BURCON

THE RIGHT PRODUCT FOR YOUR APPLICATION

Vice

35 years

PRESSURE SEAL VALVES

Gate, Globe and Check

- Cast and Forged
- ASME Class 600 to 4500#
- Size ½ - 24” (15 - 600mm)

ISO 9001 BUREAU VERITAS Certification

FUNDAÇÃO ABRINQ | EMPRESA AMIGA DA CRIANÇA

CE

A HISTORY OF GROWTH AND EXCELLENCE

DURCON-VICE is a premium manufacturer of industrial valves in Brazil. It combines high standards in technology, quality and productivity, with tradition, experience and reliability.

Founded in 1974, DURCON-VICE employs 250 workers in 4 (four) manufacturing plants in Brazil and the USA. The total plant area is 20 thousand square meters.

The company produces a wide range of high technology valves, with over 2 hundred thousand valves sold, with sizes ranging from 1/4" to 104" and pressure class up to 4500#. We are present in Latin America, North America, Europe and Asia.

Our QMS is ISO 9001:2000 certified for design, development, manufacture and service. We are also PED 97/23/EC (Pressure Equipament Directive) certified, (CE Mark).

Custom-made and Specialty Valves
Cajamar - SP - Brazil

Serial-made Valves
Cajamar - SP - Brazil

Specialty Valves
Three Rivers - Michigam - USA

Steel Foundry
Caieiras - SP - Brazil

Under construction
Jundiaí - SP - Brazil

MARKET AND CUSTOMERS

Thermoelectric power plants and co-generation

DURCON-VICE is specialist in valves and industrial equipment for thermoelectric power plants and co-generation, having sold complete packages of valves and equipment for hundreds of thermoelectric power plants.

Power

AES Uruguaiana
ALSTOM Power Brasil
Birchwood Co-Generation
CBC Ind. Pesadas
CGTEE
Eletronuclear
Gerasul
Eletrobolt
Fafen Energia
Foster Wheeler
Furnas Centrais Elétricas
Mitsubishi
Tractebel
Petrobras
Promom Engenharia
SIEMENS
Sierra Pacific Power Co.
Termelétrica Araucária
Termobahia
Termelétrica Piratininga
Kvaerner
Snam Progetti
CBI (ABB-Lummus)
CHESF
Eletronorte
Energyworks

Chemical and Petrochemical

Copesul / Quattro
Copene / Brasken
PQU
Rio Polimeros
Grupa Lotos (HDS UNIT)

Steel Mill

CSN
Usiminas
Arcelor Mittal-CST
Cosipa

Sugar and Alcohol

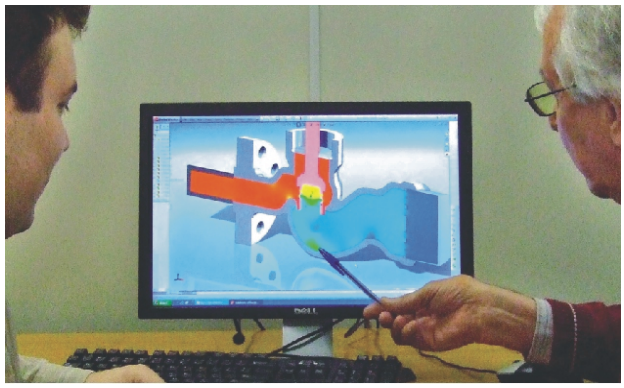
LDC - Bio Energia
Grupo Equipav
Grupo Cosan
Brenco
ETH - Odebrecht
Abengoa

Pulp & Paper

Aracruz
Federal Papers
Veracel
Cenibra
VCP
Klabin

PRODUCTION CYCLE

DESIGN AND P&D



All valves are designed according to the requirements of the applicable standard, with finite element and CAD/CAM/CAE/CFD/FEA, Techiniques.

SUPPORT AND AFTER-SALES

Provided through our application and techical assistant experts, in our or your own company.

QUALITY ASSURANCE

CE 0045

ISO 9001:2000

SA 8000

We are certified by BVQI in ISO 9001:2000 and PED 97/23/EC (Pressure Equipament Directive) certified, (CE Mark).

QUALITY CONTROL

We comply with all requirements for nondestructive examinations (NDE) as radiography, liquid penetrant, ultrasonic, magnetic particle, etc.

MANUFACTURE

We have state-of-the-art equipment for the manufacture of valves, from large-sized CNC machines to CNC Machining Centers.

TESTS

We are able to test valves according to ASME B16.34 up to pressure Class 4500#.

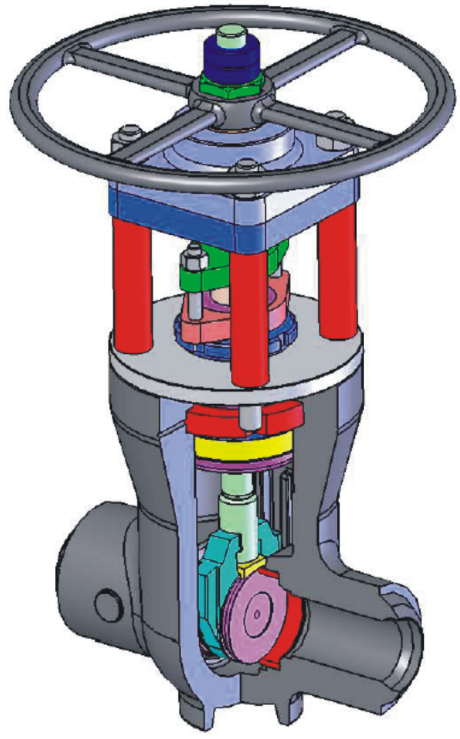
TABLE OF CONTENTS

GENERAL FEATURES

ORIGIN OF THE THECHNOLOGY

DURCON-VICE has been manufacturing Pressure Seal Valves for more than 35 years and during 10 years under license of the world's largest manufacturer of pressure seal valves.

The Pressure Seal (PS) system uses the process pressure to exercise additional force in the body/bonnet sealing ring, ensuring far superior sealing of this area. The sealing rings are metallic, thus avoiding the possibility of wear or deterioration. The thrust ring above the sealing rings ensures homogeneous distribution of forces in the entire circumference.



CHOOSING VALVE TYPE

Choose the valve type according to the application (gate, globe or check):
Gate valves allow choosing the type of wedge.
Globe, Globe non return stop-check and Check piston valves allow choosing the body construction (“T” or “Y”).
Check valves allow chossing the design: Piston, Swing or Tilting Disc.

SIZE

The valve size must be in accordance with the existing or designed pipe size. Check valves must take into consideration the flow rate for a perfect operation.

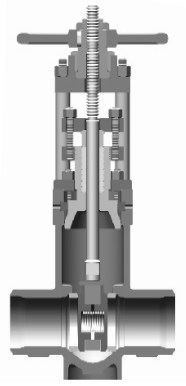
The valves must follow the Pressure Class determined by ASME B16.34, that make a relation bettwen Pressure Class (Standard or special) and design Pressure, design temperature and body material.

MATERIALS

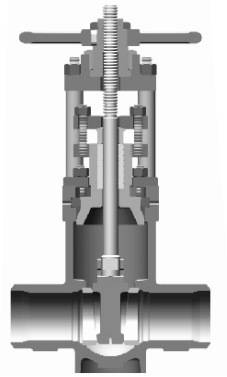
The chosen materials must be compatible with the application and among others, must be considered the fluid, the pressure and the temperature. In case of doubt, contact our specialists.

GATE VALVES

Gate valves are typically used in on-off services, in applications where no pressure loss and excellent two-directional sealing are required. They are not recommended for control. The ideal operating conditions are fully opened or fully closed. Their use in the intermediate positions (for control) may damage the seat, body and wedge sealing surfaces. Gate valves are usually installed in horizontal piping, with the stem in the vertical position upwards. They may be installed with the stem in another position provided that the manufacturer has been previously noticed at the time of the order, since this implies in design changes and, consequently, in the manufacturing process.
After the closing of the gate valve with the torque required for sealing, the valve must be relieved with 1/8 to 1/4 turn of the stem so as to avoid unnecessary stress in the stem resulting from thermal expansion. Such relief does not imply loss of sealing.



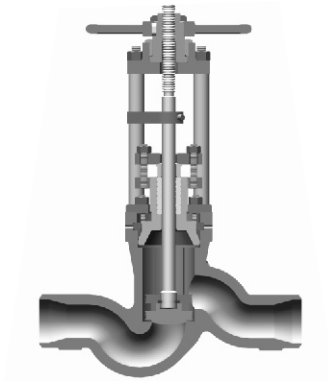
Parallel Slides (Wedge)



Flexible wedge

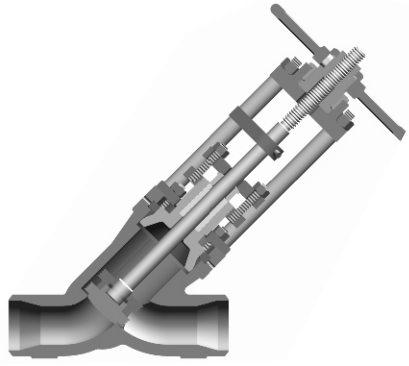
GLOBE AND GLOBE STOP-CHECK VALVES

Globe valves are used to control flow and/or block lines, usually installed with the flow direction entering under the disc. The globe valves supplied by DURCON-VICE are available with construction option in “T”, “Y” and Angular (90°). Because of the constructive geometry, the “T” globe valves have pressure loss higher than the “Y” valves. “T” valves are economically superior, due to the smaller weight and easier actuation. Globe valves with angular construction 90° are installed replacing elbows in the piping, saving space. Standard globe valves are designed for control and blocking, however, they are not recommended to be used in control applications for a long period with an opening less than 20%, since it may cause damage to the internal components.



"T" type

Globe Stop-check valves must be installed with stem in the vertical position and the flow direction under the plug. When the stem is opened, the fluid pressure under the plug opens the valve, allowing the fluid to pass. When the stem is in the closed position, has sealing capacity in both flow directions. With the stem in the open position, they operate as a piston-type (check) valve. In the closed position, the plug is pushed against the sealing seat by the stem, blocking the flow in the piping, such as in globe valve. Such kind of valve is normally applied in the replacement of two valves, a block valve (gate or globe) and a swing type check valve. The most common applications are in the discharge of pumps or in the protection against reverse flow of equipment connected to a common collector, such as boilers, pumps, etc.



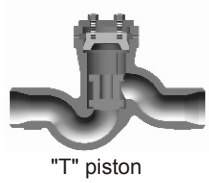
"Y" type

Globe and Globe stop-check valves are usually operated by Handwheel. Are also available with gear reducer and handwheel, electric actuator or pneumatic or hydraulic cylinder.

