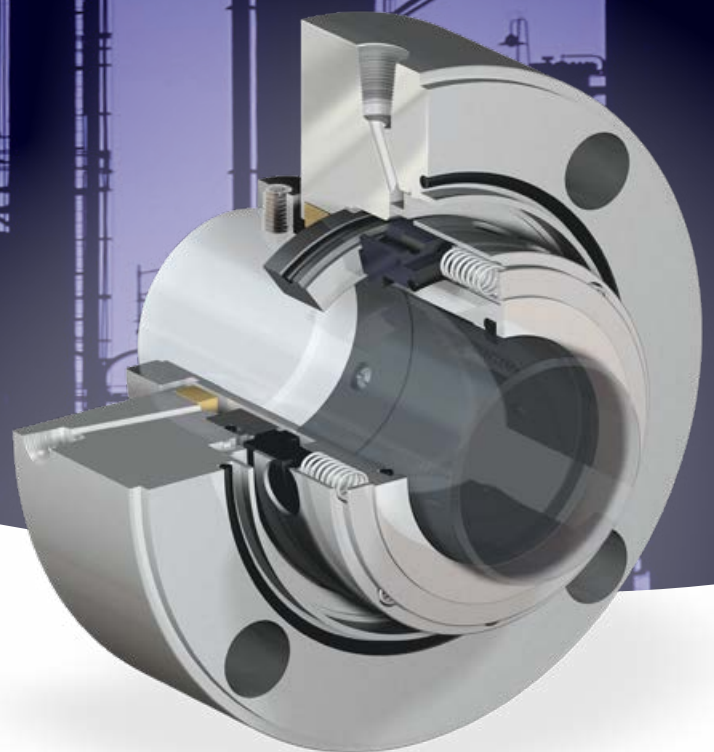




# **QBQ LZ** **Featuring Precision Face Topography**

Leading-edge sealing solutions for  
light hydrocarbon applications



*Experience In Motion*

# The leader in light hydrocarbon sealing technology

Today's hydrocarbon processing plants face multiple operational goals — from maintaining reliability, safety and profitability to meeting hydrocarbon emissions regulations. Light hydrocarbons present unique challenges in mechanical seal applications, where vaporization can lead to premature seal failure and impact both emissions and reliability objectives. Keeping equipment running properly in these conditions consumes maintenance time and energy.

In complex hydrocarbon plant systems, any variation can produce unexpected low vapor pressure margins, even on stable equipment. If vaporization occurs at the mechanical seal, the seal may not recover — despite attempts at vapor suppression.

## Precision Face Topography

A proven approach for preventing vaporization is to address the fundamental physics of pressure and temperature on the seal faces. The Flowserve QBQ LZ seal features Precision Face Topography to satisfy the demands of light hydrocarbons, particularly at low vapor pressure margins.

### Low-amplitude wave design

Smooth, low-amplitude waves are engineered specifically for light hydrocarbon fluids to provide a stable hydrodynamic effect that changes the pressure profile on the seal faces, reduces contact loads, and suppresses product vaporization (see Figure 1).

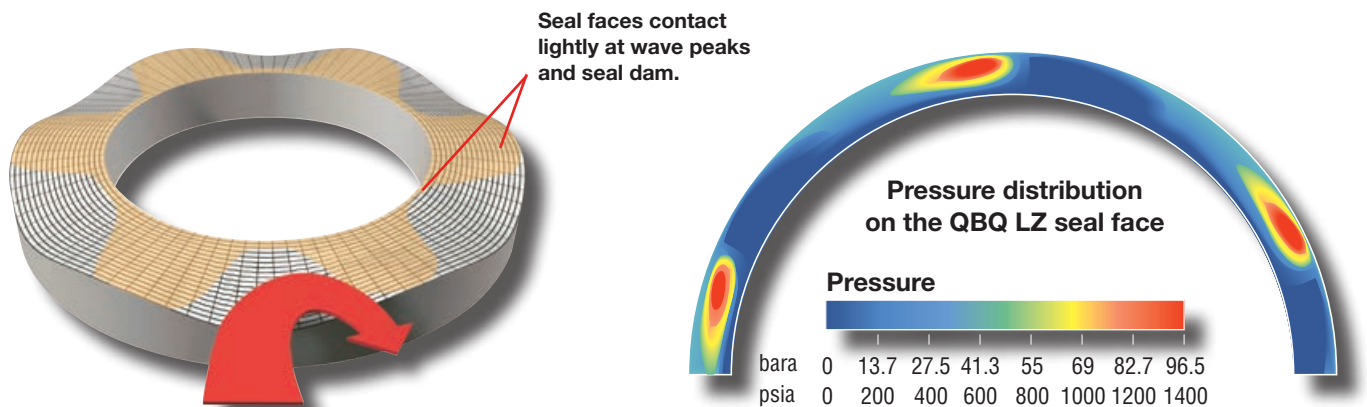
### Increase reliability with low-contact loads

