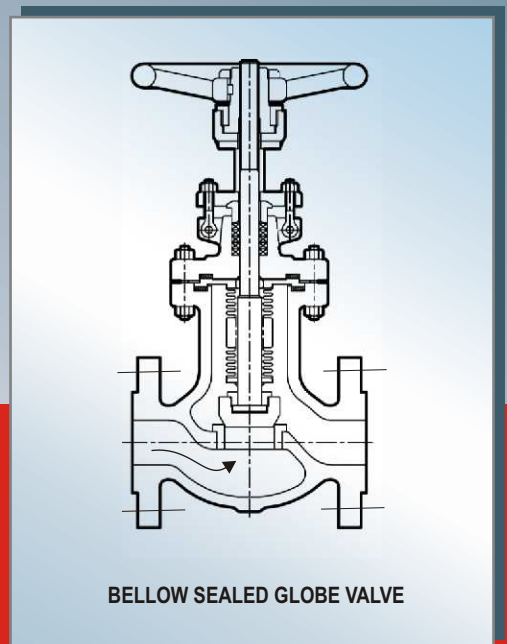
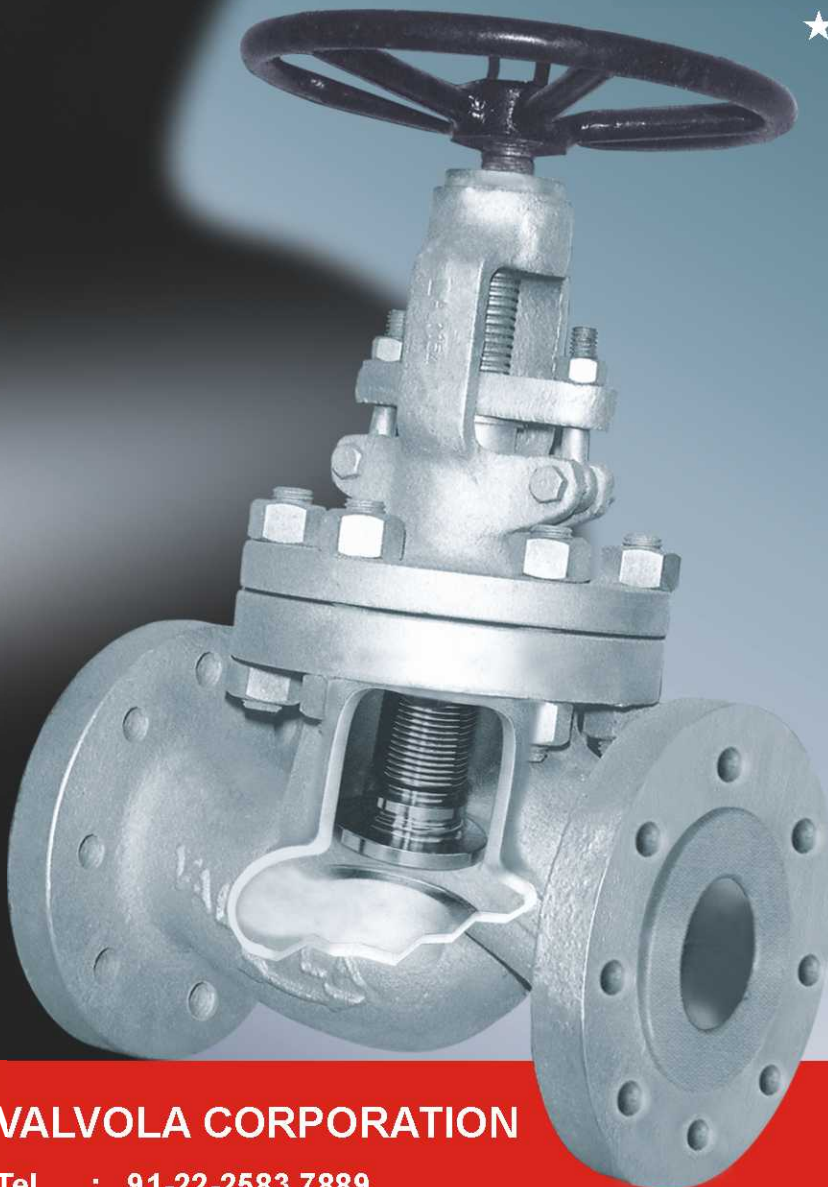




VALVOLA™
Bellow Sealed Valves

An ISO-9001:2000
Company

- ★ Emission Free
- ★ Zero Leakage
- ★ Maintenance Free
- ★ Environmental Friendly



BELLOW SEALED GLOBE VALVE

VALVOLA CORPORATION

Tel : 91-22-2583 7889
Fax : 91-22-2582 0964
Email : sales@valvola.com
Web : www.valvola.com

WHAT ARE BELLOW SEALED VALVES ?

