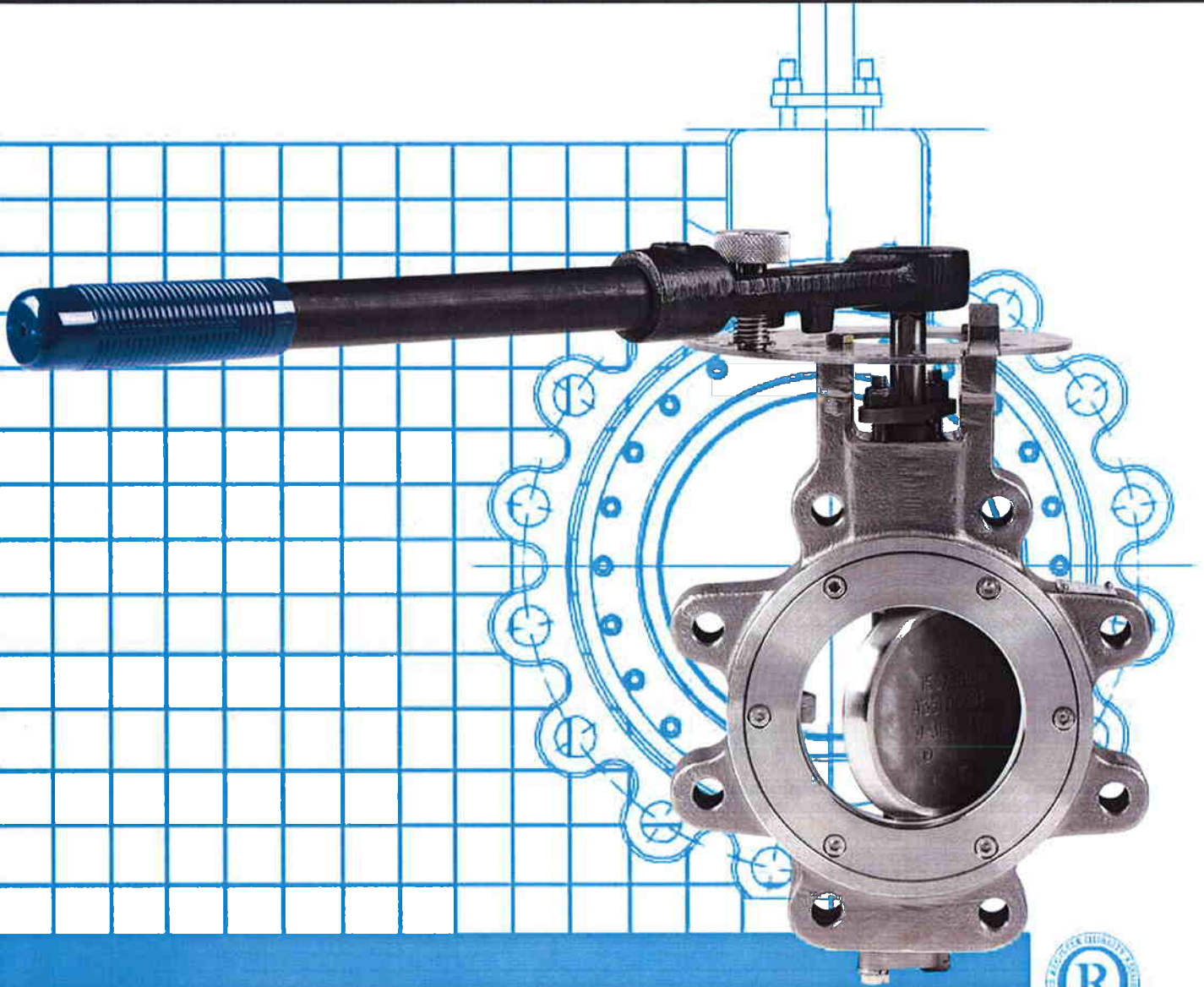


HP-SERIES HIGH PERFORMANCE BUTTERFLY VALVES ENGINEERING DATA



INNOVATION IN EVERY VALVE



MILWAUKEE VALVE

HP-SERIES HIGH PERFORMANCE BUTTERFLY VALVES

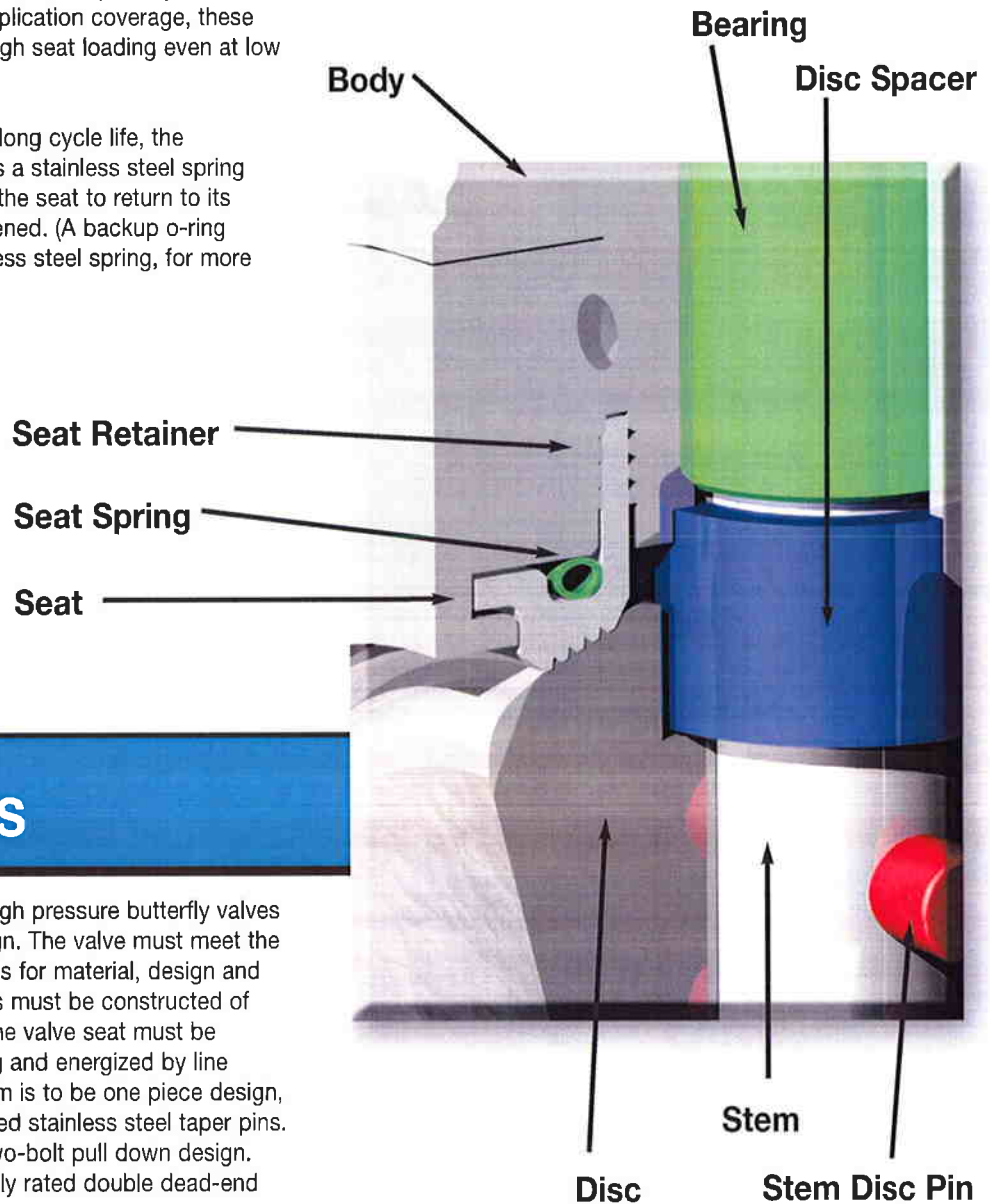
Now you can turn high pressure applications into low risk decisions by turning to high performance butterfly valves from Milwaukee Valve, the quality valves designed for the elevated temperature and pressure requirements found in rigorous commercial and industrial applications.

