

Product Information Sheet: Shear Stability Tester (KRL)



For more information, contact your local office:

Ducom USA

620 Johnson Ave., Suite 5
Bohemia, NY 11716, USA
P: 847-737-1590
F: 847-737-1580
info@ducom.com

Ducom Europe

Zernikepark 6,
9747 AN, Groningen,
The Netherlands
P: +31 (85) 065-7410
info@ducom.com

Ducom Asia

477/A 4th Phase,
Peenya Industrial Area,
Bangalore, 560058, India
P: +91 (80) 4080-5555
F: +91 (80) 4080-5510
info@ducom.com

Ducom Malaysia

No 23-1B, Block 5
Jalan Pahat H15/H
Kompleks Otomobil
Seksyen 15,
40200, Shah Alam,
Selangor, Malaysia
info@ducom.com

BASIC INSTRUMENT

The Ducom KRL Shear Stability Tester is used to determine an oil's resistance to viscosity loss due to shearing. Kinematic viscosity loss is investigated as per CEC L-45-A-99, where the test oil is sheared using a bearing pot with a tapered roller bearing. Such a test method is useful, for example, for the formulation of hydraulic oils, which can reduce the cost per ton of digging in the mining industry.

The Ducom KRL Shear Stability Tester is CEC L-45-A-99 compliant. The load range is 500 to 5000 N, the speed range is 150 to 1500 rpm and the lubricant temperature range is RT to 60°C.



Figure 1. Ducom Shear Stability Tester (KRL)

APPLICATIONS

- Quality analysis of hydraulic and gear oils used in mining and construction equipment.
- Screening of polymers used as viscosity index improvers (VIIs) in oils.
- Development of predictive models using both friction torque and kinematic viscosity loss of oils.



Tapered Roller Bearing

FUNCTIONAL FEATURES

- **Manual Loading System:** Comprised of calibrated dead weights and a loading pan connected to the loading lever. Load is transferred to the bearing pot through a shaft connected to a load sensor and antifriction bearing pad.
- **Pneumatic Loading System:** Uses compressed air and a bellows arrangement. Load is transferred to the bearing pot through a shaft connected to a load sensor and antifriction bearing pad.

PRINCIPLE OF OPERATION

The Ducom KRL Shear Stability Tester can be equipped with either a manual or pneumatic loading system (refer to the Picture Gallery section). Applied load is measured by a load sensor (located below the antifriction bearing pad). The bearing pot (see Fig. 2) is placed over the pad. It contains a shearing element comprised of a tapered roller bearing dipped in a test fluid. The bearing is loaded against a rotating spindle driven by a motor.

