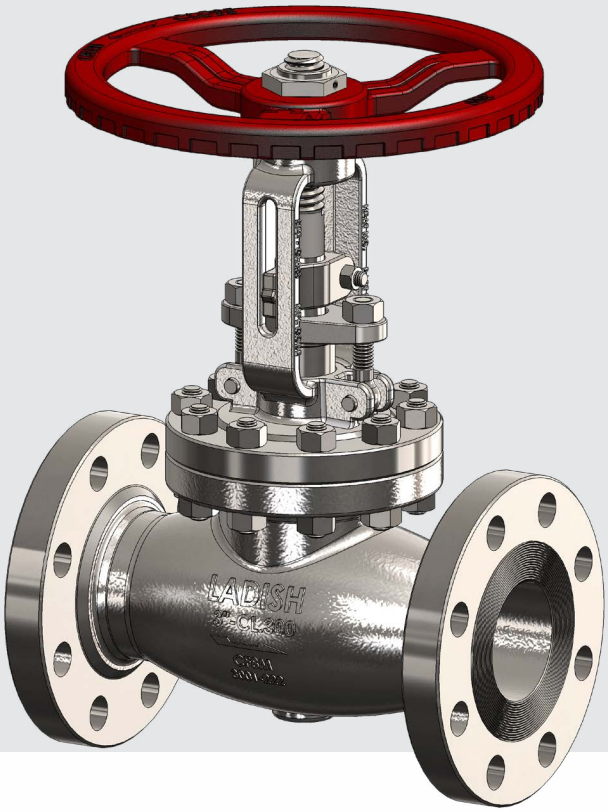
LADISH VALVES

CONTROLLED QUALITY • CORROSION RESISTANT

TO MARK PROGRESS

API 600, API 603, API 594, API 623

CATALOG 821 CAST STEEL VALVES



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LADISH MALT
LADISH MALTING CO
MILWAUKEE, WIS.
THERE IS
NO SUBSTITUTE
FOR FINE
Malt
LADISH
QUALITY
FLOUR
LADISH
VALVES

TO MARK PROGRESS

LADISH VALVES

A Heritage Brand

Herman W. Ladish was born in Milwaukee, Wisconsin in 1880 and began his career in the bustling malting industry at the age of 16. Herman quickly established himself in the business, climbing the corporate ladder and assuming the role of superintendent at The American Malting Company. Ladish folklore has it that Herman's interest in metalworking was born from a problematic crankshaft that consistently halted production. Herman's search for an alternative manufacturing method led him to metal forging, and the birth of a metal working conglomerate of forgings, flanges, fittings and industrial valves was born.

Today, Ladish Valves is proud to have a history dating back to 1961 in Cynthiana, Kentucky. After experiencing a crippling flood of the Ohio River and several changes in ownership, Ladish Valves moved its headquarters to Houston in 2007.

With a foundation of more than 60 years of industrial valve production, Ladish Valves continues to be the industry benchmark for stainless steel and high nickel alloy industrial valves. The Ladish Valves trademark symbolizes a reputation that is emblematic of the highest quality standards, unmatched design and metalworking craftsmanship. Our history is important to us and we pay homage to it daily.

The Ladish Valves product line is specifically designed and manufactured to meet the stringent demands of the most corrosive service environments and high temperature applications. Our product is produced under rigorous metallurgical and manufacturing controls that assure a consistent, high degree of performance and dependability. The quality of the material we receive is critical to the quality of our product. With domestic source foundries and strictly monitored international vendors, Ladish Valves is relentless about the quality of materials sourced from its vendor community.

WHAT IT MEANS TO MARK PROGRESS

Ladish Valves is a responsive company that prides itself in being "local" with an exhaustive commitment to our customers and our product.

This means that no matter where you are, our team in Houston will provide a customized, clear response in a timely manner.

We pride ourselves in serving our customers and taking on the challenges of unconventional projects.

LADISH COMPLETE LINE OF PRODUCTS

Manufactured to the Ultimate in Quality Standards

A WIDE RANGE OF VALVE TYPES, SIZES, RATINGS & MATERIALS

Processes

CAST • FORGED
BAR STOCK

End Types

THREADED ENDS
SOCKET ENDS
FLANGED ENDS
BUTTWELD ENDS

Handwheel Options

RISING STEM
NON-RISING STEM

Disc Options

SOLID WEDGE DISC
FLEX WEDGE DISC
SPLIT WEDGE DISC
PLUG DISC
TEFLON DISC

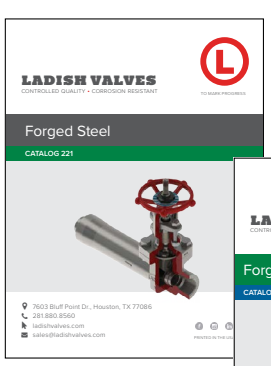
Size and Class Options

½"–36"
CL150—CL2500

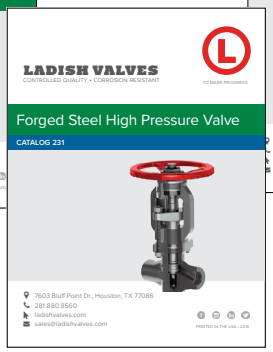
Materials

CARBON STEEL
STAINLESS STEEL
ALLOY 20 • DUPLEX
HIGH NICKEL ALLOY
TITANIUM • ZIRCONIUM

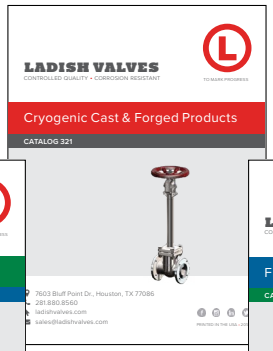
Ladish Product Line Catalogs



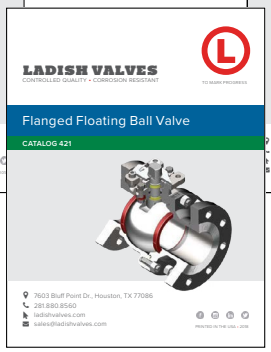
CATALOG 221
FORGED STEEL



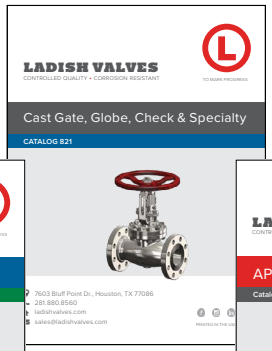
CATALOG 231
HIGH PRESSURE



CATALOG 321
CRYOGENIC



CATALOG 421
FLOATING BALL VALVE



CATALOG 821
CAST STEEL

CATALOG 401 PF
PROCESS BALL VALVES

TO MARK PROGRESS

LADISH VALVES

Why We're Different

One-stop Manufacturing, Controlled Quality.

Ladish Valves is a premier manufacturer of multi-turn and quarter-turn valves. Our valves are widely used in the chemical and petrochemical markets, spanning from upstream extraction through midstream transportation and downstream processing. Ladish has a long history of supplying products to these markets, in addition to the power and pulp & paper industries.

Ladish has a full complement of value-added services to address the many challenges that often delay projects. Our team specializes in quick turnaround deliveries—even on challenging orders—with the confidence of controlled quality through in-house design and manufacturing.

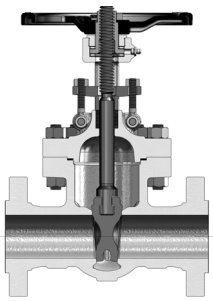
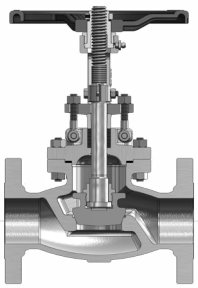
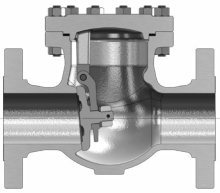
We're a Step Above the Competition. Here's Why.

Ladish is local. Our manufacturing facility is located in Houston, giving us the flexibility to design, machine, assemble, test, verify and expedite our customers' orders—setting us apart from everyone else. Our other differentiators include:

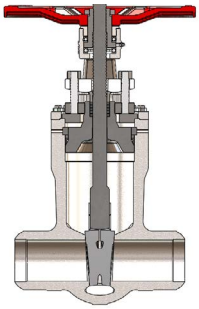
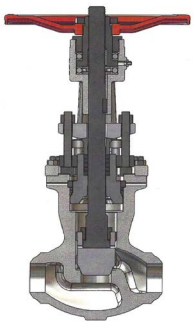
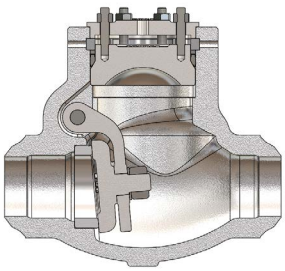
- One of the largest (stocked) stainless and exotic alloy inventories in the U.S.
- In-house machining: Cryo extensions, end connections, modifications, etc.
- Same-day deliveries available
- Custom valve solutions using Ladish engineering & design teams
- Fully compliant clean room (oxygen, chlorine, hydrogen peroxide and others)
- Extensive in-house NDE capabilities

CATALOG 821
CAST, GATE, GLOBE, CHECK & SPECIALTY VALVES

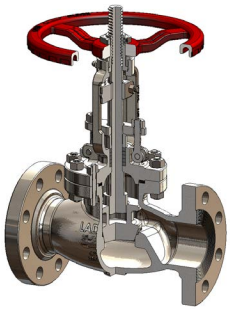
Catalog 821 serves to highlight the Ladish Valves line of API 600, API 603, API 594 and API 623 cast steel corrosion resistant valves. The features of this catalog will assist piping system designers, engineers, contractors and purchasing personnel in finding the ideal product for their application. This catalog includes Gate, Globe and Check valves with bolted bonnet and pressure seal designs.

