.11	853.33
	kg	26	31	37	51	67	110	174	203	384
CV Factors		-	227	329	680	-	1950	2400	3340	4000

Check Valves - Class 600

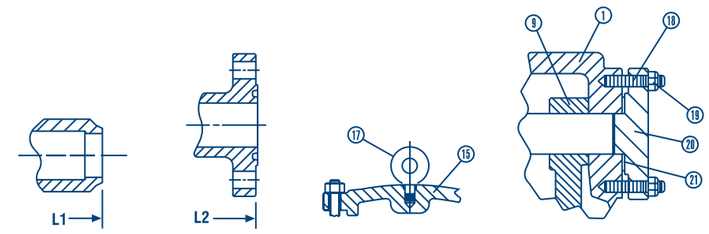
BONNEY FORGE

Design construction:
ASME B16.34
Pressure – Temperature Rating ASME B16.34
Face to Face / End to End ASME B16.10
Connection ASME B16.5 / B16.25
Testing and Inspection API 598



MATERIALS OF CONSTRUCTION

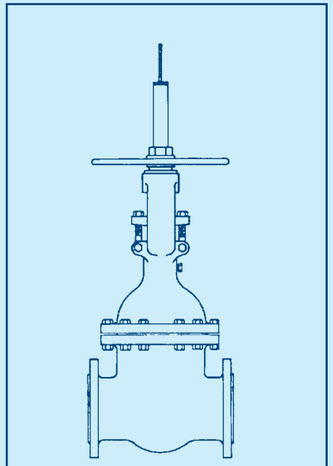
ITEM	DESCRIPTION	MATERIAL
1	Body	A216 WCB
2	Seat Ring	A105 + Stellite
3	Disc	A105 / 13% CR.
4	Hinge	A216 WCB
5	Washer	Steel
6	Disc Nut	S.S.
7	Pin	S.S.
8	Hinge Pin	A182 F6
9	Yoke	A216 WCB
10	Hinge Bolt	A182 F304
11	Washer	Steel
12	Spring Washer	Steel
13	Cover Bolt	A193 GR. B7
14	Gasket	Soft Iron
15	Cover	A216 WCB
16	Cover Nut	A194 GR. 2H
17	Eye Bolt	Steel
18	Bolt	A193 GR. B7
19	Nut	A194 GR. 2H
20	Cap	A105
21	Gasket	S.W. + Graphite



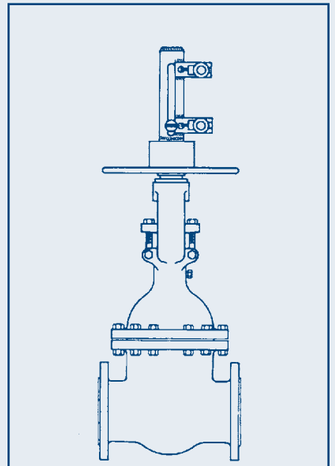
DIMENSIONAL SPECIFICATIONS

SIZE	inch / mm	2 / 50	2.5 / 65	3 / 80	4 / 100	5 / 130	6 / 150	8 / 200	10 / 250	12 / 300
L	inch	11.50	13.00	14.00	17.00	20.00	22.00	26.00	31.00	33.00
	mm	292.10	330.20	355.60	431.80	508.00	558.80	660.40	787.40	838.20
L1	inch	11.50	13.00	14.00	17.00	20.00	22.00	26.00	31.00	33.00
	mm	292.10	330.20	355.60	431.80	508.00	558.80	660.40	787.40	838.20
L2	inch	11.62	13.12	14.12	17.12	20.12	22.12	26.12	31.12	33.12
	mm	295.15	333.25	358.65	434.85	511.05	561.85	663.45	790.45	841.25
H	inch	7.09	7.76	11.22	12.80	13.50	14.80	20.94	22.95	23.94
	mm	180	197	285	325	343	376	532	583	608
WT (RF)	lb	71.11	93.33	133.33	244.44	357.78	491.11	768.89	1395.56	1768.89
	kg	32	42	60	110	161	221	346	628	796
WT (BW)	lb	53.33	73.33	108.89	182.22	282.22	404.44	646.67	1106.67	1535.56
	kg	24	33	49	82	127	182	291	498	691
CV Factors		-	213	308	679	-	1873	2400	3340	5045

