

Abstract Submitted  
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**Zero leakage sealings**<sup>1</sup> BERNHARD KOTESOVEC, HERBERT STEINRÜCK, Technical University Vienna — The piston rod of a reciprocating compressor is sealed with elastic cylindrical sealing elements. Across the sealings the pressure drops from the operating pressure to the ambient pressure. The lubrication gap between the elastic sealing and reciprocating piston rod is studied with the aim to find conditions of a leakage free sealing. The flow in the lubrication gap and the elastic deformation of the sealing are determined simultaneously. The net-flow during one cycle of the reciprocating piston rod is calculated. It turns out that maintaining zero leakage is very sensible. Indeed the outbound flow during out-stroke has to be equal the inbound flow during the in-stroke. By prescribing a special shape of the undeformed sealing zero leakage can be attained - at least theoretically for certain operating conditions. It turns out that temperature dependent material data and a model for cavitation is necessary. The model, its numerical implementation and results will be discussed.

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