



Dome Valve®

inflatable seat valves



Macawber

the process engineering valve solution

Welcome to Macawber Engineering, Inc.

Macawber Engineering is the parent company of the Macawber Group of companies. Since its establishment in 1977, the company has remained focused on its core technology to achieve the highest level of expertise in low velocity, dense phase pneumatic conveying for fragile and abrasive bulk materials and advanced methods of bulk material injection systems for pressure processes.

Today, over 10,000 systems later, the Group has a worldwide reputation as a supplier of reliable and cost-effective systems for a wide variety of applications from lime to peanuts, coal to baby powder and everything in between covering every process industry involving bulk materials handling.

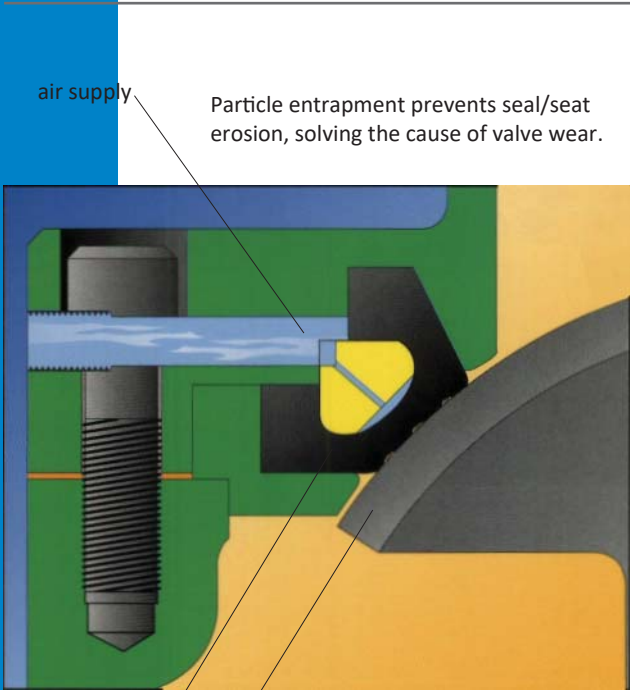
Dome Valve®

inflatable seat valve

A pioneering and innovative departure from the traditional valve seat approach to achieving sealing efficiency and acceptable valve seat life.



relaxed seat
dome component



air supply
Particle entrapment prevents seal/seal erosion, solving the cause of valve wear.

inflated seat
dome component

principle of operation

The dome component closes beneath the seat (seal) when the seal is relaxed (not inflated), allowing a controlled gap between the seat (seal) and the closing member (dome). Material is allowed to pass through or enter the controlled gap if, due to its characteristics, it is pulled into the gap by the action of the dome component moving to its closed position. In the closed position, high pressure air or other gas enters the space between the back of the seal face and the insert ring to cause the seal face to expand onto and around the periphery of the dome component. Material particles are entrapped by the seal against the dome surface, irrespective of particle size or shape. Before opening the valve, the seat is relaxed, and the controlled gap is re-established before the dome component moves to its open position. The seal is a loose component clamped into place by a spigot piece and external fasteners holding the top plate assembly to the body. The seal is easily removed for inspection.