With a machined seat containing multiple concentric sealing edges, high performance butterfly valves from Milwaukee Valve deliver bi-directional, positive shutoff. The valve seat's "L" design clamps between the body and retaining ring, capturing the seat's "short leg" in the retaining ring. This redundant seal prevents the seat from being drawn into the flow stream, especially under high flow velocities. For complete application coverage, these multiple-sealing edges also assure high seat loading even at low pressures.

To resist seat movement and assure long cycle life, the Milwaukee Valve seat design features a stainless steel spring to help increase seat load and force the seat to return to its original position when the disc is opened. (A backup o-ring can be ordered in place of the stainless steel spring, for more demanding service.)

To further meet high pressure applications, Milwaukee Valve's high performance butterfly valves have matching tapers between the disc and the seat to utilize the flow-stream pressure for a bubble tight fit and maximized sealing capabilities.

High performance butterfly valves from Milwaukee Valve are available in sizes ranging from 2-1/2 inches to 24 inches for Class 150 ANSI ratings and 2-1/2 inches to 16 inches for Class 300. Dependable, durable service is assured with a one piece stem and stainless steel backed reinforced PTFE bearings.



SPECIFICATIONS

Valves must meet MSS SP-68, for high pressure butterfly valves with offset seat, disc and stem design. The valve must meet the latest ASTM, ANSI and API standards for material, design and testing specifications. Stem bearings must be constructed of PTFE and stainless steel material. The valve seat must be supported by a stainless steel spring and energized by line pressure for a bubble tight seal. Stem is to be one piece design, with disc attached by two seal-welded stainless steel taper pins. Packing must have an adjustable, two-bolt pull down design. Lugged valve must be capable of fully rated double dead-end service.

HP-SERIES HIGH PERFORMANCE BUTTERFLY VALVES

Handle: Rugged ductile iron provides superior strength.

Latching Knob: Stainless steel, spring loaded for one-handed operation.

Notch Plate: Stainless steel plate allows for positive latching in 10 positions.

Adjustable Packing Gland and Follower: Two point adjustable packing load for easy adjustment, stainless steel materials for corrosion resistance.

Snap Ring: Provides additional stem retention for blowout proof safety.

PTFE Packing: Minimize stem emissions and maintenance over thousands of cycles.

Disc Spacers: Maintains positive disc positioning to reduce seat wear.

Detail ←

Taper Pins: Seal welded, 18-8 stainless steel pins ensure positive stem and disc retention.

Retaining Ring: Suitable for dead-end service with 316-stainless steel and ASTM grade cap screws.

Disc: CF8M stainless steel, double-offset design ensures low operating torque and provides positive bi-directional sealing and extended life.

