

NELES

Welcome and thank you for attending this session



Product school - Jamesbury™ Wafer-Sphere™

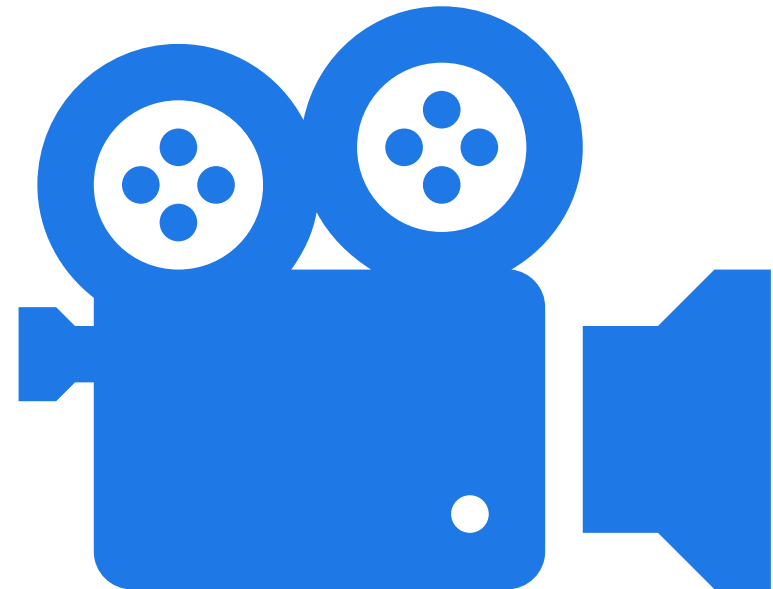
Double Eccentric Softed Seated Butterfly Valves

Data privacy

Practicalities

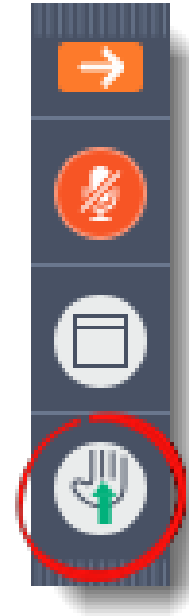
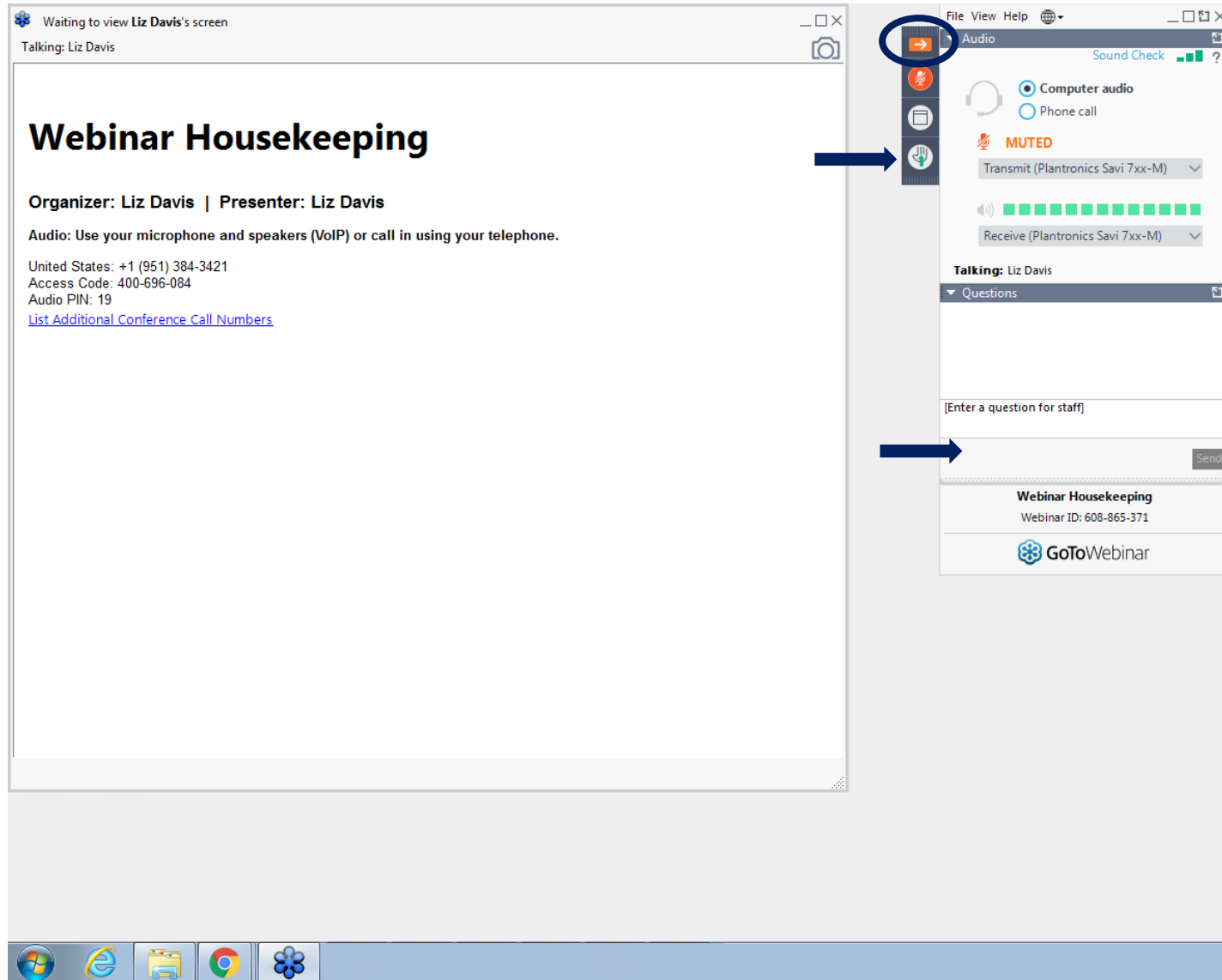
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In session features

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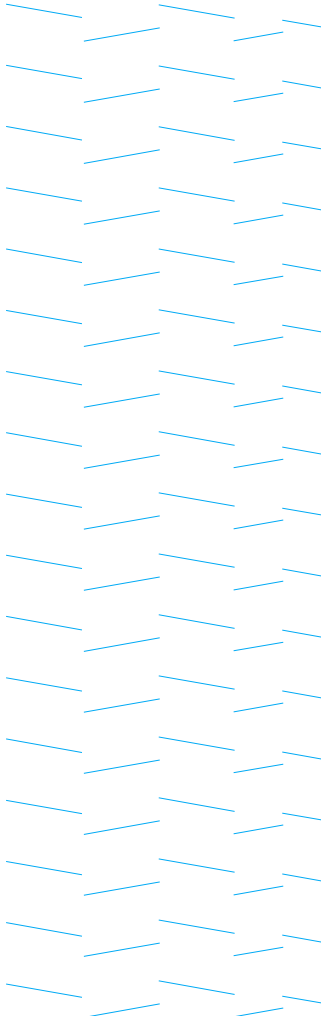


If experiencing audio issues please let us know in question field.

Speaker Introduction

NELES

- Joseph Bowab
- Butterfly Product Manager – North America
- 15 years of valve and actuator experience
- Bachelors degree in mechanical engineering



Agenda

- Jamesbury Wafer-Sphere
 - Product Details
 - Features & Tools
 - Customer Challenges & Solutions
 - Competitor Info
 - Applications
- Contact us

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Butterfly Valve Portfolio

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WS Series

Low-Moderate
Temperature
Low dP
General/Clean Service
TSO / Bidirectional



L Series

Low-High Temperature
Low dP
Dirty Service
High Velocity
TSO / Bidirectional



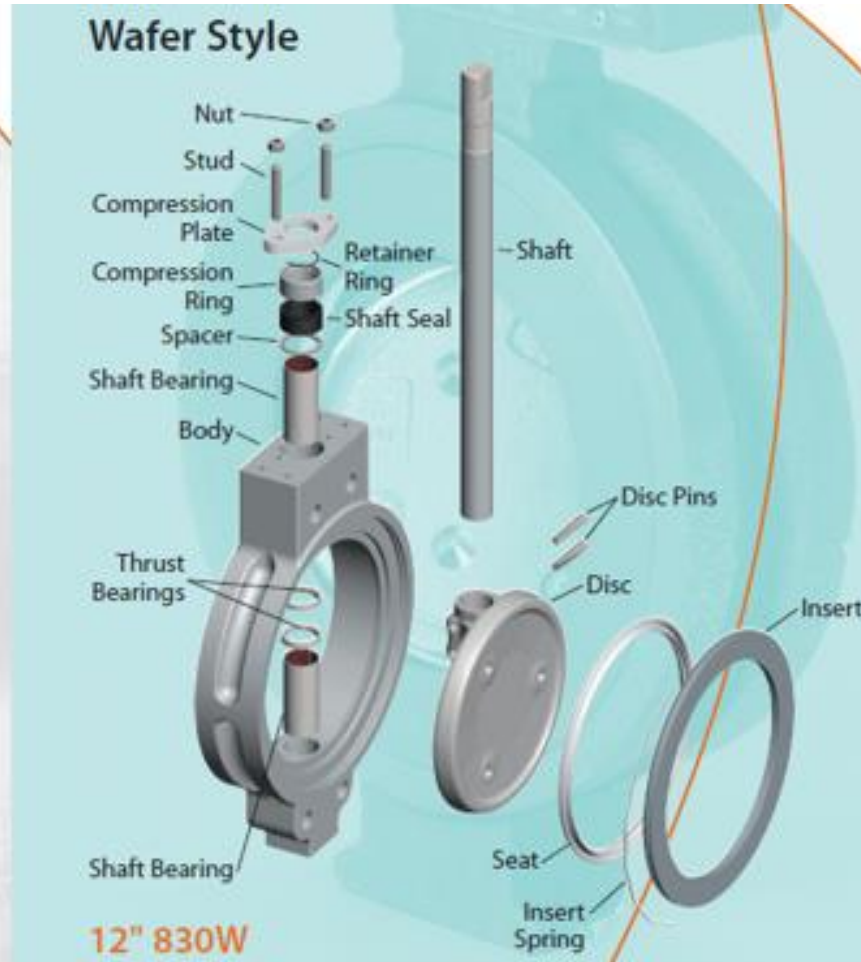
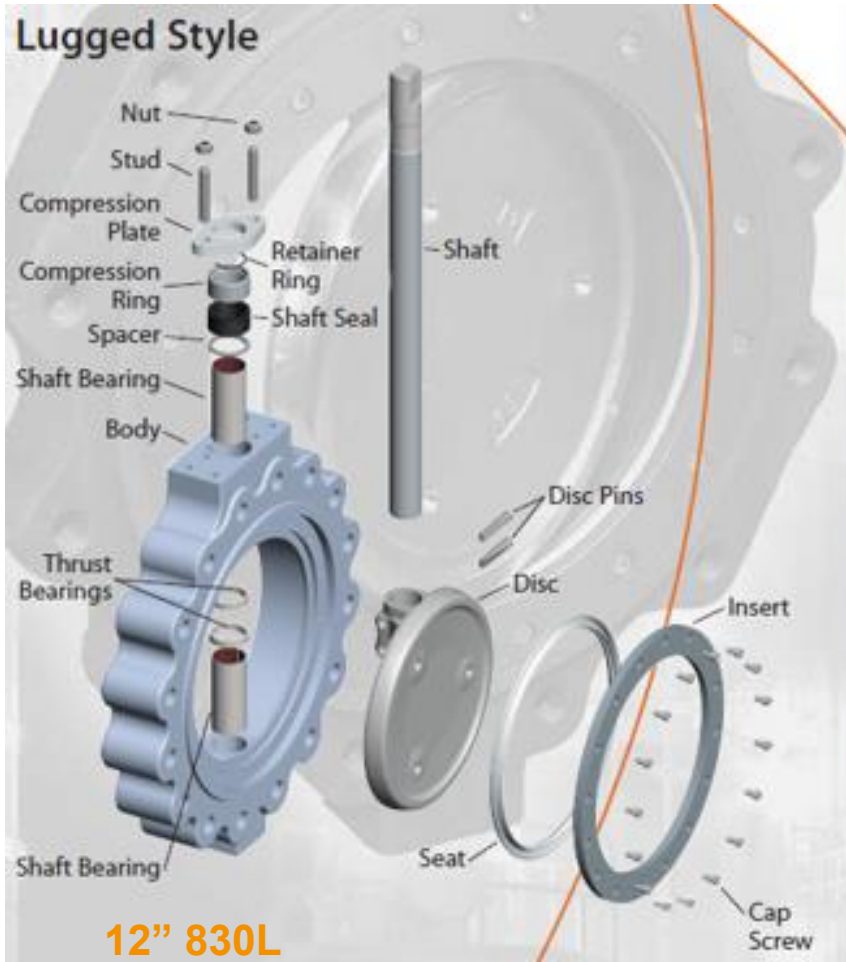
B Series

Low-High Temperature/dP
Variety of Services



Design/Construction Details

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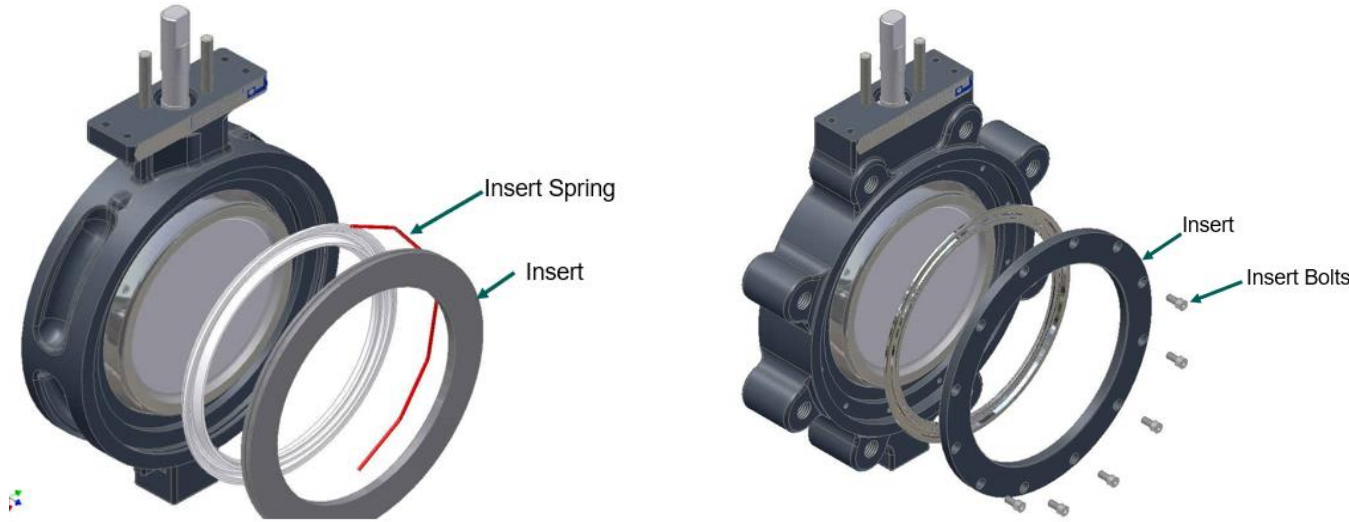


Details

- Body styles: Wafer & Lugged
- One piece drive shaft, lower body as cast up to 12"
- Shaft/Thrust bearings located top and bottom of disc
- Interchangeable components

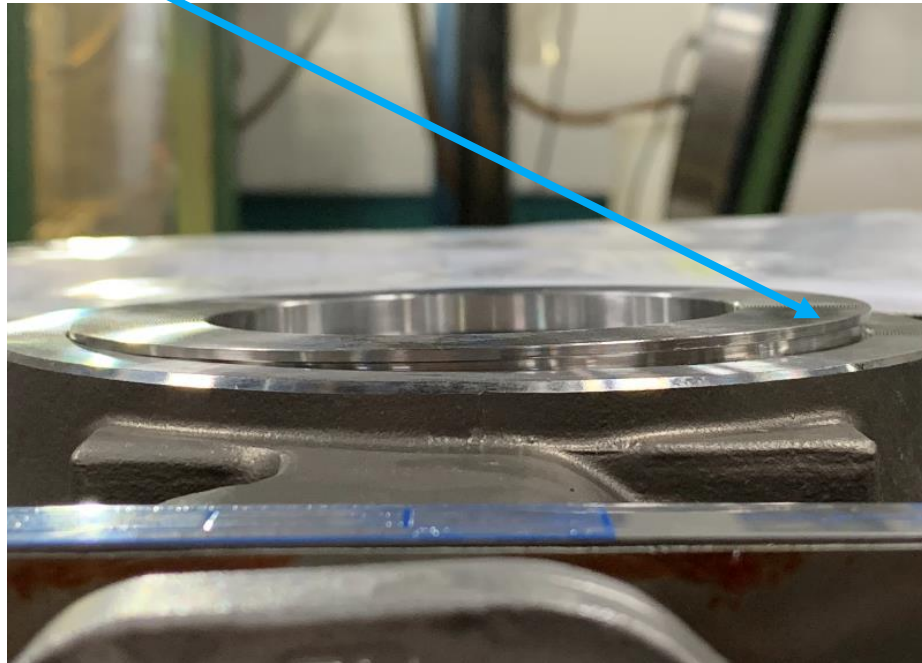
Design/Construction Details

NELES



Wafer

Lugged



Insert Design

- Insert Spring
 - Wafer < 14"
 - For assembly only
- Insert Spring
 - Insert may stick out from valve service due to spring attachment method. When installing into pipeline the insert will get pushed into place.
- Cap Screws
 - Lugged all sizes
 - Wafer > 12"
 - Dead end service

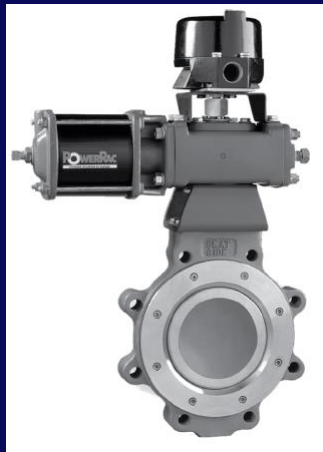
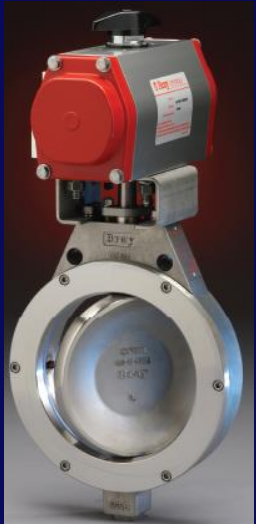
Jamesbury™ Wafer-sphere™

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Typical challenges our customers face

- Safety, reliability and durability
- Inconsistent seal performance
- Increasing cycle life expectations
- Higher pressure/temperature range
- Difficult to maintain
- Less maintenance intervals
- Complicated to automate/single source
- Limiting leak paths
- Better chemical compatibility
- Safe tightness/emissions





Competitors

- Bray
- Flowseal
- ABZ
- Xomox
- Dezurik
- Keystone

Maximum strength, reliability & durability

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- As cast maximizes strength
- Some stops are welded onto body.
 - Bray, Xomox
 - Will it withstand hard impact with disc due to incorrect actuator stop setting?
 - Will bacteria collect in crevices?
 - Will welding to pressure retaining valve body induce cracks?
 - Will heat affected zone of weld lead to corrosion, especially in high alloys?