CHECK VALVES

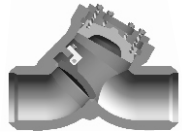
Check valves are used to prevent flow reversion in piping. They may be applied in the horizontal or vertical position (only upward flow). Swing-type check valves have low loss of pressure and must be applied preferably when the flow speed is moderate. It is very important the correct sizing of this valve type. Very low or very high flow speeds cause damage to the internal components and shorten valve life. Applications involving large number of cycles with quick reversion of the flow direction, turbulent flows or pulsating flows must also be avoided.

Contact DURCON-VICE for advice in the selection of the proper product for your application.

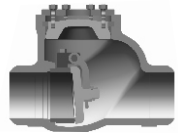


"T" piston

"Y" piston



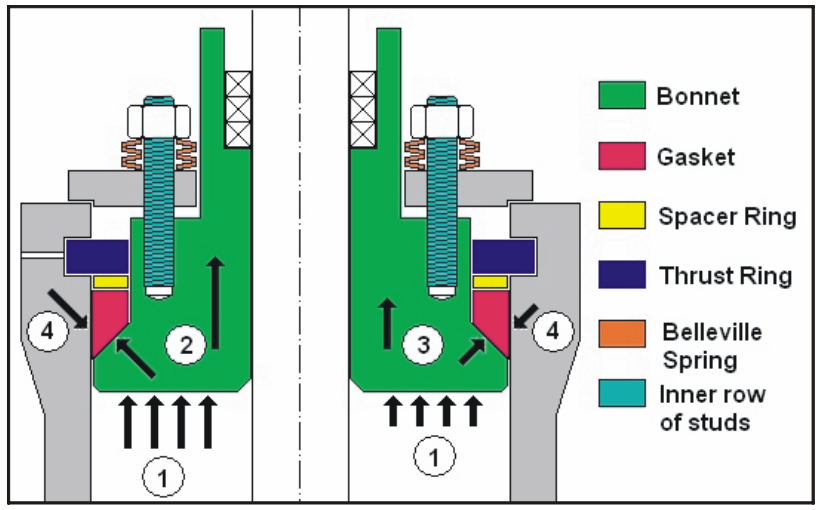
Tilting Disc



Swing

Pressure Seal, Standard or Live-Loaded design

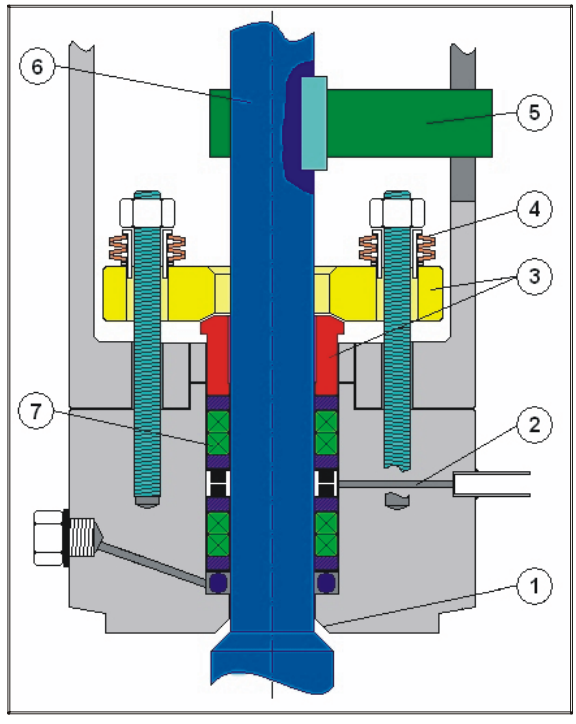
- The Thrust Ring Absorbs the Force promoted by Internal Pressure;
- Spacer Ring has the right clearance to avoid Gasket deformation or extrusion through it;
- Gasket is made from graphite or silver coated soft steel (to prevent corrosion and galling). It provides the surface for adequate sealing.
- Belleville Springs are responsible for the live-loaded design (Optional). Live-loading stores energy for automatic compensation of bonnet movement during transient loads (pressure or temperature) while keeping an upward force in the bonnet assuring sealing.



1. Internal Pressure;
2. Higher the internal pressure, higher the sealing force;
3. If the internal pressure decreases, the sealing force decreases too;
4. Sealing force according to internal pressure.

Stem Seal, Standard or Live-Loaded Design

1. **Backseat.** cone-in-cone design eliminates problems with over-torque;
2. **Leak-off for double packing (optional).** A lantern ring and a leak-off pipe are provided to remove any leakage from the lower packing set;
3. **Heavy two-piece gland.**
4. **Live-loading (optional).** Belleville springs assure a permanent load on the packing, even after a long time without maintenance.
5. **For Globe Valves to lower operation torque when compared to rotating stem.** The torque arm prevents stem rotation, indicates the position and actuates the limit switches.
6. **The non-rotating stem** close roundness, stringent tolerances and superior surface finish, as well as packing chamber superior surface finish, assure effective sealing.
7. **Pre-compressed rings.** Each braided graphite ring is preformed and compressed at installation to ensure extreme tightness and high packing strain.



Casting

Metal flow within the mold and solidification are the main factors that must be considered to avoid quality problems in cast valves. Recent advances in foundry technology were enormous, mainly due to computational models that made improvements in patterns design and flow geometry during pouring. Even so, these advances were not enough and it is still difficult to achieve quality acceptance of castings for severe applications.
The following problems are possible to happen during the process of pouring metal into the mold cavity and the solidification that follows:

Shrinkage – is the decrease in volume during cooling. Molten metal can be added to compensate for shrinkage that takes place above the melting point, but the contraction during cooling in the solid state must be compensated by oversized mold dimensions.

Segregation – or chemical separation of the melt is the non-uniform distribution of elements in metal. It is usually result of the primary crystallization of one phase with the subsequent concentration of other elements in the remaining liquid. The results of segregation are non-uniform hardness, second-phase precipitations and inclusions of intermetallic or nonmetallic compounds.

Porosity – can be caused by gases coming out of the solution during cooling process. These gases can become trapped between crystals dendrite arms as very small voids.

Crack and Hot Tears - fracture formed prior to completion of metal solidification as a result of the combination of stress concentration from non-uniform contraction and metal's low strength near melting point temperatures. A hot tear is frequently open to the surface of the casting.

In order to overcome the above problems and to meet X-Ray quality requirements, upgrading of the casting is necessary. The upgrading process relies on the grinding out of the area with problems, weld repair, heat treatment, retest and examination. Only specialized foundries are able to cast high quality castings that avoid all the above problems.

Forgings for High Temperature and Pressure Valves

When compared with casting, forging has several advantages:

Higher strength – recrystallization and grain refinement lead to higher strength. The continuous grain flow, that closely follows the outline of the body, decreases the susceptibility to fatigue and other failures (figure 1). Comparing with casting, forging has more predictable strength properties that are assured from part to part.

Structural integrity - Forging refines defects from cast ingots or continuous cast bar. Internal flaws are eliminated creating a coherent and uniform metallurgical structure.

Reliability – This characteristic takes into account the higher strength and structural integrity. Forged products are more reliable because hot working refines grain pattern and provides high strength, ductility and resistance properties. Since casting defects occur in a variety of forms, the ability of forgings to meet design requirements consistently is one the most important advantages.

Dimensional Uniformity – Dimensional uniformity of closed-die forging provides excellent control of critical wall thickness.

Fatigue Resistance to Creep Under Temperature Fluctuation is More Than Three Times Better for Forging

– The formula for calculating surface stress during frequent temperature fluctuation is:

$$S = (K_S K_n) \cdot \frac{E\alpha}{1-\nu} (T_m - T_f)$$

S = Surface stress [psi]; E = Modulus of Elasticity[psi]; α = Coefficient of Thermal Expansion [in./in.°F]; $T_m - T_f$ = Metal temperature before shock minus temperature of fluid causing shock; ν = Poisson's ratio; K_S = Surface finish stress intensification factor;
K_n = Notch stress intensification factor.
For example, two identical situations except for the material:

$T_m - T_f = 200°F$ $\quad E = 28{,}8 \cdot 10^6$
$\alpha = 7{,}65 \cdot 10^{-6}$ $\quad \nu = 0{,}3$ $\quad K_n = 1$
$K_S = 4.0$ - For casting material with non-machined internal surfaces.
$K_S = 1.2$ - For Forged or machined internal surfaces.
Situation 1 – Casting $\Rightarrow$ $S = 25196\,psi$
Situation 2 – Forging $\Rightarrow S = 75538\,psi$

From the calculation above, it is possible to realize the stresses generated in thermal shocks in forging are more than three times smaller.

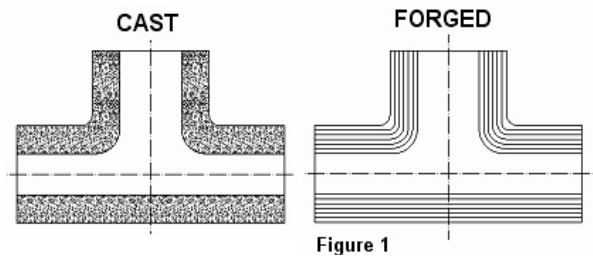


Figure 1

CONCLUSION

As seen above, forgings show many technical advantages when compared to castings, especially when the subject is reliability. However, for most applications concerning valves, castings after repair and appropriated examination can achieve an acceptable quality and can satisfy the requirements for a safe use.

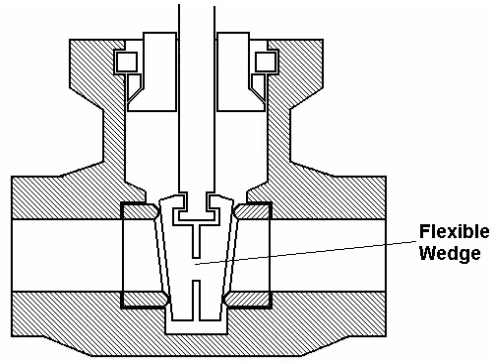
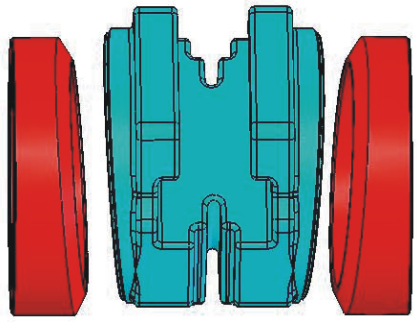


Figure 1 - Flexible Wedge Gate Valve.

