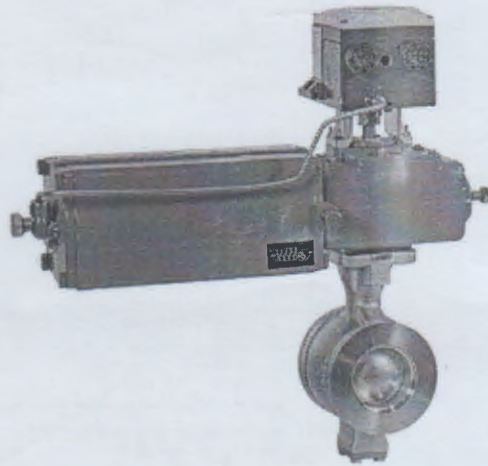




Neles™ V-port segment valve RA-series

Neles V-port valve in the R-series is primarily intended as a control valve, but it can also be used for shut-off service. The R-series V-port segment valve is a good general control valve for most pulp and paper process applications. The valve can be fitted with an aerodynamic noise- and liquid cavitation-reducing (for example, steam and gas applications) Q-Trim™ segment. A low capacity segment is available for the DN25 valve.



Features

Single-piece valve body

- R-series valves have single-piece bodies, which prevents leaks caused by separate flanges or locking rings.

Durable metal seat

- The seat of the R-series V-port segment valve is firm and uniquely durable. The seat is designed in such a way that its sealing surface is not located directly in the flow stream. This gives the seat an extended service life. The working principle is a pressure-aided seat which enables good sealing properties at a low pressure difference. The seat is located inside the valve, which prevents forces from the pipe system influencing the sealing effect.

PTFE seat

- The R-series V-port segment valve is also available with a soft seat. This is primarily intended for applications where a hard chromium plated segment is unsuitable, e.g. for acids and acidic liquids. This structure contains an Xtreme™ seat, fitted in a body made of stainless steel.

Bearings

- The bearings are located in the valve body, away from the flow stream, with a large bearing surface, offering a low bearing pressure and a long service life.

Smooth action

- Because of the double bearing, the pre-tightened spring-loaded gland packing, and the low seat friction, the torque requirement of the R-series V-port segment valve is low. For this reason the size of actuator required is small. As a consequence, the control valve package combines low overall costs with good control performance.

