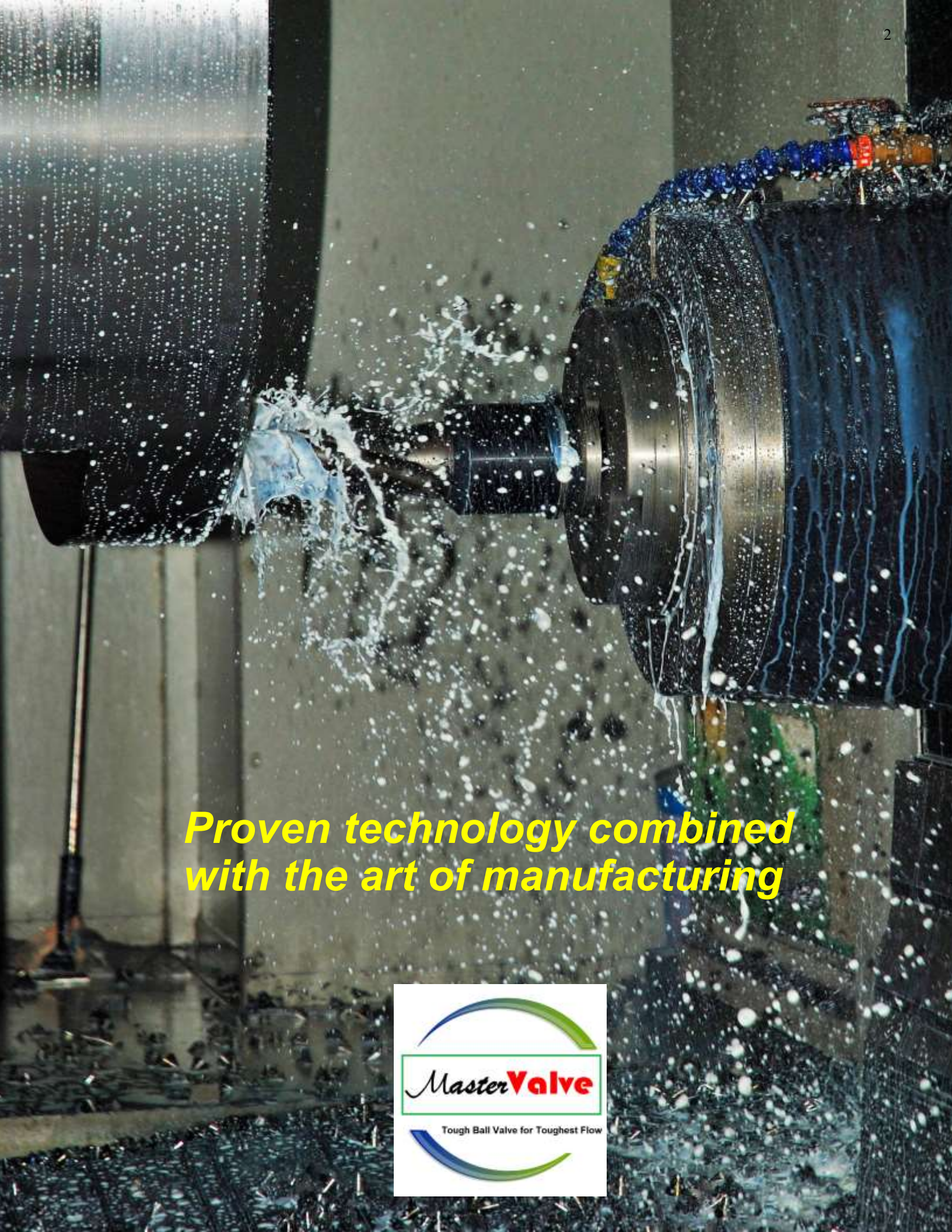
Master Valve USA

B Series Floating Ball Valve

Tough Valve for Toughest Flow


Proven technology combined
with the art of manufacturing
MasterValve
Tough Ball Valve for Toughest Flow

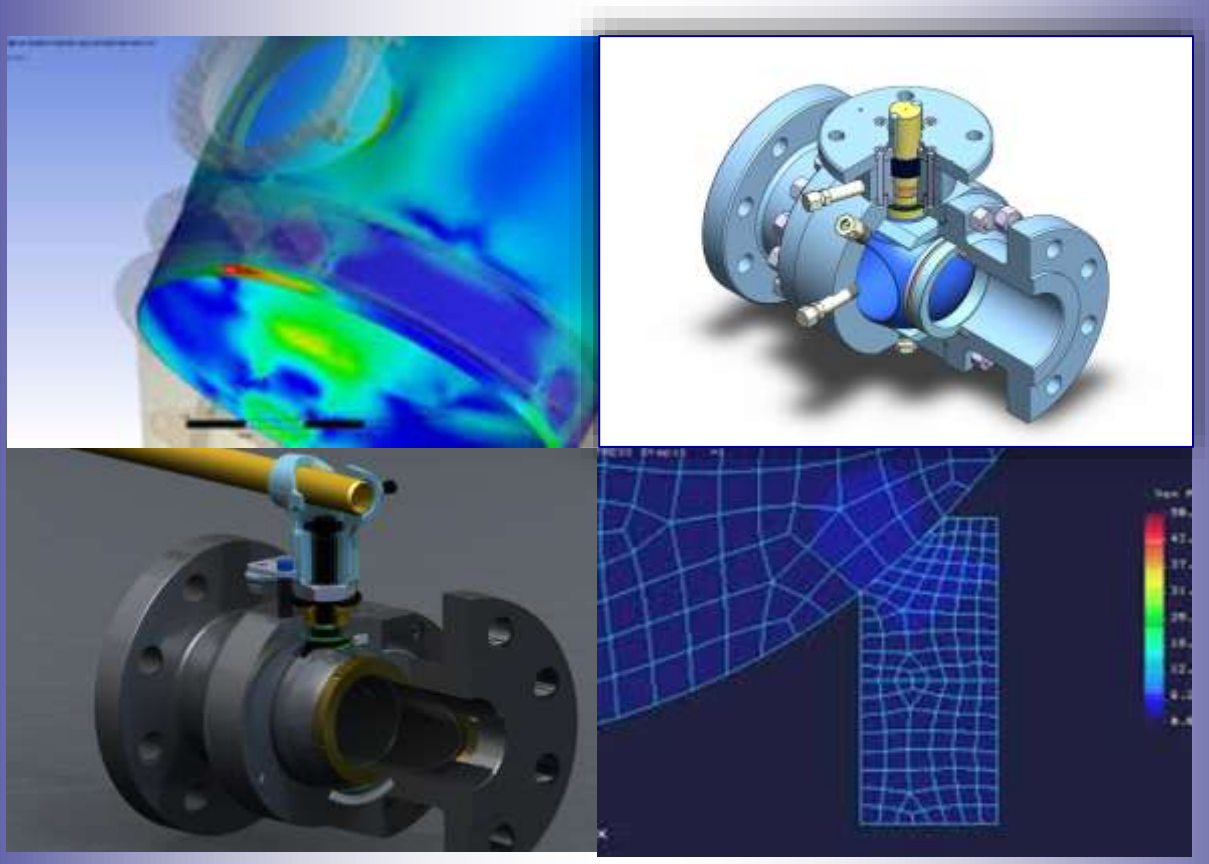
Quality comes from disciplined **control……**