Weld vs As Cast



Challenge

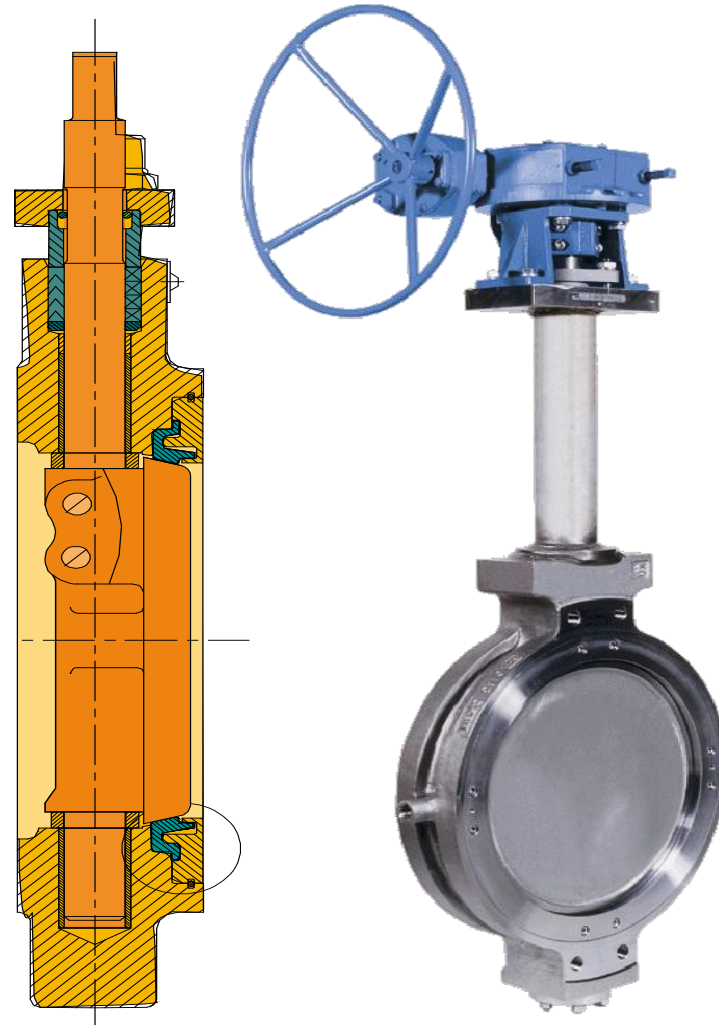
Reliable & durable design to prevent over travel and damaging the soft seat

Solution

As cast positive stop

Designed to reduce leak paths

- Small sizes as cast
 - < 14"
 - Lower trunnion – extra leak path
 - ABZ, Bray, DeZurik
- Cryo all welded design
 - Competitors bolted designs adds leak paths



Challenge

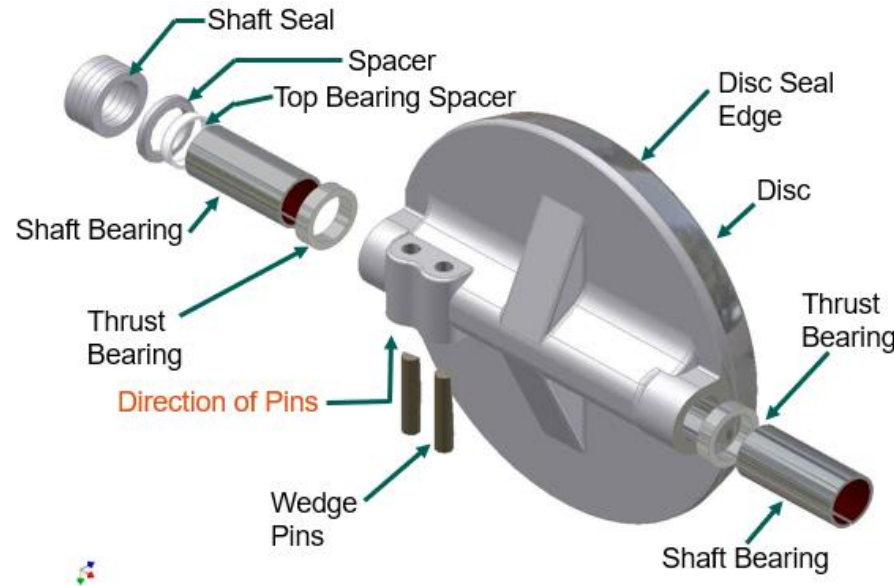
Release of media to atmosphere thru potential leak paths

Solution

As cast/all welded design

Reliability, extended lifecycle & ease of maintenance

- Shaft/Thrust bearings located top and bottom of disc
- No thrust bearings on either side
 - ABZ, Flowseal, Xomox, DeZurik
- Thrust Bearing on top side only
 - Bray
- Standard bearings are filled PTFE reinforced with SS mesh, backed by SS.
- Flowseal uses filled PTFE tape liner backed by fiberglass.
 - Worn through after 200,000 cycles. Jamesbury was fine



Challenge

Safety, reliability & durability

Increasing cycle life expectations

Less maintenance intervals

Ease of Maintenance

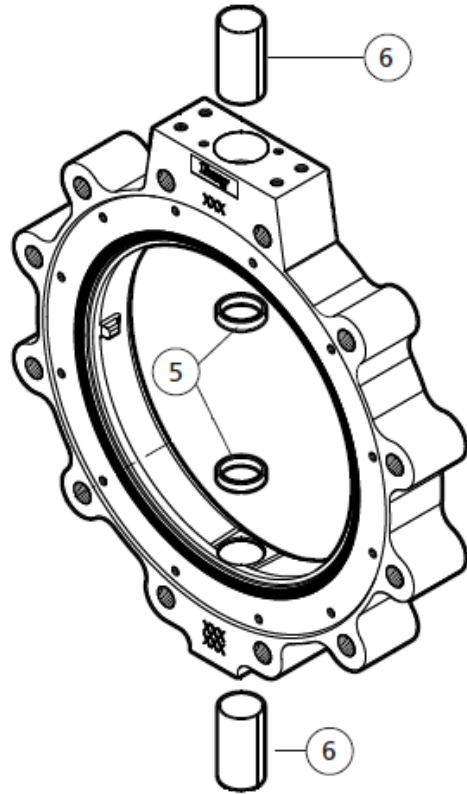
Solution

Robust bearing design

Ease of Maintenance

Competition maintenance challenges

- Some competitors are not symmetric or interchangeable



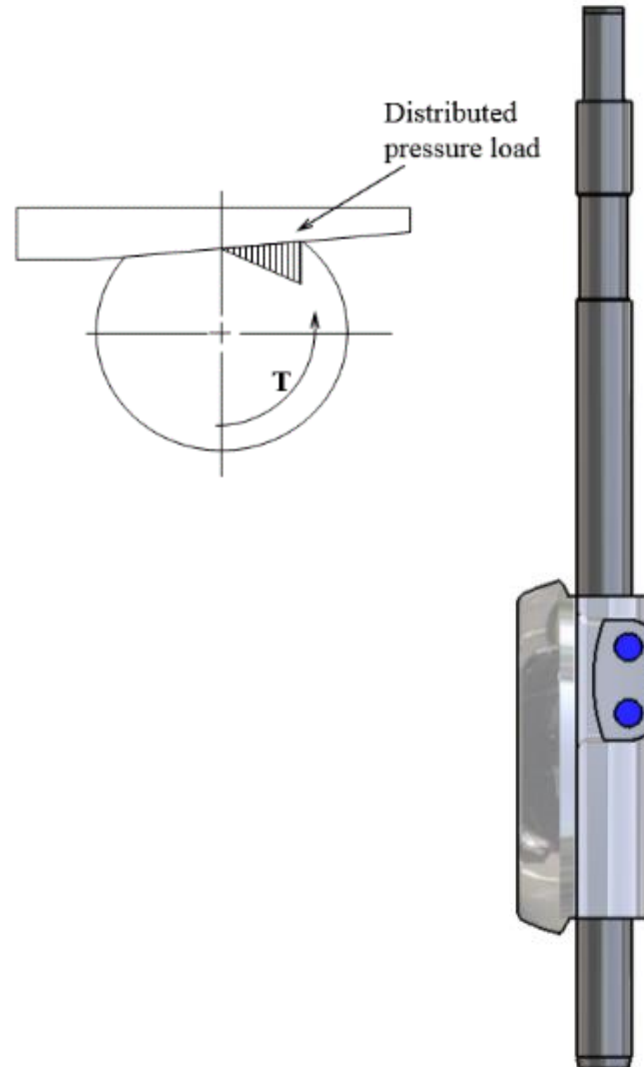
Bray/McCannalok *Operations and Maintenance Manual*

9. Disc spacers (5) are used at top and bottom of disc to properly position disc in body. Proper spacers were selected at initial assembly and rarely require replacement. The location of these spacers should be noted, and the spacers marked at disassembly so that they are reinstalled in the same positions, top and bottom.
10. Separate body from disc, and remove thrust washer (9) from packing bore.
11. Examine stem bearings (6) for excessive wear. If removed from body, note position and mark to reinstall in same location. If bearing liner is worn through to the shell, or severe damage is evident they should be replaced. Replacement is rarely needed.

Maximum strength, reliability & durability

Pinning design

- Majority of the shaft cross section remains to transmit torque and withstand bending from differential pressure
- Disc pins are offset from the shaft centerline
- Surface of the pins are in compression
- Compression is the strongest material condition for materials
- Pins are welded on both sides



Challenge

Increasing cycle life expectations

Safety, reliability & durability

Less maintenance intervals

Solution

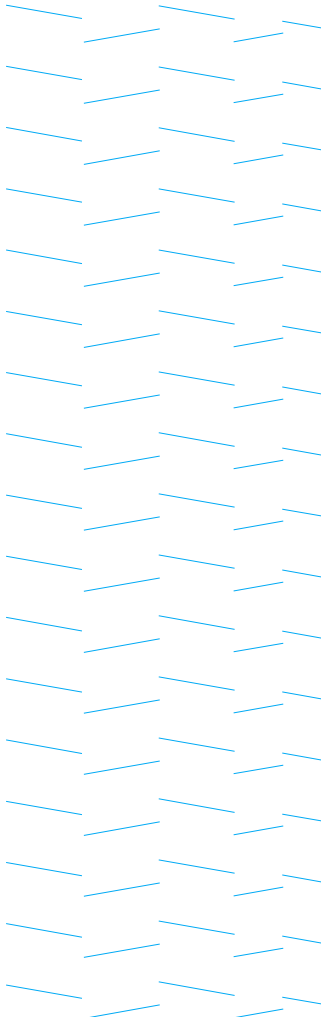
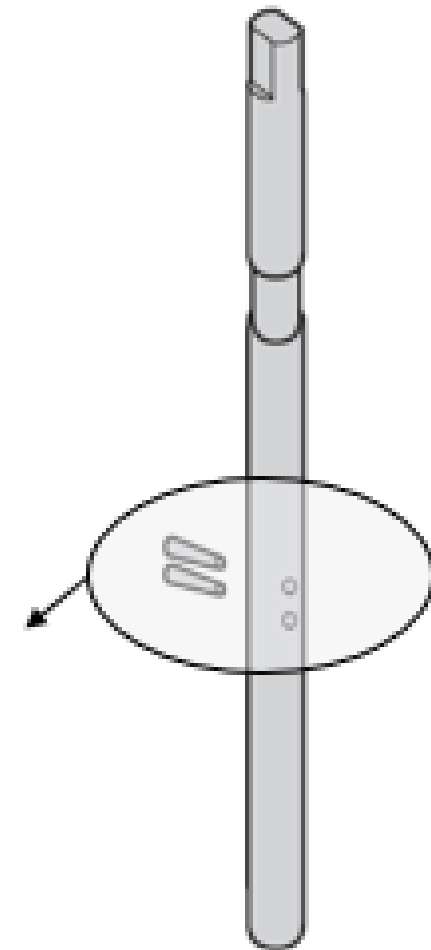
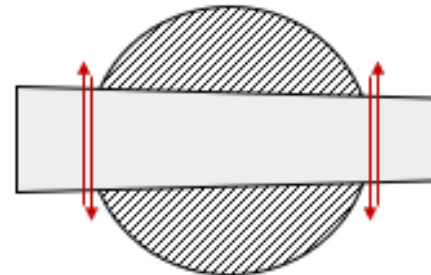
Strongest possible connection with no backlash

Safety, Reliability & Durability Concerns

Competition Pinning Methodology

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- Taper pins are through the middle of the shaft. A significant portion of the shaft cross-section is removed for the pins
 - Bray
- Only a fraction of the shaft cross-section remains to transfer torque, and support bending from differential pressure
- Failure mode for taper pins shearing across the interface.
- Shear is the weakest stress condition for materials.
- Taper pins require disc and shaft to be a matched set.



Competitive Pinning Comparison Cont.

NELES

Other methods to connect disc and shaft

ABZ



- Shaft pinned at ends of disc hubs with small diameter taper pins

XOMOX



- Two small taper pins thru center of shaft used to lock disc

FLOWSEAL



- Wedge pins are $\frac{1}{2}$ Dia compared to Jamesbury.

DEZURIK

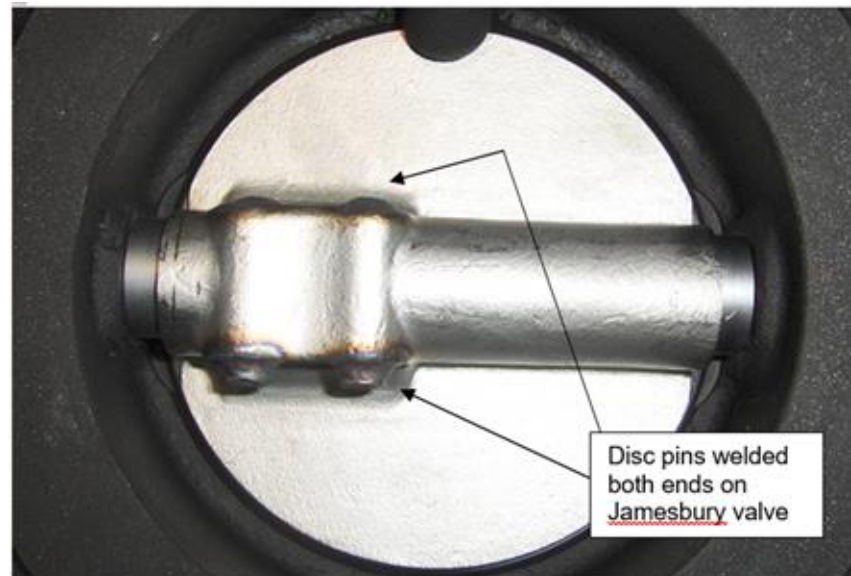


- Wedge pins similar to Jamesbury.

