Specifying DSI® Cast Stainless Steel Valve Figure Numbers

It's easy to specify DSI® Stainless Steel Valves. Just follow the example and use the figure number chart below to specify the valve you need.

APPROVED
By John Conway, CMG (Laptop) at 8:16 am, Jun 06, 2011

Stainless Steel Example:

A 16" Gear Operated Class 150 Gate Valve with RTJ Flanged End Connections, A351 CF8M Stainless Steel Body, 316 Stainless Steel Trim with Half Hard Faced Trim Option, Graphoil® Packing and Gaskets, API 603 Design Conformance with no Specials specified.

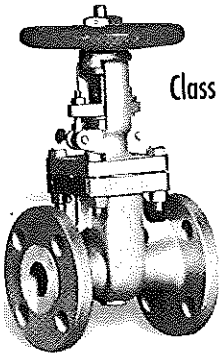
DSI A	G B	37 C	R D	16 E	16 F	HFS G	H	I	J
DSI Series	**Operation**	**Pressure Classes**	**End Connection**	**Body Material**	**Trim Material**	**Stellite® Option**	**Packing and Gasket Material**	**Specials**	**Design**
DSI	No Denotation for Manual Operation and Check Valves **G** Gear Operated **CW** Chain Wheel Operated **A** Motor Operated	See Chart Below	No Denotation for Raised Face Flanged End **1/2** Weld End **R** RTJ Flanged Ends **FF** Flat Faced Ends	**04** A351 CF8 **04L** A351 CF3 **16** A351 CF8M **16L** A351 CF3M **17** A351 CG8M **17L** A351 CG3M **47** A351 CF8C **A20** A351 CN7M	**04** 304SS **04L** 304LSS **16** 316SS **16L** 316LSS **17** 317SS **17L** 317LSS **47** 347SS **A20** Alloy 20	**HFS** Half Hard Faced Trim **U** Full Hard Faced Trim	No Denotation for Graphoil® Packing and Gaskets **T** PTFE Packing and Gaskets	**EB** Extended Bonnet **LD** Locking Device **BP** Bypass **N** NACE (MR0175 2002 Edition) **DD** Double Disc Design **EQ** Equalization Line	No Denotation for API 603 Design **H** API 600 Design

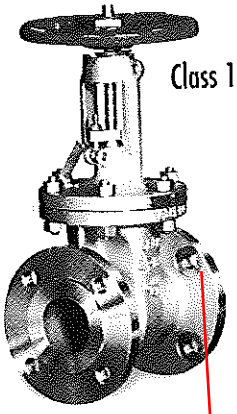
Valve Type	Class	Code
Gate	150	37
	300	23
	600	66
Globe	150	133
	300	141
	600	161
Swing Check	150	137
	300	149
	600	165

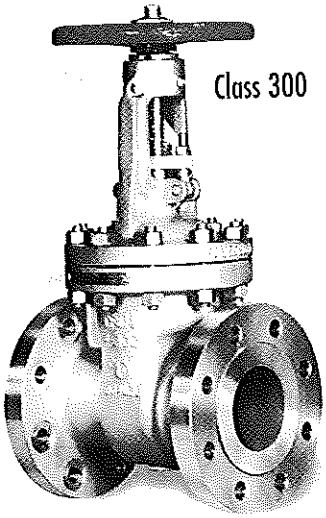
See Codes Below for Stainless Steel Check Valves

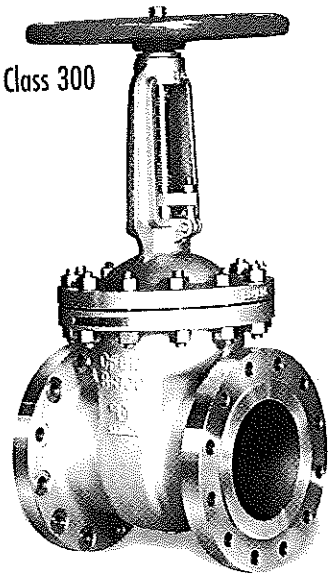
Specials	Packing Material	Design
N NACE (MR0103) NACE (MR0175 2002 Edition)	No Denotation for Graphoil® Gaskets **T** PTFE Gaskets	No Denotation for B16.34 Design **H** API 600 Design