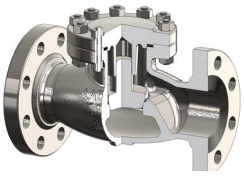




Bolted Bonnet/Cap

Pressure Seal Valves





Specialty Valves

API 600, API 603, API 623 & API 594 CAST STEEL VALVES

Products for Corrosive Service Environments

Corrosion Resistance is a serious business within the chemical industry and requires a manufacturer who is serious about its materials. Ladish Valves sole focus is on supplying the highest quality stainless steel and high alloy valves to the processing industry.

Ladish Valves vision of 'Controlled Quality' when it comes to material involves recurring, consistent process through rigid material testing of our castings. Beyond insuring our material is traceable and meets the standards with which it was procured, Ladish Valves conducts additional mechanical and corrosion testing above what is required by industry standards.

Ladish Valves compliments our material testing with rugged, time-tested valve designs to insure reliability, durability and low cost of ownership. With in-house NDE capabilities including radiographic testing, liquid dye penetrant testing, ferrite analysis and many others, Ladish focuses on providing the highest quality in the industry.

Typical metallurgical tests to insure material integrity and soundness:

- Positive material identification
- Spectrographic analysis
- Corrosion testing
- Ferrite content testing
- Ultrasonic testing
- Inert gas testing
- Radiographic examination
- Liquid dye penetrant examination
- Magnetic particle examination

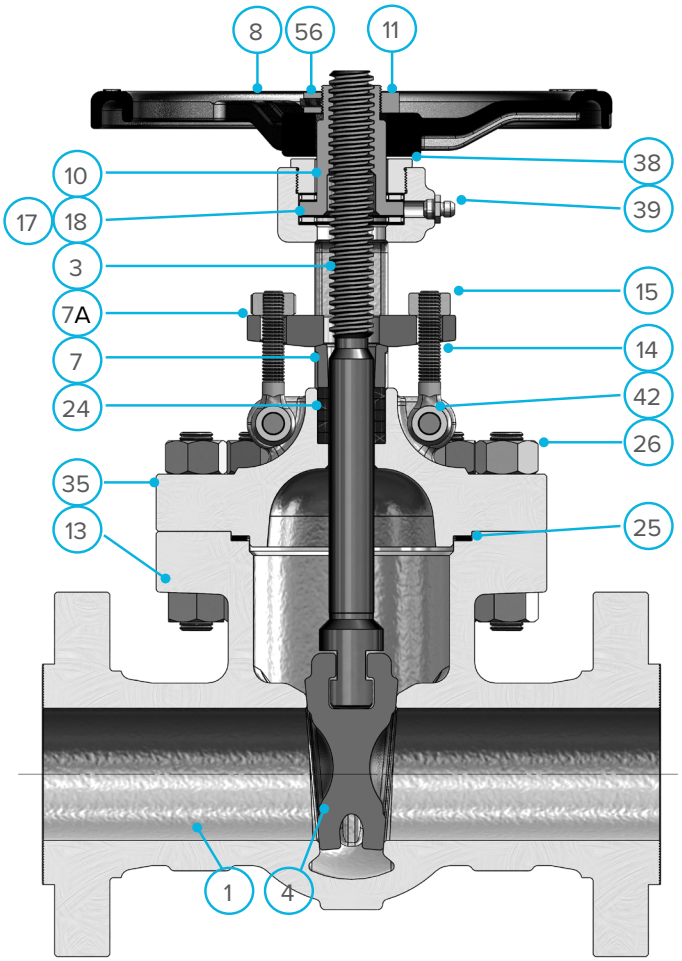
CAST GATE VALVES

Overview

Gate Valves are the most commonly used valve type in the industry. It is intended for on-off flow control. Any attempt to use in a partially opened position for throttling could result in chattering, excessive wear and rapid erosion of the disc and seat, and impair its ability to close tightly.

When fully opened, fluid through the valve is in a straight line, resulting in minimum pressure drop across the valve. Closure is accomplished by moving a gate or disc across the flow through the valve body to shut off flow from either direction. Gate Valves are well suited for water, air, oil and gas service as well as a variety of other fluids. The most common type of gate valve discs are solid or flex wedge discs. The flex wedge type is a machined, wedge shaped disc which mates with the machined tapered integral seats in the valve body. When the valve is closed the disc wedges between the two seats to establish tight shut-off. It is a rugged construction and provides good closure even on fluids where there are solids in suspension. Ladish Valves also offers a two-piece split wedge design with each piece free to adjust to the seat angle. Split wedge discs operate better in piping systems with large temperature variations.

As opposed to an oval yoke design, Ladish Valves offers a round yoke design as standard in 3"–8" class 150 designs. This design allows for uniform sealing across the body to yoke connection. All end connections are available—flanged, butt weld, threaded, socket weld, ring joint type—and conform to applicable ASME and MSS standards. Both API 600 and API 603 designs are available.



1	Body
3	Stem
4	Wedge
7	Gland
7A	Gland Flange
8	Handwheel
10	Stem Nut
11	Stem Nut Lock Nut
13	Body/Yoke Bolt
14	Eyebolt
15	Eyebolt Nut
17	Thrust Bearing
18	Thrust Washer
24	Packing
25	Gasket
26	Body/Yoke Bolt Nut
35	Yoke
38	Yoke Nut Retainer
39	Grease Fitting
42	Eyebolt Pin
56	Set Screw

Dimensional Data

Cast Gate Valves

GATE VALVE FIGURE NUMBER	CLASS 150	
	FIG #	END
	8273	THD
	8274	SWE
	8275	RF
	8279	BWE

CLASS 300	
FIG #	END
8363	THD
8364	SWE
8375	RF
8379	BWE

CLASS 600	
FIG #	END
8663	THD
8664	SWE
8675	RF
8679	BWE

CLASS 900	
FIG #	END
8975	RF
8979	BWE

CLASS 1500	
FIG #	END
8575	RF
8579	BWE

Note: For full figure number and ordering information please see 'How to Order' on page 24.

THD & SWE ENDS	CLASS	CLASS 150 – 8273/8274					CLASS 300 – 8363/8364					CLASS 600 – 8663/8664				
	SIZE	½"	¾"	1"	1½"	2"	½"	¾"	1"	1½"	2"	½"	¾"	1"	1½"	2"
	L	2.75	2.88	3.50	4.25	5.00	2.75	3.25	3.75	5.00	5.75	2.75	3.25	3.75	5.00	5.75
	D	3.50	3.50	4.88	6.50	6.50	4.88	4.88	6.50	7.50	7.50	4.88	4.88	6.50	7.50	7.50
	H	8.00	8.00	9.50	12.00	15.13	10.13	10.13	11.00	14.00	15.75	10.13	10.13	11.00	14.00	15.75
	WT LBS	7	8	9	15	22	8	8	13	22	31	9	10	14	26	39

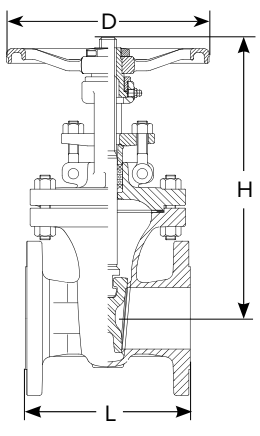
CL150 8275 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	4.25	4.63	5.00	6.50	7.00	8.00	9.00	10.50	11.50	13.00	14.00	15.00	16.00	17.00	18.00	20.00
	D	3.50	3.50	4.88	6.50	6.50	8.82	9.84	12.40	13.98	15.75	17.72	19.69	22.05	24.80	27.95	31.50
	H	8.19	8.19	9.63	12.25	15.13	17.36	21.06	28.94	36.50	44.29	51.85	613.02	71.77	74.80	83.46	98.50
	WT LBS	9	9	11	19	28	64	95	159	256	381	580	855	1,179	1,429	1,812	2,813

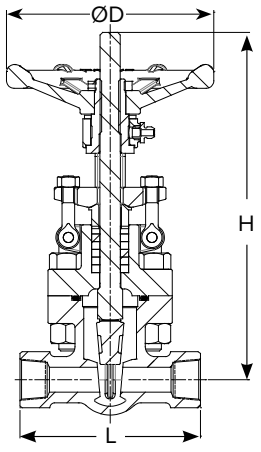
CL300 8375 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	5.50	6.00	6.50	7.50	8.50	11.12	12.00	15.88	16.50	18.00	19.75	30.00	33.00	36.00	39.00	45.00
	D	4.88	4.88	6.50	7.50	7.50	8.82	9.84	13.98	15.75	17.72	19.69	22.05	24.80	27.95	31.50	35.43
	H	10.75	10.75	13.00	15.00	16.75	17.40	21.10	29.33	37.44	44.96	52.17	64.21	66.61	75.16	83.43	98.11
	WT LBS	11	13	18	31	44	90	130	262	425	642	904	1,515	1,931	2,648	3,307	4,978