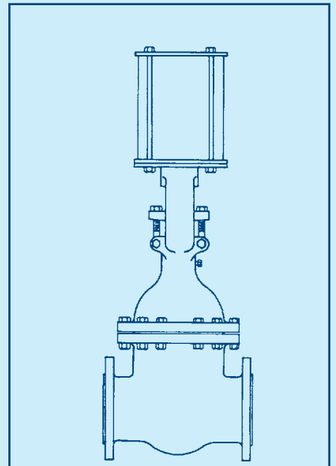
SPECIAL FEATURES



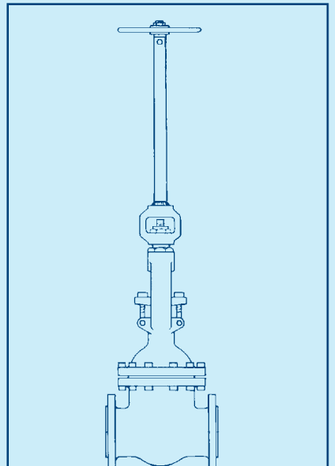
LIFT INDICATOR



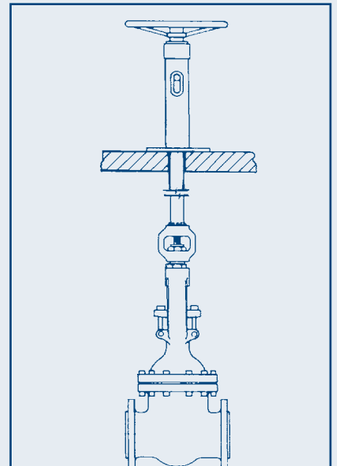
LIMIT MICRO SWITCHES



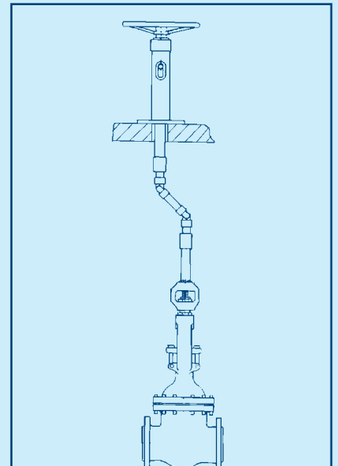
PNEUMATIC OPERATOR



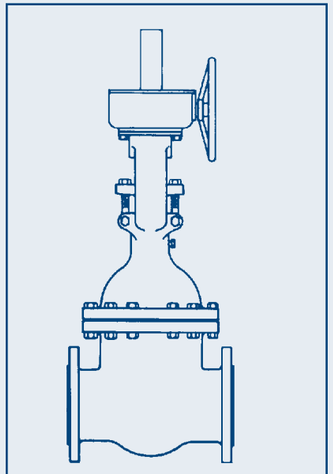
EXTENSION STEM



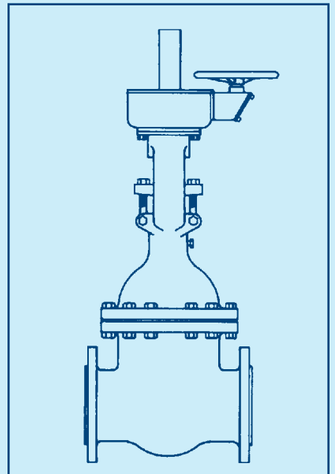
FLOOR STAND



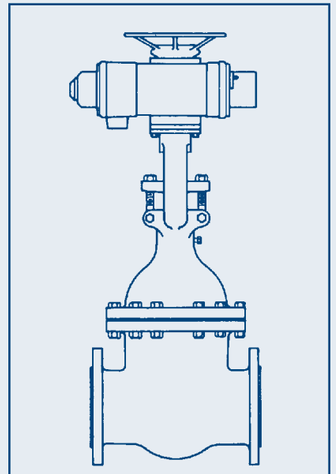
FLOOR STAND WITH UNIVERSAL JOINT



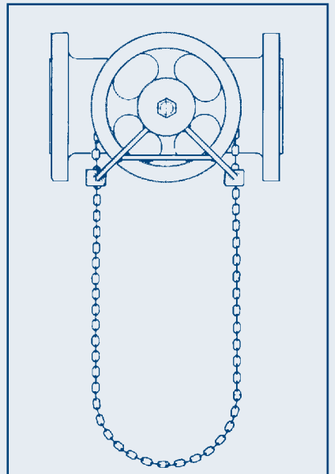
BEVEL GEARING



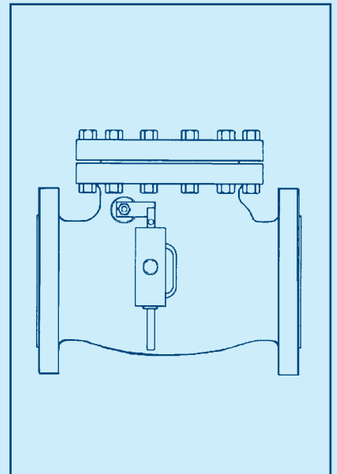
BEVEL GEARING WITH HORIZONTAL HANDWHEEL



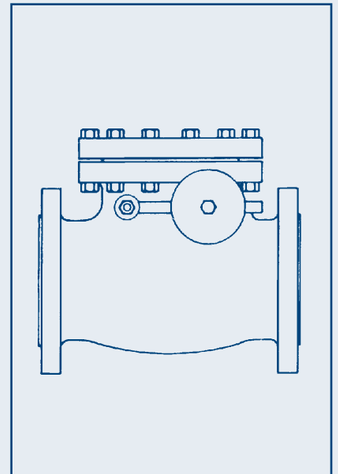
ELECTRIC ACTUATOR



CHAIN WHEEL

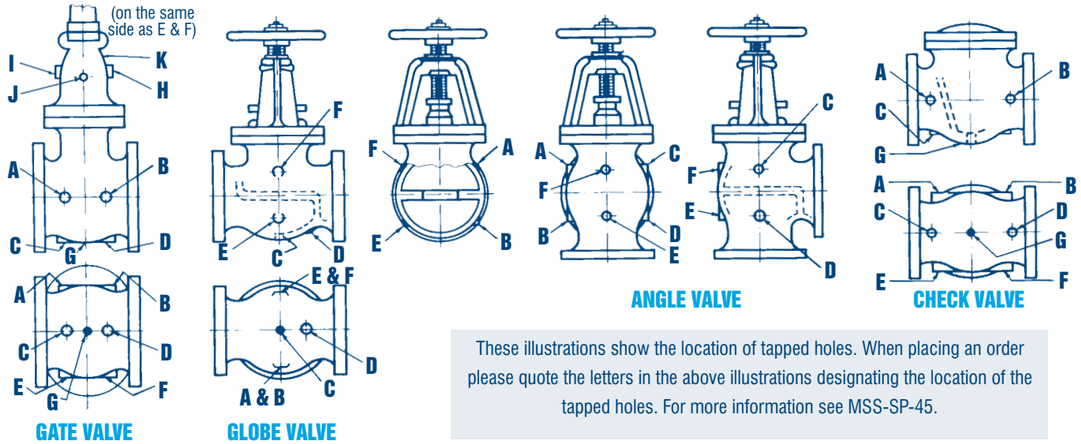


CHECK VALVE WITH DASH POT



CHECK VALVE WITH OUTSIDE LEVER & WEIGHT

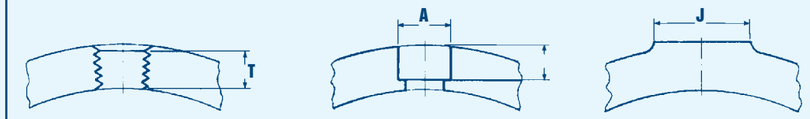
BYPASS & DRAIN CONNECTION



GATE VALVE | GLOBE VALVE | ANGLE VALVE | CHECK VALVE

These illustrations show the location of tapped holes. When placing an order please quote the letters in the above illustrations designating the location of the tapped holes. For more information see MSS-SP-45.

DRAIN & BYPASS DIMENSIONS



THREAD FOR CONNECTION TAPPING | SOCKET WELDING FOR CONNECTIONS | BOSSES FOR CONNECTIONS

Size of Valve		2" to 4"	5" to 8"	10" to 24"
Size of Tapping		1/2	3/4	1
Length of Thread	T	9/16	9/16	11/16
Minimum Diameter of Socket	A	7/8	1 1/16	1 5/16
Minimum Depth of Socket	B	3/16	1/4	1/4
Diameter of Boss	J	1 1/2	1 3/4	2 1/8

All dimensions given in inches

Bonney Forge valves can be equipped with by-passes which permit equalization of pressure on both sides of the valve. Unless otherwise specified the by-pass arrangement will be furnished on the side of the main valve. By-passes of other types can be made to order. Inquiries should give complete description or drawings.

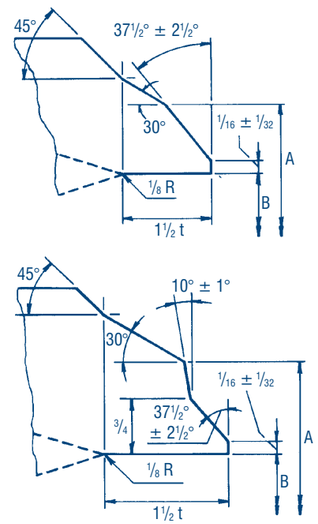
By-pass valves are "Bonney Forge" forged steel bolted-bonnet, outside screw and yoke, socket-weld end globe valves, and materials are suitable for the same service as the main valve.

BONNEY FORGE

ENGINEERING SPECIFICATIONS

BUTT-WELDING ENDS

ASME B 16.25



Figures refer to
ASME B 16-25

IMPORTANT: When ordering butt welding end valves please state the type of ends required and give the pipe dimensions or schedule number.

STD = Standard Wall Thickness
XS = Extra Strong Wall Thickness
XXS = Double Extra Strong Wall Thickness

All dimensions given in inches
Designations per ASME B 16.25

Nominal Pipe Size	Nominal Pipe OD	Schedule Number	Valve OD A	Nominal ID B	Wall Thickness of Pipe T
2 /12	2.875	40 80 160 XXS	2.875	0.203 0.276 0.375 0.552	2.469 20323 2.125 1.771
3	3.500	40 80 160 XXS	3 19/32	0.216 0.300 0.438 0.600	3.068 2.900 2.624 2.300
4	4.500	40 80 120 160 XXS	4 5/8	0.237 0.337 0.438 0.531 .0674	4.026 3.826 3.624 3.438 3.152
5	5.563	40 80 120 160 XXS	5 11/16	0.258 0.375 0.500 0.625 0.750	5.047 4.813 4.563 4.313 4.063
6	6.625	40 80 120 160 XXS	6 25/32	0.280 0.432 0.562 0.719 0.864	6.065 5.761 5.501 5.187 4.897
8	8.625	40 60 80 100 120 140 XXS 160	8 25/32	0.322 0.406 0.500 0.594 0.719 0.812 0.875 0.906	7.981 7.813 7.625 7.437 7.187 7.001 6.875 6.813
10	10.750	40 60 80 100 120 140 160	10 15/16	0.365 0.500 0.594 0.719 0.844 1.000 1.125	10.020 9.750 9.562 9.312 9.062 8.750 8.500
12	12.750	STD 40 XS 60 80 120 140 160	12 31/32	0.375 0.406 0.500 0.562 0.688 1.00 1.125 1.312	12.000 11.938 11.750 11.625 11.375 10.750 10.500 10.126
14	14.000	STD 40 XS 60 80 100 120 140 160	14 1/4	0.375 0.438 0.500 0.594 0.750 0.938 1.094 1.250 1.406	13.250 13.125 13.000 12.812 12.500 12.124 11.812 11.500 11.188
16	16.000	STD 40 60 80 100 120 140 160	16 1/4	0.375 0.500 0.656 0.844 1.031 1.219 1.438 1.594	15.250 15.000 14.688 14.312 13.938 13.562 13.124 12.812
18	18.000	40 60 80 100 120 140 160	18 9/32	0.562 0.750 0.938 1.156 1.375 1.562 1.781	16.876 16.500 16.124 15.688 15.250 14.876 14.438
20	20.000	40 60 80 100 120 140 160	20 5/16	0.594 0.812 1.031 1.281 1.500 1.750 1.969	18.812 18.376 17.938 17.438 17.000 16.500 16.062
24	24.000	30 40 60 80 100 120 140 160	24 3/8	0.562 0.688 0.969 1.219 1.531 1.812 2.062 2.344	22.876 22.624 22.062 21.562 20.938 20.376 19.876 19.312

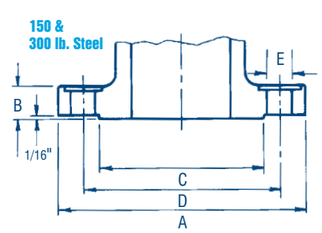
FLANGE DIMENSIONS ASME B 16.5 and MSS-SP-44

