

Уплотнения с аксиально подвижным вторичным уплотнением

Технические характеристики

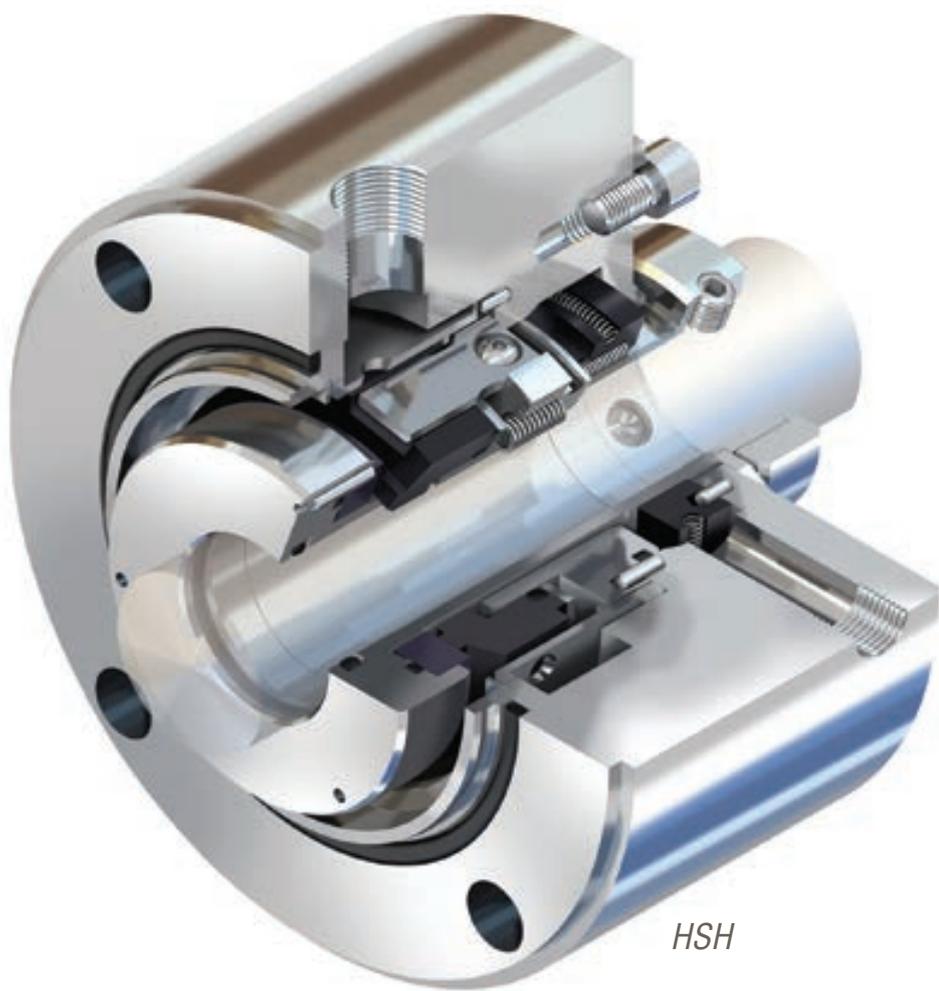
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HSH

PUSHER

Popular for their cost-effective versatility, you'll find Flowserve pusher seals in a wide variety of applications and industries. From general services and light hydrocarbons to high-pressure and high-speed applications, Flowserve pusher seals provide the extended reliability and rugged durability you can count on. Even after years of operation, Flowserve pusher seals have a proven reputation for easy repairs that return them to service quickly.

Pusher – Quick Reference*

Product	Sub-Type	Pressures to	Temperatures	Speeds to	Sizes
ISC2-PX, ISC2-XP, ISC2-682PX and ISC2-682XP	Industrial Process	20.6 bar (300 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	25 to 200 mm (1.000 to 8.000 in)
ISC2-PP and ISC2-682PP	Industrial Process	20.6 bar (300 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	25 to 200 mm (1.000 to 8.000 in)
QB, QBS and QBU	Industrial Process	51.7 bar (750 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	12.7 to 139.7 mm (0.500 to 5.500 in)
UC and UCQ	Industrial Process	27.6 bar (400 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	14.1 to 148 mm (0.566 to 5.838 in)
RO	Industrial Process	20.7 bar (300 psi)	-40°C to 260°C (-40°F to 500°F)	23 m/s (75 fps)	9.5 to 115 mm (0.375 to 4.500 in)
CRO	Industrial Process	20.7 bar (300 psi)	-40°C to 260°C (-40°F to 500°F)	23 m/s (75 fps)	9.5 to 115 mm (0.375 to 4.500 in)
Europac Series	Industrial Process	25 bar (360 psi)	-40°C to 220°C (-40°F to 430°F)	23 m/s (75 fps)	10 to 100 mm (0.394 to 3.940 in)
RA and RA-C	Industrial Process	27.6 bar (400 psi)	-40°C to 177°C (-40°F to 350°F)	23 m/s (75 fps)	13 to 127 mm (0.500 to 5.000 in)

* Additional products shown on next page

Pusher – Quick Reference, cont'd.