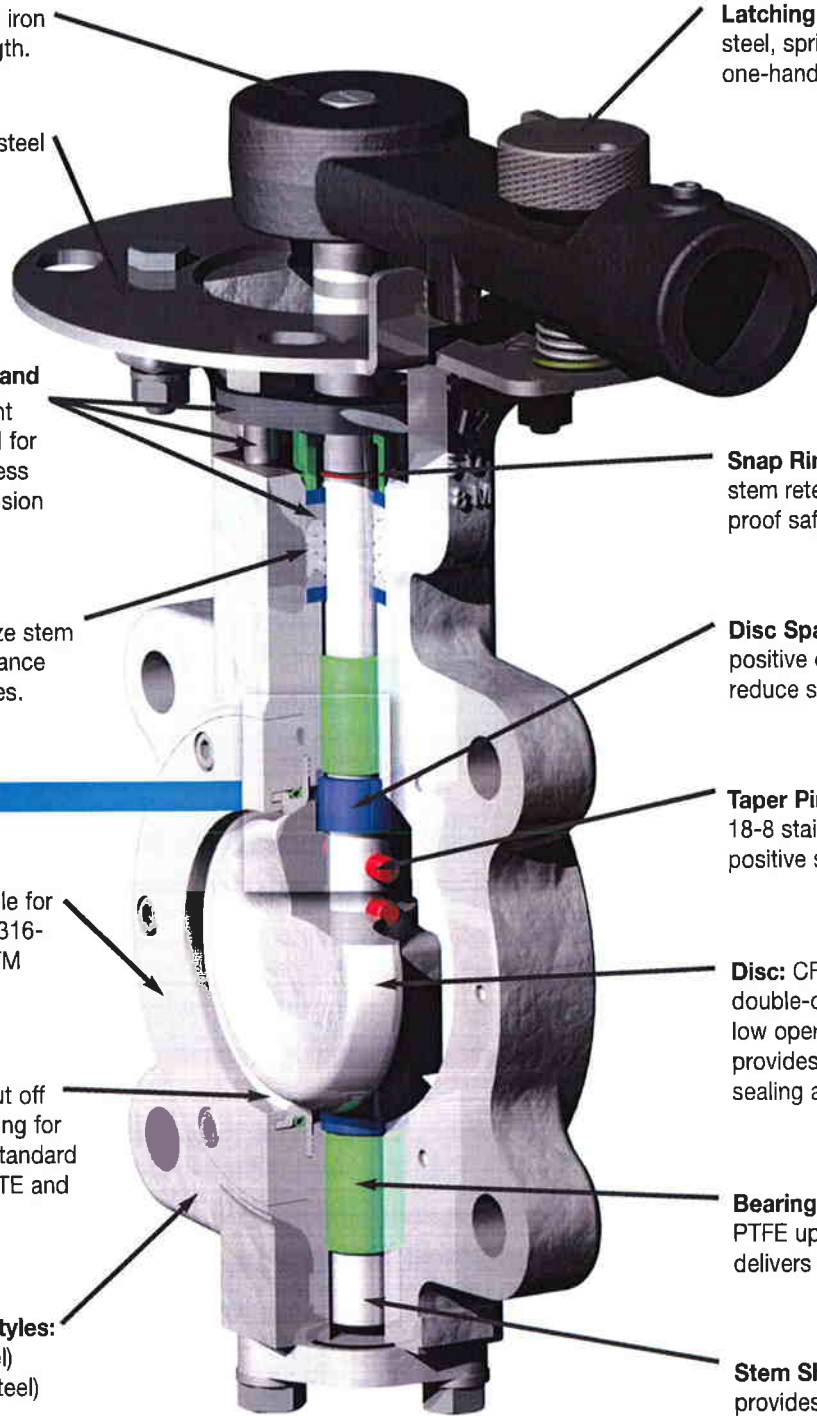
Seat: Bi-directional shut off with stainless steel spring for improved sealing life (standard RPTFE, available in PTFE and UHMWPE).

Bearing: Stainless steel and PTFE upper and lower bearing delivers superior stem support.

Body Materials and Styles:

- WCB (carbon steel)
- CF8M (stainless steel)
- ANSI Class 150
- ANSI Class 300
- Wafer styles
- Lug styles

Stem Shaft: One piece design provides rigid support and alignment for the disc.



High Performance Cv Data

Size	Class 150	Class 300
2 1/2	160	160
3	263	263
4	460	460
5	726	726
6	1,200	1,200
8	2,060	2,060
10	3,280	3,130
12	4,710	4,540
14	6,500	5,360
16	8,450	7,900
18	10,970	9,510
20	13,570	12,438
24	19,010	17,510