1 Flexible Wedge



This kind of wedge / has a flexibility that / allows to compensate distortions in the valve seat caused by piping loads, pressure and temperature variations within normal closure torques and stress limits.

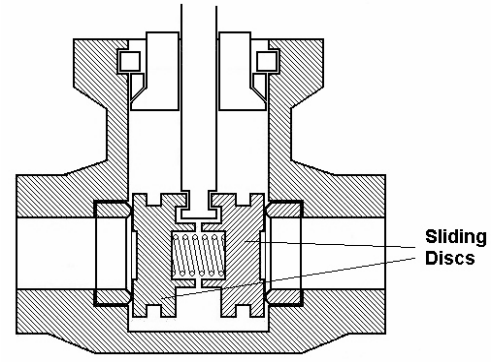
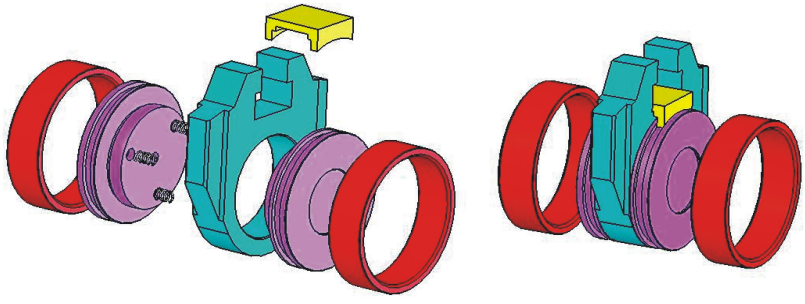


Figure 2 - Parallel Slides Gate Valve.

2 Parallel Slides Wedge

Manufactured with two parallel discs, each one sliding over its own seat. This kind of valve relies on the upstream pressure actuating on the downstream disc to assure a good sealing. There is no wedging or extra load on the seats allowing a smaller actuator torque. On the other hand, is a disadvantage the seat wear caused by the sliding disk during actuation.



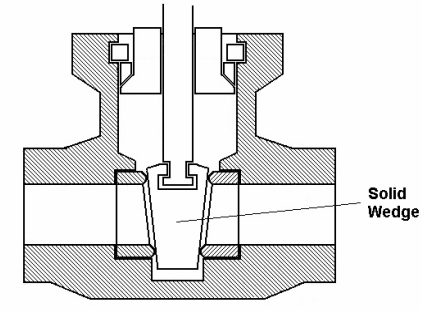
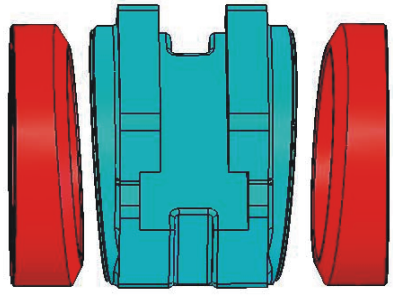


Figure 3 – Solid Wedge Gate Valve.

3 Solid Wedge

There are Solid Wedge Gate Valves too. Never use this kind of wedge in high pressure and temperatures (over 200°C or 392°F).



1 Overview

Gate Valves, Flexible Wedge or Parallel Slides - or any other kind of double-seated valve - are subject to failure under critical conditions if determined phenomena are not foreseen and/or their consequences neglected during design time. These phenomena are commonly known as:

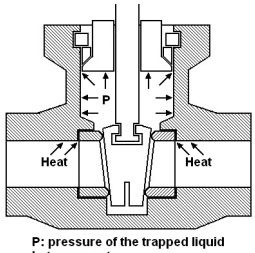
- Over-Pressurization
- Pressure Locking
- Thermal Binding

These phenomena may cause the inoperability of the valve closure member as will be seen on next items. Some possible solutions are given too. It is important to remark that the choice for the most appropriated solution depends on the valve application and process design, whose details are known only by process/piping engineer or end user. ASME B16.34 paragraph 2.3.3 reflects this situation, **requiring the end user to determine if Over-Pressurization protection is necessary or not.**

2 Problems and Comparison between Flexible Wedge and Parallel Slides Wedge

2.1 Over-Pressurization

Over-Pressurization happens when the trapped fluid between seats of double-seated valve is heated. The trapped fluid expands due to the increase in the temperature what leads to an increase in the pressure. Example: valve fulfilled in the close position and heated by the boiler.



P: pressure of the trapped liquid between seats

Figure 1 – Over-Pressurization.

Over-Pressurization can breach the pressure boundary.

• For each 1,8ºF (1ºC) that the temperature raises, the pressure of the trapped fluid can increase about 85 psi (0,6 MPa).

• Both pressure-seal and bolted-bonnet type valves are subjected to Over-Pressurization. Although bolted-bonnet valves can leak trough the gasket, a rapid temperature transient can breach the pressure boundary.

• Over-Pressurization phenomenon can happen no matter the valve size. Equalization provisions (a solution for this problem as seen forward) are requested to valves NPS 6 and above, and some times it is necessary to sizes even below.

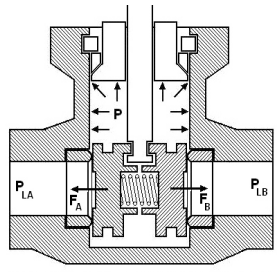
• Over-Pressurization can happen also in a length of pipe isolated in both ends by valves.

2.1.1 Comparing Over-Pressurization in Flexible Wedge and Parallel Slides

Over-Pressurization affects the same way both types.

2.2 Pressure Locking

Pressure Locking takes place with Over-Pressurization. The pressure inside body cavity applied to the effective area of the wedge generates a pushing force against seats. The friction in the seat due to this pushing force can cause inoperability of the valve closure members.



P: pressure of the trapped fluid between seats.
P_{LA} / P_{LB}: line pressure.

Figure 1 – Pressure Locking.

2.2.1 Comparing Pressure Locking in Flexible Wedge and Parallel Slides

Pressure Locking Problem is much greater in Parallel Slides, since this kind of gate has a larger effective area exposed to the fluid.

2.3 Thermal Binding

Thermal Binding is another phenomenon that leads to the valve closure member inoperability.

Thermal Binding is caused by the dimensional interference between seat surfaces of the wedge and valve body. This interference happens due to a difference in thermal expansion between wedge and valve body/piping. Example: an open gate valve working in a high temperature (expanded) is closed and subsequently cools down. This will generate a dimensional interference between the involved parts. Stem thermal expansion and mechanical and thermal stresses in the piping contribute for this problem.

2.3.1 Comparing Thermal Binding in Flexible Wedge and Parallel Slides Wedge

Thermal Binding does not affect Parallel Slide Gate Valves. The spring between parallel slides can easily absorb eventual geometrical interferences between parts. Flexible Wedge may be affected by Thermal Binding depending on the application conditions (the higher the temperature, the higher is the probability of Thermal Binding).

3 Solutions

3.1 Solutions for Over-Pressurization and Pressure Locking

Once determined that Over-Pressurization and/or Pressure Locking is a potential problem, the solution is to provide a pressure relief device for the valve body cavity. Below, some ways that this can be done:

3.1.1 Equalizing Pipe or One Side Wedge Hole

The equalizing pipe connects one side of the valve to the valve body cavity. **The valve will only seal in one direction**; this means that the equalizing pipe must be on the high pressure side when the valve is closed.

A second way to connect the high pressure side to the valve body cavity is provided by making a hole in one side of the wedge. The same way as the equalizing pipe, **the valve will only seal in one direction**.

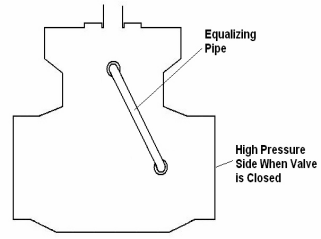


Figure 1 – Equalizing Pipe.

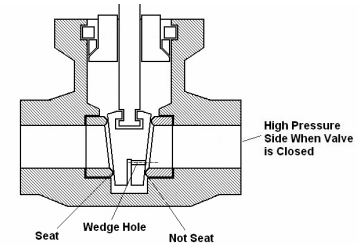


Figure 1 - Hole in the Wedge.

3.1.2 Equalizing Pipe with Valve

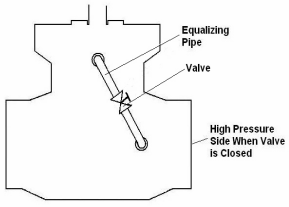


Figure 2 - Equalizing Pipe and Equalizing Valve.

The valve can seal from both sides. **Note that the pressure relief is not available when the valve in the equalizing pipe is closed. Equalization only happens when high pressure is on the side B and The valve in the equalizing pipe is opened. This means that when the high pressure is on side A, equalization will not happen.**

3.1.3 Relief Valve

A valve connecting the valve body cavity to the atmosphere is another way to provide pressure relief. A self actuated valve or a drain valve can be used as seen in the pictures below. The discharge of this valve must be made to a safe location.

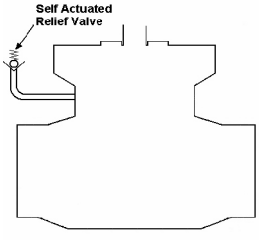


Figure 1 - Self Actuated Relief Valve.

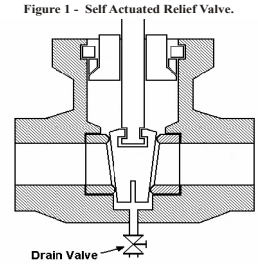


Figure 2 - Drain to relief pressure.

3.1.4 Self-Actuating Equalizing Device (SAED) When High Pressure can Occur on Both Sides

SAED is a special device that provides a solution for Over-Pressurization and Pressure Locking while allowing valve to seal in both directions automatically and self-operated. This means that there is no need for manual actuation or the use of external hardware in the valve for pressure equalization. The way this device works is described below:

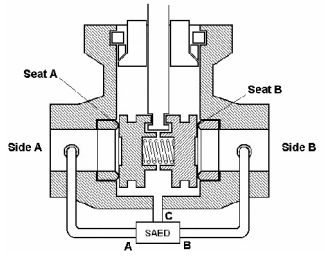


Figure 1 - Self-Actuating Equalizing Device

Port **A** is connected to one valve side;

Port **B** is connected to the other valve side;

Port **C** is connected to the valve body cavity

High Pressure on the A Port side (Figure 9):

-The shuttle is pushed to seat on the low pressure side.