Designed for easy service and maintenance

NELES

- Pins/Welds can be clearly seen for easy removal
- Welds can be removed for pin replacement
- Disc and shaft are independently replaceable



Challenge

Difficult to maintain and service

Solution

Welded pinning

Service/Maintenance Concerns

NELES

Securing Pin Connection

Bray



- Quality of the weld makes it very difficult to find and remove the taper pin

ABZ

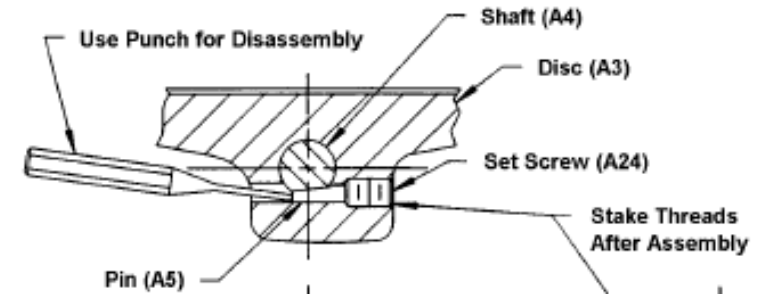


ABZ



- Pins only welded on one side

DEZURIK, FLOWSEAL



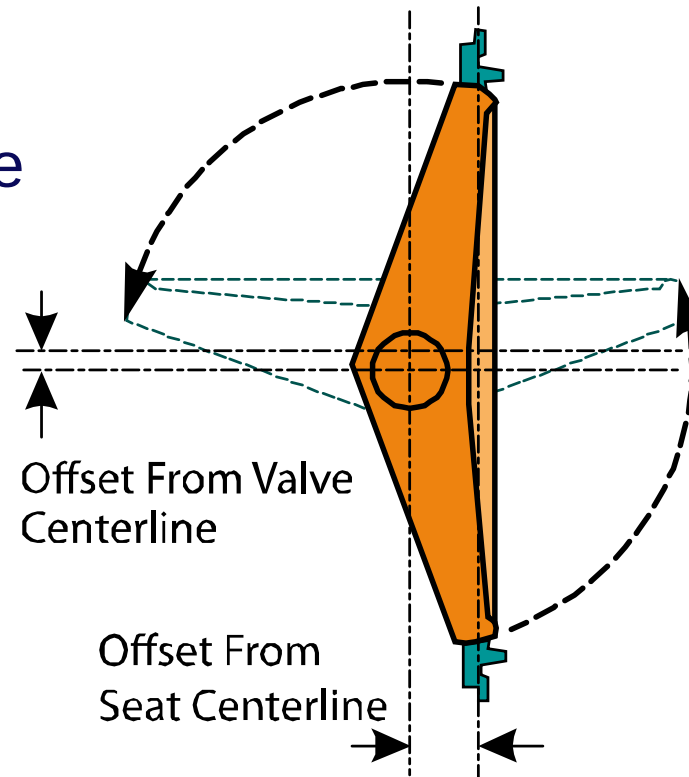
- Set screws to secure pin.
- Pins are retained by staking the edge of the bore in the disc. Can be easily removed by pressing opposite end. – XOMOX stakes too, but no set screw

Questions?

Seal performance, reliability & extended lifecycle

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- No seat/disc contact in the open or intermediate positions
- Eliminates wear points at the top and bottom of seat for higher cycle life
 - Single offset design
 - Dezurik, Posi-Seal
- Reduces **torque** which results in smaller operators



Challenge

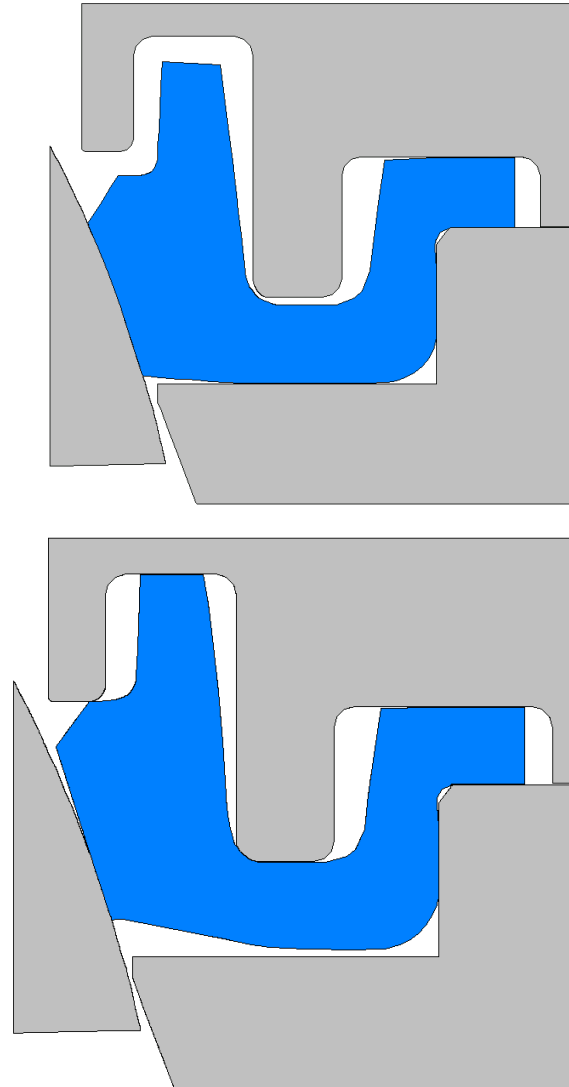
Safety, reliability and durability
Inconsistent seal performance
Increasing cycle life expectations

Solution

Patented double offset design

Designed for reliability, extended lifecycle and seal performance

- Minimizes permanent deflection
- Compensates for wear
- Adjusts to excursions in pressure and temperature



Challenge

Safety, reliability and durability
Inconsistent seal performance
Increasing cycle life expectations

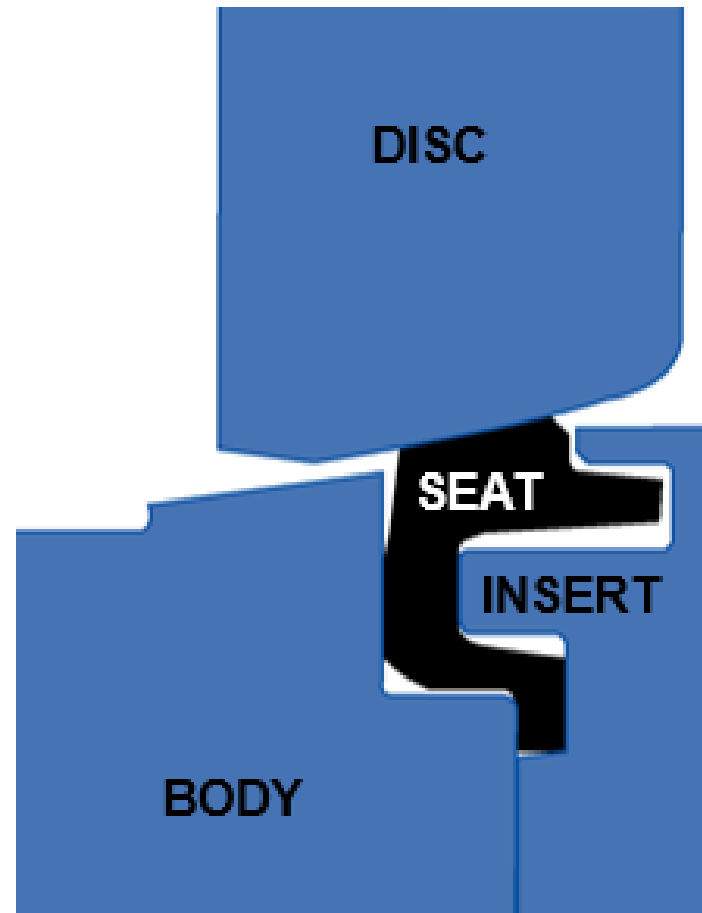
Solution

Flexible seat design/flexure zone

Designed for reliability, extended lifecycle and seal performance

As assembled...

- Seat is energized by the disc
- This allows bubble tight sealing from vacuum levels through the maximum pressure rating of the valve



Challenge

Safety, reliability and durability
Inconsistent seal performance
Increasing cycle life expectations

Solution

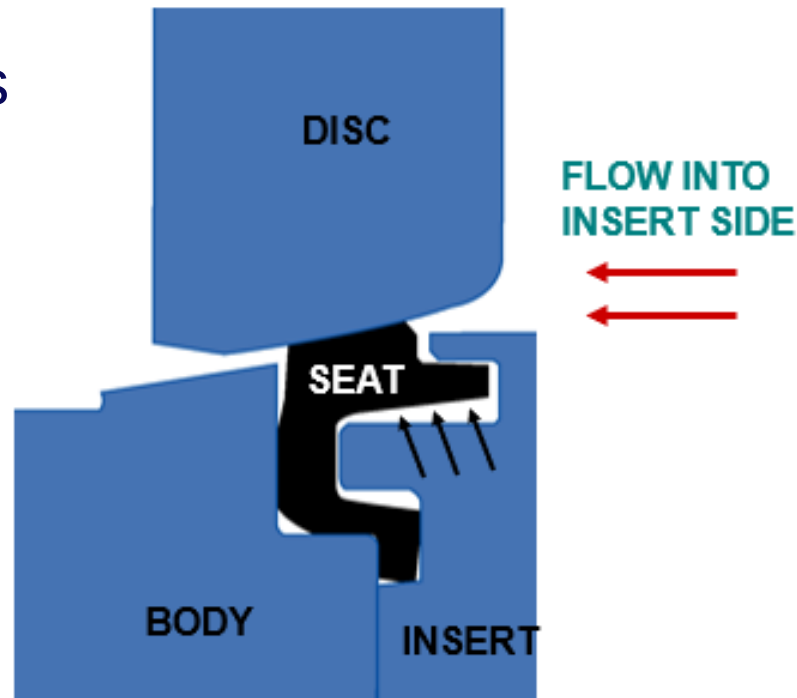
Flexible seat design/flexure zone

Designed for reliability, extended lifecycle and seal performance

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Pressure to the insert Side...Preferred direction

- Pressure pivots the seat forward amplifying sealing force
- Insert flexure zone design allows the seat to pivot
- We mark the valve on the insert side, on the tag, “high pressure side”.



Challenge

Safety, reliability and durability
Inconsistent seal performance
Increasing cycle life expectations

Solution

Flexible seat design/flexure zone

Designed for reliability, extended lifecycle and seal performance

Benefits of Preferred direction

- Lowest torque (disc is not wedging into seat like it does when pressure is on shaft side).
- Insert design protects the seat from abrasion and erosion
- Longer cycle life
- Packing is isolated from pressure when valve is closed.
- On lug body, insert is on upstream side so if someone forgets to tighten insert screws, or screws loosened over time, no chance of leak.
- So message is the valve can be installed either way and get the same shut-off. But...we do define a preferred installation direction for the above reasons.

Challenge

Safety, reliability and durability

Inconsistent seal performance

Increasing cycle life expectations

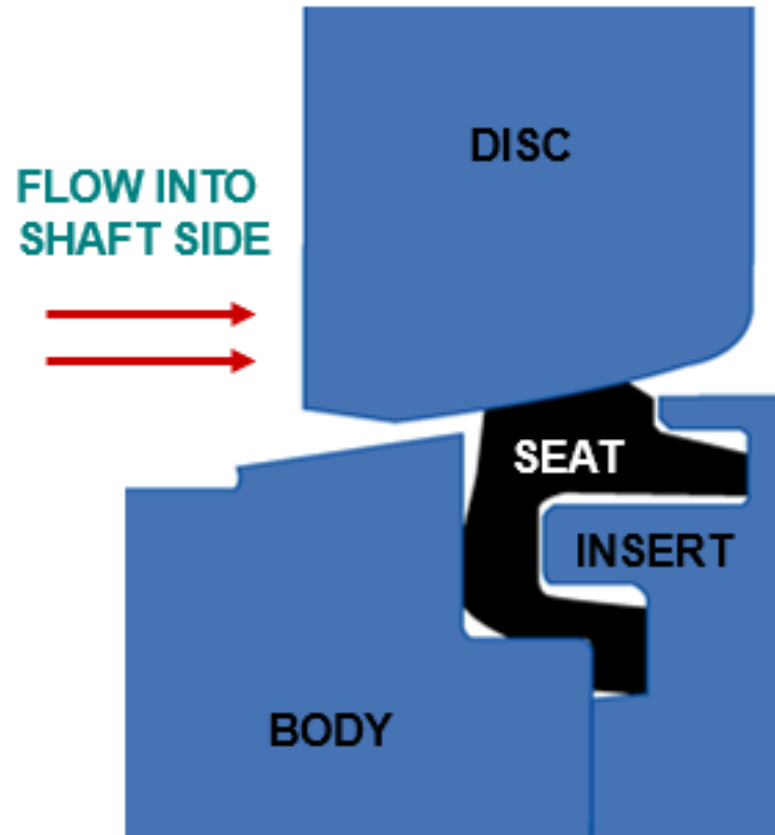
Solution

Flexible seat design/flexure zone

Designed for reliability, extended lifecycle and seal performance

Pressure to the shaft side...

- Spherical seat profile creates tighter seal as disc moves
- Excess seat movement is prevented by the insert design



Challenge

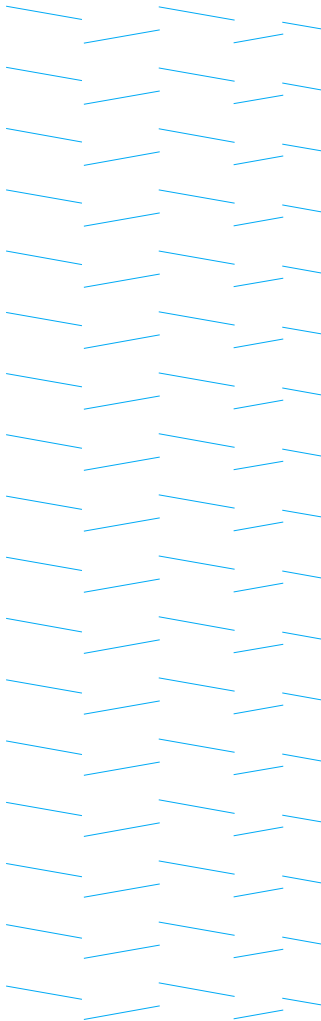
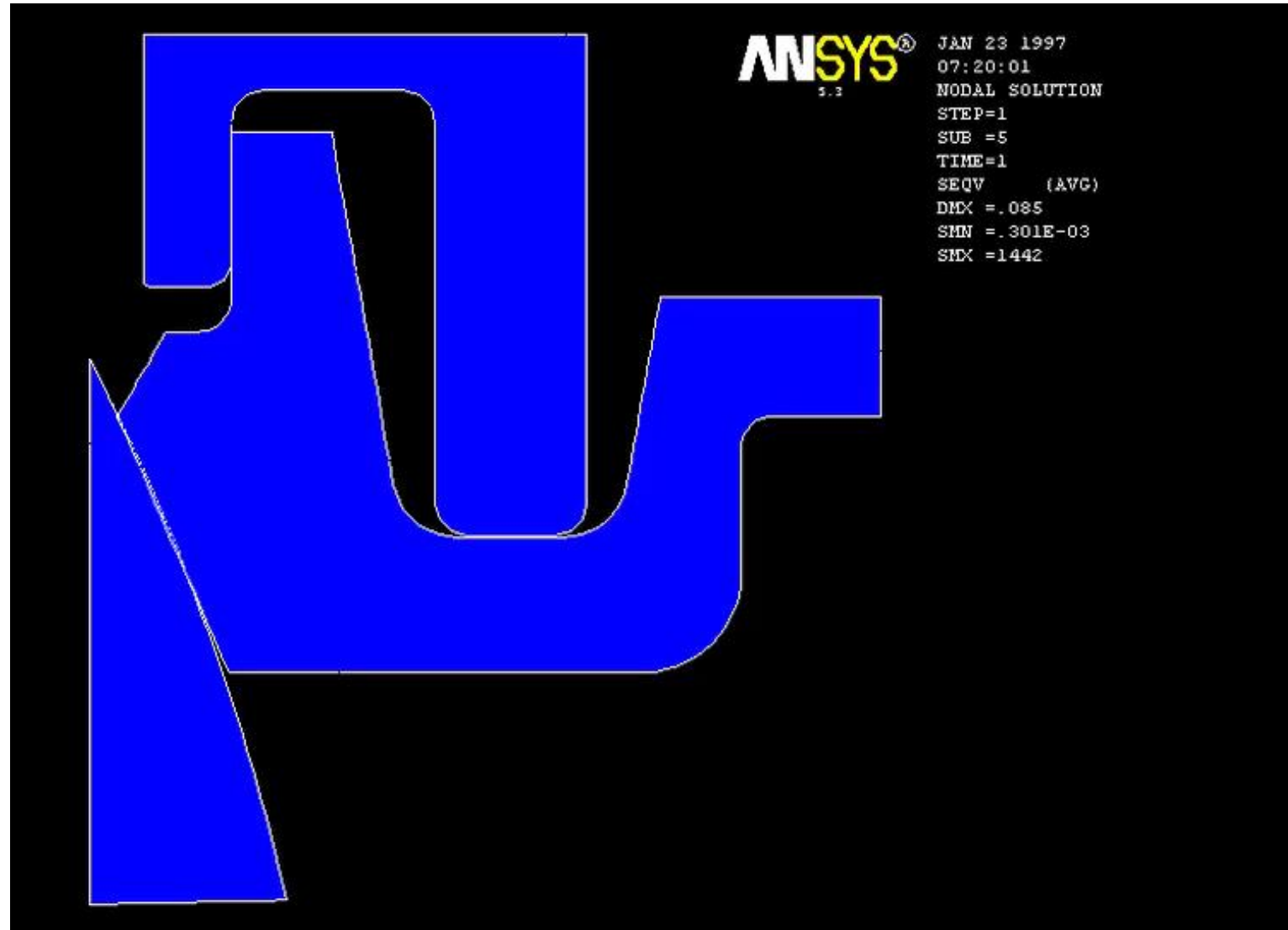
Safety, reliability and durability
Inconsistent seal performance
Increasing cycle life expectations