Gate Valves


Class 150


Class 150


Class 300

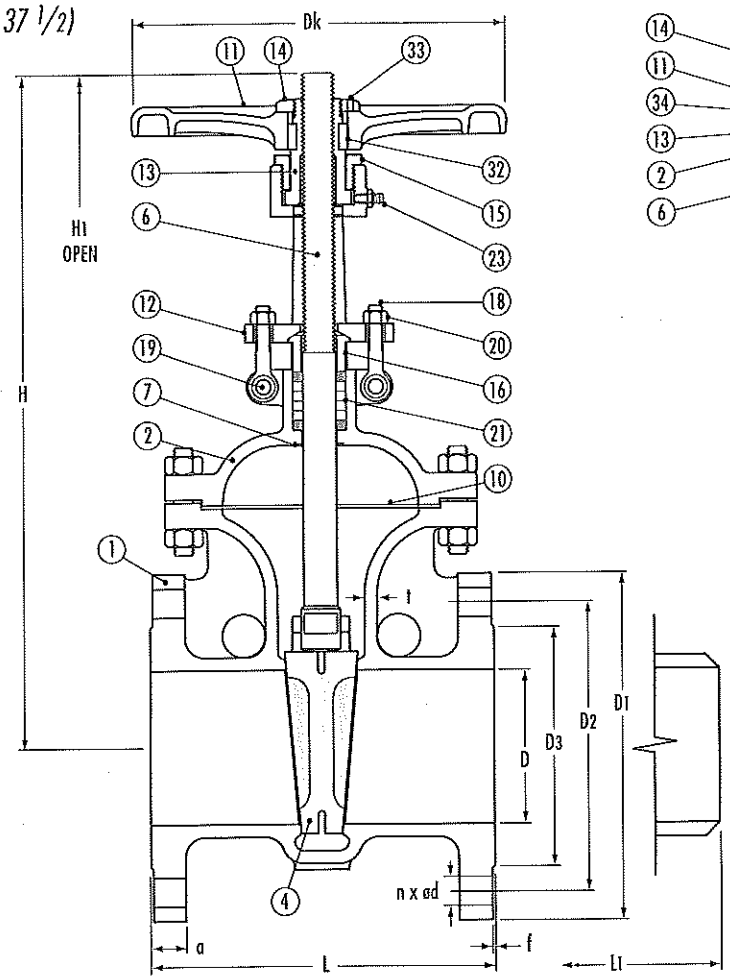

Class 300

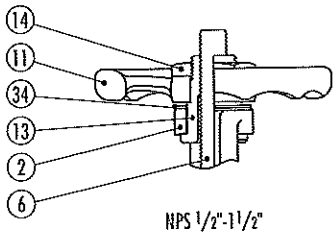
Parts And Materials • Class 150, 300 & 600

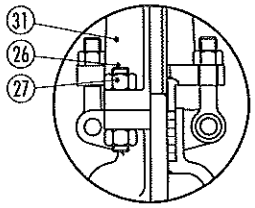
Item	Part Name	CF8M	316L	317	317L	304	Alloy 20
1	Body	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
2	Bonnet	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
4	Solid Wedge ≤ 1½"	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
	Flex Wedge ≥ 2"	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
5	Seats	A351 CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
6	Stem	A276-316	A276-316L	A276-317	A276-317L	A276-304	B473-N08020
7	Backseat	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
8	Studs ½"-12"	A193-B8M	A193-B8M	A193-B8M	A193-B8M	A193-B8	A193-B8M
	Studs ≥ 14"	A193-B8	A193-B8	A193-B8	A193-B8	A193-B8	A193-B8
9	Stud Nuts ½"-12"	A194-8M	A194-8M	A194-8M	A194-8M	A194-8	A194-8M
	Stud Nuts ≥ 14"	A194-8	A194-8	A194-8	A194-8	A194-8	A194-8
10	Gasket Cl. 150	Graphite Sheet W/SS					
	Gasket Cl. 300 & Above	Spiral Wound / Graphite + 316					
11	Handwheel ½"-12"	ASTM A536	ASTM A536	ASTM A536	ASTM A536	ASTM A536	ASTM A536
	Handwheel ≥ 14"	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB	A216-WCB
12	Gland Flange	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
13	Yoke Sleeve	A439 D-2	A439 D-2C	A439 D-2C	A439 D-2C	A439 D-2C	A439 D-2C
14	Handwheel Nut ½"-12"	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
15	Retainer Nut ½"-12"	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
	Retainer Nut ≥ 14"	A576-1020-Zn	A576-1020-Zn	A576-1020-Zn	A576-1020-Zn	A576-1020-Zn	A576-1020-Zn
16	Gland	A276-316	A276-316L	A276-317	A276-317L	A276-304	B473-N08020
18	Eyebolts	A193-B8	A193-B8	A193-B8	A193-B8	A193-B8	A193-B8
19	Eyebolt Pins	A194-8	A194-8	A194-8	A194-8	A194-8	A194-8
20	Eyebolt Nuts	A194-8	A194-8	A194-8	A194-8	A194-8	A194-8
21	Packing	Braided and Die-formed Graphite Rings					
23	Grease Fitting	Steel	Steel	Steel	Steel	Steel	Steel
32	Key 2"-12"	A108	A108	A108	A108	A108	A108
33	Set Pin	Steel	Steel	Steel	Steel	Steel	Steel
34	Washer ½"-1½"	304SS	304SS	304SS	304SS	304SS	304SS
NPS 10" - 24"							
25	Bearing 16"-24"	Steel	Steel	Steel	Steel	Steel	Steel
26	Stud	A193 B8M	A193 B8M	A193 B8M	A193 B8M	A193 B8M	A193 B8M
27	Stud Nut	A194 8M	A194 8M	A194 8M	A194 8M	A194 8M	A194 8M
31	Yoke	A351 CF8M	A351 CF8M	A351 CF8M	A351 CF8M	A351 CF8M	A351 CF8M

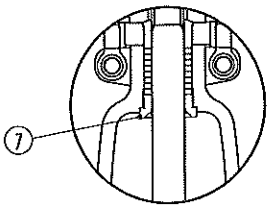
Class 150 Gate Valves

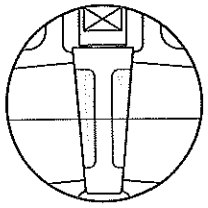
(37-37 1/2)

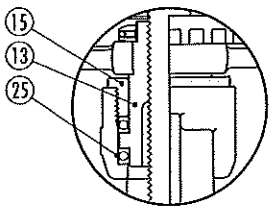


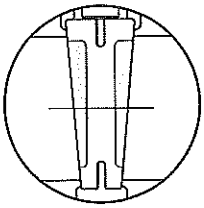

NPS 1/2"-1 1/2"


NPS 10" And Over


Separate Backseat
NPS 14"-24"


Solid Wedge
NPS 1/2"-1 1/2"

