



# **ISC2 Series Innovative Standard Cartridge Seals**

Sealing solutions for fluid-handling applications  
on shaft diameters up to 200 mm (8.000 in)



*Experience In Motion*

*ISC2 Series seals meet all major international standards and are designed to fit hundreds of pump models from global manufacturers.*



## **Increased reliability and reduced cost of ownership in a versatile cartridge seal**

The ISC2 Series is a complete suite of mechanical seals that provide exceptional reliability and standardization over the widest variety of industrial applications and equipment.

### **Improve operational efficiency throughout your facility**

Based on an extensive global review of equipment requirements, performance expectations, service conditions and best practices, ISC2 seals are the most capable general purpose cartridge seals available. Facilities that standardize with ISC2 seals will immediately benefit from less inventory, greater flexibility, rapid availability, less downtime and longer seal life.

### **Protect your employees; protect your environment**

ISC2 seals do more to provide a safe work environment and protect the natural environment than any other standard cartridge seal. Single seals have capable throttle bushings to protect against leaks. Pressurized dual seals provide zero process emissions. The outboard seal of dual seals can handle full operating conditions if the inboard seal were to fail. All seal faces are dual balanced for normal and reverse pressure operation.

ISC2 seals work hard to eliminate the possible causes of leakage. Our thermal management technology for dry running tolerance, robust seal face drive mechanisms, high-efficiency barrier circulation, rigid setting devices and high-quality materials all contribute to improve seal life, even with multiple service conditions, off-design operation, and frequent starts and stops. ISC2 seals are capable of sustaining years of uninterrupted, long-term operation.

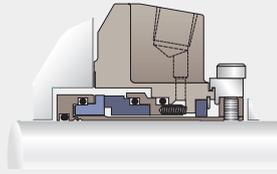
### You're not alone with Flowserve

Through our network of Quick Response Centers located throughout the world, ISC2 seal hardware is only one component of Flowserve's commitment to reducing your total cost of ownership. Our seal hardware is backed by 24-hour support, on-site service, engineering analysis, seal repair capabilities, customized stocking programs and on-time delivery.

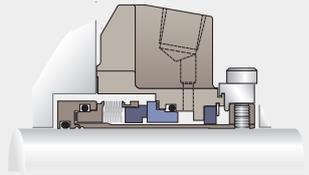
Our ultimate demonstration of commitment to customer service is through a LifeCycle Advantage™ program where ISC2 seals fit perfectly into inventory standardization programs and measurably improve mean time between repair (MTBR).

### ISC2 seals are available in four primary configurations

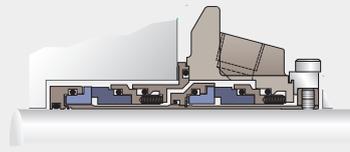
Designs for standard bore seal chambers are shown. Enlarged bore and other seal chamber sizes are available.