Zero Leakage Ball Valves for Chemical, Refining, Pipeline and Exploration Applications

Innovative Engineering Design

Based on years of valve application experience and material breakthrough, Master Valve's innovative ball valve deliver following features to you and your customers:

- Low stem torques, typically 20% lower than the norm, which drives your automation costs lower
- Actuation friendly design on stem material and MAST
- Better performance in sealing and leak protection due to new materials used
- Lighter weight resulting in better protection to your pipes and flanges



Tough Valve for Toughest Flow

Manufacturing Capabilities

Master Valve has its own forging facility and heat treatment workshop. And we can strictly control the quality of forging , heat treatment, welding, testing and painting to deliver top-notch quality products for toughest applications.

Tough Valve for Toughest Flow

Tough Valve for Toughest Flow

All Master Valve quality products are designed and tested to meet the standards of qualifying authorities around the world. Advanced engineering and Quality Management System assure that our valve products continue to exceed your expectations

Quality Control

Inventory for Short Lead-time

Inventory is a critical piece of our business model to please customers. Master Valve and associated companies keep inventory from forging material, work-in-progress to finished valves. In today's environment, our customers need the inventory to cut their project delivery short and archive high Return On Investment (ROI).

Table of Contents

Master Valve B Series Floating Ball Valves

Due to upgrades in industry standards, material innovations, and Master Valve® constant commitment to product advancement, data presented in this brochure is subject to change. Please contact your Master Valve Sales person for updated and/or current drawings and material compliance. This information is available on our website at www.MasterValveUSA.com

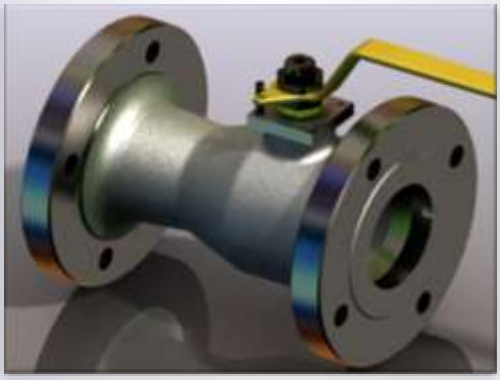
Tough Valve for Toughest Flow

Applications of B Series Floating Ball Valves

Master Valve manufactures some of most dependable floating ball valves in the industry. Master Valve offers B Series floating ball valves and is a complete solution provider for your flow control applications. Master Valve manufactures a complete range of floating ball valves in a size range of 0.5" to 12" in pressure ratings of up to class 2500.

B Series valves are designed, manufactured, and tested in accordance with respective API, ASME, and ANSI standards, for instance, ASME B16.34, API 6D, API-607, API 608, API 598, ASME B16.5, ASME B16.10, ASEM B16.25, MR-01-75, TA-Luft/ISO 15848 et al. In the standard designs, **B** series ball valves are specified for **transmission pipeline, pumping stations, compressor stations, gas processing plants, rejection units, offshore platforms, and chemical processing.**

B1 Series Valve



B2 Series Valve

B3 Series Valve

B4 Series Valve

B5 Series Valve

B Series Design Standards and Design Features

Design Standards

American Petroleum Institute

- API 6D -- Specifications for pipeline valves
- API 598 -- Valve Inspection and Testing
- API 607--- Fire test for soft-seated ball valves
- API 608--- Metal Ball Valves-Flanged, Threaded and Welding End
- API 6FA ---Fire test for valves

American National Standard

- ASME/ANSI B16.10 --- Face-to-face and end-to-end dimensions on ferrous valves
- ASME/ANSI B16.5 --- Steel pipe flanges and flanged fittings
- ASME/ANSI B16.25 --- Buttwelding ends
- ASME/ANSI B16.34 --- Steel valves-flanged and butt weld end
- ASME/ANSI B31.1 --- Chemical plant and petroleum refinery piping

Manufacturers Standardization Society

- MSS SP-25 --- Standard marking system for valves
- MSS SP-55 --- Quality Standard for Steel Casting

National Association of Corrosion Engineers

- NACE MR-01-75 --- Sulfide stress cracking materials for oilfield equipment

ISO Standards

- ISO 15848-1 Industrial Valves – Measurement, Test and Qualification procedures for fugitive emissions
- ISO 5211 Industrial valves — Part-turn actuator attachment for actuator mounting pad

Standard Features

- Bi-directional shut-off with bubble-tight sealing capability
- Equalized cavity pressure
- Ball position indication and locking device
- Multiple seals for protection against external leakage
- Blowout proof stem design
- Live-loaded stem packing design
- Antistatic device
- ISO 5211 actuator mounting pad
- Metal-to-metal contact fire safe to API 607
- ISO 15848 compliance for fugitive emissions
- NACE compliance and fully comply with MR-0175
- Extended stem for buried service upon request
- Metal-seated design upon request
- Cryogenic service design (-196^{o}C or -320^{o}F) upon request

B Series Design Features (cont')

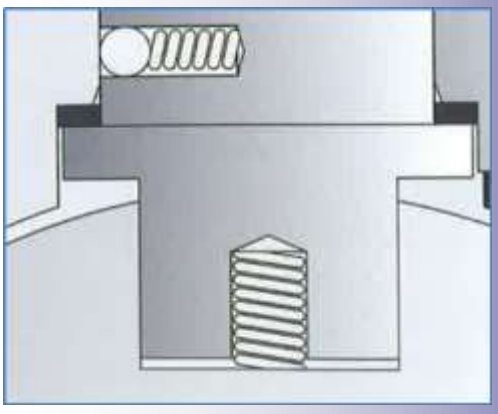
Manufacturing range of B series is shown in the table below. Other sizes and special classes are also available upon special request.

