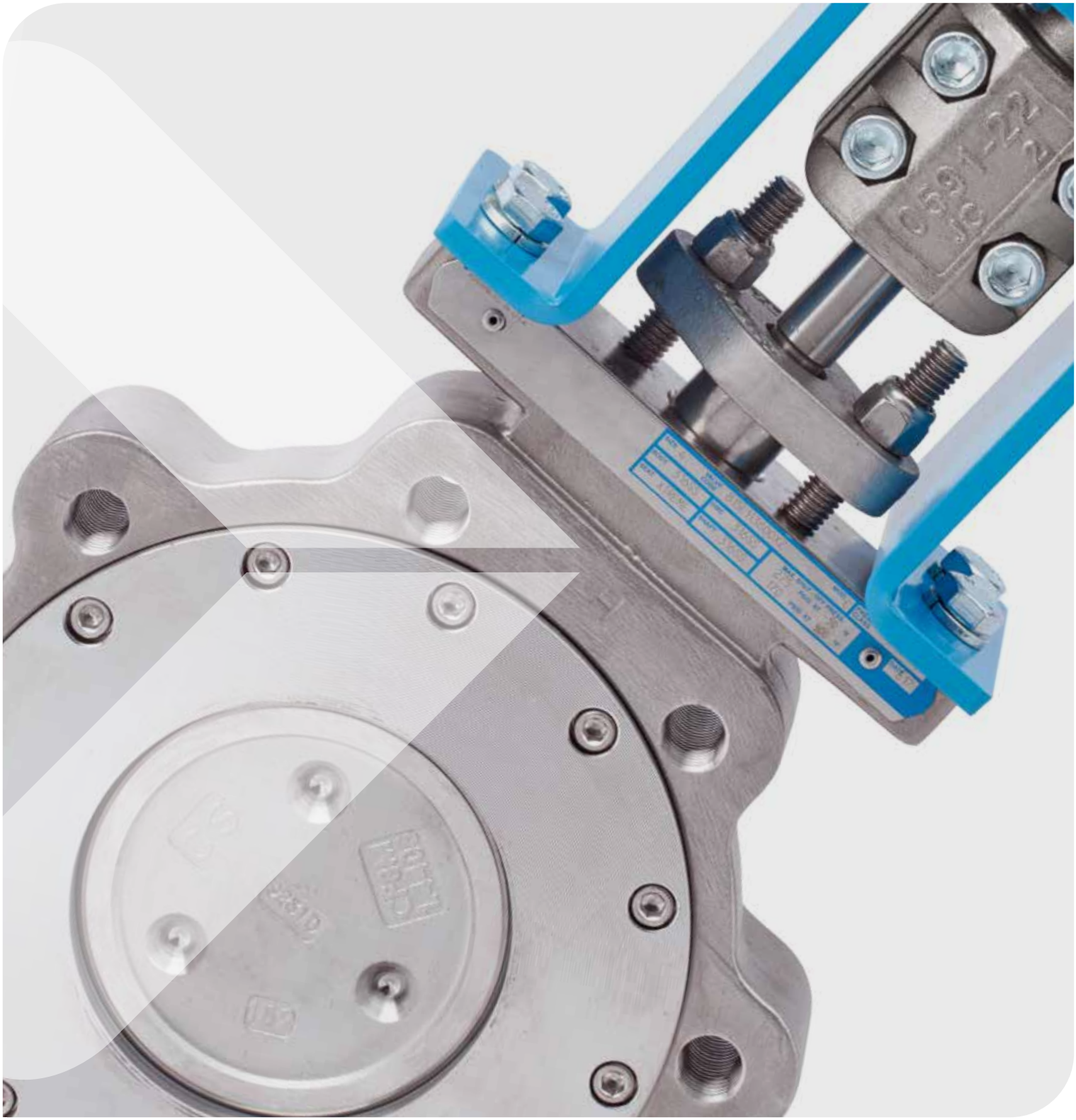
World's best gate crasher

Jamesbury™ Wafer-Sphere™ high-performance butterfly valves



Not just another butterfly valve

The Jamesbury™ Wafer-Sphere™ is not just another butterfly valve. It is a high-performance valve that offers significant performance, weight, size and cost of ownership advantages.