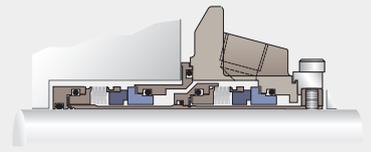
Single pusher



Single metal bellows

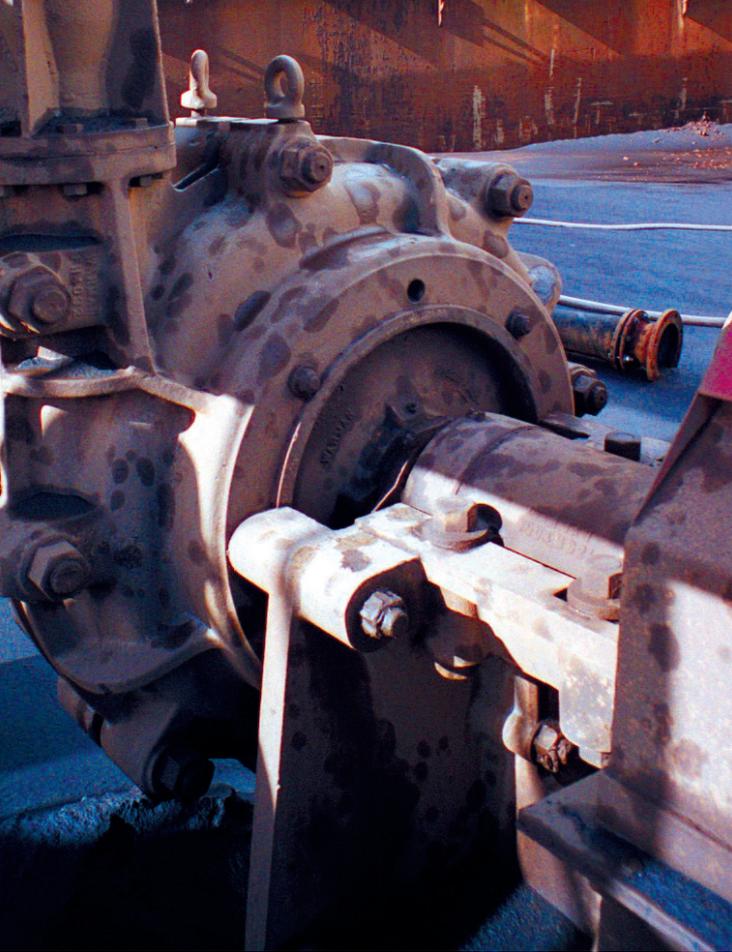


Dual pusher



Dual metal bellows





## ISC2 Series seals succeed in the widest variety of industries and applications

**With the most comprehensive industry coverage, ISC2 seals may be the only seals you need**

**Chemical** — corrosion-resistant standard and optional materials of construction; excellent dual seal performance in hazardous and toxic fluids

**Petrochemical** — pusher and bellows seal geometries engineered for a broad range of equipment sizes and operating conditions facilitate plant-wide design standardization

**Corn processing** — drive mechanisms tolerate high viscosity-driven torque and sticky fluids; high barrier flow rates enhance dual seal cooling

**Biofuels** — economical designs are versatile to multiple service types; cartridge installation is easy and the first step toward reliability

**Pulp and paper** — retrofit more packed pumps to significantly reduce leakage and water consumption; springs located outside the process fluid prevent clogging

**Water and wastewater** — simple yet robust single pusher cartridge seals are ideal for cost-effective sealing; certified to NSF International's standards for drinking water



**Mining** — pusher seals handle light solids up to 10% by weight with hard-on-hard seal faces; smooth geometry reduces opportunity for erosion

**Power** — single seals with an optional circulating device provide economical warm water sealing on condensate and circulation pumps

**Unloading terminals** — seal face thermal management survives short-term dry run events and batch processes

## Industry standards we satisfy

### API 682/ISO 21049

Standard ISC2 seals surpass all qualification testing requirements for Type A and B, Arrangement 1, 2 and 3 seals as required by API 682/ISO 21049. All design requirements for Category 1 and 2 services are satisfied with ISC2-682 seals, which feature non-slotted pilot-fit glands, thick sleeves, setting plates and much more. ISC2-682 seals will help facilities to align their standardization programs with the sealing industry's most comprehensive best practices standard.