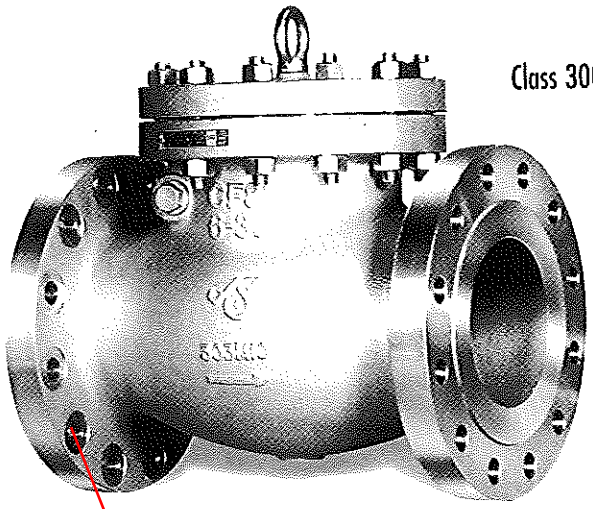

NPS 16" And Over


Flexible Wedge
NPS 2" And Over

Dimensional Data (in.) and Flow Coefficient (Cv)

	End Flange															
			Bolt Hole													
Size	ØD	ØD1	ØD2	N	Ød	ØD3	a	f	L	L1	H	H1	Dk	t	Wt. Lbs.	Cv
1/2	0.50	3.50	2.38	4	0.63	1.38	0.31	0.06	4.25	4.25	6.61	7.20	3.94	0.11	5	14
3/4	0.75	3.88	2.75	4	0.63	1.69	0.34	0.06	4.62	4.62	6.65	7.64	3.94	0.12	6	22
1	1.00	4.25	3.12	4	0.63	2.00	0.38	0.06	5.00	5.00	7.01	8.35	3.94	0.16	8	34
1 1/2	1.50	5.00	3.88	4	0.63	2.88	0.50	0.06	6.50	6.50	8.90	10.55	5.51	0.19	16	110
2	2.00	6.00	4.75	4	0.75	3.62	0.56	0.06	7.00	8.50	11.56	13.89	7.87	0.22	30	200
2 1/2	2.50	7.00	5.50	4	0.75	4.12	0.62	0.06	7.50	9.50	13.70	16.54	7.87	0.22	46	260
3	3.00	7.50	6.00	4	0.75	5.00	0.69	0.06	8.00	11.12	15.14	18.50	7.87	0.22	52	460
4	4.00	9.00	7.50	8	0.75	6.19	0.88	0.06	9.00	12.00	17.48	21.76	9.84	0.25	80	825
6	6.00	11.00	9.50	8	0.87	8.50	0.94	0.06	10.50	15.88	22.80	29.06	9.84	0.28	135	2300
8	8.00	13.50	11.75	8	0.87	10.62	1.06	0.06	11.50	16.50	28.76	36.88	13.78	0.31	222	4150
10	10.00	16.00	14.25	12	1.00	12.75	1.12	0.06	13.00	18.00	34.67	45.00	17.72	0.34	224	6700
12	12.00	19.00	17.00	12	1.00	15.00	1.19	0.06	14.00	19.75	40.71	52.99	17.72	0.38	472	9700
14	13.25	21.00	18.75	12	1.12	16.25	1.31	0.06	15.00	22.50	47.80	58.54	17.72	0.41	685	16,277
16	15.25	23.50	21.25	16	1.12	18.50	1.38	0.06	16.00	24.00	54.61	66.89	19.69	0.44	1000	21,562
18	17.25	25.00	22.75	16	1.25	21.00	1.50	0.06	17.00	26.00	61.00	74.80	22.05	0.47	1300	28,715
20	19.25	27.50	25.00	20	1.25	23.00	1.62	0.06	18.00	28.00	66.06	83.46	27.95	0.51	1500	35,760
24	23.25	32.00	29.50	20	1.25	27.25	1.81	0.06	20.00	32.00	78.25	98.50	31.50	0.57	2000	52,165