-The pressure is then equalized between the high pressure side **A,** and the valve cavity **C.**

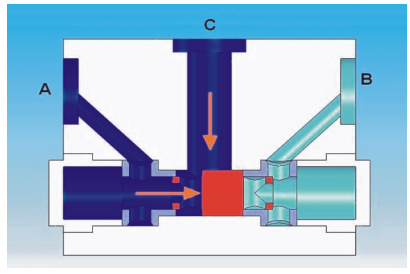


Figure 9 - High Pressure on the A Port.

- Any high pressure on the **C** Port side (valve body cavity) will escape to Port **A**, preventing over pressure in the valve body cavity.

Reverse Pressure (Figure 10):

-The shuttle is pushed to seat on the low pressure side.

-The pressure is then equalized between the side **B** and the body cavity **C.**

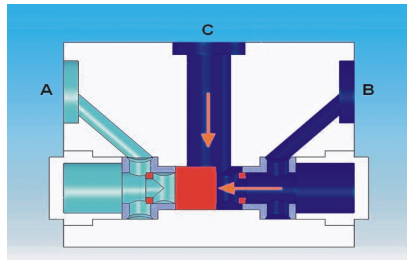


Figure 10 - High Pressure on the B Port.

-Any high Pressure on the C Port side (valve body cavity) will escape to Port B, preventing over pressure in the valve body cavity.

3.2 Solutions for Thermal Binding

Once determined that Thermal Binding can occur, the following solutions are available to eliminate or reduce this problem:

3.2.1 Bypass Pipe and Valve

When the Bypass valve is opened (see Figure 11), the flow warms up both sides of the wedge. The warm up pipe must be near to the wedge; otherwise this solution is not very effective. Bypasses are standardized by MSS SP-45.

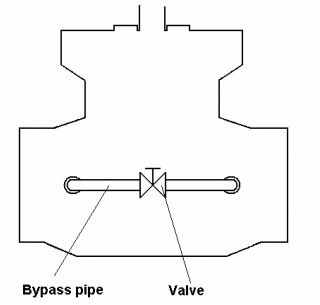


Figure 11 - Bypass provision.

3.2.1.2 Reduce Temperature Variation

Check the process if it is possible to reduce the temperature variation between opened and closed position of the valve to less than 250°C (482°F).

3.2.2 Back up of the Stem

After the valve is closed, back up the stem about half of the backlash (approximately 1/8 turn). This will give room for dimensional changes due to temperature variation. This is a practical solution for Thermal Binding and Stem Buckling only applicable for manual operated valves or motor operated valves.

3.2.3 Adequate Valve Supporting

Adequate supports can reduce the Thermal Binding problem by reducing pipe stresses.

3.2.4 Use of Parallel Slide Gate Valve

Parallel Slide Gate Valves are not subjected to Thermal Binding. While evaluating if this is the right solution, the designer must remember the disadvantages of this kind of valves: seat wear, poor sealing under low pressure (Pressure Class below 600#) and higher susceptibility to Pressure Locking.

3.2.5 Cycle the Valve near Closure

Stroke the valve several times near closure, or close the valve very slowly, to warm up the stem and wedge.

3.2.6 Use of Position Seating

Depending on the situation, the use of position seating instead of torque seating on closure may be a solution for Thermal Binding.

3.3 Combined Solutions for Over-Pressurization, Pressure Locking and Thermal Binding

If determined that Thermal Binding exists combined with Over-Pressurization and/or Pressure Locking, a combined solution of equalizing pipe relief and bypass must be adopted. Below, figures show some possibilities for combined solutions. The right choice depends on the process and the requirement for a bidirectional sealing. (Figure 12)

OVER-PRESSURIZATION, PRESSURE LOCKING AND THERMAL BINDING IN GATE VALVES: PROBLEMS AND SOLUTIONS

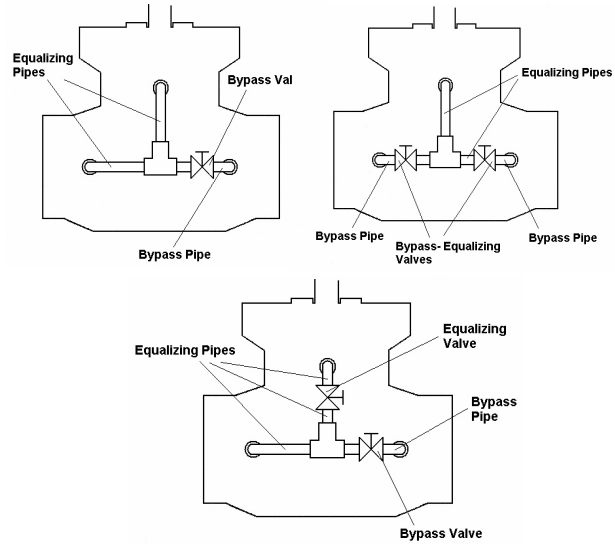


Figure 12 – Solutions for Combined Effects.

CONCLUSION

The problems and solutions for Over-Pressurization, Pressure Locking and Thermal Binding were shown as well as the way that different types of gate valves are affected by them.

Once again, Durcon-Vice highlights that the choice for the right solution depends on the application and the process, whose details are only known by the end user. That is why the responsibility to determine what can be an appropriated solution remains on the end user (according to ASME B16.34 paragraph 2.3.3 and ASME B31.1).

Final Durcon-Vice Recommendations:

-Use Flexible Wedge for working temperatures until 750°F (400°C)

-Use Parallel Slides for working temperatures above 750°F (400°C)

Feel free to contact Durcon-Vice engineering department for help about any specific application question.

GATE VALVES MATERIALS

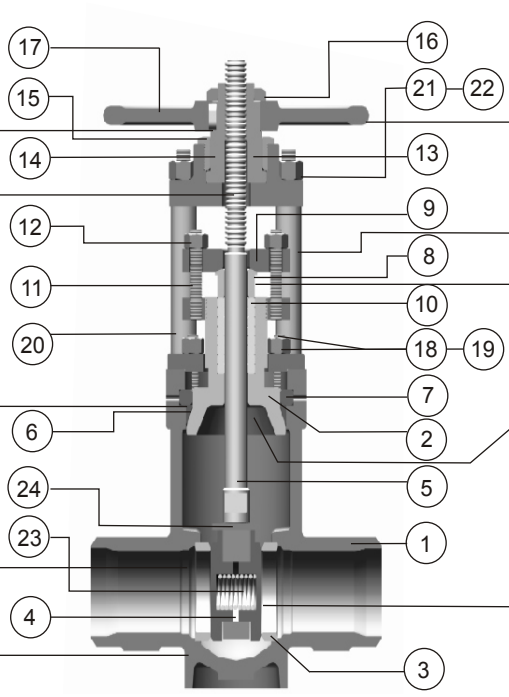
THREADED BUSHING - Bronze material, supported by bearing, when applicable, to minimize the torque.

STEM - In Heat-treated stainless steel, with fine finishing, to reduce friction with the packing.

PRESSURE SEAL - Simplified and Pressure-aided the body/bonnet sealing.

SEAT RINGS - Coated with Stellite and welded to the body, do not obstruct the flow of fluid.

BODY - Straight flow. Minimizes the pressure loss.



ACTUATOR - May be supplied With handwheel, gear reducer, electromechanical, pneumatic or hydraulic actuator.

YOKE - Simplified and tubular, make easier the maintenance and replacement of actuators.

PACKING GLAND, HUB and FLANGE - Manufactured in two self-aligning pieces, recessed in the gland flange eliminates frequent re-tightening.

BACKSEAT - Hardened and contained in the bonnet.

WEDGE - Flexible, Solid or Parallel: discs with springs and stroke limits by position decrease the cost of automation.

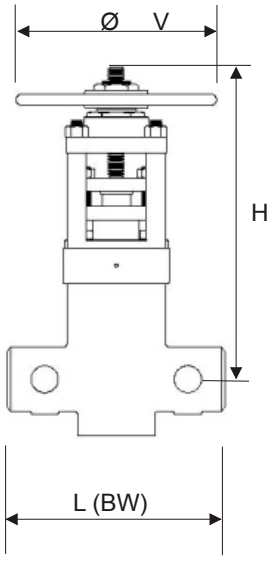
MATERIALS ACCORDING TO ASME B16.34						
Pos.	Description	WC B	WC 6	WC 9	C12A	C F 8 M
1.	Body [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Wedge [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Stem [3)]	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
6.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
7.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
8.	Gland hub	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
9.	Gland plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
10.	Packing	CARBON FIBER	CARBON FIBER	CARBON FIBER	CARBON FIBER	TEFLON
11.	Gland studs	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
12.	Gland nut	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
13.	Bushing bearing [4)]	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
14.	Threaded bushing	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863
15.	Safety sleeve	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
16.	Handwheel nut	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
17.	Handwheel	ASTM A 395	ASTM A 395	ASTM A 395	ASTM A 395	ASTM A 395
18.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
19.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
20.	Tubular yoke	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
21.	Yoke stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
22.	Yoke nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
23.	Spring [5)]	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
24.	Pin [5)]	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL

1. Forged body and bonnet material available under request.
2. Seat faces coated with Stellite #6 or 13% Cr.
3. Heat treated (only for Martensitic Stainless Steels - AISI 410).
4. Depending on the size and Pressure Class, DURCON-VICE uses bronze, steel or axial ball bearing.
5. Applied only to parallel Slide Wedge.

Class	Dimensions (mm)																	
	Sizes (inches)	1/2"	3/4"	1"	1.1/2"	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
900#	L (BW/SW)	140	140	140	178	216	254	305	356	508	660	787	914	991	1092	1219	1321	1549
	L (FR)	254	254	254	305	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
	L (FRTJ)	254	254	254	305	371	422	384	460	613	740	841	968	1039	1140	1232	1334	1568
	~H	306	306	334	447	512	520	512	575	760	4023	1232	1410	2002	1688	2290	2535	2900
	ØV	150	150	203	229	267	267	280	450	580	640	***508***	***508***	***800***	***800***	***800***	***800***	***800***
	Weight (kg) BW	12.5	13	15	16	20	23.5	34.5	52	121	278	440	748	990	1455	2100	2215	5950
1500#	L	140	140	140	178	216	254	305	406	559	711	864	991	1067	1194	1346	1473	1943
	L (FR)	254	254	254	305	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	1943
	L (FRTJ)	254	254	254	305	371	422	473	549	711	842	1001	1146	1276	1406	1559	1686	1971
	~H	306	306	334	447	512	520	545	616	903	972	1346	1483	1460	1688	2340	2805	3040
	ØV	150	150	203	229	267	267	356	450	640	750	***640***	***640***	***800***	***800***	***800***	***800***	***800***
	Weight (kg) BW	12,5	13	15	16	20	23.5	42	65	198	414	832	1137	1284	1986	2500	4658	5950
2500#	L	264	273	186	232	279	330	368	457	610	762	914	1041	1118	1245	1397	1574	1676
	L (FR)	264	273	308	384	451	508	578	673	914	1022	1270	1422	--	--	--	--	--
	L (FRTJ)	264	273	308	387	454	514	584	683	927	1038	1292	1444	--	--	--	--	--
	~H	320	320	350	500	448	559	650	775	815	1000	1328	1850	2070	2070	2260	2464	2921
	ØV	150	150	203	406,4	356	356	450	508	508	***640***	***640***	***800***	***800***	***800***	***800***	***800***	***800***
	Weight (kg) BW	12,5	13	21	43.5	63	121	213	250	612	627	1092	1849	1856	2947	3830	5510	7530

Notes:

1. Face-to-face dimensions (mm), according to ASME B16.10, when applicable, Weights (kg).
2. Pressure classes according to ASME B16.34 "standard or special" class
3. Valves 900# up 10", 1500# up 10" and 2500# up 8" are supplied with gear box reducer.
4. For BW connections, please inform the piping schedule.
5. Dimensions, weights and other information of this catalogue are subject to changes.