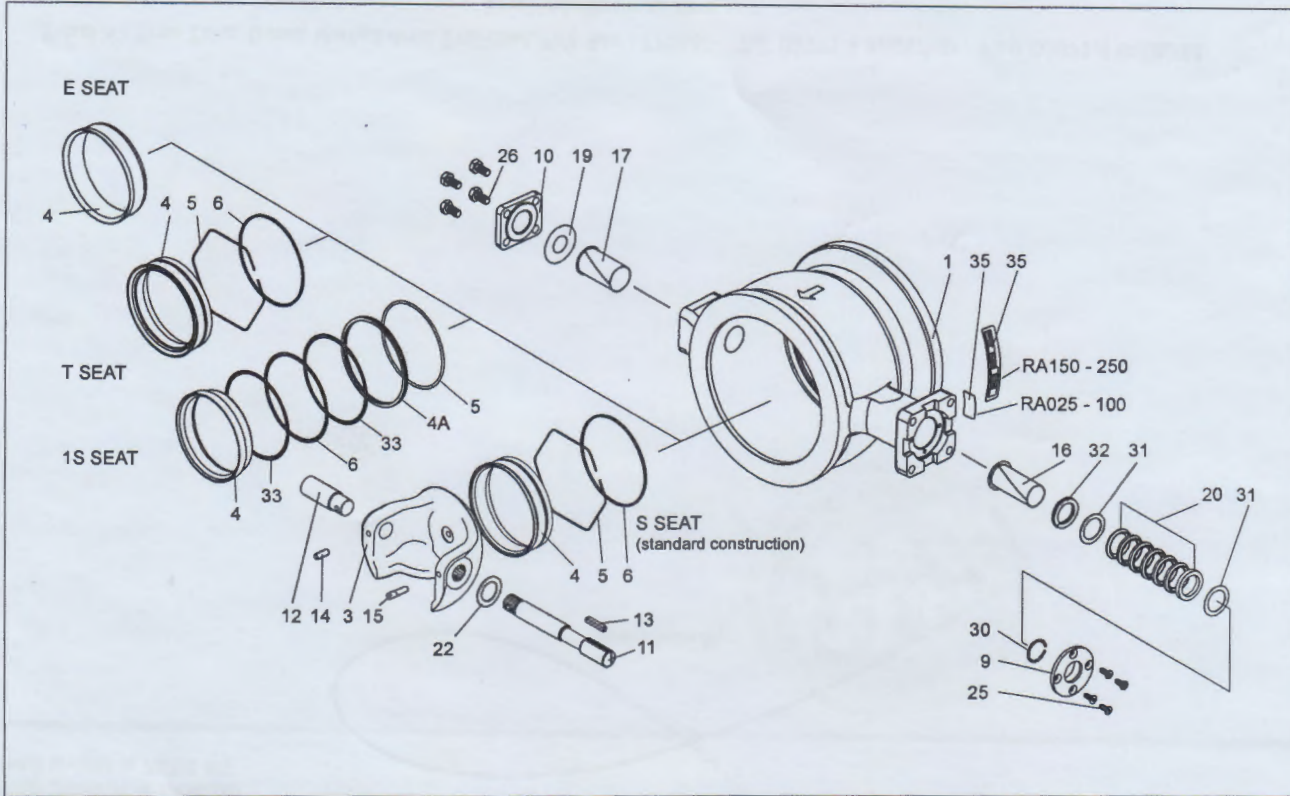
Q-Trim™

- Most pulp and paper mills have maximum noise levels for control valves. These limits are easily exceeded, especially for gas and steam applications, when using standard valves. High pressure drops, which occur during control of water and liquid flows, generate cavitation which may cause damage to the pipe system. The solution to these applications is the Q-Trim design. Impurities will not block the valve because of the self-cleaning design. The design can be used for media such as impure steam, black liquor, and even 3.5 % pulp.

Low capacity

- Four different low capacity C_v trims are available for the DN25 valve. These enable high accuracy control of small flows. Typical applications are, for example, dyes and other additives on a paper machine.

Exploded view



Parts list (standard construction)*

Part	Name	Body material
1	Body	ASTM A351 gr. CF8M
3	V-port segment	SIS 2324 + chromium / SIS 2324 / AISI 329
4	Seat	Cobalt based alloy / PTFE 1)
4A	Back ring	AISI 316
5	Lock spring	INCONEL 625
6	Back seal	Stainless steel + PTFE
9	Gland follower	ASTM A351 gr. CF8M
10	Blind flange	ASTM A351 gr. CF8M
11	Drive shaft	SIS 2324/AISI 329 duplex SS
12	Shaft	SIS 2324/AISI 329 duplex SS
13	Key	SIS 2324/AISI 329
14	Cylindrical pin	SIS 2324/AISI 329
15	Cylindrical pin	SIS 2324/AISI 329
16	Bearing	PTFE + SS net
17	Bearing	PTFE + SS net
19	Sealing plate	Graphite
20	Packing	PTFE
22	Filling ring (only low Cv 1"/DN 25)	Stainless Steel AISI 316
25	Countersunk screw	ISO 3506 A2-70
26	Hexagon bolt	ISO 3506 A2-70
30	Retainer ring	AISI 316
31	Sheet ring	AISI 316
32	Wave spring	AISI 316
35	Identification plate	AISI 304

* The parts are not in number order since certain part has dedicated part number.

