



LOW TEMPERATURE TORQUE TESTER

ONE PLATFORM FOR ASTM AND IP STANDARDS

The Ducom Low Temperature Torque Tester (LTT) consists of two separate chambers controlled by an electronic chiller and complies with **ASTM D1478**, **ASTM D4693** and **IP 186**.

The LTT is used to determine the resistance of a grease to retard the rotation of a slow speed ball or spring bearing at sub-zero temperatures (below -20 °C) by measuring the starting and running torque.

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Evaluate Low Temperature Performance

Break-away torque and running torque evaluation of greases at low temperatures

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Technical Specifications

- Speed: 1 rpm
- Load: 454 g (ASTM D1478); 400 N (ASTM D4693); 4.5 kg (IP 186)
- Friction Torque: 40 Nm
- Temperature: Up to -80 deg C
- Duration: 100 hours (maximum)
- Sample type: Grease
- Test bearings: Open type ball bearing No 6204 (ASTM D1478); Taper roller bearing LM -67010 & LM-67048 or LM-11910 & LM-11949 (ASTM D4693); Open ball bearing RHP 7204 TU EP9 (IP 186)

Test Standards

The Low Temperature Torque Tester is fully compliant with global standards for low temperature grease testing. With test protocols embedded in the software, you can run tests in accordance with ASTM and IP at the click of a button.

- **ASTM D1478:** Standard Test Method For Low-Temperature Torque Of Ball Bearing Grease
- **ASTM D4693:** Standard Test Method For Low-Temperature Torque Of Grease-Lubricated Wheel Bearings
- **IP 186:** Determination Of Low Temperature Torque Of Lubricating Grease

Application Examples

Greases for bearings used in components working at sub-zero temperatures, like in aviation, automotive, defense, agriculture equipment and food storage.

- Screening of grease ingredients like base oils, thickeners and additives for extremely low temperature grease applications (in house R&D).
- Qualification of different grease for low powered mechanisms like aviation instrument bearings (quality analysis of grease suppliers)
- Testing of bio-based lubricating greases used in food storage applications (quality analysis of grease suppliers)

Product Features

ASTM D1478

This test module consists of a motor with a **drive shaft assembly**, a test cage with load disc and bearing housing, a low temperature box and a **frictional force sensor**. An open ball bearing (No. 6204 size) is packed with grease and it is fixed on the bearing housing of the test cage. The test cage is directly mounted on the shaft driven by the motor (horizontally mounted). The