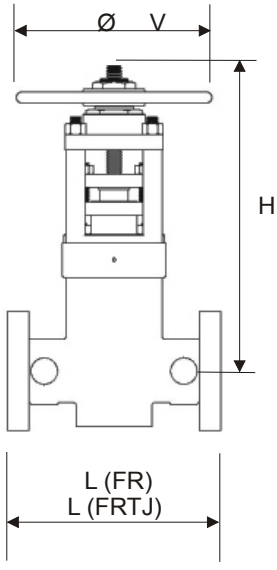
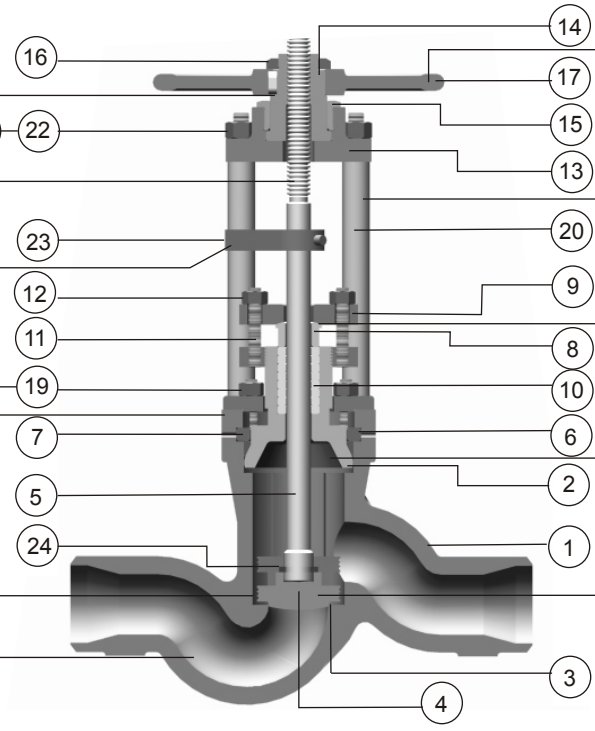


Figure	Class	Wedge
7710	900#	Solid
7715		Flexible
7720		Parallel
7810	1500#	Solid
7815		Flexible
7820		Parallel
7910	2500#	Solid
7915		Flexible
7920		Parallel

“T” - TYPE GLOBE VALVES MATERIALS



THREADED BUSHING - Bronze material, supported by bearing, when applicable, to minimize the torque.

STEM - In heat treated stainless steel, with fine finishing, to reduce friction with the packing.

STEM GUIDE - Avoids stem rotation.

PRESSURE SEAL - Simplified and pressure-aided the body/bonnet sealing.

SEAT SURFACES - The disc and body seats are hardened to increase the useful life.

BODY - Optimized Kv. Minimizes the pressure loss.

ACTUATOR - May be supplied with handwheel, impact handwheel, gear Reducer, electromechanical, pneumatic or hydraulic actuator.

YOKE - Simplified and tubular, makes easier the maintenance and replacement of actuators.

PACKING GLAND, HUB and FLANGE- Manufactured in two self-aligning pieces, recessed in the gland flange eliminates frequent re-tightening.

BACKSEAT - Hardened and contained in the bonnet.

INTERNAL GUIDES - The disc is fully guided during the stroke.

MATERIALS ACCORDING TO ASME B16.34						
Pos.	Description	WC B	WC 6	WC 9	C 12A	C F 8 M
1.	Body [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Disc [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Stem [3)]	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
6.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
7.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
8.	Gland hub	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
9.	Gland plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
10.	Packing	CARBON FIBER	CARBON FIBER	CARBON FIBER	CARBON FIBER	TEFLON
11.	Gland studs	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
12.	Gland nut	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
13.	Bushing bearing [4)]	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
14.	Threaded bushing	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 A LLOY 863	ASTM B 584 ALLOY 863
15.	Safety sleeve	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
16.	Handwheel nut	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
17.	Handwheel	ASTM A 395	ASTM A 395	ASTM A 395	ASTM A 395	ASTM A 395
18.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
19.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
20.	Tubular yoke	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
21.	Yoke stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
22.	Yoke nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
23.	Stem lock	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
24.	Ring	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL

1. Forged body and bonnet material available under request.
2. Seat faces coated with Stellite #6 or 13% Cr.
3. Heat treated (only for Martensitic Stainless Steels - AISI 410).
4. Depending on the size and Pressure Class, DURCON-VICE uses bronze, steel or axial ball bearing.

Class	Dimensions (mm)													
	Sizes (inches)	*1/2"	*3/4"	*1"	*1.1/2"	*2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"
900#	L	--	--	254	305	368	254	305	356	508	660	787	914	991
	L (FR)	--	--	254	305	368	419	381	457	610	737	838	965	1029
	L (FRTJ)	--	--	254	305	371	422	384	460	613	740	841	968	1039
	~H	--	--	325	460	494	593	767	674	874	1005	1535	1680	1596
	ØV	--	--	203	280	280	406	500	500	580	580	750	750	750
	Weight (kg) BW	--	--	14,7	30	70	70	70	130	360	576	950	1400	1960
1500#	L	216	229	254	305	216	254	305	406	559	711	864	991	1067
	L (FR)	216	229	254	305	368	419	470	546	705	832	991	1130	1257
	L (FRTJ)	216	229	254	305	371	422	473	549	711	842	1001	1146	1276
	~H	262	262	325	460	494	593	674	794	974	1394	1474	2005	2005
	ØV	220	220	203	280	280	406	500	580	580	750	945	1200	1200
	Weight (kg) BW	11,1	11,1	14,7	30	80	80	120	220	520	1024	1620	2680	3200
2500#	L	264	273	308	384	279	330	368	457	610	762	914	1041	--
	L (FR)	264	273	308	384	451	508	578	673	914	1022	1270	1422	--
	L (FRTJ)	264	273	308	387	454	514	584	683	927	1038	1292	1444	--
	~H	262	262	262	482	482	495	603	850	971	1200	1416	1524	--
	ØV	220	220	220	350	350	406	500	500	750	750	945	1200	--
	Weight (kg) BW	11,1	11,1	14,7	37	120	120	205	270	790	1280	2250	3400	--

Notes:

1. Face-to-face dimensions (mm), according to ASME B16.10, when applicable, Weights in (kg).
2. Pressure classes according to ASME B16.34 “standard or special”
3. Valves with size above 3” are supplied with impact handwheel.
4. For BW connection, please inform the piping schedule.
5. Dimensions, weights and other information of this catalogue are subject to changes.

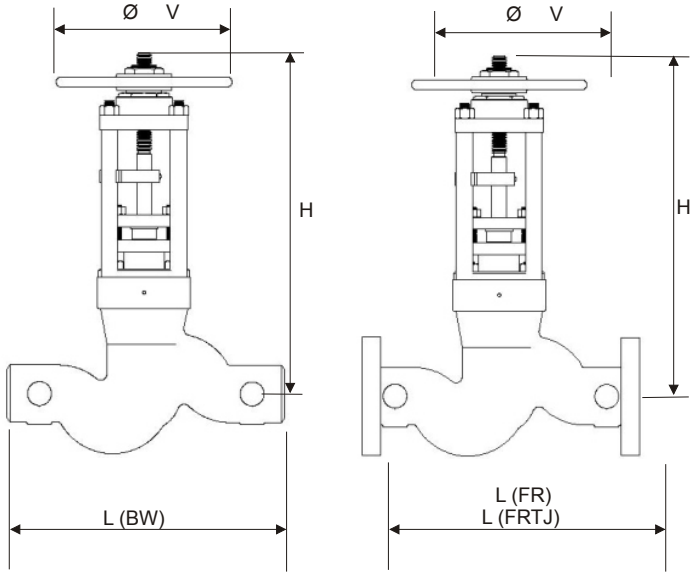


Figure	Class
7750	900#
7850	1500#
7950	2500#

“Y” - TYPE GLOBE VALVES MATERIALS

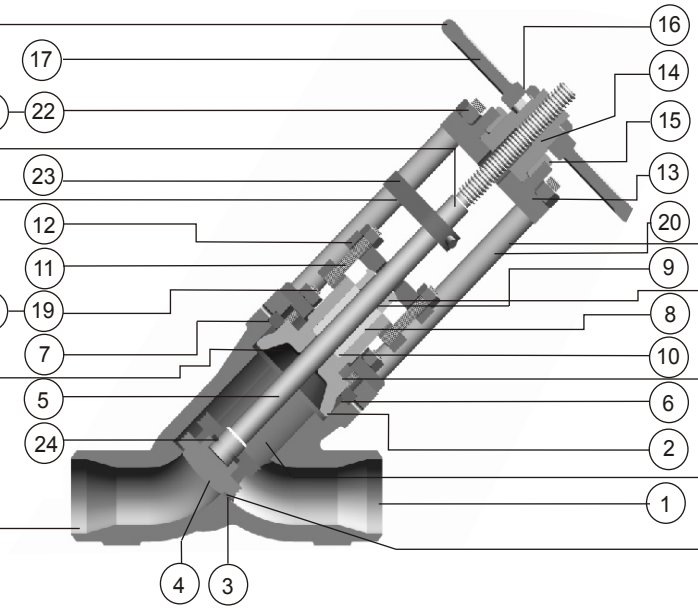
ACTUATOR - May be supplied with handwheel, impact handwheel, gear reducer, electromechanical, pneumatic or hydraulic actuator.

STEM - Heat treated in stainless steel with fine finishing in order to minimize the friction with the packing during operation.