Bellow Sealed Valves are a new breed of Industrial process valves, designed to eliminate Valve leakage and are also known as 'Zero Leak Valves' or 'Emission Free Valves'.

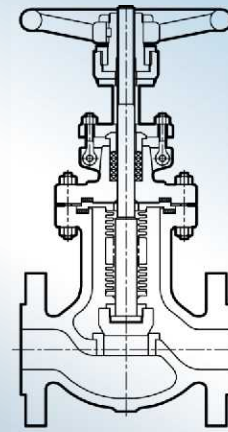
In these Valves, conventional gland packing is appended / supplemented by a metallic Bellow Cartridge joined to the valve bonnet at one end, and the stem at the other end. A bellow is a long accordion-like tube. As the valve stem strokes, the bellow expands or compresses with the stroke movement. The stem is fully covered with metallic bellow in wet zone, process fluid never reach to the gland area.

Thus the fluid will enter the valve from the seat of the valve & come in contact with the bellow, but will not come in contact with the stem. Since the stem is the only moving part in the valve, it is a source of potential leakage through the gland due to constant friction caused by the axial movement.

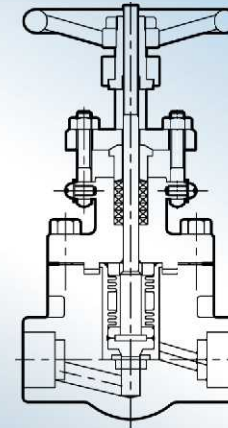
In a bellow sealed valve this potential leak through gland is totally avoided due to the metallic bellow which blocks the leak path effectively by not allowing the media to come in contact with the stem and thus the gland.

A bellow is the heart of this type of valve. There are two types of bellows: **Formed** and **Welded leaf**. A formed bellow is made by rolling a flat metal sheet into a tube with longitudinal fusion welding. This tube is then mechanically or hydraulically formed into bellows with rounded and widely spaced folds. In Welded Leaf-Type Bellows, washer like plates of thin metal are welded together.

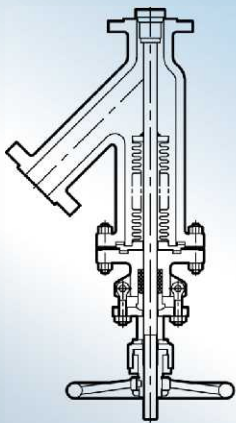
We at 'Valvola' use only formed bellows, as inspite of being more expensive than welded bellows, their life is many times more than welded bellows.



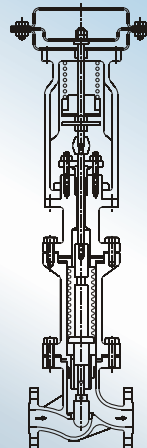
BELLOW SEALED GLOBE VALVE



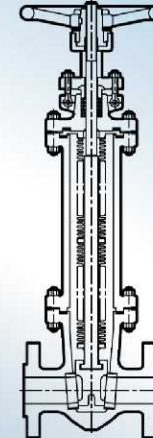
BELLOW SEALED GLOBE VALVE
(COMPACT DESIGN - FORGED STEEL)



