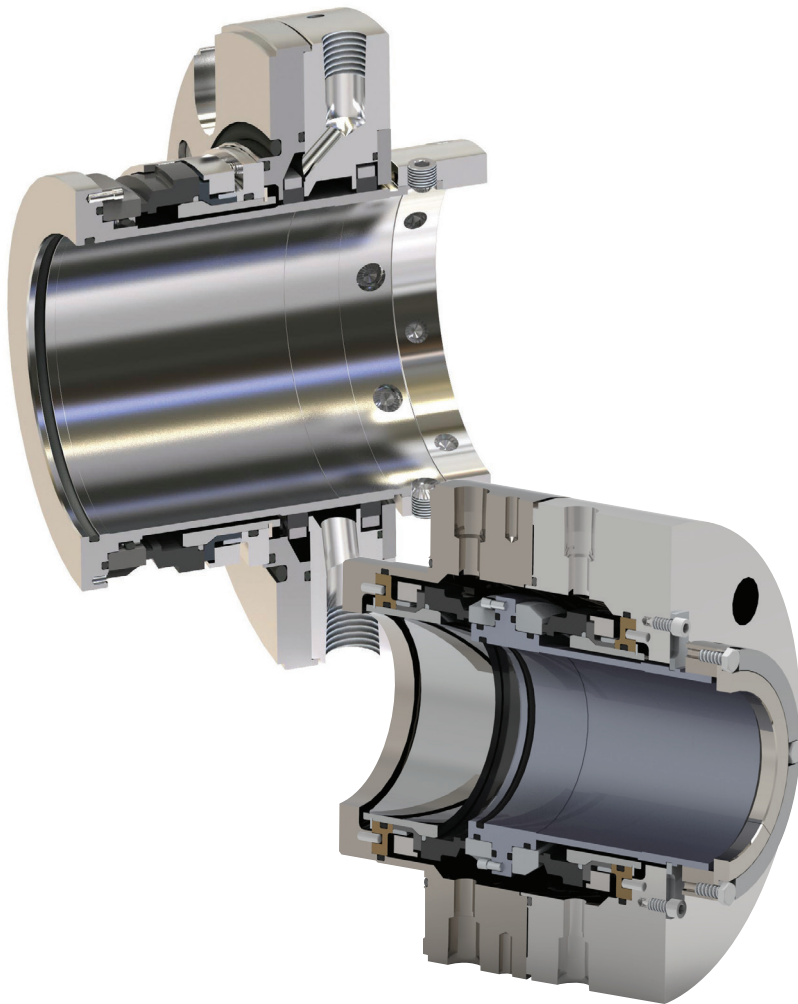


NON-PUSHER ELASTOMER LIQUID HYDROCARBON PIPELINE SEAL



DESIGN BENEFITS

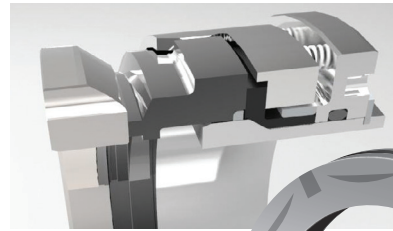
- Unique patented NPSS technology prevents wear to the sealing diameter and prevents secondary seal hang-up
- Available as a single, dual pressurized or non pressurized seal arrangement
- Balanced design and construction, including anti-extrusion ring, permitting use on higher pressure pipelines
- Rotating mating ring design enhances cooling and permits use at higher shaft speeds
- Optimized technical solutions for difficult liquid hydrocarbon pipeline applications

PRODUCT DESCRIPTION

- Long distance hydrocarbon pipeline operations with multiple, unmanned and remote pumping stations, means that in certain regions, many pipeline pumps rely on single mechanical seals to prevent leakage. The Type 8648VRS, non-pusher elastomer mechanical seal is now available for crude oil and light hydrocarbon pipeline applications such as 'products' and 'NGLs'. Where a single seal is not suitable, John Crane now offers the Type 8648VRS in either a dual pressurized or non pressurized arrangement with a whole range of NPSS enabled seals.

NON-PUSHER ELASTOMER SEAL FOR CRUDE OIL, FLASHING AND NON FLASHING HYDROCARBONS

The Type 8648VRS now enables pipeline operators transporting crude oil, non flashing hydrocarbons such as gasoline and diesel, and flashing hydrocarbons such as propane and butane to increase the reliability and operational uptime for between-bearing pumps, so significantly reducing operational costs. By allowing operation without the potential for secondary seal problems the 8648VRS provides longevity and reliability even in the most difficult hydrocarbon pipeline applications. Additionally, it provides proven equipment integrity from fugitive emissions by reducing the potential for secondary seal leakage with equipment age. The Type 8648VRS can be configured as a dual pressurized seal arrangement and used with either Type 8628VSC or Type 8648SC for increased secondary containment.



The Type 8648VRS is available in three versions for crude oil and light hydrocarbons with viscosity nominally above and below 0.65 specific gravity. For crude oil applications, hard faces are used to handle the higher viscosity fluids and high torque applications, as well as abrasive wear resistance. Applications with high pressure and close to their saturated vapor pressure (SVP) such as flashing hydrocarbons, benefit from the reduced friction sealing provided by John Crane's unique Laserface technology. Laserface provides active control of the sealing interface, augmenting face lubrication while minimizing heat generation and leakage.

Performance Capabilities

Temperature	Pressure	Speed
-4° to 400°F/-20° to 204°C	Dynamic pressure (single seal): Up to 1,500 psig/100 barg (crude) 1,300 psig/90 barg (non-crude) Dynamic Pressure (dual seal): Up to 1,750 psig/120 barg (crude) Static Pressure Up to 2,200 psig/152 barg (crude) 2,000 psig/138 barg (non-crude)	5,000 fpm/25.3 m/s (crude) 6,000 fpm/31.5 m/s (non-crude)

Together, we will work with you to keep your mission-critical operations up and running with support and guidance from our experienced team.



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If the products featured will be used in a potentially dangerous and/or hazardous process, your John Crane representative should be consulted prior to their selection and use. In the interest of continuous development, John Crane Companies reserve the right to alter designs and specifications without prior notice. It is dangerous to smoke while handling products made from PTFE. Old and new PTFE products must not be incinerated. ISO 9001 and ISO14001 Certified, details available on request.