inflatable seats

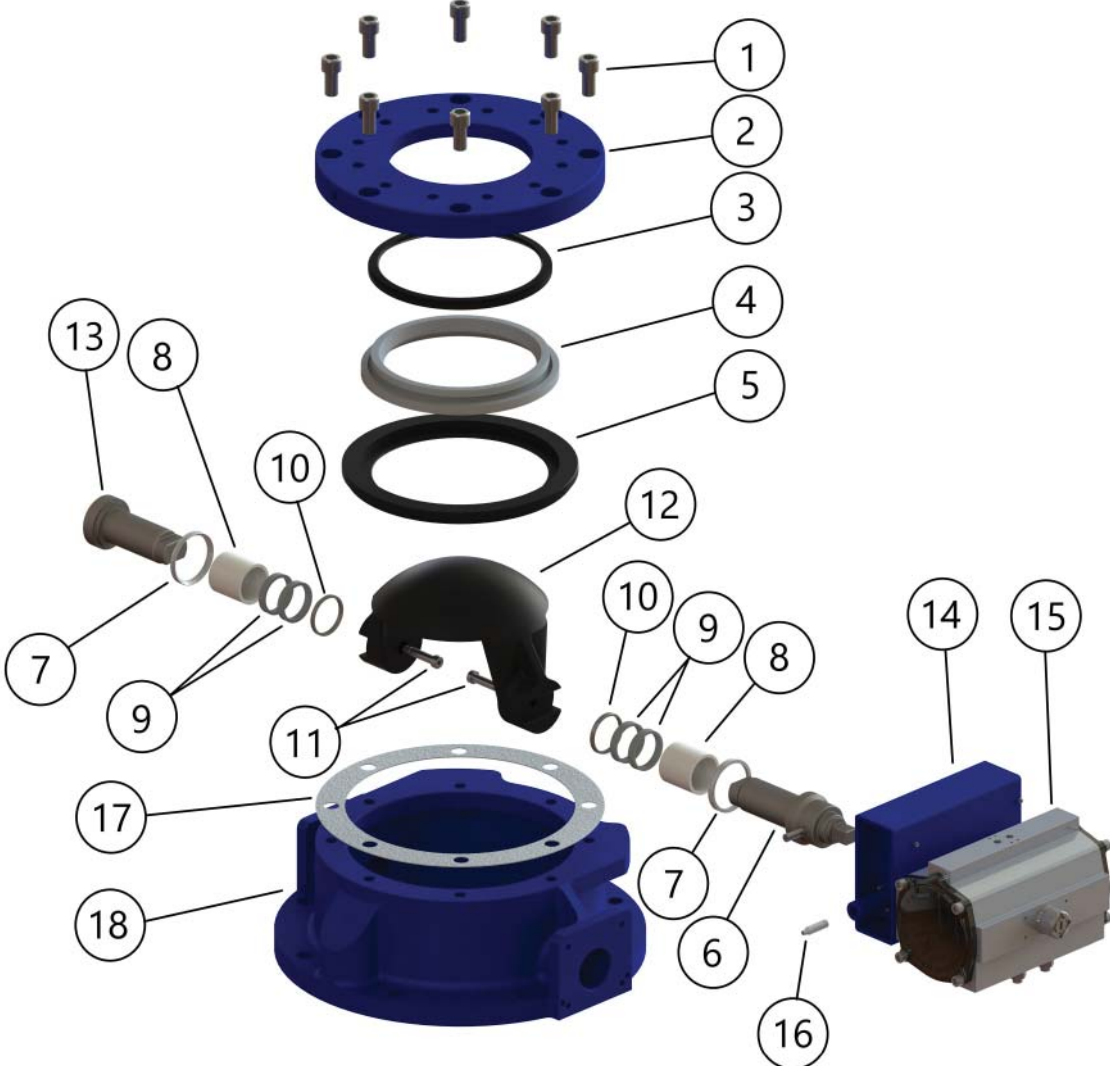
Inflatable flexible seat entraps particles that are normally the cause of seat erosion. Particles are induced to move across valve seats under the influence of pressure differentials on either side of the closing member. Entrapping particles within a flexible face during the period of valve closure prevents particle movement and considerably reduces valve seat wear. Inflatable seats allow automatic wear compensation. The conventional hard material approach to valve seat life relies on crushing particles between the faces. This approach does not attempt to entrap particles, but causes the particles remaining to become very small to reduce their erosion effect on the valve seat. However small the particles are, each particle contributes to continuing erosion. Particle movement and initial erosion allows accelerated subsequent erosion since the hard seats cannot compensate for wear.

flexible seats

Flexible seats that do not inflate require the force of engagement on closing to entrap particles. However the flexible valve seat has limited life because the worn surface of the flexible seat cannot continue to reengage the closing member and entrap particles. Inflatable seats compensate for wear to the seat and provide longer sealing life.

Dome Valve®

advanced features



1	TOP PLATE BOLTS	10	SEAL RETAINER
2	TOP PLATE	11	DOME-TO-SHAFT BOLT
3	INSERT RING	12	DOME
4	INFLATABLE SEAL	13	PIVOT SHAFT
5	SPIGOT PIECE	14	ACTUATOR MOUNT
6	DRIVE SHAFT	15	ACTUATOR
7	V-RING	16	PROXIMITY SWITCH
8	BEARING	17	GASKET
9	SHAFT SEAL	18	VALVE BODY

quality, durability, simplicity, reliability

Dome Valve®

the problem solver



special performance advantages

The Dome Valve® is used in a wide variety of applications in almost every process. The unique closing and sealing action of the Dome Valve® enables continuous reliable operation where conventional valves fail to perform.

abrasive materials

Slurries, bulk powders, granules, lumps or dust-laden gases cause seat erosion and ineffective closure. The inflatable seal provides continuous wear compensation.

pressure differential

Pressure differential causes accelerated seat wear in conventional seat valves. The inflatable seal provides continuous wear compensation.

high temperature

Thermal expansion prevents consistent valve seat action. The inflatable seal provides compensation throughout the temperature range of 32°F (0°C) to 662°F (350°C). Temperatures above this range require special valve configurations.

close and seal

The action of the rotating dome within the valve housing allows displacement of material so that a choke-filled Dome Valve® will close and seal through most packed materials.

seal and protection

Seal protection and dome scraper ring remove particles adhering to the dome surface that affect seal performance.

abrasion / temperature / pressure

The Dome Valve® can achieve operating reliability in severe applications combining abrasive materials, high temperature and high pressure differential.

reliability

A heavy-duty valve designed to perform where other valves cannot. Rated for hundreds of thousands of cycles between inspections in approved applications.

applications in every process worldwide

More than 15,000 Dome Valves® are in operation in almost every country of the world, providing long life and operating reliability where conventional valves have failed.