Size		ASME CLASS					
NPS	DN	150	300	600	900	1500	2500
0.5	15	B1;B2; B3;B4;B5	B1;B2; B3;B4;B5	B1;B2;B3;B4;B5	B3;B4;B5	B3;B4;B5	B3;B4;B5
0.75	20	B1;B2; B3;B4;B5	B1;B2; B3;B4;B5	B1;B2;B3;B4;B5	B3;B4;B5	B3;B4;B5	B3;B4;B5
1	25	B1;B2; B3;B4;B5	B1;B2; B3;B4;B5	B1;B2;B3;B4;B5	B3;B4;B5	B3;B4;B5	B3;B4;B5
1.5	40	B1;B2; B3;B4;B5	B1;B2; B3;B4;B5	B3;B4	B3;B4	B3;B4	
2	50	B1; B2; B3; B4	B1; B2; B3; B4	B3; B4	B3; B4	B3; B4	
2.5	65	B1; B2; B3; B4	B1; B2; B3; B4				
3	80	B1; B2; B3; B4	B1; B2; B3; B4	B3; B4	B3; B4		
4	100	B1; B2; B3; B4	B1; B2; B3; B4	B3; B4			
5	125	B2	B2				
6	150	B1; B2; B3; B4	B1; B2; B3; B4	B3; B4			
8	200	B2; B3; B4	B2; B3; B4				
10	250	B2; B3; B4	B2; B3; B4				

Note: Other sizes and special classes are also available upon request.

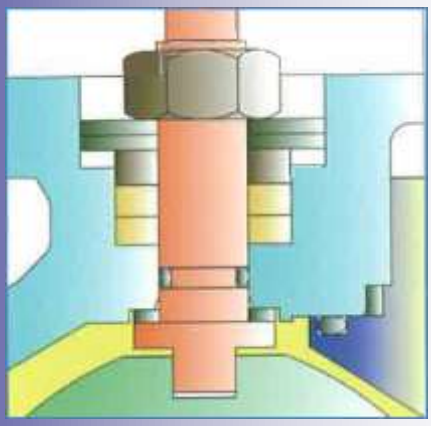
Handle Stop Pin for Tight Shutoff

Anti-static & Blowout Proof Stem

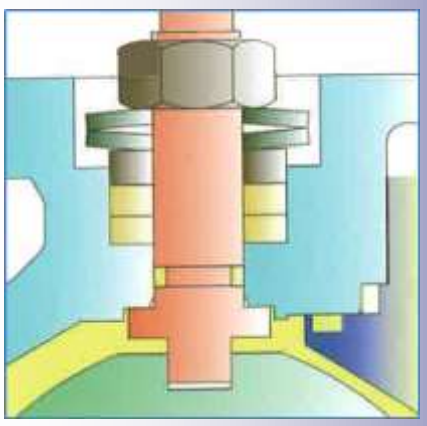


B Series Design Features (cont')

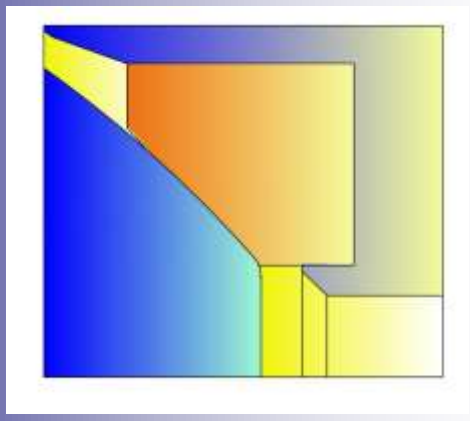
Fire Safe Design



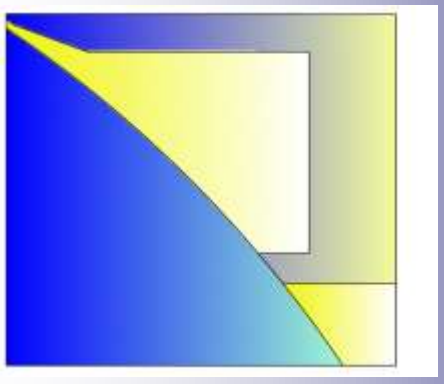
Stem Seal Before Fire



Stem Seal After Fire



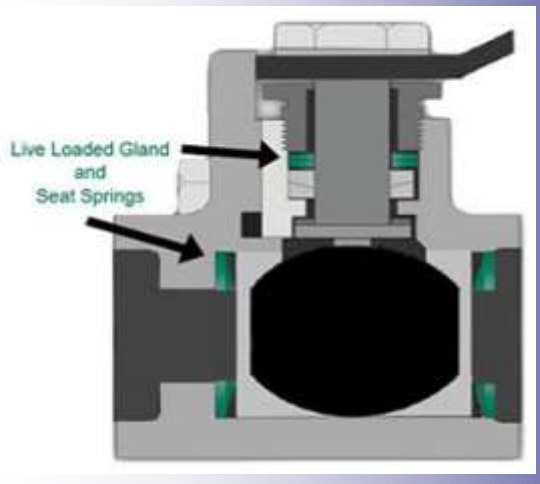
Seat Before Fire



Seat After Fire

Live-loaded Stem Packing

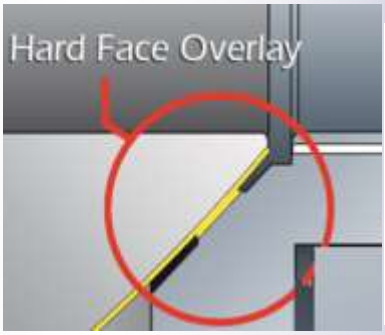
For frequently cycled valves, high temperature and thermal cycling valves, critical application valves, safety or difficult located valves, and history of packing leak valve, Master Valve standard features offer live loading on the stem packing and seals through Belleville spring washers. This assures positive and tight sealing in high cycle severe applications.



B Series Features on Request

Metal-to-Metal Seat

Master Valve has extensive experience in the supply of valves for severe application such as high temperature and in corrosive and/or erosive environments. Master Valve achieves the metal-to-metal seating technology through the use of various hard face material on ball and seat face.



Welding Overlay Technology

This technology is cost effective for ball valves in highly corrosive or erosive services. The life of a valve can be a solid corrosion resistant alloy valve by the application of a weld overlay to valve internal surfaces. Sealing areas and other critical parts of the valve can be weld overlayed. More frequently used materials are AISI 316L and Alloy 625.

Welding is performed in accordance with ASME BPV Section 9

How to Order

Example: **020B2F-RR3-1671-GH-NB**. This figure number represents a 2” B2 Series (2-piece cast steel) Floating Ball Valve, Full Port, Raised Face, ANSI Class 300, A105 Body, 316SS ball and seat, 17-4PH stem, B7M/2HM Bolting, PTFE seats, HNBR seals, per NACE MR0175 Service, Bare stem.