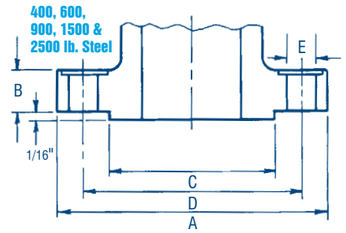
	Nominal Pipe Size	Flange Diameter A	Flange Thickness Companion Flange B	Flange Thickness Valve Flange B	Diameter of Raised Face C	Diameter of Bolt Circle D	Diameter of Bolt Holes E	Number of Bolts	Diameter of Bolts
ASME 150	1/2	3 1/2	7/16	-	1 3/8	2 3/8	5/8	4	1/2
	3/4	3 1/2	1/2	-	1 11/16	2 3/4	5/8	4	1/2
	1	4 1/2	9/16	7/16	2	3 1/8	5/8	4	1/2
	1 1/4	4 1/2	5/8	1/2	2 1/2	3 1/2	5/8	4	1/2
	1 1/2	5	11/16	9/16	2 7/8	3 7/8	5/8	4	1/2
	2	6	3/4	5/8	3 5/8	4 3/4	3/4	4	5/8
	2 1/2	7	7/8	11/16	4 1/8	5 1/2	3/4	4	5/8
	3	7 1/2	15/16	3/4	5	6	3/4	4	5/8
	3 1/2	8 1/2	15/16	13/16	5 1/2	7	3/4	8	5/8
	4	9	15/16		6 3/16	7 1/2	3/4	8	5/8
	5	10	15/16		7 5/16	8 1/2	7/8	8	3/4
	6	11	1		8 1/2	9 1/2	7/8	8	3/4
	8	13 1/2	1 1/8		10 5/8	11 3/4	7/8	8	3/4
	10	16	1 3/16		12 3/4	14 1/4	1	12	7/8
	12	19	1 1/4		15	17	1	12	7/8
	14	21	1 3/8		16 1/4	18 3/4	1 1/8	12	1
	16	23 1/2	1 7/16		18 1/2	21 1/4	1 1/8	16	1
	16	25	1 9/16		21	22 3/4	1 1/4	16	1 1/8
	20	27 1/2	1 11/16		23	25	1 1/4	20	1 1/8
	24	32	1 7/8		27 1/4	29 1/2	1 3/8	20	1 1/8
	26	34 1/4	1 3/8		29 1/2	31 3/4	1 5/8	24	1 1/4
	28	36 1/2	1 7/16		31 1/2	34	1 5/8	28	1 1/4
	30	38 3/4	1 9/16		33 3/4	36	1 5/8	28	1 1/4
	32	41 3/4	1 11/16		36	38 1/2	1 5/8	28	1 1/2
	34	43 3/4	1 7/8		38	40 1/2	1 5/8	32	1 1/2
	36	46	3 9/16		40 1/4	42 3/4	1 5/8	32	1 1/2
	38	48 3/4	3 7/16		42 1/4	45 1/4	1 5/8	32	1 1/2
	40	50 3/4	3 9/16		44 1/4	47 1/4	1 5/8	36	1 1/2
	42	53	3 13/16		47	49 1/2	1 5/8	36	1 1/2
ASME 300	1/2	3 3/4	9/16		1 3/8	2 5/8	5/8	4	1/2
	3/4	4 5/8	5/8		1 11/16	3 1/4	3/4	4	5/8
	1	4 7/8	1116		2	3 1/2	3/4	4	5/8
	1 1/4	5 1/4	3/4		2 1/2	3 7/8	3/4	4	5/8
	1 1/2	6 1/8	13/16		2 7/8	4 1/2	7/8	4	3/4
	2	6 1/2	7/8		3 5/8	5	3/4	8	5/8
	2 1/2	7 1/2	1		4 1/8	5 7/8	7/8	8	3/4
	3	8 1/4	1 1/8		5	6 5/8	7/8	8	3/4
	3 1/2	9	1 13/16		5 1/2	7 1/4	7/8	8	3/4
	4	10	1 1/4		6 3/16	7 7/8	7/8	8	3/4
	5	11	1 3/8		7 5/16	9 1/4	7/8	8	3/4
	6	12 1/2	1 7/16		8 1/2	10 5/8	7/8	12	3/4
	8	15	1 5/8		10 5/8	13	1	12	7/8
	10	17 1/2	1 7/8		12 3/4	15 1/4	1 1/8	16	1
	12	20 1/2	2		15	17 3/4	1 1/4	16	1 1/8
	14	23	2 1/8		16 1/4	20 1/4	1 1/4	20	1 1/8
	16	25 1/2	2 1/4		18 1/2	22 1/2	1 3/8	20	1 1/4
	16	28	2 3/8		21	24 3/4	1 3/8	24	1 1/4
	20	30 1/2	2 1/2		23	27	1 3/8	24	1 1/4
	24	36	2 3/4		27 1/4	32	1 5/8	24	1 1/2
	26	38 1/4	3 1/8		29 1/2	34 1/2	1 3/4	28	1 5/8
	28	40 3/4	3 3/8		31 1/2	37	1 3/4	28	1 5/8
	30	43	3 5/8		33 3/4	39 1/4	1 7/8	28	1 3/4
	32	45 1/4	3 7/8		36	41 1/2	2	28	1 7/8
	34	47 1/2	4		38	43 1/2	2	28	1 7/8
	36	50	4 1/8		40 1/4	46	2 1/8	32	2
	38	46	4 1/4		40 1/2	43	1 5/8	32	1 1/2
	40	48 3/4	4 1/2		42 3/4	45 1/2	1 3/4	32	1 5/8

The regular 1/16-inch raised face of 150 lb. flanges is included in the minimum flange thickness given, but other raised faces must be added thereto. The bolt holes, which are in multiples of four, are drilled to straddle the centerline unless otherwise ordered.

The regular 1/16-inch raised face of 300 lb. flanges is included in the minimum flange thickness given, but other raised faces must be added thereto. The bolt holes, which are in multiples of four, are drilled to straddle the centerline unless otherwise ordered.

End Flange dimensions comply with ASME B 16.5 and MSS-SP-44
All dimensions are in inches





	Nominal Pipe Size	Flange Diameter A	Flange Thickness	Diameter of Raised Face C	Diameter of Bolt Circle D	Diameter of Bolt Holes E	Number of Bolts	Diameter of Bolts
ASME 600	1/2	3 3/4	9/16	1 3/8	2 5/8	5/8	4	1/2
	3/4	4 5/8	5/8	1 11/16	3 1/4	3/4	4	5/8
	1	4 7/8	11/16	2	3 1/2	3/4	4	5/8
	1 1/4	5 1/4	13/16	2 1/2	3 7/8	3/4	4	5/8
	1 1/2	6 1/8	7/8	2 7/8	4 1/2	7/8	4	5/8
	2	6 1/2	1	3 5/8	5	3/4	8	5/8
	2 1/2	7 1/2	1 1/8	4 1/8	5 7/8	7/8	8	3/4
	3	8 1/4	1 1/4	5	6 5/8	7/8	8	3/4
	3 1/2	9	1 3/8	5 1/2	7 1/4	1	8	7/8
	4	10 3/4	1 1/2	6 3/16	8 1/2	1	8	7/8
	5	13	1 3/4	7 5/16	10 1/2	1 1/8	8	1
	6	14	1 7/8	8 1/2	11 1/2	1 1/8	12	1
	8	16 1/2	2 3/16	10 5/8	13 3/4	1 1/4	12	1 1/8
	10	20	2 1/2	12 3/4	17	1 3/8	16	1 1/4
	12	22	2 5/8	15	19 1/4	1 3/8	20	1 1/4
	14	23 3/4	2 3/4	16 1/4	20 3/4	1 1/2	20	1 3/8
	16	27	3	18 1/2	23 3/4	1 5/8	20	1 1/2
	18	29 1/4	3 1/4	21	25 3/4	1 3/4	20	1 5/8
	20	32	3 1/2	23	28 1/2	1 3/4	24	1 5/8
	24	37	4	27 1/4	33	2	24	1 7/8
	26	40	4 1/4	29 1/2	36	2	28	1 7/8
	28	42 1/4	4 3/8	31 1/2	38	2 1/8	28	2
	30	44 1/2	4 1/2	33 3/4	40 1/2	2 1/8	28	2
	32	47	4 5/8	36	42 1/2	2 3/8	28	2 1/4
	34	49	4 3/4	38	44 1/2	2 3/8	28	2 1/4
	36	51 3/4	4 7/8	40 1/4	47	2 5/8	28	2 1/2
ASME 900	3	9 1/2	1 1/2	5	7 1/2	1	8	7/8
	4	11 1/2	1 3/4	6 3/16	9 1/4	1 1/4	8	1 1/8
	5	13 3/4	2	7 5/16	11	1 3/8	8	1 1/4
	6	15	2 3/16	8 1/2	12 1/2	1 1/4	12	1 1/8
	8	18 1/2	2 1/2	10 5/8	15 1/2	1 1/2	12	1 3/8
	10	21 1/2	2 3/4	12 3/4	18 1/2	1 1/2	16	1 3/8
	12	24	3 1/8	15	21	1 1/2	20	1 3/8
	14	25 1/4	3 3/8	16 1/4	22	1 5/8	20	1 1/2
	16	27 3/4	3 1/2	18 1/2	24 1/4	1 3/4	20	1 5/8
	18	31	4	21	27	2	20	1 7/8
	20	33 3/4	4 1/4	23	29 1/2	2 1/8	20	2
	24	41	5 /12	27 1/4	35 1/2	2 5/8	20	2 1/2

The regular 1/4-inch raised face of 600 lb. flanges is not included in the minimum flange thickness given. The bolt holes, which are in multiples of four, are drilled to straddle the centerline unless otherwise ordered.