Swing Check Valves



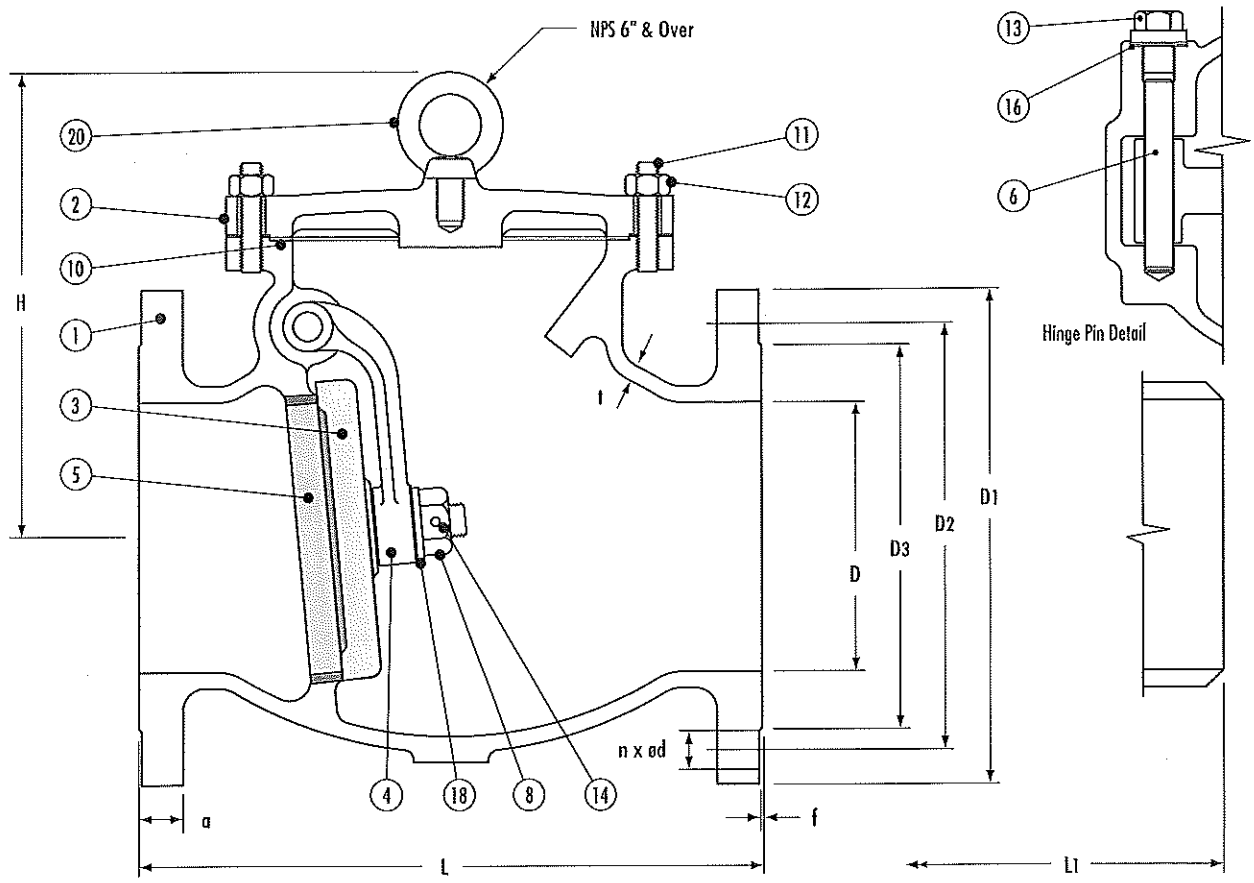
Class 300

Parts And Materials • Class 150, 300 & 600

Item	Part Name	CF8M	316L	317	317L	304	Alloy 20
1	Body	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
2	Cover	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
3	Disc	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
4	Arm	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
5	Seat	A351-CF8M	A351-CF3M	A351-CG8M	A351-CG3M	A351-CF8	A351-CN7M
6	Arm Pin	A276-316	A276-316L	A276-317	A276-317L	A276-304	B473-N08020
8	Disc Nut	A276-316	A276-316L	A276-317	A276-317L	A276-304	B473-N08020
10	Gasket Cl. 150	Graphite Sheet W/ GHE					
	Gasket Cl. 300 & above	Spiral Wound / Graphite + 316					
11	Studs	A193-B8M	A193-B8M	A193-B8M	A193-B8M	A193-B8	A193-B8M
12	Stud Nuts	A194-8M	A194-8M	A194-8M	A194-8M	A194-8	A194-8M
13	Side Plug	A276-316	A276-316L	A276-317	A276-317L	A276-304	B473-N08020
14	Split Pin	A276-316	A276-316L	A276-317	A276-317L	A276-304	B473-N08020
16	Side Plug Gasket	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
18	Disc Washer	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
20	Eyebolt	Steel	Steel	Steel	Steel	Steel	Steel

Class 150 Swing Check Valves

(137-137 1/2)



Dimensional Data (in.) and Flow Coefficient (C_V)

	End Flange													
			Bolt Hole											
Size	ØD	ØD1	ØD2	N	Ød	ØD3	a	f	L	L1	H	t	Wt. Lbs.	C_V
1/2	0.50	3.50	2.38	4	0.63	1.38	0.31	0.06	4.25	4.25	2.72	0.11	4	9
3/4	0.75	3.88	2.75	4	0.63	1.69	0.34	0.06	4.62	4.62	2.95	0.12	6	10
1	1.00	4.25	3.12	4	0.63	2.00	0.38	0.06	5.00	5.00	3.41	0.16	8	22
1 1/2	1.50	5.00	3.88	4	0.63	2.88	0.50	0.06	6.50	6.50	3.74	0.19	15	55
2	2.00	6.00	4.75	4	0.75	3.62	0.56	0.06	8.00	8.00	4.59	0.22	21	82
2 1/2	2.50	7.00	5.50	4	0.75	4.12	0.62	0.06	8.50	8.50	5.26	0.22	30	170
3	3.00	7.50	6.00	4	0.75	5.00	0.69	0.06	9.50	9.50	5.89	0.22	43	170
4	4.00	9.00	7.50	8	0.75	6.19	0.88	0.06	11.50	11.50	6.69	0.25	68	295
6	6.00	11.00	9.50	8	0.87	8.50	0.94	0.06	16.00	16.00	10.35	0.28	128	830
8	8.00	13.50	11.75	8	0.87	10.62	1.06	0.06	19.50	19.50	12.19	0.31	226	1525
10	10.00	16.00	14.25	12	1.00	12.75	1.12	0.06	24.50	24.50	14.39	0.34	317	2400
12	12.00	19.00	17.00	12	1.00	15.00	1.19	0.06	27.50	27.50	16.13	0.38	530	3500