Neles™ V-port segment valves

Series R

Installation, maintenance and
operating instructions

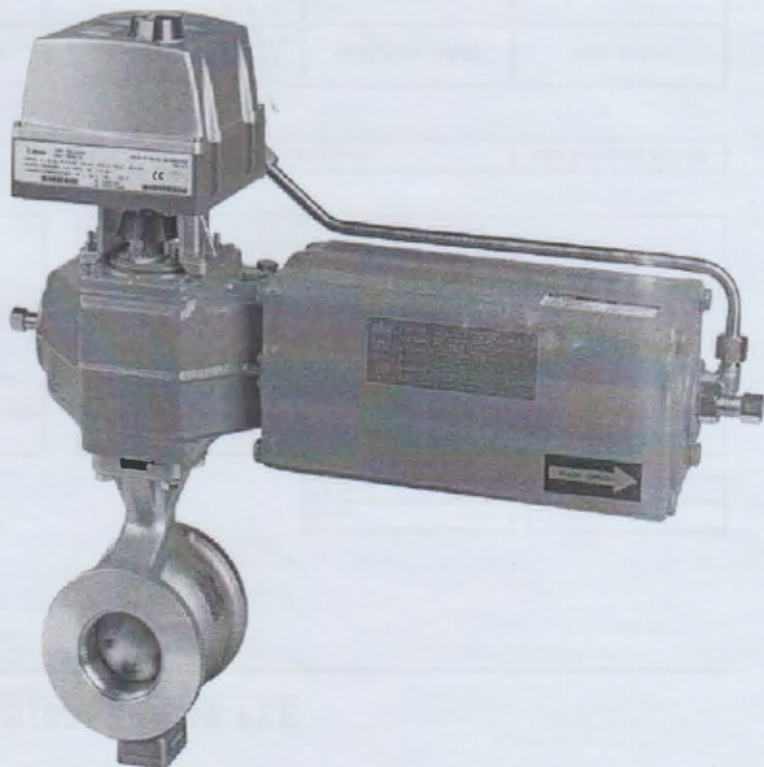


TABLE OF CONTENTS

GENERAL	3	TROUBLE SHOOTING TABLE	15
Scope of the manual	3	TOOLS	15
Valve construction	3	ORDERING SPARE PARTS	15
Valve markings	3	EXPLODED VIEWS AND PARTS LISTS	16
Technical specifications	4	Series RA	16
Valve approvals	6	Series RE	17
CE marking	6	DIMENSIONS AND WEIGHTS	18
Recycling and disposal	6	Series RA	18
Safety precautions	6	RA-B1C	19
Welding notes	6	RA - B1J, B1JA	20
TRANSPORTATION, RECEPTION AND STORAGE	7	RA - M	21
INSTALLATION	7	Series RE	22
General	7	RE - B1C	23
Installing in the pipeline	7	RE - B1J, B1JA	24
Actuator	7	RE - QPX	25
COMMISSIONING	8	Suitability with different flanges, RA and RE1 valves	26
MAINTENANCE	8	Flange ratings, RE (Class 150, 300)	26
Maintenance general	8	TYPE CODE	27
Replacing the gland packing	8	Series RA	27
Detaching the actuator	9	Series RE, RE1	28
Removing the valve from the pipeline	9		
Replacing the seat	10		
Dismantling the valve	11		
Inspection of removed parts	12		
Assembly	12		
TESTING THE VALVE	13		
INSTALLING AND DETACHING THE ACTUATORS	13		
General	13		
Installing B1C actuators	13		
Installing B1J actuators	14		
Detaching B series actuators	14		
Installing a Quadra-Powr™ actuator	14		

Subject to change without notice.

All trademarks are property of their respective owners.

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

1 GENERAL

1.1 Scope of the manual

This manual provides essential information on R series V-port segment valves, i.e. RA, RE and RE1-series valves. Actuators and other accessories are only discussed briefly. Refer to the individual manuals for further information on their installation, operation and maintenance.

NOTE:

Selection and use of the valve in a specific application requires close consideration of detailed aspects. Due to the nature of the product, this manual cannot cover all the individual situations that may occur when the valve is used.

If you are uncertain about use of the valve or its suitability for your intended purpose, please contact Valmet for more information.

For valves in oxygen service, please see also the separate installation, maintenance and operating instructions for oxygen service (see Neles document id: 10O270EN.pdf).

1.2 Valve construction

RA, RE and RE1-series valves are V-port segment valves installed between flanges. RE series valves are flanged V-port segment valves. The body is in one part; the shaft and the segment are separate. Shaft blow-out is prevented by plates mounted against the shaft shoulder. See Figs. 1 and 2.

The valve is either soft or metal seated. Tightness derives from the spring force pressing the seat against the segment. The structure of the valve supplied may vary, depending on the customer's requirements. The detailed structure is revealed by the type code shown on the valve identification plate. The type code is explained in Section 15.

The valve is designed for both control and shut-off applications.

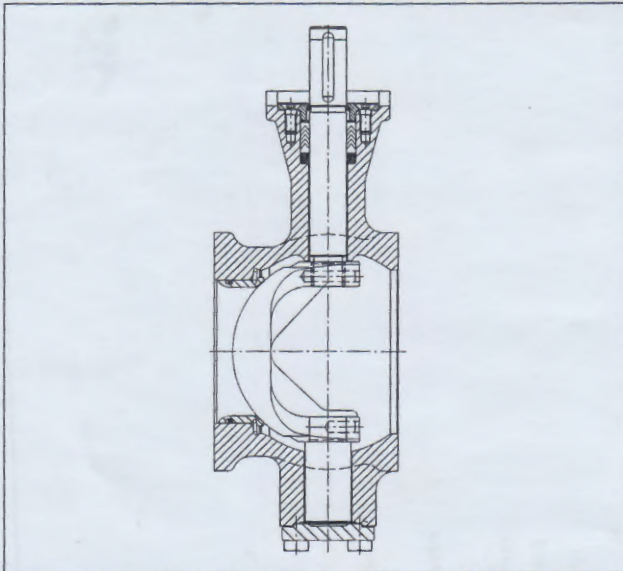


Fig. 1 Construction of a V-port segment valve, RA

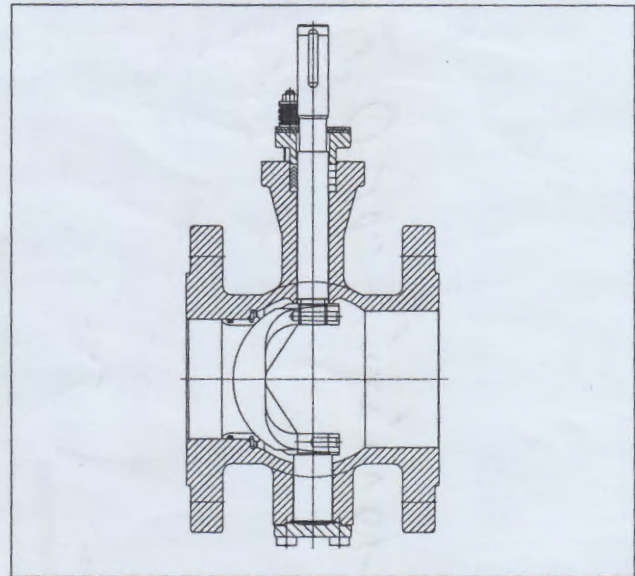


Fig. 2 Construction of a V-port segment valve, RE/RE1

1.3 Valve markings

Body markings are cast on the body. The valve also has an identification plate attached to it, see Fig. 3.