Product	Sub-Type	Pressures to	Temperatures	Speeds to	Sizes
QBQ and QBQ LZ	API Process	51.7 bar (750 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	12.7 to 139.7 mm (0.500 to 5.500 in)
QBB and QB2B	API Process	51.7 bar (750 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	20 to 121 mm (0.787 to 4.750 in)
HSH	API Process	103 bar (1500 psi)	-40°C to 260°C (-40°F to 500°F)	46 m/s (150 fps)	25.4 to 156 mm (1.000 to 6.125 in)
UO and UOP	Pipeline Process	103.4 bar (1500 psi)	-40°C to 204°C (-40°F to 400°F)	23 m/s (75 fps)	14.1 to 148 mm (0.566 to 5.838 in)
D and DP	High-Energy Process	103.4 bar (1500 psi)	-73°C to 343°C (-100°F to 650°F)	23 m/s (75 fps)	13.4 to 137 mm (0.525 to 5.400 in)
UHTW and DHTW	High-Energy Process	207 bar (3000 psi)	-40°C to 371°C (-40°F to 700°F)	76 m/s (250 fps)	25.4 to 228.6 mm (1.000 to 9.000 in)

INDUSTRIAL PROCESS

ISC2-PX, ISC2-XP, ISC2-682PX and ISC2-682XP

The ISC2-PX single cartridge pusher seal brings superior reliability to ASME, ISO and JIS pumps used in chemical, power, water, pulp and paper, and general industries. ISC2-682 versions provide full API 682 compliance.



- Increased reliability with thermal management technology that runs cooler in suboptimal conditions such as short-term dry running events
- Longer service life enabled by corrosion-resistant design and drive mechanisms that reduce wear in high-vibration applications
- Comprehensive range of pre-engineered configurations with standard flush (PX), Plan 23 cooling (XP); custom solutions available
- Increased safety delivered by throttle bushing with standard quench and drain for safe containment in the unlikely event of seal failure

SPECIFICATIONS

Press. to: 20.6 bar (300 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 25 to 200 mm (1.000 to 8.000 in)
Refer to literature FSD243 at /library.

INDUSTRIAL PROCESS

ISC2-PP and ISC2-682PP

These dual cartridge pusher seals from the versatile ISC2 Series bring superior reliability to ASME, ISO, JIS and API pumps used in chemical, power, water, oil and gas, and other industries.



- Reliable operation resulting from advanced volute groove design and internal circulating devices that promote cool running
- Longer service life via a stationary face support drive mechanism that reduces wear in applications with high vibration levels, and springs and pins outside the process for reduced corrosion and clogging
- Application flexibility with double-balanced seal face geometry, allowing both pressurized and unpressurized operation; ISC2-682PP provides full API 682 compliance

SPECIFICATIONS

Press. to: 20.6 bar (300 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 25 to 200 mm (1.000 to 8.000 in)
Refer to literature FSD243 at /library.

INDUSTRIAL PROCESS

QB, QBS and QBU

QB Series balanced pusher seals are ideal for medium-duty applications in power and industrial applications.



- Greater reliability and installation ease assured by rugged components, heavy-duty seal faces and cartridge seal configuration
- Combat dirty services with the clog-resistant large cross-section, single coil spring in the QBS seal
- Handle low lubricity hot water without the need for auxiliary cooling systems with the QBU seal
- Choice of throttle bushing design: fixed, floating or segmented for safe equipment operation

SPECIFICATIONS

Press. to: 51.7 bar (750 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 12.7 to 139.7 mm
(0.500 to 5.500 in)
Refer to literature FSD152 at /library.

PUSHER

INDUSTRIAL PROCESS

UC and UCQ



The UC Series is a balanced pusher seal with a substantial single coil spring that provides exceptional performance in refinery, pipeline and petrochemical services.

- Extended service life in heavy-duty applications assured by rugged single pusher seal with thick cross-section components
- Increased reliability via large, low spring rate single coil spring that tolerates axial setting dimensions while reducing opportunity for clogging and hang-up from solids
- Consistent seal face contact provided by robust U-cup seal and spring holder
- Low-emissions performance enabled by silicon carbide rotating face mounted on graphite ring, preventing shrink fit distortions and sustaining a flat seal face

SPECIFICATIONS

Press. to: 27.6 bar (400 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 14.1 to 148 mm
(0.566 to 5.838 in)
Refer to literature FSD110 at /library.

