



## **QB Series Balanced pusher seals**



*Experience In Motion*

## Workhorse of the hydrocarbon processing industry

QB Series seals are balanced pusher seals available in single and dual seal configurations used for sealing environmentally restricted products and meeting the most stringent regulations. They are fully compliant with API 682 Type A requirements.

QB Series seals are differentiated by their wide range of standardized feature packages and comprehensive custom options library. From hot water to light hydrocarbons, QB Series seals are easily configured to cover the vast majority of a plant's low and moderate duty services. Seal faces can be optimized for each application. QB Series seals complement API 610 pumps by installing as a unitized cartridge without requiring pump modifications in almost all cases.

### API 682 Arrangements 1 and 2

Single QB Series seals and the inner seals of dual unpressurized seals operate directly on the process fluid and must be selected based on the type of fluid being pumped.

- QB** Seal face balance optimized for non-flashing water, hydrocarbon, acids and amines
- QBU** Features Flowserve precision face topography lube grooves, for use on flashing water applications such as boiler feed water
- QBQ** Seal face balance optimized for flashing hydrocarbons; capable of emissions levels less than 500 ppm
- QBQ LZ** Features Flowserve precision face topography waves, for use on flashing hydrocarbon applications where the seal chamber pressure is at or near the fluid's vapor pressure
- QBS** Replaces multiple coil springs with a large single coil spring to provide the highest resistance to clogging in dirty services

### API 682 Arrangement 3

Dual seals with pressurized barrier fluid are unique in that during upset conditions, the pressure acting on the seal can reverse directions. To handle these upsets, the QB Series seals include double-balanced seal face technology to handle pressure from either the process or barrier fluid side of the seal faces.

- QBB** Double-balanced seal face optimized for face-to-back configured Arrangement 3 seals
- QB2B** Double-balanced seal face optimized for back-to-back configured Arrangement 3 seals

### Seal faces optimized for the application

Flowserve precision face topography hydropads, lube grooves, waves and diamond coatings reduce seal face heat generation and wear in low-lubricity, flashing fluid applications.



## Features and benefits

### Barrier fluid circulation extends seal reliability

To keep seal faces cool and properly lubricated, integrated axial and radial flow circulating devices are available for single seals with Plan 23 or dual seals to move fluid from the seal to the seal cooler or reservoir.

### Handle upset conditions

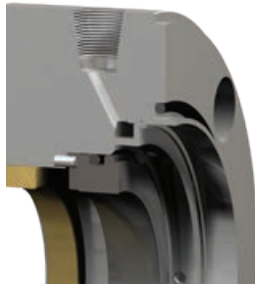
Fully retained parts and double-balanced inner seals enable dual QB Series seals to survive seal chamber over-pressurization or loss of barrier fluid pressure.

### Withstand torque with solid seal face drive keys

Solid drive keys efficiently transmit torque loads from the seal face without deforming. The large radius on the drive key couples with a similar radius on the seal face, providing full-length engagement to prevent edge chipping.

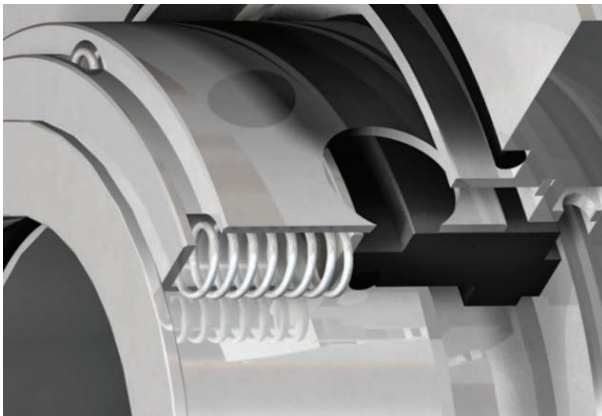
### Multiport flush design improves heat dissipation for uniform face cooling

A distribution ring connected to the seal's flush port and located co-axially with the sealing interface improves the cooling efficiency of Piping Plans 11, 14, 21, 31 and 32 by injecting the flush flow 360 degrees around the seal faces.