020	B2	F		RR	3		1	6	7	1		G	H		N	B		
Bore size	Value Type	Port config.	—	End Connection	Pressure class	—	Body material	Ball/Seat material	Stem material	Bolting material	—	Seat insert	Seal code	—	NACE option	Operator	Miscellaneous	Mod code

Bore Size

005 = 0.5"
007 = 0.75"
010 = 1" —
015 = 1.5" —
020 = 2"
030 = 3"
040 = 4"
060 = 6"
080 = 8"
100 = 10"
120 = 12"

Valve Type

B1 = Unibody cast steel floating ball valve

B2 = 2-piece cast steel floating ball valve

B3 = 2-piece forged steel floating ball valve

B4 = 3-piece forged steel floating ball valve

B5 = Seal welded/extended body /cooling fins forged steel floating ball valve

Port Configuration

F = Full port

R = Reduced port

Left End Connection

A = API 6A

B = Butt Welds

F = Flat Face

G = Grayloc Hub

H = Rcon

J = RTJ

L = Blank

P = Pipe Extension X Pipe

R = Raised Face

S = Socket Weld

T = Threaded (NPT)

W = Wafer

X = Special

Right End Connection

A = API 6A

B = Butt Welds

F = Flat Face

G = Grayloc Hub

H = Rcon

J = RTJ

L = Blank

P = Pipe Extension X Pipe

R = Raised Face

S = Socket Weld

T = Threaded (NPT)

W = Wafer

X = Special

Pressure Class

1 = 150#

3 = 300#

4 = 400#

6 = 600#

8 = 800#

9 = 900#

A = 1500#

B = 2500#

C = 2000 PSI

D = 3000 PSI

E = 5000 PSI

How to Order

Example: **020B2F-RR3-1671-GH-NB**. This figure number represents a 2" B2 Series (2-piece cast steel) Floating Ball Valve, Full Port, Raised Face, ANSI Class 300, A105 Body, 316SS ball and seat, 17-4PH stem, B7M/2HM Bolting, PTFE seats, HNBR seals, per NACE MR0175 Service, Bare stem.

020	B2	F		RR	3		1	6	7	1		G	H		N	B		
Bore size	Value Type	Port config.	—	End Connection	Pressure class	—	Body material	Ball/Seat material	Stem material	Bolting material	—	Seat insert	Seal code	—	NACE option	Operator	Miscellaneous	Mod code

Body

1 = A105/A350 LF2

2 = A105N

3 = ASTM A216 WCB

4 = CF3M/SS316L/F316L

5 = A29 4140

6 = CF8M/SS316/F316

7 = 17-4PH

8 = A29 4130

9 = A105

A = CA15/SS410/F6A

I = Inconel

L = ASTM A352 LCC

U = Duplex SS

O = Special

Available for other materials

Ball

1 = A105/A350 LF2

2 = A105N

3 = ASTM A216 WCB

4 = CF3M/SS316L/F316L

5 = A29 4140

6 = CF8M/SS316/F316

7 = 17-4PH

8 = A29 4130

9 = A105

A = CA15/SS410/F6A

I = Inconel

L = ASTM A352 LCC

U = Duplex SS

O = Special

Available for other materials

Stem

1 = A105/A350 LF2

4 = F316L

5 = A29 4140

6 = F316

7 = 17-4PH

8 = A29 4130

9 = A105

I = Inconel

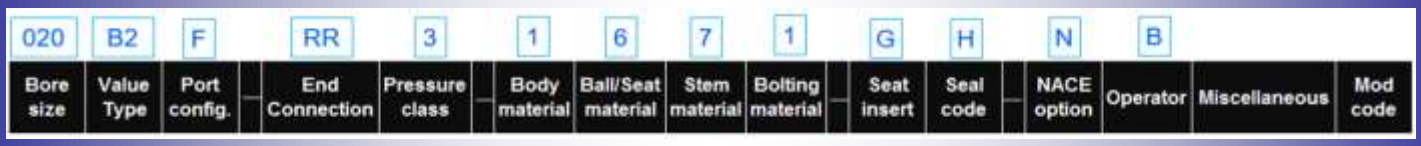
U = Duplex SS

O = Special

Available for other materials

How to Order

Example: **020B2F-RR3-1671-GH-NB**. This figure number represents a 2" B2 Series (2-piece cast steel) Floating Ball Valve, Full Port, Raised Face, ANSI Class 300, A105 Body, 316SS ball and seat, 17-4PH stem, B7M/2HM Bolting, PTFE seats, HNBR seals, per NACE MR0175 Service, Bare stem.



Bolting

1 = B7M/2HM

2 = B7/2H

3 = L7M/7M

4 = L7/7

5 = B8M/8M

6 = A453 Gr.660

O = Special

Available for other materials

Seat Insert

B = Buna-N

G = Glass Filled PTFE

N = Nylon

D = Devlon®

E = EPDM

H = HNBR

P = Peek

R = Low Temp Buna-N

V = Viton® A

W = Viton® B

T = Lip Seal TFE

U = Vtion GLT

Y = Viton GF

Z = Tungsten Carbide Coating

O = Special

Available for other materials

Seal Code

B = Buna-N

G = Glass Filled PTFE

N = Nylon

D = Devlon®

E = EPDM

H = HNBR

P = Peek

R = Low Temp Buna-N

V = Viton® A

W = Viton® B

T = Lip Seal TFE

U = Vtion GLT

Y = Viton GF

Z = Tungsten Carbide Coating

O = Special

Available for other materials

NACE Option

N = NACE

S = Non NACE

Operator

A = Actuator

B = Bare stem

G = Gear operator

L = Lever

O = Special

Mod Code

Exx = Stem extension xx inches

xxx = Modification code xxx

How to Order

Example: **080B2R-RR1-L671-PB-NG**. This feature number represents a 8" B2 Series (2-Piece cast steel) Floating Ball Valve, Reduced Port, Raised Face, ANSI Class 150, ASTM A352 LCC body, 316SS ball and seat, 17-4PH stem, Peek seats, Buna-N seals, Fire Tested, for NACE MR0175 Service with gear operator.

Example: **100B3F-RR3-1671-DV-NB**. This feature number represents a 10" B3 Series (2-Piece Forged) Floating Ball Valve, Full Port, Raised Face, ANSI Class 300, A105/LF2 Body, 316SS ball and seat, 17-4P stem, Devlon seats, Viton B seals, Fire Tested for NACE MR0175 Service and bear stem.

