

# CAST STEEL VALVES

GATE  
GLOBE  
SWING CHECK  
CRYOGENIC



**RPC Valve**

**SALES CENTER • WAREHOUSE**  
14496 Croghan Pike - Mount Union, PA 17066  
P: (800) 345-7546 | F: (814) 542-9977  
bfsales@bonneyforge.com



AN ISO 9001 CERTIFIED COMPANY  
WWW.BONNEYFORGE.COM | (800) 345-7546

**Bonney Forge cast steel valves are some of the highest quality products available in the industry...**

**...because they are cast with special industry leading requirements and tested above and beyond industry standard requirements.**



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## Bonney Forge Europe Bergamo, Italy



- API 602 Forged Valves
- Pressure Seal Valves
- API 6A Valves
- Floating Ball Valves
- Trunnion Ball Valves
- Double Block & Bleed Valves

## Bonney Forge Mount Union, PA



- Forged Elbows/Tees
- Forged Laterals/Crosses
- Forged Street Elbows
- Plugs/Bushings
- Couplings
- Reducer Inserts
- Unions
- Weldolet®
- Sockolet®
- Thredolet®
- Flexolet®
- Latrolet®
- Elbolet®
- Sweepolet®
- Brazolet®
- Coupolet®

## Bonney Forge Shanghai Shanghai, China



- API 594 Valves
- API 600 Valves
- API 623 Valves
- API 6D Valves

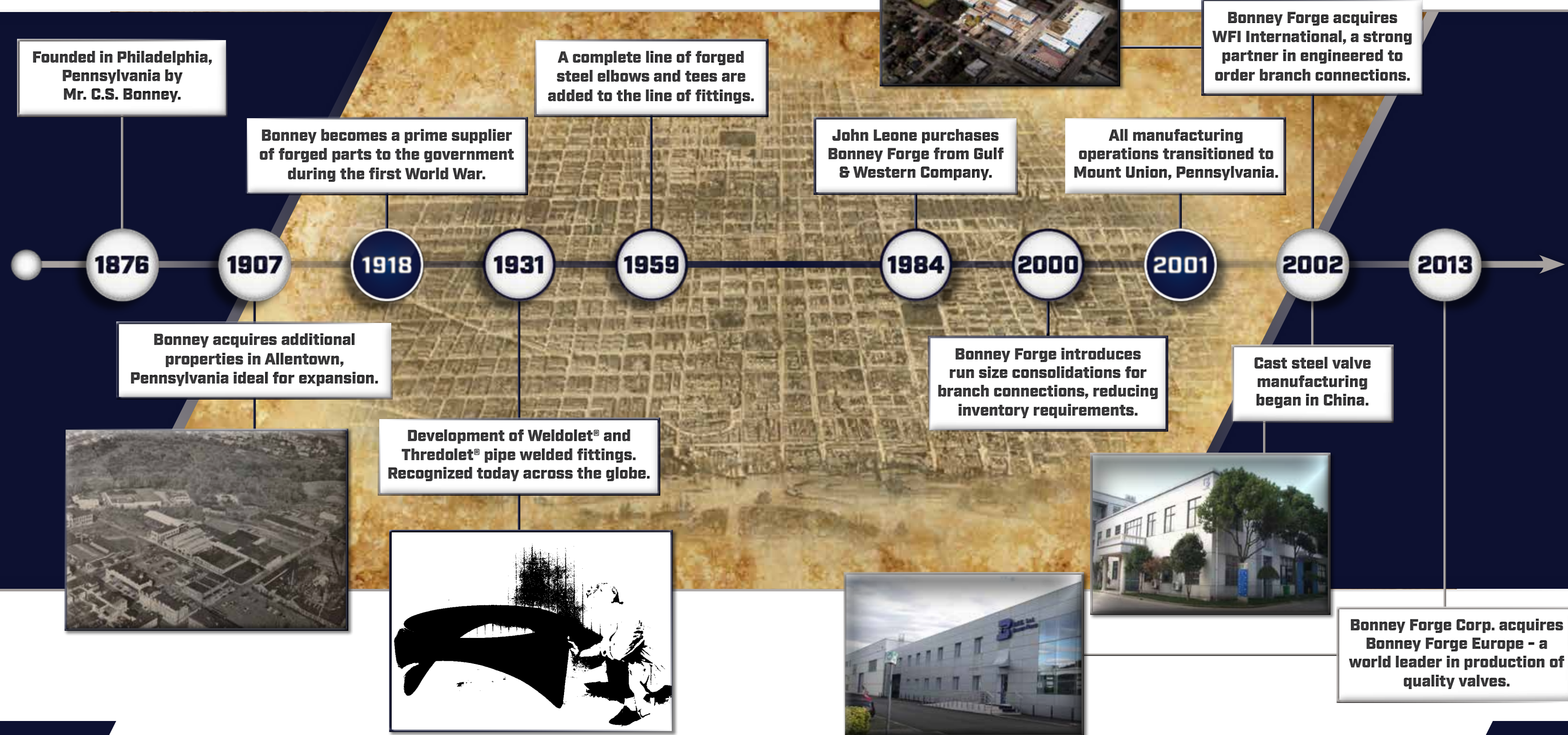
## WFI International Houston, TX



- Pipet®
- Bosset®
- Vesselet® (Insert Weldolet)
- Nozzelet®
- Flanges
- Swage Nipples
- Stub Ends
- Studding Outlet
- Safe End/Transition Piece
- Seamless Forged Specialty Tees
- Seamless Forged Wyes & Laterals

# HISTORY

Since 2002 Bonney Forge has been providing cast steel valves to the marketplace. We pride ourselves as being the industry leader in large bore cast steel valves, so we take care to review, test and evaluate applications that require special attention. Give us a call to see what we can provide for your application.



# QUALITY ASSURANCE

## QUALITY - DRIVEN, QUALITY - FOCUSED

Bonney Forge cast steel valves are manufactured and tested in strict accordance to ASTM, ASME, API, MSS, and other industry codes and standards as applicable.

Investment in a new 107,000 sq. ft. facility with modern machine, assembly, test and finishing equipment was required to supply product deserving of the Bonney Forge name.

With main engineering operations in the US, coupled with frequent technical visits ensuring casting quality, machine tool modernization, and processing, operations continue to meet the growing demand for quality Bonney Forge cast steel valves.



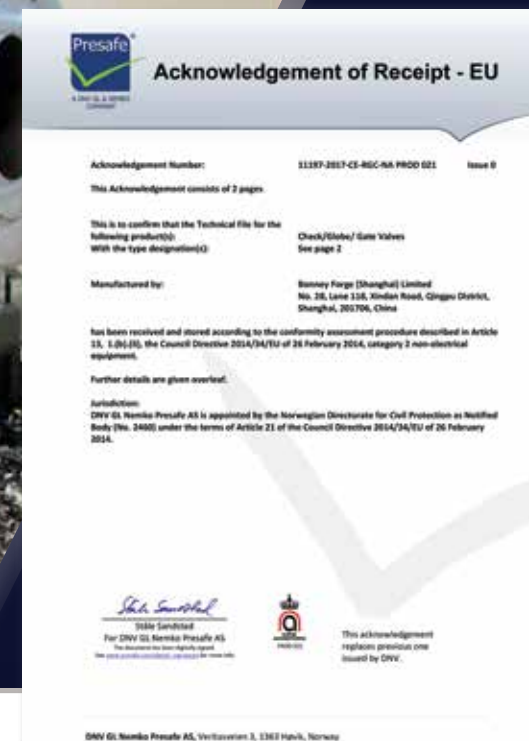
## MORE TESTING, LESS DEFECTS

Bonney Forge cast steel valves are subject to a unique program in the cast steel valve industry:

- ASME B16.34 Special Class testing of castings upon design
- Sample testing upon receipt of castings to ASME B16.34 Special Class NDE requirements
- Sample testing upon arrival at our state-of-the-art inventory center by a certified third party to ASME B16.34 Special Class NDE requirements

Providing a product that meets and exceeds industry standards is the Bonney Forge way. This testing program reinforces that; assuring our customers a quality product through and through.

Records are available upon request and reviewed on a case by case basis.



## CERTIFICATES

Bonney Forge Shanghai is a fully qualified manufacturing facility, and maintains the following certifications:

- ATEX Directive 2014/34/EU
- PED Directive 2014/68/EU
- ISO 9001
- EN ISO 3834-2
- AD 2000 Merkblatt HP 0

# BONNEY FORGE ECO-SEAL®

## LOW FUGITIVE EMISSIONS IS OUR STANDARD: IN EVERY VALVE

Bonney Forge developed low emissions valves with Bonney Forge Eco-Seal®. Eco-Seal packing is a true die-formed flexible graphite packing technology that exceeds API 622 2<sup>nd</sup> Edition requirements and has validated packing and valve performance with 3<sup>rd</sup> party test results of less than 50 ppm.

Bonney Forge low emissions valves meet the EPA's Enhanced LDAR consent decree requirements as a "Certified Low-Leak Valve Technology". All Bonney Forge cast steel valves are offered with Bonney Forge Eco-Seal® as a standard, meaning that Bonney Forge has made the commitment to low emissions valves, adding timely value to meet the consent decree requirements imposed by the EPA.



## QUALIFICATION PROGRAM

Extensive testing at a third party facility in Houston, TX was completed on fully assembled gate and globe valves (4" Class 300) from Bonney Forge inventory. Tests were carried out in accordance to API 622 2<sup>nd</sup> Edition with the following test protocol:

- 600 psig - Methane test pressure maintained from beginning to end of all testing
- 300 cycles - Thermal cycling at both room temperature and 500 °F, 150 cycles each
- 50 cycles - Method 21 leakage monitoring. Packing and valve operating torque checked at beginning and end of each ambient and 500 °F temperature cycles
- 10 sets - Number of cycle sets at room temperature and 500 °F, 5 sets each or 5 thermal cycles
- 10 cycles - Final cycles, after 1500 completed cycles, at room temperature
- 1510 - Total number of valves cycles (open/close)
- 1510 - Final leak test performed and packing and valve operation torque measurements
- No packing adjustments allowed
- Any leakage readings exceeding 100 ppm would have resulted in a failed test

## TEST RESULTS

Requirement for Gate & Globe Valves < 100 ppm

Gate Valve Leakage - Average 2 ppm

Globe Valve Leakage - Average 48 ppm



### CERTIFICATE

This is to certify that Bonney Forge Eco-Seal® packing was tested in a Standard Bonney Forge 4" 300# Carbon Steel Globe Valve in accordance with API 622 2nd Edition protocol. The valve was subjected to 1,510 mechanical cycle's total, and 5 thermal cycles. The valve packing measured less than 100 ppm throughout the duration of the test with no packing adjustments. The leakage data was recorded and signed off as in compliance with the maximum allowable leakage rates per API 622 2nd Edition Fugitive Emissions standards.

MANUFACTURER: Nippon Pillar™ - Osaka Japan  
LOCATION: United Valve - Houston, Texas  
CUSTOMER: Bonney Forge  
EQUIPMENT: Bonney Forge Eco-Seal® - 4" 300# Globe Valve  
TEST DATE: April 2, 2013 through April 7, 2013

James A. Nelson  
Engineer, I.E.  
United Valve

9916 Gulf Freeway, Houston, TX 77034  
(713) 944-9852, fax (713) 944-5964

### Fugitive Emission Test Report

API 624 1<sup>st</sup> Edition Standard

Performed for

**Bonney Forge**

2015

Bonney Forge 4" 600 SA WCB Globe Valve  
Made Per ASME B16.34/API 623  
Met Qualifications Set Forth In API 624 1<sup>st</sup> Edition Using  
Bonney Forge Eco-Seal  
Work Order: 89690  
Start Date: May 28, 2015  
End Date: June 2, 2015

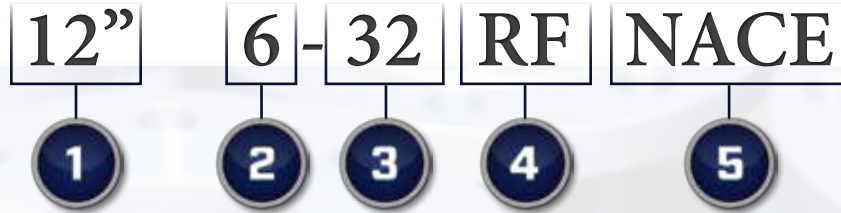
Performed by

**United Valve, LLC**

9916 Gulf Freeway  
Houston, TX 77034  
Phone: 713-944-9852  
Fax: 713-944-5964  
[www.unitedvalve.com](http://www.unitedvalve.com)

# HOW TO ORDER

Use the following description to specify valve products



Please specify

1. Valve size
2. Pressure class code from Section A
3. Valve type code (*first digit*) from Section B (eg. 3)  
Material code (*second digit*) from Section C (eg. 2)
4. End connection code from Section D (eg. RF)
5. Special requirements from Section F (eg. NACE)