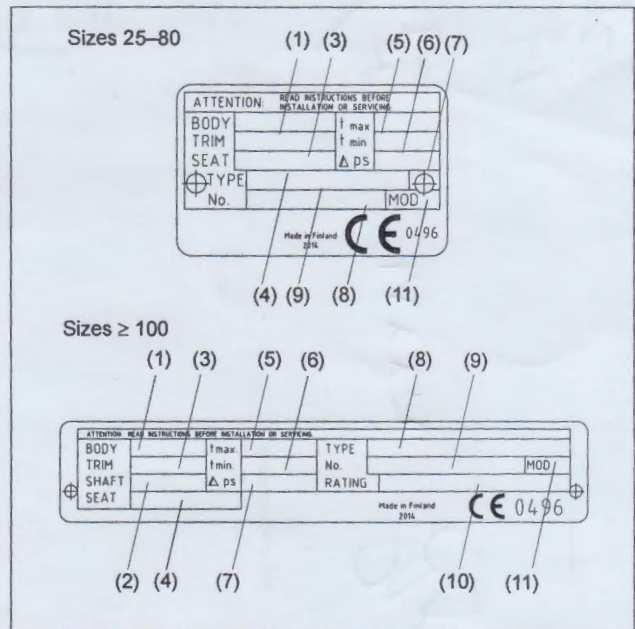


Fig. 3 Identification plate

Identification plate markings:

1. Body material
2. Shaft material
3. Segment material
4. Seat material
5. Maximum operating temperature
6. Minimum operating temperature
7. Maximum shut-off pressure differential
8. Type designation
9. Valve manufacturing parts list no.
10. Pressure class
11. Model

Jamesbury™ Wafer-Sphere™
butterfly valves high performance
series 815W & 815L
model A & B 3"-14" (DN 80-350)
series 830W, 830L, 860W, 860L
model A 3"-12" (DN 80-300)

Installation, maintenance and
operating instructions

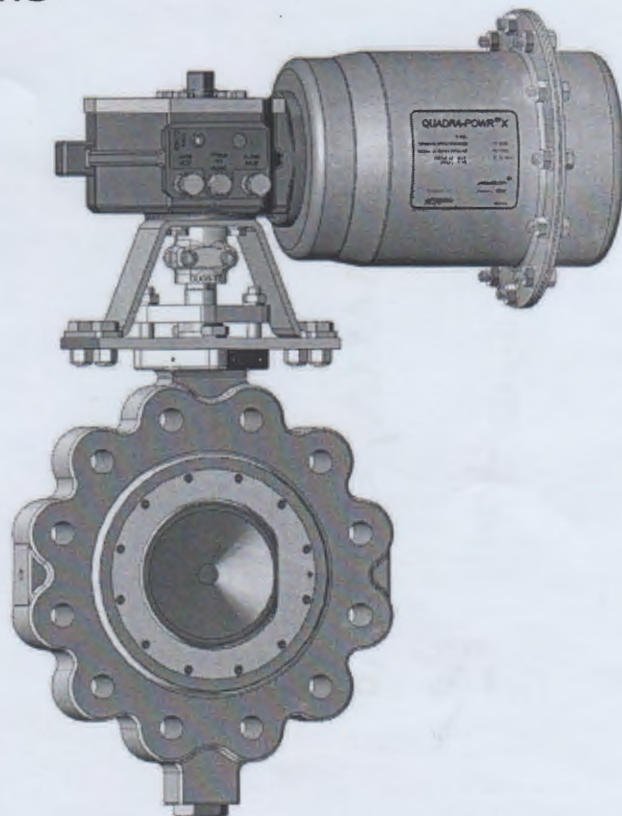


TABLE OF CONTENTS

GENERAL	3	ACTUATOR MOUNTING	11
Scope of the Manual	3	Change of Actuator Quadrant	11
Valve Markings	3		
Safety Precautions	3	CHANGE OF HANDLE QUADRANT	12
Eccentric Shaft Design	4		
Positive Stop Feature	4	SETTING ADJUSTMENTS	12
Wafer Body Design	4	Setting Stops (Valve in the Line)	12
Actuation	4	Setting Stops (Valve Out of Line)	12
		Setting Handle Stop (Figure 15)	13
TRANSPORTATION AND STORAGE	4	Setting Stops on ST and ST-MS	13
		Pneumatic Actuators (Figure 16)	13
INSTALLATION	4	Setting Stops on Quadra-Powr Actuators	14
General	4	Setting Stops on MA Manual Gear Actuator (Figure 17)	14
Installing in the pipeline	4	Setting Stops on Electric Actuators	16
Valve Insulation	4		
Commissioning	5	SERVICE / SPARE PART	16
		WELDING WARNING	16
MAINTENANCE	7		
General	7		
Actuated Valve	7		
Manual Valve - with Handle	7		
Seat Replacement Non Fire-Tite Valves	7		
Seat Replacement Fire-Tite Valves	8		
Shaft Packing Replacement	9		
Valve Disassembly	10		
Valve Assembly	10		
High Cycle Construction (860 only)	11		
Testing the Valve	11		

READ THESE INSTRUCTIONS FIRST!