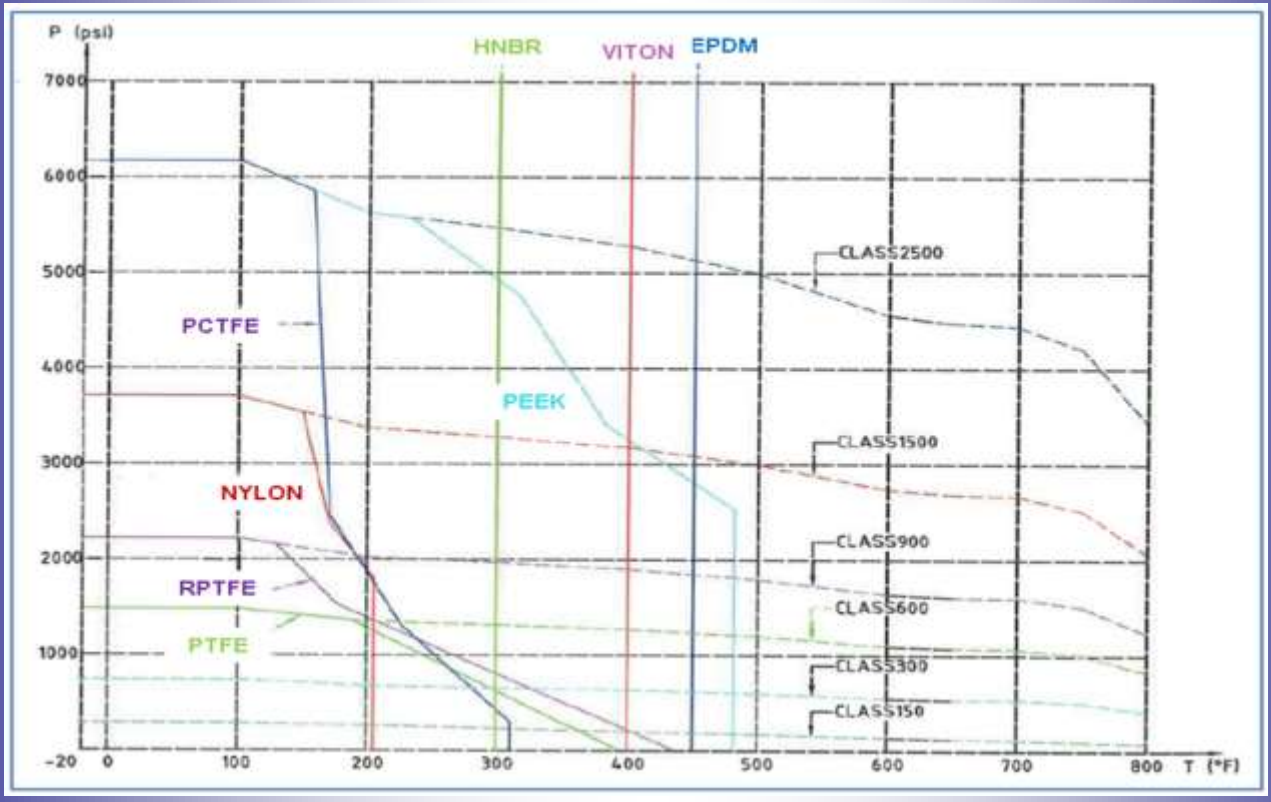
B Series Material Options

B series floating ball valves offer a full range of material option. The material options of our commodity valves are shown in the Table below. Material test reports in accordance with EN10204.3 are available on each serialized valve. In addition, all B series floating ball valves, with standard trim, have been proven reliable, and fully comply with NACE MR0175, customers must provide application specific operating conditions. Inclusive to above, Materials type selected may vary depending on design requirements.

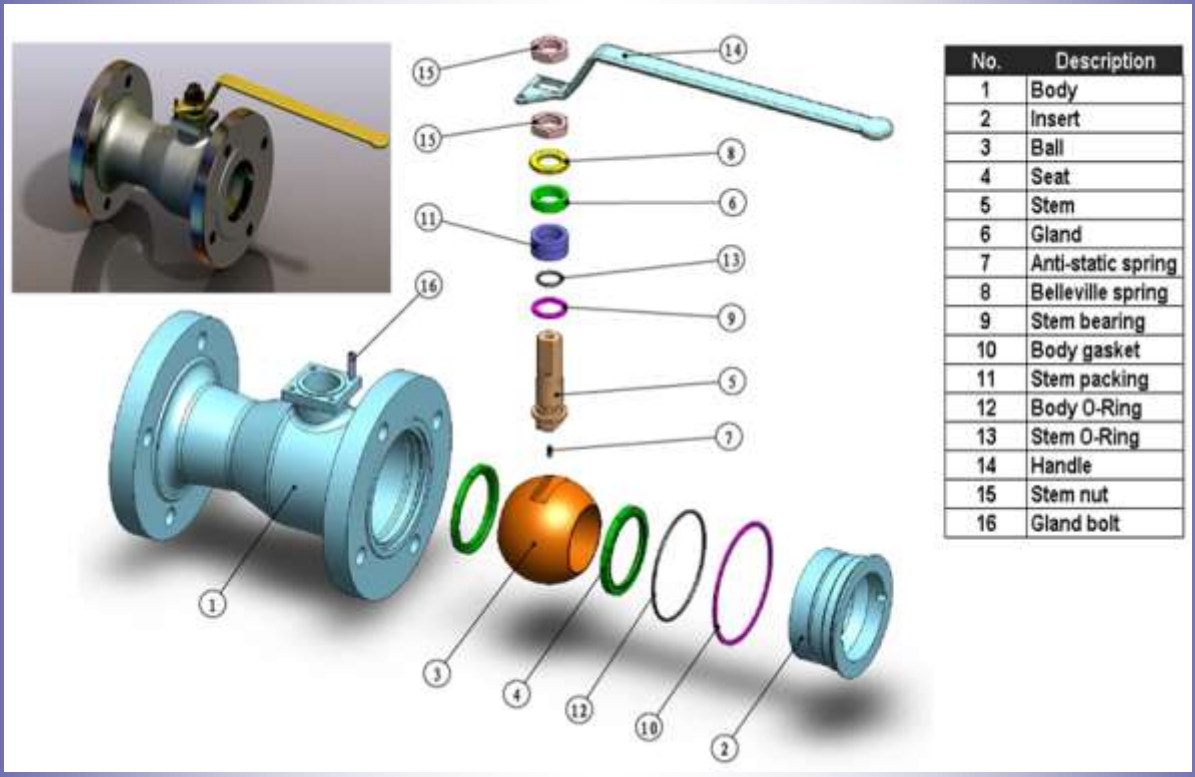
Part	Material Options
Body & Closure	WCB, LCC, 316SS, A105/LF2
Ball & Seat	316SS / A105/A350 LF2 with ENP / Duplex SS
Stem	ASTM A29 Grade 4130 with ENP / 316 SS / A564 Type 630
Seat insert	Glass filled PTFE / Peek / Devlon / Nylon
Seal	Vtion® / Nitril / Buna / HNBR / EPDM / Viton GLT
Studs / Cap Screws	A193 B7M / A320 L7M / A193 B8M
Nut	A 194 2HM / A194 7M / A194 8M