Solution

Flexible seat design/flexure zone

Designed for reliability, extended lifecycle and seal performance

NELES



Designed for reliability, extended lifecycle and seal performance

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- Standard tightness for Wafer-Sphere series is bubble tight
 - Tested acc. to JST 03 which is based on API598 test but doesn't fully fulfill the standard (differences below)
 - To fully comply with API598 use word modifier JH

	JST-03 (for standard valves)	JST-50 (for API-598 with word modifier JH)
Pneumatic test pressure	6,9+/-0,69 bar (100+/-10 psig)	4,1-6,9 bar (60-100 psig)
Seat test duration	15 sec	<=6", 60 sec: >=8", 120 sec
Direction tested	one direction	both directions

DN	NPS	Class 150	Class 300	Class 600
65	2½		830L	
80	3			
100	4			
125	5			
150	6			
200	8			
250	10			
300	12	815W 815L	830W 830L	860W 860L
350	14			
400	16			
450	18			
500	20			
600	24			
650	26			
700	28			
750	30			
800	32		830L	
900	36			
1000	40	815L		
1200	48			
1400	56			
1500	60			
1600	64			

Disc Seal Competitive Analysis

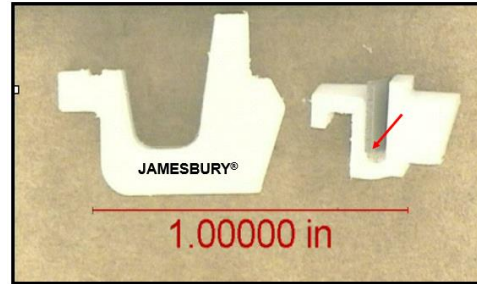
NELES

XOMOX



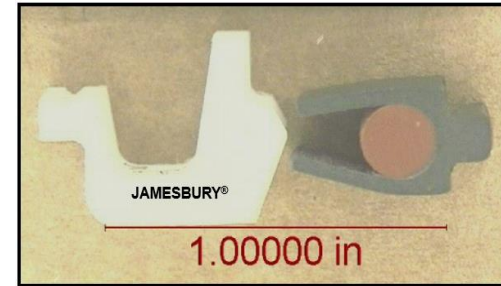
- Seat center is a multi-layered fiberglass membrane

DEZURIK



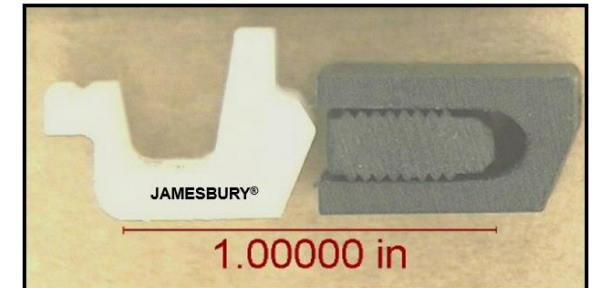
- Metal backing ring
- Seat profile 2X smaller

FLOWSEAL



- A loose secondary O-Ring
- Sealing profile 3X smaller
- Seat tail gets pinched in between body/retainer and flexes with each cycle which can weaken and break in this area.

KEYSTONE



- Strands of wire between the two items
- Block design: Lack of flexibility.

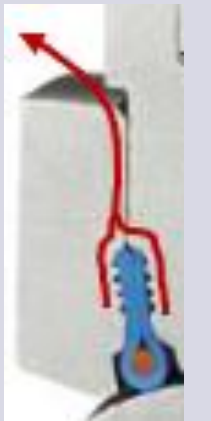
Disc Seal Competitive Analysis

NELES

Competition:

- Less reliable and durable
- Inconsistent seal performance
- Reduced cycle life expectations

- Energizing of the seat relies on secondary components
- Thermal expansion characteristics of dissimilar materials
- Chemical compatibility of o-ring and back up ring material
- Thin cross section of material limits seat life and usage in abrasive applications
- Range of thermal cycling is limited
- Insert retention may allow a leak path outside of the pressure vessel



Questions?

Designed for reliability, extended lifecycle and seal performance

XTREME™

- Multi blend proprietary material
- Minimum temperature of -50F
- Operating torques are equal to filled PTFE
- Seat life expectancy far exceeding PTFE or filled PTFE
- Improved seat recovery = improved sealing + longer life + improved tightness under pressure and thermal cycling
 - RTFE has lower cycle life and min temperature of -20F

Challenge

Safety, reliability and durability

Inconsistent seal performance

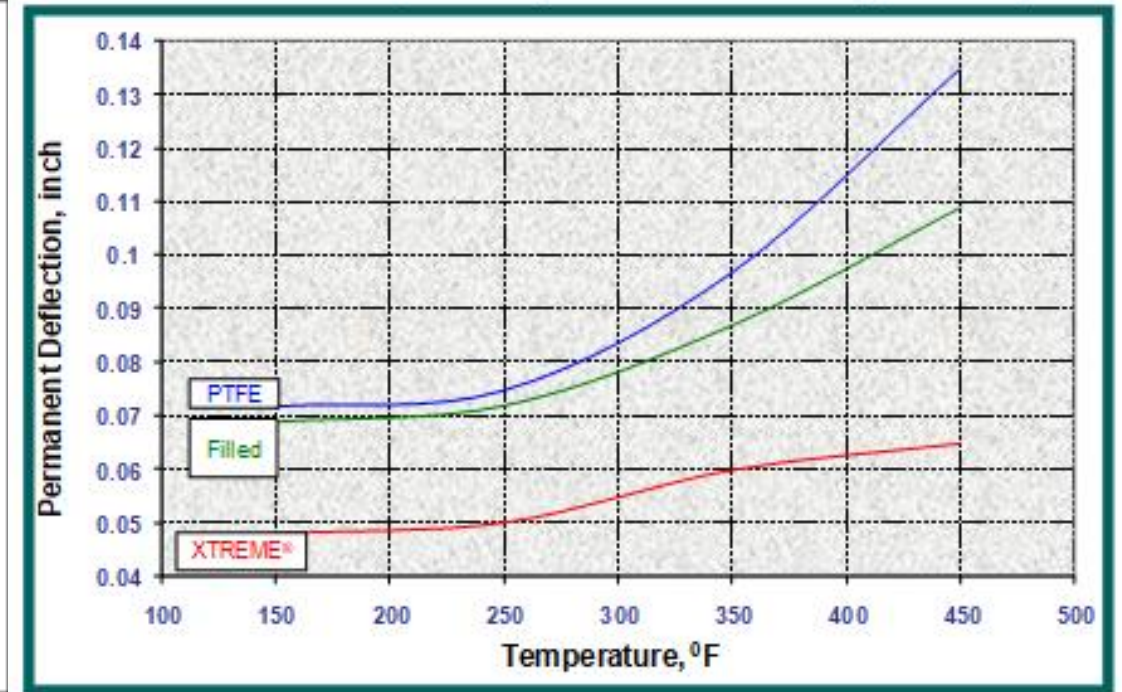
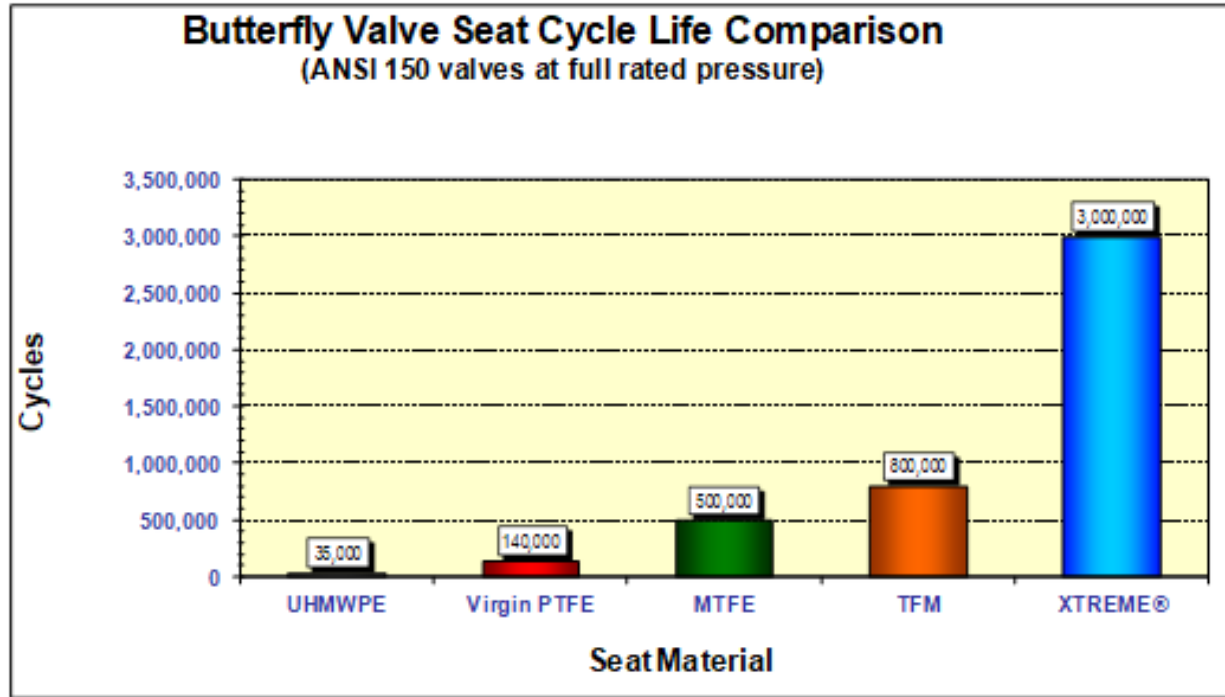
Increasing cycle life expectations

Solution

Advance Sealing Technology

Designed for reliability, extended lifecycle and seal performance

NELES



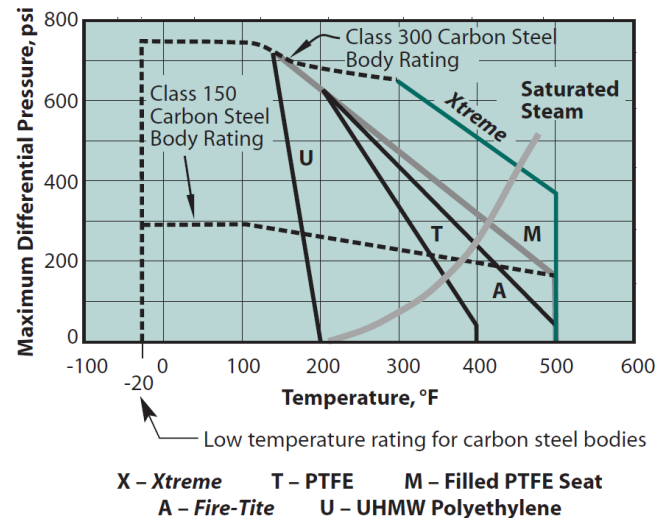
- Competitor A failed seat leakage at 48,440 cycles
- Competitor F failed seat leakage at 201,736 cycles
- Competitor B failed seat leakage at 258,000 cycles

Higher Pressure/Temperature Demands

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- Significantly higher pressure/temperature rating than filled PTFE (500°F and 380 PSI).

- Keystone (500°F and 50 PSI)
- Dezurik (500°F and 25 PSI)
- Flowseal (500°F and 25 PSI)
- Xomox (450°F and 100 PSI)
- ABZ (500°F and 50 PSI)
- Apollo (450°F and 100 PSI)
- Bray (500°F and 100 PSI)



	3 815W1122HBXZ	LW5CBA03PACAT	12 815W1122HBXZ	LW5CBA12PACAT
LP	\$616	\$1,323	\$3,734	\$4,600
Torque(FT-LB)	29	44.3	350	590
Actuator	VP300SR4/5	VP350SR4/5	VP650SR4/5	VP700SR4/5
	\$472	\$584	\$3,179	\$4,706
	B1J6	B1J8	B1J16	B1J20
	\$1,010	\$1,121	\$3,512	\$5,958

Challenge

Higher pressure/temperature range

Solution

Xtreme - multi blend proprietary material

Better Overall Chemical Compatibility

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- Will match or exceed reinforced PTFE chemical compatibility in any application (B rating for caustic applications)
- Metals Compatibility Chart
 - [T101-1](#)
- Polymers/Elastomers Compatibility Chart
 - [T101-3](#)
- Chemical Compatibility Guide
 - [Compatibility Guide](#)

The screenshot shows the Metso Chemical Compatibility Guide web interface. At the top, there is a header with the Metso logo, the title "Chemical Compatibility Guide", and a "Help" link. Below the header, there is an "Introduction" section with text about the guide's purpose and limitations. This is followed by a "Disclaimer" section. Below the disclaimer, there is a "Reports" section with a dropdown menu set to "Chemical Compatibility Guide" and a "Create Spreadsheet" checkbox. A "Search" button is also present. At the bottom, there is a "LEGEND" section with a table of ratings and their corresponding descriptions.

LEGEND		
A = No Effect - Excellent	1 = Satisfactory to 72 F (24 C)	+ = May Ignite
B = Minor Effect - Good	1 = Satisfactory to 120 F (49 C)	a = barrier seat construction required
C = Moderate Effect - Fair	1 = Satisfactory to 275 F (135 C)	
D = Severe Effect - Not Recommended	* = Consult Jamesbury Inc. if conditions within the valve permit polymerization.	

An empty box indicates that no data were available at time of printing.
** = Some decrease in wear resistance should be expected due to corrosion of proprietary filler. However, cycle life is expected to be better than virgin PTFE in the same application.

Challenge

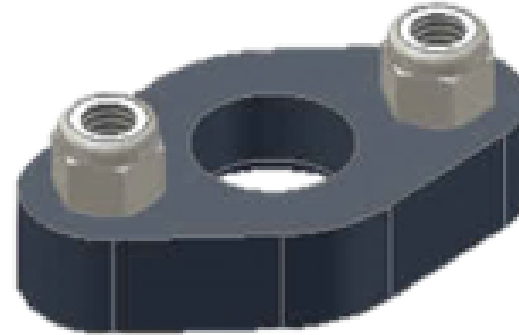
Ability to automate

Solution

Xtreme - multi blend proprietary material

Reduce maintenance complexity and intervals

- Self Locking nuts instead of lock washers
 - More robust design
 - Less loosening potential
- ABZ, Bray utilizes lock washers
- ABZ has hardware underneath plate



Challenge

Safety, reliability and durability

Difficult to maintain

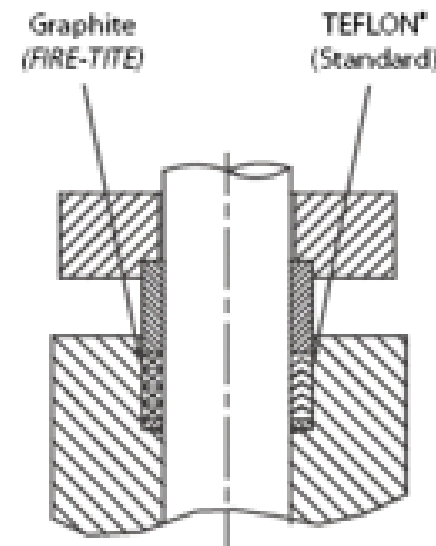
Less maintenance intervals

Solution

Self locking nuts

Reduce maintenance complexity/intervals and reduce leak paths

- Jamesbury Wafer-Sphere uses solid circular V-rings
- Jamesbury parts are close fitting, eliminating need for carbon fiber top ring. Avoiding potential problems from incorrect assembly
- Split packing provides additional internal leak paths through the packing
- Bray valve packing design needs carbon fiber top ring to prevent extrusion through large gaps and clearances