STEM GUIDE - Avoids the stem rotation

BACKSEAT - Hardened and contained in the bonnet.

BODY - Designed to maximize the Kv, minimizing the pressure loss and the operating costs.



YOKE - Simplified and tubular, makes easier the maintenance and replacement of actuators.

PACKING GLAND, HUB and FLANGE- Manufactured in two self-aligning pieces, recessed in the gland flange eliminate frequent re-tightening.

PRESSURE SEAL - Simplified and pressure-aided the body/bonnet sealing.

INTERNAL GUIDES - The disc is fully guided by the body during the stroke

SEAT SURFACES - The disc and body seats are hardened to increase the useful life.

		MATERIALS ACCORDING TO ASME B16.34				
Pos.	Description	WC B	WC 6	WC 9	C12A	C F 8 M
1.	Body [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Disc [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Stem [3)]	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
6.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
7.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
8.	Gland hub	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
9.	Gland plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
10.	Gaskets	CARBON FIBER	CARBON FIBER	CARBON FIBER	CARBON FIBER	TEFLON
11.	Gland studs	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
12.	Gland nut	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
13.	Bushing bearing [4)]	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
14.	Threaded bushing	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863	ASTM B 584 ALLOY 863
15.	Safety sleeve	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
16.	Handwheel nut	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
17.	Handwheel	ASTM A 395	ASTM A 395	ASTM A 395	ASTM A 395	ASTM A 395
18.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
19.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
20.	Tubular yoke	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL
21.	Yoke stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
22.	Yoke nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
23.	Stem lock	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
24.	Ring	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL

1. Forged body and bonnet material available under request.
2. Seat faces coated with Stellite #6 or 13% Cr.
3. Heat treated (only for Martensitic Stainless Steels - AISI 410).
4. Depending on the size and Pressure Class, DURCON-VICE uses bronze, steel or axial ball bearing.

Class	Dimensions (mm)													
	Sizes (inches)	*1/2"	*3/4"	*1"	*1.1/2"	*2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"	16"
900#	L	127	127	127	202	202	254	305	356	508	660	787	914	991	1092
	~H	254	254	254	460	460	571	571	1006	954	1718	1732	1732	1906	1906
	ØV	220	220	220	220	220	356	500	500	500	750	750	945	945	1200
	Weight (kg) BW	7	7	7	23	23	100	100	248	340	750	1410	1920	1920	3510
1500#	L	127	127	127	202	202[1]	254	305	406	559	711	864	991	1067	1194
	~H	254	254	254	460	460	571	571	1006	954	1718	1732	1732	1906	1906
	ØV	220	220	220	220	220	356	500	500	500	750	945	945	945	1200
	Weight (kg) BW	7	7	7	23	23	100	100	248	340	750	1410	1920	1920	3510
2500#	L	127	127	127	202	202[2]	330	368	457	610	762	914	1041	1092	1092
	~H	254	254	254	460	460	571	571	1006	1116	1200	1694	1422	1906	1906
	ØV	220	220	220	220	220	356	500	500	750	750	945	1200	1200	1200
	Weight (kg) BW	7	7	7	23	23	100	100	248	420	767	1410	2208	3510	3510

Notes:

1. Face-to-face dimensions (mm), according to ASME B16.10, when applicable, Weights in (kg).
2. Pressure classes according to ASME B16.34 "standard or special"
3. Valves with size above 3" are supplied with impact handwheel.
4. For BW connections, please inform the piping schedule.
5. Dimensions, weights and other information of this catalogue are subject to changes.

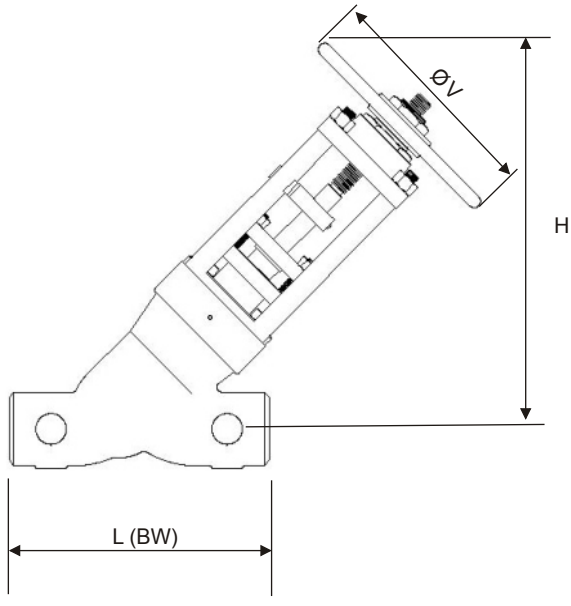
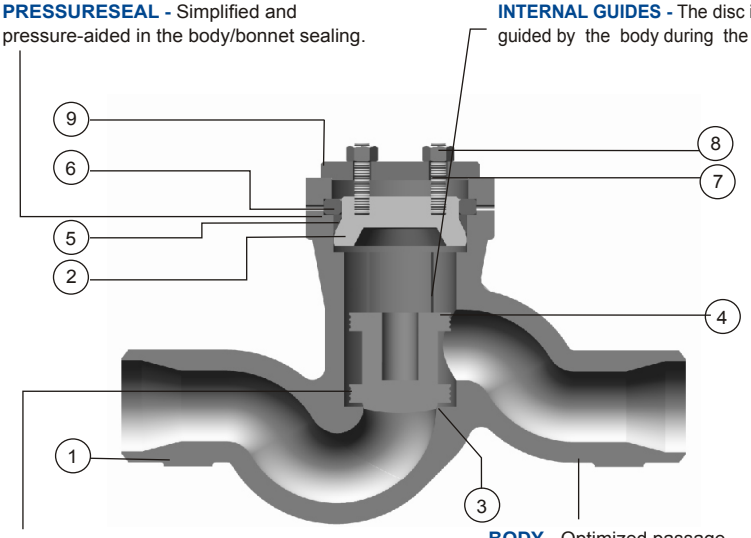


Figure	Class
7755	900#
7855	1500#
7955	2500#

“T” PISTON CHECK VALVES, SIZES ½” TO 14” CLASSES 900#, 1500# AND 2500#

PRESSURESEAL - Simplified and pressure-aided in the body/bonnet sealing.

INTERNAL GUIDES - The disc is fully guided by the body during the stroke



SEAT SURFACES - The disc and body seats are hardened to increase the useful life.

BODY - Optimized passage. Minimizes the pressure loss.

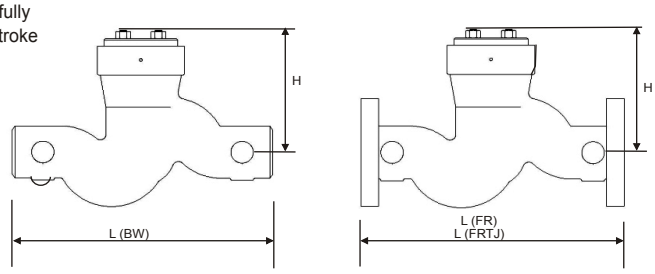


Figure	Class
7760	900#
7860	1500#
7960	2500#

MATERIALS ACCORDING TO ASME B16.34						
Pos.	Description	WC B	WC 6	WC 9	C 12A	C F 8 M
1.	Body [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Piston [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
6.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
7.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
8.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
9.	Locking plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBO N STEEL

1. Body and bonnet avaliable in forged materials under request.
2. Seat faces coated with Stellite #6 or 13% Cr.

Class	Dimensions (mm)														
	Sizes (inches)	1/2"	3/4"	1"	1.1/2"	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"	16"
900#	L	127	127	127	202	202	254	305	356	508	660	787	914	991	1092
	~H	140	140	140	210	210	238	238	400	398	626	840	840	905	905
	Weight (kg) BW	5	5	5	16	16	45	45	165	210	640	1190	1190	1640	1640
1500#	L	127	127	127	202	202[1]	254	305	406	559	711	864	991	1067	1194
	~H	140	140	140	460	210	238	238	400	398	626	840	840	905	905
	Weight (kg) BW	5	5	5	16	16	45	45	165	210	640	1190	1190	1640	1640
2500#	L	127	127	127	202	202[2]	330	368	457	610	762	914	1041	1092	1092
	~H	140	140	140	210	210	238	238	400	398	626	840	840	905	905
	Weight (kg) BW	5	5	5	16	16	45	45	165	252	640	1270	1270	1640	1640

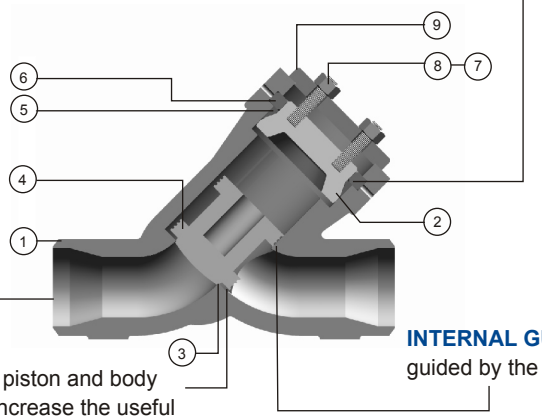
Notes:

1. Forged body and bonnet material available under request.
2. Pressure classes according to ASME B16.34 “standard or special”
3. For BW connections, please inform the piping schedule.
4. Dimensions, weights and other information of this catalogue are subject to changes.

“Y” PISTON CHECK VALVES, SIZES ½” TO 16” CLASSES 900#, 1500# AND 2500#

BODY - Designed to maximize the Kv, minimizing the pressure loss and the operating costs.

PRESSURE SEAL - Simplified and pressure-aided the body/bonnet sealing.



SEAT SURFACE - The piston and body seats are hardened to increase the useful life.