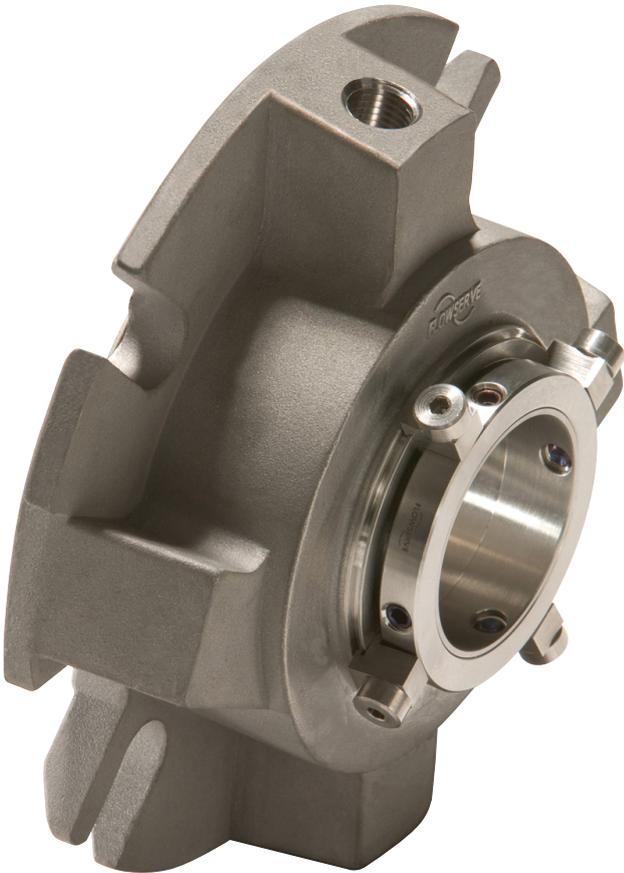


Certified to  
NSF/ANSI/CAN 61  
& NSF/ANSI 372

### NSF/ANSI/CAN 61

ISC2-PX-61 pusher seals satisfy NSF International's rigorous evaluation process and are certified to NSF/ANSI/CAN 61 and NSF/ANSI 372 for applications that involve drinking water, from the source to the tap.

NSF certifications cover all wetted components and demonstrate how ISC2-PX-61 seals meet regulatory requirements for drinking water quality, giving municipalities and water consumers confidence in safe seal selection and operation.



## Pre-engineered ISC2 seals are available for most of your pumping equipment, including custom solutions that solve unique equipment needs.

- ABS
