

Service Life Improvement of Piston-Rod Sealing Systems by Means of Pressure-Relieved Sealing Elements

by:

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Abstract:

Pressure relief of frictional sealing elements, i.e. a deliberate introduction of the gas to be sealed into the friction surface in order to reduce contact pressure, is a well-known method for improving service life of sealing systems. It is used for piston rings as well as packing rings. However, more common are applications inside cylinders, where pressure-relieved sealing elements are used to seal gases with high pressure differences. Experiments with pressure-relieved packing rings have shown that their favourable wear characteristics are frequently offset by poor or even unacceptable sealing efficiency. Obtained results make it clear that the pressure-relief principle should not be applied to all sealing elements, especially when it comes to dry-running packings for sealing hydrogen. At the same time, pressure-relieved sealing elements employed specifically for sealing the dynamic pressure component improve the service life of the entire packing. Especially favourable operating characteristics are exhibited here by the crown ring developed by BCA, in combination with the widely known step bridge design (penguin ring).