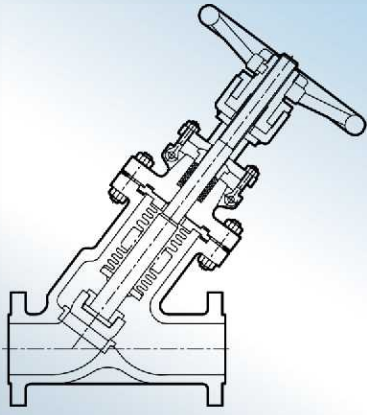
BELLOW SEALED FLUSH BOTTOM VALVE



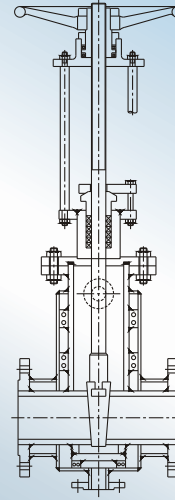
BELLOW SEALED CONTROL VALVE



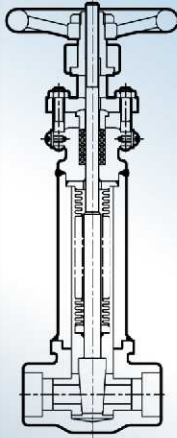
BELLOW SEALED GATE VALVE



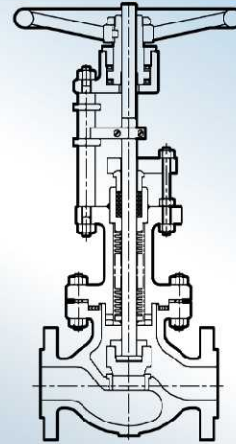
BELLOW SEALED "Y - TYPE" GLOBE VALVE



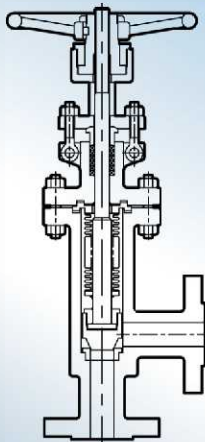
POLYMER GATE VALVE



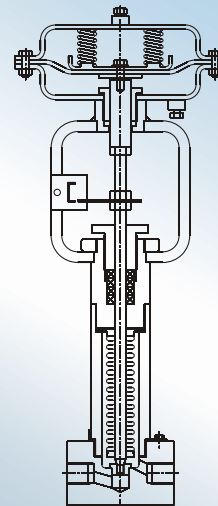
BELLOW SEALED GATE VALVE
(FORGED STEEL)



BELLOW SEALED "EURO - CHLOR" VALVE

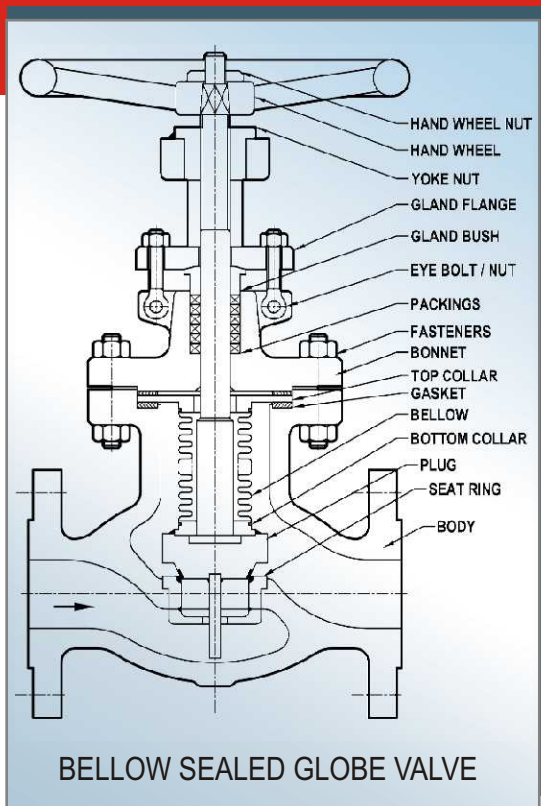


BELLOW SEALED ANGLE TYPE VALVE



MICRO FLOW BELLOW SEALED CONTROL VALVE

Sectional Drawing



Material of Construction

Body & Bonnet Material	Forging	Casting
Carbon Steel	A 105	A216 WCB
Carbon Steel	- - -	GS C 25
Grey Cast Iron	- - -	GG 25
S G Iron	- - -	GGG 40.3
Carbon Steel (Low Temperature)	A 350 LF2 A 350 LF3	A352 LCB / LCC LC2 / LC3
Carbon Steel (High Temperature)	A 182 F1 F11 / F22 / F5a	A 217 WC1 WC4 WC6 WC9 C5
Stainless Steel	A182 F304 / F304L F316 / F316L	A351 CF8 CF8M CF3 / CF3M
Nickel Alloy	Alloy 20, Monel 400 Hastelloy C276 Inconel 600	- - -

Bellow Material :

• SS - 316Ti • Hastelloy C 276 • Monel 400 • Inconel 625
Bellows available in 2 ply, 3 ply & above