These instructions provide information about safe handling and operation of the valve.

If you require additional assistance, please contact the manufacturer or manufacturer's representative.

SAVE THESE INSTRUCTIONS!

Addresses and phone numbers are printed on the back cover.

Series 815 ASME Class 150 and series 830 ASME Class 300 Jamesbury™ Wafer-Sphere™ high performance butterfly valves

Jamesbury™ Wafer-Sphere high-performance butterfly valves provide long-lasting tight shutoff capability, excellent flow characteristics, and long service life. The following standard sizes are available:

815W (Class 150 Wafer-Body Design)	2-1/2"–30" (DN 65–750)
815L (Class 150 Single-Flange Design)	2-1/2"–60" (DN 65–1500)
F815 (Class 150 Fire-Tested Version)	3"–60" (DN 80–1500)
818W (CE Marked Class 150 Wafer-Body Design)	2-1/2"–30" (DN 65–750)
818L (CE Marked Class 150 Single Flange Design)	2-1/2"–30" (DN 65–750)
F818 (CE Marked Class 150 Fire-Tested Version)	3"–30" (DN 80–750)
830W (Class 300 Wafer-Body Design)	3"–30" (DN 80–750)
830L (Class 300 Single-Flange Design)	2-1/2"–36" (DN 65–900)
F830 (Class 300 Fire-Tested Version)	3"–36" (DN 80–900)
838W (CE Marked Class 300 Wafer-Body Design)	3"–24" (DN 80–600)
838L (CE Marked Class 300 Single Flange Design)	2-1/2"–24" (DN 65–600)
F838 (CE Marked Class 300 Fire-Tested Version)	3"–24" (DN 80–600)

The Wafer-Sphere high-performance butterfly valve is available in a range of materials and seat combinations suitable for service in a wide variety of applications including NACE MR0103, and abrasive services. Also available are valves specifically prepared for chlorine, oxygen and high-vacuum applications.

Features

Field-proven single-piece flexible seat design

- Xtreme™ seat provides longer life, expanded performance boundaries, and greater value
- Lip-seal design compensates for temperature and pressure changes
- No additional o-rings or metal parts required to maintain tightness
- Tight shut-off in either direction
- Longer service life with less maintenance

Offset shaft and eccentric disc

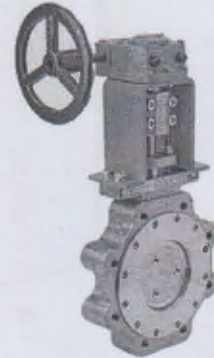
- No seat/disc contact in the open or intermediate position
- Eliminates wear points at top and bottom of seats for higher cycle life
- Reduces torque requirements, allowing for smaller operators

Fire-tested version available

- Fire-Tite™ Wafer-Sphere valves have been tested to API 607 and ISO-10497-5:2004

CE marked versions available

- CE marked and documented valves that conform to the European Pressure Equipment Directive (PED) 2014/68/EU are available in ASME Class 150/300, both standard and Fire-Tite construction. Operating torques, construction options and valve dimensions are exactly the same as the standard ASME 150/300 offering. The applicable sizes for CE marked valves are shown in table to left.



Positive shaft retention

- 2-1/2" - 24" (DN 65 - 600) valves are equipped with a retaining ring at the top of the shaft to prevent movement of the top portion of the shaft past the compression ring if for any reason the shaft should break within the valve.

Easy seat maintenance

- Simply remove body insert and replace seat – disassembly of disc and shaft is not required

Excellent for both on-off and control applications

- Superior control characteristics
- Inherent flow characteristic is modified equal percentage
- Wide rangeability
- Tight shut-off even in control applications
- Standard lugged style valves are suitable for bidirectional dead-end service at the full pressure/temperature rating of the valve.

Single-source responsibility

- Purchase valves, actuators and accessories, completely mounted from one source
- Available with electric, manual gear and pneumatic double acting or spring return actuators and a variety of accessories including limit switches, solenoids and positioners
- OEM service available through world-wide service centers

Available in a wide choice of materials for a broad range of applications

- Standard body materials include carbon steel, stainless steel, Alloy 20 and Monel®. Other materials, such as Avesta® 254SMO are available on application.

Additional information

Please refer to the bulletins listed below for additional information on other Jamesbury high-performance butterfly valves.