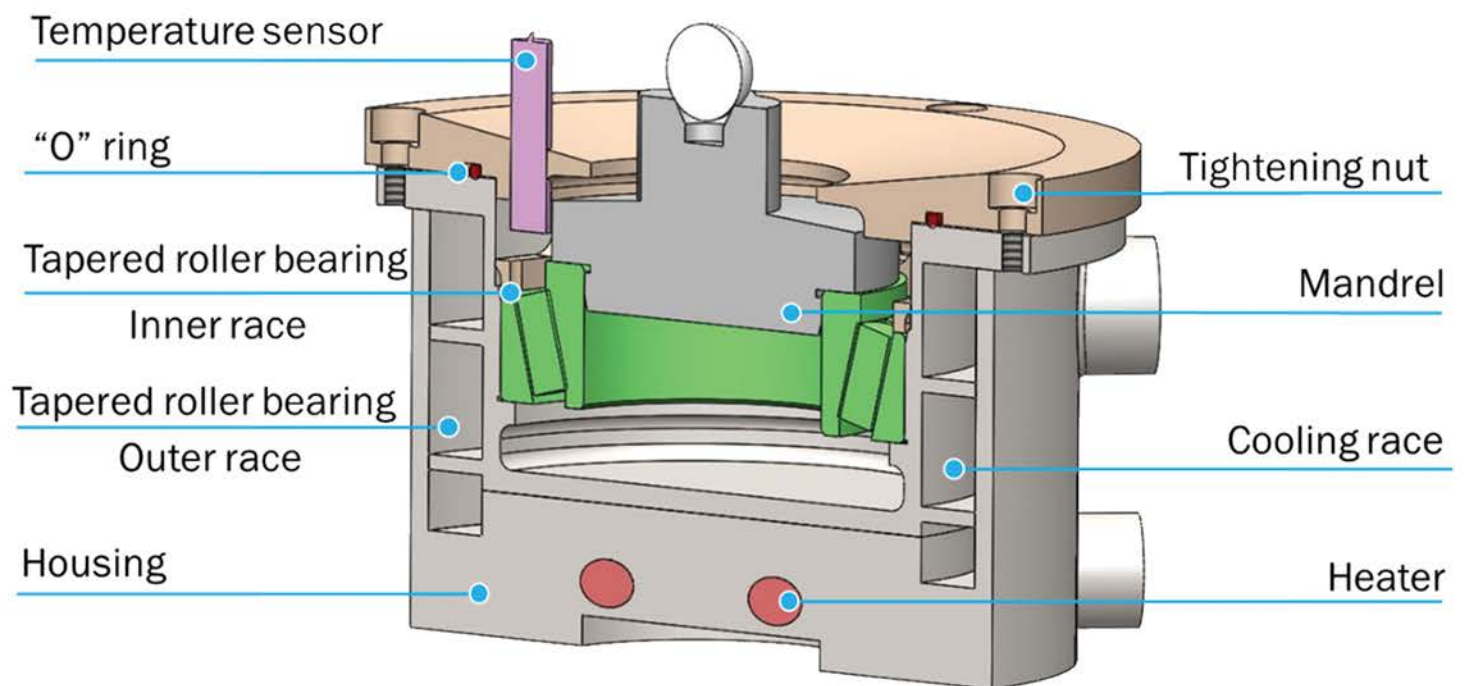


Figure 2. Cut section of bearing pot in Ducom Shear Stability Tester (KRL)

The test fluid is heated using a pair of heating elements under the bearing pot. A closed loop temperature control system is used to maintain the set temperature (60°C) during shearing. It includes a type-k thermocouple (see Fig. 3), heat exchanger, recirculating water reservoir and a pump with a variable frequency drive. Cold water is pumped and circulated in the bearing pot. The heat exchanger is used to extract the heat from the hot water which then exits the bearing pot. Using this system, the temperature during shearing is maintained between 59°C and 61°C.

