Abstract

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Title
33-1: Reliable Sealing Technology for High Pressure CO_2 Applications

Summary
CO_2 process gas compressors are a demanding application area regarding the use of O-Ring-seals. For these kind of applications O-Ring-seals made out of the material FKM and even FFKM are tending to an early malfunction due to explosive decompression and subsequent leakage.
As an example in a three-stage compressor especially the high pressure above 240 bar was found to be critical. As a consequence the exchange of the complete set of O-Ring seals was necessary after every shutdown of the compressor. This leads to an increased down time of the compressor and therefore higher maintenance costs.
The paper presents the results of investigations and shows that it is possible to define an appropriate O-ring material. In a holistic approach for high pressure CO_2-applications all aspects concerning explosive decompression, lube oil compatibility und CO_2-permeation were taken into consideration in order to achieve an extended lifetime. The chosen material shows an excellent resistance against explosive decompression effects and is now suitable for all stages of the high pressure CO_2-application. The combination of material and O-ring design eliminates down times and allows a reliable operation of the compressor.