Wafer-Sphere polymer (soft) seat HP Butterfly valves	
Cryogenic Service	W130-1
Steam Service	W150-1
Chlorine Service	W150-2
Oxygen Service	W150-3
Vacuum Service	W150-4
Jacketed Valves	W151-3

Specifications

Valve seat ratings

Seat ratings, shown by the graph at right, are based on differential pressure with the *disc in the fully closed position* and refer to seats only. Maximum body working pressures are shown in the **Valve Body Ratings** tables below.

Valve body ratings

The tables below are maximum working pressure ratings of the **valve body only**. The seat ratings determine the practical pressure limitations according to actual service conditions. Test pressures are for hydrostatic test with disc open.

Temp °F	Carbon steel*	316 Stainless steel*	Alloy 20*	Monel
-20 to 100	285	275	230	230
200	260	235	200	200
300	230	215	180	190
400	200	195	160	185
500	170	170	150	170
Test pressure	450	425	350	350

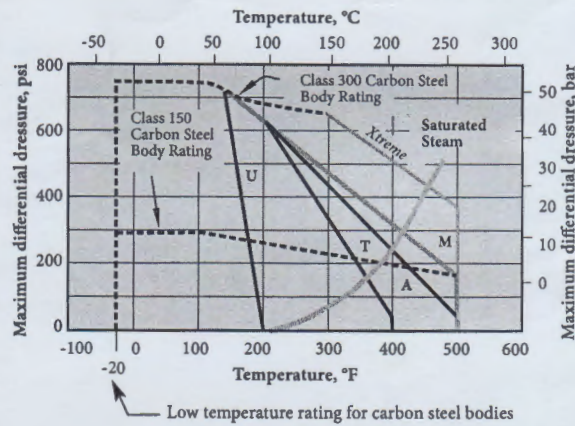
Temp °C	Carbon steel*	316 Stainless steel*	Alloy 20*	Monel
-29 to 38	19.6	19.0	15.9	15.9
100	17.7	16.2	13.5	13.7
150	15.8	14.8	12.3	13.1
200	13.8	13.7	11.3	12.8
250	12.1	12.1	10.4	11.9
Test pressure	30	29	24	24

Temp °F	Carbon steel*	316 Stainless steel*	Alloy 20*	Monel
-20 to 100	740	720	600	600
200	680	620	520	530
300	655	560	465	495
400	635	515	420	480
500	605	480	390	475
Test pressure	1125	1100	900	900

Temp °C	Carbon steel*	316 Stainless steel*	Alloy 20*	Monel
-29 to 38	51.1	49.6	41.4	41.3
100	46.6	42.2	35.3	36.2
150	45.1	38.5	32.0	34.1
200	43.8	35.7	29.4	33.1
250	41.9	33.4	27.2	32.8
Test pressure	77	75	63	63

* Ratings correspond to ASME B16.34 for material grades shown in bills of material herein.

Seat ratings



X - Xtreme T - PTFE M - Filled PTFE Seat
A - Fire-Tite U - UHMW Polyethylene

NOTE: 14" - 60" (DN 350 - 1500) Class 150 valves equipped with 316 stainless, Alloy 20 or Hastelloy® C shafts are rated for maximum differential pressure of 150 psi (10.35 bar). 3" - 36" (DN 80 - 900) Class 300 valves equipped with 316 stainless, Alloy 20 or Hastelloy C shaft are rated for maximum differential pressure of 300 psi (20.7 bar)

These ratings are a conservative guide for general service. Previous experience in a process or new developments and alternative seat materials may permit applications at ratings above those shown. Please consult our home office for specific recommendations.

Flow data

The tables below provide flow coefficients for Series 815 and 830 butterfly valves covered in this bulletin. The C_v values represent the number of gallons per minute of +60°F water that flows through a fully open valve at a pressure drop of 1 psi. The metric equivalent, K_v , is the flow of water at 16°C through the valve in cubic meters per hour at a pressure drop of 1kg/cm². To convert C_v to K_v , multiply by 0.8569. C_v values for partially open valves are given below.

Valve size		C_v
Inches	DN	
2-1/2	65	78
3	80	165
4	100	400
5	125	650
6	150	1,050
8	200	2,200
10	250	3,300
12	300	5,100
14	350	5,800
16	400	8,000
18	450	10,500
20	500	14,000
24	600	21,600
30	750	34,000
36	900	55,500
42	1050	82,650
48	1200	108,300
54	1350	133,500
60	1500	159,000

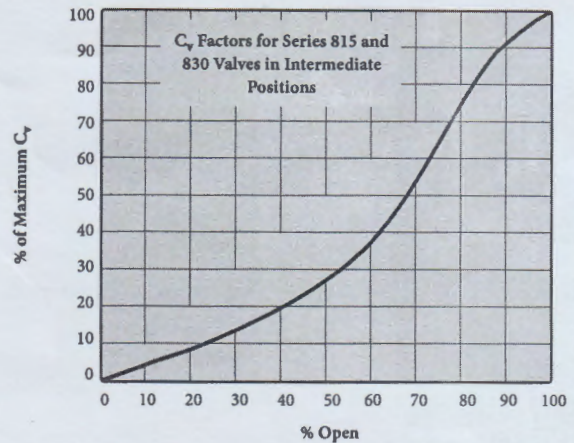
Valve size		C_v
Inches	DN	
2-1/2	65	78
3	80	165
4	100	400
5	125	650
6	150	1,050
8	200	1,800
10	250	3,150
12	300	4,750
14	350	5,200
16	400	6,900
18	450	9,300
20	500	11,300
24	600	18,500
30	750	29,100
36	900	47,500

