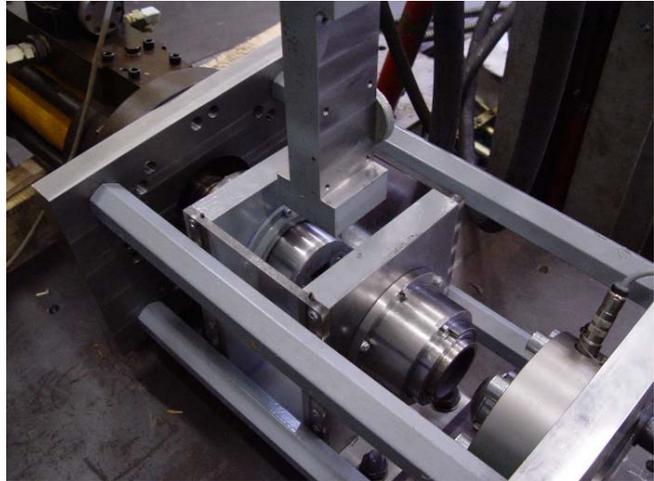


This tribological test-rig is constructed using a refurbished 200 kN load frame. This load frame is used to provide the sliding motion of the moving surfaces. On the vertical piston of this load frame a central sliding block with two counterfaces (one in the front and one in the back) is mounted. On these two counterfaces, two friction material specimens with a contact surface of typically 30 mm x 30 mm to 60 mm x 60 mm are pressed, using a clamp with a servo-controlled hydraulic actuator. To allow for a wide range of contact pressures a clamp of 50kN and a clamp of 200kN capacity are available.



Both friction material specimens are placed in holders, which fit into the wall of the test-box, mounted on the bottom plate of the load-frame. The specimen holders can slide in the horizontal direction to accommodate wear of the friction material specimens. The test box itself is sealed such that it can be filled with a lubricant or with (sea) water to simulate as close as possible the working conditions of the application.

This test-rig is considered as "medium-scale" due to the fact that the size of the sliding surface is only 900 mm<sup>2</sup> to 3600 mm<sup>2</sup>, which is relatively small for tribological applications of flat surfaces. Nonetheless the forces involved for such applications are relatively high for commercially available test-rigs. For a contact surface of 900 mm<sup>2</sup>, a contact pressure of 50 MPa (which is allowable for most commercially available sliding bearing material) translates to a normal force of 45 kN. Herein lies the reason for the name "medium-scale test-rig". The high contact forces involved in the testing of bearing materials also necessitated the design of this new test-rig.

The test-rig is servo-hydraulically operated which allows for a load controlled or displacement controlled operation to ensure an accurate execution of the test. The test rig is equipped with data acquisition devices to measure various additional instruments such as temperatures, local displacements, local strains, ...

The test-rig is equipped with a dedicated environmental chamber to allow for a controlled ambient temperature and humidity. The counter material can be cooled with cold water (at 15°C) or with chilled liquid ethanol (at -40°C).

## TEST RIG CHARACTERISTICS

Property	Value	Value
Normal load	Max. 200 kN	Max. 50 kN
Friction force (per interface)	Max. 100 kN	Max. 25 kN
Velocity	Max. 50 mm/s	Max. 100 mm/s
Stroke	Max. 100 mm	
Friction material dimensions	Typical: 30 mm x 30 mm x 30 mm Max: 60 mm x 60 mm x 30 mm	
Counter surface dimensions	200 mm x 80 mm x 20 mm	