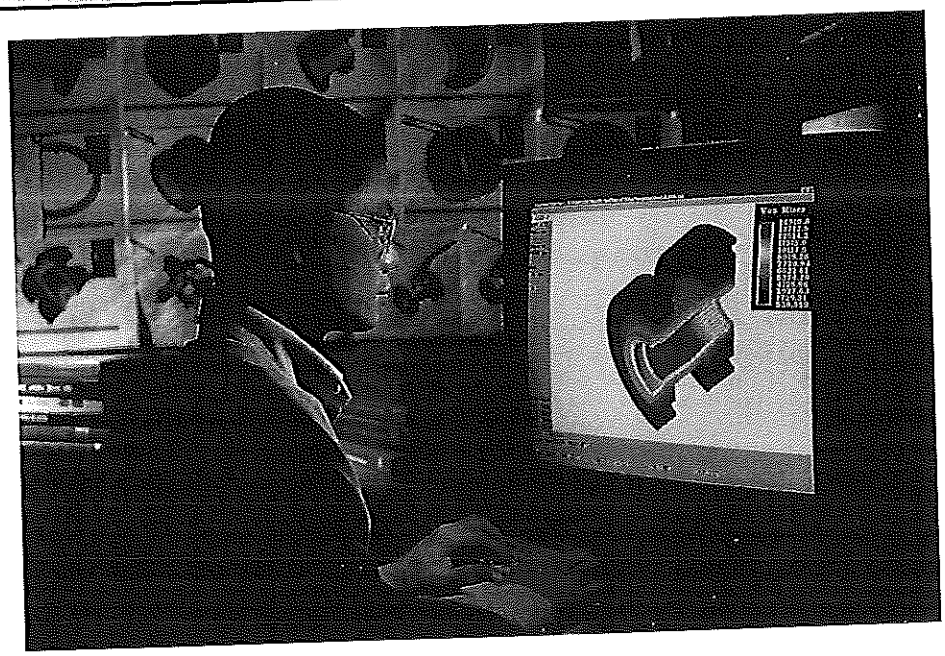
How to Identify PBV-USA, Inc. Ball Valves

The PBV-USA 4400/5400/6400 series valve figure number is made up of significant numbers that fully describe all standard variations of the valve with one additional optional code to denote special service. Valve coding is as follows:

□ – □ □ □ – □ □ – □ □ – □ □ – □ □

General Material	Port Configuration	Valve Type	Pressure Class	Fire Tested	End Connection	Body Material	Trim Material	Seat Material	Seal Material	NACE Option	Operator	Design	Modifier Code
C Carbon Steel	4 Regular Split Body	4 Stem Packing Flanged Floating Type	10 150 Class	0 Non-Fire Tested, No Emergency Seals	1 RF	22 WCB	00 Same as Body	C Carbon Filled TFM	B Buna	N NACE	A Actuator	I ISO 5211 Mounting Pad	
S Stainless Steel	5 Regular Unibody	5 O-Ring Stem Flanged Floating Type	30 300 Class	3 Fire Tested with No Emergency Grease Seals	4 Non-Standard	28 LCC	36 316SS	F Virgin TFM	T Virgin PTFE	S Standard	B Bare Stem		
	6 Full Split Body		60 600 Class		3 RTJ	36 CF8M	71 Monel	N Nylon	V Viton		G Gear Operator		
						73 Hastelloy	73 Hastelloy	P Peek	Y Viton GF		L Lever		
									Z Special		V Round or Oval Handwheel		

Example: S-6410-31-3600-CT-NLI would be the appropriate figure number for an all stainless, full port, ANSI Class 150, flanged end floating ball valve, fire tested, with Carbon Filled TFM seats and graphite seals for use in a NACE application, lever operated ISO design.



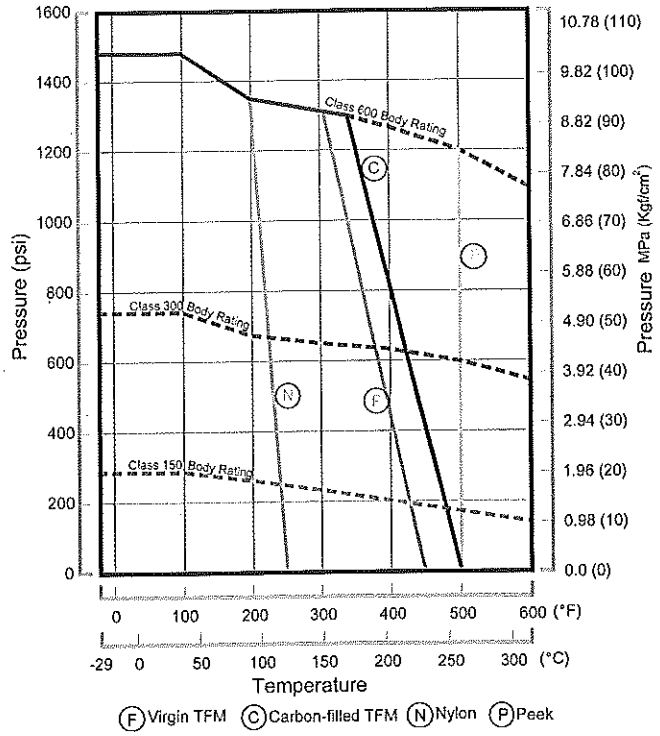
PBV-USA 4400/5400/6400 floating ball valves are designed to meet the following industry standards:

ITEM	AMERICAN STANDARD	BRITISH STANDARD
Valve Shell Pressure - Temperature	ASME/ANSI B16.34	BS 5351
Seat Pressure - Temperature	See PBV P-T ratings	See PBV P-T ratings
Shell Wall Thickness	ASME/ANSI B16.34	BS 5351
Face-to-Face Dimensions	ASME B16.10	BS 2080 (note)
End Flange Dimensions	ASME/ANSI B16.5	BS 1560
Pressure Test	API 598 and API 6D	BS 6755 Part 1 (note)
Fire Test	API 607 and API 6FA	BS 6755 Part 2 (note)
Design Standard	API 608 and MSS-SP-72	BS 5351