Flow data (continued)

To determine C_v values for a valve in an intermediate position:
 (1) determine the percent of maximum C_v from the graph at right (2) multiply the percent of maximum C_v shown on the graph by the C_v value from the appropriate Flow Data table on the previous page.

EXAMPLE: The C_v for a 6" (DN 150) 815 that is 70% open is:

- (1) From the graph, a 6" (DN 150) 815 that is 70% open has a C_v value that is 53% of the maximum C_v .
- (2) 53% of the maximum $C_v = 0.53 \times 1050 = 560$.



Seat tightness

ANSI/FCI 70-2 establishes a series of six leakage classes for control valves and defines the test procedure. Class VI allows the least leakage. Wafer-Sphere High Performance Butterfly Valves are bubble-tight, MSS-SP61, which would exceed Class VI requirements.

Seat designs

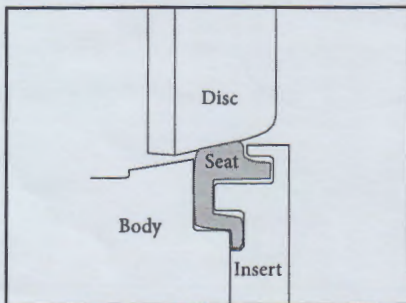
Xtreme performance and value

Xtreme seats provide longer life, expanded performance boundaries, and the greatest possible value. Xtreme is a

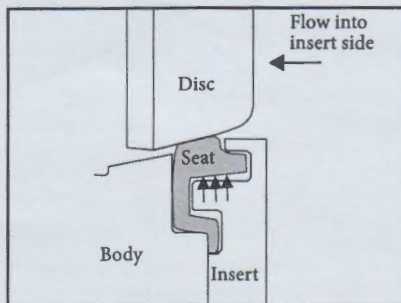
unique material that resulted from a technological breakthrough in our polymer research lab. The material is a fluoropolymer-based blend proprietary to Jamesbury that provides superior quarter-turn performance.

Standard seats

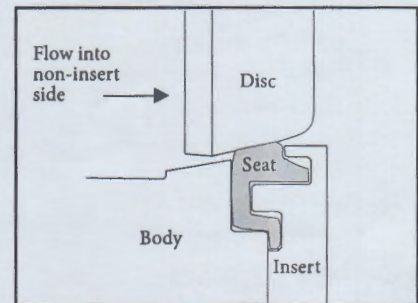
Wafer-Sphere standard seat design, constructed of PTFE, Filled PTFE, or UHMW Polyethylene, utilizes a flexible lip, which, when distorted, will always attempt to return to its original shape and maintain a seal against the disc regardless of flow direction.



When the valve is shut, the disc slightly deflects the seat. This slight deflection "energizes" the seat. While energized, the sealing surface of the seat is constantly pushing against the edge of the disc.



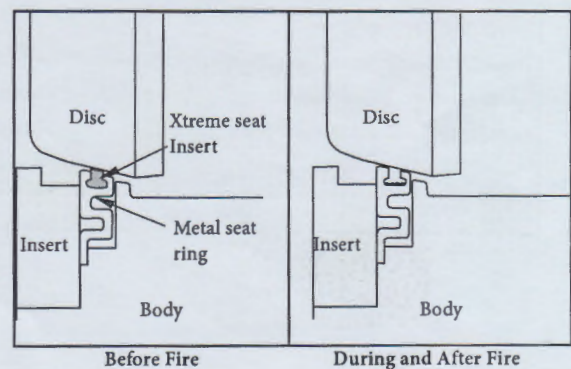
When pressure is on the insert side, pressure is applied under the seat lip. This further amplifies the sealing force between the disc and the seat.



When pressure is on the non-insert side, the disc moves into the seat. Due to the spherical profile of the disc, the more the disc moves into the seat, the tighter the shut-off. Excessive movement of the seat is limited by the flexible lip which contacts the bottom of the groove in the insert ring.

Fire-Tite seats

The Fire-Tite seat was developed for applications where effective shut-off during a fire is a concern. The primary sealing element is Xtreme with a back-up metal seat ring. In the event that the Xtreme is destroyed, the secondary metal seat provides effective shut-off. The Fire-Tite seat is also ideal for critical or severe service applications. Wafer-Sphere butterfly valves with Fire-Tite seats have been tested and approved to API 607 and to ISO-10497-5.