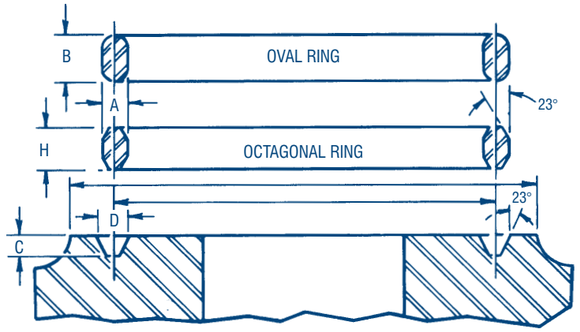
Use 1500 lb. dimensions in sizes smaller than 3-inch.

End Flange dimensions comply with ASME B 16.5 and MSS-SP-44
All dimensions are in inches

Engineering Specifications

RING JOINT FACINGS

ASME B 16.5 and B 16.20



Groove suitable for either Oval or Octagonal ring

	Nominal Pipe Size	Ring Number	Ring Width A	Oval Ring Height B	Groove Width D	Octagonal Ring Height H	Ring Joint Raised Face Diameter K	Groove Depth L	Ring & Groove Pitch Diameter P
150 LB.	1	R15	5/16	9/16	11/32	1/2	2 1/2	1/4	1 7/8
	1 1/4	R17	5/16	9/16	11/32	1/2	2 7/8	1/4	2 1/4
	1 1/2	R19	5/16	9/16	11/32	1/2	3 1/4	1/4	2 9/16
	2	R22	5/16	9/16	11/32	1/2	4	1/4	3 1/4
	2 1/2	R25	5/16	9/16	11/32	1/2	4 3/4	1/4	4
	3	R29	5/16	9/16	11/32	1/2	5 1/4	1/4	4 1/2
	4	R36	5/16	9/16	11/32	1/2	6 3/4	1/4	5 7/8
	5	R40	5/16	9/16	11/32	1/2	7 5/8	1/4	6 3/4
	6	R43	5/16	9/16	11/32	1/2	8 5/8	1/4	7 5/8
	8	R48	5/16	9/16	11/32	1/2	10 3/4	1/4	9 3/4
	10	R52	5/16	9/16	11/32	1/2	13	1/4	12
	12	R56	5/16	9/16	11/32	1/2	16	1/4	15
	14	R59	5/16	9/16	11/32	1/2	16 3/4	1/4	15 5/8
	16	R64	5/16	9/16	11/32	1/2	19	1/4	17 7/8
	18	R68	5/16	9/16	11/32	1/2	21 1/2	1/4	20 3/8
	20	R72	5/16	9/16	11/32	1/2	23 1/2	1/4	22
	24	R76	5/16	9/16	11/32	1/2	28	1/4	26 1/2
300, 600 LB.	1/2	R11	1/4	7/16	9/32	3/8	2	7/32	1 11/32
	3/4	R13	5/16	9/16	11/32	1/2	2 1/2	1/4	1 11/16
	1	R16	5/16	9/16	11/32	1/2	2 3/4	1/4	2
	1 1/4	R18	5/16	9/16	11/32	1/2	3 1/8	1/4	2 3/8
	1 1/2	R20	5/16	9/16	11/32	1/2	3 9/16	1/4	2 11/16
	2	R23	7/16	11/16	15/32	5/8	4 1/4	5/16	3 1/4
	2 1/2	R26	7/16	11/16	15/32	5/8	5	5/16	4
	3	R31	7/16	11/16	15/32	5/8	5 3/4	5/16	4 7/8
	4	R37	7/16	11/16	15/32	5/8	6 7/8	5/16	5 7/8
	5	R41	7/16	11/16	15/32	5/8	8 1/4	5/16	7 1/8
	6	R45	7/16	11/16	15/32	5/8	9 1/2	5/16	8 5/16
	8	R49	7/16	11/16	15/32	5/8	11 7/8	5/16	10 5/8
	10	R53	7/16	11/16	15/32	5/8	14	5/16	12 3/4
	12	R57	7/16	11/16	15/32	5/8	16 1/4	5/16	15
	14	R61	7/16	11/16	15/32	5/8	18	5/16	16 1/2
	16	R65	7/16	11/16	15/32	5/8	20	5/16	18 1/2
	18	R69	7/16	11/16	15/32	5/8	22 5/8	5/16	21
	20	R73	1/2	3/4	17/32	11/16	25	3/8	23
	24	R77	5/8	7/8	21/32	13/16	29 1/2	7/16	27 1/4

All dimensions are in inches

	Nominal Pipe Size	Ring Number	Ring Width A	Oval Ring Height B	Groove Width D	Octagonal Ring Height H	Ring Joint Raised Face Diameter K	Groove Depth L	Ring & Groove Pitch Diameter P
900 LB.	3	R31	7/16	11/16	15/32	5/8	6 1/8	5/16	4 7/8
	4	R37	7/16	11/16	15/32	5/8	7 1/8	5/16	5 7/8
	5	R41	7/16	11/16	15/32	5/8	8 1/2	5/16	7 1/8
	6	R45	7/16	11/16	15/32	5/8	9 1/2	5/16	8 5/16
	8	R49	7/16	11/16	15/32	5/8	12 1/8	5/16	10 5/8
	10	R53	7/16	11/16	15/32	5/8	14 1/4	5/16	12 3/4
	12	R57	7/16	11/16	15/32	5/8	16 1/2	5/16	15
	14	R62	5/8	7/8	21/32	13/16	18 3/8	7/16	16 1/2
	16	R66	5/8	7/8	21/32	13/16	20 5/8	7/16	18 1/2
	18	R70	3/4	1	25/32	15/16	23 3/8	1/2	21
	20	R74	3/4	1	25/32	15/16	25 1/2	1/2	23
	24	R78	1	1 5/16	1 1/16	1 1/4	30 3/8	5/8	27 1/4
1500 LB.	1/2	R12	5/16	9/16	11/32	1/2	2 3/8	1/4	1 9/16
	1/4	R14	5/16	9/16	11/32	1/2	2 3/8	1/4	1 3/4
	1	R16	5/16	9/16	11/32	1/2	2 13/16	1/4	2
	1 1/4	R18	5/16	9/16	11/32	1/2	3 3/16	1/4	2 3/8
	1 1/2	R20	5/16	9/16	11/32	1/2	3 5/8	1/4	2 11/16
	2	R24	7/16	11/16	15/32	5/8	4 7/8	5/16	3 3/4
	2 1/2	R27	7/16	11/16	15/32	5/8	5 3/8	5/16	4 1/4
	3	R35	7/16	11/16	15/32	5/8	6 5/8	5/16	5 3/8
	4	R39	7/16	11/16	15/32	5/8	7 5/8	5/16	6 3/8
	5	R44	7/16	11/16	15/32	5/8	9	5/16	7 1/8
	6	R46	1/2	3/4	17/32	11/16	9 3/4	3/8	8 5/16
	8	R50	5/8	7/8	21/32	13/16	12 1/2	7/16	10 5/8
	10	R54	5/8	7/8	21/32	13/16	14 5/8	7/16	12 3/4
	12	R58	7/8	1 1/8	29/32	1 1/16	17 1/4	9/16	15
	14	R63	1	1 5/16	1 1/16	1 1/4	19 1/4	5/8	16 1/2
	16	R67	1 1/8	1 7/16	1 3/16	1 3/8	21 1/2	11/16	18 1/2
	18	R71	1 1/8	1 7/16	1 3/16	1 3/8	24 1/8	11/16	21
	20	R75	1 1/4	1 9/16	1 5/16	1 1/2	26 1/2	11/16	23
	24	R79	1 3/8	1 3/4	1 7/16	1 5/8	31 1/4	13/16	27 1/4