Note: Optional

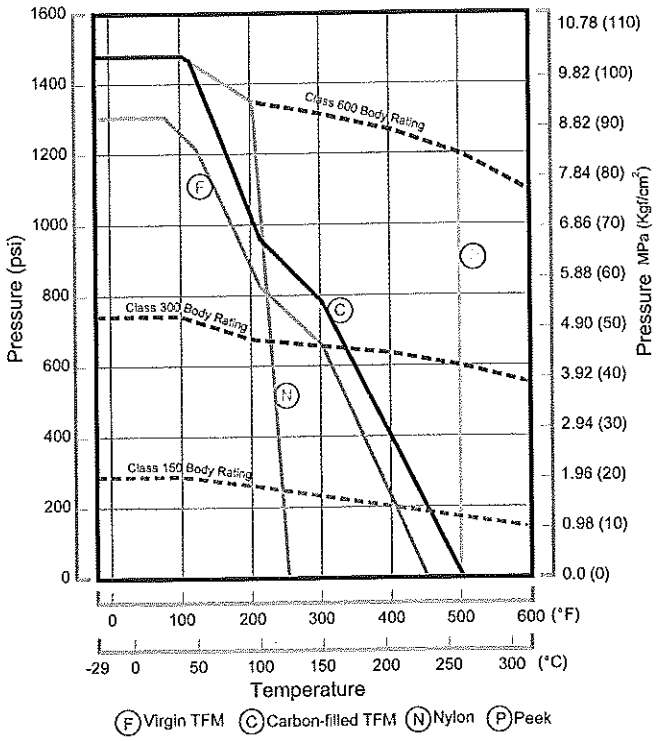
The pressure/temperature ratings for PBV-USA's flanged floating ball valves are determined by the body material and the seat material rating. The charts below are indicative of the standard seat materials; for ratings of other materials, contact the Technical Services Department of PBV-USA.

1/2" TO 1 1/2" 4400: Class 150/300/600
1/2" TO 1 1/2" 4500: Class 150/300/600
1/2" TO 1 1/2" 5400: Class 150/300
1/2" to 1" 6400: Class 150/300/600
1/2" to 1" 6500: Class 150/300/600



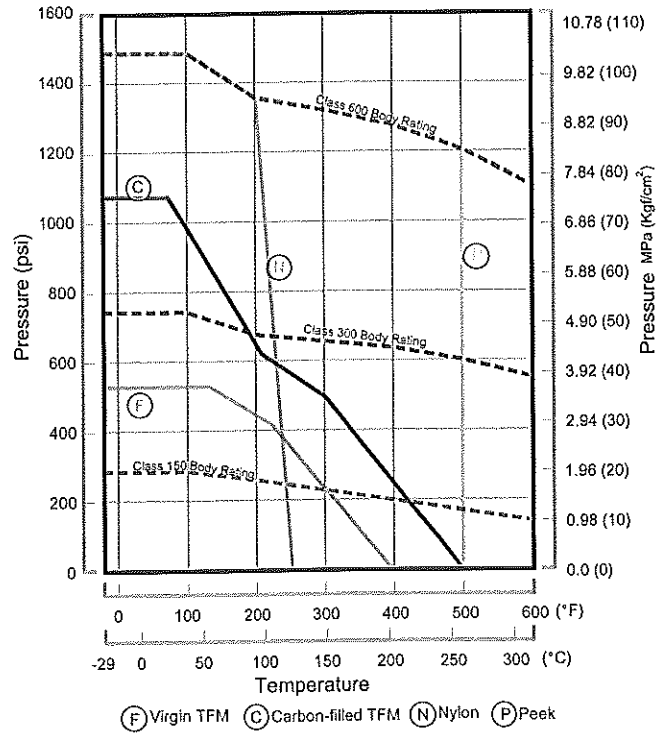
(F) Virgin TFM (C) Carbon-filled TFM (N) Nylon (P) Peek

2" to 4" 4400: Class 150/300/600
2" to 4" 4500: Class 150/300/600
2" to 4" 5400: Class 150/300
1 1/2" to 3" 6400: Class 150/300/600
11/2" to 3" 6500: Class 150/300/600



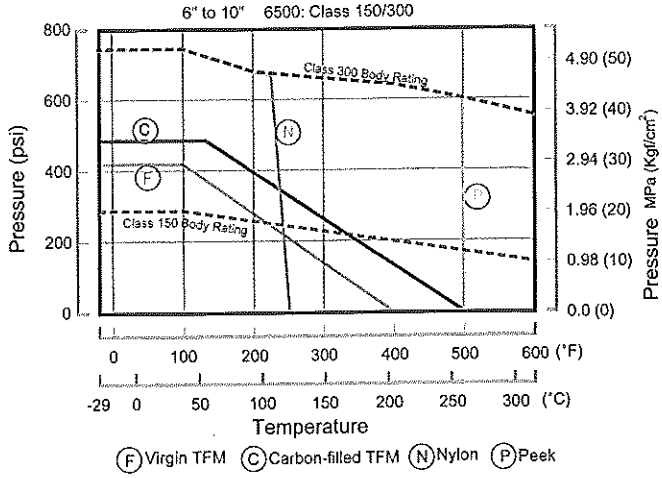
(F) Virgin TFM (C) Carbon-filled TFM (N) Nylon (P) Peek

6" 4400: Class 150/300/600
6" 4500: Class 150/300/600
6" 5400: Class 150/300
4" 6400: Class 150/300/600
4" 6500: Class 150/300/600