Note: Materials not listed above can be offered on request

B Series Pressure Temperature Ratings



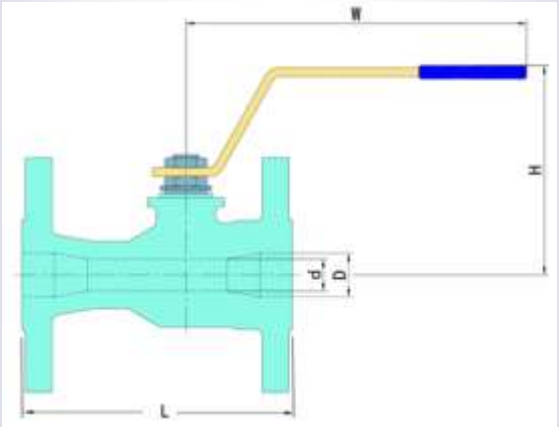
B1 Series Standard Design General Assembly



No.	Description
1	Body
2	Insert
3	Ball
4	Seat
5	Stem
6	Gland
7	Anti-static spring
8	Belleville spring
9	Stem bearing
10	Body gasket
11	Stem packing
12	Body O-Ring
13	Stem O-Ring
14	Handle
15	Stem nut
16	Gland bolt

B1 Floating Ball Valves' Dimensional Data

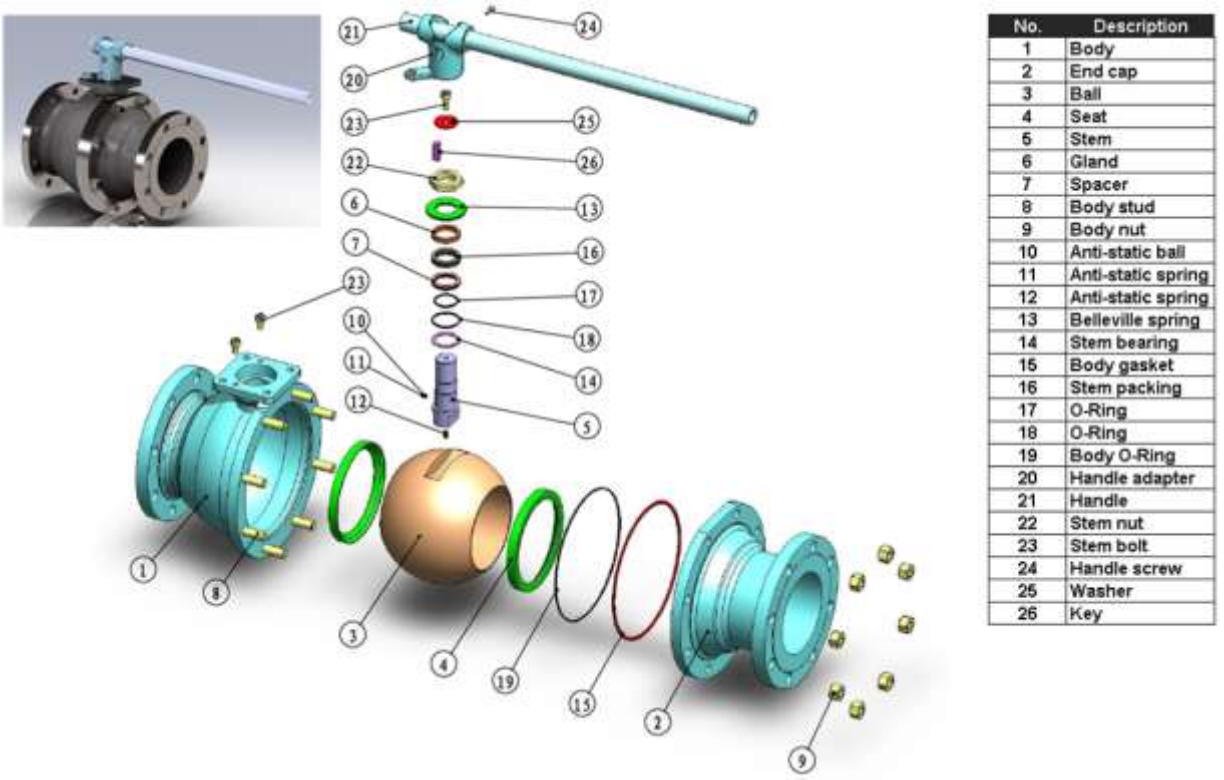
The chart and table below depict B1 Series floating ball valves' dimensional data (in inches). Some dimensional data may vary according to the latest design. Please contact Master Valve® Salesperson for Top Works data.



Class 150						
Size (in)	d	D	L (RF)	H	W	Weight lbf (kg)
0.75"	0.59	0.75	4.61	3.54	6.30	14 (6.1)
1"	0.75	0.98	5.00	3.74	6.30	15 (6.7)
1.5"	1.26	1.50	6.50	4.37	7.09	18 (8)
2"	1.50	2.01	7.01	5.16	9.45	29 (13)
3"	2.32	2.99	7.99	5.83	17.72	56 (25)
4"	2.99	4.02	9.02	6.89	17.72	88 (40)
6"	4.02	5.98	10.51	7.87	27.56	172 (78)

Class 300						
Size (in)	d	D	L (RF)	H	W	Weight lbf (kg)
0.75"	0.59	0.75	5.98	3.54	6.30	14 (6.1)
1"	0.75	0.98	6.50	3.74	6.30	15 (6.7)
1.5"	1.26	1.50	7.48	4.37	7.09	18 (8)
2"	1.50	2.01	8.50	5.16	9.45	29 (13)
3"	2.32	2.99	11.10	5.83	17.72	56 (25)
4"	2.99	4.02	12.01	6.89	19.69	88 (40)
6"	4.02	5.98	15.87	7.87	27.56	172 (78)

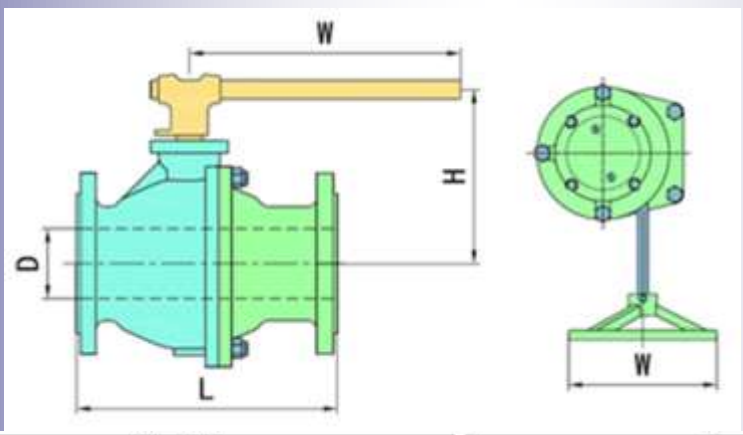
B2 Series Standard Design General Assembly



No.	Description
1	Body
2	End cap
3	Ball
4	Seat
5	Stem
6	Gland
7	Spacer
8	Body stud
9	Body nut
10	Anti-static ball
11	Anti-static spring
12	Anti-static spring
13	Belleville spring
14	Stem bearing
15	Body gasket
16	Stem packing
17	O-Ring
18	O-Ring
19	Body O-Ring
20	Handle adapter
21	Handle
22	Stem nut
23	Stem bolt
24	Handle screw
25	Washer
26	Key