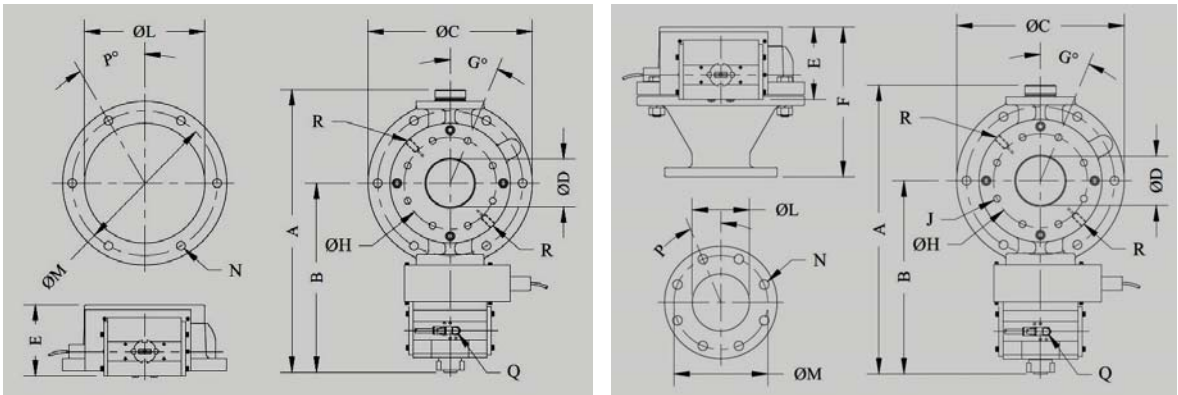


Dome Valve®

standard configurations

bulkhead

inline



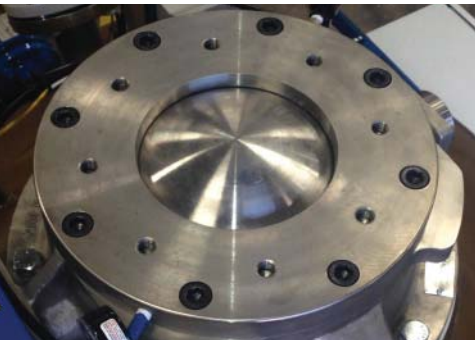
specifications	
size (in)	2, 4, 6, 8, 10, 12, 16, 20, 24, 30
design temperature	212°F (100°C) to 650°F (350°C) custom options up to 1500°F (815°C)
pressure	100 psig / 7 barg, custom options up to 630 psig / 43 barg
flanges	ANSI 150 / PN 10 / PN 16 / custom
finishes	Standard Paint < 400° (204°C) Mill Finish - stainless steel (Ra < 125 micron) Electro-polish - stainless steel (Ra < 32 micron) Super finish - stainless steel (Ra < 8 micron) High Temperature Paint > 400°F (204°C)
construction materials	Cast Iron ASTM A278, ASTM A516 Gr 70, Stainless Steel Grade 304/316
controls	CON0 Controls not supplied CON1 Pneumatic Solenoids only CON2 Solenoids + Fail Safe CON3 Position Confirmation, SM-95 CON4 Seal confirmation pressure switch CON5 PLC w/enclosure CONX Special configuration



Dome Valve® Handling Glass Cullet



Dome Valve® Handling Alumina Oxide



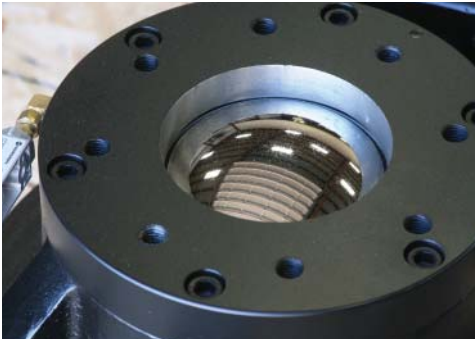
Dome Valve® Handling Sugar—Stainless Steel



1 Inch Dome Valve®



Dome Type Switch Valve



Chrome Plated Dome Valve®



Double Dump Valve—Stainless Steel



Dome Valve® Handling EAF Dust

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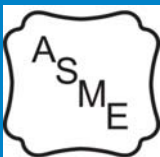
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Macawber Engineering, Inc.

advanced pneumatic conveying systems
controlled rate injection systems
inflatable seat valves



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COMPLIANT