- Ahlstrom
- Allis-Chalmers
- Arai
- Aurora
- CPC
- Dean
- Deming
- Durco
- Ebara
- Flowserve
- Floway
- Furukawa
- Fybroc
- Gorman-Rupp
- Goulds/ITT
- IDP
- Johnston
- KSB
- Kubota
- LaBour
- Lawrence
- Malhaty
- Masuda
- Moyno
- Netzsch
- Nishigaki
- Pacific
- Peerless
- Robuschi
- Ruhrpumpen
- Scanpump
- Shin Nippon
- Shinryo
- SIHI
- Sulzer
- Taiheiyo
- Torishima
- Union
- United
- Viking
- Warren
- Weir
- Wilson-Snyder
- Worthington



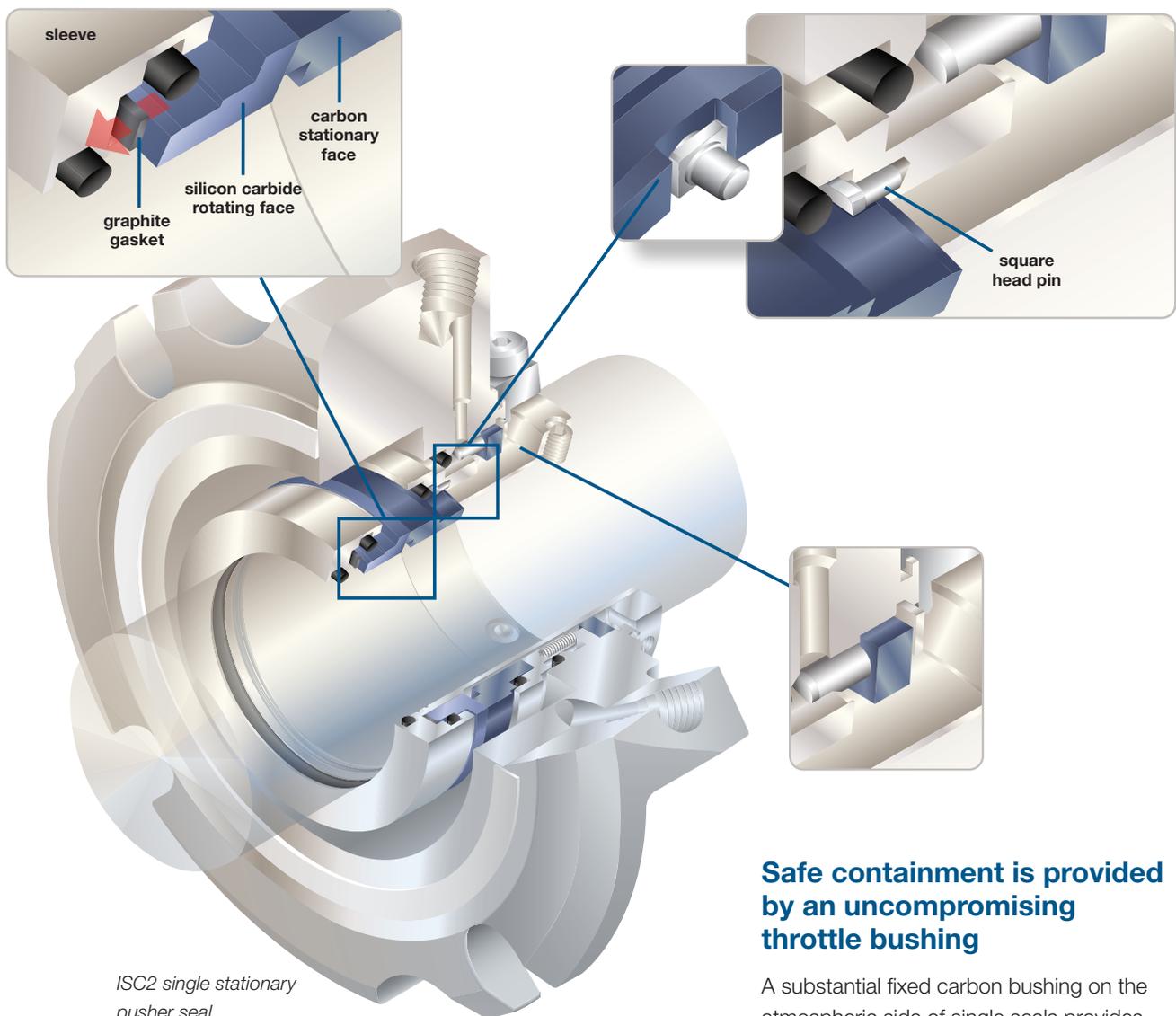
# Advanced ISC2 seal design features enable superior rotating equipment reliability