The Wafer-Sphere provides a cost-effective solution for a wide range of applications where bubble-tight shut-off is required in manual, automated and proportional services with temperatures from -320°F to 500°F (-196°C to 260°C) and pressures to 1480 psi (102.1 bar).

The Wafer-Sphere high-performance butterfly valve's unique design is an extension of sealing technology. Utilizing an eccentric disc and offset shaft, the design incorporates the flexible-lip sealing system into a lightweight, compact body. The result is tight-sealing, long-lasting, yet lower-cost alternative to gate valves and other rotary valves.

Benefits offered by Wafer-Sphere when compared to a gate valve:

- Significantly less weight
- Higher pressure ratings
- Compact design requiring less space
- Leaktight shut-off over long cycle life
- Ease of automation
- Multitude of applications
- Ease of maintenance
- Lower overall installed cost

The gate crasher

The Wafer-Sphere eliminates
all the reasons for using gate valves.

Compact design

The compact design of Wafer-Sphere is a major benefit when space is at a premium. As an example, the face-to-face dimension of a 10" (DN 250) ANSI Class 150 single-flange lugged pattern Wafer-Sphere is a mere 2-13/16" (71 mm), whereas the face-to-face dimension of a comparable Outside Screw & Yoke (OS&Y) gate valve is 13" (330 mm).

Automated Wafer-Sphere has low profile compared to competing gate valve

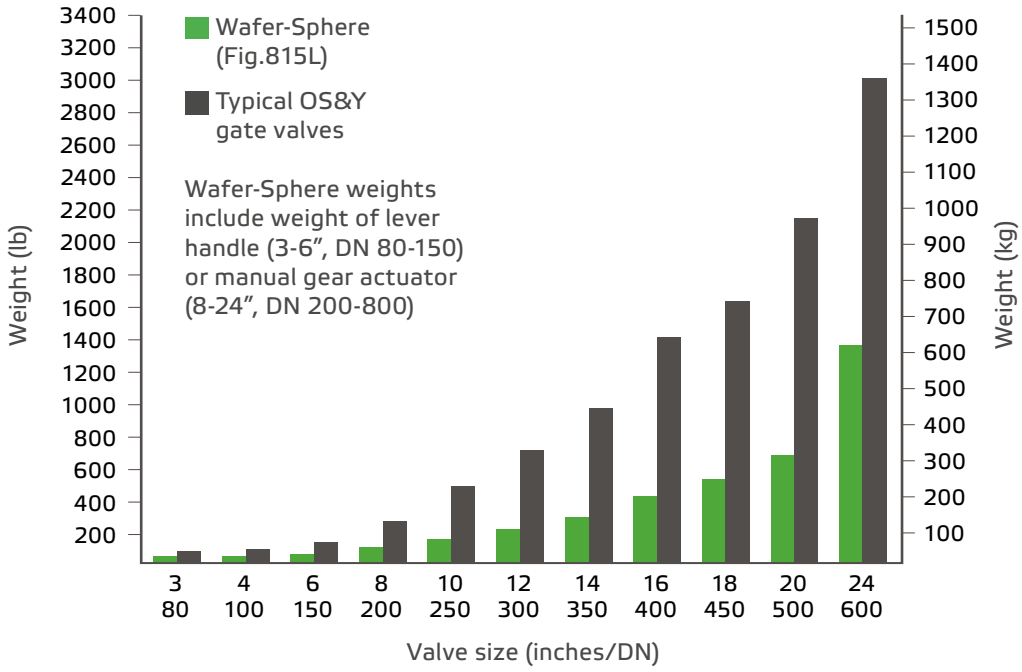
→ The table shown compares face-to-face and height dimensions for ANSI Class 150 OS&Y gate valves and Wafer-Sphere valves.