All dimensions are in inches

STANDARD CLASS PRESSURE TEMPERATURE RATINGS

ASME B 16.34

Working Class by Pressures	Temperature, °F	A 216 WCB(a)	A 352 LCB(d)	A 216 WCC(a) A 352 LC2(d) A 352 LC3(d) A 352 LCC(e)	A 217 WC1(b) A 352 LC1(d)	A 217 WC4(h) A 217 WC5(i)	A 217 WC6(j)	A 217 WC9(j)	A 217 C5	A 217 C12	A 351 CF3(f) A 351 CF8	A 351 CF3M(g) A 351 CF8M	A 351 CF8C	A 351 CN7M(i)
		Working Pressures in PSI												
150 LB.	-20 to 100	285	265	290	265	290	290	290	290	290	275	275	275	230
	200	260	255	260	255	260	260	260	260	260	230	235	255	200
	300	230	230	230	230	230	230	230	230	230	205	215	230	180
	400	200	200	200	200	200	200	200	200	200	190	195	200	160
	500	170	170	170	170	170	170	170	170	170	170	170	170	150
	600	140	140	140	140	140	140	140	140	140	140	140	140	140
	650	125	125	125	125	125	125	125	125	125	125	125	125	125
	700	110	110	110	110	110	110	110	110	110	110	110	110	110
	750	95	95	95	95	95	95	95	95	95	95	95	95	95
	800	80	80	80	80	80	80	80	80	80	80	80	80	80
	850	65	65	65	65	65	65	65	65	65	65	65	65	-
	900	50	50	50	50	50	50	50	50	50	50	50	50	-
	950	35	35	35	35	35	35	35	35	35	35	35	35	-
	1000	20	20	20	20	20	20	20	20	20	20	20	20	-
	1050	-	-	-	-	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	-
	1100	-	-	-	-	-	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	-
	1150	-	-	-	-	-	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	20(1)	-
	1200	-	-	-	-	-	15(1)	15(1)	15(1)	20(1)	20(1)	20(1)	20(1)	-
	1250	-	-	-	-	-	-	-	-	-	20(1)	20(1)	20(1)	-
	1300	-	-	-	-	-	-	-	-	-	20(1)	20(1)	20(1)	-
	1350	-	-	-	-	-	-	-	-	-	20(1)	20(1)	20(1)	-
	1400	-	-	-	-	-	-	-	-	-	20(1)	20(1)	15(1)	-
	1450	-	-	-	-	-	-	-	-	-	20(1)	20(1)	10(1)	-
	1500	-	-	-	-	-	-	-	-	-	15(1)	15(1)	10(1)	-
300 LB.	-20 to 100	740	695	750	695	750	750	750	750	750	720	720	720	600
	200	680	660	750	660	750	750	750	750	750	600	620	660	520
	300	655	640	730	640	730	720	730	730	730	540	560	615	465
	400	635	615	705	615	705	695	705	705	705	495	515	575	420
	500	605	585	665	585	665	665	665	665	665	465	480	540	390
	600	570	550	605	550	605	605	605	605	605	440	450	515	360
	650	550	535	590	535	590	590	590	590	590	430	440	505	450
	700	530	510	555	510	570	570	570	570	570	420	435	495	445
	750	505	475	505	475	530	530	530	530	530	415	425	490	440
	800	410	390	410	390	510	510	510	510	510	405	420	485	430
	850	320	300	320	300	485	485	485	485	485	395	420	485	-
	900	230	200	225	200	450	450	450	375	450	390	415	450	-
	950	135	135	135	135	315	320	385	275	375	380	385	385	-
	1000	85	85	85	85	200	215	265	200	255	355	365	365	-
	1050	-	-	-	-	160	145	175	145	170	325	360	360	-
	1100	-	-	-	-	-	95	110	100	115	255	305	310	-
	1150	-	-	-	-	-	65	70	60	75	205	235	210	-
	1200	-	-	-	-	-	40	40	35	50	165	185	150	-
	1250	-	-	-	-	-	-	-	-	-	135	145	115	-
	1300	-	-	-	-	-	-	-	-	-	115	115	75	-
	1350	-	-	-	-	-	-	-	-	-	95	95	50	-
	1400	-	-	-	-	-	-	-	-	-	75	75	40	-
	1450	-	-	-	-	-	-	-	-	-	60	60	30	-
	1500	-	-	-	-	-	-	-	-	-	40	40	25	-

Working Class by Pressures	Temperature, °F	A 216 WCB(a)	A 352 LCB(d)	A 216 WCC(a) A 352 LC2(d) A 352 LC3(d) A 352 LCC(e)	A 217 WC1(b) A 352 LC1(d)	A 217 WC4(h) A 217 WC5(i)	A 217 WC6(j)	A 217 WC9(j)	A 217 C5	A 217 C12	A 351 CF3(f) A 351 CF8	A 351 CF3M(g) A 351 CF8M	A 351 CF8C	A 351 CN7M(i)
		Working Pressures in PSI												
600 LB.	-20 to 100	1480	1395	1500	1395	1500	1500	1500	1500	1500	1440	1440	1440	1200
	200	1360	1320	1500	1320	1500	1500	1500	1500	1500	1200	1240	1325	1035
	300	1310	1275	1455	1275	1455	1445	1455	1455	1455	1075	1120	1235	930
	400	1265	1230	1405	1230	1410	1385	1410	1410	1410	995	1025	1150	845
	500	1205	1175	1330	1175	1330	1330	1330	1330	1330	930	955	1085	780
	600	1135	1105	1210	1105	1210	1210	1210	1210	1210	885	900	1030	720
	650	1100	1065	1175	1065	1175	1175	1175	1175	1175	865	885	1015	900
	700	1060	1025	1110	1025	1135	1135	1135	1135	1135	845	870	995	890
	750	1015	955	1015	955	1065	1065	1065	1065	1065	825	855	985	880
	800	825	780	825	780	1015	1015	1015	1015	1015	810	845	975	865
	850	640	595	640	595	975	975	975	975	975	790	835	970	-
	900	460	405	445	405	900	900	900	745	900	780	830	900	-
	950	275	275	275	275	630	640	755	550	755	765	775	775	-
	1000	170	170	170	170	405	430	535	400	505	710	725	725	-
	1050	-	-	-	-	315	290	350	290	345	650	720	720	-
	1100	-	-	-	-	-	190	220	200	225	515	610	625	-
	1150	-	-	-	-	-	130	135	125	150	410	475	420	-
	1200	-	-	-	-	-	80	80	70	105	330	370	300	-
	1250	-	-	-	-	-	-	-	-	-	265	295	225	-
	1300	-	-	-	-	-	-	-	-	-	225	235	150	-
	1350	-	-	-	-	-	-	-	-	-	185	190	105	-
	1400	-	-	-	-	-	-	-	-	-	150	150	80	-
	1450	-	-	-	-	-	-	-	-	-	115	115	60	-
	1500	-	-	-	-	-	-	-	-	-	85	85	55	-
900 LB.	-20 to 100	2220	2090	2250	2090	2250	2250	2250	2250	2250	2160	2160	2160	1800
	200	2035	1980	2250	1980	2250	2250	2250	2250	2250	1800	1860	1985	1555
	300	1965	1915	2185	1915	2185	2165	2185	2185	2185	1615	1680	1850	1395
	400	1900	1845	2110	1845	2115	2080	2115	2115	2115	1490	1540	1730	1265
	500	1810	1760	1995	1760	1995	1995	1995	1995	1995	1395	1435	1625	1165
	600	1705	1655	1815	1655	1815	1815	1815	1815	1815	1325	1355	1550	1080
	650	1650	1600	1765	1600	1765	1765	1765	1765	1765	1295	1325	1520	1350
	700	1590	1535	1665	1535	1705	1705	1705	1705	1705	1265	1305	1490	1335
	750	1520	1430	1520	1430	1595	1595	1595	1595	1595	1240	1280	1475	1320
	800	1235	1175	1235	1175	1525	1525	1525	1525	1525	1215	1265	1460	1295
	850	955	895	955	895	1460	1460	1460	1460	1460	1190	1255	1455	-
	900	690	605	670	605	1350	1350	1350	1120	1350	1165	1245	1350	-
	950	410	410	410	410	945	995	1160	825	1130	1145	1160	1160	-
	1000	255	255	255	410	605	650	800	595	760	1065	1090	1090	-
	1050	-	-	-	255	475	430	525	430	515	975	1080	1080	-
	1100	-	-	-	-	-	290	330	300	340	770	915	935	-
	1150	-	-	-	-	-	195	205	185	225	615	710	625	-
	1200	-	-	-	-	-	125	125	105	155	495	555	455	-
	1250	-	-	-	-	-	-	-	-	-	400	440	340	-
	1300	-	-	-	-	-	-	-	-	-	340	350	225	-
	1350	-	-	-	-	-	-	-	-	-	280	290	155	-
	1400	-	-	-	-	-	-	-	-	-	225	225	125	-
	1450	-	-	-	-	-	-	-	-	-	175	175	95	-
	1500	-	-	-	-	-	-	-	-	-	125	125	80	-