## Tolerate dry running events with our exclusive thermal management technology

Thermally conductive and mechanically compliant graphite material dramatically improves heat transfer between the silicon carbide rotating seal face and the sleeve. The sleeve acts as a heat sink, lowering seal face operating temperatures and transforming cavitating and dry running bad actors into highly reliable installations.

## Robust drive mechanisms deliver high torque loads with low seal face stress

Square-head drive pins self-align with the seal faces to distribute torque loads evenly over an area instead of a high-stress point load, reducing seal face fractures. The torque-carrying capability of the ISC2 seal is three times that of similar competitor seals.



## Safe containment is provided by an uncompromising throttle bushing

A substantial fixed carbon bushing on the atmospheric side of single seals provides an added measure of safety and reliability in the unlikely event of a seal failure. Process leakage is directed to the drain for safe handling and disposal.

## Industry's most durable metal bellows are bigger and better

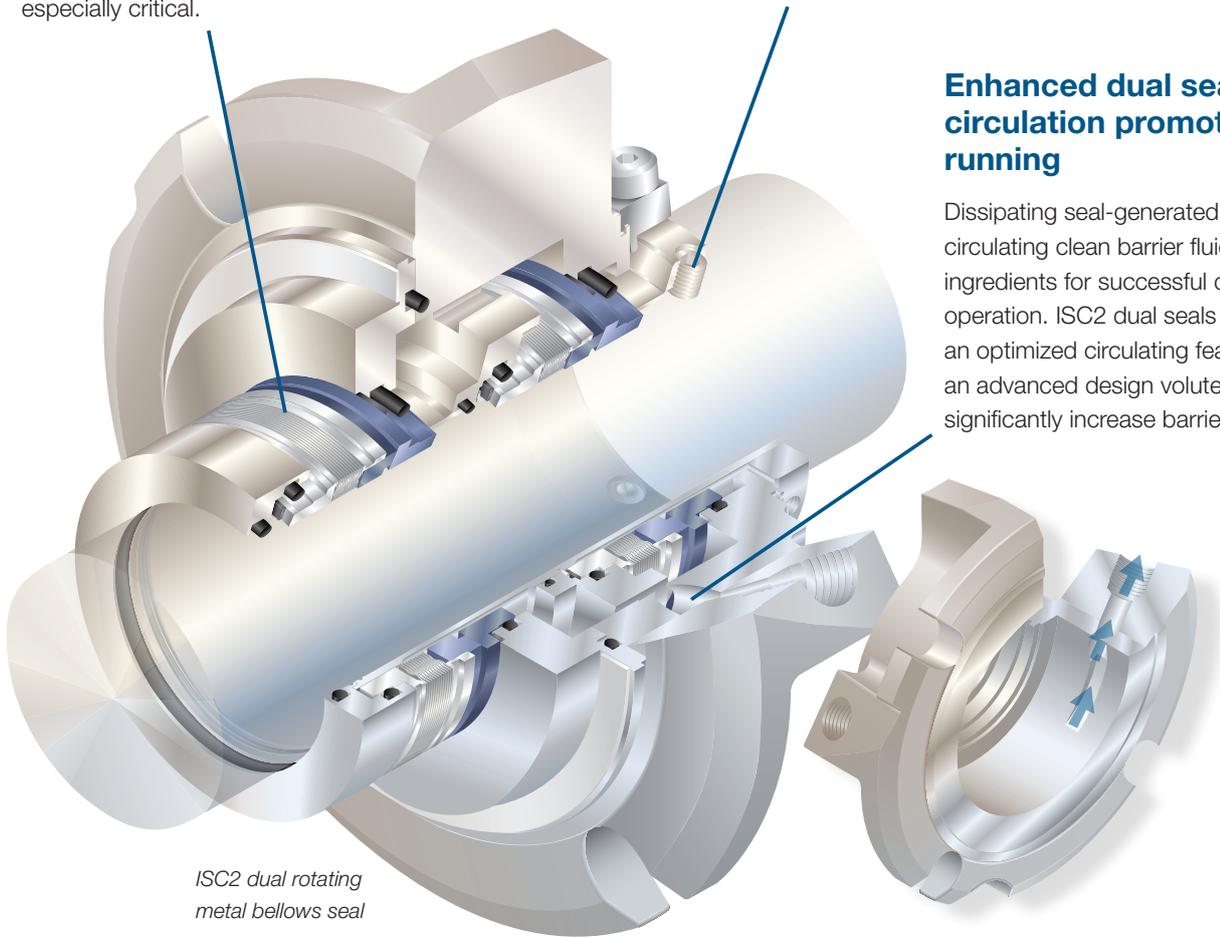
Edge-welded metal bellows of Alloy C-276 metallurgy are well-suited for a wide range of chemical environments in seal sizes up to 95 mm (3.750 in). Rotating bellows have a self-cleaning effect and are the preferred solution for highly corrosive services where avoiding seal face hang-up is especially critical.

## Hard set screws bite harder for better holding power

Drive collar set screws of 17-4 H900 stainless steel securely engage the shaft or pump sleeve and lock the cartridge sleeve in place. Opportunity for galling the shaft or drive collar is greatly reduced in case the seal ever needs to be removed.

## Enhanced dual seal barrier circulation promotes cool running

Dissipating seal-generated heat and circulating clean barrier fluid are essential ingredients for successful dual seal operation. ISC2 dual seals incorporate an optimized circulating feature, including an advanced design volute groove, to significantly increase barrier fluid flow.



*ISC2 dual rotating metal bellows seal*

### Materials of construction

<b>Metal Parts</b>	316 Stainless Steel, Alloy C-276, Alloy 20, Titanium
<b>Seal Faces</b>	Premium Resin Carbon vs. Sintered Silicon Carbide Sintered Silicon Carbide vs. Sintered Silicon Carbide Premium Resin Carbon vs. Tungsten Carbide Tungsten Carbide vs. Sintered Silicon Carbide
<b>Metal Bellows</b>	Alloy C-276
<b>Elastomers</b>	Fluoroelastomer, Perfluoroelastomer, EPDM, TFE-Propylene
<b>Springs</b>	Alloy C-276
<b>Set Screws</b>	17-4 H900 Stainless Steel

### Operating parameters

<b>Pressure</b>	
Pusher seal	0 to 20.6 bar (300 psig)
Metal bellows seal	0 to 13.8 bar (200 psig)
<b>Temperature</b>	-40°C to 204°C (-40°F to 400°F)
<b>Maximum Speed</b>	3,600 rpm or 23 m/s (75 fps)
<b>Seal Chamber Specifications</b>	ASME B-73, EN 12756, JIS, ISO 3069, API 682
<b>Shaft Size</b>	
Pusher seal	25 to 200 mm (1.000 to 8.000 in)
Metal bellows seal	25 to 95 mm (1.000 to 3.750 in)



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