Fastners Material

APPLICATION	STUD / BOLT	HEX - NUT
Carbon Steel	ASTM A 193 - Gr. B7	ASTM A 194 - Gr. 2H
Low Temperature	ASTM A 320 - Gr. L7	ASTM A 194 - Gr. 4
High Temperature	ASTM A 193 - Gr. B 16	ASTM A 194 - Gr. 2H
Stainless Steel	ASTM A 193 - Gr. B8	ASTM A 194 - Gr. 8

Critical Media Where Bellow Sealed Valves are used

Bellow Sealed Valves were invented specially for use in Nuclear Plants for preventing radioactive emissions from valves. Even today the Nuclear Industry and its associated industries remain the single largest market for such valves. But the bellow sealed valves has since evolved in there present form to encompass a variety of Industries such as :

A. Nuclear & Thermal Power Industry

1. Helium
2. Vacuum
3. Heavy Water
4. High pressure Steam
5. High temperature application etc ...

B. Chemical & Petrochemical Industry

1. Ammonia
2. Chlorine
3. Thermic Fluids (Dowtherm, Santotherm)
4. Hydrogen
5. Benzene
6. Various Acids
7. Phosgene
8. Freon
9. Cryogenics etc ...

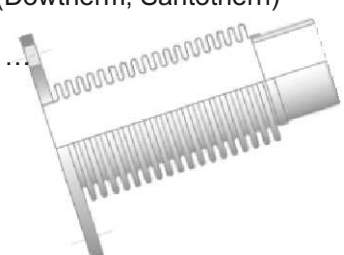
C. Food & Pharmaceutical Industry

1. Vegetable Oils
2. Fatty acids
3. Oxygen
4. Cynide compounds
5. Steam
6. Nitrogen
7. Hydrocarbon
8. Parathion
9. Argon etc ...

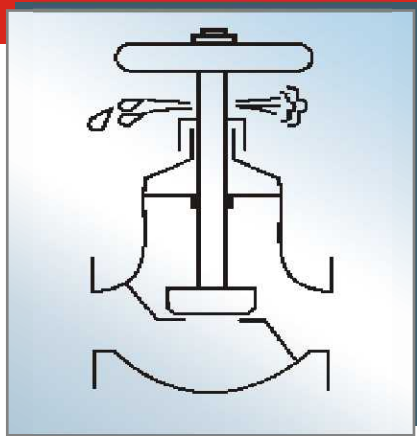
D. General Industries

Apart from above industries there is wide range of industries such as Refineries, Natural Gas, LPG & LNG, Synthetic, Paper & Pulp and Industrial plants such as fertilizers, plastics, paints, shipping, rubber, cement. These industries typically includes all kind Hazardous & Corrosive Chemicals & Heat Transfer Media like :

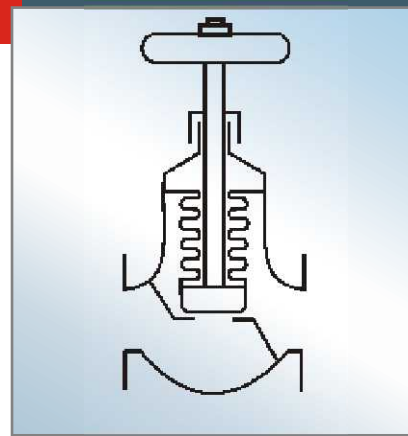
- High & Medium pressure Steam
- Hot Oils like Dowtherm, Therminol, Santotherm etc.
- Hot Water / Condensate etc.



WHY BELLOW SEALED VALVES ?



ORDINARY VALVE
(Observe Leakage Through Gland)



BELLOW SEALED VALVE
(Gland Leak Shut-Off With Metallic Bellow)

Leakage from the “Valve Gland” is often a problem for the Maintenance Engineer.

Losses incurred due to this type of leakage are considerable. For e.g. (in a 15 mm valve) Steam at a pressure of 150psi escapes through a gland with a clearance of 0.001 in. at a rate of 25 lb/hr. This translates to a loss of approx \$1.2/8-hr (Rs. 54/8-hr) shift and \$1,100/yr. (Rs. 59,130/yr.)

A tiny drop of 0.4 mm diameter/sec results in a waste of about 200 Ltr. / yr. of costly oil or solvent. That translates to a loss of approx \$1,200 / yr. (Rs. 54,000 / yr.) of a commonly used heating fluid like Dowtherm. And all this for \$100 valve!!!. (Rs. 4,500 valve!!!.)

Apart from this high cost of energy and material loss, the leakage also results in serious environmental, ecological and containment problems. The leaking fluid can be corrosive, inflammable, explosive or poisonous. In any case, a check needs to be kept on all leaks.