CL600 8675 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	6.50	7.50	8.50	9.50	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00
	D	4.88	4.88	6.50	7.50	7.50	9.84	13.98	17.72	19.69	24.80	24.80	24.80	27.95	27.95	31.50	35.43
	H	10.31	10.38	11.38	14.38	16.19	18.70	23.27	31.54	39.57	46.93	63.19	70.55	81.85	85.04	93.15	107.9
	WT LBS	12	15	22	39	56	141	243	489	893	1,380	1,936	2,568	3,285	4,048	5,313	8,023

CL900 8975 RF	SIZE	2"	3"	4"	6"	8"	10"	12"
	L	14.50	15.00	18.00	24.00	29.00	33.00	38.00
	D	9.84	13.98	13.98	16.69	24.80	27.95	27.95
	H	18.66	24.53	28.27	37.72	50.79	57.13	70.31
	WT LBS	161	227	351	701	1,252	2,002	2,721

CL1500 8575 RF	SIZE	2"	3"	4"	6"	8"	10"	12"
	L	14.50	18.50	21.50	27.75	32.75	39.00	44.50
	D	9.84	13.98	13.98	19.69	24.80	27.95	31.50
	H	18.66	23.74	34.65	43.54	53.15	61.81	71.89
	WT LBS	179	311	500	1,135	2,187	3,534	5,670





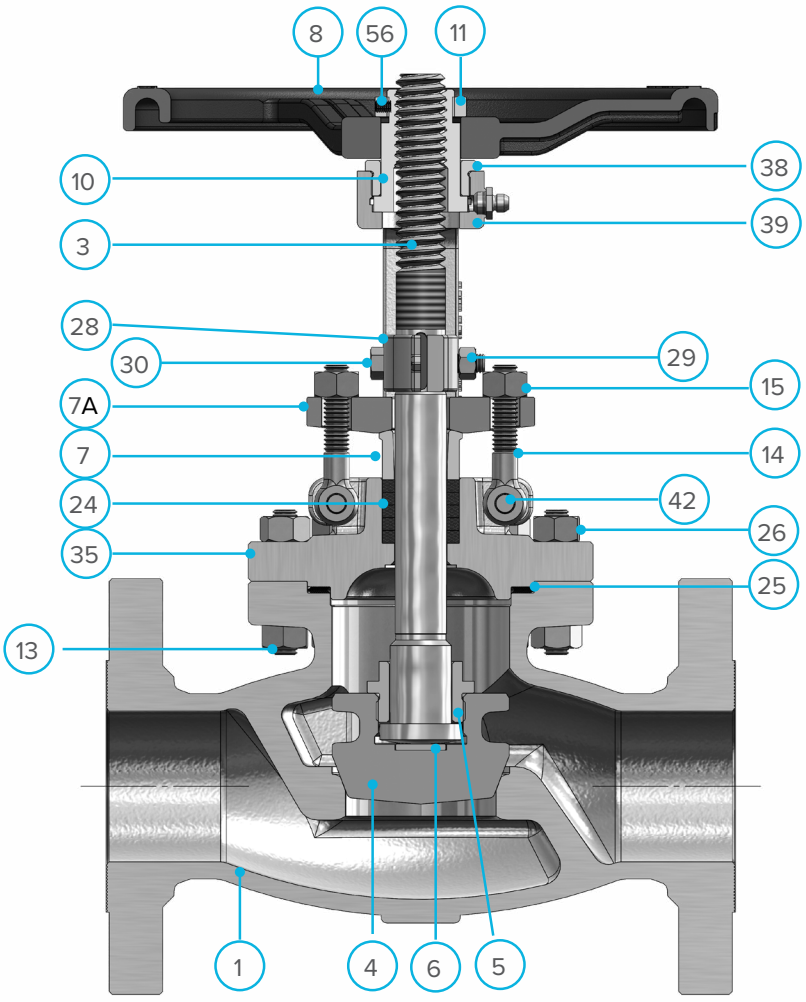
CAST GLOBE VALVES

Overview

Globe Valves are used for throttling flow control. Shut-off is accomplished by moving the disc against the flow stream rather than across it. This reduces chatter, wear & erosion to a minimum. The flow pattern through a globe valve involves changes in direction, resulting in greater resistance than a gate valve.

The Globe Valve is available in two basic type of discs: metal plug or renewable disc. The metal plug disc has high resistance to wear and the abrasive effect of dirt, scale and other solids in the fluid. When wear occurs, the metal disc can readily be 'lapped in' to form tight closure. The renewable disc assembly includes a soft ring insert (typically Teflon), which seals against the valve seat. The ring insert will seat tightly on uneven surfaces without leaking as well as being easily replaced.

Ladish Valves also offers a non-rotating stem design to alleviate deterioration of the packing performance as well as offers a fully body guided disc (see below). All end connections are available—flanged, butt weld, threaded, socket weld, ring joint type—and conform to applicable ASME and MSS standards. Both ASME B16.34 and API 623 valve designs are available.



1	Body
3	Stem
4	Disc
5	Disc Nut
6	Wear Plate
7	Gland
7A	Gland Flange
8	Handwheel
10	Stem Nut
11	Stem Nut Lock Nut
13	Body/Yoke Bolt
14	Eyebolt
15	Eyebolt Nut
24	Packing
25	Gasket
26	Body/Yoke Bolt Nut
28	Stem Stop
29	Stem Stop Nut
30	Stem Stop Bolt
35	Yoke
38	Yoke Nut Retainer
39	Grease Fitting
42	Eyebolt Pin
56	Set Screw

Dimensional Data

Cast Globe Valves

GLOBE VALVE FIGURE NUMBER	CLASS 150	
	FIG #	END
	7270	THD
	7271	SWE
	7272	RF
	7276	BWE

CLASS 300	
FIG #	END
7360	THD
7361	SWE
7372	RF
7376	BWE

CLASS 600	
FIG #	END
7660	THD
7661	SWE
7672	RF
7676	BWE

CLASS 900	
FIG #	END
7972	RF
7976	BWE

CLASS 1500	
FIG #	END
7572	RF
7576	BWE

Note: For full figure number and ordering information please see 'How to Order' on page 24.

THD & SWE ENDS	CLASS	CLASS 150 – 7270/7271					CLASS 300 – 7360/7361					CLASS 600 – 7660/7661				
	SIZE	½"	¾"	1"	1½"	2"	½"	¾"	1"	1½"	2"	½"	¾"	1"	1½"	2"
	L	3.38	3.75	4.25	5.75	6.25	3.75	4.25	5.00	6.00	7.25	3.75	4.25	5.00	6.00	7.25
	D	3.50	3.50	4.88	6.50	6.50	4.88	4.88	6.50	7.50	7.50	4.88	4.88	6.50	7.50	7.50
	H	9.25	9.25	10.75	12.75	13.75	10.13	10.13	11.13	12.88	15.13	10.13	10.13	11.13	14.13	15.13
	WT LBS	7	7	12	22	28	12	12	17	32	51	12	12	17	32	51

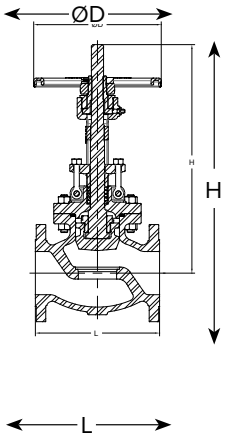
CL150 7272 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	4.25	4.63	5.00	6.50	8.00	9.50	11.50	16.00	19.50	24.50	27.50	31.00	36.00	38.50	38.50	54.00
	D	3.50	3.50	4.88	6.50	6.50	9.84	12.40	13.98	13.98	15.75	15.75	22.05	24.80	24.80	31.50	31.50
	H	9.25	9.25	10.75	12.75	13.75	13.54	15.28	19.88	24.53	31.69	33.03	36.30	38.58	44.88	71.85	79.88
	WT LBS	10	11	17	28	45	60	95	201	392	564	902	1,358	1,819	2,116	3,058	4,383

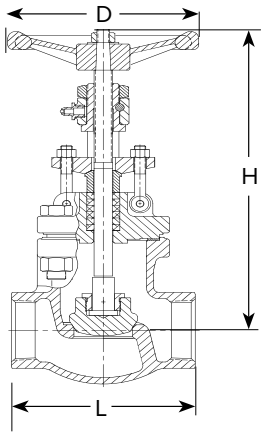
CL300 7372 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	6.00	7.00	8.00	9.00	10.50	12.50	14.00	17.50	22.00	24.50	28.00	33.00	34.00	36.00	40.00	53.00
	D	4.88	4.88	6.50	7.50	7.50	9.84	12.40	13.98	15.75	17.72	16.69	27.95	27.95	27.95	31.50	31.50
	H	10.13	10.13	11.13	14.13	15.13	13.62	15.43	24.33	31.22	34.65	38.23	42.56	44.09	48.03	65.91	82.13
	WT LBS	13	16	24	47	63	82	128	309	573	930	1,250	1,645	2,150	3,748	4,608	7,674