B2 Floating Ball Valves' Dimensional Data

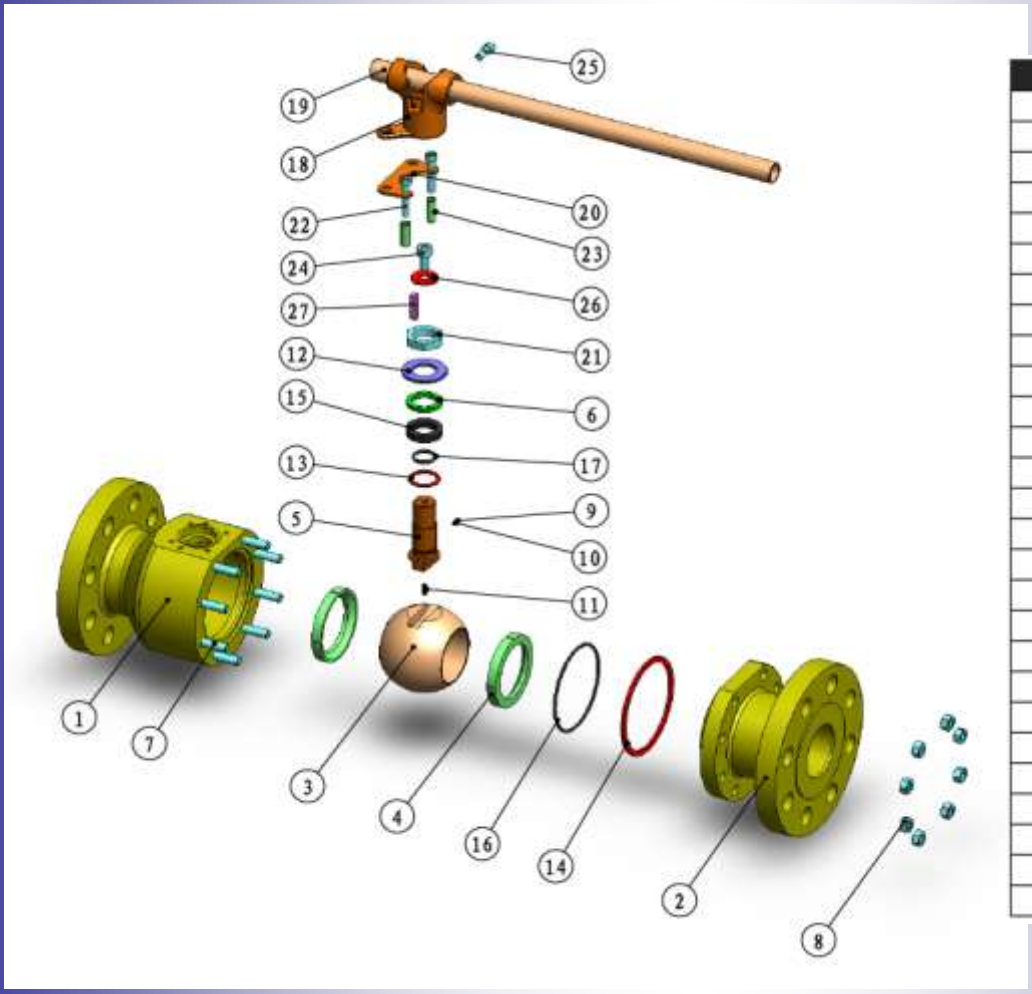
The chart and table below depict B2 Series floating ball valves' dimensional data (in inches). Some dimensional data may vary according to the latest design. Please contact Master Valve® Salesperson for Top Works data



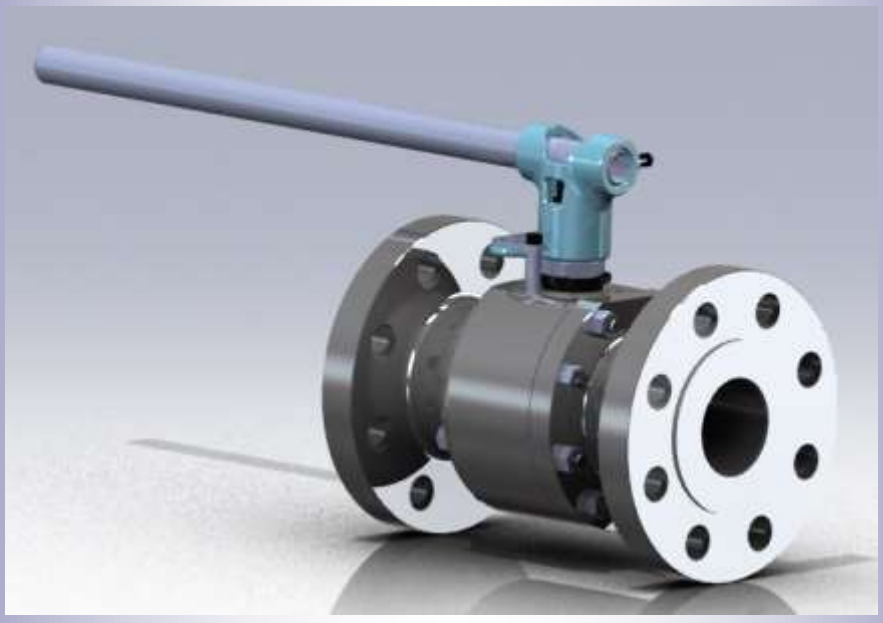
Class 150					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	4.25	3.19	6.30	5 (2.3)
0.75"	0.75	4.61	3.35	6.30	6.2 (2.8)
1"	0.98	5.00	3.86	7.09	10 (4.55)
1.5"	1.50	6.50	5.24	9.45	16 (7.25)
2"	2.01	7.01	5.41	15.75	21 (9.6)
2.5"	2.44	7.48	6.14	17.72	32 (14.2)
3"	2.91	7.99	6.89	17.72	43 (19.5)
4"	4.02	9.02	7.87	19.69	69 (31)
5"	4.92	14.02	10.87	21.65	130 (59)
6"	5.98	15.51	11.69	11.81 (Gear)	163 (74)
8"	7.99	17.99	12.99	15.75 (Gear)	256 (116)
10"	9.92	20.98	14.57	15.75 (Gear)	394 (178.5)