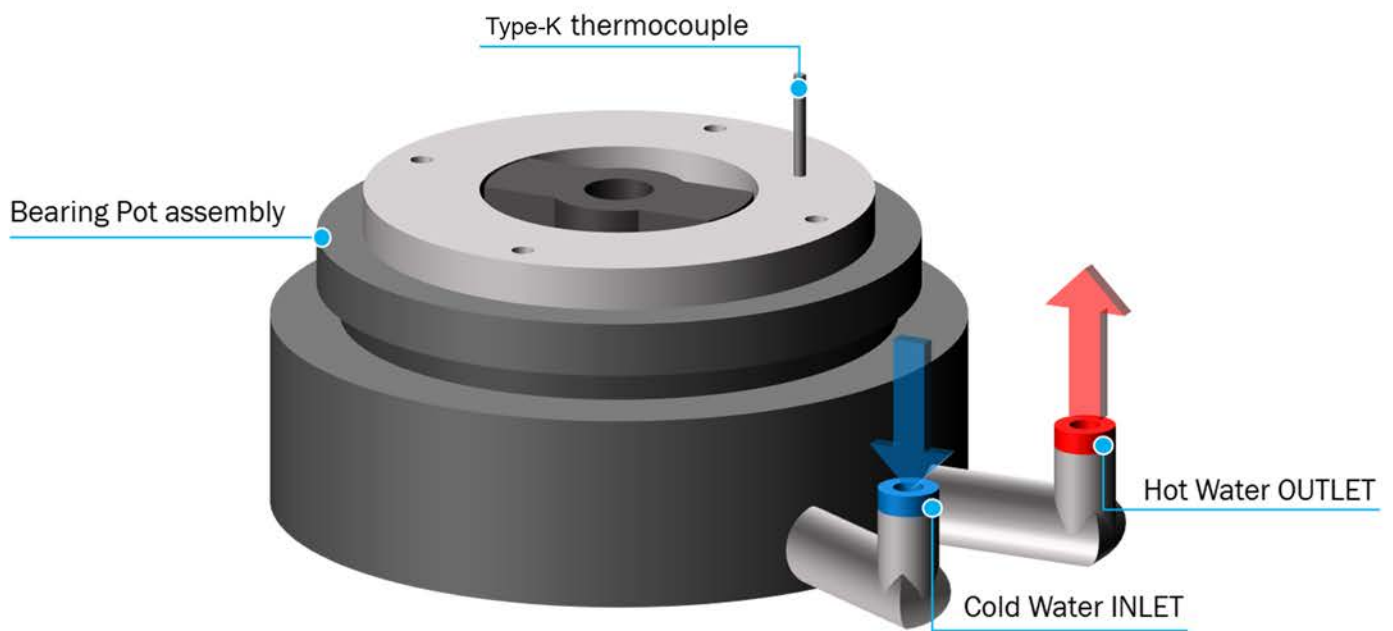


Figure 3. Illustration of a bearing pot with a thermocouple and water circulation

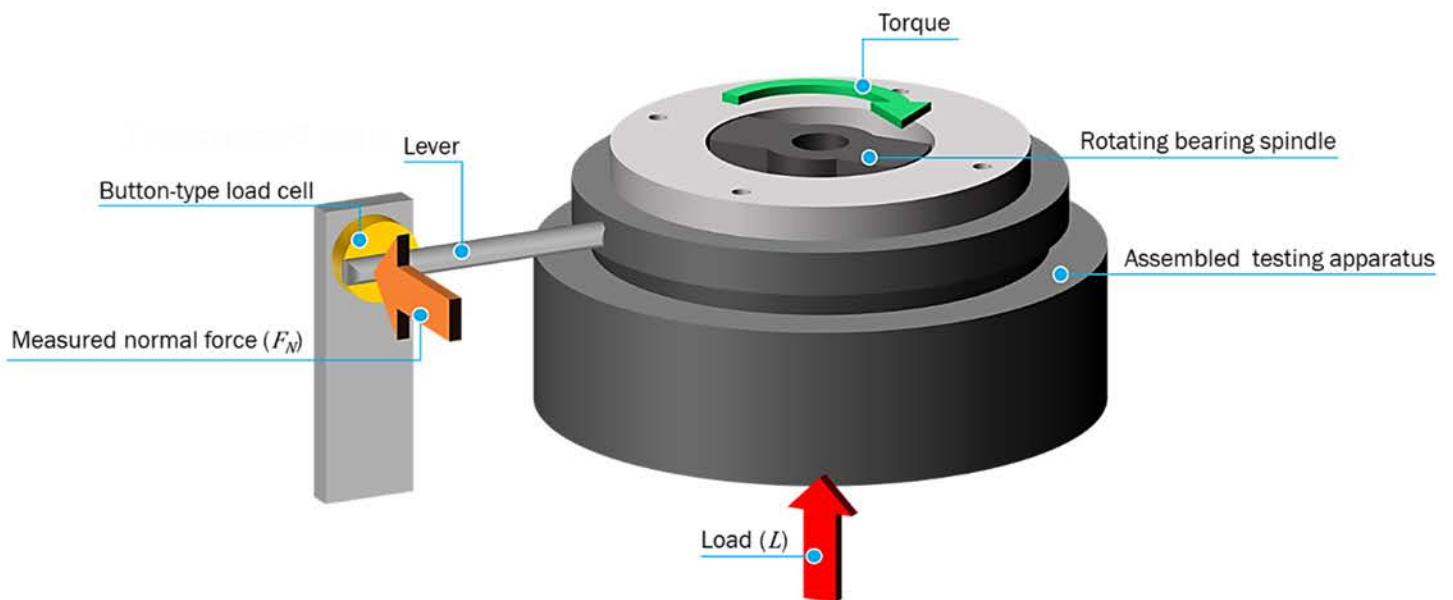
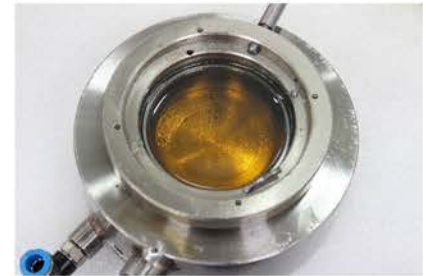