INTERNAL GUIDES - The Piston is fully guided by the body during the stroke

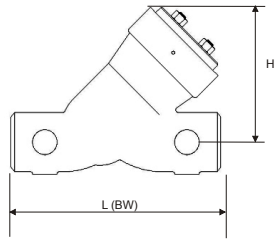


Figure	Class
7765	900#
7865	1500#
7965	2500#

MATERIALS ACCORDING TO ASME B16.34						
Pos.	Description	WCB	Wc6	WC9	C12A	CF8M
1.	Body [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet[1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Piston [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
6.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
7.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
8.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
9.	Locking plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL

1. Forged body and bonnet material available under request.
2. Seat faces coated with Stellite #6 or 13% Cr.

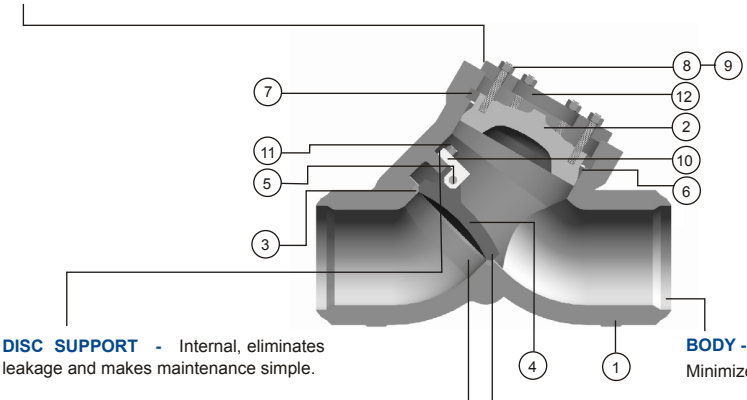
Class		Dimensions (mm)													
	Sizes (inches)	1/2"	3/4"	1"	1.1/2"	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"	16"
900#	L	127	127	127	202	202	254	305	356	508	660	787	914	991	1092
	~H	140	140	140	210	210	238	238	400	398	626	840	840	905	905
	Weight (kg) BW	5	5	5	16	16	45	45	165	210	640	1190	1190	1640	1640
1500#	L	127	127	127	202	202[1]	254	305	406	559	711	864	991	1067	1194
	~H	140	140	140	460	210	238	238	400	398	626	840	840	905	905
	Weight (kg) BW	5	5	5	16	16	45	45	165	210	640	1190	1190	1640	1640
2500#	L	127	127	127	202	202[2]	330	368	457	610	762	914	1041	1092	1092
	~H	140	140	140	210	210	238	238	400	398	626	840	840	905	905
	Weight (kg) BW	5	5	5	16	16	45	45	165	252	640	1270	1270	1640	1640

Notes:

1. Face-to-face dimensions (mm), according to ASME B16.10, when applicable, Weights in (kg).
2. Pressure classes according to ASME B16.34 “standard or special”
3. For BW connections, please inform the piping schedule.
4. Dimensions, weights and other information of this catalogue are subject to changes.

TILTING DISC CHECK VALVES, SIZES 2” TO 24” CLASSES 900#, 1500# AND 2500#

PRESSURE SEAL - Simplified and pressure-aided the body/bonnet Sealing.



DISC SUPPORT - Internal, eliminates leakage and makes maintenance simple.

BODY - Optimized passage. Minimizes the pressure loss.

SEAT SURFACES - The body seat is hardened to increase the useful life.

DISC - Spherical and hardened to increase the useful life.

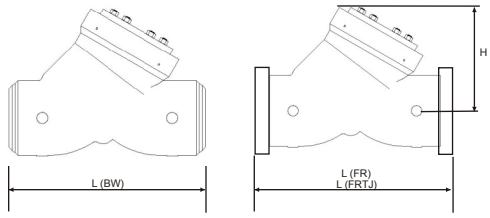


Figure	Class
7780	900#
7880	1500#
7980	2500#

MATERIALS ACCORDING TO ASME B16.34						
Pos.	Description	WC B	WC 6	WC 9	C 12A	C F 8 M
1.	Body [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet [1)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Disc [2)]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Shaft	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
6.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
7.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
8.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
9.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
10.	Swing disc support	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
11.	Lock screw	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
12.	Locking plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL

1. Forged body and bonnet material available under request.
2. Seat faces coated with Stellite #6 or 13% Cr.

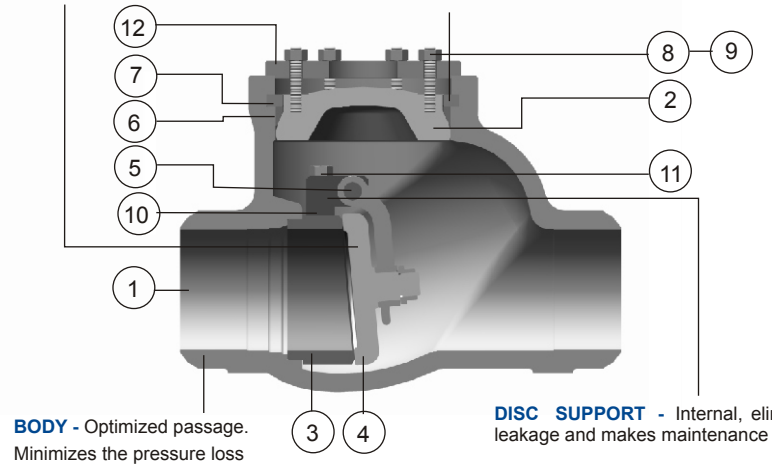
Class	Dimensions (mm)													
	Sizes (inches)	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
900#	L	254	254	305	356	508	660	787	914	991	1092	1219	1321	1549
	~H	200	200	165	200	300	400	430	450	570	610	610	675	805
	Weight (kg) BW	23	23	35	60	68	200	245	375	469	959	959	1267	2190
1500#	L	216	254	305	406	559	711	864	991	1067	1194	1320	1422	1676
	~H	210	200	210	230	300	360	440	485	570	582	680	750	898
	Weight (kg) BW	29	29	29	30	145	210	375	573	718	985	1455	1930	3321
2500#	L	279	330	368	457	610	762	914	1041	1118	1220	1348	1448	1678
	~H	215	215	215	320	340	420	480	556	600	680	720	805	960
	Weight (kg) BW	42	42	42	58	166	323	598	833	1121	1434	1825	2216	3621

Notes:
1. Face-to-face dimensions (mm), according to ASME B16.10, when applicable, Weights in (kg).
2. Pressure classes according to ASME B16.34 “standard or special”
3. For BW connections, please inform the piping schedule.
4. Dimensions, weights and other information of this catalogue are subject to changes.

SWING DISK VALVES, SIZES 2” TO 24” CLASSES 900#, 1500# AND 2500#

SEAT SURFACES - The disc and body seats are hardened to increase the useful life.

PRESSURE SEAL - Simplified and pressure-aided the body/bonnet sealing.



BODY - Optimized passage. Minimizes the pressure loss

DISC SUPPORT - Internal, eliminates leakage and makes maintenance simple.

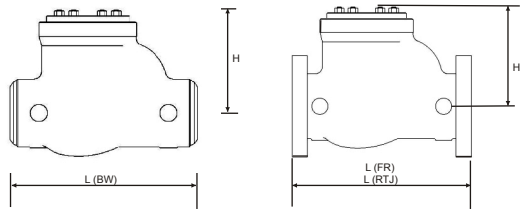


Figure	Class
7785	900#
7885	1500#
7985	2500#

MATERIALS ACCORDING TO ASME B16.34						
Pos.	Description	WC B	WC 6	WC 9	C 12A	C F 8 M
1.	Body [1]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
2.	Bonnet [1]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
3.	Seat ring [2]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
4.	Disc [2]	ASTM A 216 GR WCB	ASTM A 217 GR WC6	ASTM A 217 GR WC9	ASTM A 217 GR C12A	ASTM A 351 GR CF8M
5.	Shaft [3]	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
6.	Sealing ring	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	LOW CARBON STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED	STAINLESS STEEL SILVER PLATED
7.	Segmented ring	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL	ALLOY STEEL
8.	Bonnet stud	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7	ASTM A 193 GR B7
9.	Bonnet nut	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H	ASTM A 194 GR 2H
10.	Swing disc support	AISI 410	AISI 410	AISI 410	AISI 410	AISI 316
11.	Lock screw	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL	STAINLESS STEEL
12.	Locking plate	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL	CARBON STEEL

1. Forged body and bonnet material available under request.
2. Seat faces coated with Stellite #6 or 13% Cr.

Class	Dimensions (mm)													
	Sizes (inches)	2"	2.1/2"	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
900#	L	216	254	305	356	508	660	787	914	991	1092	1219	1321	1549
	L (FR)	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549
	L (FRTJ)	371	422	384	460	613	740	841	968	1039	1140	1232	1334	1568
	~H	200	200	185	200	290	470	430	450	457	501	596	660	787
	Weight (kg) BW	46	48	60	77	123	380	463	482	482	589	834	1102	1905
1500#	L	216	254	305	406	559	711	864	991	1067	1194	1346	1473	1943
	L (FR)	368	419	470	546	705	832	991	1130	1257	1384	1537	1664	1943
	L (FRTJ)	371	422	473	549	711	842	1001	1146	1276	1406	1559	1686	1971
	~H	200	200	215	250	300	465	560	605	508	558	660	736	876
	Weight (kg) BW	46	45	60	123	145	266	612	690	786	857	1265	1678	2888
2500#	L	279	330	368	457	610	762	914	1041	--	--	--	--	--
	L (FR)	451	508	578	673	914	1022	1270	1422	--	--	--	--	--
	L (FRTJ)	454	514	584	683	927	1038	1292	1444	--	--	--	--	--
	~H	171	171	196	215	323	425	508	550	--	--	--	--	--
	Weight (kg) BW	85	35	55	76	239	408	771	1800	--	--	--	--	--

Notes:
1. Face-to-face dimensions (mm), according to ASME B16.10, when applicable, Weights in (kg).
2. Pressure classes according to ASME B16.34 “standard or special”
3. For BW connections, please inform the piping schedule.
4. Dimensions, weights and other information in this catalogue are subject to changes.

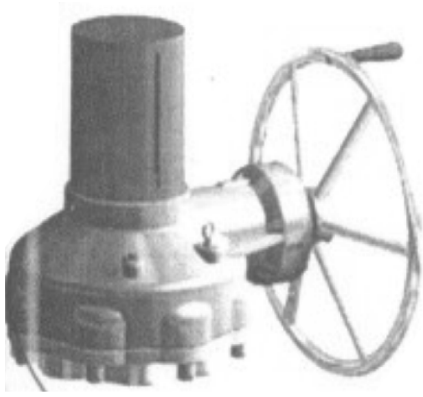
VALVE ACTUATOR SIZING

The Durcon-Vice procedure for selecting an actuator is to calculate the required torque and thrust to operate the valve at the required service conditions. A safety margin of actuator capability is always allowed for the final actuator selection, but oversized actuators are avoided.
Because of the wide variations in system operating conditions, actuator sizing is based on the following:

ACTUATOR TYPE	LINE PRESSURE	DIFFERENTIAL PRESSURE (CLOSED)	POWER SUPPLY
ELECTRIC	Specified by customer	Specified by customer	Voltage, type, phase and frequency specified by customer
PNEUMATIC	Specified by customer	Specified by customer	Air pressure specified by customer
HYDRAULIC	Specified by customer	Specified by customer	Hydraulic pressure specified by customer
HANDWHEEL/ GEAR ACTUATED	70% of CWP unless otherwise advised by customer	70% of CWP unless otherwise advised by customer	200 lb (90 kg) rimpull unless otherwise specified by customer

GEAR ACTUATORS

MODEL	CLASS	OPTIONAL	STANDARD
PS Gate Flexibles Wedge	600	4 - 6"	8" & up
	900	4 - 6"	8" & up
	1500	4"	6" & up
	2500	-	6" & up
	4500	-	6" & up
PS Globe T Pattern	600	-	6" & up
	900	-	6" & up
	1500	-	6" & up
	2500	-	6" & up
PS Parallel Slides Wedge	600	4 - 8"	10" & up
	900	4 - 6"	8" & up
	1500	4 - 6"	8" & up
	2500	6"	8" & up
PS Globe Y-Pattern	900	-	6" & up
	1500	-	6" & up
	2500	-	6" & up



STANDARDIZED YOKE AND GEAR REDUCERS

The yoke of DURCON-VICE's valves are standardized and allow more flexibility in the assembling of the actuators. Valves with handwheel may be converted in field into gear reducer or electromechanical actuator with a minimum of new parts.