STANDARD CLASS PRESSURE TEMPERATURE RATINGS

ASME B 16.34

Working Class by Pressures	Temperature, °F	A 216 WCB(a)	A 352 LCB(d)	A 216 WCC(a) A 352 LC2(d) A 352 LC3(d) A 352 LCC(e)	A 217 WC1(b) A 352 LC1(d)	A 217 WC4(h) A 217 WC5(i)	A 217 WC6(j)	A 217 WC9(j)	A 217 C5	A 217 C12	A 351 CF3(f) A 351 CF8	A 351 CF3M(g) A 351 CF8M	A 351 CF8C	A 351 CN7M(l)
		Working Pressures in PSI												
1500 LB.	-20 to 100	3705	3480	3750	3480	3750	3750	3750	3750	3750	3600	3600	3600	3000
	200	3395	3300	3750	3300	3750	3750	3750	3750	3750	3000	3095	3310	2590
	300	3270	3190	3640	3190	3640	3610	3640	3640	3640	2690	2795	3085	2330
	400	3170	3075	3520	3075	3530	3465	3530	3530	3530	2485	2570	2880	2110
	500	3015	2930	3325	2930	3325	3325	3325	3325	3325	2330	2390	2710	1945
	600	2840	2755	3025	2755	3025	3025	3025	3025	3025	2210	2255	2580	1800
	650	2745	2665	2940	2665	2940	2940	2940	2940	2940	2160	2210	2530	2250
	700	2665	2560	2775	2560	2840	2840	2840	2840	2840	2110	2170	2485	2225
	750	2535	2385	2535	2385	2660	2660	2660	2660	2660	2065	2135	2460	2200
	800	2055	1955	2055	1955	2540	2540	2540	2540	2540	2030	2110	2435	2160
	850	1595	1490	1595	1490	2435	2435	2435	2435	2435	1980	2090	2425	-
	900	1150	1010	1115	1010	2245	2245	2245	1870	2245	1945	2075	2245	-
	950	685	685	685	685	1575	1595	1930	1370	1885	1910	1930	1930	-
	1000	430	430	430	430	1010	1080	1335	995	1270	1770	1820	1820	-
	1050	-	-	-	-	790	720	875	720	855	1630	1800	1800	-
	1100	-	-	-	-	-	480	550	495	565	1285	1525	1560	-
	1150	-	-	-	-	-	325	345	310	375	1030	1185	1045	-
	1200	-	-	-	-	-	205	205	170	255	825	925	755	-
	1250	-	-	-	-	-	-	-	-	-	670	735	565	-
	1300	-	-	-	-	-	-	-	-	-	565	585	375	-
	1350	-	-	-	-	-	-	-	-	-	465	480	255	-
	1400	-	-	-	-	-	-	-	-	-	380	380	205	-
	1450	-	-	-	-	-	-	-	-	-	290	290	155	-
	1500	-	-	-	-	-	-	-	-	-	205	205	135	-

NOTE:
(1) For welding end valves only. Flanged end ratings terminate at 1000°F.

NOTES:
(a) Permissible, but not recommended for prolonged usage above about 800°F.
(b) Permissible, but not recommended for prolonged usage above about 850°F.
(d) Not to be used over 650°F.
(e) Not to be used over 700°F.
(f) Not to be used over 800°F.
(g) Not to be used over 850°F.
(h) Not to be used over 1000°F.
(i) Not to be used over 1050°F.
(j) Not to be used over 1100°F.
(l) Ratings apply for 300°F and lower.

GATE VALVE "O.S." & "Y"

1.0 Periodic Inspections

1.1 The valve stem packing should be inspected at least monthly. If the stem packing shows signs of leakage, simply tighten the adjusting nuts to compress the packing. Do not over-tighten the adjusting nuts as this will make operation of the valve more difficult. If, after tightening the adjusting nuts to their fullest extent, the leakage does not stop, it is then necessary to replace the stem packing. It is not recommended that additional packing rings be added to the stuffing box as this may cause damage to the stem sealing system. Please contact Bonney Forge or it's distributor for new stem packing sets. For packing replacement see paragraphs 2.2 and 2.3.

1.2 The lubrication of the yoke nut should be inspected at least monthly. A high pressure grease gun should be used for valves supplied with ball type grease fittings. For valves supplied with a Stauffer type grease cup, the cup should be checked to assure that it is full so that the grease can be injected by turning the screw cap. The valve stem threads should also be given a coating of lubricant.

1.3 Bonnet bolt tension should be checked periodically when valves are used in high temperature applications where creep may occur. Although leaks through ring joints are rare, erosion or corrosion could cause rings to fail. In these cases, a new ring gasket is required.

2.0 Extraordinary Maintenance or Replacement of Damaged Parts

2.1 Stem. If the stem locks or "freezes", causes can generally be attributed to worn packing, a dry yoke nut or dry stem threads. In either of these cases, the following service is required:

a*) Unscrew gland nuts, remove the gland flange and bushing to expose stem packing and lantern ring. Replace stem packing if it is damaged.
b) Check lubrication of yoke nut. If it is dry, remove the yoke nut and determine if there is evidence of seizure marks. If so, replace it with a new yoke nut. Also check the nut and stem threads.

2.2 Disassembly of Stem Packing.*

a) In those cases where the valve can not be removed from the piping system, it is important that prior to servicing, the valve be opened to its fullest extent. Partially unscrew nuts to reduce the compression load on the stuffing box. Remove the stem packing and then replace with new set(s) of packing. Finally, tighten nuts sufficiently while allowing the stem to operate smoothly.
b) To replace the stem when the valve is completely disassembled for general maintenance follow this procedure:
- Open the valve half way and remove bonnet bolts and nuts.
- Lift up the bonnet to remove the wedge.
- With the bonnet removed, unscrew the gland bolts and lift up the gland flange exposing the stem packing.
- Remove the stem packing.
- Remove the stem through the stuffing box.

*CAUTION: Always be sure that the valve is de-pressurized and isolated prior to performing any maintenance work.

GATE VALVE "O.S." & "Y" (CONTINUED)

2.3 The procedure to re-assembly the valve is as follows:
Re-insert the stem through the stuffing box taking special care to reassemble parts in sequence. Insert the remaining packing rings into the stuffing box and compress using the gland and flange. Then, reassemble nuts and tighten. Note, the stem must slide freely through the stuffing box without applying excessive force. Finally, install the bonnet gasket making sure it is not damaged. The gasket should be replaced if there is any question as to its performance.

2.4 Raise the bonnet, making sure the stem is in a half open position, then connect disc to stem. Lower bonnet on to the valve body making sure that the disc fits exactly into body guides and the bonnet gasket is properly seated. Align holes and tighten bonnet nuts taking care that excessive force is not used, possibly damaging the gasket. Hydrostatically test the valve to assure that there is no leakage.

2.5 Disassembly of yoke nut
When necessary use the following procedure for disassembling and replacing yoke nut:

a) direct hand-operated valves (handwheel)
- remove set screw;
- unscrew handwheel nut;
- remove handwheel;
- unscrew yoke nut retaining nut, removing spot welds if necessary;

Reverse the procedure for re-assembly.

b) bevel gear operated valves
- to remove the bevel gear from the valve, unscrew nuts and turn the handwheel in the open direction indicated by the arrow until the drive nuts are disengaged from the stem.
- to check the condition of the drive nut or bearing, unscrew the retainer ring and remove the drive nut and bearing. If damaged, a new drive nut or bearing is necessary.

2.6 Wedge and Seats
Leakage through seats and wedges is not always easy to spot when valves are in service. However, when leaks are identified, immediate action is necessary. Any delay can permanently damage seat or wedge seal surfaces.

To repair or replace wedges or seats, the valve must be removed from the line and the following procedure should be applied:
- make sure that the valve is not under pressure before unscrewing bonnet nuts;
- remove the bonnet, being careful not to damage the gasket;
- remove the bonnet when the wedge is in the half open position;
- lift up the bonnet until the wedge is disconnected from the guides;
- release the wedge from the stem.

If seat surfaces show signs of seizing, pitting, grooves or other defects not deeper that 0.8 mm (1/32") it is possible to repair seating surfaces to its original conditions by relapping the surface with line grain abrasive paste, creating a perfect tightness once again.

Defects having a depth exceeding 0.8 mm (1/32") cannot be repaired by lapping. In this case, parts must be replaced.

It is recommended that the face of the disc be blued to check for contact of seating surface after final lapping. For re-assembly of valves use the procedure outlined under para. 2.4.

GLOBE VALVE "O.S." & "Y"

1.0 Periodic Inspections

1.1 The valve stem packing should be inspected at least monthly. If the stem packing shows signs of leakage, simply tighten the adjusting nuts to compress the packing. Do not over-tighten the adjusting nuts as this will make operation of the valve more difficult. If, after tightening the adjusting nuts to their fullest extent, the leakage does not stop, it is then necessary to replace the stem packing. It is not recommended that additional packing rings be added to the stuffing box as this may cause damage to the stem sealing system. Please contact Bonney Forge or it's distributor for new stem packing sets. For packing replacement see paragraphs 2.2 and 2.3.