## SECTION A - 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
25	Bolted Bonnet	CLASS 2500

1. Pressure seal bonnets shall be indicated by having the pressure class suffixed by "PS" (e.g. 15PS)

## SECTION B - VALVE TYPE

1	Gate Valve
3	Globe Valve
6	Swing Check Valve

## SECTION C - MATERIAL

1	A216 WCB	13Cr Trim, API Trim #8
2	A216 WCB	13Cr Trim, API Trim#5
3	A216 WCB	18Cr-8Ni Trim, API Trim #12
4	A216 WCB	Ni-Cu Alloy (MONEL), API Trim #9
5	A217 WC9	13Cr Trim, API Trim #8
6	A217 C5	13Cr Trim, API Trim #8
7	A351 CF8	18Cr-8Ni Trim, API Trim #2
8	A351 CF8M	18Cr-8Ni Trim, API Trim #10
8S	A351 CF8M	18Cr-8Ni Trim, API Trim #12
9	A217 WC6	13Cr Trim, API Trim #8
0	OTHER	Please Specify ( <i>Per Section E</i> )

## SECTION D - END CONNECTION

RF	Raised Face Flange
RTJ	Ring Type Flange
BW	Butt Weld ( <i>Please Specify Pipe Schedule</i> )
UM	Unmachined Flange

## SECTION E - OTHER MATERIALS

C12	A217 C12	9Cr-1Mo Steel
CA15	A217 CA15	13Cr-1/2Mo Steel
LCB/LCC	A352 LCB	Low Temp Carbon Steel
CF3	A351 CF3	304L Stainless Steel

Note: Other Body/Bonnet or trim materials available upon request

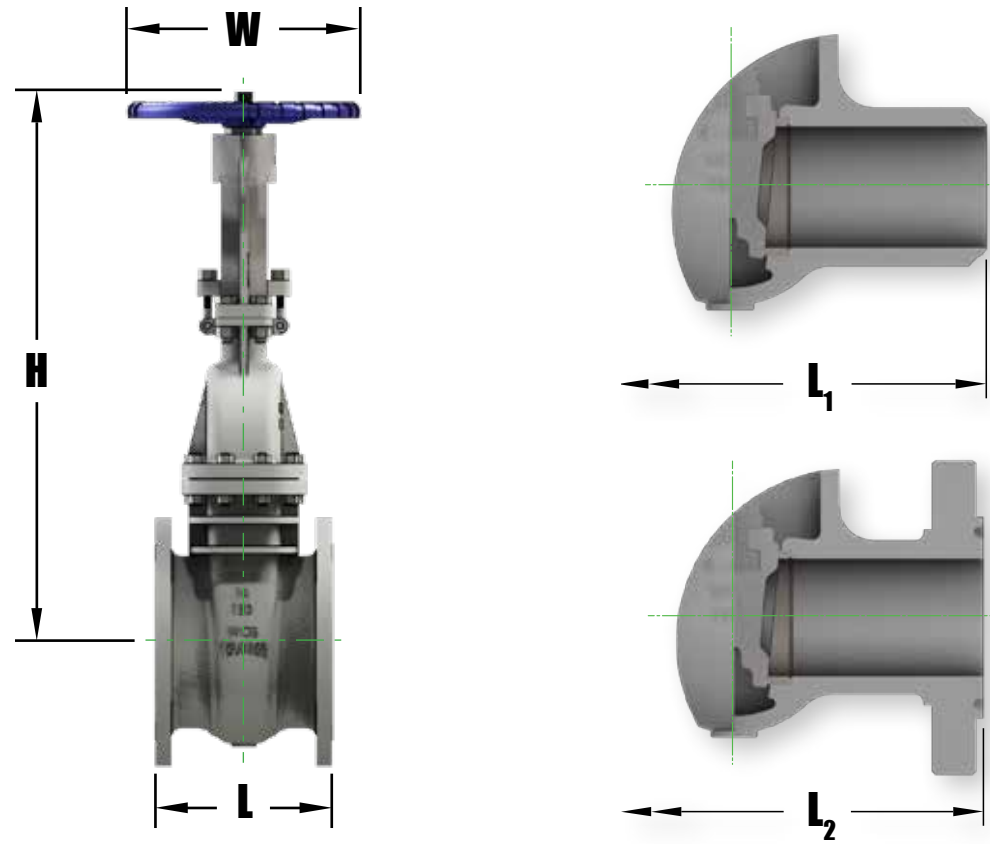
## SECTION F - SPECIAL REQUIREMENTS

BG	Bevel Gear Operator
CWO	Chainwheel Operated
CRY	Cryogenic Bonnet
MO	Electric Motor Operator
NACE	NACE Requirements Per MRO103

Note: List as a suffix any other requirement not on this list, as an abbreviation if possible

# GATE VALVE

## CLASS 150



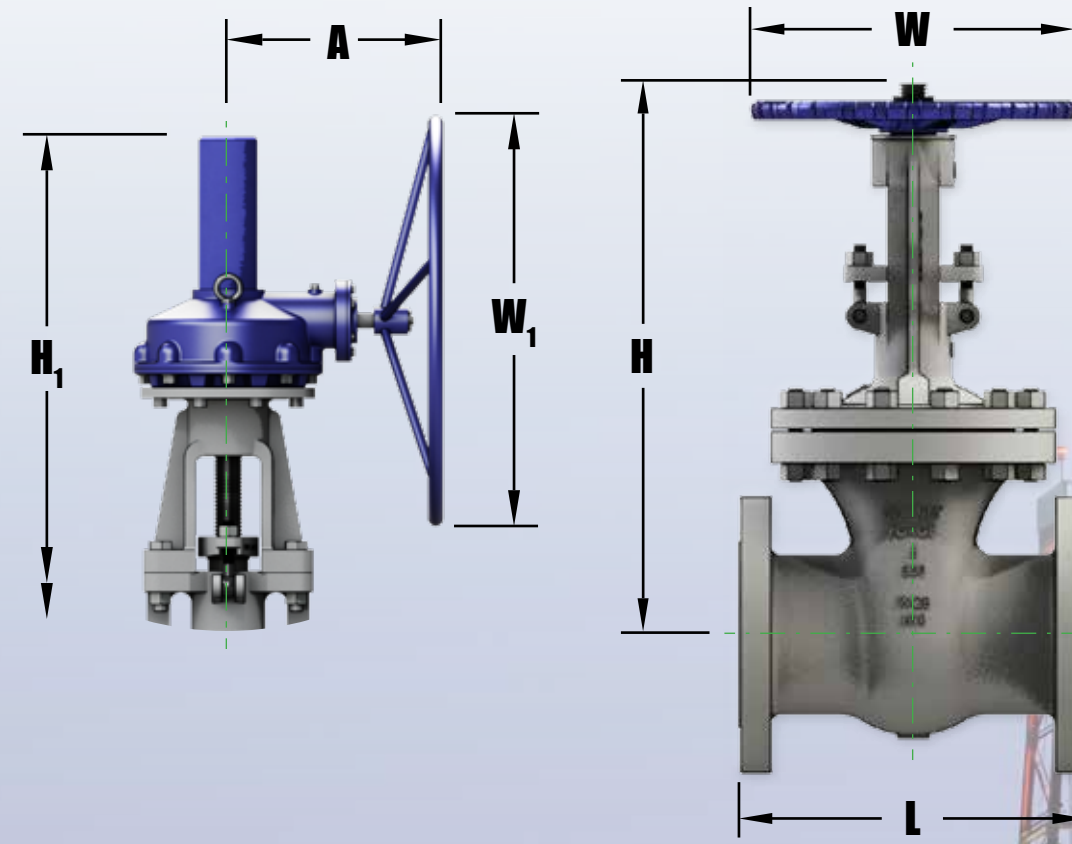
Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	7	8 ½	7 ½	8	-	16 15/16	-	-	40	39 ½	-	-
NPS 3	8	11 ½	8 ½	10	-	20 ½	-	-	80	66	-	-
NPS 4	9	12	9 ½	10	-	23 ¾	-	-	117	97	-	-
NPS 6	10 ½	15 ¾	11	12	-	29 15/16	-	-	185	168	-	-
NPS 8	11 ½	16 ½	12	14	12	39 3/16	42 ½	8 1/4	306	278	355	326
NPS 10	13	18	13 ½	16	12	45 ¾	50 ¾	8 1/4	443	395	518	439
NPS 12	14	19 ¾	14 ½	20	12	53 ¼	59 7/16	8 1/4	597	668	750	712
NPS 14	15	22 ½	15 ½	20	12	60 7/16	63 ½	14 3/16	948	878	992	922
NPS 16	16	24	16 ½	24	12	71 5/16	70 7/8	14 3/16	1,208	1,122	1,252	1,166
NPS 18	17	26	17 ½	25	18 ½	79 3/16	79 ¼	14 3/16	1,640	1,565	1,640	1,632
NPS 20	18	28	18 ½	26	18 ½	87 13/16	85 13/16	16 3/16	2,463	2,374	2,529	2,441
NPS 24	20	32	20 ½	30	24	104	100 13/16	16 3/16	3,232	3,144	3,298	3,210
NPS 30	26	36	26 ½	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 36	32	40	32 ½	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV

TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Nut	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
NPS 2	309	60	81	20	27	
NPS 3	705	60	81	22	30	
NPS 4	1307	60	81	25	34	
NPS 6	3090	60	81	44	60	
NPS 8	5706	115	156	47	64	
NPS 10	8936	115	156	50	68	
NPS 12	13351	200	271	67	91	
NPS 14	16277	200	271	90	122	
NPS 16	21534	320	434	92	125	
NPS 18	28682	490	664	109	148	
NPS 20	35759	490	664	143	199	
NPS 24	52255	725	983	185	251	
NPS 30	IFV	IFV	IFV	IFV	IFV	
NPS 36	IFV	IFV	IFV	IFV	IFV	

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

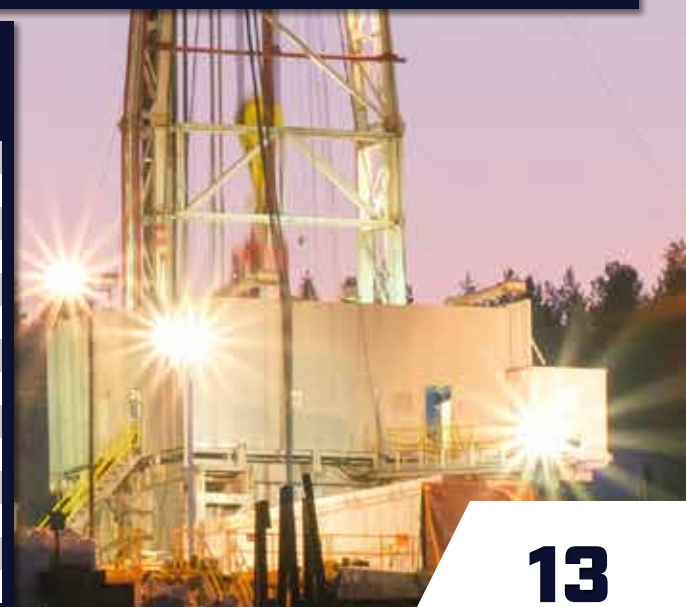
# GATE VALVE

## CLASS 300



Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	8 ½	8 ½	9 ½	7 ¾	-	16 15/16	-	-	62	48 ½	-	-
NPS 3	11 ½	11 ½	11 ¾	9 ¾	-	21 7/8	-	-	112	88	-	-
NPS 4	12	12	12 5/8	9 ¾	-	24 7/16	-	-	172	132 ¼	-	-
NPS 6	15 ¾	15 ¾	16 ¼	13 ¾	12	31 11/16	32 7/8	8 1/4	317	249	366	297 ½
NPS 8	16 ½	16 ½	17 ½	15 ¾	12	39 9/16	40 ¾	8 1/4	480	403 ½	551	452
NPS 10	18	18	18 5/8	17 11/16	12	48 7/16	50 3/16	8 1/4	705 ½	600	761	630 ½
NPS 12	19 ¾	19 ¾	20 3/8	19 11/16	18 ½	57 11/16	57 7/8	10 ½	990	789	1,063	860
NPS 14	30	30	30 5/8	25 3/16	18 ½	62	64 3/16	14 3/16	1,530	1,270	1,889	1,629
NPS 16	33	33	33 5/8	25 3/16	18 ½	69 3/16	71 7/16	14 3/16	2,381	2,061	2,584	2,264
NPS 18	36	36	32 5/8	26 ¾	21 ¼	77 11/16	79 3/16	14 3/16	2,723	2,324	3,270	2,870
NPS 20	39	39	39 ¾	29 15/16	21 ¼	85 5/16	87 7/8	16 3/16	3,649	3,159	4,081	3,591
NPS 24	45	45	45 7/8	35 7/16	24	111 11/16	105	16 3/16	5,115	4,330	5,807	5,022
NPS 30	55	55	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 36	68	68	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV

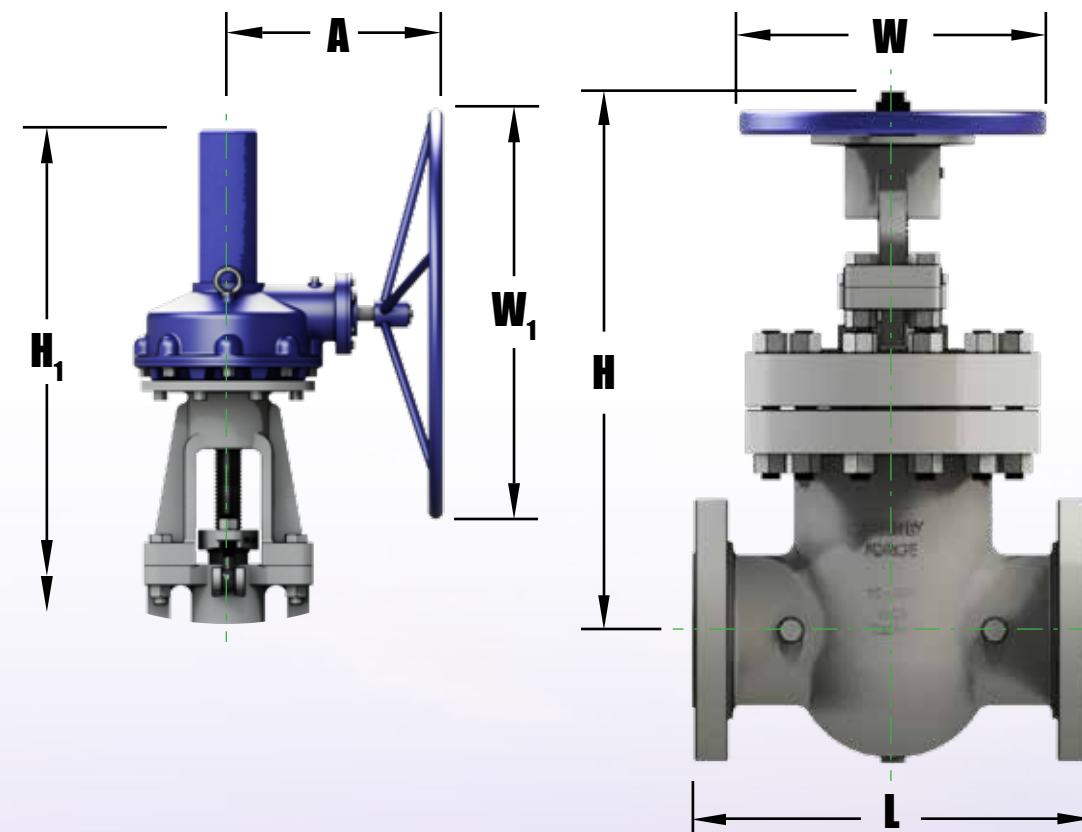
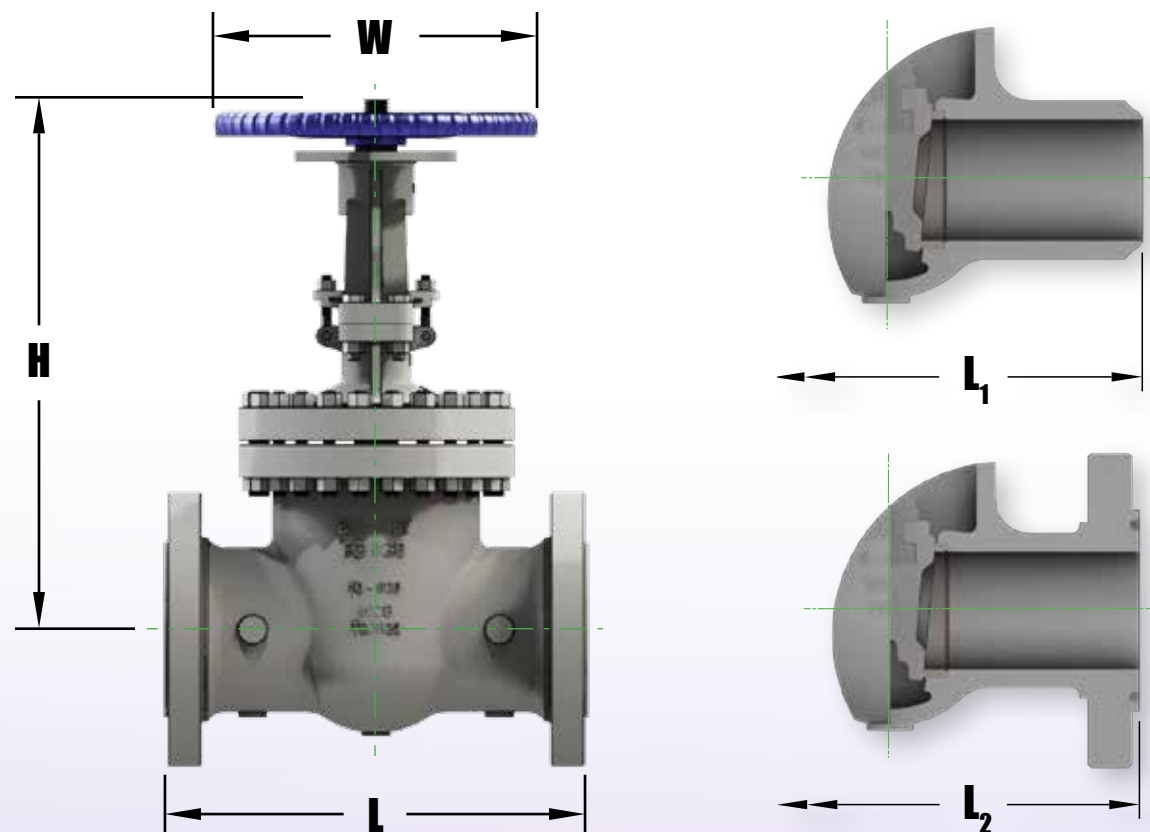
TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Nut	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
NPS 2	309	60	81	20	27	
NPS 3	705	115	156	22	30	
NPS 4	1307	115	156	25	34	
NPS 6	3090	200	271	49	66	
NPS 8	5706	320	434	50	68	
NPS 10	8936	200	271	67	91	
NPS 12	13351	320	434	90	122	
NPS 14	16277	320	434	92	125	
NPS 16	21534	490	664	119	161	
NPS 18	27889	725	983	143	194	
NPS 20	34837	725	983	154	209	
NPS 24	51049	1,800	2,440	236	320	
NPS 30	IFV	IFV	IFV	IFV	IFV	
NPS 36	IFV	IFV	IFV	IFV	IFV	





# GATE VALVE

## CLASS 600



## CLASS 900

# GATE VALVE

Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	11 1/2	11 1/2	11 5/8	9 7/8	-	18 5/16	-	-	90.5	75	-	-
NPS 3	14	14	14 1/8	9 7/8	-	22	-	-	159	128	-	-
NPS 4	17	17	17 1/8	13 3/4	-	27	-	-	282	218	-	-
NPS 6	22	22	22 1/8	17 11/16	12	36 3/16	45 1/2	9 7/16	586	461	635	509
NPS 8	26	26	26 1/8	19 11/16	18 1/8	44 11/16	56 11/16	10 1/4	924	741	990	807
NPS 10	31	31	31 1/8	23 3/8	24	48 15/16	62 7/16	12 1/2	1,662	1,358	1,773	1,468
NPS 12	33	33	33 1/8	25 3/16	24	56 11/16	72 3/16	12 1/2	2,163	1,808	2,273	1,918
NPS 14	35	35	35 1/8	26 3/4	24	63 11/16	80 3/8	12 1/2	2,805	2,383	3,042	2,621
NPS 16	39	39	39 1/8	IFV	24	71 1/2	90 15/16	16 1/8	IFV	IFV	3,686	3,051
NPS 18	43	43	43 1/8	IFV	IFV	78 1/2	IFV	IFV	IFV	IFV	IFV	IFV
NPS 20	47	47	47 1/4	IFV	31 1/2	88 7/16	112	28 3/16	IFV	IFV	8,702	IFV
NPS 24	55	55	55 3/8	IFV	31 1/2	105 13/16	132 3/8	26 3/16	IFV	IFV	9,437	IFV

Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	IFV	IFV	IFV	IFV	-	IFV	-	-	IFV	IFV	-	-
NPS 3	15	15	15 1/8	13 3/4	-	23 3/4	-	-	250	IFV	-	-
NPS 4	18	18	18 1/8	18 1/8	-	26 3/16	-	-	350	IFV	-	-
NPS 6	24	24	24 1/8	23 3/8	IFV	39 3/16	IFV	IFV	1,410	IFV	IFV	IFV
NPS 8	29	29	29 1/8	25 3/16	27 15/16	45 1/16	54 11/16	18 9/16	1,433	IFV	1,549	IFV
NPS 10	33	33	33 1/8	25 3/16	27 15/16	56 5/16	68 5/16	23 1/4	2,579	IFV	2,395	IFV
NPS 12	38	38	38 1/8	28 3/8	31 1/2	60 13/16	76 1/2	25 1/4	2,880	IFV	2,896	IFV

Valve Size	C <sub>v</sub>	Torque			
		Body / Bonnet		Gland Nut	
		(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
NPS 2	309	115	156	20	27
NPS 3	705	115	156	30	41
NPS 4	1307	200	271	44	60
NPS 6	3090	490	664	80	109
NPS 8	5706	490	664	90	122
NPS 10	8620	490	664	110	149
NPS 12	12800	725	983	143	194
NPS 14	15366	1,350	1,830	183	248
NPS 16	20209	1,800	2,440	193	262
NPS 18	IFV	IFV	IFV	199	270
NPS 20	IFV	2,781	3,770	266	361
NPS 24	IFV	2,781	3,770	347	471

Valve Size	C <sub>v</sub>	Torque			
		Body / Bonnet		Gland Nut	
		(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
NPS 2	IFV	IFV	IFV	IFV	IFV
NPS 3	649	200	271	47	64
NPS 4	1231	320	434	47	64
NPS 6	2851	725	983	91	123
NPS 8	5052	1,350	1,830	98	133
NPS 10	7844	2,210	2,996	151	205
NPS 12	11464	IFV	IFV	185	251

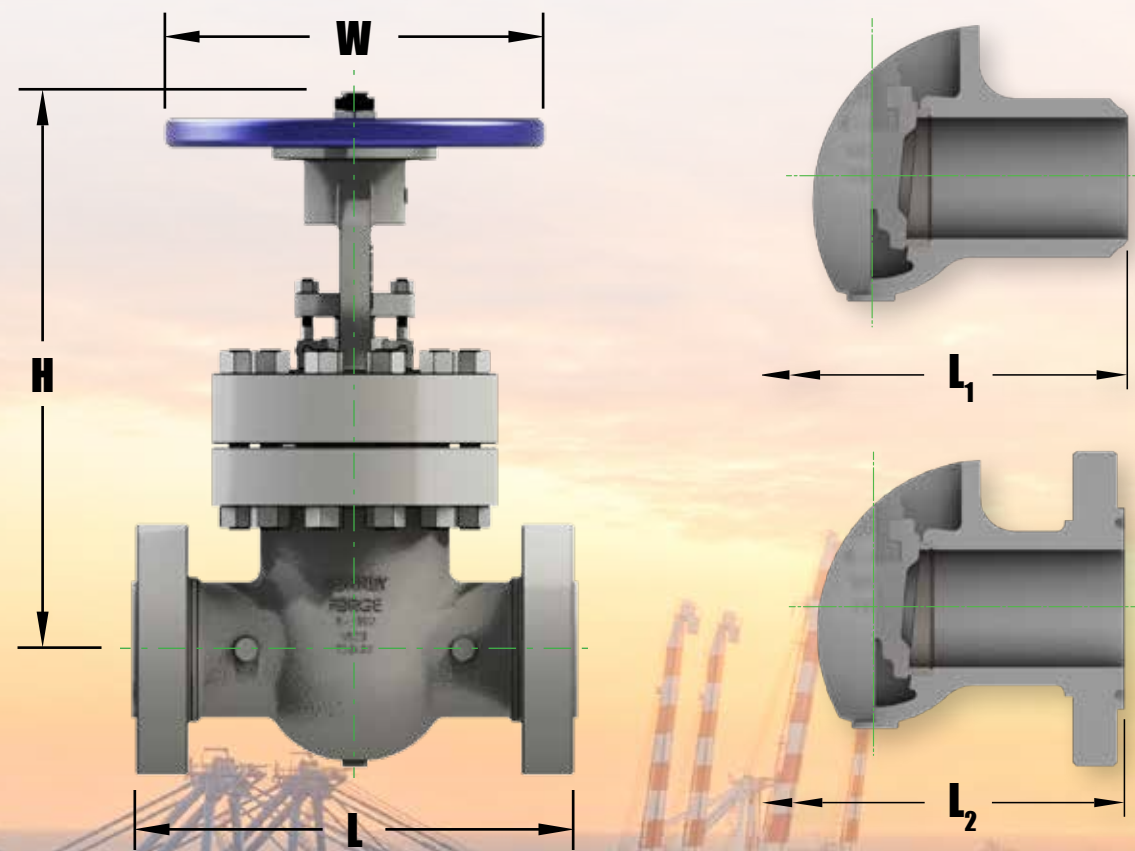
- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

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- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge



# GATE VALVE

## CLASS 1500



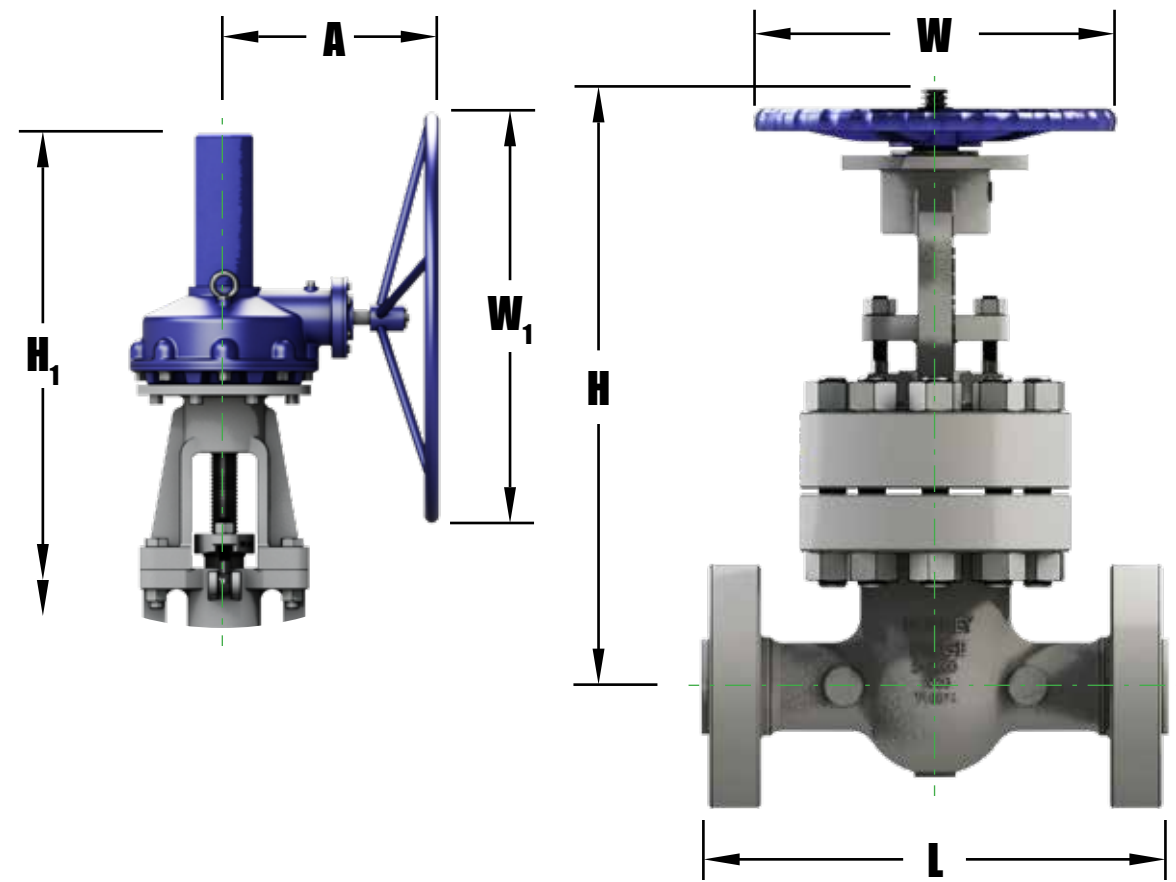
Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	14 ½	14 ½	14 ⅝	13 13/16	-	27 ⅞	-	-	205	-	-	-
NPS 3	18 ½	18 ½	18 ⅝	15 ¾	-	30 5/16	-	-	350	-	-	-
NPS 4	21 ½	21 ½	21 ⅝	19 11/16	-	34 5/16	-	-	585	-	-	-
NPS 6	27 ¾	27 ¾	28	23 ⅜	IFV	41 5/16	IFV	IFV	1,300	IFV	IFV	IFV
NPS 8	32 ¾	32 ¾	33 ⅝	25 3/16	27 15/16	51 1/16	63 ½	18 11/16	2,405	IFV	2,525	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 12	44 ½	44 ½	45 ⅝	IFV	24	IFV	85 ⅜	25 13/16	IFV	IFV	5,955	IFV

Valve Size	C <sub>v</sub>	Torque			
		Body / Bonnet		Gland Bolt	
		(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
NPS 2	268	320	434	30	41
NPS 3	596	320	434	47	64
NPS 4	1064	725	983	67	91
NPS 6	2511	1,350	1,830	91	123
NPS 8	IFV	2,198	2,980	151	205
NPS 10	IFV	IFV	IFV	232	315
NPS 12	IFV	IFV	IFV	255	346

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

## CLASS 2500

# GATE VALVE



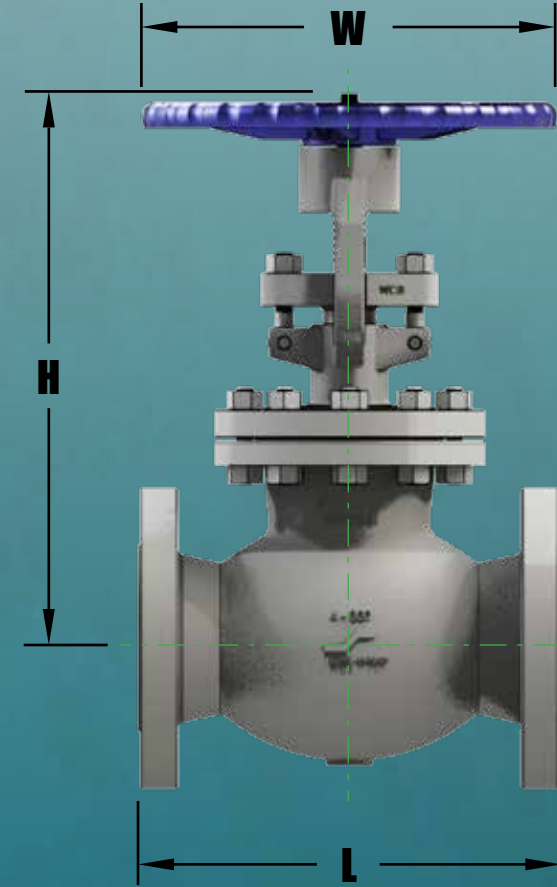
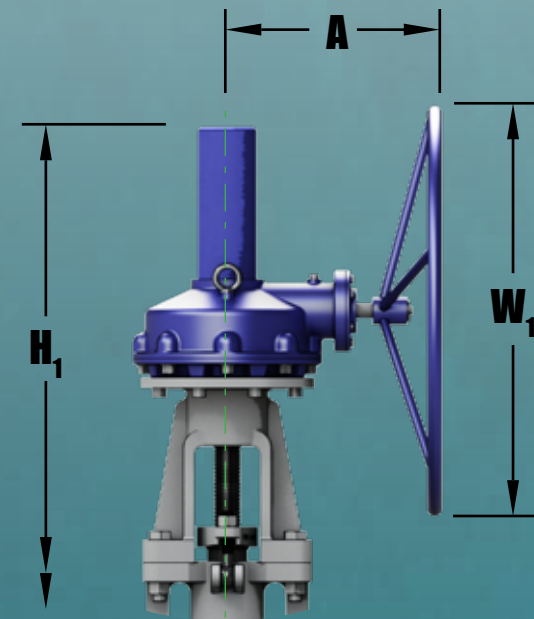
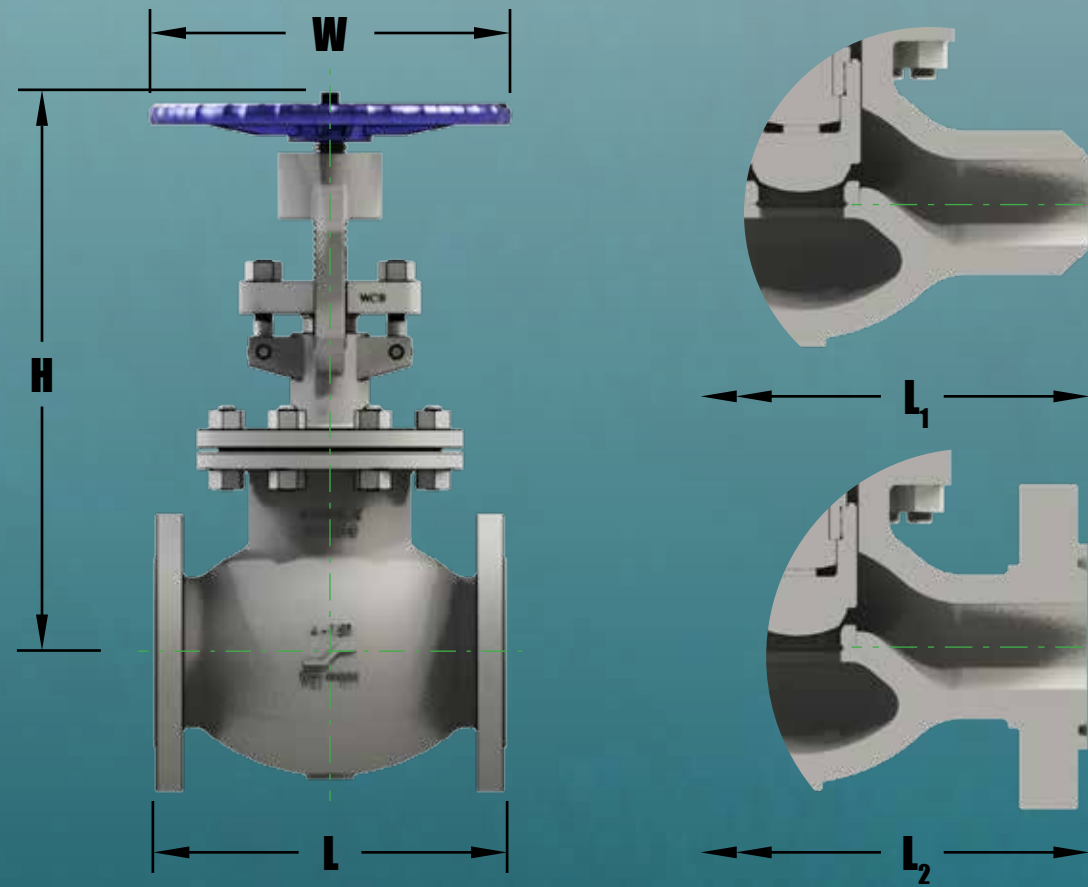
Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	17 ¾	17 ¾	17 ⅞	13 ¾	-	26 ⅞	-	-	325	-	-	-
NPS 3	22 ¾	22 ¾	23	23 ⅝	-	30 ⅞	-	-	625	-	-	-
NPS 4	26 ½	26 ½	26 ⅞	23 ⅝	-	34 ⅞	-	-	871	-	-	-
NPS 6	36	36	36 ½	25 3/16	IFV	41 5/16	IFV	IFV	2,097	IFV	IFV	IFV
NPS 8	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 12	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV

Valve Size	C <sub>v</sub>	Torque			
		Body / Bonnet		Gland Bolt	
		(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
NPS 2	IFV	909	1,232	30	41
NPS 3	IFV	1,282	1,738	47	64
NPS 4	IFV	1,707	2,315	80	109
NPS 6	IFV	2,781	3,770	109	148
NPS 8	IFV	IFV	IFV	IFV	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV
NPS 12	IFV	IFV	IFV	IFV	IFV

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

# GLOBE VALVE

## CLASS 150



## CLASS 300

# GLOBE VALVE

Valve Size	Dimensions (inches)									Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)	
NPS 2	8	8	8 1/2	7 7/8	-	14	-	-	46 1/4	37 1/2	-	-	
NPS 3	9 1/2	9 1/2	10	9 7/8	-	16 3/16	-	-	66 1/4	48 1/2	-	-	
NPS 4	11 1/2	11 1/2	12	12	-	18 11/16	-	-	57	46	-	-	
NPS 6	16	16	16 1/2	15 3/4	12	21 5/8	22 13/16	9 7/16	220 1/2	189 1/2	269	238	
NPS 8	19 1/2	19 1/2	20	17 11/16	18 1/8	24 5/8	12 15/16	14 3/16	344	295 1/2	355	306	
NPS 10	24 1/2	24 1/2	25	17 11/16	18 1/8	29 1/2	26 5/16	14 3/16	575 1/2	500 1/2	679	604	
NPS 12	27 1/2	27 1/2	28	25 3/16	18 1/8	36 5/16	33 7/8	14 3/16	679	600	981	902	

Valve Size	Dimensions (inches)									Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)	
NPS 2	10 1/2	10 1/2	11 1/8	7 7/8	-	13 11/16	-	-	68	55	-	-	
NPS 3	12 1/2	12 1/2	13 1/8	11 13/16	-	17 11/16	-	-	121	101 1/2	-	-	
NPS 4	14	14	14 5/8	13 3/4	-	20 1/4	-	-	185	167 1/2	-	-	
NPS 6	17 1/2	17 1/2	18 1/8	17 11/16	12	24 5/16	25 1/2	9 7/16	331	262	379	311	
NPS 8	21	21	21 5/8	19 11/16	18 1/8	29 1/8	30 5/16	14 3/16	496	397	496	463	
NPS 10	24 1/2	24 1/2	25 1/8	24	24	41 5/16	42 7/16	16 3/16	849	725	1,323	1,177	
NPS 12	28	28	28 5/8	25 3/16	24	43 11/16	43 5/16	16 3/16	1,348	1,142	1,500	1,314	

TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Bolt	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
	NPS 2	47	60	81	20	27
	NPS 3	109	60	81	25	34
	NPS 4	199	115	156	43	58
	NPS 6	476	115	156	46	62
	NPS 8	877	115	156	50	68
	NPS 10	984	320	434	67	91
	NPS 12	1494	320	434	76	103

