

Single seal Cartex-SN with DiamondFace for high pressure centrifugal pumps in the pharmaceutical industry

EagleBurgmann®
Rely on excellence

Ready for dry running

Roughly 400 pump shafts are equipped with mechanical seals from EagleBurgmann at the production site of a pharmaceutical company. Constantly changing operating conditions and dry running phases place extreme demands on the seals. Diamond-Face technology significantly extends service life and reduces stock costs through further rationalisation.

This pharmaceutical company in Great Britain produces active substances by a fermentation process for the production of antibiotics. End suction centrifugal pumps according to ANSI specification transfer the medium between vessels. During the process one vessel is completely evacuated by the pumps, causing them to run dry and leaving the seals with insufficient or no lubrication at all. Both the production personnel and the control systems cannot intervene quickly enough to respond in time to dry running as the process is automated. No standard single mechanical seal can withstand dry running at the speeds involved here and dry running of pump seals accounted for 80 % of the

failures on site. Since the production site uses many solvents as a carrier within the process, only standard leakage can be tolerated, any more is classed as a "loss of containment" which can be reportable.

Significantly increasing the MTBF

As the production process has very few standby pumps, any increases in the MTBF interval (MTBF: Mean Time Between Failures) are highly appreciated. Today EagleBurgmann's DiamondFace technology is providing a significant benefit.

Some years ago, the customer and EagleBurgmann signed a "TotalSealCare" contract and started to convert all pumps from component seals to "Cartex" seals, i.e. cartridge single and doubles seals. Principally Cartex single seals are installed on the pump shafts to prevent egress of the process fluids. These mechanical seals are completely pre-assembled and precisely positioned component seals with cover plate and shaft sleeve. The cartridge design allows for quick and



Universal applicable for packings conversions, for retrofits or original equipment: Cartex single seal

easy installation and makes it difficult for dirt to enter during assembly. Construction of this seal complies with the requirement for minimum downtimes in production as well as with the high degree of purity required in the pharmaceutical industry. It also provides a platform for stock rationalization and FDA compliance where necessary.



By using DiamondFace technology the MTBF interval has increased considerably and stockkeeping has been streamlined.



DiamondFace is a synthetically-produced pure diamond with the same excellent properties as natural diamond ...

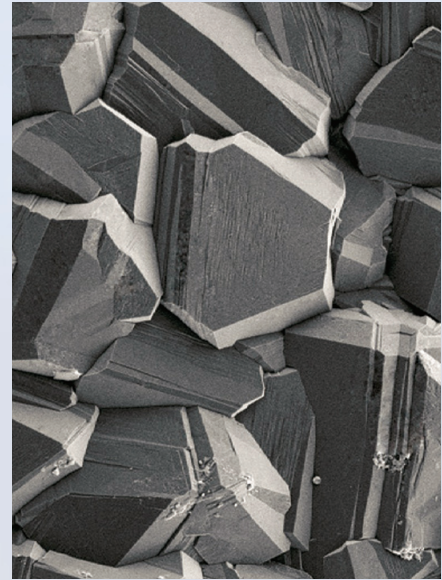
One of the next steps was to optimize the Cartex seals by using DiamondFace technology: A special procedure provides the surfaces of the seal faces with a microcrystalline coating of artificially produced diamond, making them extremely wear-resistant and capable of partial dry running. Furthermore, very little heat is generated during the dry running phases.

Reduced costs, reduced stock levels

The concept has been tried and tested. In the meantime, the DiamondFace version of the Cartex single seal is being installed bit by bit in the pumps. Not only have the costs for the seals been noticeably reduced, but so have the costs for new shaft bearings and shafts.

The MTBF interval has increased one hundred percent from two to four years. The risk of costly production interruptions has been significantly reduced. From now on, all single seals are to be supplied with DiamondFace sliding surfaces as standard.

There is another decisive advantage to DiamondFace. It only requires one material combination for the seal faces, allowing the stock held on site to be reduced from 24 parts to eight parts per seal. Additional standardization measures in sealing design and material combination have enabled EagleBurgmann to reduce the site stock over the years from 900 individual parts to 150 complete seals. The number of stores inventory locations has been streamlined from 22 to six.



... and is applied to silicon carbide seal faces in the form of a microcrystalline coating.

EagleBurgmann and the pharmaceutical company have been working together since 2002. Extended operating periods and increased reliability of the Cartex-SN as well as reduced storage costs, training and 24/7 support have encouraged the customer to continue to rely on EagleBurgmann as their supplier of all sealing solutions.

Operating conditions

Temperature: usually ambient
 Tank pressure: p_1 max. = 1 barg (14.5 PSIG)
 Rotational speed: n max. = 1,450 min⁻¹