Dimension comparison for ANSI Class 150 OS&Y gate valves and Wafer-Sphere valves				
Valve size	**Face-to-face dimension** inches (mm)		**Height-to-top dimension** inches (mm)	
	OS&Y	**Wafer-Sphere**	**OS&Y**	**Wafer-Sphere**
3" / DN 80	8 (203)	1.94 (49)	20.06 (510)	8.00 (203)
6" / DN 150	10.5 (267)	2.25 (57)	33.78 (858)	9.25 (235)
10" / DN 250	13 (330)	2.50 (64)	51.38 (1305)	22.88 (581)
14" / DN 350	15 (381)	3.63 (92)	69.44 (1764)	24.15 (613)
20" / DN 500	18 (457)	5.00 (127)	94.03 (2388)	28.68 (728)
24" / DN 600	24 (610)	6.06 (154)	105.22 (2673)	39.83 (1012)

Lower weight

Because the Wafer-Sphere valve has a significantly narrower face-to-face dimension and a shorter centerline to top of valve profile, it uses less metal than a gate valve. The result is significant weight reduction for the same or higher rating.

→ The bar graph shown compares Wafer-Sphere and typical Outside Screen and Yoke gate valves by weight.



Ease of automation

Wafer-Sphere valves are easily automated. Every valve is drilled and tapped to accept linkages for a full line of Jamesbury brand actuators. Unlike the gate valve, there is no need to purchase a special yoke or other device to modify the gate valve body to accept actuation. Because the Wafer-Sphere valve is quarter-turn, the actuated valve profile is much smaller than a gate valve.

In addition, all Jamesbury brand pneumatic actuators are designed with mounting pads to accept solenoids, limit switches and positioners, many with direct and NAMUR mounting patterns. Reliable Jamesbury brand actuators, accessories, and dedicated linkages provide the customer with a single-source automated package.

Less installation time

The benefits derived from using a lighter valve are difficult to measure in terms of handling ease, the impact on plant design and the resultant savings. Analysis of comparative installation times, however, can relate to the potential savings.

Typical man-hours required to install specific valve sizes

Typical man-hours required to install specific valve sizes				
Valve type	**4" DN 100**	**6" DN 150**	**8" DN 200**	**10" DN 250**
Wafer-type butterfly with handle	0.29	0.45	0.69	1.01
Outside Screw & Yoke gate valve flanged	3.24	4.49	5.99	8.22
Non-rising stem gate valve flanged	3.12	4.22	5.82	8.00

→ The table shown compares 4-10" (DN 100-250) valve installation times based on data developed through field survey. The difference is particularlysignificant in the smaller sizes.

Leak-tight shut-off

Sealing in a gate valve is done by jamming a metal solid or split wedge into a metal seat or cavity. The effectiveness of the seal therefore is subject to the condition of the mating metal surfaces and the cleanliness of the gate.

In practice, tight sealing of a gate valve is uncertain. Typically, the gate valve experiences leakage from minor erosion of the wedge or seal area, from wire drawing caused by steam leakage, accumulated slurry particles and coking and scalling of the seat surfaces.

The Wafer-Sphere valve flexible lip polymeric and eccentric disc sealing system experiences none of these problems. The polymeric seat is flexible and forgiving and protected from erosion. The eccentric design eliminates wear points during cycling and its camming action effects sealing with consistent torque. The result is leak-tight shut-off for thousands of cycles before simple seat replacement is required.

Lower total cost

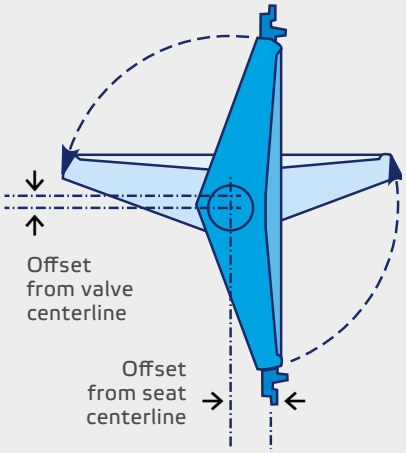
The price differential between Wafer-Sphere and gate valves becomes increasingly significant as size increases. Adding this to the lower installation costs, lower maintenance costs, more up-time and the lower costs of automation, Wafer-Sphere is indeed the best economic selection.