Class 150 & 300 Operating Torques, In-Lb

Size	Pressure drop (PSIG)						
	100	200	285*	400	500	600	740**
2 1/2	133	276	336	475	552	607	706
3	167	345	420	593	690	759	883
4	483	828	923	1,150	1,449	1,610	1,863
5	665	1,018	1,152	1,564	1,760	1,932	2,254
6	845	1,208	1,380	1,978	2,070	2,254	2,645
8	1,380	1,794	2,260	2,967	3,519	4,002	4,761
10	1,863	3,036	3,812	4,071	6,003	7,245	7,590
12	3,312	5,635	7,107	7,935	8,625	9,315	10,695
14	4,773	6,785	9,039	11,696	14,019	16,319	19,550
16	5,026	7,349	14,766	19,435	23,495	27,554	33,235
18	8,614	14,088	15,916	-	-	-	-
20	12,995	19,090	24,610	-	-	-	-
24	20,700	29,325	37,605	-	-	-	-

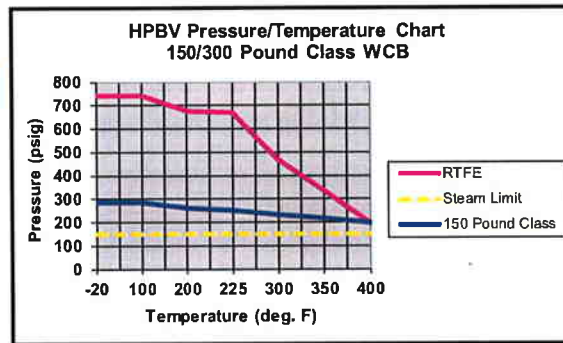
* Class 150, ** Class 300

Cv Definition:

The valve flow coefficient, or Cv, is defined as the amount of water in gallons per minute that will flow through the valve with a pressure drop of 1 psi. Indicated values are for 100% open.

Saturated Steam Table

Steam Pres PSI	Temp °F
0	212
10	239
25	266
50	297
75	320
100	338
125	353
150	365
200	387



* Valves can be used on saturated steam up to 150 psi without limit (dead end valves on steam should always have a downstream flange for safety). Otherwise consult factory.

Flange Bolting

Note: 10" thru 24" Wafers have blind holes tapped each side of shaft, thus requiring capscrews or shorter studs.

Numbers in Parenthesis () reflect quantities needed. Based on gasket thickness of 1/8 (2 1/2" - 5"), 3/16 (6" - 24").