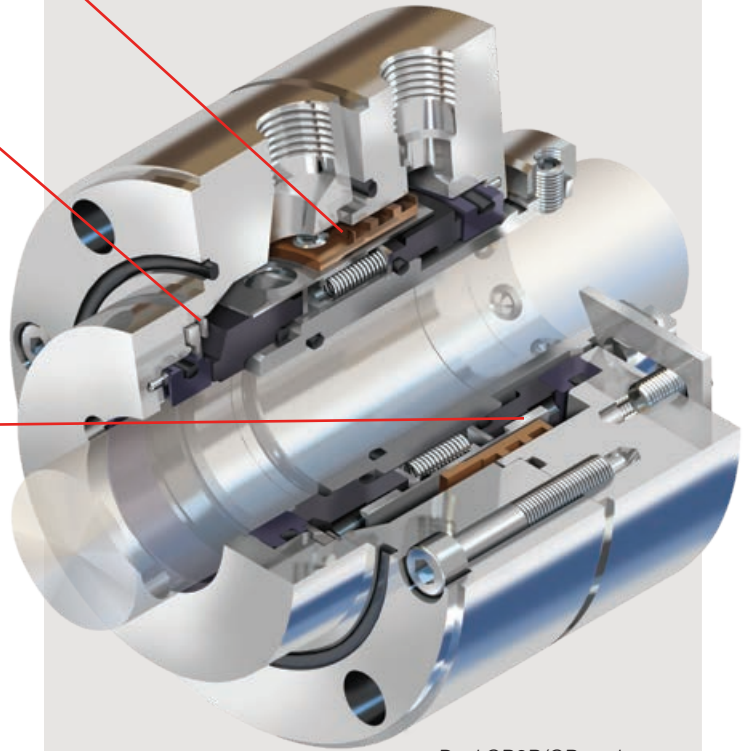
### Advanced spring holder design

A rotating spring holder with radial openings at both ends of the springs uses centrifugal force to create circulation through the springs. This feature keeps springs clean and properly functioning to accommodate for shaft axial movement and thermal growth.



### Part interchangeability between single and dual seal arrangements

Minimizes inventory requirements and maximizes design flexibility.



Dual QB2B/QB seal

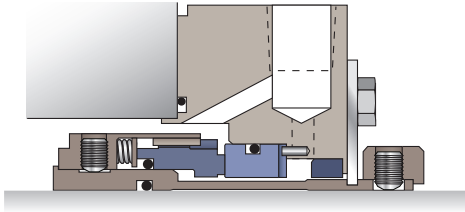
### Reliability-enhancing features from the custom options library meet specific customer needs

QB Series seals can be configured with a number of additional features, including:

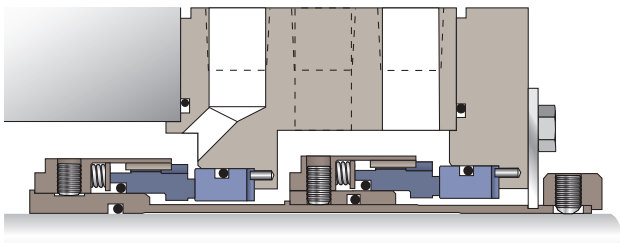
- Isolating seal chamber throat bushings
- Wear-resistant overlays for metal parts
- Secondary containment devices
- High-pressure sleeve drive collars
- Thermal isolation devices and cooling jackets



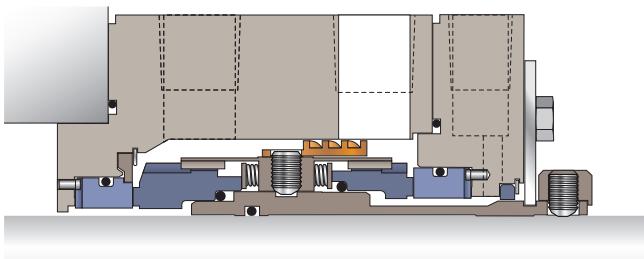
## Available arrangements



Arrangement 1 QB single seal with fixed throttle bushing for secondary containment



Arrangement 2 QBQ/QBQ unpressurized dual seal with liquid buffer fluid provides near-zero emissions sealing



Arrangement 3 QB2B/QB back-to-back pressurized dual seal with barrier fluid provides zero-emissions sealing

## Materials of construction

### Metal components

316 stainless steel, Alloy C-276, Alloy 20

### Rotating face

Carbon, silicon carbide, diamond coating

### Stationary face

Silicon carbide, tungsten carbide, diamond coating

### Gaskets

Fluoroelastomer, perfluoroelastomer

### Springs

Alloy C-276

## Operating parameters

### Pressure

to 51.7 bar (750 psi)

### Temperatures

-40°C to 204°C (-40°F to 400°F)

### Speed

to 23 m/s (75 fps)

### Shaft sizes

12.7 to 139.7 mm (0.500 to 5.500 in)

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