CL600 7672 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"
	L	6.50	7.50	8.50	9.50	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00
	D	4.88	4.88	6.50	7.50	7.50	12.40	12.40	17.72	22.05	24.80	31.50	31.50	31.50
	H	10.13	10.13	11.13	14.13	15.13	18.82	20.91	26.57	29.69	37.76	66.54	73.56	79.33
	WT LBS	15	19	25	49	62	139	265	514	915	1,437	2,901	3,450	4,674

CL900 7972 RF	SIZE	2"	3"	4"	6"	8"
	L	14.50	15.00	18.00	24.00	29.00
	D	12.40	12.40	13.98	17.72	27.95
	H	19.61	20.20	23.82	28.74	35.20
	WT LBS	170	227	390	855	1,444

CL1500 7572 RF	SIZE	2"	3"	4"	6"	8"
	L	14.50	18.50	21.50	27.75	32.75
	D	12.40	13.98	15.75	19.69	31.50
	H	19.57	22.99	28.11	41.93	46.89
	WT LBS	170	324	578	1,475	2,617





Note: Ladish also offers a fully body-guided globe design, a non-rotating stem option.

CAST CHECK VALVES

Overview

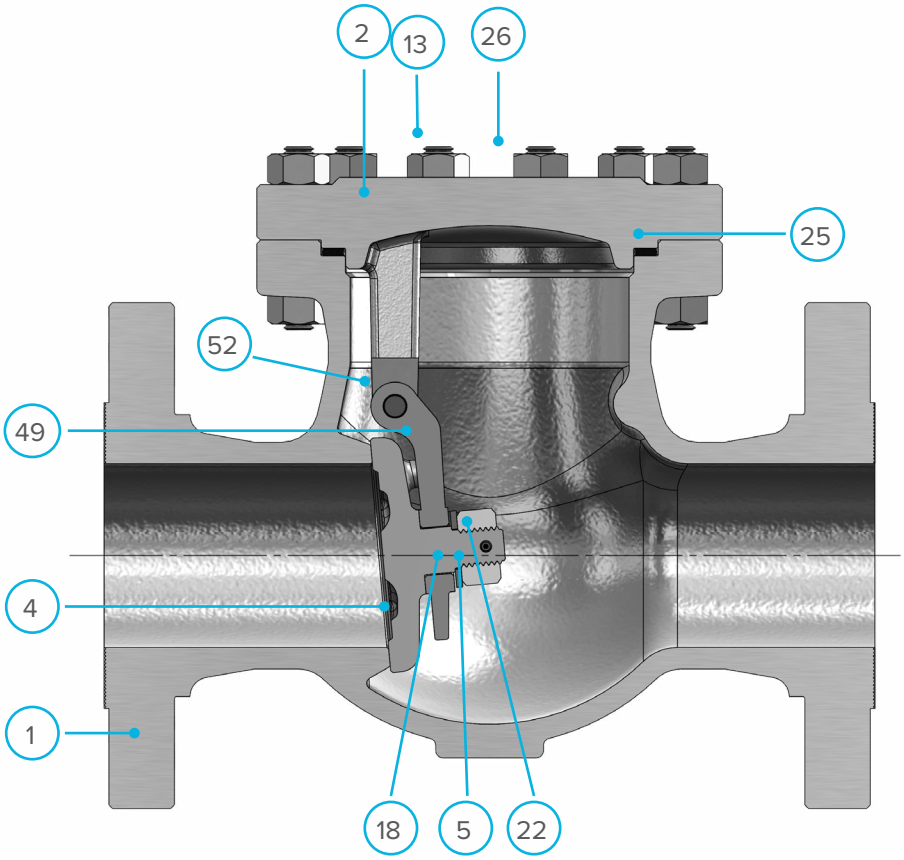
The Swing Check Valve is used to prevent back flow in the process line. Flow is in a straight line through the valve resulting in minimal pressure drop.

The disc swings into open position as media flows through the line. Back pressure in the line and/or gravity holds the disc in closed position.

Swing Check valves may be installed in horizontal or vertical lines but must be installed in proper relation to media flow as indicated by the flow direction arrow on the body.

Like the globe valve, the Swing Check Valve is available in two basic type of discs: metal plug or renewable disc. The metal plug disc has high resistance to wear and the abrasive effect of dirt, scale and other solids in the fluid. When wear occurs, the metal disc can readily be 'lapped in' to form tight closure. The renewable disc assembly includes a soft ring insert (typically Teflon), which seals against the valve seat. The ring insert will seat tightly on uneven surfaces without leaking as well as being easily replaced.

In select designs, Ladish offers a disc assembly that is hinged from the bottom of the cover to allow for ease of maintenance. The cover-body connection is designed to confine the gasket to protect the gasket from process media and assist with reducing leakage paths. All end connections are available—flanged, butt weld, threaded, socket weld, ring joint type—and conform to applicable ASME and MSS standards. Both ASME B16.34 and API 594 valve designs are available.



1	Body
2	Cover
4	Disc
5	Disc Nut
13	Body/Cover Bolt
18	Disc Washer
22	Disc Nut Lock Pin
25	Gasket
26	Body/Cover Bolt Nut
49	Arm
52	Hinge Pin

Dimensional Data

Cast Check Valves

CHECK VALVE FIGURE NUMBER	CLASS 150	
	FIG #	END
	5270	THD
	5271	SWE
	5272	RF
	5276	BWE

CLASS 300	
FIG #	END
5370	THD
5371	SWE
5372	RF
5376	BWE

CLASS 600	
FIG #	END
5670	THD
5671	SWE
5672	RF
5676	BWE

CLASS 900	
FIG #	END
5972	RF
5976	BWE

CLASS 1500	
FIG #	END
5572	RF
5576	BWE

Note: For full figure number and ordering information please see 'How to Order' on page 24.

THD & SWE ENDS	CLASS	CLASS 150 – 5270/5271					CLASS 300 – 5370/5371					CLASS 600 – 5670/5671				
	SIZE	½"	¾"	1"	1½"	2"	½"	¾"	1"	1½"	2"	½"	¾"	1"	1½"	2"
	L	3.63	3.63	4.00	5.88	6.25	3.63	3.63	4.00	5.88	6.25	3.63	3.63	4.00	5.88	6.25
	H	2.88	2.88	2.88	4.38	4.63	3.25	3.25	3.50	5.50	6.25	3.25	3.25	3.50	5.50	6.25
	WT LBS	3	3	4	12	15	7	7	9	28	30	7	7	9	28	30

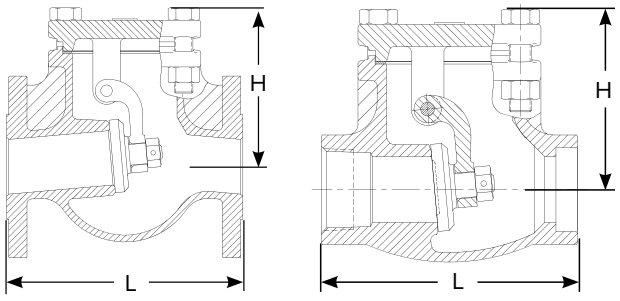
CL150 5272 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	4.25	4.25	5.00	6.50	8.00	9.50	11.50	14.00	19.50	24.50	27.50	31.00	34.00	38.50	38.50	51.00
	H	3.00	3.00	3.00	4.38	4.38	7.48	8.86	10.24	12.60	13.78	14.96	15.94	18.11	19.88	22.44	26.77
	WT LBS	5	5	7	17	28	57	99	172	300	472	703	908	1,133	1,651	2,057	2,967

CL300 5372 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	6.00	7.00	8.50	9.50	10.50	12.50	14.00	17.50	21.00	24.50	28.00	33.00	34.00	38.50	40.00	53.00
	H	3.50	3.63	3.88	6.00	6.25	7.83	8.94	10.94	12.68	15.08	17.13	20.08	20.51	22.52	24.49	28.03
	WT LBS	10	13	17	42	43	93	119	273	490	642	979	1,394	1,733	2,333	2,668	4,225

CL600 5672 RF	SIZE	½"	¾"	1"	1½"	2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
	L	6.50	7.50	8.50	9.50	11.50	14.00	17.00	22.00	26.00	31.00	33.00	35.00	39.00	43.00	47.00	55.00
	H	3.63	3.63	3.88	6.00	6.25	8.27	10.08	12.95	14.33	18.27	19.13	22.52	25.98	27.99	30.98	34.02
	WT LBS	10	13	17	44	47	123	227	450	754	1,376	1,711	2,068	2,756	3,347	5,269	8,126

CL900 5972 RF	SIZE	2"	3"	4"	6"	8"	10"	12"
	L	14.50	15.00	18.00	24.00	29.00	33.00	38.00
	H	10.51	11.42	12.05	13.31	18.11	19.69	22.76
	WT LBS	150	234	306	648	1,157	1,612	2,260

CL1500 5572 RF	SIZE	2"	3"	4"	6"	8"	10"	12"
	L	14.50	18.50	21.50	27.75	32.75	39.00	44.50
	H	10.50	11.65	13.98	18.31	21.26	25.87	28.66
	WT LBS	161	276	467	1,036	1,819	2,116	3,329



Note: Ladish offers a swing check design with external hinge pin.