Figure 4. Illustration of a bearing pot assembly with an extended lever and load sensor

OPTIONAL

- Manual Load System (with calibrated dead weights)
- Pneumatic Load System
- Friction Torque Measuring Unit
- Hydrostatic antifriction bearing pad for reducing parasitic friction from torque measurement.



Bearing Pot with Test Oil

Please contact us for the technical specification sheet.

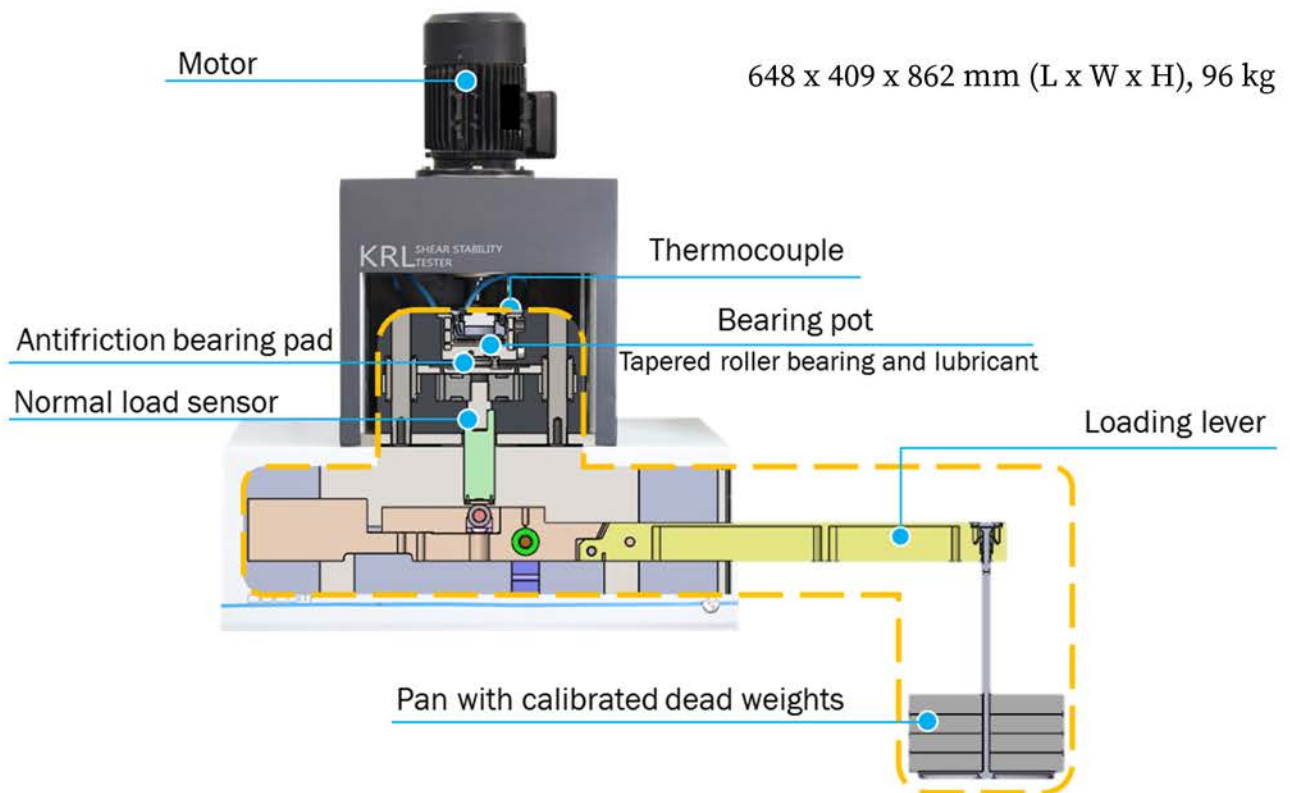
USER CONVENIENCE

- **Ease of Operation:** It is easy to assemble and disengage the test specimen. Test parameters are pre-programmed to conduct repetitive sets of experiments.
- **Industrial Grade Panel PC:** Enables automatic data storage for long duration testing. Also includes: Wi-Fi and Bluetooth connection to personal devices (computer, smartphone, etc.).