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

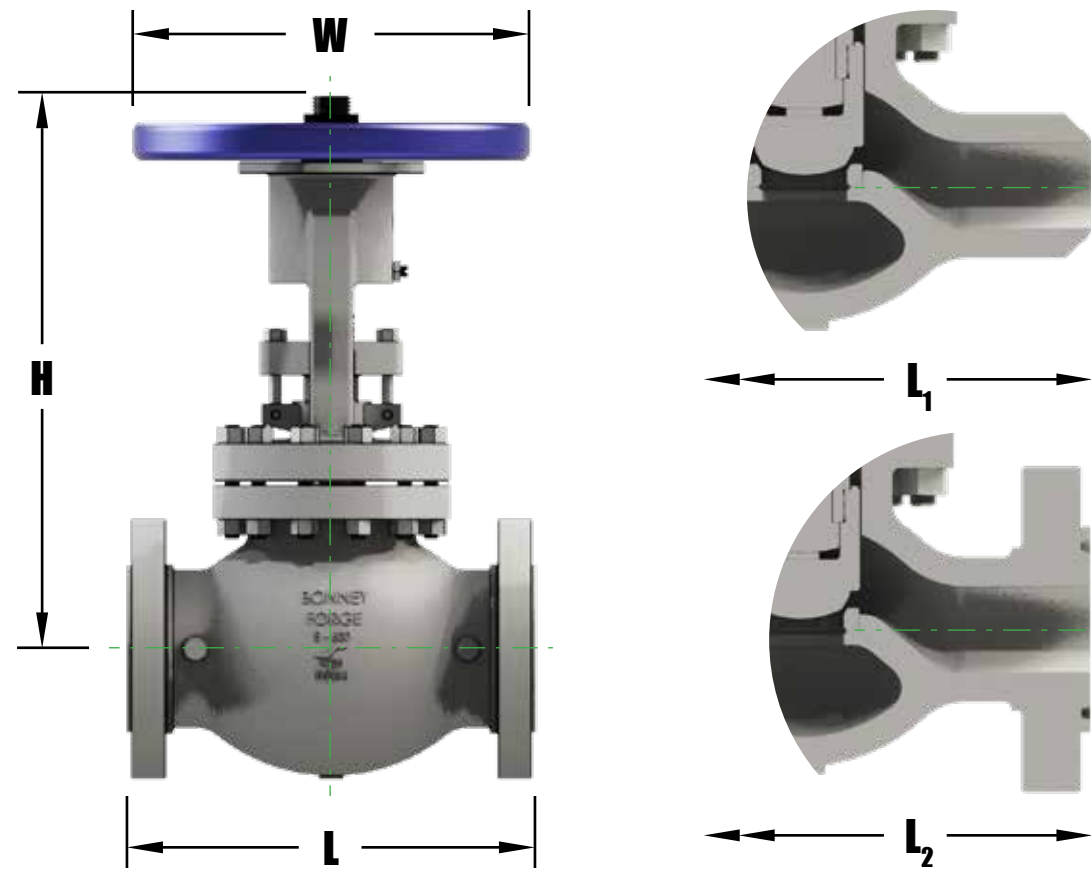
TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Bolt	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
	NPS 2	47	60	81	20	27
	NPS 3	109	115	156	25	34
	NPS 4	199	115	156	43	58
	NPS 6	476	115	156	50	76
	NPS 8	877	200	271	76	103
	NPS 10	984	490	664	157	213
	NPS 12	1494	490	664	181	245

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge



# GLOBE VALVE

## CLASS 600



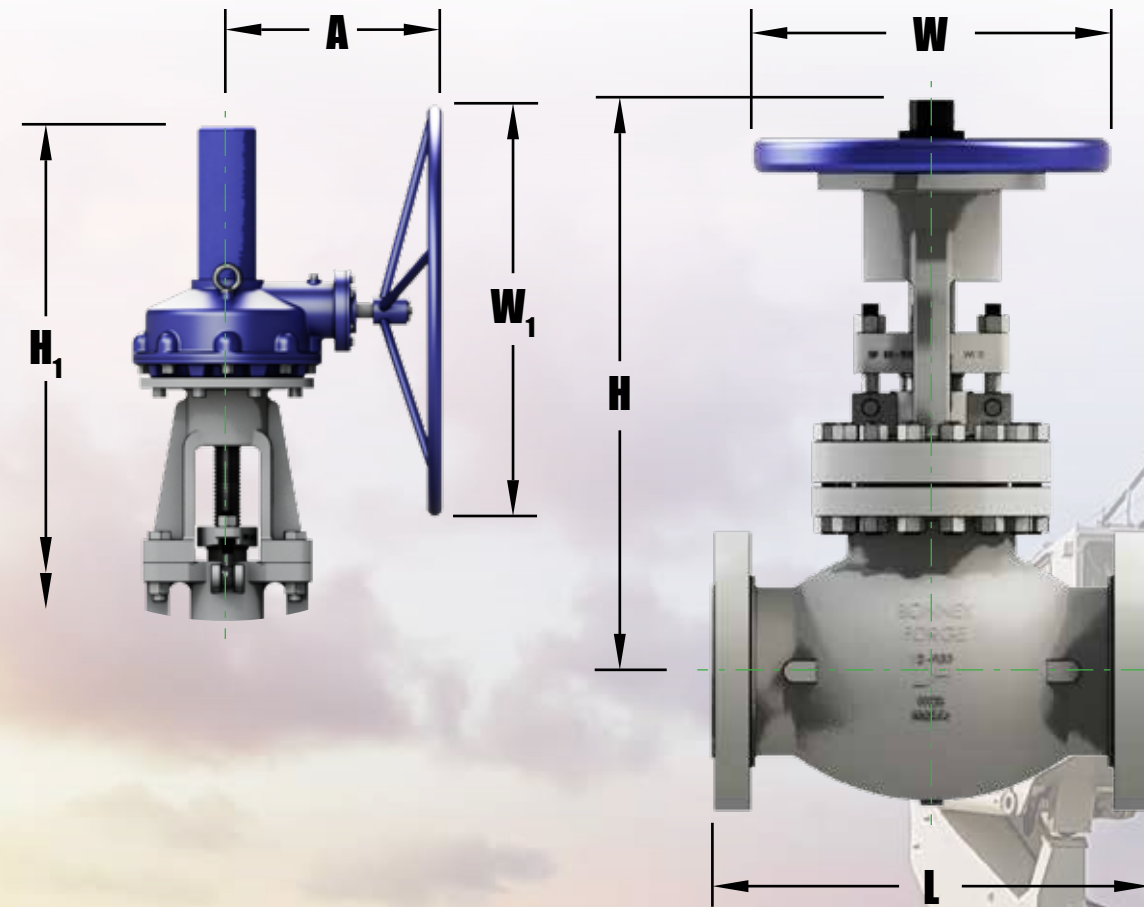
Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	11 1/2	11 1/2	11 5/8	9 7/8	-	17 13/16	-	-	99	84	-	-
NPS 3	14	14	14 3/8	13 3/4	-	22 3/16	-	-	172	141	-	-
NPS 4	17	17	17 1/8	15 3/4	12	25 15/16	27 1/16	9 7/16	298	234	346	282
NPS 6	22	22	22 1/8	22 1/16	18 1/8	31	34 1/4	9 7/16	721	575	919	794
NPS 8	26	26	26 1/8	25 3/16	24	40 3/16	37	16 3/8	957	IFV	1,195	1,012
NPS 10	31	31	31 1/8	28 3/8	24	46 1/4	39 3/4	16 3/8	1,305	IFV	1,543	1,239
NPS 12	33	33	33 1/8	28 3/8	31 1/2	48 7/16	57 3/8	19 1/8	1,984	1,753	2,624	2,392

TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Bolt	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
	NPS 2	47	115	156	22	30
	NPS 3	109	115	156	43	58
	NPS 4	199	200	271	46	62
	NPS 6	476	200	271	84	114
	NPS 8	877	490	664	171	232
	NPS 10	931	1,050	1,423	324	439
	NPS 12	1138	1,050	1,423	342	464

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

## CLASS 900

# GLOBE VALVE



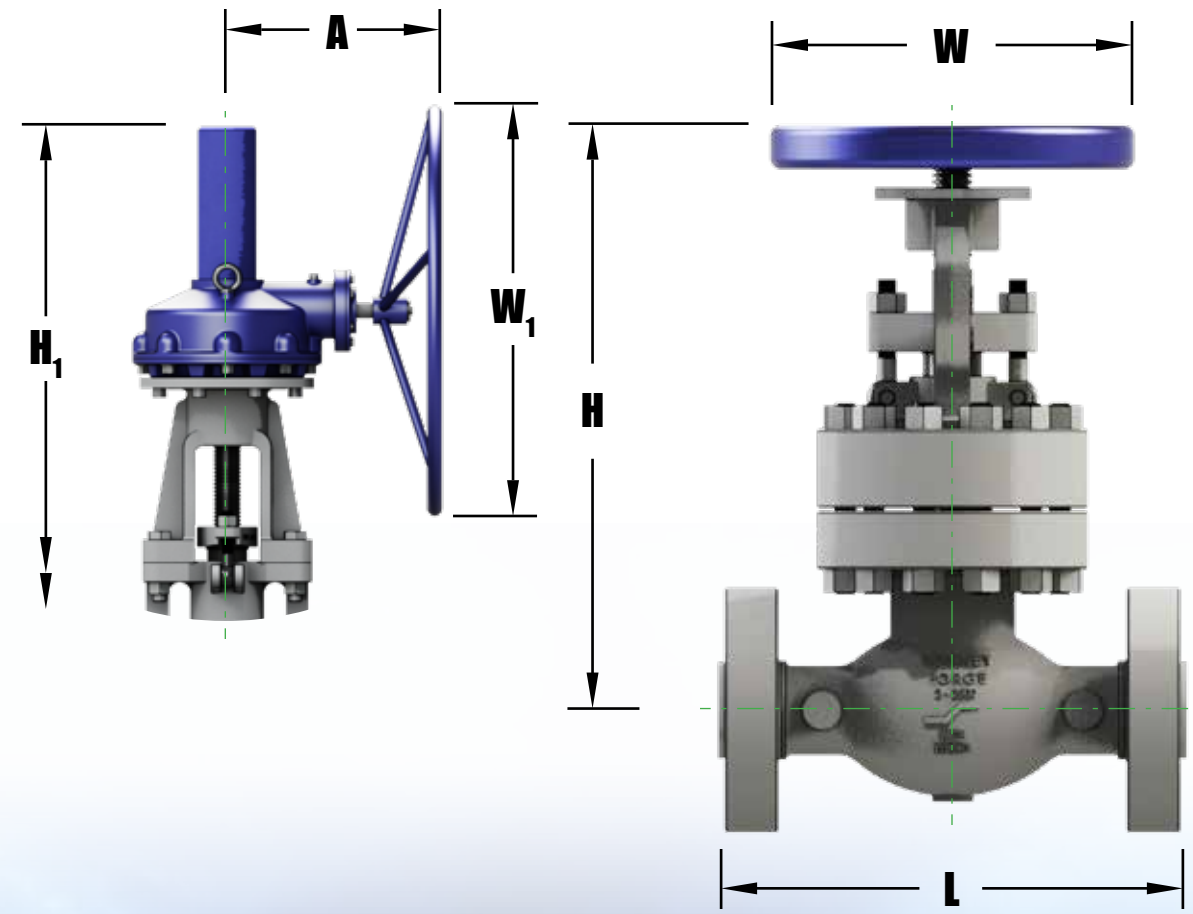
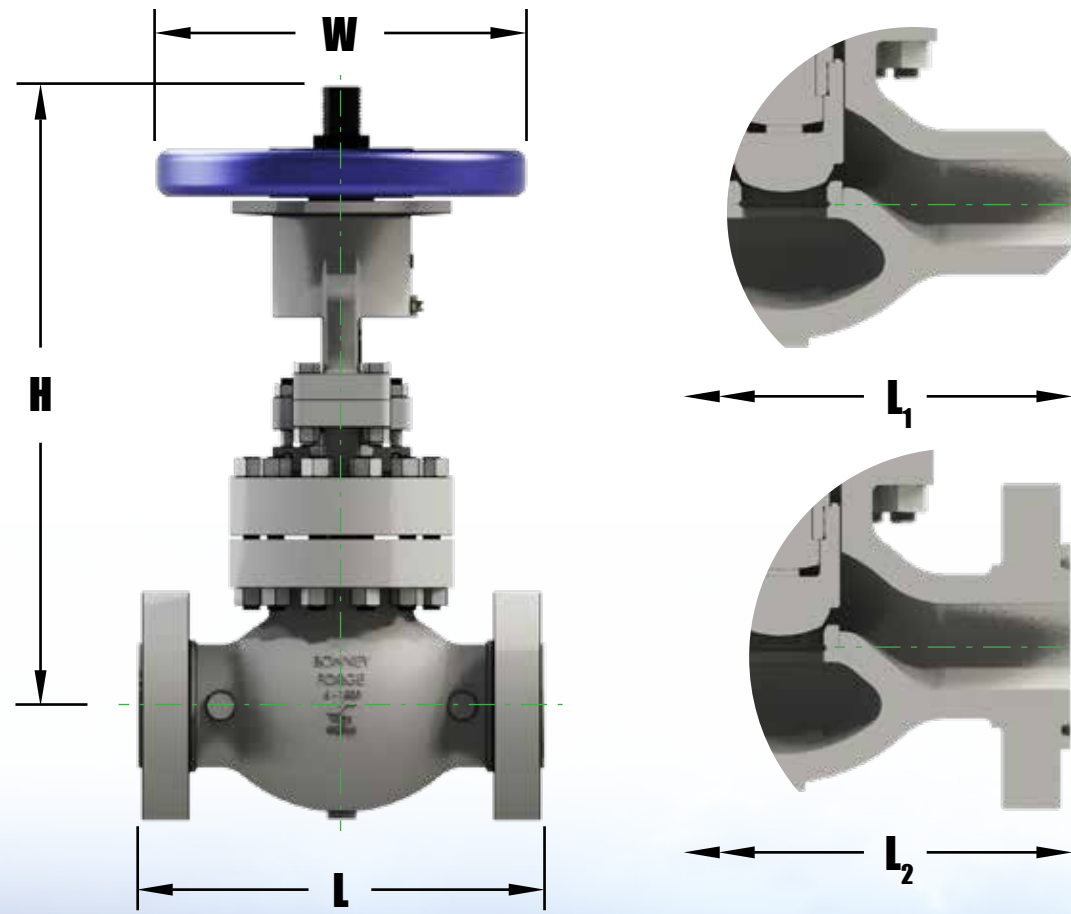
Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	IFV	IFV	IFV	IFV	-	IFV	-	-	IFV	IFV	-	-
NPS 3	15	15	15 1/8	15 3/4	-	23 1/4	-	-	250	IFV	-	-
NPS 4	18	18	18 1/8	17 11/16	-	28 3/8	-	-	405	IFV	-	-
NPS 6	24	24	24 1/8	23 3/8	24	37 3/8	45 1/16	20 1/4	860	IFV	1,006	IFV
NPS 8	29	29	29 1/8	25 3/16	31 1/2	43 5/16	52 3/16	24 7/16	1,488	IFV	1,858	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 12	38	38	38 1/8	IFV	31 1/2	IFV	63 3/8	28 1/8	IFV	IFV	4,727	IFV

TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Bolt	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
	NPS 2	IFV	IFV	IFV	IFV	IFV
	NPS 3	92	200	271	67	91
	NPS 4	171	200	271	80	109
	NPS 6	318	490	664	157	213
	NPS 8	561	1,050	1,423	228	309
	NPS 10	IFV	IFV	IFV	IFV	IFV
	NPS 12	IFV	IFV	IFV	IFV	IFV

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

# GLOBE VALVE

## CLASS 1500



## CLASS 2500

# GLOBE VALVE

Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	14 1/2	14 1/2	14 5/8	13 3/4	-	21 1/2	-	-	210	-	-	-
NPS 3	18 1/2	18 1/2	18 5/8	17 11/16	-	28 3/8	-	-	330	-	-	-
NPS 4	21 1/2	21 1/2	21 5/8	19 11/16	-	29 11/16	-	-	530	-	-	-
NPS 6	27 3/4	27 3/4	28	25 3/16	-	43 5/16	-	-	1,389	-	-	-
NPS 8	32 3/4	32 3/4	33 1/8	28 3/8	31 1/2	51 1/16	58	25 3/4	2,579	IFV	3,005	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 12	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV

Valve Size	Dimensions (inches)								Weight (lbs.)			
	L	L <sub>1</sub>	L <sub>2</sub>	W	W <sub>1</sub>	H <sub>open</sub>	H <sub>1</sub>	A	(RF)	(BW)	(RF+GO)	(BW+GO)
NPS 2	17 3/4	17 3/4	17 7/8	13 3/4	-	25 3/8	-	-	329	-	-	-
NPS 3	22 3/4	22 3/4	23	17 11/16	-	26 13/16	-	-	532	-	-	-
NPS 4	26 1/2	26 1/2	26 7/8	19 11/16	-	30 7/8	-	-	800	-	-	-
NPS 6	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 8	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV
NPS 12	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV	IFV

TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Bolt	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
	NPS 2	33	320	434	43	59
	NPS 3	92	320	434	67	91
	NPS 4	163	490	664	80	109
	NPS 6	248	1,050	1,423	216	293
	NPS 8	435	2,210	2,996	359	487
	NPS 10	IFV	IFV	IFV	704	955
	NPS 12	IFV	IFV	IFV	IFV	IFV

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

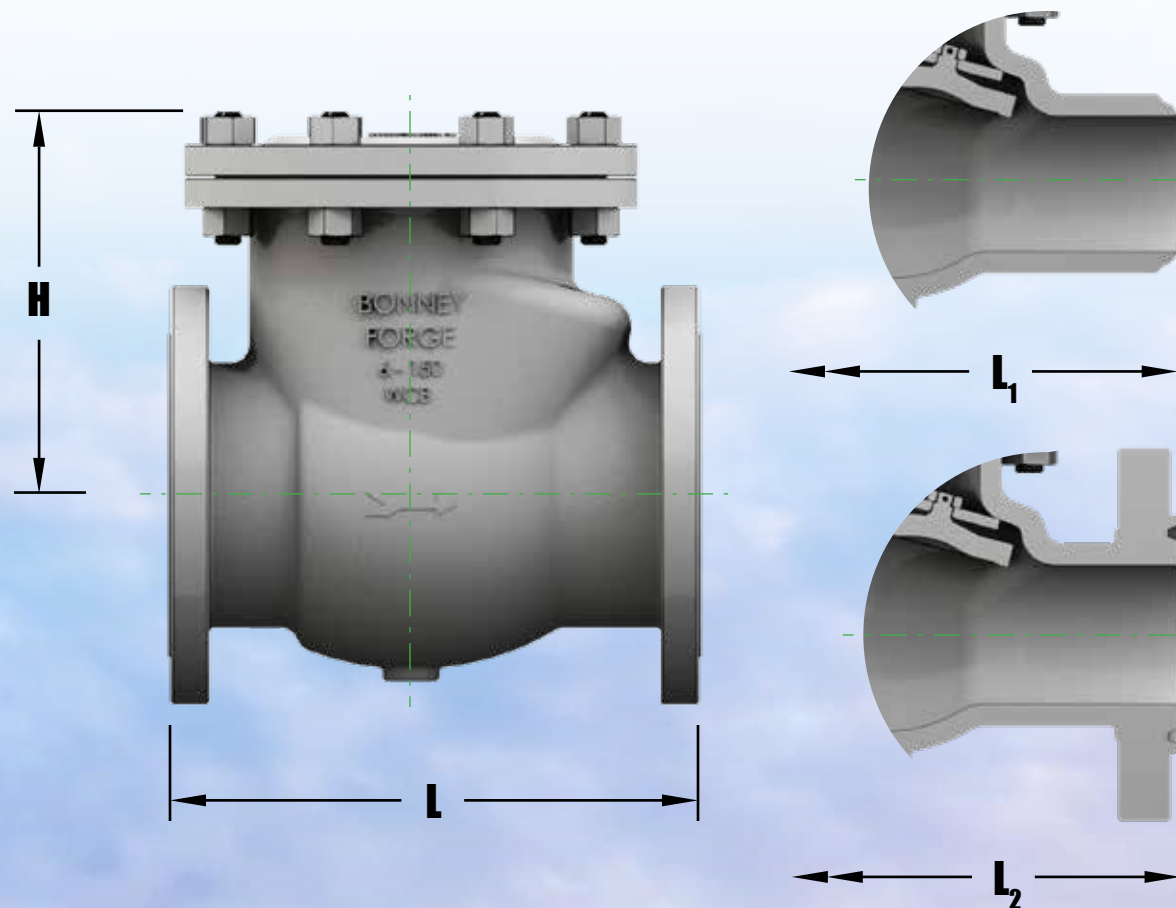
TECHNICAL	Valve Size	C <sub>v</sub>	Torque			
			Body / Bonnet		Gland Bolt	
			(ft.-lbs.)	(N-m)	(ft.-lbs.)	(N-m)
	NPS 2	IFV	320	434	80	109
	NPS 3	IFV	725	983	91	123
	NPS 4	IFV	1,050	1,423	145	197
	NPS 6	IFV	IFV	IFV	IFV	IFV
	NPS 8	IFV	IFV	IFV	IFV	IFV
	NPS 10	IFV	IFV	IFV	IFV	IFV
	NPS 12	IFV	IFV	IFV	IFV	IFV

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge



# CHECK VALVE

## CLASS 150



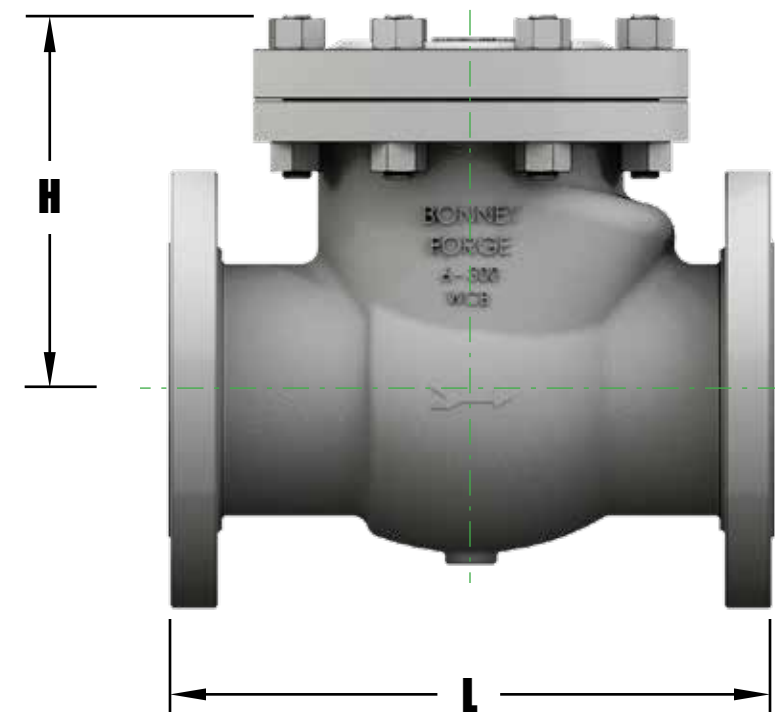
Valve Size	Dimensions (inches)				Weight (lbs.)	
	L	L <sub>1</sub>	L <sub>2</sub>	H	(RF)	(BW)
NPS 2	8	8	8 ½	6 ⅝	42	33
NPS 3	9 ½	9 ½	10	7 ⅞	62	51
NPS 4	11 ½	11 ½	12	8 ⅞	106	95.5
NPS 6	14	14	14 ½	12 ⅜	174	148
NPS 8	19 ½	19 ½	20	14 ⅜	287	260
NPS 10	24 ½	24 ½	25	17 ½	440	357
NPS 12	27 ½	27 ½	28	20 ⅛	661	520
NPS 14	31	31	31 ½	20 ⅝	994	710
NPS 16	34	34	34 ½	22 ⅝	1,226	1,034
NPS 18	38 ½	38 ½	39	27 ⅞	1,729	1,471
NPS 20	38 ½	38 ½	39	29 ⅝	1,841	1,581
NPS 24	51	51	51 ½	33 ⅞	3,483	3,023

Valve Size	C <sub>v</sub>	Torque	
		Body / Bonnet (ft.-lbs.)	(N-m)
NPS 2	122	60	81
NPS 3	283	60	81
NPS 4	518	60	81
NPS 6	1134	200	271
NPS 8	2287	200	271
NPS 10	3573	200	271
NPS 12	5340	490	664
NPS 14	6510	320	434
NPS 16	8624	414	561
NPS 18	11486	490	664
NPS 20	14303	1,050	1,423
NPS 24	20866	1,282	1,738