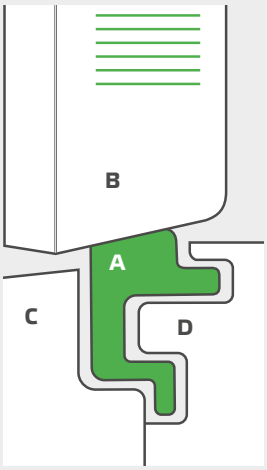
Double offset design

- The unique sealing system also incorporates a double eccentric disc and shaft design to further extend the effectiveness of the seat.
- This unique offset design transmits a camming action to the disc and swings the disc completely away from the seat, no jamming or squeegeeing.
- This design eliminates wear points around the disc at the top and bottom of the seat. When closed, the disc cams tightly into its seat to creat a double-tight seal.
- The combination of the double-offset disc and the flexible-lip seat are especially effective in a full range of applications from high vaccuum (1x10-5 Torr) to 1480 psi (102.1 bar).

The unique seal

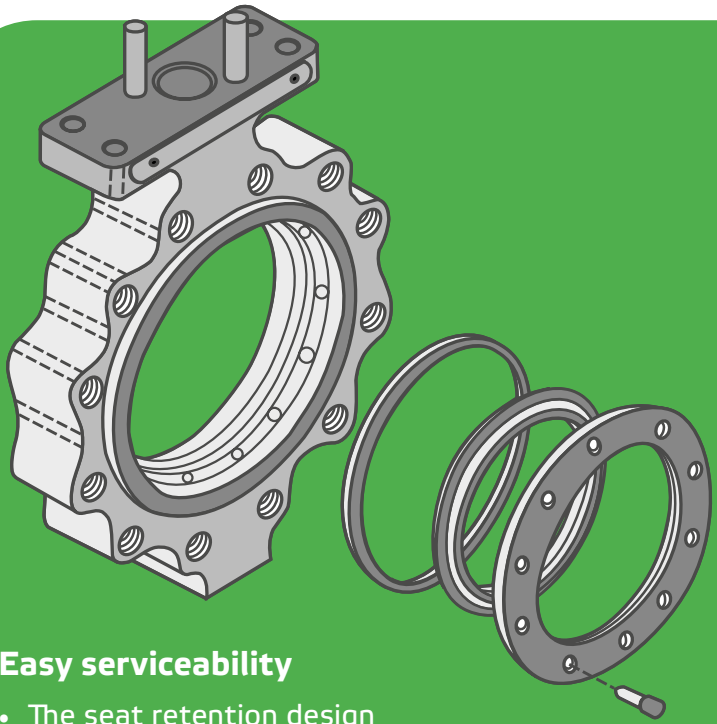
- Unlike most butterfly valves, the Wafer-Sphere one-piece all-polymer seat does not rely on a squeegee seal and liner, seal backup spring or O-rings for a bubble tight shut-off.
- The Wafer-Sphere seal uses a flexible lip (A) which is pressure energized to move against the outer edge of the disc (B) — which is spherical segment — to create a bi-directional seal. The body (C) and insert (D) hold the seat in position and shield it from flow, protecting it from abrasion and erosion.
- Simply stated, the seat flexes rather than deforms unlike type BFV liners that experience scuffing, beading and eventual tearing, providing long life shut-off.





Ease of maintenance

Improving productivity and lowering cost of ownership are a necessity in today's competitive environment. Both are highly dependent on process up-time, and the frequency of maintenance and time required to maintain equipment is most critical in all industries.



Easy serviceability

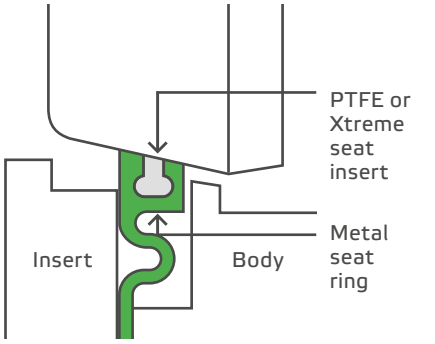
- The seat retention design provides for easy seat replacement.
- Unlike most butterfly valves where removing the shaft and disc is required, the Wafer-Sphere seat can be replaced by simply removing the body insert and inserting the new seat, which is self aligning.
- Unlike the typical gate valve, seat replacement requires no machining.