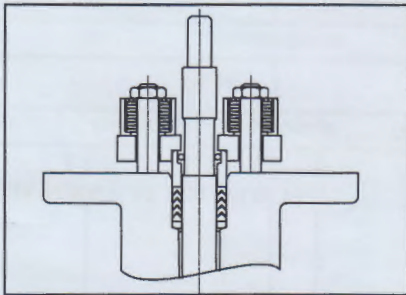


Special services

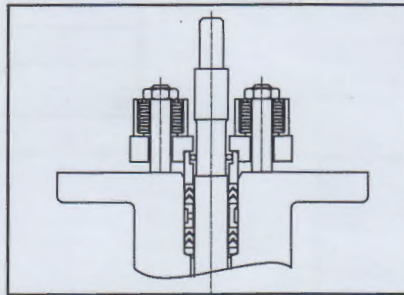
Emission-Pak™ live-loaded packing

When enhanced emissions control is needed to comply with evolving emissions standards, Emission-Pak live-loaded packing is available. The Emission-Pak live-loaded packing assembly includes PTFE V-ring packing live-loaded with disc spring washers for standard construction valves and graphite packing with Inconel disc springs for Fire-Tite valves to maintain a constant packing force without overcompression. It is available with new valves or as a retrofit kit for existing valves.

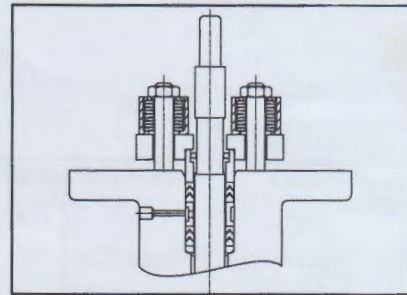
Additional options, available with or without the Emission-Pak live-loaded packing, include double packing or double packing with monitoring port to facilitate testing of the primary seal and allow detection of a potential leak problem. Refer to the How to Order section at the end of this bulletin for specific ordering instructions. The **operating torque** of valves with Emission-Pak live-loaded packing will increase. (Refer to the torque equation in the Valve Torque Data section).



Emission-Pak Live-loaded Packing



Emission-Pak Live-loaded Packing With Double Packing



Emission-Pak Live-loaded Packing With Double Packing And Monitoring Port

Note *All Emission-Pak illustrations depict a standard valve with PTFE V-ring packing.

Steam service

Wafer-Sphere butterfly valves are well-suited for a wide range of steam applications. These range from PTFE-seated valves capable of handling lower pressure to valves with Xtreme seats. Ratings of Wafer-Sphere valves in this bulletin for on-off steam service are as follows: Valves may be derated based on shaft material selection.

Valve type	Seat material	Maximum pressure differential	
		psi	bar
815W, 815L	Xtreme	200*	14*
830W, 830L	Xtreme	450	31

* Max. rating of carbon steel body per ASME B16.34 at corresponding saturated steam temperature.

Cryogenic service

Using Wafer-Sphere with unique polymeric and polymeric/metal composite seats, cryogenic Wafer-Sphere valves are rated to give tight, reliable shutoff on service extending from -320°F (-196°C) to ambient condition at pressures up to 1440 psi (99 bar). Cryogenic seats for valve sizes 3" - 12" (DN 80 - 300) are composite. Seats for sizes 14" - 48" (DN 350 - 1200) are Kel-F® material. See Bulletin W130-1.

Chlorine service

Wafer-Sphere valves reliably control the flow of both liquid and gaseous chlorine. The patented seat design insures positive, leaktight shutoff of this lethal substance. A range of key materials permits selection of the Wafer-Sphere valve best suited for the moisture content of the chlorine that is to be handled. Valves for chlorine service are specially cleaned to preclude possible reaction of the chlorine to foreign substances. For further information see Bulletin W150-2.

Oxygen service

Wafer-Sphere valves are available specially prepared for oxygen service, capable of filling a wide range of applications that include both on-off operation and proportional control. A rigid procedure is followed in preparing components, assembling, testing, and packaging these valves to assure cleanliness and to avoid the inherent danger of oxygen's reaction with grease, oil or other foreign matter. Bulletin W150-3 contains additional details.

NACE service

ASME Class 150 and 300 Wafer-Sphere valves are available to comply with the NACE MR0103 standard. These valves are well suited for oil and gas industry applications requiring sulfide stress cracking resistant metallic materials.

Abrasive service

For applications involving slurries or gas-borne solid particles, Wafer-Sphere valves are available with the disc hard-coated with tungsten titanium carbide (TTC). Service life of the valve is increased significantly with the assurance of extended sealing capability. This hard coating is also available on application on other valve components that may be subject to wear in other unusual process conditions.

Vacuum service

Standard Wafer-Sphere valves are rated for tight shut-off of vacuum to 2×10^{-2} torr. Special high vacuum Wafer-Sphere valves can be provided for vacuums to 1×10^{-5} torr. Additionally, high vacuum valves can be certified to have a leakage rate not to exceed 1×10^{-5} cc/sec. of helium at 1×10^{-5} torr vacuum. Refer to Bulletin W150-4 for details.