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge

## CLASS 300

# CHECK VALVE



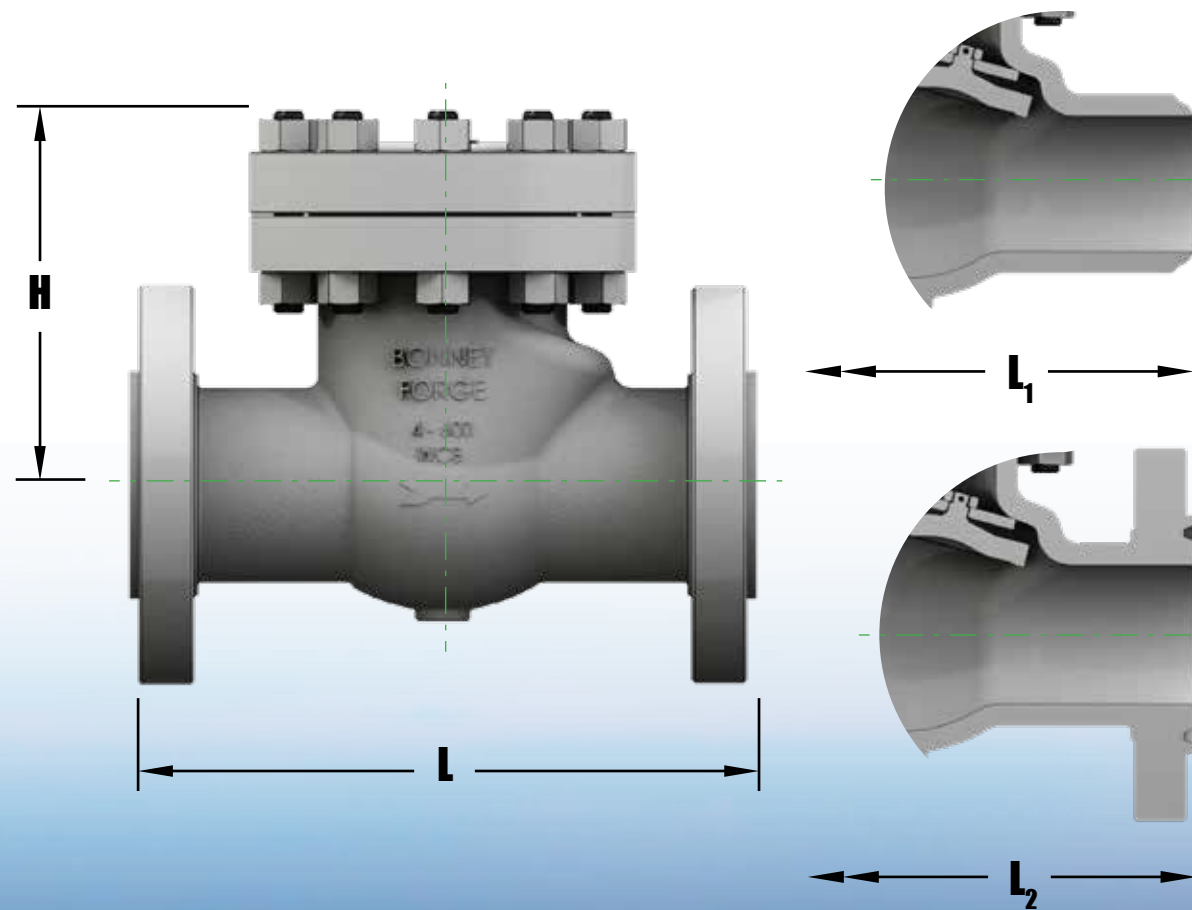
Valve Size	Dimensions (inches)				Weight (lbs.)	
	L	L <sub>1</sub>	L <sub>2</sub>	H	(RF)	(BW)
NPS 2	10 ½	10 ½	11 ⅞	7 ⅞	68	86
NPS 3	12 ½	12 ½	13 ⅞	8 ⅞	99	81 ½
NPS 4	14	14	14 ⅝	10 ⅝	150	112 ½
NPS 6	17 ½	17 ½	18 ⅞	13	299	242 ½
NPS 8	21	21	21 ⅝	15 ⅞	462	383 ½
NPS 10	24 ½	24 ½	25 ⅞	18 ⅝	693	447 ½
NPS 12	28	28	28 ⅝	19	990	846 ½
NPS 14	33	33	33 ⅝	23	1,499	1,235
NPS 16	34	34	34 ⅝	24 ⅞	1,852	1,499
NPS 18	38 ½	38 ½	39 ⅞	23 ¼	2,260	1,826
NPS 20	40	40	40 ¾	24 ⅞	2,910	2,359
NPS 24	IFV	IFV	IFV	IFV	IFV	IFV

Valve Size	C <sub>v</sub>	Torque	
		Body / Bonnet (ft.-lbs.)	(N-m)
NPS 2	122	60	81
NPS 3	283	115	156
NPS 4	518	115	156
NPS 6	1134	200	271
NPS 8	2287	200	271
NPS 10	3573	200	271
NPS 12	5340	490	664
NPS 14	6510	IFV	IFV
NPS 16	8624	1,050	1,423
NPS 18	11155	IFV	IFV
NPS 20	13934	IFV	IFV
NPS 24	20419	IFV	IFV

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge
- ▶ For values labeled as "IFV" please contact Bonney Forge

# CHECK VALVE

## CLASS 600



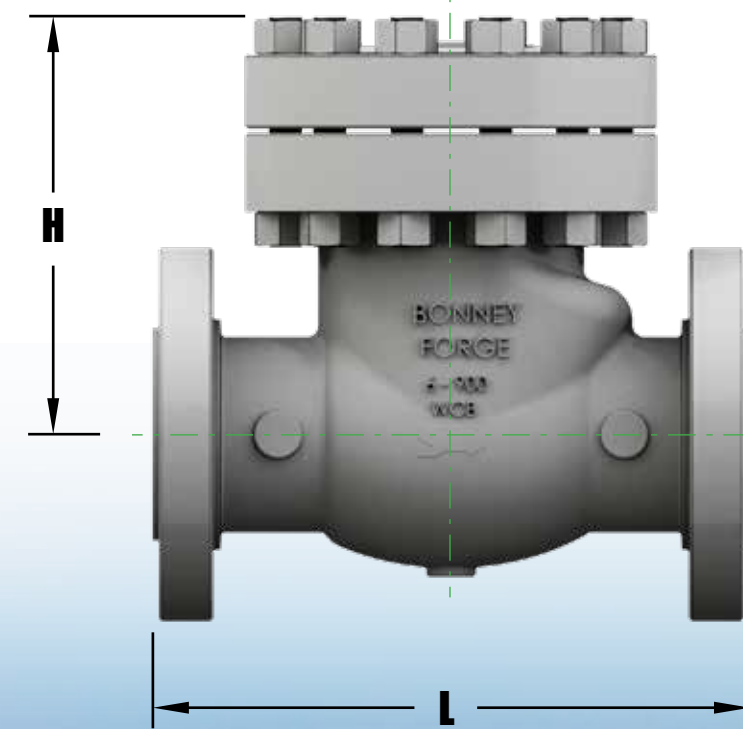
Valve Size	Dimensions (inches)				Weight (lbs.)	
	L	L <sub>1</sub>	L <sub>2</sub>	H	(RF)	(BW)
NPS 2	11 ½	11 ½	11 ⅝	7 ⅞	71	53
NPS 3	14	14	14 ⅞	11 ¼	132	108
NPS 4	17	17	17 ⅞	12 ¾	243	181
NPS 6	22	22	22 ⅞	14 ¾	487	401
NPS 8	26	26	26 ⅞	21	763	642
NPS 10	31	31	31 ⅞	23	1,385	1,098
NPS 12	33	33	33 ⅞	24	1,755	1,523
NPS 14	35	35	35 ⅞	22 ½	2,081	1,704
NPS 16	39	39	39 ⅞	26	2,690	2,238
NPS 18	43	43	43 ⅞	32	3,836	IFV
NPS 20	47	47	47 ¼	34 ½	4,846	IFV
NPS 24	55	55	55 ⅞	39	6,861	IFV

	Valve Size	C <sub>v</sub>	Torque	
			Body / Bonnet (ft.-lbs.)	(N-m)
TECHNICAL	NPS 2	122	115	156
	NPS 3	283	115	156
	NPS 4	518	200	271
	NPS 6	1134	490	664
	NPS 8	2287	725	983
	NPS 10	3573	725	983
	NPS 12	5340	725	983
	NPS 14	6146	1,800	2,440
	NPS 16	8083	1,800	2,440
	NPS 18	10503	2,210	2,996
	NPS 20	12936	2,210	2,996
	NPS 24	18762	2,625	3,560

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge

## CLASS 900

# CHECK VALVE



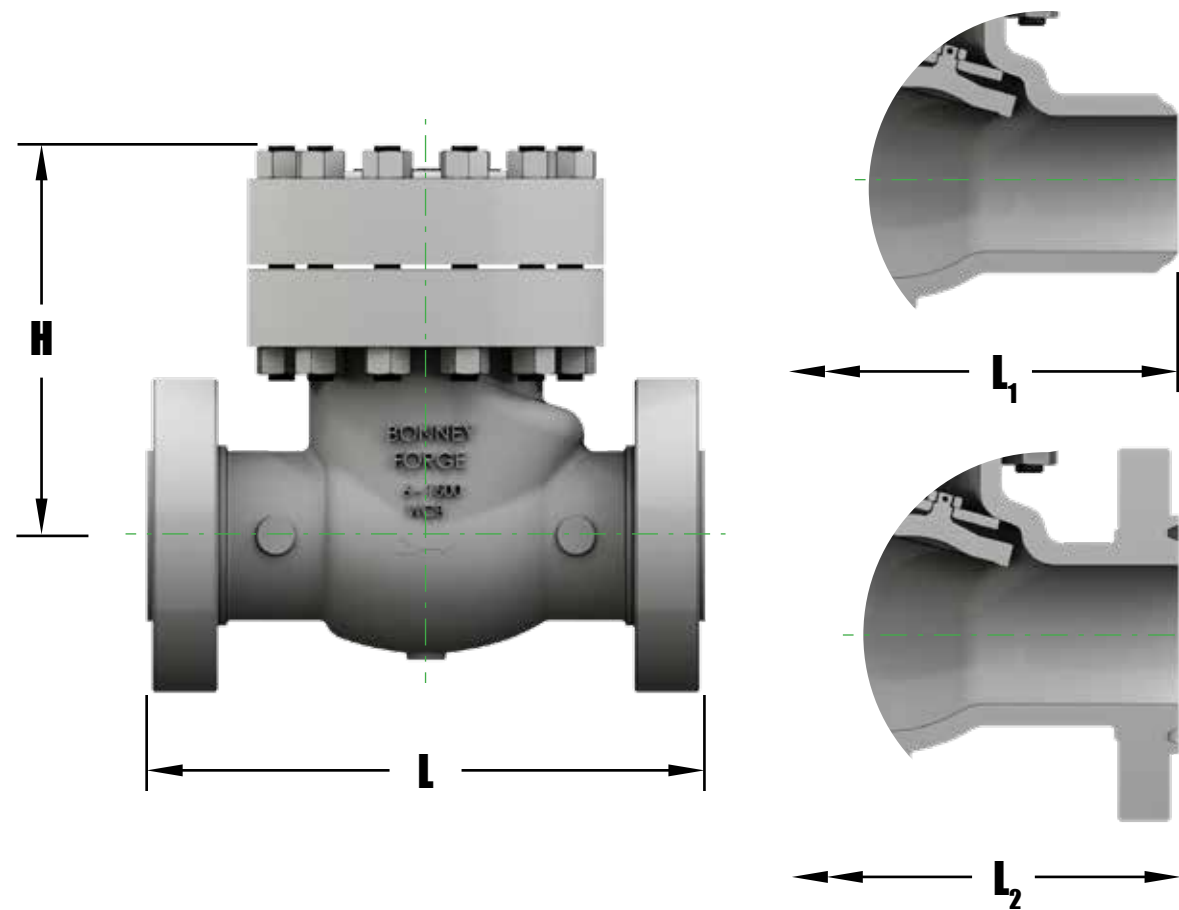
Valve Size	Dimensions (inches)				Weight (lbs.)	
	L	L <sub>1</sub>	L <sub>2</sub>	H	(RF)	(BW)
NPS 2	IFV	IFV	IFV	IFV	IFV	IFV
NPS 3	15	15	15 ⅞	9 ¾	205	IFV
NPS 4	18	18	18 ⅞	11 ¾	325	IFV
NPS 6	24	24	24 ⅞	18 ¾	772	IFV
NPS 8	29	29	29 ⅞	21 ¾	1,257	IFV
NPS 10	33	33	33 ⅞	22	1,698	IFV
NPS 12	38	38	38 ⅞	26 ¾	2,447	IFV

	Valve Size	C <sub>v</sub>	Torque	
			Body / Bonnet (ft.-lbs.)	(N-m)
TECHNICAL	NPS 2	IFV	200	271
	NPS 3	260	320	434
	NPS 4	492	490	664
	NPS 6	1055	1,350	1,830
	NPS 8	2020	1,350	1,830
	NPS 10	IFV	2,210	2,996
	NPS 12	IFV	1,350	1,830

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge

# CHECK VALVE

## CLASS 1500



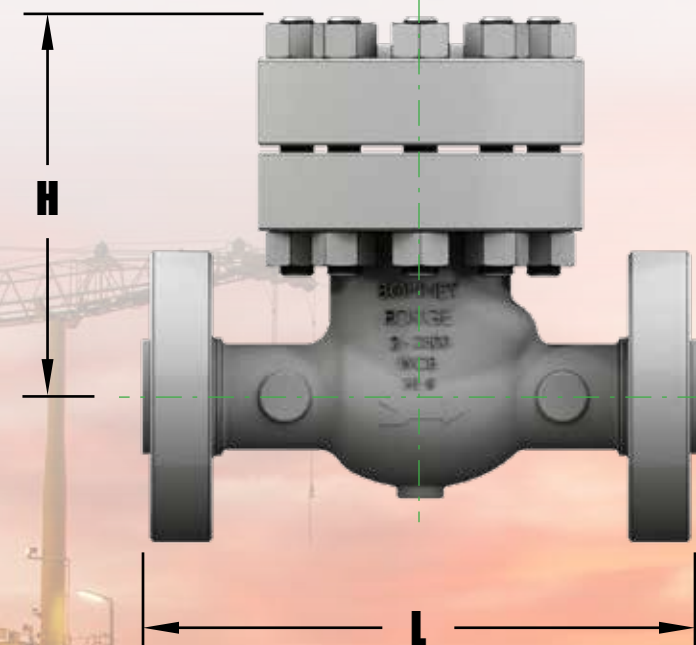
Valve Size	Dimensions (inches)				Weight (lbs.)	
	L	L <sub>1</sub>	L <sub>2</sub>	H	(RF)	(BW)
NPS 2	14 ½	14 ½	14 ⅝	12 ⅞	170	IFV
NPS 3	18 ½	18 ½	18 ⅝	11 ¾	295	IFV
NPS 4	21 ½	21 ½	21 ⅝	15 ¾	455	IFV
NPS 6	27 ¾	27 ¾	28	21 ¼	1,169	IFV
NPS 8	32 ¾	32 ¾	33 ⅞	25 ¾	2,205	IFV
NPS 10	39	39	39 ⅜	27	2,808	IFV
NPS 12	44 ½	44 ½	45 ⅞	31	4,839	IFV