(F) Virgin TFM (C) Carbon-filled TFM (N) Nylon (P) Peek

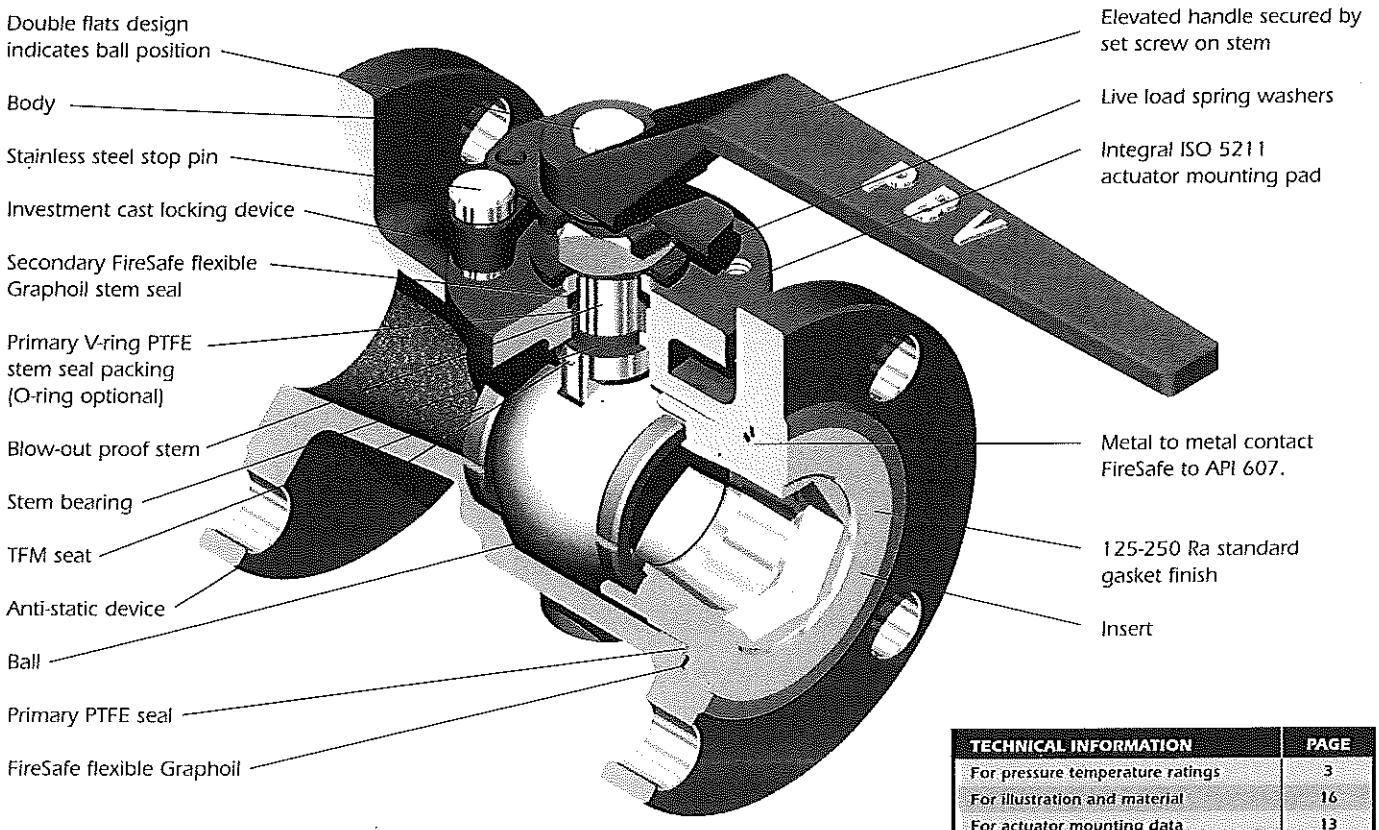
8" & 10" 4400: Class 150/300/600
8" & 10" 4500: Class 150/300/600
8" to 12" 5400: Class 150/300
6" to 10" 6400: Class 150/300
6" to 10" 6500: Class 150/300



(F) Virgin TFM (C) Carbon-filled TFM (N) Nylon (P) Peek

This is an illustrated cross-section of a typical PBV-USA regular port, uni-body, floating type ball valve exhibiting the basic design concept. The actual design of a valve may be slightly different from this illustration, depending on its size and pressure class.

SERIES	CLASS	SIZE - RANGE
5400	150/300	1/2" - 12"



TECHNICAL INFORMATION	PAGE
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PBV figure number system	2

STANDARD FEATURES FOR ALL PBV FLOATING BALL VALVES (continued)

API 6D or 598 to assure the integrity of the shell and seals, and final inspection to confirm that all marking, tagging and processing have been performed in accordance with PBV-USA and industry standards.

Equalized Cavity Pressure

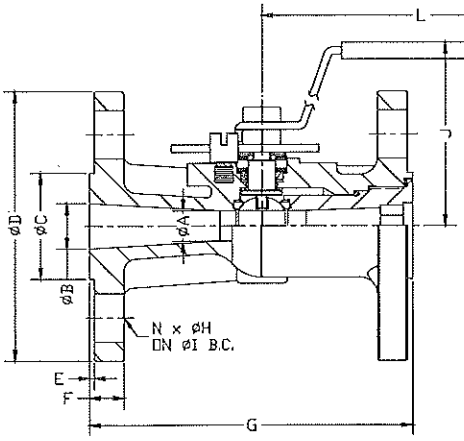
The pressure equalization hole at the top of the ball combined with seat design are engineered to maintain the pressure balance in the line and in the body cavity while the valve is in the open or closed position.