- **Partial Automation:** Fully computer-controlled system with a LabVIEW-based test setup and data acquisition software. Aside from preparing and mounting the bearing pot, the rest of the functions are automated.
- **Low Maintenance Costs:** Our instruments are manufactured with high-quality features and components that ensure low-maintenance costs for our users. In addition, online customer support is complimentary.

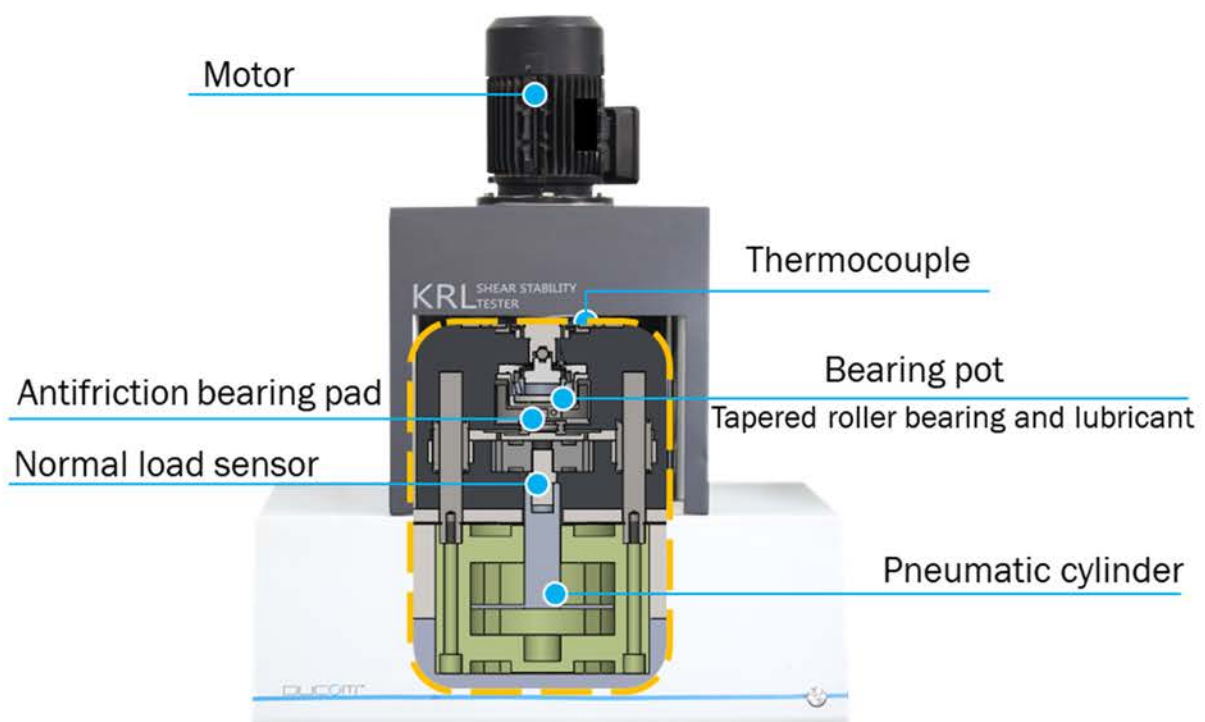
INSTRUMENT CONTROL AND DATA ACQUISITION

The Ducom Shear Stability Tester (KRL) is controlled by our LabVIEW-based WinDucom software, which also acquires and displays the load, friction torque, friction coefficient, speed, fluid temperature and test duration. Acquired data can be presented in several ways: graphs of individual tests can be printed, results of different tests can be superimposed for comparative viewing and data can be exported to Excel.