PRESSURE SEAL GATE VALVES

Overview

Pressure seal valves are intended for high pressure and/or temperature applications for most types of medium. The unique feature of pressure seal valve is that Body-Bonnet joint seals efficiency increases as the internal pressure/temperature in the valve increases. Ladish manufactures a wide range of pressure seal gate valves with an expansive list of materials of construction. Manufacturing and quality assurance procedures include extra controls of dimensional and NDE examinations and test on critical areas.

DESIGN STANDARDS

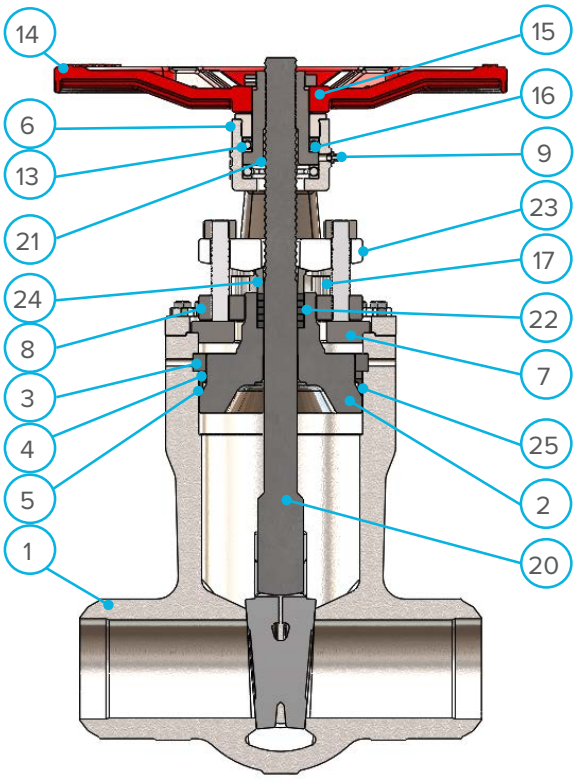
- In accordance to ASME B16.34 and MSS SP-144. Also available in API 600.
- End to end: B16.10
- BWE end dimensions per ASME B16.25
- Flanged ends dimensions per ASME B16.5
- Per NACE MR103 and MR1075 for nonexposed bolting.

CONSTRUCTION

- Body, yoke and wedge: cast, one-piece construction.
- Bonnet: cast or machined from bar depending on material selection
- Seat: the seating structure can be integral or separate seat rings with hardfaced seating for enhanced erosion and abrasion resistance.

PSB DESIGN

- Bonnet draw bolts: bonnet draw bolts perform the initial seal of the pressure seal joint.
- Segment thrust ring: a segment thrust ring absorbs the thrust applied by the internal pressure of the valve.
- Pressure seal: the pressure seal ring/gasket can be made from steel or graphite depending on customer requirements
- Packing: two-piece packing gland arrangement to simplify packing replacement. API 622 packing is utilized and live-load packing is available upon request.
- Wedge: fully guided



1	BODY
2	BONNET
3	SEGMENT RING
4	SPACER RING
5	PRESSURE SEAL
6	YOKE
7	BONNET RETAINER
8	GLAND PLATE
9	GREASE FITTING
13	THRUST BALL BEARING
14	HANDWHEEL
15	STEM NUT LOCK NUT
16	STEM NUT RETAINER
17	SOCKET HEAD BOLT
20	WEDGE
21	STEM
22	PACKING
23	GLAND YOKE
24	GLAND BUSING

Dimensional Data

PSB Gate Valves

PSB GATE VALVES – WEDGE TYPE				
CLASS	FIG #	END	FIG#	END
CL900	8929	BWE	8925	RF
CL1500	8529	BWE	8525	RF
CL2500	8429	BWE	8425	RF

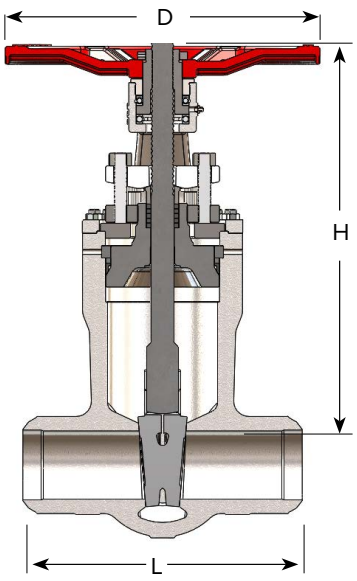
PSB GATE VALVES

CLASS 900 – 8929										
BWE	2	3	4	6	8	10	12	14	16	18
L	8.5	12.01	14.02	20	25.98	30.98	35.98	39.02	42.99	46.5
D	11.8	14.2	16.7	20.7	24.8	24.8	27.9	27.9	31.4	35.4
H	23.4	24.1	27.8	35.7	44.9	60.7	70.1	79.8	89.0	98.9
WT (LBS)	128	192	213	395	1056	1571	2245	2993	4170	5338

CLASS 1500 – 8529										
BWE	2	3	4	6	8	10	12	14	16	18
L	8.5	12.01	15.98	22.01	27.99	34.02	39.02	42.01	47.01	52.99
D	11.8	14.2	16.7	24.8	27.9	27.9	31.4	31.4	35.4	35.4
H	20.5	26.0	30.0	39.8	51.6	64.8	77.8	87.2	91.8	92.5
WT (LBS)	128	267	320	727	1454	1924	3100	3849	5880	9901

CLASS 2500 – 8429										
BWE	2	3	4	6	8	10	12	14	16	18
L	10.98	14.49	17.99	24.02	30.00	35.98	40.98	44.21	49.01	55.01
D	14.2	14.2	16.7	24.8	35.4	31.4	35.4	35.4	35.4	39.4
H	21.9	27.0	30.6	47.3	51.8	63.4	82.5	90.2	97.2	114.2
WT (LBS)	213	363	406	1112	1582	3421	6415	6477	8271	13077

Note: Valves available in flanged-end designs.



PRESSURE SEAL GLOBE VALVES

Overview

Pressure seal globe valves are intended for high pressure applications and are suitable for most throttling applications. Ladish recommends at least 20% and greater open for standard plug type disc design. Ladish manufactures a wide range of pressure seal globe valves (T-pattern and Y-Pattern) with an expansive list of materials of construction Manufacturing and quality assurance procedures include extra controls of dimensional and NDE examinations and test on critical areas.

Design Standards

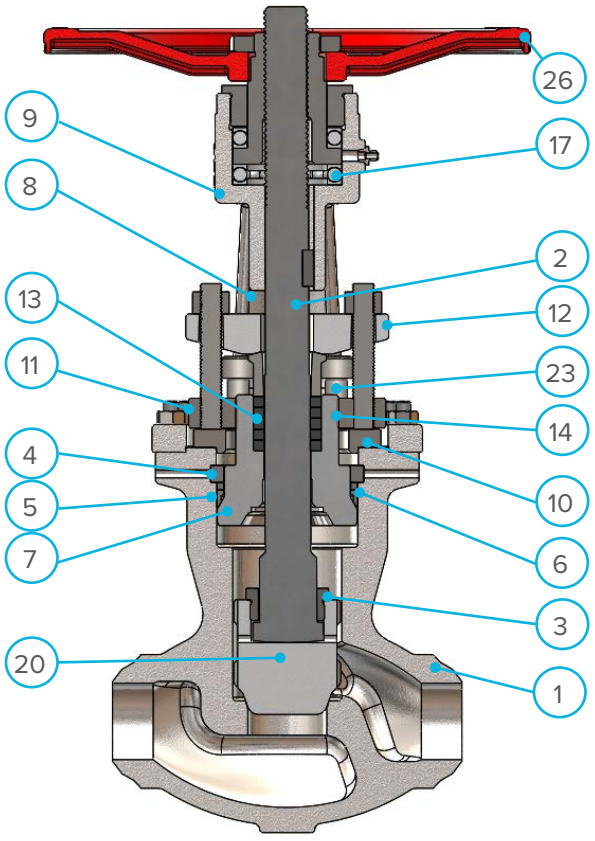
- In accordance to ASME B16.34 and MSS SP-144. Also available in API 623.
- End to end: B16.10
- BWE end dimensions per ASME B16.25
- Flanged ends dimensions per ASME B16.5
- Per NACE MR103 and MR1075 for nonexposed bolting.

Construction

- Body and yoke: cast, one-piece construction.
- Bonnet and disc: cast or machined from bar depending on material selection
- Seat: integral seat ring with stellite 6 hardfaced seating for enhanced erosion and abrasion resistance.