IP 186

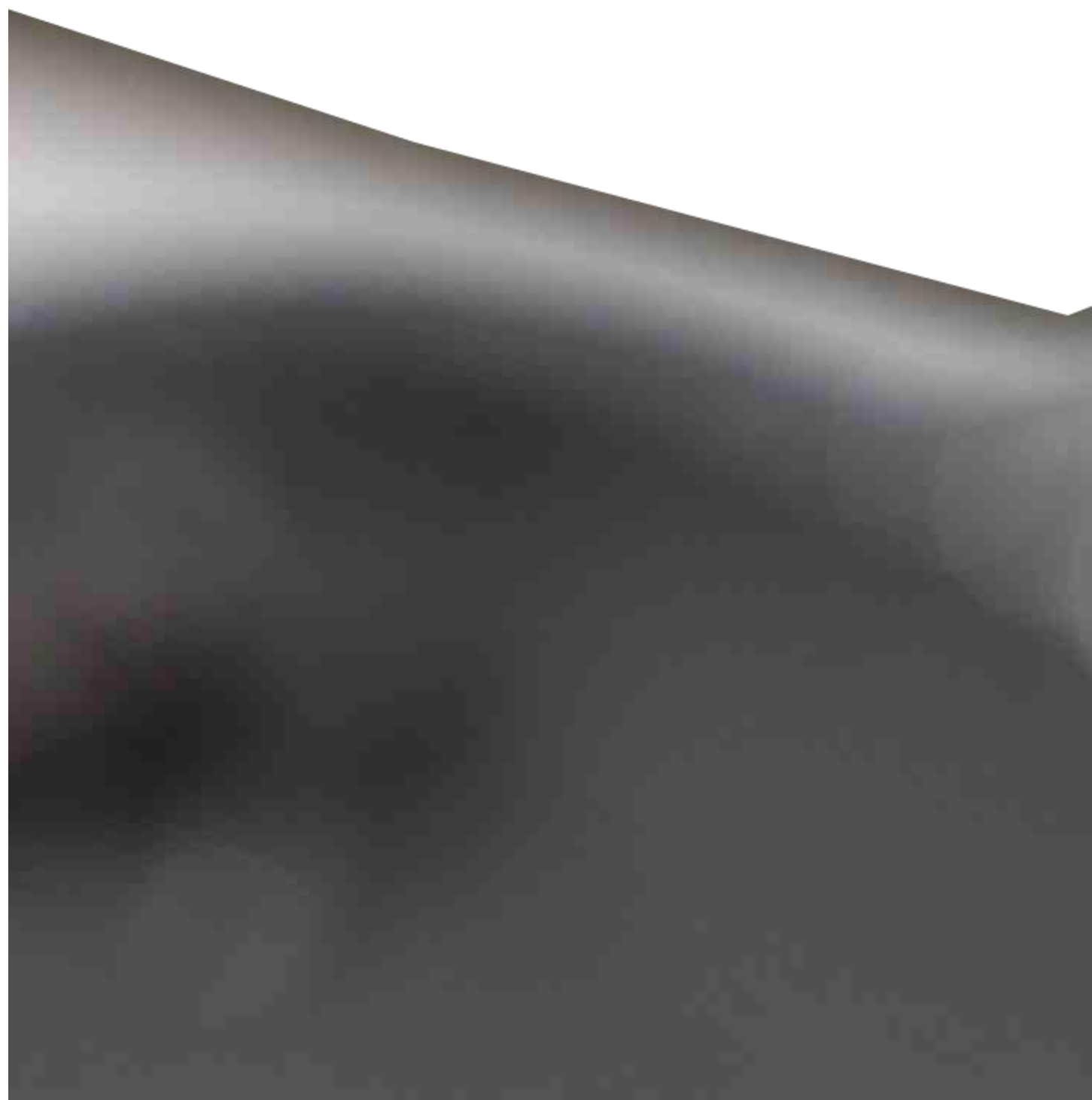
An angular contact bearing (No 7204) is packed with grease and it is directly mounted on the bearing-spindle assembly. The bearing-spindle assembly is then vertically immersed into the low temperature box. The spindle is connected to the motor by a pulley arrangement. The normal load is applied axially using a dead weight of 4.5 kg. The motor starts the rotation of the driver pulley and the same is transmitted to the bearing inner race via the seamless belt. As the test bearing inner race rotates at 1 rpm, the bearing friction torque (starting and running) is recorded by a load cell connected to friction pulley.

load is applied radially by a 454 ± 3 grams load disc. As the test bearing inner race rotates at 1 rpm, the bearing friction torque (starting and running) is recorded by the load cell, which is connected to the outer race of the bearing through a chord (as per ASTM 1478).



Electronic chiller

The subzero temperature in the test units are maintained by a closed loop temperature control system using the electronic chiller. The chilling system is equipped with a dual stage cascade refrigeration system for precise and stable ultra-low test temperatures. The refrigerant is pumped and circulated at low temperature via copper tubing coils to provide convective cooling to the test bearing. The temperature can be controlled and maintained within ± 0.5 °C.



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Fully Integrated Design

An innovative design and a test area that is easily viewed and accessed make the LTT simple to use. This design has the capability of being upgraded to the ASTM D4693.

Questions?

Our experienced and knowledgeable staff can help you.

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