A bellow sealed valve can be a simple solution to all these problems.

Valves for Special Application:-

- Jacketed Valves
- Regulating Valves
- Three-Way Valves
- Manifold Valves
- Vacuum Valves
- Bellow Seal Bellow Operated
- Cryogenic Valves
- Needle Valves

Optional Requirements:-

- Valves with Locking Arrangement
- Valves with Gear Operation
- Valves with Electric Actuator
- Valves with Pneumatic Actuator
- Valves with Chain Wheel Operation

TEST PRESSURES (BAR)

RATING - CLASS	ANSI VALVES								DIN VALVES					
	150	300	400	600	800	900	1500	2500	PN10	PN16	PN25	PN40	PN64	PN100
SHELL HYDRO.	32	77	103	154	210	230	383	639	15	24	39	60	96	150
SEAT HYDRO.	23	56	75	113	140	170	281	468	11	18	28	44	71	110
SEAT PNEUMATIC	7	7	7	7	7	7	7	7	7	7	7	7	7	7

Comparison between Types of Valves

	BELLOW SEALED VALVES	PISTON VALVES	CONVENTIONAL VALVES
Primary Stem Seal	Metallic Bellow	Piston ring	Gland Packing
Secondary Stem Seal	Gland Packing	None	None
Stem Leakage	Not Possible. Metallic Bellows are designed to last several thousand cycles	Occurs as soon as the rings (which are made of gasket material) wear out	Very Common Due to friction between stem and the gland, leakage occurs within a few cycles no matter which make valve or what quality of gland packing.
Packing Replacement	Not Applicable	Rings need to be changed frequently	Packing needs to be replaced very often
Replacement Cost	Not applicable	very high	High
Media Loss	Zero Loss as the isolation is by Metallic bellows, Leakage (even in ppm) is not possible	Large in case of leaks	Through gland leakages. Normally large amount when leakage remains unattended
Equipment Downtime	Nil	Very high for replacing Rings	Very high for replacing gland packing
Maintenance Cost	Nil	High as rings need to be changed at least once in six months.	Very High. Gland packing need to be replaced / repacked often. This cost along with equipment down time, man hours spent etc. is very high
Valve life	High (in years)	Low	Very Low in months. Due to leakage through gland, certain parts erode, making the valve irreparable after some months. Valves needs to be replaced.
Safety	Can be used safely for almost any media	Can be used for limited media	Highly unsafe when the media is hazardous / poisonous
Cost	Comparatively Higher initially but lowest Total Cost of Ownership over the years of use.	High compared to the benefits viz a viz Problems	Initially low but very high Total Cost of Ownership if cost of packing, down time, man-hours spent, number of valves replaced etc. are taken into account.

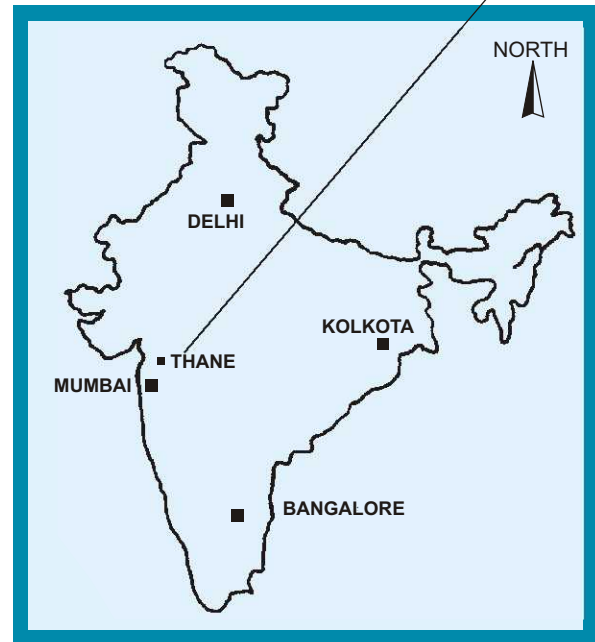
STANDARDS FOLLOWED

- ANSI
- ASME
- API
- JIS
- DIN
- BS
- ISO
- MSS
- Eurochlor - Brussels
- Chlorine Institute - USA

We undertake Third Party Inspections like:

- TUV
- JACOBS H & G
- NPCIL
- TCE etc.
- PDIL
- TOYO
- ABS
- LRIS
- UHDE
- IRS
- DNV
- MOODY
- KPG

LOCATION



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