Design Features

Standard design features, product line range, material selection, and a centrally-located operations facility all combine to make PBV-USA the first choice for floating ball valves.

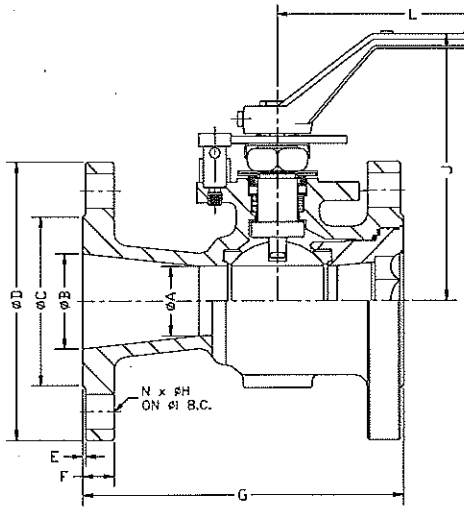
The inherent ball valve characteristics of quick quarter-turn operation, bi-directional shut-off capability, ease of automation, and low maintenance are enhanced with many additional features such as 300 Series stainless steel gland, double packing seals, live load packing, heavy bolting meeting NACE MR0175, 125-250 Ra flange finish, and port diameters in conformance with API 608.

Test pressure	Shell (hydrostatic)	Seat (air)
Class 150:	450 psi	80 psi
Class 300:	1125 psi	80 psi
Class 600:	2225 psi	80 psi



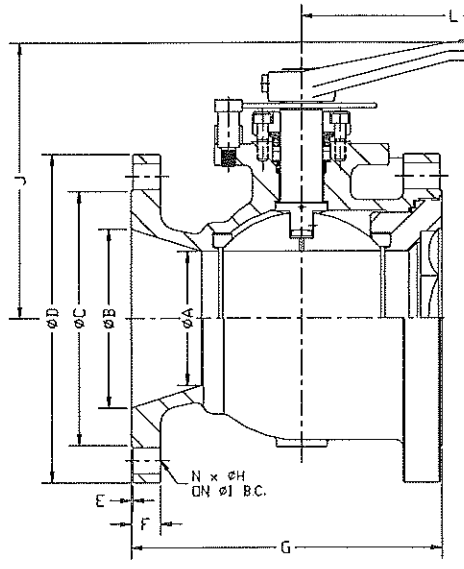
5400 SERIES

Valve Size	A	B	C	D	E	F	G	NxøH	I	J	L
1/2" - 1-1/2" Class 150											
1/2"	0.39	0.59	1.38	3.50	0.06	0.44	4.25	4xø.62	2.38	4.07	5.50
3/4"	0.49	0.79	1.69	3.88	0.06	0.44	4.62	4xø.62	2.75	4.25	5.50
1"	0.71	0.98	2.00	4.25	0.06	0.44	5.00	4xø.62	3.12	4.68	6.30
1-1/2"	1.18	1.50	2.88	5.00	0.06	0.57	6.50	4xø.62	3.88	5.80	6.30
1/2" - 1-1/2" Class 300											
1/2"	0.39	0.59	1.38	3.75	0.06	0.56	5.50	4xø.62	2.62	4.07	5.50
3/4"	0.49	0.79	1.69	4.62	0.06	0.62	6.00	4xø.75	3.25	4.25	5.50
1"	0.71	0.98	2.00	4.88	0.06	0.69	6.50	4xø.75	3.50	4.68	6.30
1-1/2"	1.18	1.50	2.88	6.12	0.06	0.81	7.50	4xø.88	4.50	5.80	6.30



5400 SERIES

Valve Size	A	B	C	D	E	F	G	NxøH	I	J	L
2" - 4" Class 150											
2"	1.50	2.00	3.62	6.00	0.06	0.68	7.00	4xø.75	4.75	5.74	9.00
3"	2.28	3.00	5.00	7.50	0.06	0.81	8.00	4xø.75	6.00	7.13	16.50
4"	3.00	4.00	6.19	9.00	0.06	1.00	9.00	8xø.75	7.50	7.69	16.50
2" - 4" Class 300											
2"	1.50	2.00	3.62	6.50	0.06	0.88	8.50	8xø.75	5.00	5.74	9.00
3"	2.28	3.00	5.00	8.25	0.06	1.12	11.12	8xø.88	6.62	7.13	16.50
4"	3.00	4.00	6.19	10.00	0.06	1.25	12.00	8xø.88	7.88	7.69	16.50



5400 SERIES

Valve Size	A	B	C	D	E	F	G	NxøH	I	J	L
6" - 12" Class 150											
6"	4.49	6.00	8.50	11.00	0.06	1.00	10.50	8xø.88	9.50	9.22	19.70
8"	6.00	8.00	10.62	13.50	0.06	1.12	11.50	8xø.88	11.75	11.65	43.00
10"	7.32	10.00	12.75	16.00	0.06	1.19	13.00	12xø1.00	14.25	14.00	58.00
12"	8.94	12.00	15.00	19.00	0.06	1.25	14.00	12xø1.00	17.00	14.30	
6" - 12" Class 300											
6"	4.49	6.00	8.50	12.50	0.06	1.44	15.88	12xø.88	10.62	9.22	19.70
8"	6.00	8.00	10.62	15.00	0.06	1.62	16.50	12xø1.00	13.00	11.65	43.00
10"	7.32	10.00	12.75	17.50	0.06	1.88	18.00	16xø1.12	15.25	14.00	58.00
12"	8.94	12.00	15.00	20.50	0.06	2.00	19.75	16xø1.25	17.75	14.30	19.70

Note: 8"-12": Optional gear operation.