INDUSTRIAL PROCESS

RO



This single, unbalanced, multi-spring component seal is usable as an inside or outside mounted seal. Suitable for abrasive, corrosive and viscous fluids in chemical services.

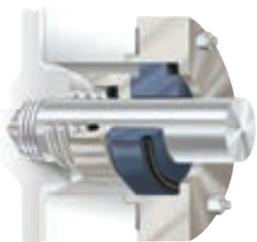
- Increased durability from robust rotating spring compression unit that helps to keep solids away from the seal faces and removes seal-generated heat
- Improved reliability with rotating seal ring that is independently centered on the shaft and has multiple springs and drive pins that evenly distribute the load
- Broad application flexibility enabled by completely interchangeable shaft packing materials, dimensionally interchangeable insert mounting, and compression unit availability in any machinable metallurgy

SPECIFICATIONS

Press. to: 20.7 bar (300 psi)
Temp: -40°C to 260°C (-40°F to 500°F)
Speeds to: 23 m/s (75 fps)
Sizes: 9.5 to 115 mm
(0.375 to 4.500 in)
Refer to literature FSD155 at /library.

INDUSTRIAL PROCESS

CRO



The CRO is an economical, single-coil spring, friction drive component seal for use in pumps with packing box seal chambers. Available in single or dual arrangements.

- Longer service life derived from rotating seal ring that self-centers around the shaft and withstands the harsh demands of cyclic operation or continuous duty
- Increased durability from robust single-coil spring that resists clogging and chemical attack
- Simplified installation and improved corrosion resistance due to a design with a minimum number of seal components with heavy cross-sections

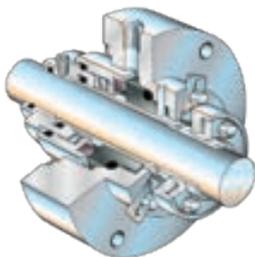
SPECIFICATIONS

Press. to: 20.7 bar (300 psi)
Temp: -40°C to 260°C (-40°F to 500°F)
Speeds to: 23 m/s (75 fps)
Sizes: 9.5 to 115 mm
(0.375 to 4.500 in)
Refer to literature FSD169 at /library.

INDUSTRIAL PROCESS

Europac Series

Europac single, wavy spring seals are designed for ISO pumps in a wide range of duties in chemical and general industries. Designed according to metric DIN EN 12 756 standard to L1k.



- Longer service life assured by rigid, corrosion-resistant retainer with or without integrated pumping thread
- Increased reliability delivered by X-spring with anti-axial displacement and rigid PTFE or elastomers for secondary sealing
- Broad application versatility provided by multiple arrangements, including standard design (600), balanced stepped shaft (610) and hot water services without cooling (615)

SPECIFICATIONS

Press. to: 25 bar (360 psi)
Temp: -40°C to 220°C (-40°F to 430°F)
Speeds to: 23 m/s (75 fps)
Sizes: 10 to 100 mm
(0.394 to 3.940 in)

Refer to literature FSD128 at /library.

INDUSTRIAL PROCESS

RA and RA-C

With its composite rotor, the RA single outside-mounted component seal is a cost-effective solution for highly corrosive chemical services. Suitable for metallic and nonmetallic equipment, such as plastic, glass and lined designs.



- Installation ease with design that attaches to the outside of the seal chamber
- Corrosive application performance and flexibility provided by seal faces and elastomers in diverse materials, plus non-wetted drive collar, springs and drive pins on the RA-C configuration to avoid the need for expensive alloys
- Greater reliability assured by flexible rotor design, hydraulically balanced to provide proper face loading
- Better process control via double O-ring mounted stator that prevents distortion

SPECIFICATIONS

Press. to: 27.6 bar (400 psi)
Temp: -40°C to 177°C (-40°F to 350°F)
Speeds to: 23 m/s (75 fps)
Sizes: 13 to 127 mm
(0.500 to 5.000 in)

Refer to literature FSD170 at /library.

Learn to Visually Identify Seal Failures

Troubleshoot seal failures with the Flowserve Seal Failure Analysis app. This tool is an invaluable resource for maintenance personnel and reliability engineers tasked with maximizing equipment uptime. You'll learn the tell-tale signs for visually identifying more than 60 seal failure modes plus typical causes and options for prevention.



PUSHER

API PROCESS

QBQ and QBQ LZ



This medium- to high-pressure seal features a high balance face that meets the lowest light hydrocarbon emissions level: less than 500 ppm. Designed to suppress flashing and minimize heat generation.

- Satisfies all API 682 design and qualification test requirements for single and dual Arrangement 1 and 2 seals
- Extended equipment reliability with optimal face cooling and reduced distortion from available multiport injection
- Safety and environmental compliance assured by dual seal arrangement, which provides safety backup and emissions control in hazardous services
- Handle low vapor pressure margin with the QBQ LZ seal, featuring wave pattern precision face topography to minimize heat generation and seal face wear

SPECIFICATIONS

Press. to: 51.7 bar (750 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 12.7 to 139.7 mm
(0.500 to 5.500 in)
Refer to literature FSD152 and FSD216 at /library.