TECHNICAL	Valve Size	C <sub>v</sub>	Torque	
			Body / Bonnet (ft.-lbs.)	(N-m)
	NPS 2	109	200	271
	NPS 3	252	320	434
	NPS 4	485	490	664
	NPS 6	1005	1,350	1,830
	NPS 8	IFV	1,350	1,830
	NPS 10	IFV	2,625	3,560
	NPS 12	IFV	2,781	3,770

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge

## CLASS 2500

# CHECK VALVE



Valve Size	Dimensions (inches)				Weight (lbs.)	
	L	L <sub>1</sub>	L <sub>2</sub>	H	(RF)	(BW)
NPS 2	17 ¾	17 ¾	17 ⅞	12 ⅞	293	IFV
NPS 3	22 ¾	22 ¾	23	13 ⅞	525	IFV
NPS 4	26 ½	26 ½	26 ⅞	16 ⅞	851	IFV
NPS 6	36	36	36 ½	22 ½	2,138	IFV
NPS 8	IFV	IFV	IFV	IFV	IFV	IFV
NPS 10	IFV	IFV	IFV	IFV	IFV	IFV
NPS 12	IFV	IFV	IFV	IFV	IFV	IFV

TECHNICAL	Valve Size	C <sub>v</sub>	Torque	
			Body / Bonnet (ft.-lbs.)	(N-m)
	NPS 2	IFV	725	983
	NPS 3	IFV	725	983
	NPS 4	IFV	1,350	1,830
	NPS 6	IFV	2,625	3,560
	NPS 8	IFV	IFV	IFV
	NPS 10	IFV	IFV	IFV
	NPS 12	IFV	IFV	IFV

- ▶ Torque values shown are for WCB valve material only.
- ▶ For WCB NACE or LCC material, multiply torque value by 0.75
- ▶ For CF8M material, multiply torque value by 0.30
- ▶ For all other body/bonnet material, please contact Bonney Forge



### **CRYOGENIC VALVES**

Bonney Forge is ever expanding its cast steel valve line.

With all valve design and verification performed in Houston, Texas, Bonney Forge has complete control of made to order valve design. This means that our engineers can modify designs to combat specific application issues.

#### **Cryogenic Valves**

Bonney Forge cast steel cryogenic valves are designed and tested to meet the extreme conditions required by cryogenic temperatures typically seen in LNG, heat exchanger units, air separation units, etc.

#### **Non-Destructive Examined Valves**

With the casting process comes the potential for internal defects to be present, and while Bonney Forge has quality systems in place to ensure that is much less likely than the industry requires, verification of that requires specially ordered castings. Bonney Forge excels at providing high quality castings and by working closely with foundries we can meet any major end user specification for casting quality.



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

<b>WARRANTY</b>	BF expressly warrants to the Purchaser (the "Purchaser") that all BF products (each, a "Product") will be free from manufacturing defects for the one (1) year period immediately following the date of shipment (the "Warranty Period"). BF HEREBY DISCLAIMS ALL OTHER WARRANTIES WITH RESPECT TO BOTH THE PRODUCTS AND THIS AGREEMENT, INCLUDING THESE TERMS AND CONDITIONS, WHETHER EXPRESS OR IMPLIED INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE AND WARRANTIES ARISING FROM COURSE OF DEALING OR COURSE OF PERFORMANCE. The foregoing warranty shall not apply: (1) to any use of a Product in aircraft or aerospace applications ("Prohibited Applications"), (2) if a Product was not used as recommended and in accordance with approved installation and operating practices, (3) if the failure of a Product results from any cause other than a manufacturing defect, including but not limited to damage due to corrosive, abrasive or other wear normally to be expected in the use of the Product, (4) if the Product was modified or changed (unless written approval was given in advance by BF), and (5) if Purchaser fails to deliver written notice of such defect to BF during the Warranty Period.
<b>EXCLUSIONS</b>	Do not use BF Products in aircraft or aerospace applications. Purchaser assumes all risk of loss that arises from or relates to any use of Product in a Prohibited Application and Purchaser shall, at its own expense, indemnify, defend and hold BF harmless against all claims or losses (including legal and accounting fees) that arise from or relate to the use of any Product in a Prohibited Application.
<b>PURCHASER'S REMEDIES</b>	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 the option of BF, repayment of the sale price for the particular Product that gives rise to the claim. BF shall have no liability to Purchaser or to any other person, in tort, contract or otherwise, for claims losses, damages or injuries arising out of this purchase or use of any Product, except for the return by BF of an amount not in excess of the payments made by the Purchaser to BF for the particular Products giving rise to Purchaser's claim. No action, whether based on contract, tort or otherwise, arising out of or related to Products furnished pursuant to the Agreement may be brought by Purchaser more than one year after the cause of action has accrued and no claims for breach of warranty may be brought by Purchaser unless Purchaser notifies the BF in writing within 10 days of discovery of the breach. Any claim made after the time periods specified in the foregoing sentence shall be deemed to be null and void. UNDER NO CIRCUMSTANCES WILL BF BE LIABLE TO PURCHASER FOR DAMAGES IN EXCESS OF THE AMOUNTS PAID BY PURCHASER TO BF UNDER THE AGREEMENT OR FOR INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL OR EXEMPLARY DAMAGES (EVEN IF BF HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES), SUCH AS, BUT NOT LIMITED TO, LOSS OF REVENUE OR ANTICIPATED PROFITS OR LOST BUSINESS.
<b>PRICES</b>	Prices, and other terms of sale and payment, are subject to change by BF 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.
<b>ACCEPTANCE OF ORDERS</b>	All orders are subject to BF credit department approval prior to acceptance by BF.
<b>REMITTANCES</b>	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.
<b>PARTIAL SHIPMENTS AND PAYMENTS</b>	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.
<b>TAXES</b>	Unless otherwise specifically noted, the amount of any federal, state or local sales, use, occupancy, excise tax, or other tax of any nature, for which BF is legally liable, either intentionally or through failure of payment by Purchaser, shall be added or be in addition to the price quoted and Purchaser agrees to pay same to BF.
<b>SHORTAGES AND DAMAGES IN TRANSIT</b>	All claims for loss, damages, shortages, etc. must be made by Purchaser in writing within 10 days after receipt of shipment. Loss or damage to materials in transit is the responsibility of the carrier and not BF.
<b>FREIGHT POLICY TITLE AND RISK OF LOSS</b>	Unless otherwise specifically negotiated with the customer, BF's standard freight policy is to ship all product FCA (plant of manufacture) with BF's responsibility ceasing after delivery to the carrier. Title to and all risk of loss or damage to the Products vests in Purchaser at the time BF delivers the Products to the carrier regardless of any shipping and insurance arrangements made by BF on Purchaser's behalf. However, BF reserves and Purchaser grants, until full payment is received, a purchase money security interest in each of the Products delivered. Purchaser hereby authorizes BF to file such financing statements and deliver such notices as BF may reasonably require to perfect such purchase money security interest. BF shall have all rights and may exercise all remedies of a secured creditor under Article 9 of the Uniform Commercial Code as adopted from time to time in the Commonwealth of Pennsylvania. The remedies reserved herein shall be cumulative and in addition to any other remedies provided in law or equity. No waiver of the remedy for any breach of any provision in these terms shall constitute a waiver of any other remedy.
<b>DELAYS</b>	All shipping dates are good faith estimates by BF. BF makes no guarantee to ship on any date. BF shall assume no obligation to ship Products on any date and BF shall not be liable for the failure to ship Product on any date. Materials slated to be in stock are subject to prior sales.
<b>CANCELLATIONS AND SUSPENSIONS</b>	Purchaser may cancel this order or contract, or delay work or delivery, only upon receipt of written notification by BF from Purchaser and with BF's prior consent, and upon agreement to pay BF's adjustment charge. Orders for special products (usually "price on application items") may be changed and/or canceled only upon receipt of written instructions by BF from Purchaser and with BF's prior consent, and Purchaser shall make payment to BF for material used and work already performed.
<b>RETURN OF MATERIAL</b>	No Product may be returned without the prior written consent of BF. 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.
<b>INDEMNITY</b>	Purchaser shall defend, indemnify and hold BF and its affiliates harmless from any and all loss or damage sustained by BF and from and against all claims asserted against BF with respect to the Products covered hereunder arising in whole or in part out of (1) failure of Purchaser, its agents, employees, or customers to follow specifications, instructions, warnings or recommendations furnished by BF or others; (2) failure of Purchaser, its agents, employees or customers to comply with all applicable legal requirements; (3) misuse of the Products by Purchaser, its agents, employees or customers; (4) misrepresentation by Purchaser, its agents, employees or customers; (5) the full extent of the negligence of Purchaser, its agents, employees or customers; or, (6) alleged infringement of any patent, trademark, trade secret, copyright, or other intellectual property or proprietary right of Purchaser or a third party as a result of BF's performance in accordance with Purchaser's designs, plans or specifications. Purchaser hereby waives and releases BF and its affiliates from all rights of contribution or indemnity to which it may otherwise be entitled.
<b>GOVERNING LAW</b>	The contract shall be governed by, construed, and enforced in accordance with the laws of the Commonwealth of Pennsylvania without regard to the conflict-of-law principles of any jurisdiction. Purchaser and BF (i) agree that all actions and proceedings arising out of or relating to this Agreement shall be litigated exclusively in the state courts located in Huntingdon County, Pennsylvania and/or the United States District Court for the Middle District of Pennsylvania; (ii) consent to the jurisdiction and venue of such courts; and (iii) waive any and all rights to object to the jurisdiction and venue of such courts, to transfer or change the venue of any such action or proceeding, including but not limited to upon the basis of forum non conveniens. PURCHASER AND BF FURTHER EACH WAIVE THE RIGHT TO TRIAL BY JURY IN ANY ACTION OR PROCEEDING BASED UPON, ARISING OUT OF, OR IN ANY WAY RELATING TO, THIS AGREEMENT.
<b>NO WAIVER</b>	The failure of BF to exercise any of its rights under this Agreement for a breach thereof shall not be deemed to be a waiver of such rights nor shall the same be deemed to be a waiver of any subsequent breach.
<b>DIES, TOOLS AND PATTERNS</b>	Dies, tools and patterns used by BF to produce any Product (collectively, the "Material") shall be and remain the exclusive property of BF. Payment by Purchaser of any preparation charge with respect to such Material shall not give the Purchaser any right, title or interest in or to such Material. BF shall not be responsible for retention of dies or patterns on which no orders are received for two years or more.
<b>FORCE MAJEURE</b>	Neither party shall be liable to the other under this Agreement if delayed or prevented from performance by causes beyond its control including, but not limited to, fires, floods, strikes, acts of God, war, insurrection, government restrictions, or other causes of a like or different nature.
<b>ASSIGNMENT</b>	No assignment of the Purchaser's rights or obligations may be made without the prior, written consent of BF.
<b>PURCHASER'S ACCEPTANCE OF BF'S TERMS</b>	BF is not bound by any terms on the Purchaser's order form or any other document emanating from the Purchaser which attempts to impose any condition at variance with BF's terms and conditions of sale included herein or stated on BF's packages, invoices, technical data sheets or any other BF documents. BF's failure to object to provisions contained in the aforementioned forms of the Purchaser shall not be deemed a waiver of the provisions of BF's terms and conditions of sale which shall constitute the entire contract between BF and the Purchaser. No waiver, alteration, or modification of the terms and conditions of this document shall be binding unless in writing and signed by an authorized representative of BF. These BF terms and conditions constitute the entire understanding between the parties with respect to the subject matter hereof and supersede any and all prior understandings, statements, warranties, representations and agreements, oral and written, relating hereto. In the event of any discrepancy or inconsistency between these terms and conditions and any other purchase order or acceptance form used by the Purchaser in connection herewith, these BF terms and conditions shall govern, and such Purchaser purchase order, or acceptance form shall not amend, modify or add to the BF terms and conditions stated herein.
<b>PROPRIETARY INFORMATION</b>	Any Purchaser information provided to BF shall not be considered confidential unless otherwise agreed to by BF in a separate agreement. All drawings, works of authorship, trade secrets, inventions, improvements or other items made or developed by or for BF in connection with the performance of its obligations hereunder (the "Works") shall be BF's property. Purchaser hereby assigns all right and title in and to such Works to BF. Purchaser shall not use or disclose any of BF's trade secrets or other confidential information, whether or not designated as such, except as required in connection with the use of the Products covered hereunder.
<b>SEVERABILITY</b>	If any provisions of this Agreement are held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof, all of which provisions are hereby declared severable.
<b>EXPORT COMPLIANCE</b>	Bonney Forge Corporation complies with all export laws issued by the United States government, including all Export Administration Regulations (EAR) issued by the United States Department of Commerce Bureau of Industry and Security (BIS) and the Office of Foreign Assets Control (OFAC) of the United States Department of the Treasury. As such, any products quoted and/or shipped to customers must not be shipped or trans-shipped by customers to any country, individual or entity that is not permitted under and in accordance with these regulations or other laws or regulations issued by the United States government. We are not considering any Export Licenses or Technical passports that may be required due to the material grades on this bill of material. In the event of an order we can then proceed with any fees and delivery increases that may occur with this inquiry.

► 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.