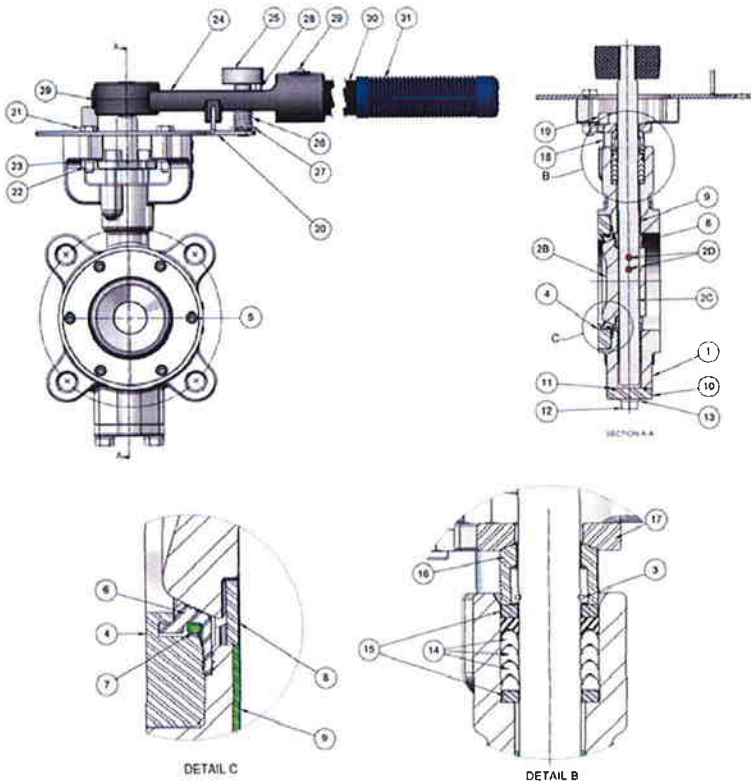
150 Class

150 Class	Flanged Data		Wafer Style		Lugged Style	
Valve Size	No. of Holes	Thread Size	Bolt / Nut / Capscrew	Stud / Nut & Stud / Nut	Capscrew	Stud / Nut
2 1/2	4	5/8-11	(4) 4.50 / NA	(4) 5.00 / NA	(8) 1.75	(8) 2.50
3	4	5/8-11	(4) 4.75 / NA	(4) 5.25 / NA	(8) 2.00	(8) 2.50
4	8	5/8-11	(8) 5.00 / NA	(8) 5.50 / NA	(16) 2.00	(16) 2.75
5	8	3/4-10	NA	NA	(16) 2.00	(16) 2.75
6	8	3/4-10	(8) 5.25 / NA	(8) 6.00 / NA	(16) 2.00	(16) 2.75
8	8	3/4-10	(8) 6.00 / NA	(8) 6.75 / NA	(16) 2.50	(16) 3.25
10	12	7/8-9	(8) 6.25 / (8) 2.50	(8) 7.25 / (8) 3.25	(24) 2.50	(24) 3.25
12	12	7/8-9	(8) 6.75 / (8) 3.00	(8) 7.75 / (8) 3.75	(24) 3.00	(24) 3.75
14	12	1-8	(10) 7.75 / (4) 3.25	(10) 8.75 / (4) 4.25	(24) 3.25	(24) 4.25
16	16	1-8	(12) 8.25 / (8) 3.25	(12) 9.25 / (8) 4.50	(32) 3.25	(32) 4.50
18	16	1 1/8-8	(12) 9.00 / (8) 3.75	(12) 10.25 / (8) 5.00	(32) 3.75	(32) 5.00
20	20	1 1/8-8	(16) 9.75 / (8) 4.25	(16) 11.00 / (8) 5.50	(40) 4.25	(40) 5.50
24	24	1 1/4-8	(16) 11.25 / (8) 5.00	(16) 12.75 / (8) 6.25	(40) 5.00	(40) 6.25

300 Class

2 1/2	8	3/4-10	NA	NA	(16) 2.00	(16) 2.75
3	8	3/4-10	(8) 5.25 / NA	(8) 6.00 / NA	(16) 2.00	(16) 3.00
4	8	3/4-10	(8) 5.75 / NA	(8) 6.50 / NA	(16) 2.25	(16) 3.25
5	8	3/4-10	(12) 6.00 / NA	(12) 6.75 / NA	(16) 2.50	(16) 3.25
6	12	3/4-10	(12) 6.25 / NA	(12) 7.00 / NA	(24) 2.50	(24) 3.25
8	12	7/8-9	(12) 7.50 / NA	(12) 8.75 / NA	(24) 3.00	(24) 4.00
10	16	1-8	(12) 8.50 / (8) 3.50	(12) 9.50 / (8) 4.50	(32) 3.50	(32) 4.50
12	16	1 1/8-8	(12) 9.25 / (8) 4.50	(12) 10.25 / (8) 5.00	(32) 3.75	(32) 5.00
14	20	1 1/8-8	(16) 10.50 / (8) 4.50	(16) 11.50 / (8) 5.50	(40) 4.50	(40) 5.50
16	20	1 1/4-8	(16) 11.50 / (8) 4.75	(16) 13.00 / (8) 6.00	(40) 4.75	(40) 6.00