Low-contact loads lead to less temperature rise and allow the QBQ LZ seal to operate in services with lower vapor pressure margins than any other contacting seal face design (see Figure 2). This reduced sensitivity to vapor pressure margin increases reliability when upset conditions arise.

### Improve startups and shutdowns

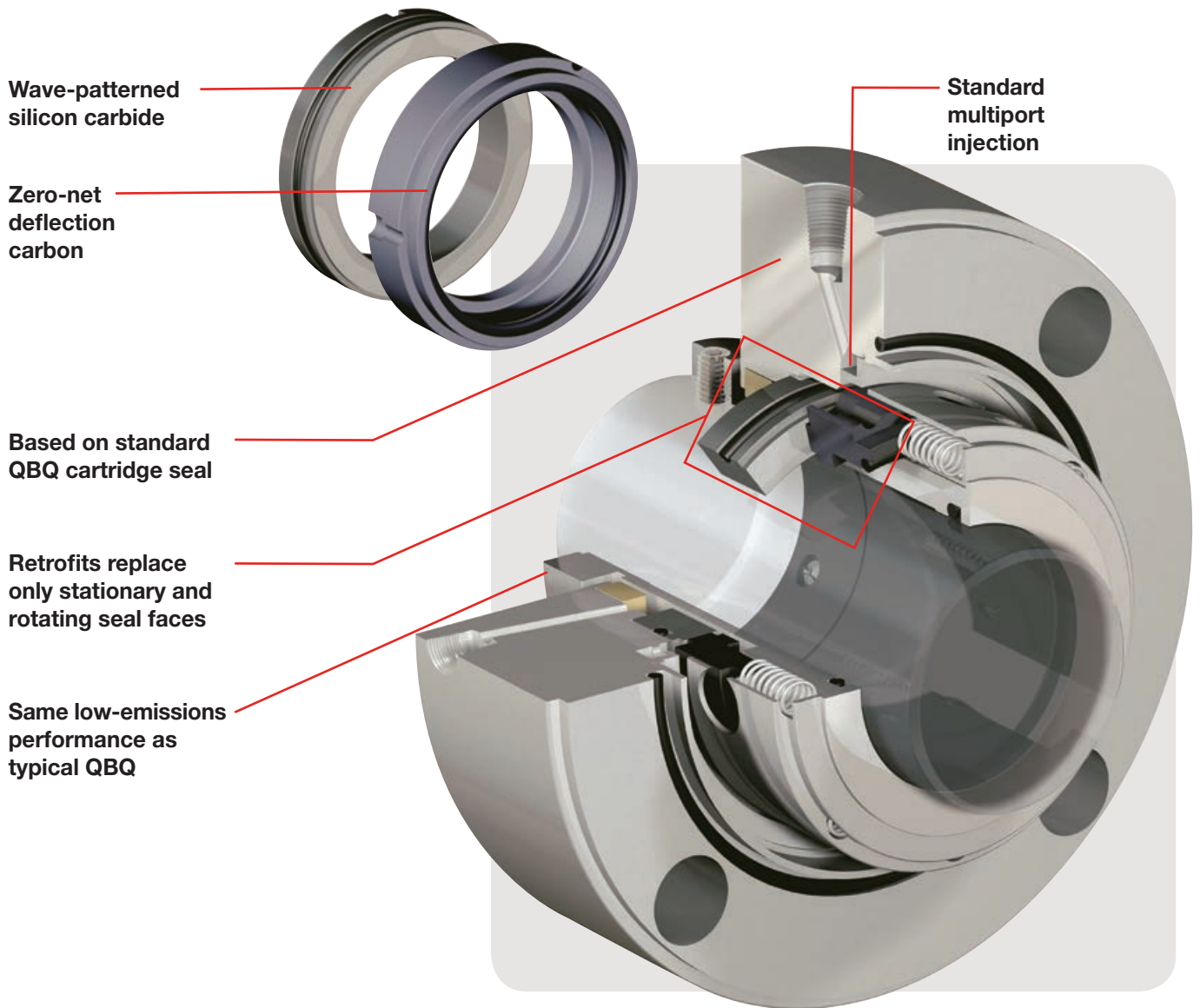
Reduced contact loading also minimizes startup torque and face damage associated with startups and shutdowns. The Flowserve QBQ LZ seal with Precision Face Topography sets new industry standards of reliability and safety margin when vapor pressure margin is scarce.