1.2 The lubrication of the yoke nut should be inspected at least monthly. A high pressure grease gun should be used for valves supplied with ball type grease fittings. For valves supplied with a Stauffer type grease cup, the cup should be checked to assure that it is full so that the grease can be injected by turning the screw cap. The valve stem threads should also be given a coating of lubricant.

1.3 Bonnet bolt tension should be checked periodically when valves are used in high temperature applications where creep may occur. Although leaks through ring joints are rare, erosion or corrosion could cause rings to fail. In these cases, a new ring gasket is required.

2.0 Extraordinary Maintenance or Replacement of Damaged Parts

2.1 Stem. If the stem locks or freezes, causes can generally be attributed to worn packing, a dry yoke nut or dry stem threads. In either of these cases, the following service is required:
a*) Unscrew gland nuts, remove gland flange and bushing to expose stem packing and lantern ring. Replace stem packing if it is damaged.
b) Check lubrication of yoke nut. If it is dry, remove the yoke nut and determine if there is evidence of seizure marks. If so, replace it with a new yoke nut. Also check the nut and stem threads.

2.2 Disassembly of Stem Packing.*
a) In those cases where the valve cannot be removed from the piping system, it is important that prior to servicing, the valve be opened to its fullest extent. Partially unscrew nuts to reduce the compression load on the stuffing box. Remove the stem packing and then replace with new set(s) of packing. Reassemble plug and gland flange. Finally, tighten nuts sufficiently while allowing the stem to operate smoothly.

b) To replace the stem when the valve is completely disassembled for general maintenance follow this procedure:
- Open the valve and remove the bonnet bolts and nuts.
- With the bonnet removed, unscrew the gland bolts and lift up the gland flange exposing the stem packing.
- Remove the stem packing.
- Remove handwheel, then turn stem to release it from yoke nut and remove from stuffing box.
- Check condition of back-seat bushing for seizure marks. If apparent, order replacement parts.

*CAUTION: Always be sure that the valve is de-pressurized and isolated prior to performing any maintenance work.

GLOBE VALVE "O.S." & "Y" (CONTINUED)

2.3 The procedure to re-assembling the valve is as follows:
Re-insert the stem through the stuffing box, taking special care to reassemble parts in sequence. Insert the remaining packing rings into the stuffing box and compress using the gland ring and flange. Then, reassemble nuts and tighten. Note, the stem must slide freely through the stuffing box without applying excessive force. Finally, install the bonnet gasket making sure it is not damaged. The gasket should be replaced if there is any question as to its performance.

2.4 Raise the bonnet assembly, making sure the stem is in the fully open position. Lower bonnet on to the valve body making sure that the disc fits exactly into body guides and the bonnet gasket is properly seated. Align holes and tighten bonnet nuts taking care that excessive force is not used, possibly damaging the gasket. Hydrostatically test the valve to assure that there is no leakage.

2.5 Disassembly of yoke nut
When necessary use the following procedure for disassembling and replacing yoke nut:

a) direct hand-operated valves (handwheel)
- remove set screw;
- unscrew handwheel nut;
- remove handwheel;
- unscrew yoke nut retaining nut, removing spot welds if necessary;
- Reverse the procedure for re-assembly.

b) bevel gear operated valves
- to remove the bevel gear from the valve, unscrew nuts and turn the handwheel in the open direction indicated by the arrow until the drive nuts are disengaged from the stem.
- to check the condition of the drive nut or bearing, unscrew the retainer ring and remove the drive nut and bearing. If damaged, a new drive nut or bearing is necessary.

2.6 Disc and Seats
Leakage through disc and seats is not always easy to spot when valves are in service. However, when leaks are identified, immediate action is necessary. Any delay can permanently damage seat or wedge seal surfaces.

To repair or replace the disc or seats, the valve must be removed from line, then use the following procedure:
- make sure that the valve is not under pressure before unscrewing bonnet nuts;
- remove bonnet, being careful not to damage the gasket;
- remove bonnet when disc is in full open position;
- lift up bonnet

If seat surfaces show signs of seizing, pitting, grooves or other defects not deeper that 1.5 mm (1/16") it is possible to repair seating surfaces to its original conditions by relapping the surface with line grain abrasive paste, creating a perfect tightness once again. Defects having a depth exceeding 1.5 mm (1/16") cannot be repaired by lapping. In this case, parts must be replaced.

It is recommended that the face of the disc be blued to check for contact of seating surface after final lapping. For re-assembly of valves use the procedure outlined under para. 2.4.

SWING CHECK VALVES

No periodic maintenance is necessary. If gasket leaks are detected, correct using the following procedure.

1 - Disassemble all cover bolts and nuts.

2 - For check valves in sizes 16" and larger, lift up the cover by using a lever inserted into the drilled and tapped cover hole. For valves in sizes 14" and smaller, use one or two bolts and nuts inserted into cover holes and, using adequate force, move the cover upwards.

3 - Check that the hinge, nut, and pin are in good condition and firmly connected. Replace damaged parts as necessary.

4 - Lift and remove the disc-hinge assembly. Movement should be free and not hindered by any malfunction of the hinge pin. Where disc travel is not sufficiently smooth, remove plugs or blind flanges and then remove hinge pin. Check surface for seizure marks. If marks are deeper than 1.5 mm (1/16"); re-machine hinge pin and re-assemble. If defect depth is greater than 1.5 mm (1/16") a new hinge pin is necessary. When reassembling hinge pin, it is recommended that the disc be removed by loosening nut.

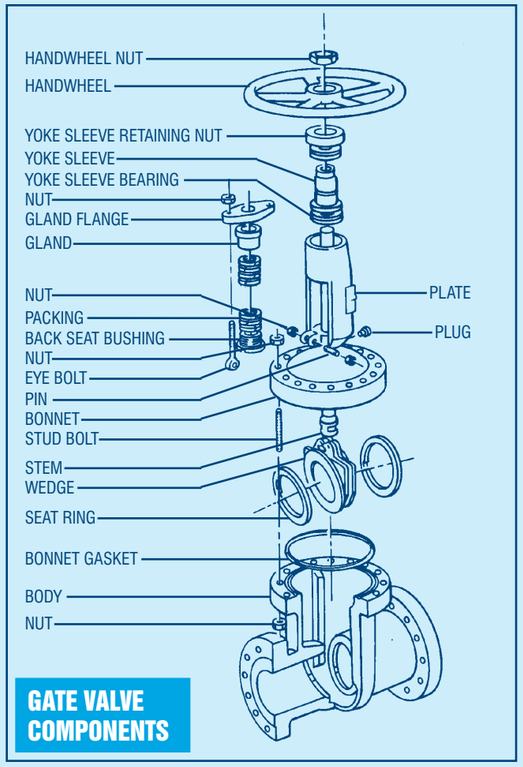
5 - When leakage is due to deterioration of seal surfaces caused by corrosion or foreign substances, it must be determined whether the disc or seat seal are the cause.

a) Deterioration of disc surfaces:
Disassemble disc by removing nut and washer. Repair surface by grinding and relapping using fine grain abrasive paste.

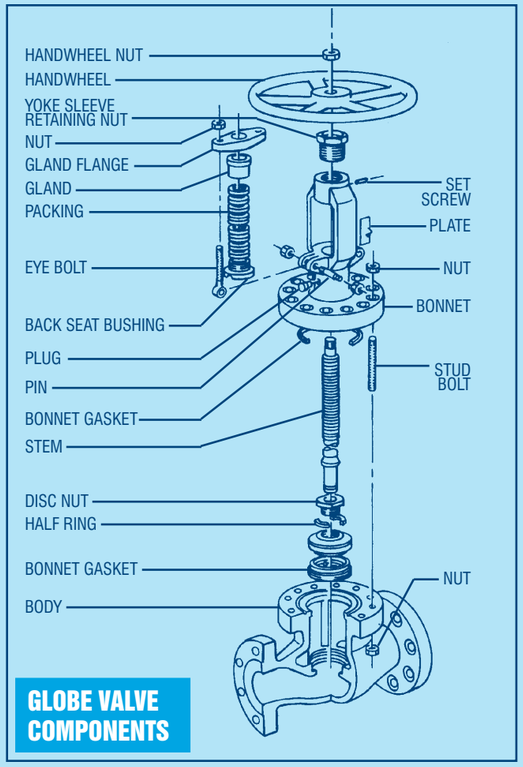
b) Deterioration of seat seal surfaces:
When seal surfaces are damaged and defects are confined to a small area but are not deeper than 0.8 mm (1/32"), the seal surface can be repaired. The recommended method is to use a cast iron strap with an outside diameter matching the valve's raceway. Then using a fine grain abrasive paste between the strap and raceway, it is rotated on the seat to restore original tightness. When defects are deeper than 0.8 mm (1/32") and found on the entire seal surface, a new seat is required. To replace the new seat, use preferably a pneumatic tool with a shape to match the dimensions of the valve seat. It is recommended that an anti seizing compound be used when installing the replacement seat to make threading it in to the body easier.