MATERIAL LIST



	PART	MATERIAL	SPECIFICATION
1	BODY	A. CARBON STEEL	ASTM A216 GR. WCB
		B. STAINLESS STEEL	ASTM A351 GR. CF8M
STEM & DISC ASSEMBLY			
2	2B. DISC	STAINLESS STEEL	ASTM A351 GR. CF8M
	2C. STEM	STAINLESS STEEL	17-4PH H1150
	2D. TAPER PIN	18-8 STAINLESS STEEL	COMMERCIAL
3	STEM RETAINER	304 STAINLESS STEEL	COMMERCIAL
4	SEAT RETAINER RING	A. CARBON STEEL	ASTM A515 GR. 70
		B. STAINLESS STEEL	ASTM A240 TY.316
5	SOCKET HEAD CAP SCREW	STAINLESS STEEL	ASTM A193 GR B8M
6	SEAT	A. PTFE COMMERCIAL	COMMERCIAL
		B. 15% GLS. FLD. PTFE	COMMERCIAL
		C. UHMWPE	COMMERCIAL
7	SEAT SPRING	STAINLESS STEEL	COMMERCIAL
8	DISC SPACER	316 STAINLESS STEEL	COMMERCIAL
9	BEARING	STAINLESS STEEL - PTFE COATED	COMMERCIAL
10	BOTTOM CAP	STAINLESS STEEL	ASTM A351 GR. CF8M
11	O-RING	VITON	COMMERCIAL
12	HEX HEAD CAP SCREW	STAINLESS STEEL	ASTM A193, GR. B8M
13	SPLIT LOCKWASHER	STAINLESS STEEL	COMMERCIAL
14	PACKING V-RING SET	A. PTFE COMMERCIAL	COMMERCIAL
		B. GRAPHITE	COMMERCIAL
15	PACKING WASHER	304 STAINLESS STEEL	COMMERCIAL
16	GLAND FOLLOWER	STAINLESS STEEL	ASTM A351 GR. CF8M
17	GLAND RETAINER	STAINLESS STEEL	ASTM A351 GR. CF8M
18	STUD	STAINLESS STEEL	ASTM A193 GR. B8M
19	HEAVY HEX NUT	STAINLESS STEEL	ASTM A194, GR. 8M
20	NOTCH PLATE	STAINLESS STEEL	COMMERCIAL
21	HEX HEAD CAP SCREW	CARBON STEEL - ZINC PLATED	COMMERCIAL
22	HEX NUT	CARBON STEEL - ZINC PLATED	COMMERCIAL
23	SPLIT LOCKWASHER	CARBON STEEL - ZINC PLATED	COMMERCIAL
24	HANDLE	DUCTILE IRON	COMMERCIAL
25	LOCK KNOB	STAINLESS STEEL	COMMERCIAL
26	SPRING	STAINLESS STEEL	COMMERCIAL
27	CLIP	STAINLESS STEEL	COMMERCIAL
28	ROLL PIN	STAINLESS STEEL	COMMERCIAL
29	SOCKET SET SCREW	STAINLESS STEEL	COMMERCIAL
30	HANDLE PIPE	CARBON STEEL	COMMERCIAL
31	GRIP	VINYL	COMMERCIAL

ORDERING INFORMATION

HOW TO ORDER MILWAUKEE VALVES HP SERIES HIGH PERFORMANCE BUTTERFLY VALVE

SERIES	ANSI CLASS	BODY STYLE	BODY MATERIAL	DISC MATERIAL	STEM MATERIAL	SEAT MATERIAL	STEM PACKING	OPERATOR	EXT. OPTIONS	SIZE
XX	X	X	X	X	X	X	X	X	XX	XXX
HP	1-150 3-300	L-LUG W-WAFER	C-WCB S-CF8M	S-CF8M	4-17-4 SS 5-316 SS	1-PTFE 2-RPTFE 4-UHMWPE 5-FireSafe	1-PTFE G-GRAPHITE	1-BARE STEM 2-LEVER-LOCK 3-GEAR OP 4-ELECT 5-PNEUMATIC 6-Epoxy Ctd. Gear Op 7-Epoxy Ctd. Lever-Lock	A-Assemble Dry C-Chlorine Clean E-Extended Mounting L-Locking O-Oxygen Clean S-Stainless Steel Seat Retainer	025-240

PART NUMBER EXAMPLE

HP1LC4111 040 = 4 INCH, HIGH PERFORMANCE, CLASS 150, LUG PATTERN, CARBON STEEL BODY, 17-4 STEM, PTFE SEAT, PTFE PACKING, BARE STEM WITH NO EXT. OPTIONS

VALVES BUILT TO TAKE IT... SINCE 1901

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