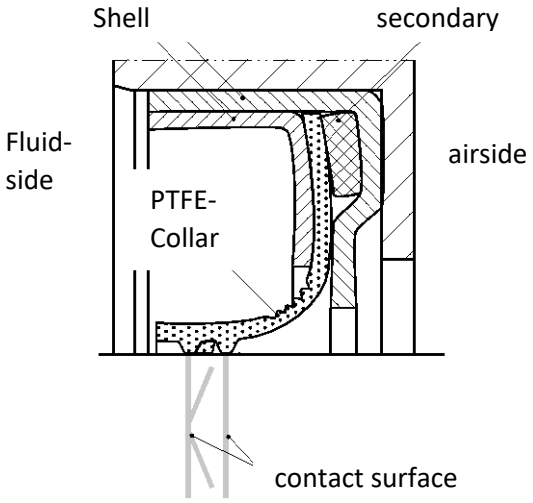
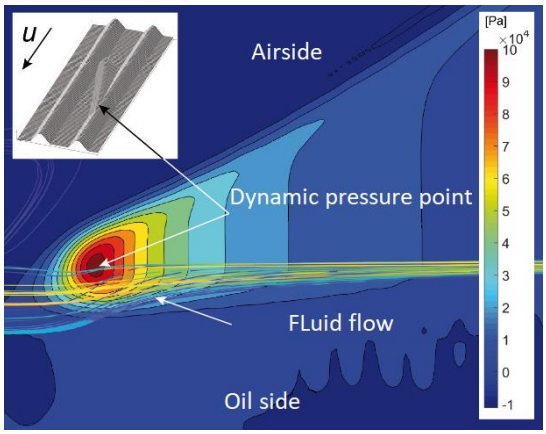
Elastohydrodynamics and friction simulation

IMA-TechSheet #103040 V2

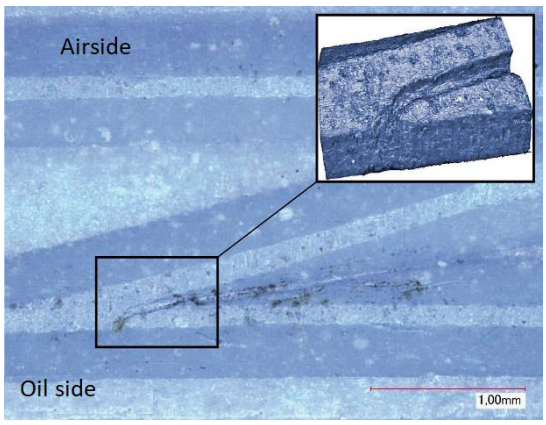
University of Stuttgart
Institute of Machine Components



Cross-section geometry and sealing contact of a conveyor-active shaft seal



Flow at return structure



Wear channel on Return structure

Description:

- Fluid simulation of the flow in the sealing gap based on the REYNOLDS or NAVIER-STOKES equations
- Specification of an initial gap profile as a detailed section from assembly simulation or measurement
- Specification of fluid data
- Specification of the relative speed between shaft and seal ring
- Setting of pressure and cavitation boundary conditions
- Simulation of flow in sealing gaps
- Primary results: hydrodynamic pressure and hydrodynamic gap height
- Secondary results: variables relevant to sealing technology such as friction force and flow rate can be determined

Available Test Methods:

- Hydrodynamic simulation (HD):
  Specification of a constant gap profile

- Elastohydrodynamics simulation (EHD):
  Iterative determination of the hydrodynamic pressure and the hydrodynamic gap height under consideration of the elastic surface deformation

- Elastohydrodynamics simulation with mixed friction (MEHD):
  Consideration of the mixed friction influence via a contact force-displacement curve