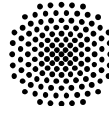


Research Project: Biogenic Hydraulic Seals

Time-Accelerated Testing of Hydraulic Rod Seals Made from Regenerative Thermoplastic Polyurethane

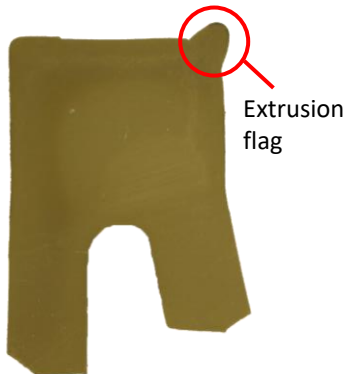
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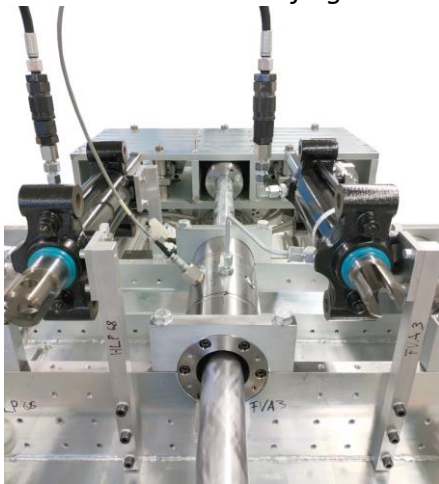


IMA-Sealscanner®



Extrusion flag

Cross-section of a hydraulic rod seal with extrusion flag



Endurance test rig for hydraulic rod seals

Motivation

Hydraulic rod seals require good chemical resistance to the hydraulic fluid as well as high resistance to abrasive wear. Commonly, hydraulic rod seals are made of thermoplastic polyurethane (TPU) based on fossil raw materials. The aim now is to develop sustainable high performance TPU by replacing conventional raw materials with regenerative biogenic structural components.

Expected results

The aim of the research project is the development of advanced tribological test methods for hydraulic rod seals manufactured from high-performance TPU with regenerative raw materials. In particular, the test rigs are intended to enable time-accelerated testing of

- extrusion behaviour and
 - wear behaviour
- with varying hydraulic fluids in order to evaluate the performance of new TPU prototypes.

Approach

The following work steps are planned:

- Design and construction of a test rig for the extrusion behaviour of seals.
- Carrying out time-accelerated test runs on the extrusion test rig. Subsequently measurement of the extrusion using IMA-Sealscanner®.
- Carrying out time-accelerated test runs on the endurance test rig for hydraulic rod seals. Subsequently measurement of the wear using IMA-Sealscanner®.

In all tests, various TPU prototypes are used in combination with the hydraulic fluids intended for this purpose (mineral, water-based, rapidly biodegradable).

Supported by:



on the basis of a decision
by the German Bundestag



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