Challenge

Safety, reliability and durability

Difficult to maintain

Less maintenance intervals

Reduce leak paths

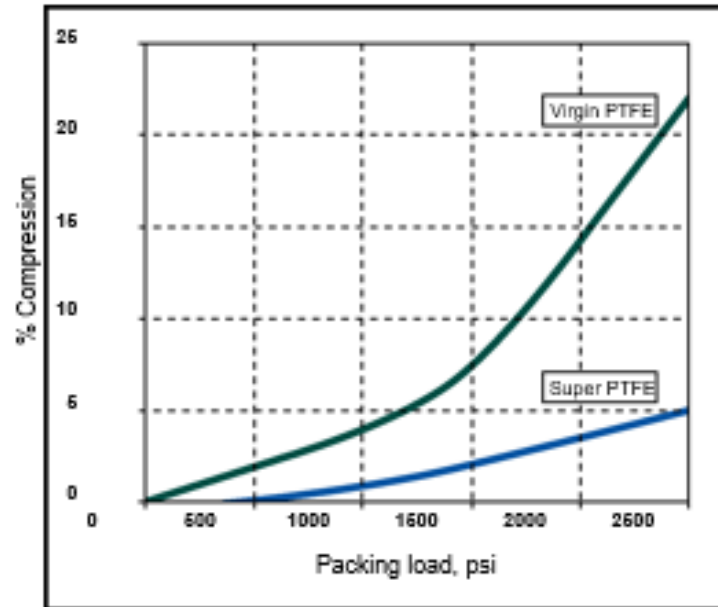
Solution

Solid packing rings

Reduce maintenance intervals

NELES

- 25% carbon filled TFM
- Less compression
- Less wear
- Longer cycle life
- Proven problem solver



Number of Cycles at Packing Adjustment						
Virgin PTFE	5,565	82,212	170,997	233,349	613,277	1,087,590
Super PTFE	480,000					1,120,000+

Challenge

Safety, reliability and durability

Difficult to maintain

Less maintenance intervals

Safe tightness/emissions

Solution

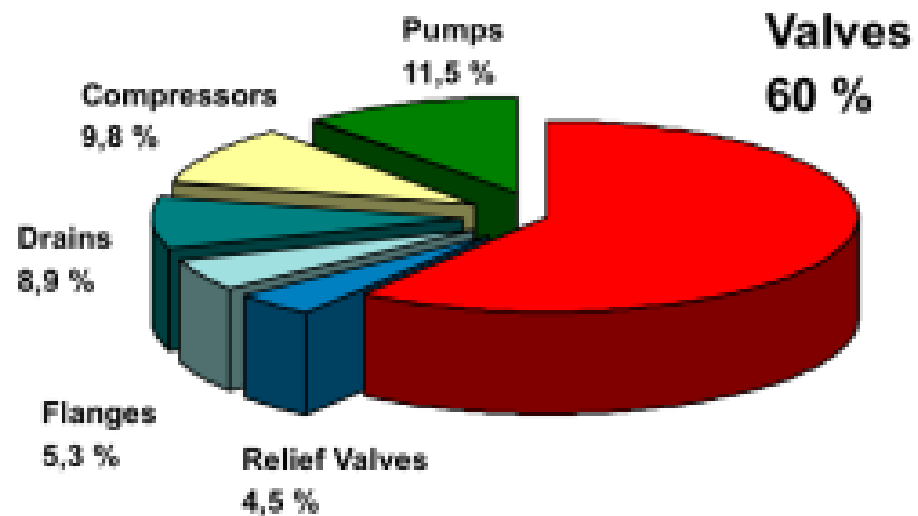
TFM stem seal

Rotary vs Reciprocating for Emission Requirements

NELES

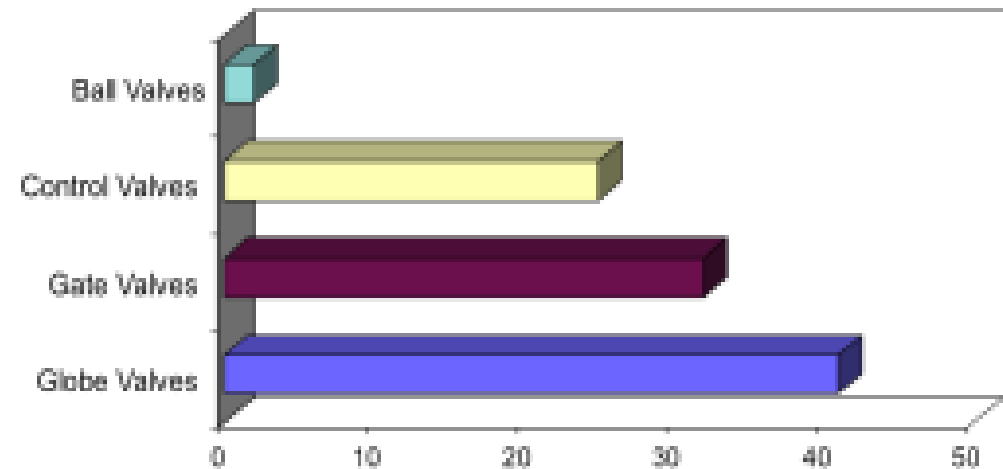
- Standard rotary design provides better emission control than standard reciprocating design

Uncontrolled Fugitive Emission



- 60% of all fugitive emission was related to valves. The main leak-source is the stem seal.

% Leakage Distribution 1000 Valves Types (>10.000 ppm)

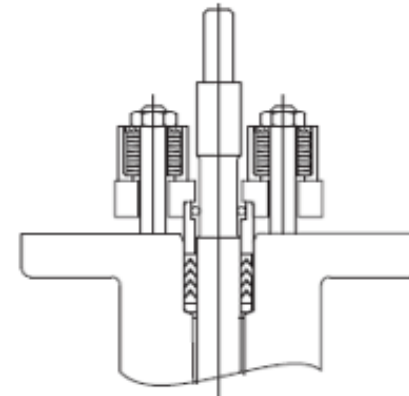


- Out of 1000 valves leaking more than 1% (10 000 ppm) only 2% was ball valves, 24% control valves, 32% gate valves and 42% globe valves(98% linear).

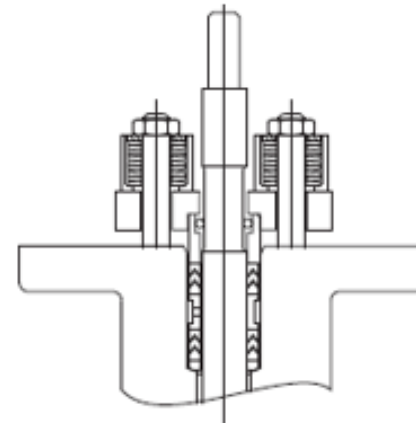
Stricter Emission Requirements

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- Provide the customer with worry free control of emissions
- Double packing enables leak-off monitoring port or pad pressure
- Standard for lethal gas service
- ISO 15848 Class BH CO-3 (5C-200C) for PTFE packing



LIVE-LOADED STANDARD PACKING
(Can Be Retrofit to a Std Valve)



DOUBLE-PACKED LIVE LOADED
Monitoring Port Optional

Challenge

Safety, reliability and durability
Less maintenance intervals
Safe tightness/emissions

Solution

Live loaded packing
options

Wafer-Sphere Conversion Kits IMO 317

NELES

STANDARD VALVE

VALVE WITH CONVERSION KIT

TABLE 1

Wafer-Sphere Live-Loaded Packing Conversion Kits

Model C	Type 815	Type 830	Type F815	Type F830
		RKW510	RKW742	RKW742
		RKW510	RKW742	RKW742
		RKW510	RKW742	RKW742
		RKW511	RKW742	RKW743
		RKW512	RKW743	RKW744
		RKW513	RKW744	RKW745
		RKW514	RKW745	RKW746
		RKW515	RKW746	RKW747
		RKW680	RKW747	RKW748
		RKW681	RKW748	RKW749
		RKW682	RKW748	RKW750
		RKW683	RKW749	RKW751
		RKW684	RKW750	RKW752
			RKW751	
			RKW752	

uts supplied in kits to prevent galling.
springs. Refer to appropriate kit number for specific quantities. Springs must be

Subsequent Springs to be stacked in series as shown, quantities vary depending on kit #.
(See Note 2 under Table 1.)

DISC SPRING STACK ASSEMBLY

To obtain proper load, tighten down on nut until top of flat washer is even with top of housing.

DISC SPRING STACK DETAIL SHOWN INSTALLED

PARTS LIST QU

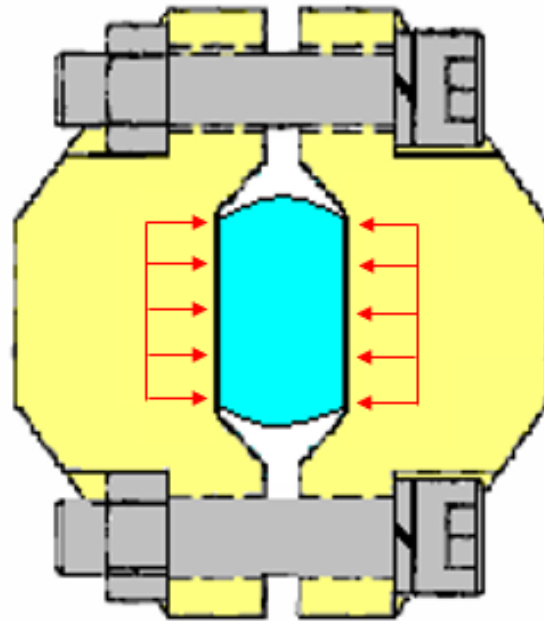
ITEM	PART NAME	2-1/2" - 6" 815/F815	8" - 14"
1	Hex Jam Nut	2	
2	Flat Washer	2	
3	*Disc Spring	18	
4	Spring Housing	2	
5	Compression Ring	1	
6	Tag	1	

* The conversion kits used on the Fire-Tite® valves are supplied with Inconel® disc springs.

Designed for increased cycle life

NELES

- Reduces wear due to “play” as a result of machining tolerances



Challenge

Safety, reliability and durability

Increasing cycle life expectations

Less maintenance intervals

Solution

No play coupling

Questions?

Designed for easy automation

- Blade or fitting square drive suitable for a variety of hand levers, gear operators and actuators
- Single source supplier for valves, actuators, instrumentation



NELES

Challenge

Ease of automation

Solution

Single source/Easy mounting and fixing of valve assembly components

Designed for easy automation

NELES

ELECTRIC



Valv-Powr™



Quadra-Powr™



B SERIES



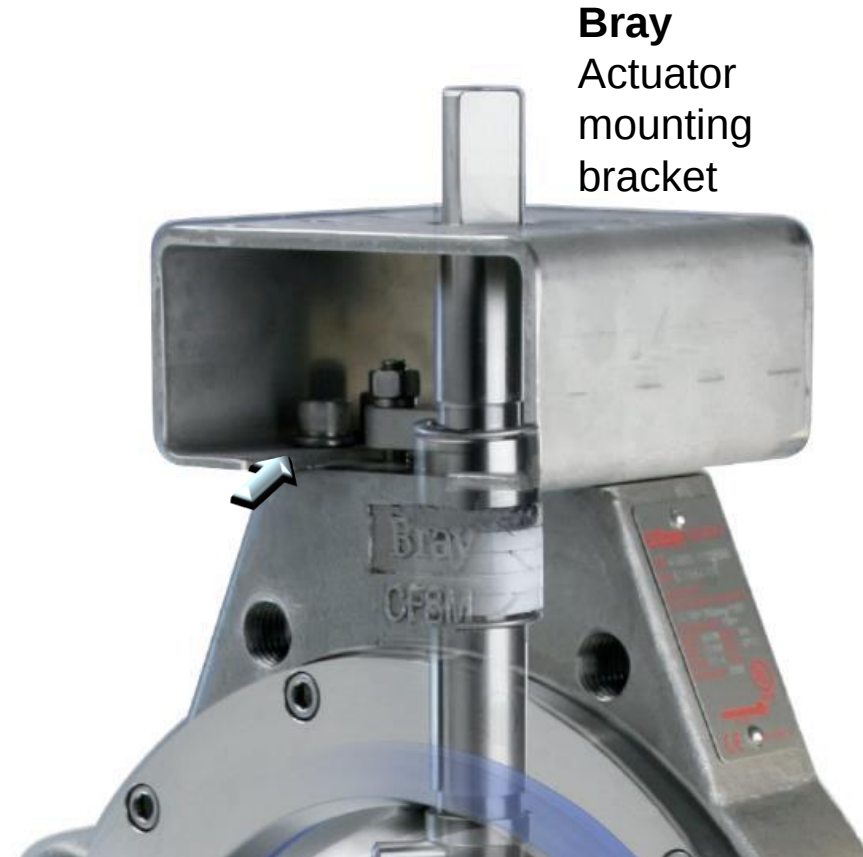
GEARS



Challenges in automation

Difficulties in access

- Actuator and handle mounting brackets are secured to valve with Allen screws
- L-shaped Allen wrenches are not common in field mechanic tool bags
- Small variations between metric and SAE screws makes fitting correct hex shape difficult and often results in stripped drive connections
- Jamesbury only permits hex head bolts, and bolt heads are outside of bracket for improved access and wider turning angle



Challenges in automation

Operating torque data is irregular

- What is the torque for an NPS 6 valve operating against 150 psi differential pressure?
- Technical manual shows a large increase with just a 2 psi change from 149 to 151 psi
 - 12% torque increase with retainer upstream
 - 19% torque increase with retainer downstream

Valve Size Inches		Bray/McCannalok Technical Manual							
		ASME 150 - Torques (Lb-in)							
		Series 40/41/4A Standard - Valve Differential Pressure (psig)							
		Less than 150 psig		>150-200 psig		>200-250 psig		>250-285 psig	
		Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream	Retainer Upstream	Retainer Downstream
6		690	810	770	960	825	1,100	840	1,200

Designed for easy automation

NELES

- Nelprof to determine valve/actuator
- Linkage kit assigned
 - [Linkage Wizard](#)
- IMO lists standard kits
 - [Butterfly IMO's](#)
 - High Cycle Kits excluded

Linkage Selector Wizard - Google Chrome

Secure | https://info.jamesbury.com/linkagewiz/linkwiz.aspx

This wizard does not perform an actuator sizing calculation. To assure that the actuator is sized correctly for the valve selected, refer to either the on-line Product Selector, NELPROF®, or perform a manual sizing calculation using published torques for the valve and actuator.

To select a linkage use all of the pull-down menus from top to bottom.

NOTE: 3" and larger 7000 series and 2" and larger 9000 series ball valves with 'live-loaded' packing may require special linkages in some sizes. Please consult the factory.

☐ Show Inactive Products

Select Valve Brand, Size and Model	
Brand:	Jamesbury
Size:	8
Model:	815 Mod. C ... Wafer-Sphere

Select Actuator Brand and Model	
Brand:	Jamesbury
Model:	M12/Q

Linkage Kit: **LK 1736**

Linkages that appear on separate lines are options: Select only one!
When two linkages appear on the same line separated by a comma: Both linkages required!

Challenge

Ability to automate

Solution

Nelprof/Linkage Wizard

Designed for easy automation

NELES

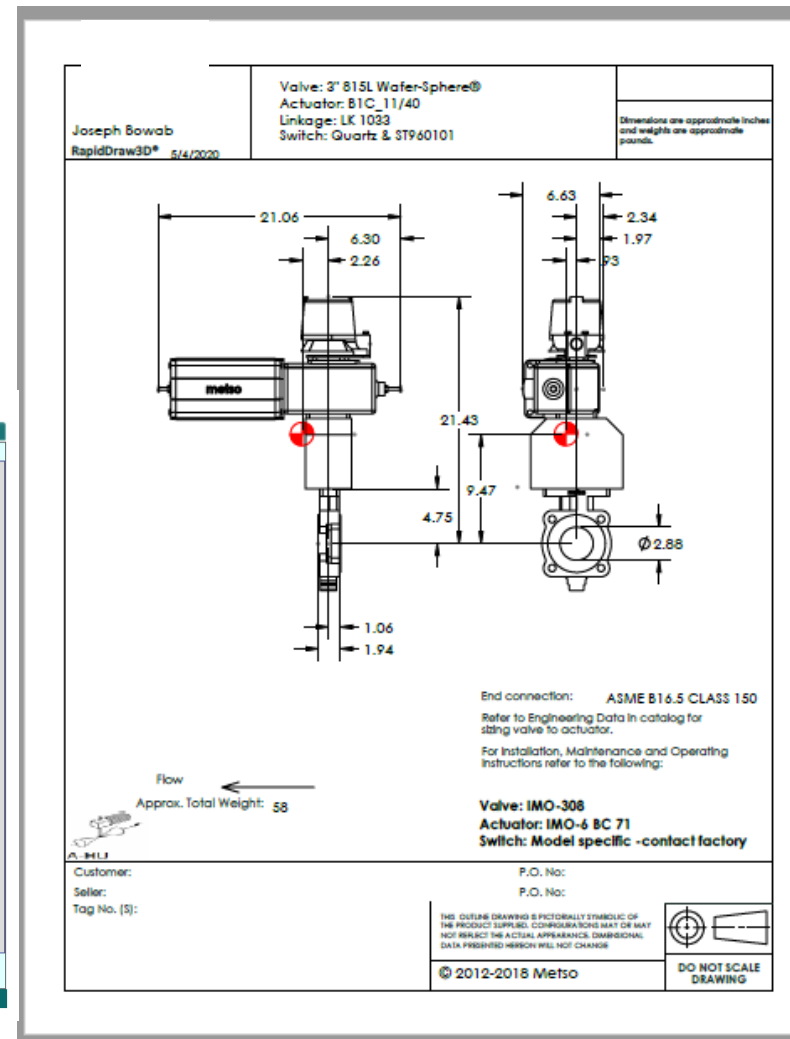
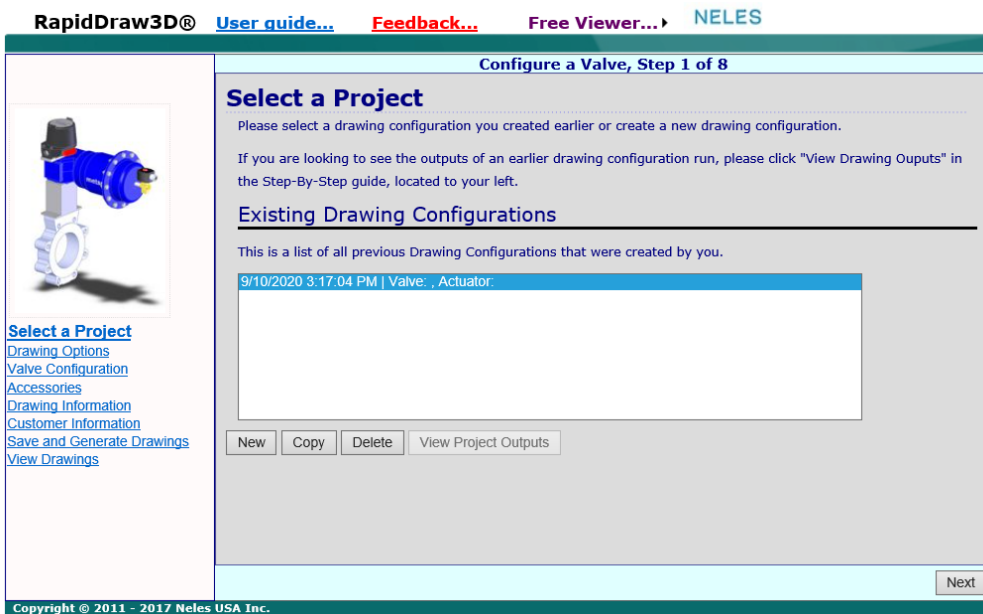
- Choose valve, actuator & instrumentation
- Dimensional drawing is generated
- [RapidDraw](#)