Figure 1: Wave design suppresses vaporization

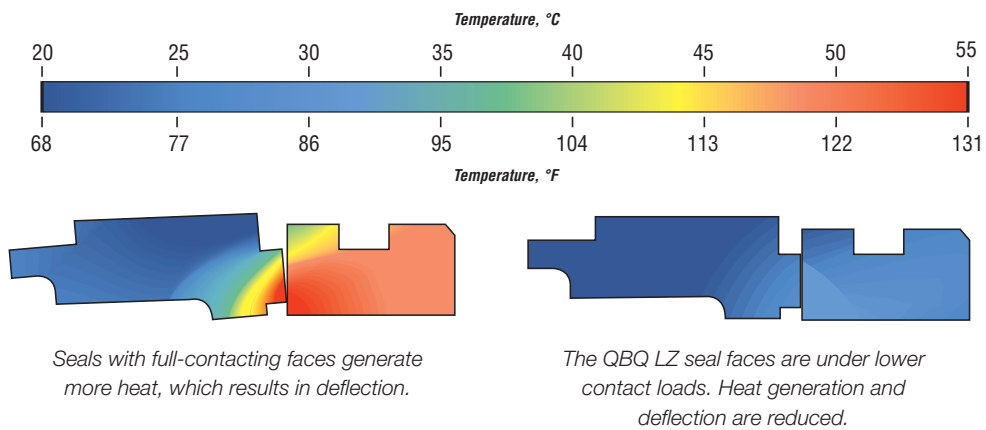


*Process fluid enters the wave valley, fluid is pressurized at the wave peaks, vapor is driven back into a liquid state, and fluid recirculates back into the seal chamber.*

*Pressure generated at the wave peaks can be several times higher than the seal chamber pressure, suppressing vaporization and maintaining stability in the area of contact.*



**Figure 2: Cooler running faces extend seal life**

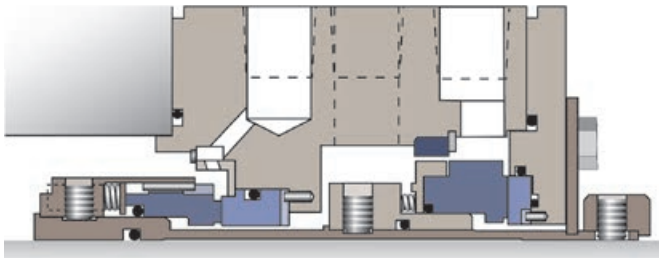




## Improving your equipment reliability

The QBQ LZ seal offers these advantages:

- It extends equipment reliability, even with variable process conditions, by addressing the fundamental challenges of low vapor pressure margin light hydrocarbons.
- Its low face contact pressure means less seal-generated heat and less startup torque at the same low-emissions level of typical contacting seals.
- It utilizes Flowserve Precision Face Topography with a wave pattern custom engineered for the physical properties of low vapor pressure margin light hydrocarbons.
- It satisfies all API 682 design and qualification test requirements for unpressurized dual seal arrangements.
- It is based on standard QBQ seals, so retrofits easily solve existing low vapor pressure margin problems and new applications start with minimal inventory impact.
- Arrangement 2 QBQ LZ seal with dry running GSL containment seal provides near-zero emissions sealing.



QBQ LZ/GSL dual seal

## Standard operating limits

<b>Temperature</b>	-40°C to 203°C (-40°F to 400°F)
<b>Pressure</b>	0 to 51.7 bar (0 to 750 psi)
<b>Speed</b>	6.1 to 22.9 m/s (20 to 75 fps)
<b>Specific gravity</b>	0.40 to 0.60
<b>Vapor pressure margin</b>	0.34 to 3.4 bar (5.0 to 50 psi)
<b>Shaft size</b>	44.45 to 130.2 mm (1.750 to 5.125 in)

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