Pressure Seal Bonnet Available Designs

- Body guided disc: The disc is fully guided at the top and bottom and eliminates the effects of side thrust
- Pressure seal: The pressure seal ring/gasket can be made from steel or graphite depending on customer requirements
- Packing: Two-piece packing gland arrangement to simplify packing replacement. API 622 packing is utilized and live-load packing is available upon request.
- Stem: non-rotating stem allows for lower operating torque and low fugitive emissions.



1	BODY
2	STEM
3	DISC NUT
4	SEGMENT RING
5	SPACER RING
6	PRESSURE SEAL
7	BONNET
8	STEMP STOP
9	YOKE
10	BONNET RETAINER
11	GLAND PLATE
12	GLAND YOKE
13	PACKING
14	GLAND
17	THRUST BALL BEARING
20	DISC
23	DRAW BOLT
26	HANDWHEEL

Dimensional Data

Cast Globe T-Pattern Valves

PSB GLOBE VALVES – T-Pattern					PSB GATE VALVES – Y-Pattern				
CLASS	FIG #	END	FIG#	END	CLASS	FIG #	END	FIG#	END
CL900	7929	BWE	7922	RF	900	6929	BWE	6922	RF
CL1500	7529	BWE	7522	RF	1500	6529	BWE	6522	RF
CL2500	7429	BWE	7422	RF	2500	6429	BWE	6422	RF

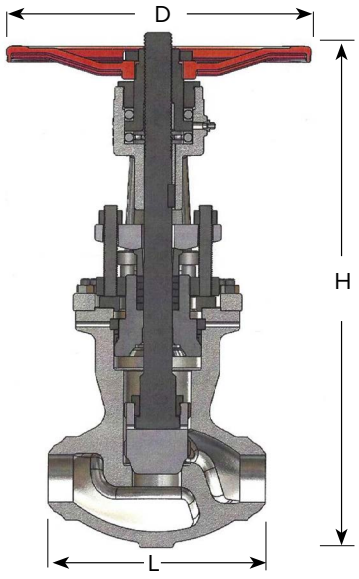
PSB GLOBE VALVES

CLASS 900 – 7929							
BWE	2	3	4	6	8	10	12
L	14.49	15.00	17.99	24.02	29.02	32.99	37.99
D	15.7	16.7	24.8	31.4	1.4	35.4	35.4
H	24.4	26.3	29.1	48.2	53.1	61.0	68.9
WT (LBS)	117	192	278	769	1924	3250	4383

CLASS 1500 – 7529							
BWE	2	3	4	6	8	10	12
L	14.49	18.50	21.50	27.76	32.76	39.02	44.49
D	14.2	16.7	16.7	20.7	35.4	35.4	35.4
H	20.9	26.3	31.6	41.6	70.9	78.7	91.0
WT (LBS)	117	203	342	1112	3058	4875	6051

CLASS 2500 – 7429							
BWE	2	3	4	6	8	10	12
L	17.76	22.76	26.50	35.98	40.24	50.00	55.98
D	15.7	16.7	20.7	35.4	35.4	35.4	39.4
H	24.3	29.5	32.2	53.9	kl	100.0	106.0
WT (LBS)	149	299	748	2031	4277	5346	7057

Note: Valves available in flanged end designs and Y-pattern configurations available. Approximate dimensions for T-Pattern shown above.



PRESSURE SEAL SWING CHECK VALVES

Overview

Pressure seal swing checks valves are normally installed in the horizontal position. Ladish manufactures a wide range of pressure seal swing checks valves (swing check and tilting disc check valves) with an expansive list of materials of construction. Manufacturing and quality assurance procedures include extra controls of dimensional and NDE examinations and test on critical areas.

Design Standards

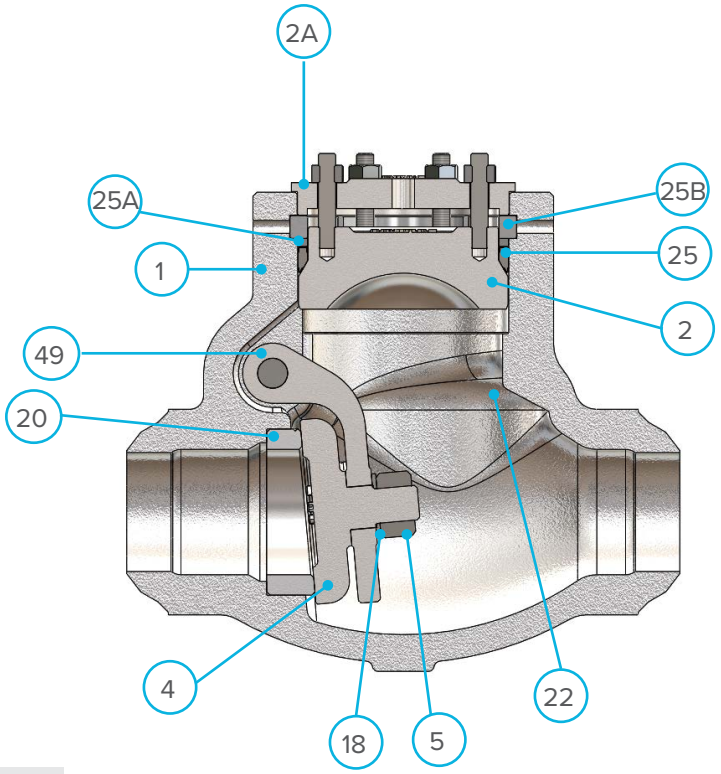
- In accordance to ASME B16.34 and MSS SP-144. Also available in API 594.
- End to End: B16.10
- BWE End Dimensions per ASME B16.25
- Flanged Ends Dimensions per ASME B16.5
- Per NACE MR103 and MR1075 for nonexposed bolting.

Construction

- Body, Cover and Arm: Cast, one-piece construction.
- Disc: Cast or machined from bar depending on material selection
- Seat: Seat ring with hardfaced seating for enhanced erosion and abrasion resistance.

PSC Design

- Seat Ring: Seat surfaces are ground and lapped to ensure tight closure and are Stellited to provide for enhanced corrosion.
- Segment Thrust Ring: A segment thrust ring absorbs the thrust applied by the internal pressure of the valve.
- Pressure Seal: The pressure seal ring/gasket can be made from steel or graphite depending on customer requirements



1	BODY
2	CAP
2A	CAP RETAINER
4	DISC
5	DISC NUT
18	DISC WASHER
20	SEAT RING
25	PRESSURE SEAL
25A	SPACER RING
25B	SEGMENT RING
49	ARM

Dimensional Data

Cast Swing Check Valves

PSC SWING CHECKS					PSC TILTING DISC CHECKS				
CLASS	FIG #	END	FIG#	END	CLASS	FIG #	END	FIG#	END
CL900	5979	BWE	5922	RF	900	59A9	BWE	59A2	RF
CL1500	5579	BWE	5522	RF	1500	55A9	BWE	55A2	RF
CL2500	5479	BWE	5422	RF	2500	54A9	BWE	54A2	RF

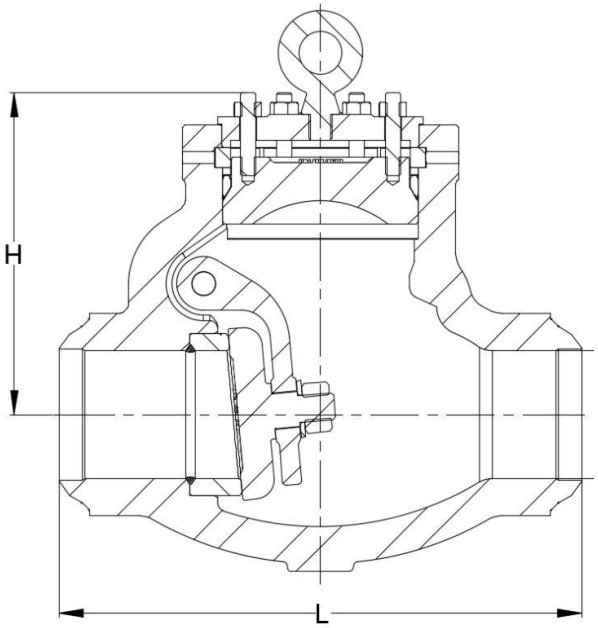
PSC Swing Checks

CL900 – 5979									
BWE	2	3	4	6	8	10	12	14	16
L	14.49	12.01	14.02	20.00	25.98	30.98	35.98	39.02	42.99
H	8.5	9.0	10.5	13.3	21.0	22.5	25.3	26.5	27.4
WT (LBS)	53	122	139	342	946	1475	2181	2566	2887

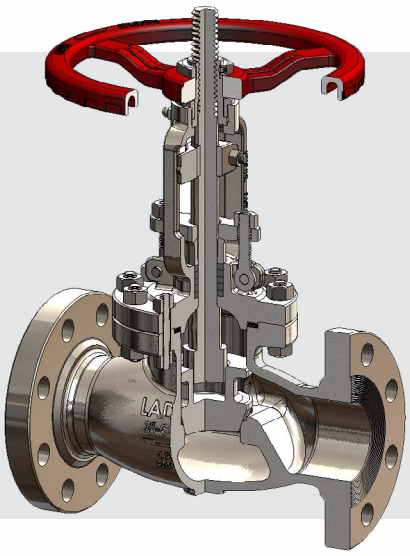
CL1500 – 5579									
BWE	2	3	4	6	8	10	12	14	16
L	14.49	18.50	15.98	22.01	27.99	34.02	39.02	42.01	47.01
H	9.5	10.0	10.4	13.8	19.5	22.8	25.7	28.0	29.4
WT (LBS)	77	177	205	599	1026	1583	2352	3015	34.21

CL2500 – 5479									
BWE	2	3	4	6	8	10	12	14	16
L	17.76	22.76	17.99	24.02	30	35.98	40.98	42.01	47.01
H	9.6	10.6	12.5	16.0	23.1	24.5	27.2	33.0	35.4
WT (LBS)	113	205	372	983	1924	2780	3849	5400	7100

Note: Valves available in flanged end designs as well as tilting disc check valve types.