Challenge

Ability to automate

Solution

RapidDraw



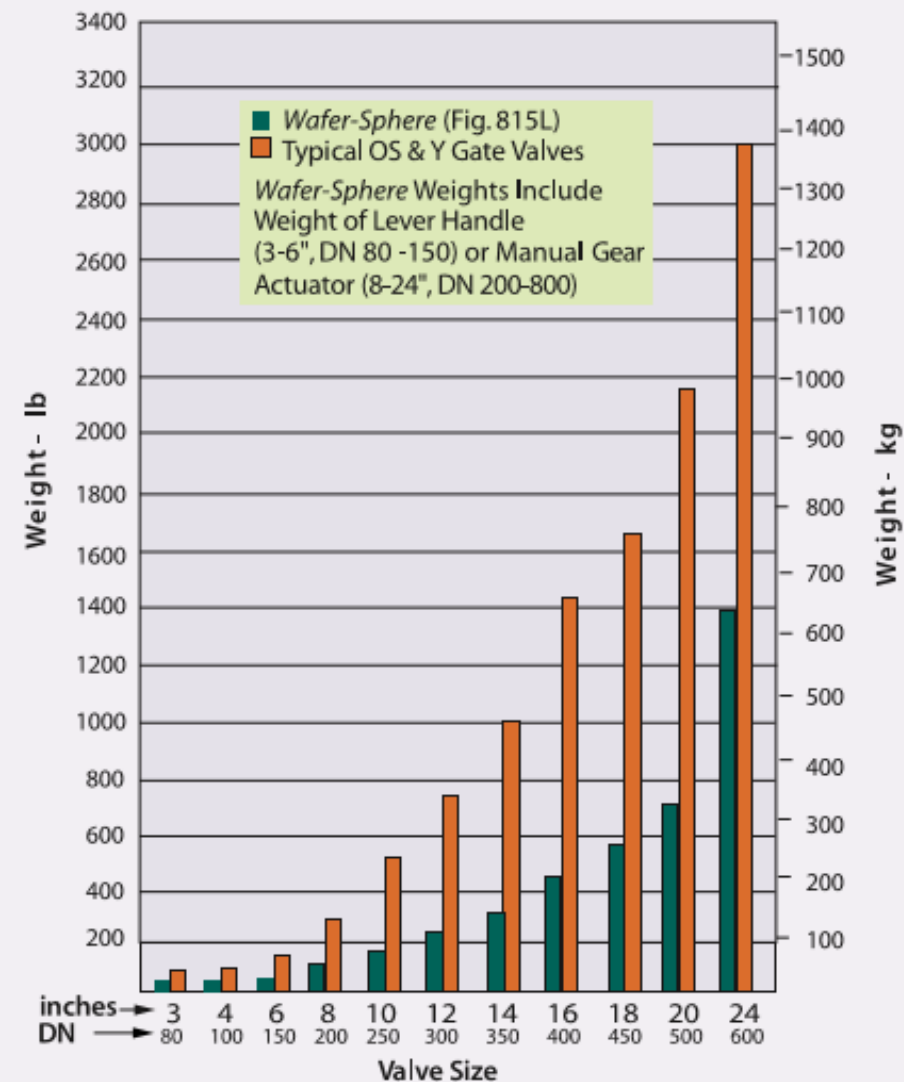
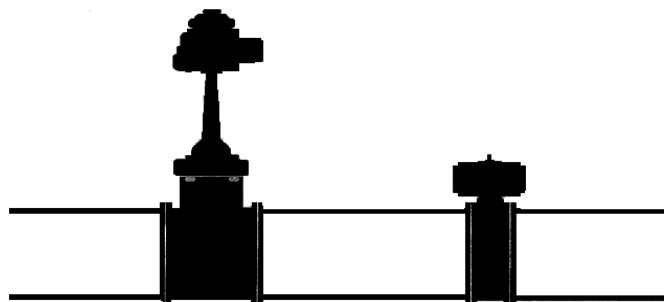
Questions?

Gatecrasher vs. Gatevalve

NELES

- Less weight
- Compact design
 - Major benefit when space is a premium.

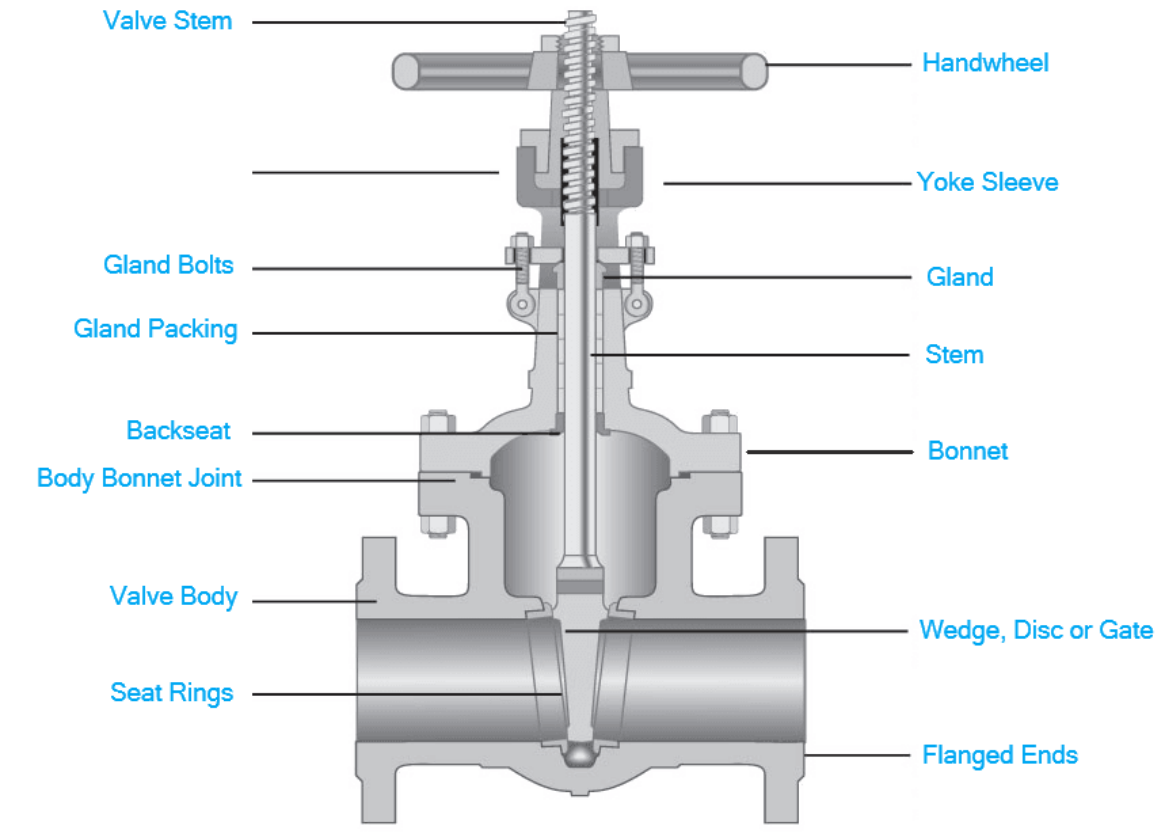
Valve Size		Dimension Comparison – Inches (mm)			
Inches	DN	Face-to-Face		Height-to-Top	
		OS&Y Gate	Wafer-Sphere	Typical OS&Y Valve	Wafer-Sphere
3	80	8 (203)	1.94 (49)	20.06 (510)	8.00 (203)
6	150	10.5 (267)	2.25 (57)	33.78 (858)	9.25 (235)
10	250	13 (330)	2.50 (64)	51.38 (1305)	22.88 (581)
14	350	15 (381)	3.63 (92)	69.44 (1764)	24.15 (613)
20	500	18 (457)	5.00 (127)	94.03 (2388)	28.68 (728)
24	600	24 (610)	6.06 (154)	105.22 (2673)	39.83 (1012)



Gatecrasher vs. Gatevalve

NELES

- Leaktight shut-off over long cycle life
 - Gate valve sealing – jamming a metal solid or split wedge into a metal seat or cavity
 - Gate valves typically do not provide reliable shut-off/tight sealing uncertain
 - Gate valves experiences leakage from minor erosion of the wedge or seal area, steam, accumulated slurry particles and coking/scaling of the seat surfaces.
- **Linear** gate valves have shorter stem cycle life
- Flexible seat and protected from erosion
- Eccentric disc eliminates leak paths



- Ease of Maintenance
 - Gate valves must be almost completely disassembled to allow access to the seat.
 - The wedge and seating area must be resurfaced by; welding, machining, grinding, and lapping.
 - Process is repeated until the desired sealing is achieved.
 - Outsourcing or a spare valve if the process line is critical.
 - Wafer-sphere one piece seat design
- Ease of automation
 - Gate Valves require to purchase a special yoke or other device to modify the gate valve body to accept actuation.

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

Applications:

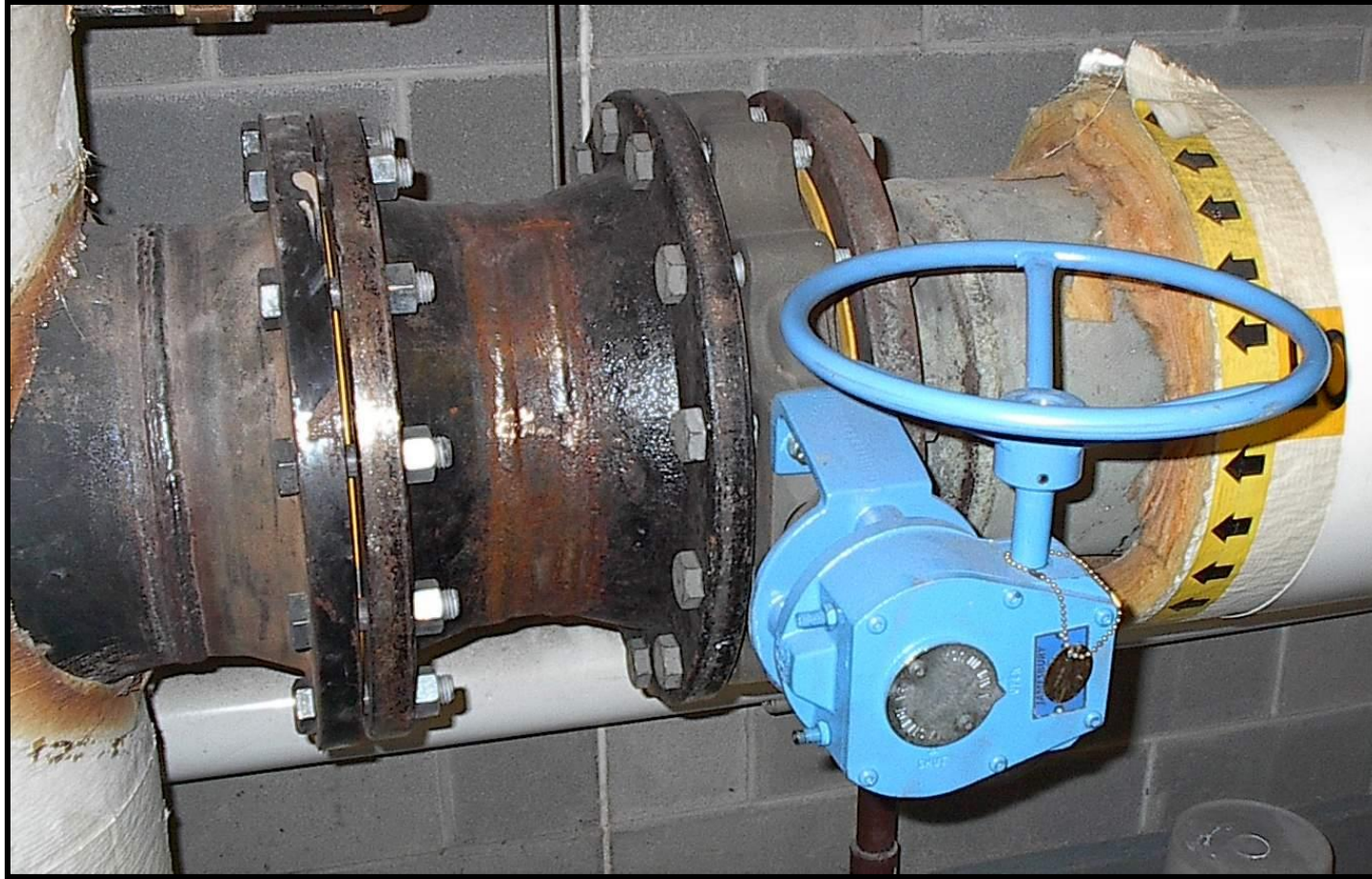
- High and low pressure steam lines
- Up to 30bar saturated Steam
- High temp/pressure water systems
- Chilled water/chemically treated H₂O
- Steam bypass lines
- Main steam lines

Gatecrasher Bulletin: [P190](#)



Wafer Replacing Gate Valve In Line

NELES



Questions?

Link for [Application Reports](#)

Application reports

- Chemicals
- Oil & gas general
- Paper
- Petrochemicals
- Power
- Pulp
- Refining
- Minerals processing

Pulp

- Batch digesters
- Bleaching
- Causticizing and lime kiln
- Continuous digesters
- Evaporation
- Washing, screening and other fiberline
- Recovery boiler

Recovery boiler

Recovery Boiler
Language options: EN
Code: 2611/09/01 (EN)
Issue: 9/2019



Link for Commercial Brochures relating to applications [Commercial Brochures](#)

Commercial brochures

Actuators

Ball valves

Butterfly valves

Jamesbury product
range

Special applications

Jamesbury® Valve Solutions for Chlor-Alkali
Processing

Language options: [EN](#)

Code: [P539 \(EN\)](#)

Issue: 12/2011



Applications Cont.

- **PTFE**

- General services, i.e. water, air, gas, clean media
- Low cost seat offering in 12" (DN 300) & smaller valves
- Temperature to +400 Degrees F (+204.4 Degrees C)
- Alternate choice in caustic applications(Extreme)
- Hydroflouric acid(Xtreme poor)

- **UHMW Polyethylene**

- Much better abrasion resistance than PTFE
- Chemical compatibility comparable to PTFE
- Good alternative when a no Teflon requirement is imposed
- Hydroflouric acid(Xtreme poor)

Challenge

Clean, general service

Abrasion resistance

Solution

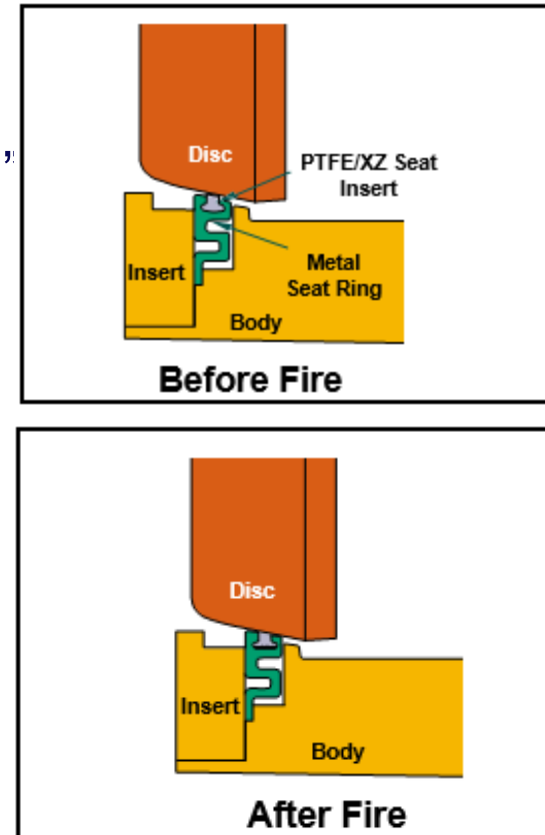
Seat materials

- PTFE
- UHMW

Applications Cont.

