Oil-lubricated mechanical seals
Screw compressors

As part of its continuous improvement measures, MAN PrimeServ has improved the design of its oil-lubricated mechanical seals based on customer requirements.

Initial situation
With older units seal systems were often used for shaft sealing that conformed to the state of the art at the time. These units can benefit massively from conversion to the latest standard. Systems from the 1970s with bellows/gaiter seals often had a servicing interval of up to just two years. Systems from the 1980s with silicon carbide sealing rings could run for up to 3 years according to the recommended servicing interval.

With the current design of the oil-lubricated mechanical seal, servicing intervals have been extended to up to 5 years in accordance with customer requirements. In addition, the system benefits from a significantly improved fail-safe performance compared to older installed systems.

Solution
The modern design is based on a further development of the silicon carbide seal ring design, which does away with a shrink-fitted metal bandage. The slide ring and counter ring are now also manufactured from silicon carbide. This significantly improves the thermal conductivity, and the thermal expansion coefficients of the components are brought into alignment. Direct contact between the cooling oil and the silicon carbide surface ensures the dissipation of friction heat and the cooling effect is therefore improved.
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Advantages

- Experience has shown that the new seal design enables the service life of seals to be extended by approx. 1-2 years. Even under extreme operating conditions, servicing intervals of up to 5 years are therefore possible.

- Because metal bandages are not used, there is also no longer any risk that shrink-fit connections come loose because of different thermal expansion coefficients or lead to stresses.

- In the case of installations at risk of process gas deposits (e.g. in the case of butadiene processes), polymerisation of the deposits is prevented by a reduced temperature in the seal and failure safety is therefore increased.

- In addition, with some systems the counter ring in the cartridge design can be fixed to a sleeve. This reduces unwanted influences on the counter ring from neighboring components e.g. deformations or irregularities transferred by the shaft nut during assembly. In addition, assembly is significantly simplified by the new design.