

SEGMENTED LIFT-OFF CARBON RING SEPARATION SEAL



DESIGN BENEFITS

- **Balanced, lift-off carbon ring minimizes gas consumption in both pressure control and flow control**
- **Self-centralizing grooves ensure dynamic seal concentricity to the shaft/sleeve**
- **Static restriction to oil ingress when separation gas is off**
- **Temperature independent separation gas consumption**
- **No restriction to gas type or dew point**

PRODUCT DESCRIPTION

The Type 93LR is a non-contacting, segmented bushing seal with a balanced, lift-off design that minimizes gas consumption and restricts oil ingress. Applications include centrifugal compressors and other mission-critical rotating equipment in the oil and gas and petrochemical industries.

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The Type 93LR has been designed to meet the requirements of the API 692 standard and reduce consumption of separation gas. It can be retrofitted to installed separation seals in the John Crane product range with minimum modifications.

Similar to the way in which dry gas seals operate, the Type 93LR forms a stiff film of separation gas to lift off the carbons, preventing oil migration and wear. However, in contrast to traditional, non-contacting bushings, the lift-off design means that temperature does not affect the gas consumption of the seal. Additionally, a patented segment joint design has been proven to successfully restrict the oil migration and seal leakage.

The separation gas is injected between the two segmented rings which leads to the creation of the stiff film and a pressure barrier between the bearing and the dry gas seal cavity. The lift-off is achieved both statically and dynamically as long as the separation gas supply is uninterrupted. The Type 93LR utilizes improved grooves that help centralize the seal and maintain consistently low consumption.

The Type 93LR has undergone intensive testing programs that have validated the concept that showed no wear or oil ingress while maintaining consistent low consumption. This makes the Type 93LR an ideal choice for any application that requires a separation seal with minimum consumption while providing constant protection against bearing oil. The improved design makes it much less susceptible to common disruptions such as high vibration and upset-conditions and helps promote a longer service life.

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.