NELES

- Meets requirements of **API 607/BS 6775 Part 2**
- Graphite packing as standard
- Chrome plated disc
- Small cross section positively locked or “coined” PTFE or Xtreme in a metal carrier for more predictability in high temperature
- Carrier material is offered in the following:
 - 316 Stainless Steel (standard material)
 - Alloy 20, Monel, Hasteloy “C” or other more noble alloys
- ISO 15848 Class BH CO-1, 5C-200C
- Bulletin link: [W101-6EN](#)



Challenge

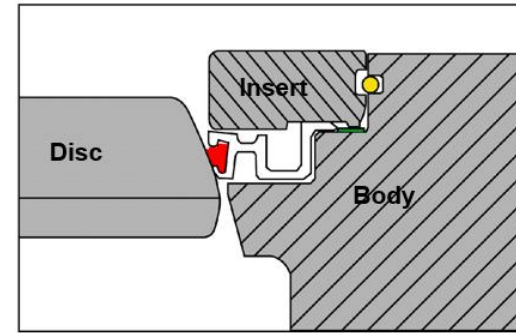
Fire Safe service

Solution

Composite Fire-Tite™ seat design

Applications Cont.

- PTFE packing as standard
- Small cross section positively locked or “coined” PTFE in a metal carrier for more predictability in low temperature
- Carrier material is offered in the following:
 - 316 Stainless Steel (standard material)
 - Alloy 20, Monel, Hastelloy “C” or other more noble alloys
- KEL-F is a hard fluorocarbon material
 - Temperature range is true cryogenic (-360°F) to +250°F
 - Standard seat offering in 14” (DN 350) & larger ANSI 150 & 300
- Bulletin link: [W130-1EN](#)



SERIES K815, K830 AND K860 CRYOGENIC WAFER-SPHERE® BUTTERFLY VALVES

Series K815 ASME Class 150, K830 ASME Class 300, and K860 ASME Class 600 *Wafer-Sphere* high-performance butterfly valves are designed to meet the severe conditions of cryogenic services such as air separation and LNG. They have been proven to provide superior performance and reliability in a wide range of applications, and offer a low cost of ownership.

Challenge

Cryogenic service

Solution

Composite/Kel-F seat design

Applications Cont.

NELES

- **The XTREME Advantage:**
 - Best in class pressure, temperature and sealing performance in saturated steam to 450 PSI(31 bar)
- Bulletin link: [W150-1EN](#)

WAFER-SPHERE® BUTTERFLY VALVES FOR STEAM SERVICE

WAFER-SPHERE high-performance butterfly valves are well suited for a wide range of steam applications. They are available in both lugged and wafer-style body designs. Sizes range from 2-1/2" – 60" (DN 65 – 1500) ANSI Class 150, 3" – 36" (DN 80 – 900) Class 300, and 3" – 24" (DN 80 – 600) Class 600.

WAFER-SPHERE valves offer a number of design features that make them the ideal choice for effective steam handling.

*Bray's seat design is limited to 150 psi in steam service for on/off.
When used for control, rating is reduced further to only 50 psi

Challenge

Steam service

Solution

Xtreme seat

Applications Cont.

- PTFE or Xtreme seat
- 0-50 ppm; carbon steel body w/Monel disc & shaft
 - 316SS, Alloy 20, Monel, Hastelloy body optional
 - Hastelloy shaft optional
- > 50 ppm; Monel construction
 - Hastelloy optional
- Bulletin link: [W150-2EN](#)

WAFER-SPHERE® BUTTERFLY VALVES FOR CHLORINE SERVICE

JAMESBURY® WAFER-SPHERE high-performance butterfly valves specially prepared for chlorine service provide reliable performance in handling a wide range of chlorine applications. Excellent for both on-off and proportional control, they are available in ANSI Class 150, sizes 2-1/2" through 60" (DN 65 – 1500), ANSI Class 300, sizes 3" through 36" (DN 80 – 900), and ANSI Class 600, sizes 3" through 24" (DN 80 – 600).

Challenge

Chlorine service

Solution

PTFE or Xtreme seat

Specific constructions

Applications Cont.

NELES

- Stainless Steel-PTFE shaft bearings
- PTFE shaft seals
- Common materials of construction
 - Monel® body with Monel disc
 - 316 SS body with Monel disc
 - 316 SS body and disc
 - Carbon Steel body with 316 SS disc.
- Bulletin link: [W150-3EN](#)

WAFER-SPHERE® BUTTERFLY VALVES FOR OXYGEN SERVICE

Wafer-Sphere high performance butterfly valves are available specially prepared for oxygen service, capable of filling a wide range of oxygen applications that include both on-off and proportional control.

Challenge

Oxygen service

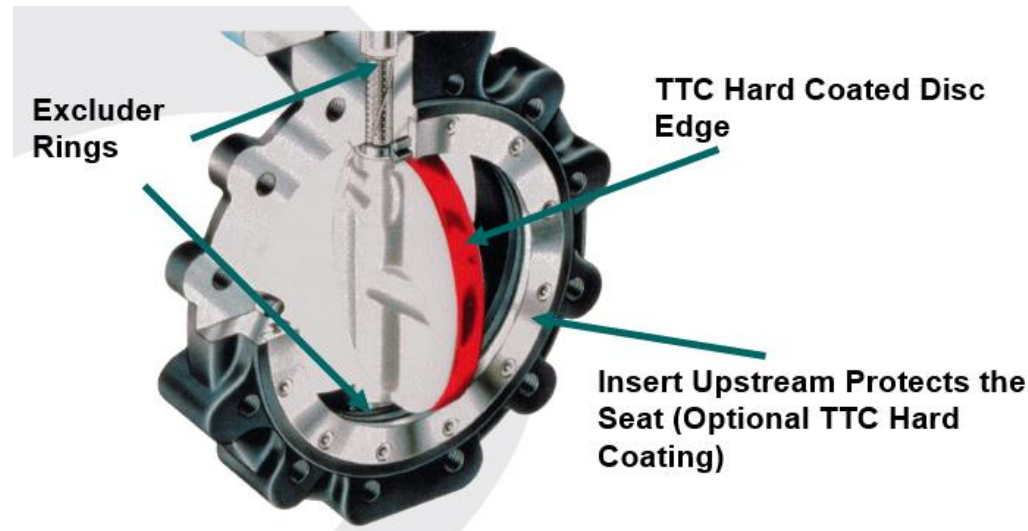
Solution

PTFE soft goods

Specific constructions

Applications Cont.

- For applications involving slurries or gas-borne solid particles, Wafer-Sphere valves are available with the disc hard-coated with tungsten titanium carbide (TTC).
 - Not recommended for corrosion resistance media...chrome plating would be preferable
- Xtreme material has great resistance in abrasive service
 - RTFE has low tolerance for abrasive media



Challenge

Abrasive service

Solution

Hard-Coated disc and
Xtreme seat

Applications Cont.

- Wafer-Sphere standard offering w/Xtreme seat & TFM seal is designed for vacuum service - 50F to 500F to 2×10^{-2} cc/sec
 - PTFE seat & seal -50F to 400F
- High Vacuum +20F to 300F not to exceed 1×10^{-5} cc/sec
- Certified vacuum requires an additional test and test report.
- Bulletin link: [W150-4EN](#)

WAFER-SPHERE® BUTTERFLY VALVES FOR VACUUM SERVICE

For vacuum applications, *Wafer-Sphere* high-performance butterfly valves offer not only the conventional butterfly valve advantages of compactness, minimum amount of surface area exposed to the vacuum, and simplicity of design, but also the tight shut-off and long cycle life resulting from the *Wafer-Sphere* valves unique construction.

Challenge

Vacuum service

Solution

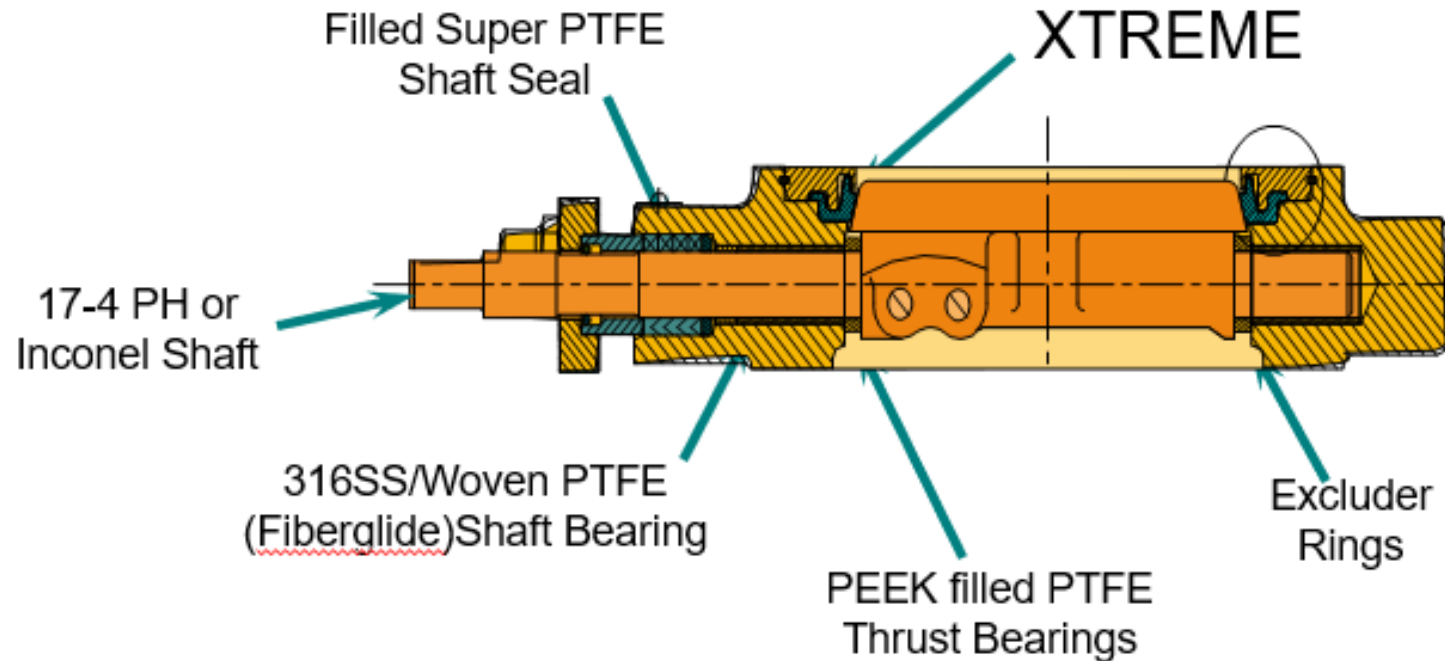
Standard offering bi-directional sealing

Questions?

Applications Cont.

NELES

Features:



Challenge

High cycle(oxygen, nitrogen, hydrogen, water, other clean media)

Solution

High cycle construction

High-Cycle Bearing Laboratory Test Results in Actual Valve

	Bearing	Picture	Bearing Load P, psi	Surface Velocity V, fpm	PV (psi - fpm)	Coefficient of friction	Bearing weight loss (%)	Cycle life
1st Generation Standard Bearing	<u>EPI Hy-Load</u> - Filled PTFE with perforated stainless steel backing		2,360	2.05	4,838	0.133	3.67	215,744
Current Generation Standard Bearing	<u>Norglide M</u> - Filled PTFE with bonded stainless steel backing		2,373	2.10	4,983	0.115	2.20	398,699
1st Generation High Cycle Bearing	<u>Bronze Bearing</u> - SAE 660 lubricated with Mobilux EP1 grease every 50,000 cycles		2,750	1.75	4,813	0.084	6.37	534,785
2nd Generation High Cycle Bearing	<u>Rexnord Duralon</u> - Woven PTFE fiber and Dacron liner with fiberglass backing		2,360	1.95	4,602	0.203	1.80	519,764
Current Generation High Cycle Bearings	<u>FIBERGLIDE</u> - Woven PTFE fiber and Dacron liner with bonded stainless steel backing		2,344	2.34	5,479	0.061	0.40	1,268,207

Challenge

High cycle(oxygen, nitrogen, hydrogen, water, other clean media)

Solution

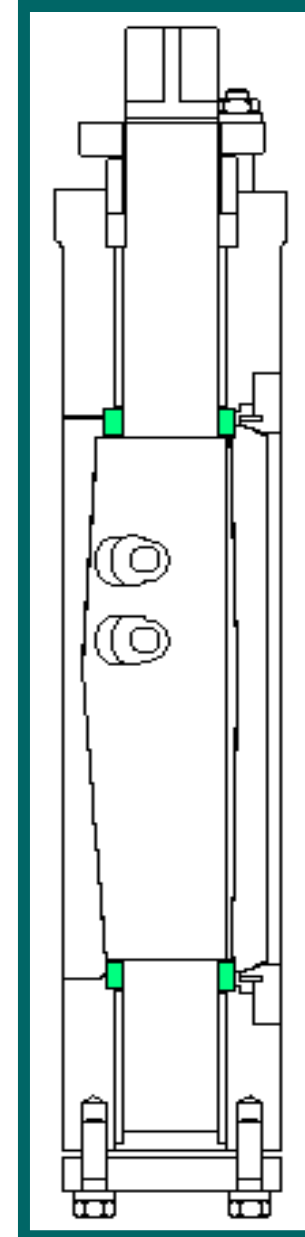
High cycle shaft bearings

Applications Cont.

NELES

High cycle life thrust bearings key features:

- PEEK and carbon fiber filled PTFE
- 200 x increase in cycle life over standard bearing
- Prevents damage to disc and body
- Low cost option
- Increases valve and plant reliability
- Chemical compatibility



Challenge

High cycle(oxygen, nitrogen, hydrogen, water, other clean media)

Solution

High cycle thrust bearings

Applications Cont.

NELES

- High cycle bearings: WM ZJ

B1 Series High Cycle Option

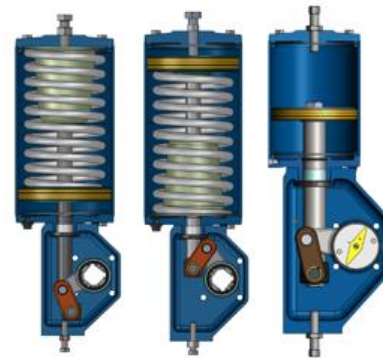
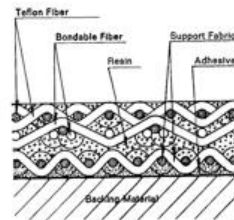
Proven → 3 – 5 million cycles



Piston rod seal

Connecting arm

Bearings



Challenge

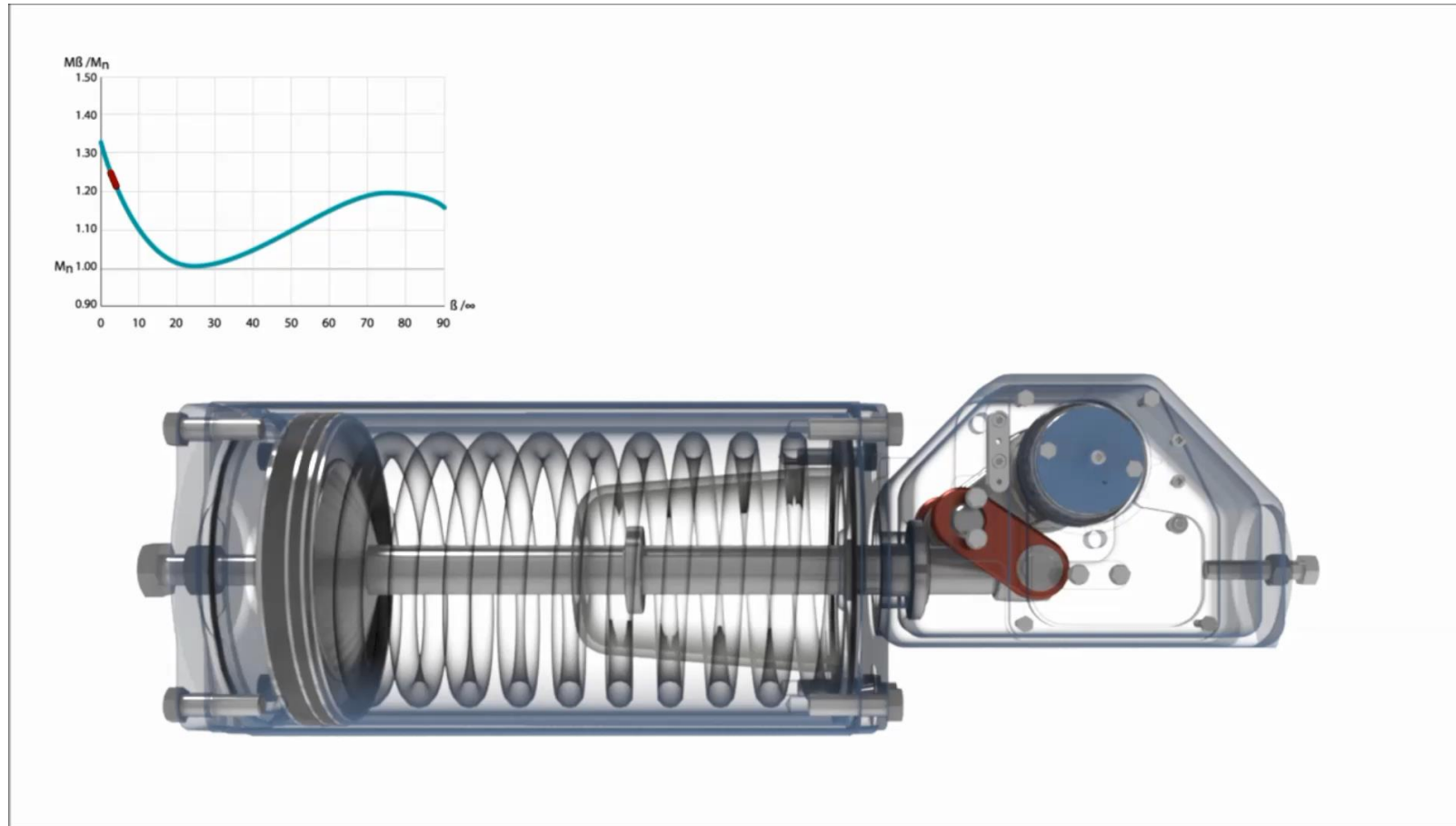
High cycle(oxygen, nitrogen, hydrogen, water, other clean media)