For gate valves, reseating is a tremendous undertaking. A gate valve must be almost completely disassembled to allow access to the seat. Then, both the wedge and seating area must be resurfaced by one or all of the following operations: welding, machining, grinding, and lapping. The valve is reassembled, tested and the process is repeated until the desired sealing is achieved. This process requires many hours and in some cases, days. Often it is so time consuming and complex, repair of a gate valve is outsourced or requires a spare valve if the process line is critical.

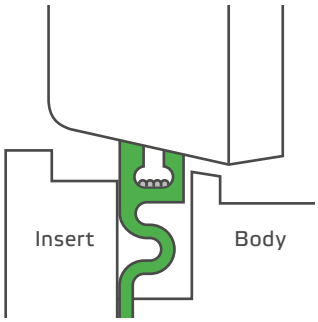
In contrast, the Wafer-Sphere valve shaft rotates only 90° within the stem packing. This minimizes the potential for leakage. Should leakage occur, it can be eliminated by simply tightening the packing gland. The gland compresses the V-Ring packing, spreading the wings of the rings and creating a tighter seal. Because the packing is not jammed, the torque remains constant. For those applications where strict emission control is required Wafer-Sphere valves are available with Emission-Pak®, a spring-loaded packing arrangement.

A multitude of applications

Wafer-Sphere valves have proven their ruggedness and dependability in a wide range of industries and applications. They are used in isolation and control services, in slurries, steam, gases and liquids. Some of the notable applications include: pulp stock, corn processing slurries, tertiary pertoleum recovery, high pressure water for pad cooling in NASA rocket launching, ambient and cryogenic high cycle air separation services, LNG and commercial HVAC.



Before fire



During and after fire

Fire-Tite™

Fire-Tite Wafer-Sphere valves offer outstanding advantages in providing reliable operation in normal service and when fire strikes. That are specifically developed for use in such industries as petroleum refining and distribution, chemical, marine, and others. The metal-seat ring effectively stops flow through the valve if the PTFE or Xtreme seat is destroyed in a fire. Fire-Tite valves meet the requirements of NACE and are qualified to API-607 and BS6755. Available in Series 815 or 830 for manual or automatic operation.

Series 815/830

Wafer-Sphere high-performance butterfly valves are available in wafer and single-flanged lugged designs for dead-end service and for ANSI Class 150, 300 and 600 pressure class applications. The 815L and 830L series are best suited for applications where exposed bolts are undesirable. All available to meet NACE MR-01-75.

Series 835

Series 835 process-rated ANSI Class 150 high-performance Wafer-Sphere butterfly valves are an excellent cost-effective alternative for shutoff pressures up to 100 psi (6.9 bar). The Series 835 provides the same long-lasting tight shut-off capability, excellent flow characteristics, and long service life as the fully ANSI-rated Series 815. They are available in 30”-60” (DN750-1500) designs.

Wafer-Sphere butterfly valves

Product	Series	Design	Size	Pressure	Max temp.	Body/trim	Bulletin
Wafer-Sphere butterfly valves 	815W	Wafer	2½ – 30” / DN 65 – 750	150	500ºF / 260ºC	Carbon Steel, 316SS, Alloy 20, Ductile iron, Monel®, Hastelloy® C	W101-6
	815L	Lugged	2½ – 60” / DN 65 – 1500				
	830W	Wafer	3 – 30” / DN 80 – 750	300			
	830L	Lugged	3 – 36” / DN 80 – 900				
	860W	Wafer	3 – 24” / DN 80 – 600	600			W104-1
	860L	Lugged					
	835L	Lugged	30 – 60” / DN 750 – 1500	150		CS, 316SS	W105-1

*Consult factory for specific materials available. Hastelloy® is a registered trademark of Haynes International, Inc. Monel® is a registered trademark of INCO.

Valmet's professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

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