CAST SPECIALTY VALVES

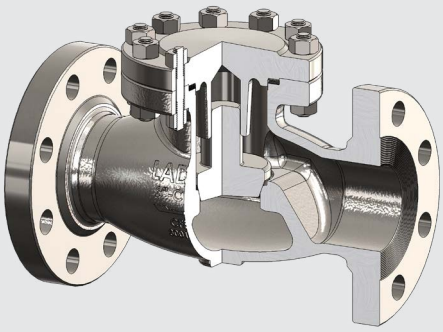


STOP CHECK VALVE

- ASME CL150 RF and BWE
- Sizes ½" – 8"
- Top and bottom guided disc
- Integral seat
- Non-rotating rising stem
- Teflon chevron packing
- 2½" and 5" available
- See Stop Check Brochure for more details

CRYOGENIC VALVE

- Valve design per ASME B16.34 and MSS SP-134
- Customizable extension length upon request
- Teflon chevron packing
- Available in trim 10, 12 & 16
- Teflon – Kel-F™ inserts available
- See Cryogenic Catalog 321 for further detail



LIFT CHECK VALVE

- Spring loaded as requested
- Special trim available
- Full port
- Face-to-face per ASME B16.10
- End flange to ASME B16.5
- Butt weld ends to ASME B16.25
- Cracking pressure available upon request

TO MARK PROGRESS

LADISH VALVES

Fugitive Emissions

Since the introduction of the U.S. Clean Air Act in 1963, the U.S. Environmental Protection Agency (EPA) and individual states have set increasingly stringent consent decrees for fugitive emissions from industrial facilities. Many companies have implemented Leak Detection and Repair (LDAR) programs, and industry groups have focuses efforts on helping member companies decrease valve emissions.

Ladish Valves was one of the first companies to help in assisting companies, by testing our valves to meet or exceed low fugitive emission in our valves. Ladish Valves has successfully tested products to the following industries standards.

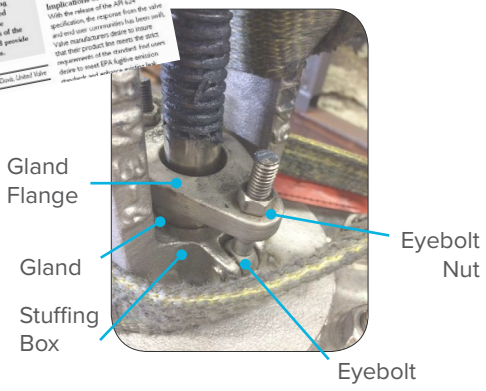
- API 624
- API 641
- ISO-15848-1
- TA-LUFT


Keywords: API • Standards • Testing

Fugitive emissions testing: Its origins, current realities and the future

Ladish Valves, partnering with TCADIT and its #2236 low emission packing product, successfully completed API 624 fugitive emissions testing on its gate and globe valve product line in early October at United Valve, an industrial valve modification, repair and testing company, headquartered in Houston, TX. Given the heightened awareness of fugitive emissions both at the end user and valve manufacturer level, this article serves to offer up key findings of the testing process, highlight the realities of API 624 testing and provide proposals for future revisions of fugitive emissions standards.

Implications of API 624



Low Fugitive Emission seals require that each element of the sealing system is precisely manufactured for straightness, surface finish and concentricity.

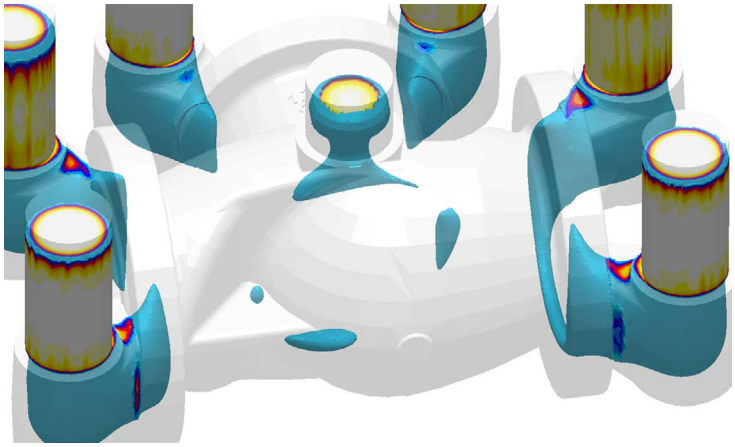
Ladish Valves utilizes an API-622 approved inter-braided graphite packing as standard, with machine surface stem finishes of better than 32 Ra and stuffing box wall finishes to 125 Ra ensuring maximum sealing effectiveness.

TECHNICAL EXCELLENCE

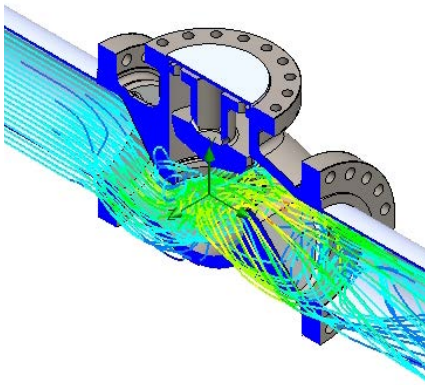
Time-Tested Design Meets The Latest Technology

Ladish Valves uses the *latest technical tools* available to:

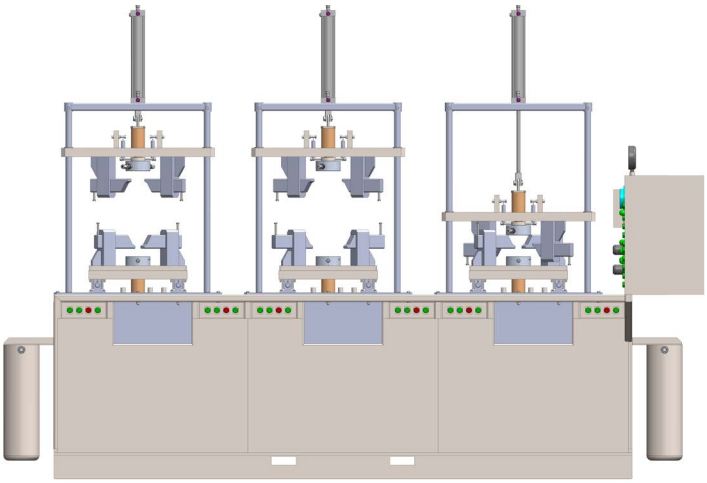
- Update existing proven designs
- Extend product lines through detailed step-wise design process
- Continually create new product lines
- Work with vendors to insure quality manufacturing standards
- Facilitate new pattern design with foundry vendors
- Use simulation models to gain valuable insight early in the design process
- Assist customers and identify root causes in the field
- Perform Finite Element Analysis (FEA) to insure soundness of design
- Increase product quality while reducing the costs of live prototyping and testing
- Connect engineering to the machine shop via Solidworks© drawing files
- Actively participate on standards committees
- Calculation of pressure-temperature ratings for unlisted materials
- Design and developing in-house testing to ensure compliance to the Ladish standards.