API PROCESS

QBB and QB2B



Engineered to handle reverse pressurization, the QBB and QB2B dual pressurized pusher seals are capable of zero emissions. Provides full range pressure capability for API 682 Arrangement 3 requirements.

- Increased durability from ability to handle reverse pressurization upsets with capabilities that far exceed conventional balanced seals
- All parts are mechanically or hydraulically retained in place, regardless of the direction of pressurization
- Environmental compliance with design optimized for pressurized barrier fluid
- Low to moderate pressures are handled by the QBB face-to-back configuration
- Moderate and high pressures, including Piping Plan 53B, are handled by the QB2B back-to-back configuration

SPECIFICATIONS

Press. to: 51.7 bar (750 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 20 to 121 mm
(0.787 to 4.750 in)
Refer to literature FSD152 at /library.

API PROCESS

HSH



HSH balanced, flexible stator cartridge seals are built for extended reliability in high-pressure, high-speed and highly viscous services such as crude oil pipeline pumps. Fully compliant with API 682 Type A, Arrangements 1, 2 and 3.

- Extended service life via high torque-capable, anti-rotation lugs that minimize distortion and wear
- Greater efficiency from standard distribution ring connected to the seal's flush port, which improves cooling efficiency by injecting flush flow 360° around seal faces
- Reliable high-speed operation and improved tolerance of misalignment enabled by flexible stator design with Alloy C-276 springs
- Decreased inventory costs and increased design flexibility owing to parts interchangeability between single and dual seal arrangements

SPECIFICATIONS

Press. to: 103 bar (1500 psi)
Temp: -40°C to 260°C (-40°F to 500°F)
Speeds to: 46 m/s (150 fps)
Sizes: 25.4 to 156 mm
(1.000 to 6.125 in)
Refer to literature FSD156 at /library.

PUSHER

UO and UOP

The UO Series is a balanced pusher seal based on the UC Series with high-pressure features. UO Series seals are well-suited for demanding refinery, pipeline and petrochemical services.

- Extended service life in high-pressure, heavy-duty applications assured by rugged single pusher seal with thick cross-section components
- Increased reliability via large, low spring rate single coil spring that tolerates axial setting dimensions while reducing clogging and hang-up from solids
- Consistent seal face contact provided by robust U-cup seal and spring holder
- High-pressure performance enabled by engineering the seal face mounting to prevent distortions under all load conditions

SPECIFICATIONS

Press. to: 103.4 bar (1500 psi)
Temp: -40°C to 204°C (-40°F to 400°F)
Speeds to: 23 m/s (75 fps)
Sizes: 14.1 to 148 mm
(0.566 to 5.838 in)

Refer to literature FSD255 at /library.



HIGH-ENERGY PROCESS

D and DP

D Series single spring, balanced pusher seals have a high-circulation integral pumping ring to ensure proper cooling. Ideal for high-temperature boiler feed water and hot hydrocarbon services.

- Cost-effective operation ensured by integrated pumping ring that eliminates the expense of cool injection systems
- Greater reliability due to the rotating face that remains flat under all conditions for very low leakage
- Consistent seal face contact provided by robust U-cup seal and spring holder
- Superior high-temperature performance enabled by large, low spring rate single coil spring that tolerates axial setting variations

SPECIFICATIONS

Press. to: 103.4 bar (1500 psi)
Temp: -73°C to 343°C (-100°F to 650°F)
Speeds to: 23 m/s (75 fps)
Sizes: 13.4 to 137 mm
(0.525 to 5.400 in)

Refer to literature FSD153 at /library.



HIGH-ENERGY PROCESS

UHTW and DHTW

These high-speed, high-pressure balanced pusher seals are custom-engineered for high-energy applications such as boiler-feed process barrel pumps.

- Unmatched performance and extended seal life derived from FEA-designed seal faces that boast zero net deflection from thermal, hydraulic, and dynamic forces
- Superior high temperature, slow roll, and hot standby operation enabled by high performance circulating features that deliver optimum cooling at all operating speeds
- Reliable operation in high speed services achieved via precisely controlled seal face balance ratio and robust drive engagement
- Extended equipment uptime with available secondary containment options

SPECIFICATIONS

Press. to: 207 bar (3000 psi)
Temp: -40°C to 371°C (-40°F to 700°F)
Speeds to: 76 m/s (250 fps)
Sizes: 25.4 to 228.6 mm
(1.000 to 9.000 in)

Refer to literature FSD140 at /library.



По вопросам продаж и поддержки обращайтесь:

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