PICTURE GALLERY

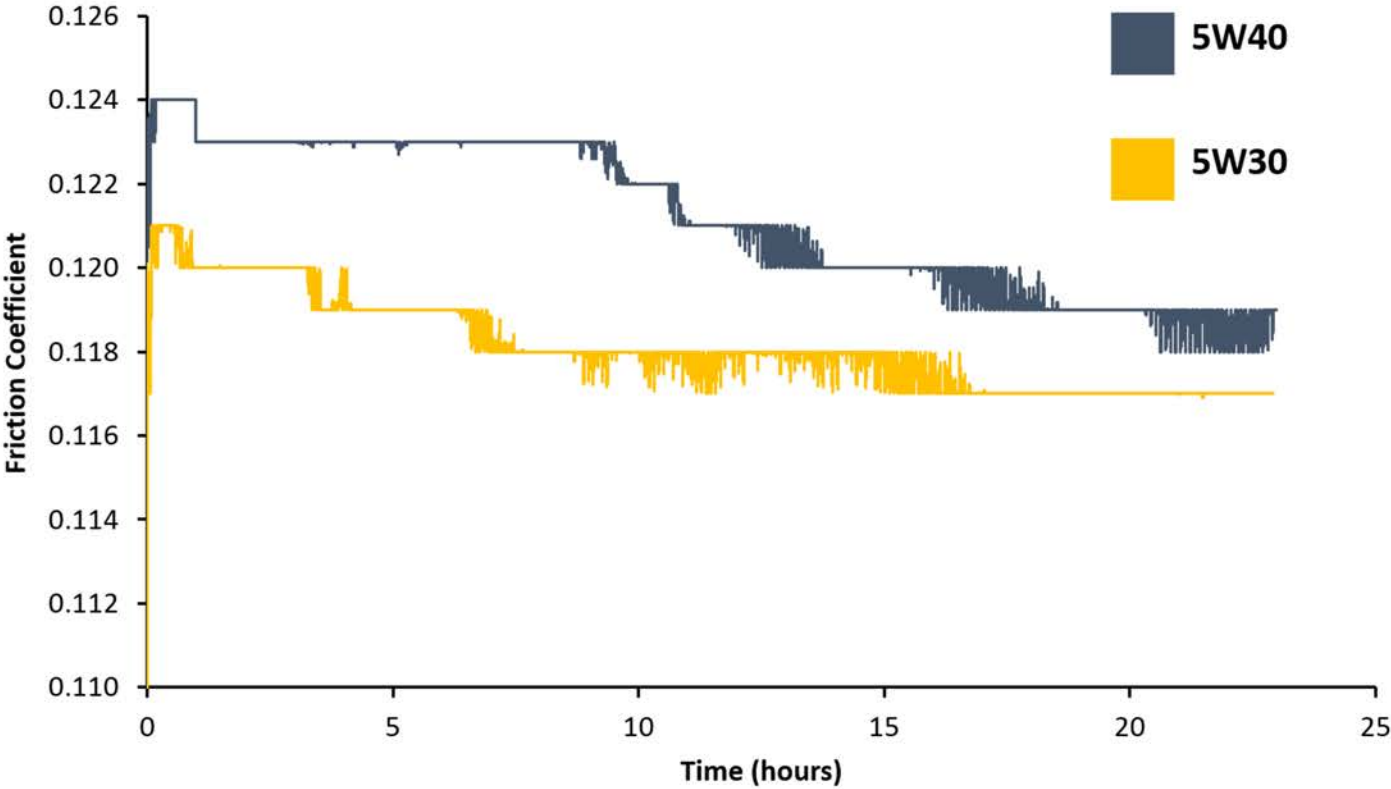
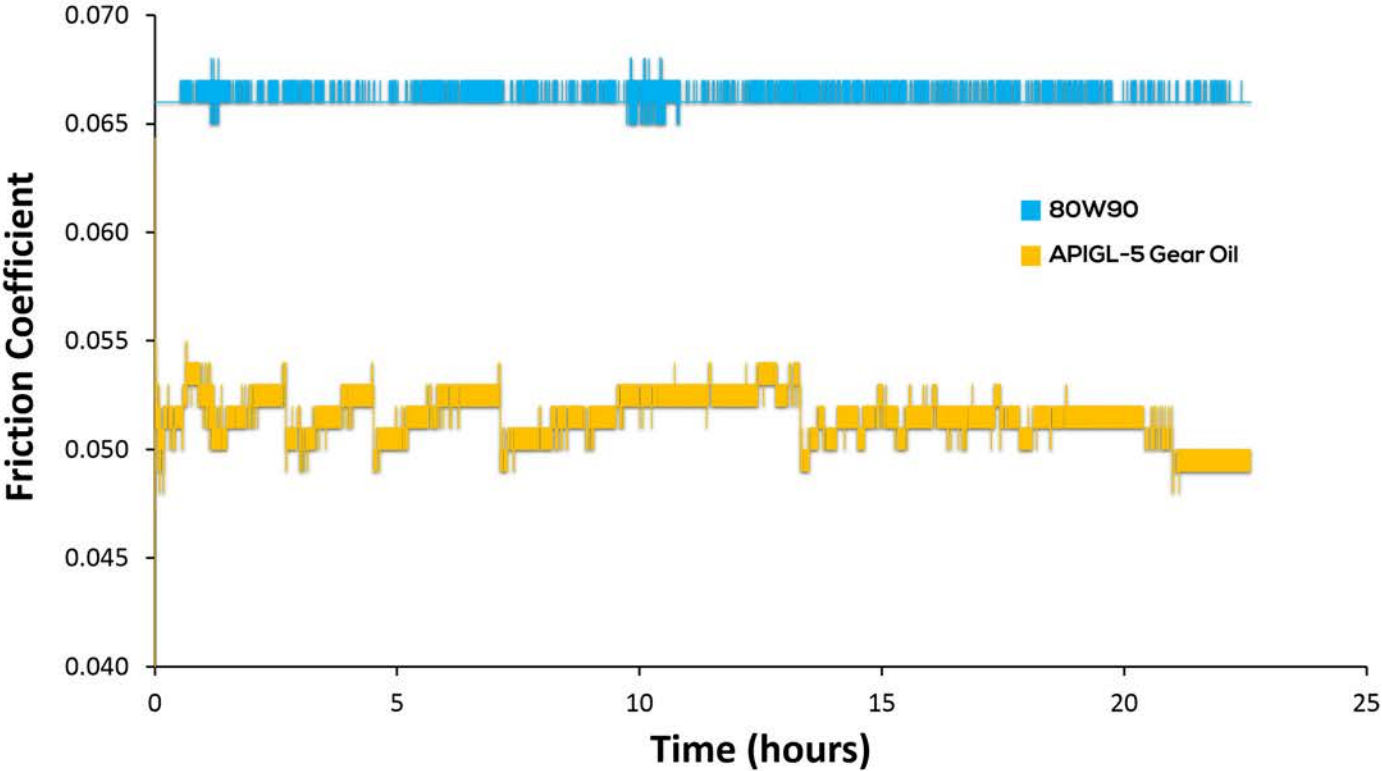


Ducom Shear Stability Tester (KRL) with Manual Loading System



Ducom Shear Stability Tester (KRL) with Automated Loading System

Friction Coefficient of Four Oil Samples



ABOUT DUCOM

Founded in 1978, Ducom Instruments has led the way in designing and manufacturing advanced materials testing instruments with a specialization in tribology. Applying cutting-edge technology and strong design principles to its products, Ducom focuses on providing customers with an excellent ownership experience starting with ease of use and maintenance.

Our locations in the United States, Netherlands and India each have an in-house Research and Development initiative coupled with development partnerships with world renowned institutions. As a result, Ducom holds several proprietary technologies, copyrights and patents with additional filings every year. Many of these technologies are applied to our instruments, and work in the background so users can enjoy better results.



Our instruments are operational all over the world: from research labs that require advanced and highly configurable test systems, to facilities with standardized quality control requirements, Ducom is a trusted solutions partner with decades of experience in a multitude of industries.

Certifications:

ISO 9001:2008 Certified Organization

AS9100:2009 Certified Manufacturing Organization