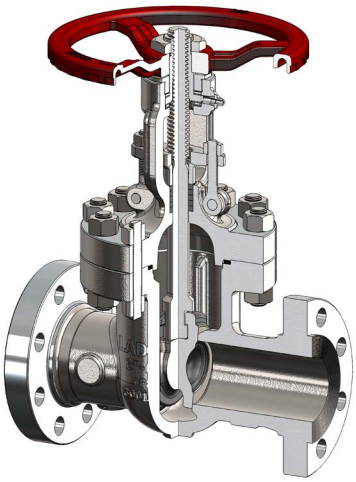
Solidification modeling for gating and riser of patterns



Flow simulation



Hydrotest Equipment



Solidworks™ 3D rendering

SERVICE OFFERINGS

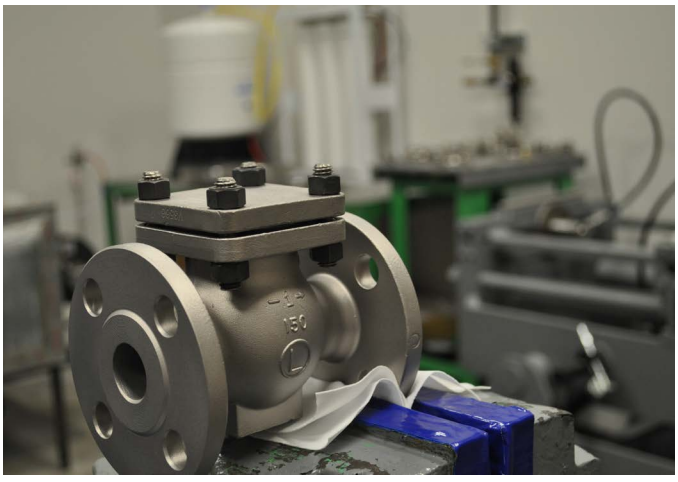
In-house, One-Stop Manufacturing

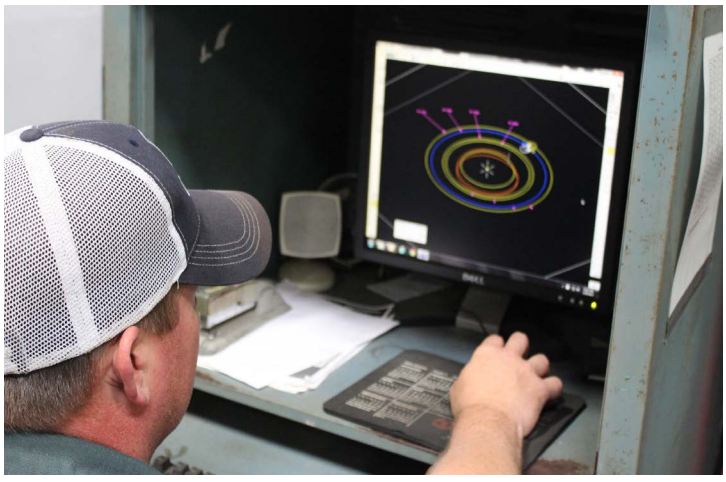
Set apart from our competition, Ladish Valves has a full complement of value added services to tackle the many challenges that tend to hold up projects. Not only do these services allow quick deliveries on challenging orders, but because they are all in-house it allows us to insure our Controlled Quality standard throughout the process.

- Fully compliant clean room (oxygen, chlorine, hydrogen peroxide and others)
- NDE – radiographic evaluation, penetrant testing (2 ASNT level II technicians)
- Machine shop (cryo extensions, end connections, component)
- Assembly & testing (API 598, helium testing, extended customer required testing)
- Miscellaneous testing (PMI, wall thickness, hardness, Ferrite)
- Certified weld procedures (general repair, hard facing all alloys, cryo extensions)
- Ladish Proprietary Quality Control Database to maintain full traceability.

LADISH VALVES

Controlled Quality • Corrosion Resistant





HOW TO ORDER

Ladish Cast Steel Multi-turn Valves

The Ladish Valves figure number is compromised of 16 alpha numeric digits defining the required product in detail. If you need assistance, give our knowledgeable sales staff a call at 281.880.8560 with the leading 4 digits and we can guide you through the rest. Our aim is to provide you with precisely what you need.

EXAMPLE:

8275-1051-GG01-G82B 12" CL150 RF OS&Y GATE A351 CF8M TR 10 GRF P&G B8CL1 GEAR

VALVE TYPE & PRESSURE CLASS		CONSTRUCT & STEM ACTION	END CONNECT & CLOSURE TYPE		DESIGN STANDARD CONNECT	MATERIAL
82		**7**	**5**		**1**	**05**
GATE 82 – CL150 83 – CL300 86 – CL600 89 – CL900 85 – CL1500 84 – CL2500 GLOBE 72 – CL150 73 – CL300 76 – CL600 79 – CL900 75 – CL1500 74 – CL2500 CHECK 52 – CL150 53 – CL300 56 – CL600 59 – CL900 55 – CL1500 54 – CL2500	Y-PATTERN GLOBE 62 – CL150 63 – CL300 66 – CL600 69 – CL900 65 – CL1500 64 – CL2500 Y-PATTERN CHECK 32 – CL150 33 – CL300 36 – CL600 39 – CL900 35 – CL1500 34 – CL2500	GATE 2 – Pressure Seal 6 – OS&Y THD/SWE (CL300, CL600, CL900 & CL1500) 7 – OS&Y THD/SWE/BWE (CL150) & RF/BWE (ALL CL) 9 – CRYO GLOBE 2 – Pressure Seal 6 – OS&Y THD/SWE/BWE (CL300, CL600, CL900 & CL1500) 7 – OS&Y THD/SWE/BWE (CL150) & RF (ALL CL) 9 – CRYO CHECK 2 – Pressure Seal 3 – STOP 5 – LIFT 7 – SWING A – TILTING DISC 9 – CRYO	GATE 3 – THD, Solid 4 – SWE, Solid 5 – RF, Solid 9 – BWE, Solid 0 – THD, Split 1 – SWE, Split 2 – RF, Split 6 – BWE, Split GLOBE 3 – THD, PTFE 4 – SWE, PTFE 5 – RF, PTFE 9 – BWE, PTFE 0 – THD, Plug 1 – SWE, Plug 2 – RF, Plug 6 – BWE, Plug	CHECK 3 – THD, PTFE 4 – SWE, PTFE 5 – RF, PTFE 9 – BWE, PTFE 0 – THD, Metal 1 – SWE, Metal 2 – RF, Metal 6 – BWE, Metal	1 – API603 2 – API600 3 – B16.34 4 – API6D 5 – API608 6 – API602 7 – API594 8 – API623	

MATERIALS OF CONSTRUCTION

01	A351-CF8	13	A351-CF8M 2%	26	A494-N7M	42	A744-CG8M	60	B367-GRC2
02	A351-CF3	14	A351-CH20	27	A494-N3M	44	A890 CD4MCu	61	B367-GRC3
03	A351-CF10	15	A351-CN7M	30	A494-M35-1	45	A890-CD3MCUN-GR1C	62	B367-GRC7
04	A351-CK20	16	A351-CK3MCUN	31	A494-M35-2	46	A990-CN3MCU	63	B752-GR702C
05	A351-CF8M	17	A351-CN3MN	32	A494-M30C	47	A990-CW2MC	71	A216-WCB
06	A351-CF3M	19	A352-CA6NM	33	A494-CY40	48	A990-N2M	72	A351-LCC
07	A351-CF10M	20	A494-CW12MW	34	A494-CW6MC	52	A995-CD4MCUN-GR1B	74	A217 WC6
08	A351-CF10MC	21	A494-CW6M	35	A351-CT15C	53	A995-CE8MN-GR2A	75	A217 WC9
09	A351-CF3M 2%	22	A494-CW2M	36	A494-CU5MCU	54	A995-CD6MN-GR3A	76	A217 C5
10	A351-CG8M	23	A494-CX2MW	37	A494-CZ100	55	A995-CD3MN-GR4A	77	A217 C12
11	A351-CG3M	24	A494-CX2M	38	A494 CY40 CL.2	56	A995-CE3MN-GR5A		
12	A351-CF8C	25	A494-N12MV	41	A744-CN7M	57	A995-CD3MWCUN-GR6A		

TRIM & PORT	PACKING TYPE	GASKET TYPE	BOLTING & NUTS	MISC. OPTIONS	SIZE	INTERNAL USE ONLY
1	G	G	01	G	82	B
1 – Std Trim Full Port 2 – Half Hard Full Port 3 – Full Hard Full Port 4 – Std Trim Red Port 5 – Half Hard Red Port 6 – Full Hard Red Port	A – N/A G – Teadit API 622 GRF P – Pillar API 622 GRF G – Teadit API 622 GRF B – Generic GRF E – Garlock EVSP H – High Temp T – Teflon V-Ring F – Teflon Braided	G – GRF H – HIGH TEMP T – PTFE R – METAL (RING JOINT)	01 – B8CL1/8 02 – B8CL2/8 03 – B8MCL1/8M 04 – B8MCL2/8M 05 – B7/2H 06 – B7M/2HM 07 – ALLOY 20 08 – MONEL400 09 – GR660 10 – L7/7 11 – INC 800 12 – HAST C 13 – B6/6 14 – B16/16 15 – K500 16 – A320 B8CL2/8 17 – B8CL2/8A 18 – B16/7	A – N/A B – Clean G – Gear Op H – Flat Face J – RTJ K – Actuator L – Live Load M – Acid Shield O – IREBxTHD R – 100% RT S – Spring Load V – Vent Wedge W – Chain Wheel OP 1 – BWE S10 4 – BWE S40 5 – BWE S5 6 – BWE S160 8 – BWE S80	02 – ⅛” 03 – ⅜” 04 – ¼” 05 – ½” 07 – ¾” 10 – 1” 12 – 1¼” 15 – 1½” 20 – 2” 22 – 22” 25 – 2½” 30 – 3” 40 – 4” 50 – 5” 60 – 6” 80 – 8” 81 – 10” 82 – 12” 83 – 14” 84 – 16” 85 – 18” 86 – 20” 87 – 24” 88 – 26” 89 – 28” 90 – 30” 91 – 32” 92 – 34” 93 – 36”	A B C D E F G H J

LADISH VALVES

CONTROLLED QUALITY • CORROSION RESISTANT

TO MARK PROGRESS

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