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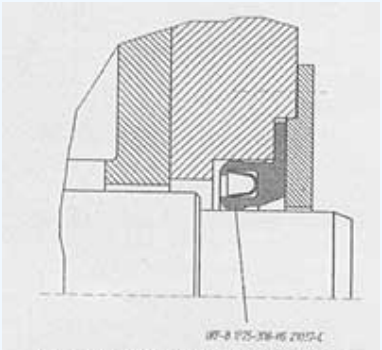
Sealing Solutions: Two Case Studies

Spring-energized seal for wind power stations

With regard to their requirements profiles, sealing solutions for wind power stations differ considerably from solutions for 'standard' hydraulics. Two examples illustrate this point.



Abdichtung der Welle des Rotorlagers einer Windkraftanlage.

Abdichtung der Tachowelle des Drehimpulsgebers HOG 131.

Designers of heavy equipment have to pay attention to certain special aspects, which, considering the dimensions of the components, are not always easy to translate into reality. ElringKlinger Kunststofftechnik's VENUS division possesses the necessary prerequisites for producing large seals. The product range includes rotational-symmetric seals up to an outer diameter of 2,800 mm. Depending on the respective application requirements, a selection of more than 600 PTFE compounds is available.

Experience potential from other industries

To serve as a vacuum seal for an application in a planetary mixer, a spring-energized seal made from a PTFE compound was selected. This geometry, fitted with a clamping flange, prevents the seal from following the rotary motion. With a diameter of 1,150 mm, the machine rotates up to 2.5 m/s and reaches a service life of up to 2,000 hrs under strictly non-lubricated operating conditions. To ensure constant spring-loading conditions even under changing temperatures during shipping and storage, the seal is mounted to a sleeve for delivery to the customer.
Experience gained with applications like the one described above, or similar applications involving the use of large seals, led to the development of a spring-energized seal, manufactured by ElringKlinger, as well, for a rotor shaft in a wind power station. The rotor shaft rotates up to 1.6 m/s, the seal is used vis-à-vis a grease of higher viscosity. In addition to ensuring that the seal protects the bearing, the project specified a very long service life. The trend towards offshore wind power stations has just begun. This means that the components used must be adapted to the new design specifications developed for such applications. As such, the digital speedometer, HOG 131, manufactured by Hübner, which, among others, is used in wind power stations, is fitted with ElringKlinger shaft seals. These seals are suitable for applications where there is a lack of lubrication, and they also offer the required corrosion resistance. Sealing elements made from PTFE compounds are particularly suited for the requirements of wind power stations: very good wear resistance due to the use of optimized PTFE compounds, no restrictions regarding media or environmental influences and, last but not least, the possibility to manufacture small volumes with customer-specific dimensions and designs.

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