ELECTRIC AND CYLINDER ACTUATORS

Information required for:

CYLINDER (PNEUMATIC OR HIDRAULIC)

1. Valve size, figure number or description.
2. Operating conditions (pressure, temperature, flow rate and fluid).
3. Maximum differential (shut-off) pressure.
4. Primary power supply-air or hydraulic-available maximum and minimum pressure and source.
5. Failure mode (open, closed, as is)
6. Control voltage and enclosure designations (NEMA, etc.).
7. Auxiliary equipment:
   a) limit switches,
   b) solenoids
   c) positioner
   d) manual over-ride
8. Valve orientation.
9. Preference for specific manufacturer, if any.

ELECTRIC

1. Valve size, figure number or description.
2. Valve operating conditions (pressure, temperature, flow rate and fluid).
3. Maximum differential (shut-off) pressure.
4. Primary power supply:
   a) electric-voltage, phase cycles,
5. Control voltage.
6. Valve stem position.
7. Closing time and frequency.
8. Required construction (NEMA, etc.) or local environment.
9 - Auxiliary equipment:
   a) push-button stations,
   b) reversing controllers,
   c) position indicators,
   d) other (i.e., stem covers, etc.),
   e) Positioner.
10 . Special requirements (i.e., radiation, seismic, etc).
11. Preference for specific manufacturer, if any.

BY PASSES

IN ACCORDANCE WITH MSS-SP45 GATE (2½ -24") AND GLOBE (2½ - 24") CLASSES 600-2500

Main Valve Nominal Pipe Size In	By-Pass Nominal Pipe Size	
	Séries A(1)	Séries B(2)
2½ e 3	½	½
4	½	1
5 e 6	¾	1¼
8	¾	1½
10	1	1½
12 e 14	1	2
16, 18 e 20	1	3
24	1	4

(1) Series A includes steam service for warming up before the main line is opened, and for balancing pressures where the lines are of limited volume.
(2) Series B includes steam lines conveying gases or liquids where bypassing may facilitate the operation of the main valve through balancing the pressure on boton sides of the disc (or discs).

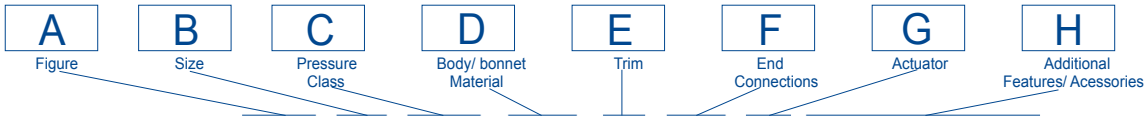
OTHERS:

- **SEAL WELDED BODY/BONNET (LIP SEAL)**
  This construction provides extra assurance against leaks in the body/bonnet joint. A metallic ring is placed between the body and the bonnet and sealed with welding in its whole circumference.

- **LIMIT SWITCHES**
- **INTERLOCKS**
- **LEAK OFF (¼ NPT)**
- **FLOOR STANDS**

HOW TO SPECIFY AND FIGURE NUMBER

When specifying or ordering DURCON-VICE's Gate, Globe and Check valves, make a full description of the valve(s) and the application including: Quantity, Construction Standard, Figure, Size, Pressure Class, Body and Bonnet materials, internals material (Trim), End connections, Desired actuator and Accessories, Packing, Fluid, Maximum and Operating Pressure, Maximum and Operating Temperature. Example:



7715 - 12” - 900# - WC9 - UU - BW 80 - RE - VGB/LMA/LMF

Pressure Seal Gate Valves, Flexible wedge, Outside Screw and Yoke (OS&Y), Raising stem, Non-raising handwheel, Size 12”, Pressure Class 900#, Body and bonnet in alloy steel ASTM A217 Gr. WC9, Stellite® sealing surfaces, Stem and Backseat in stainless steel 13% Cr., Butt Weld end connections for SCH 80 piping, Handwheel Actuator with Gear Reducer box, Packing in carbon fiber, Construction according to ANSI/ ASME B16.34, Accessories; by-pass globe valves, size 1” 1500# and Limit Switches for open and close positions.

[A] Figure Number

This code represents the basic type of desired valve. Use the Figure code indicated in the page of dimensions and weight, for each type of valve, pressure Class and desired wedge feature, Example:

7820 - Gate 1500# Parallel Wedge
7610 - Gate 600# Solid Wedge
7955 - “Y” type Globe 2500#
7785 - Swing Disc Check 900#

[B] Nominal Size

The same Nominal Size of the piping where the valve will be installed (1/2”, … 4”, 6”, 8”, … 20”, etc.)

[C]Pressre Class

The desired pressure Class: 600#, … 2500# for standard Class (ST) or 600# SP, … 2500# SP for special Class (SP).

[D] Body and Bonnet Material

Use the suffix of the body/bonnet material (WCB, WC6, WC9, C12A, CF8M, etc.)

[E] Internal Components Materials (TRIM)

Use API 600 standard. To define the trim code or: below for TRIM

XX Sealing surfaces in the wedge / disc and in the body seat rings in 13% Cr; Stem and back-seat in stainless steel 13% Cr.
UU Sealing surfaces in the wedge / disc and in the body seat ring in Stellite®, Stem and back seat in stainless steel 13% Cr.
XU Seal surface in the body seat ring in Stellite®. Seal surface in the wedge / disc in 13% Cr, Stem and back seat in stainless steel 13% Cr.

[F] End connections

Use the code of the desired end connections, according to the table below:

Flanges		Weld		Others	
FR-	Raise Face. Finishing according to MSS-SP6	**BW(__)**	Butt Weld must inform Schedule(SCH)	**SPC -**	Special (describe)
RTJ-	Ring Type Joint	**SW(__)**	Socket Weld		
FL-	Flat Face				

[G] Actuator

Use the code of the desired operation (manual) or actuator, according to the table below.

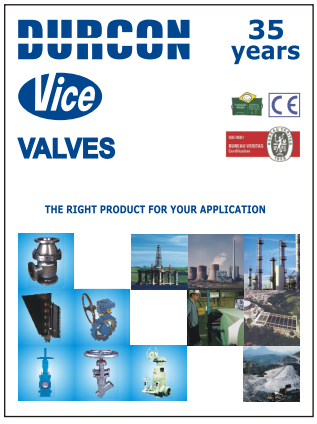
Manual		Actuators		Others	
MN-	Handle	**AE-**	Electric	**SPC -**	Special - (describe)
RE-	Handwheel and gear reducer	**AH-**	Hydraulic		
VI-	Impact handwheel	**AP-**	Pneumatic, double action		
VO-	Handwheel	**RM-**	Pneumatic, spring return		

[H] Additional Features and Accessories

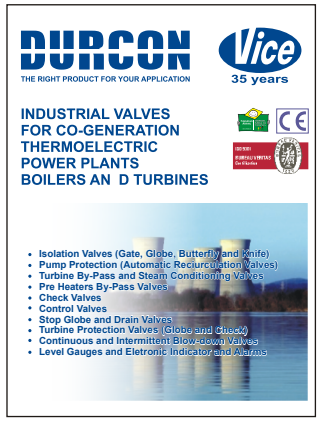
Use the code of the optional or describe the desired special feature(s), according to the table below:

Accessories		Accessories		Others	
AL-	Lantern ring	**VGE-**	Equalization globe valve	**LMA-**	Limit switch -valve open
ALS-	Lantern ring with sealant injector	**VGB-**	By-pass globe valve	**LMF-**	Limit switch - valve close
		VGEB-	Equalization and by-pass globe valve	**SPC-**	Special (describe)

Durcon Vice Products Line



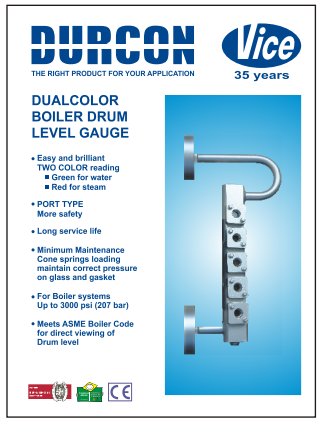
Institutional Durcon Vice



Industrial Valves for Co-generation, Thermoelectric Power Plants, Boilers and Turbines

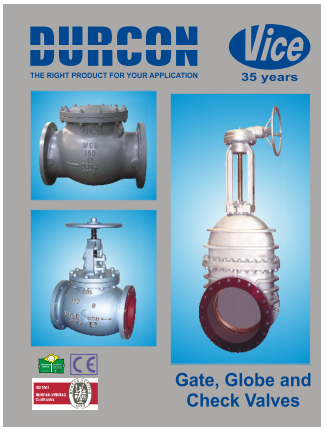
Automatic Recirculation Valves - For Centrifugal Pumps Protection Model NVM, VRM-HPM and NVL

Stop Globe Valve - Model DURBLOCK “T” and “Y”



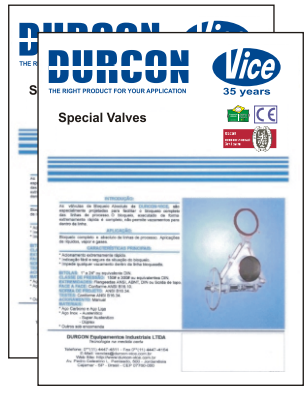
Dualcolor Boiler Drum Level Gage

Tri Eccentric Butterfly Valve



Globe, Gate and Check Valves Bolted Bonnet

Knife Gate and Slide Gate Valves



Special Valves

The right product for your application.

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