Class 300					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	5.51	3.19	6.30	5 (2.3)
0.75"	0.75	5.98	3.35	6.30	8 (3.58)
1"	0.98	6.50	3.86	7.09	11.2 (5.09)
1.5"	1.50	7.48	5.24	9.45	19 (9.02)
2"	2.01	8.50	5.41	17.72	31 (13.98)
2.5"	2.44	9.49	6.14	17.72	48 (21.8)
3"	2.91	11.10	6.89	19.69	63 (28.58)
4"	4.02	12.01	7.87	27.56	89 (40.48)
5"	4.92	15.00	10.87	27.56	146 (66)
6"	5.98	15.87	11.69	11.81 (Gear)	210 (95)
8"	7.99	19.76	12.99	15.75 (Gear)	332 (150.5)
10"	9.92	22.36	14.57	15.75 (Gear)	502 (227.5)

B3 Series Standard Design General Assembly

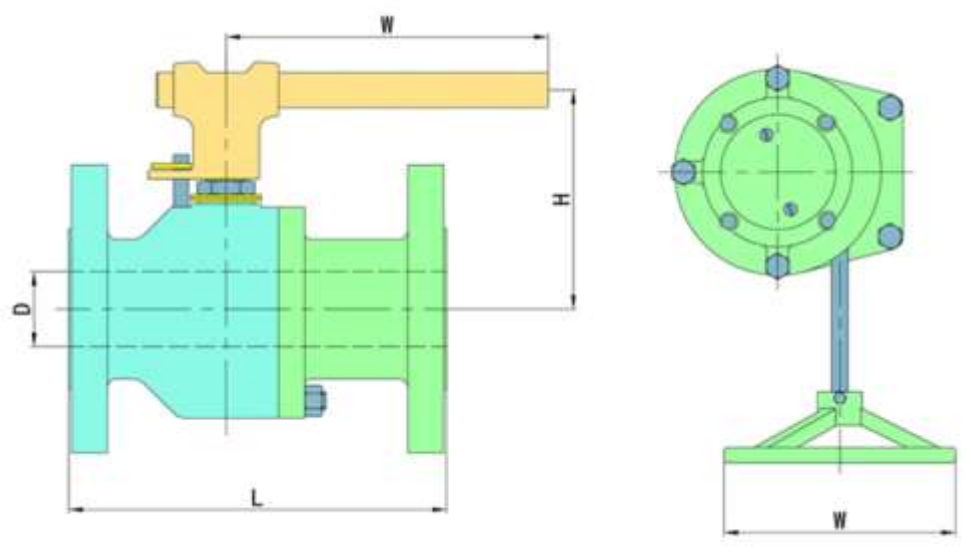


No.	Description
1	Body
2	End cap
3	Ball
4	Seat
5	Stem
6	Gland
7	Body stud
8	Body nut
9	Anti-static ball
10	Anti-static spring
11	Anti-static spring
12	Belleville spring
13	Stem bearing
14	Body gasket
15	Stem packing
16	Body O-Ring
17	O-Ring
18	Handle adapter
19	Handle
20	Stop plate/Lock device
21	Stem nut
22	Stem bolt
23	Support pin
24	Stem screw
25	Handle screw
26	Washer
27	Key



B3 Floating Ball Valves' Dimensional Data

The chart and table below depict B3 Series floating ball valves' dimensional data (in inches). Some dimensional data may vary according to the latest design. Please contact Master Valve® Salesperson for Top Works data.



Class 150					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	4.25	3.19	6.30	6.4 (2.9)
0.75"	0.75	4.61	3.74	6.30	8.4 (3.8)
1"	0.98	5.00	4.33	7.09	12 (5.4)
1.5"	1.50	6.50	4.96	9.45	19 (8.5)
2"	2.01	7.01	5.12	15.75	25 (11.3)
2.5"	2.52	7.48	5.51	17.72	41 (18.5)
3"	2.99	7.99	6.50	17.72	51 (23)
4"	4.02	9.02	7.28	19.69	87 (39.5)
6"	5.98	15.51	9.84	11.81 *(Gear)*	201 (91)
8"	7.99	17.99	14.88	15.75 *(Gear)*	310 (140.5)
10"	10.00	20.98	16.06	15.75 *(Gear)*	512 (232)

Class 300					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	5.51	3.19	6.30	7.1 (3.2)
0.75"	0.75	5.98	3.74	6.30	8.8 (4)
1"	0.98	6.50	4.33	7.09	14.3 (6.5)
1.5"	1.50	7.48	4.96	9.45	28.7 (13)
2"	2.01	8.50	5.12	17.72	42 (19)
2.5"	2.52	9.49	5.51	17.72	62.8 (28.5)
3"	2.99	11.10	6.50	19.69	87.3 (39.6)
4"	4.02	12.01	7.28	27.56	132 (60)
6"	5.98	15.87	9.84	11.81 *(Gear)*	288 (130.5)
8"	7.99	19.76	14.88	15.75 *(Gear)*	432 (196)
10"	10.00	22.36	16.06	15.75 *(Gear)*	653 (296)

Class 600					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	6.50	3.39	6.30	7.7 (3.47)
0.75"	0.75	7.48	3.54	6.30	13 (5.88)
1"	0.98	8.50	4.33	9.45	16.4 (7.43)
1.5"	1.50	9.49	5.00	9.45	29 (13.21)
2"	2.01	11.50	5.12	17.72	64 (49.97)
3"	2.99	14.02	7.05	21.65	106 (19.5)
4"	4.02	17.01	7.48	27.56	188 (85.5)

Class 900					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	8.50	3.39	6.30	12 (5.45)
0.75"	0.75	9.02	3.74	7.09	17.5 (7.96)
1"	0.98	10.00	4.33	9.45	23.2 (10.52)
1.5"	1.50	12.01	5.12	15.75	45 (20.5)
2"	2.01	14.49	5.91	19.69	56 (25.5)
3"	2.99	15.00	7.87	27.56	107 (48.5)

Class 1500					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	8.50	3.39	6.30	12.7 (5.78)
0.75"	0.75	9.02	3.74	7.09	17.6 (7.98)
1"	0.98	10.00	4.53	9.45	24 (10.88)
1.5"	1.50	12.01	5.12	15.75	45.3 (20.57)
2"	2.01	14.49	5.91	19.69	68 (30.84)

Class 2500					
Size (in)	D	L (RF)	H	W	Weight lbf (kg)
0.5"	0.51	10.39	3.74	6.30	17.4 (7.9)
0.75"	0.75	10.75	4.53	7.09	26.5 (12)
1"	0.98	12.13	4.72	9.45	35 (15.9)

Master Valve USA Product Offering

G Series Trunnion Mounted Ball Valve

Applications: upstream, midstream and downstream. Mid pressure to high pressure, pipeline and API 6D.

Valve Automation

Applications: One stop shop for manual valve and automated valve packages. Upstream, midstream and downstream.

API 6A Ball Valves

Applications: upstream high pressure; wellhead; subsea exploration; FPSO .

API 600 Gate/Globe/Check Valves

Applications: Downstream low pressure

Tough Valve for Toughest Flow

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Tough Ball Valve for Toughest Flow

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