Solution

High cycle actuator

B1J - Single Acting Fail Close

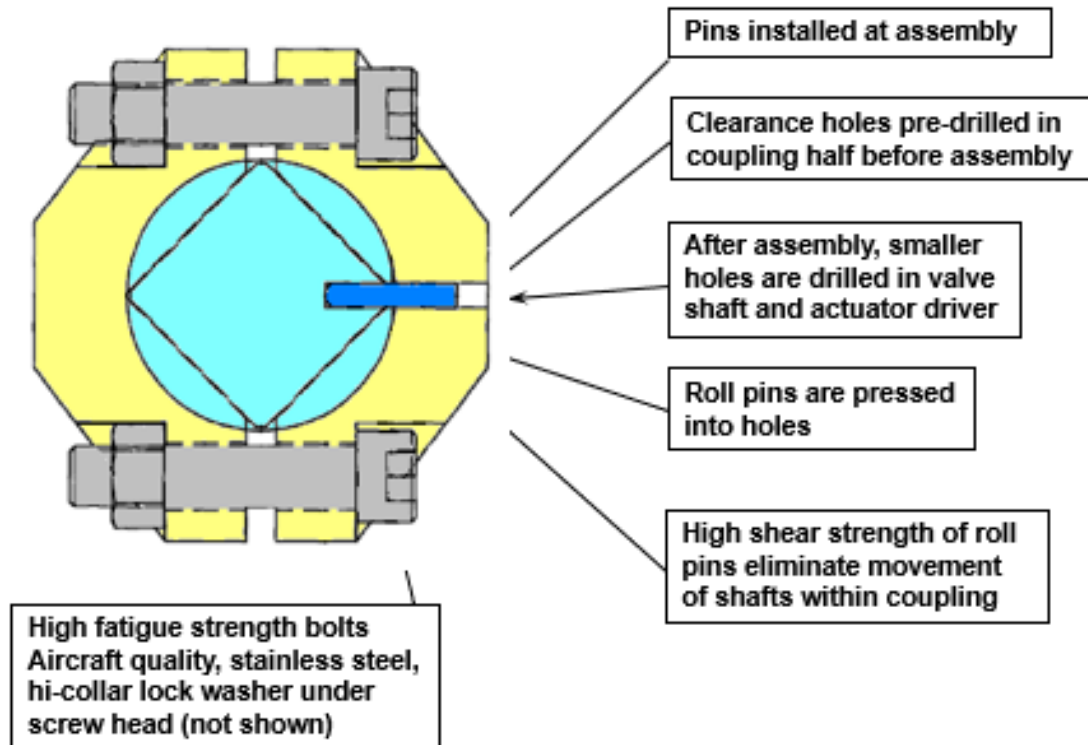
NELES



Applications Cont.

NELES

- High cycle coupling: WM WV
 - Additional Pins installed in coupling and shaft
 - High fatigue strength bolts



Challenge

High cycle(oxygen, nitrogen, hydrogen, water, other clean media)

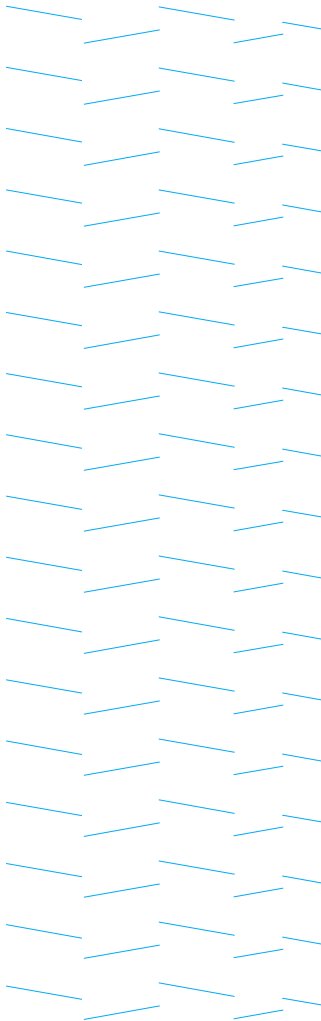
Solution

High cycle “no play” coupling

High Cycle Construction

NELES

- Jamesbury's soft seated Wafer-sphere high cycle valve, combined with Neles' high cycle B-Series actuator and no-play coupling, result in the most reliable valve on the market.
- Yields significantly longer life than a standard configuration valve
- Increase the customers maintenance interval two-fold in high-cycle, clean applications
 - High cycle bearings: WM MM
 - Inconel shaft: WM HY
 - Live loaded packing: WM QY
- **Warning:** Avoid any media containing acids or chemicals such as chlorine, bromine, sulfur dioxide, or steam, or temperatures that exceed 325°F.



Questions?

Applications Cont.

- Same seat design as 815
- Process-Rated – 100 PSI max.
- 30-60 inch is standard
- Available in lug body design
- High CV disc – two-piece shaft
- Available High Vacuum Certification
- Fire-Tite™ version available
- Bulletin link: [W105-1EN](#)



NELES

Challenge

Large size/low DP

Solution

835 Series

Product Offering

Standard & Fire-Tite™

NELES

	815/818		830/838		860/868	F815/F818		F830/F838		F860/ F868
Body Style	Wafer	Lugged	Wafer	Lugged	Wafer/Lugged	Wafer	Lugged	Wafer	Lugged	Wafer/ Lugged
Size Range	2 ½" – 30"	2 ½" – 60"	2 ½" – 30"	3" – 36"	3" – 24"	2 ½" – 30"	2 ½" – 60"	2 ½" – 30"	3" – 36"	3" – 24"
Pressure	Vacuum to ASME Class 150		Vacuum to ASME Class 300		Vacuum to ASME Class 600	ASME Class 150		ASME Class 300		ASME Class 600
Temperature	-50°F to 500°F									
Drilling	CL150 PN 10-16 optional		CL 300 PN 25-40 optional		CL 600	CL150 PN 10-16 optional		CL 300 PN 25-40 optional		CL 600
Body Material	Standard: CS, 316 SS Optional: Common/alloyed steels, 317 SS, Alloy 20, Monel, Hastelloy C									
Seating	Soft(XZ, TT, UU)					Metal Carrier/soft seat(XE, AE)				
Actuation	B1/QPX/VPVL/Gears/Levers									

Product Offering

NELES

Cryogenic & Large Size/Low DP

	K815/K818	K830/K838	K860/K868	835/83P	F835/F83P
Body Style	Wafer/Lugged	Wafer/Lugged	Wafer/Lugged	Lugged	
Size Range	3" – 20"	3" – 24"	3" – 12"	30" – 60"	
Pressure	ASME Class 150	ASME Class 300	ASME Class 600	ASME Class 150; 100 PSI ΔP MAX	
Temperature	-320°F to 300°F			-50°F to 500°F	
Drilling	CL150 PN 10-16 optional	CL 300 PN 25-40 optional	CL 600	Vacuum to CL150	CL150
Body Material	Standard: 316 SS, Monel			Standard: CS, 316 SS	
Seating	Metal Carrier/soft seat(AS, KT)			Soft(XZ, TT, UU)	Metal Carrier/soft seat(XE, AE)
Actuation	B1/QPX/VPVL/Gears/Levers			B1/Gears	

Butterfly Valves Certification/Approvals

NELES

Standard & Fire-Tite™

	815/818	830/838	860/868	F815/F818	F830/F838	F860/ F868
ISO 15848	3"-14" Class BH CO-3 (5C-200C) Live Loaded PTFE	3"-12" Class BH CO-3 (5C-200C) Live Loaded PTFE		8"-36" Class BH CO-1 (5C-200C) Live Loaded James Walker SuperGraf Premier	8"-24" Class BH CO-1 (5C-200C) Live Loaded James Walker SuperGraf Premier	
TA LUFT	2 ½"-24" VDI 2440;100,000 operations RT					
API 607				2 ½"-60" CS/SS Standard & Live Loaded Graphite Packing AE, AF, AH, XE, XF, XH		4"-24" CS/SS Standard Graphite Packing AE, AF, AH, XE, XF, XH
SIL	SIL 3	SIL 3	SIL 3			

- Approvals & certificates can be found in Business Center→
- [Certifications](#)
- [T110-1](#)

Certifications

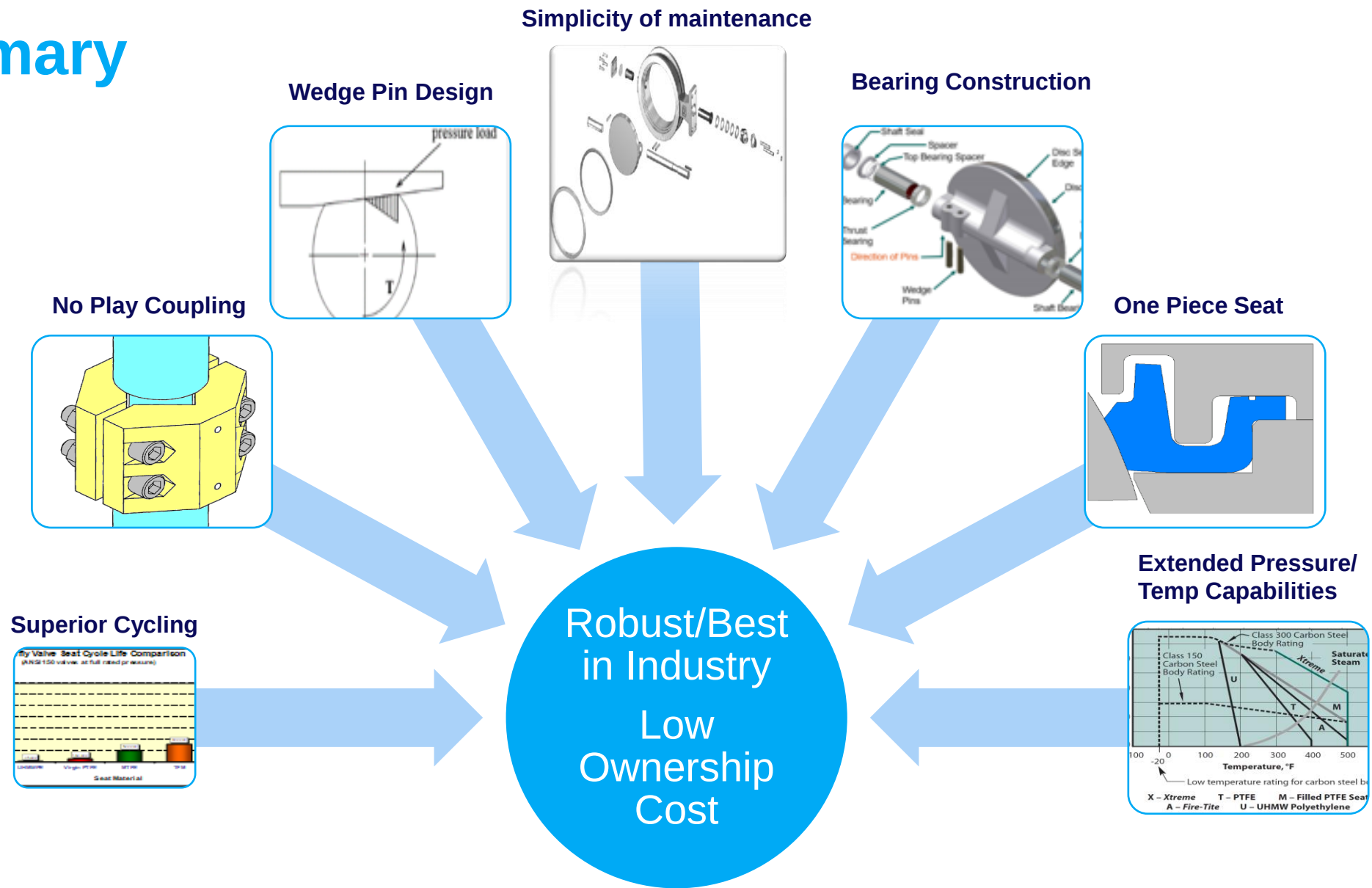
To download or email individual documents, follow the links below. For bulk ordering of printed material select the [Bulk Literature Ordering](#) link.

- » [Russian Certificates \(GOST\) \(TR-CU\)](#)
- » [AAR Certifications](#)
- » [American Bureau of Shipping \(ABS\)](#)
- » [ATEX](#)
- » [Australian Gas Association](#)
- » [Canadian Reg. Numbers & Statutory Declarations](#)
- » [CSA Certifications](#)
- » [DNV GL Marine Approval](#)
- » [FDA](#)
- » [Fugitive Emissions \(ISO 15848\)](#)
- » [Fugitive Emissions \(VDI 2440 - TA LUFT\)](#)
- » [Gas Shut-Off Valves](#)
- » [NACE](#)
- » [Oxygen Certificates](#)
- » [Pressure Equipment Directive \(PED\)](#)
- » [SIL Certification](#)
- » [TSG Approval - China](#)
- » [United States Coast Guard](#)
- » [ValvGuard Products](#)

APPROVALS, ACCEPTANCES AND LISTINGS

Jamesbury® brand products have been accepted by a number of qualifying organizations and agencies world-wide. Many of the approvals are explained herein, with a list of the specific products that have been accepted. We welcome inquiries concerning approvals or listings of any products or organizations that are not covered in this bulletin.

Summary



Contact us

- Product Manager – Joseph Bowab
 - joseph.bowab@neles.com
 - 1-508-340-8022
- Applications Engineering
 - apps.engineering@neles.com
- Area Sales Managers map
 - Link to [map](#)

NELES



Q. Has Neles compared high cycle capabilities between the Wafer-Sphere and competitor HPBFVs?

A. Many of our competitors have a high cycle construction, but Neles' solution is the most robust and reliable in the market.

Q. Since Xtreme is so superior to RTFE but many specs call out RTFE. Is it easy to offer Xtreme in place of RTFE?

A. RTFE is called out because of how common the material is, but it's inferior to Xtreme and should not be an issue to offer.

Q. Will you be covering what is done to a valve for high vacuum?

A. There is no change in the design to achieve high vacuum. Assembly must be dry and oil free.

Q. Do any of the competitors meet API 598 as standard?

A. Yes I'm sure some competitors meet API 598 as standard, however it is not necessary. Due to years of testing and field installation our team determined to test per JST-03. Our valves meet API 598.

Q. Do we have FDA certification ?

A. There is no FDA certification...just a list of acceptable materials. Using Xtreme, PTFE and SS components meets FDA requirements.

Q. Where can we get MAST values for WS valves?

A. Our application engineering group maintains this information.

Q. Does every Neles employee have access to Rapid draw?

A. RapidDraw can be accessed via the Business Center. If you need access to Business Center please [click](#) here to register.

Q. How can put in type code all these option?...with WM?

A. Type codes can accept up to 3 Word Modifiers. Any additional would require an “E” number.

FAQs

Q. Could you please explain shaft downstream and shaft upstream design as an application point of view. When we need to go for downstream and upstream. Also, is there any guidelines for this?

A. Applications do not determine the flow direction. We will always recommend flowing from the insert side, however either direction is acceptable. The design is exactly the same no matter what the flow direction.

Q. You do not get any dirt behind the seat because of this design?

A. We track all of our Returns/Warranties and dirt behind the seat has not been an issue. The tail of the seat is trapped within the flexure zone preventing this from happening.

Q. The last picture where the butterfly valve replaces the gate valves you now have more possibilities for leakage?

A. The picture showing the Wafer-Sphere replacement of a Gate Valve requires an adapter that increases the number of pipe gaskets. These are the responsibility of the end user and are not a common leak path/failure mode.

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