Sealing system for cooling water pumps

Split mechanical seal in stationary design increases service life

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Cooling water pumps are usually sealed off against the shaft protection sleeve with varying packings. Substitution of a worn-out packing is very expensive because of the pump size. The split mechanical seal 299 in stationary design enables simpler handling and longer service life.

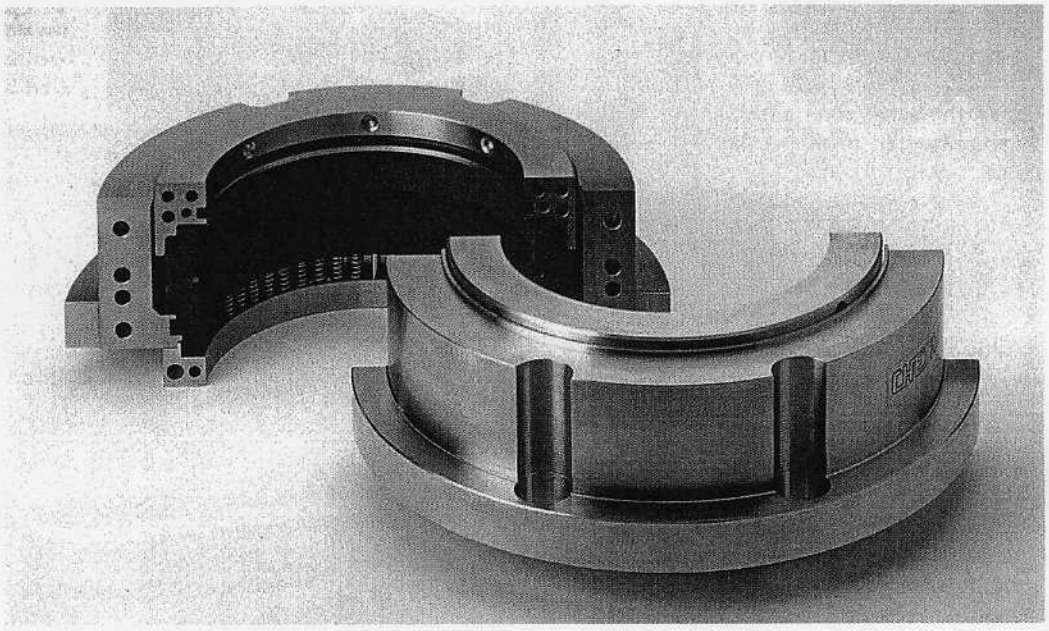
Cooling water pumps are often large tubular casing pumps or screw-pumps with a high delivery output, which normally function with using river water or seawater. The pumps are situated in the open, far away from the location of production, and are usually sealed off by packings. They require a rather high level of maintenance, however, and transport expenses to far-away locations are considerable. Furthermore packings require a certain quantity of leakage for cooling and lubrication to ensure perfect operation. This may lead to corrosion at the pump and its ambience. When tapping seawater, salt crystals are often built up, which have an unfavourable effect on the air cooling of the motor. In addition, the packings used for this wear out the shaft protection sleeve. Change of packings or of the shaft itself will also lead to high expenses, because the change requires a lot of effort.

Split mechanical seal

Conversion from packing to a mechanical seal, whose leakage rate is very low or not visible at all, offers an excellent solution. The dimension of the cooling water pumps and factors like location, accessibility etc. require a split seal in which all components are split in halves, as offered by Chetra mechanical seal 299 in stationary design. This means mainly that the springs do not rotate and are placed outside the water. Therefore they do not clog with deposits and the seal remains operative even with contaminated media. Moreover, especially with stationary design, misalignments which might occur or angular errors are levelled out on a large scale.

The split mechanical seal 299 is also hydraulically balanced with an adequate geometry of seal faces which ensures that seal face pressure does not go beyond the required corresponding closing pressure, therefore minimizing the wear of seal faces. Further positive effects are achieved by distinctly reduced requirement of energy of the mechanical seal compared with the packing. The energy demand of a packing used for such applications amounts to 5 to 10 times as much as that of a split seal with stationary design. Besides, split mechanical seal 299 causes no wear at the shaft sleeves, thus contributing to save considerable expenses. Mechanical seal 299 with hardly any leakage at all even prevents the problems of corrosion of the system as well as other unfavourable influences caused by leakage as mentioned above.

Even with initial installation, the application of heavy implements is not required. The split design also allows for rather short assembly times, which vary between one and several hours according to pump size. The split, stationary mechanical seal offers high operating safety and long service life. Even though this type of mechanical seal also requires maintenance or exchange of components after normal wear, the split design makes it possible to disassemble the seal with simple equipment and few devices without having to remove other components. A ready laid-out seal spare part kit can be fitted in easily and quickly gets the system ready for operation again. Thus shut-down maintenance may be reduced to a considerable degree. Customary split mechanical seals are limited in the pressure area as a rule – often only to be used up to 6 to 8 bar. The stationary split seal 299 enables operation in a vacuum up to 0.5 bar abs. and up to pressures of a max. of 25 bar.



The conception of the split mechanical seal 299 has turned out to be also very successful with applications with large tubular turbines (Kaplan turbines) and mixed-flow water turbines (Francis water turbines). (s_d> 100 to 400 mm)