CAUTION: Always be sure that the valve is de-pressurized and isolated prior to performing any maintenance work.

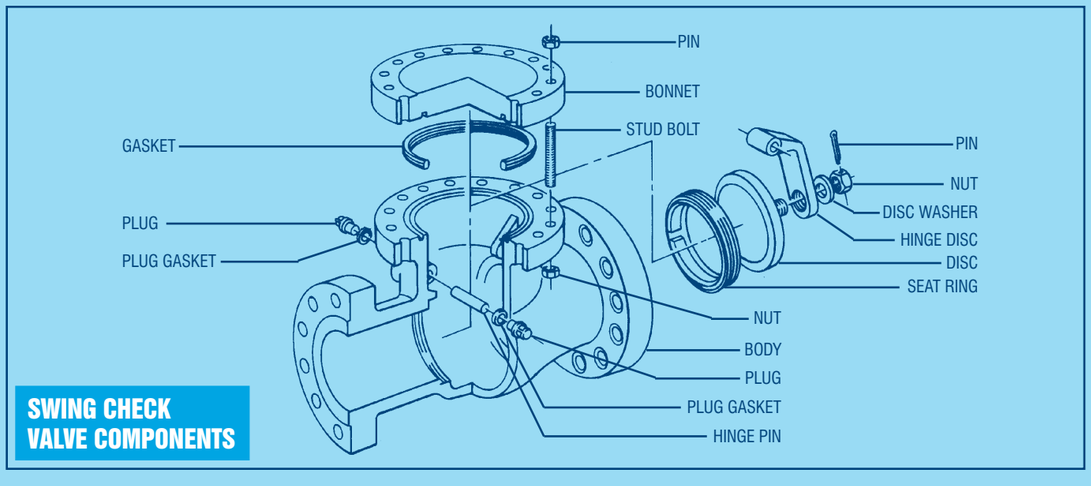
Storage, Installation And Maintenance Procedures



GATE VALVE COMPONENTS



GLOBE VALVE COMPONENTS



SWING CHECK VALVE COMPONENTS

Notes

Notes

GENERAL TERMS AND CONDITIONS OF SALE OF: BONNEY FORGE (HEREAFTER REFERRED TO AS "BF")

WARRANTY	All products are warranted to be free from manufacturing defects for a period of one (1) year from date of shipment, and any found to be defective within that period will be replaced without charge, provided (1) that the product was used as recommended and in accordance with approved installation and operating practices. (2) that its failure resulted from a manufacturing defect and not from damage due to corrosive, abrasive, or other wear normally to be expected in the services involved. (3) that the product was not modified or changed (unless written approval was give by BF), and (4) that written notice of such defect is delivered to BF during such one (1) year period. BF will not be responsible for any labor, equipment, engineering or related costs or liability associated with the replacement of a defective product. The Uniform Commercial Code shall not apply to the sale, nor the Michigan statutes adopting the Uniform Commercial Code. This express warranty is in lieu of and excludes all other warranties, guarantees, or representations, expressed or implied. There are no implied warranties of merchantability or of fitness for a particular purpose.
EXCLUSIONS	Do not use BF products in aircraft or aerospace applications. No warranties, guarantees or representations of any kind are made with respect to such applications. The Purchaser assumes all risks of any use is such applications and will indemnify and hold harmless BF against and from any claims, costs (including attorneys fees) and liabilities arising out of such use.
PURCHASER'S REMEDIES	The Purchaser's remedies with respect to any product furnished by BF hereunder that is found not to be in conformity with the terms and conditions of the contract because of breach of contract, breach of express or implied warranty, or negligence shall be limited exclusively to the right of replacement of such defective product or, at our option, repayment of our sale price of the product. In no event shall BF be liable for claims (based upon breach of contract, breach of express or implied warranty, or negligence) for any other damages, whether direct, immediate, foreseeable, consequential, or special or for any expenses incurred by reason of the use or misuse, sale or fabrication of products which do or do not conform to the terms and conditions of the contract.
PRICES	Prices, and other terms of sale and payment, are subject to change without notice. Unless a contrary provision appears in this price schedule, quotation or order acknowledgment, prices may be withdrawn without notice at any time. Stenographic or clerical errors are subject to correction.
ACCEPTANCE OF ORDERS	All orders are subject to BF credit department approval prior to acceptance by BF. No assignment of the Purchaser's rights may be made without the written consent of BF.
REMITTANCES	All accounts are payable in United States funds, free of exchange, collection or any other charges. If in the sole discretion of BF the financial condition of the Purchaser at any time so requires, BF retains the right to require full or partial payment in advance.
PARTIAL SHIPMENTS AND PAYMENTS	BF reserves the right to make partial shipments from time to time and to render invoices therefore which shall be due and payable as provided in said invoices and the paragraph entitled. "Remittances" if the Purchaser becomes overdue in any such partial payment, BF shall be entitled to suspend work and or avail itself of other legal remedies.
TAXES	Unless otherwise specifically noted, the amount of any sale, use , occupancy, excise tax or other tax, of any nature, federal, state, or local for which BF is legally liable, either initially or through failure of payment by Purchaser, shall be added or be in addition to the price quoted and Purchaser agrees to pay the same to BF.
SHORTAGES & DAMAGES IN TRANSIT	Claims for shortages must be made in writing within ten days after receipt of shipment, but loss of or damage to material in transit is the responsibility of the carrier.
DELAYS	All promises of shipment are estimated as closely as possible, and we will use our best efforts to ship within the time promised but do not guarantee to do so, and assume no liability for no doing so. Materials stated to be in stock are subject to prior sale.
CANCELLATION & SUSPENSION	The order or contract is subject to cancellation or instructions to suspend or delay work or delivery only upon receipt of written notification and with our consent, and upon agreement to pay BF's adjustment charge. Order's for special products (usually "price of application" items) may be changed and or cancelled only upon receipt of written instructions with a facit understanding and agreement to make payment for material used and work already performed.
RETURN OF MATERIAL	No product of our manufacture may be returned without written consent. All goods returned are subject to a handling charge plus freight in both directions and charges for any required reconditioning, unless otherwise specified in writing by BF.
PATENTS	The Purchaser will indemnify and hold harmless BF against and from any claims, costs (including attorneys fees) and liabilities arising out of any suit alleging infringement of any United States by any product supplied by BF under the contract and made in accordance with the design and or specification furnished by the Purchaser to BF.
GOVERNING LAW	The contract shall be governed by, construed, and enforced in accordance with the laws of the Commonwealth of Pennsylvania.
NO WAIVER	The failure of BF to insist, in any one or more instances upon the performance of any of the terms, covenants, or conditions of the contract or to exercise any right thereunder shall not be construed as a waiver or relinquishment of the future performance of any such term, covenant or condition or the future exercise of such rights, nor shall it be deemed to be a waiver or relinquishment of any other term, covenant, or condition or the exercise of any other rights under the contract.
DIES, TOOLS AND PATTERNS	Dies, tools and patterns required to produce the article quoted on shall remain the property of BF. Preparation charges for dies, tools and patterns represent only a portion of cost. Payment of such charge does not give you any right, title, or interest in such dies, tools, or other products of preparation. We will not be responsible for retention of dies or patterns on which no orders are received for two years or more.
FORCE MAJEURE	Any delays in or failure of performance of BF shall not constitute default or give rise to any claims for damages if and to the extent that such delay or failure is caused by occurrences beyond the control of BF, including but not limited to acts of God or the public enemy, expropriation or confiscation of facilities, compliance with any order or request of any governmental authority, acts of war, rebellion or sabotage or damage resulting therefrom, embargoes or other export restrictions, fires, floods, explosions, accidents, breakdowns, riots or strikes or other conceived acts of workmen, whether direct or indirect, or any other causes whether or not of the same class or kind as those specifically above named which are not within the control of BF and which by the exercise of reasonable diligence, BF, is unable to prevent or provide against.
PURCHASER'S ACCEPTANCE OF ABOVE CONDITIONS	The contract shall be subject to the terms and conditions contained or referred to in BF's price schedule, quotation or order acknowledgment and to no others whatsoever. No waiver, alteration, or modification of the terms and conditions in this price schedule, quotation or order acknowledgment shall be binding unless in writing and signed by an authorized representative of BF.

Note: The material in this catalog is for general information. For specific performance data and proper material selection, consult your Bonney Forge representative. Although every attempt has been made to ensure that the information contained in this catalog is correct, Bonney Forge reserves the right to change designs, materials or specifications without notice.

CVI 7.16 (1.5M)