DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

PIN ON DISK (POD-4.0)

PRODUCT OVERVIEW

An inside look at our new compact,
high capability rotary tribometer.

About Us

Ducom Instruments is an innovative company with decades of tribology experience.

By prioritizing technical expertise, superior design and quality instrumentation, Ducom has quickly evolved into one of the leading manufacturers of materials testing equipment.

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

About Us

A look at our international locations

Bangalore
India

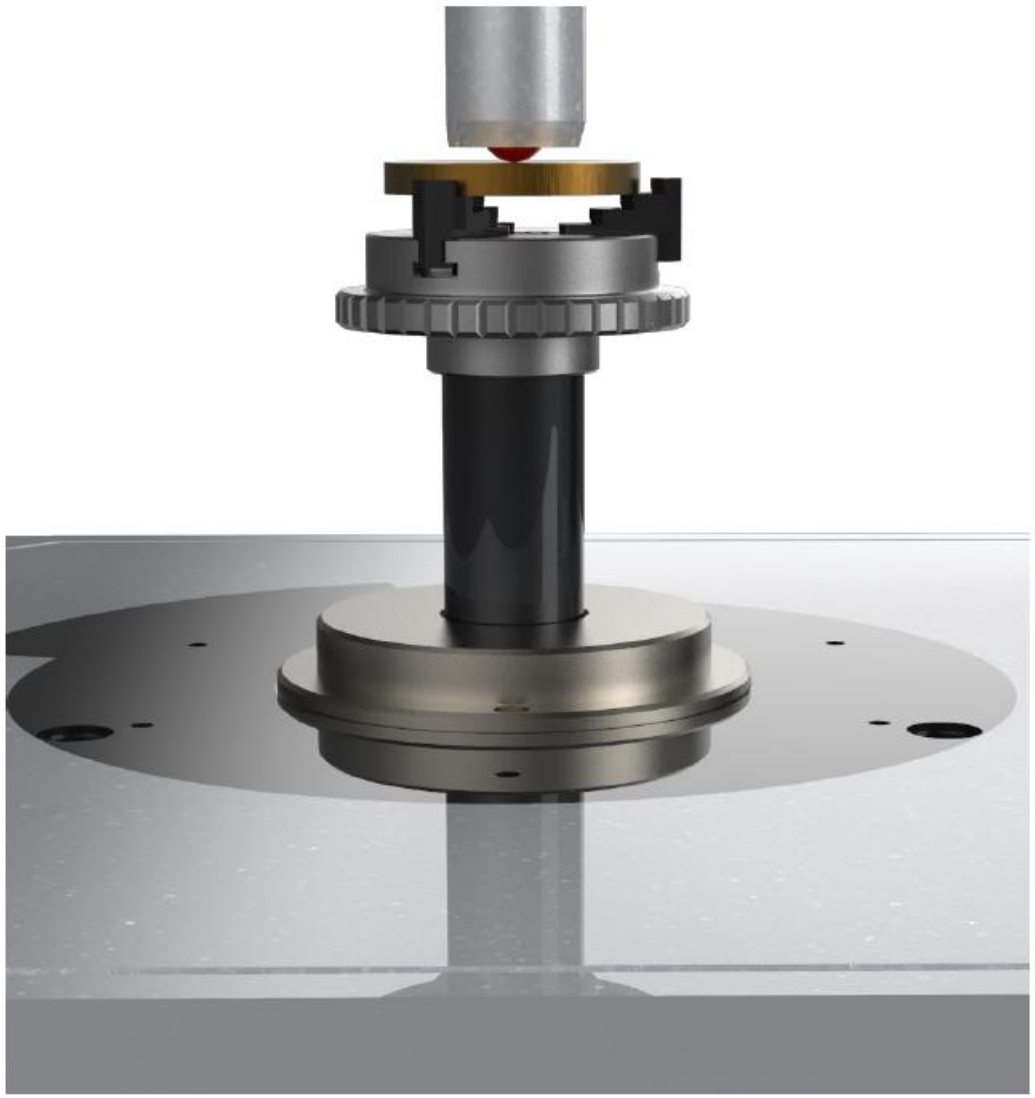
New York
United States

Groningen
The Netherlands

Kuala Lumpur
Malaysia

With four offices in key markets, as well as representatives and distributors in over 29 countries, Ducom is well-equipped to serve our international customers.

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS



Principle of Operation

The Basics

The Ducom POD-4.0 is a high capability tribometer designed for sliding wear studies in unidirectional sliding (clockwise and counterclockwise) as well as bi-directional sliding (angular reciprocation, linear reciprocation). An added component of motion can be controlled using the high precision wear track positioning system (manual, automated).

The POD-4.0 unlocks the ability for highly precise tribology testing in a variety of environments and testing conditions using a fully programable system.

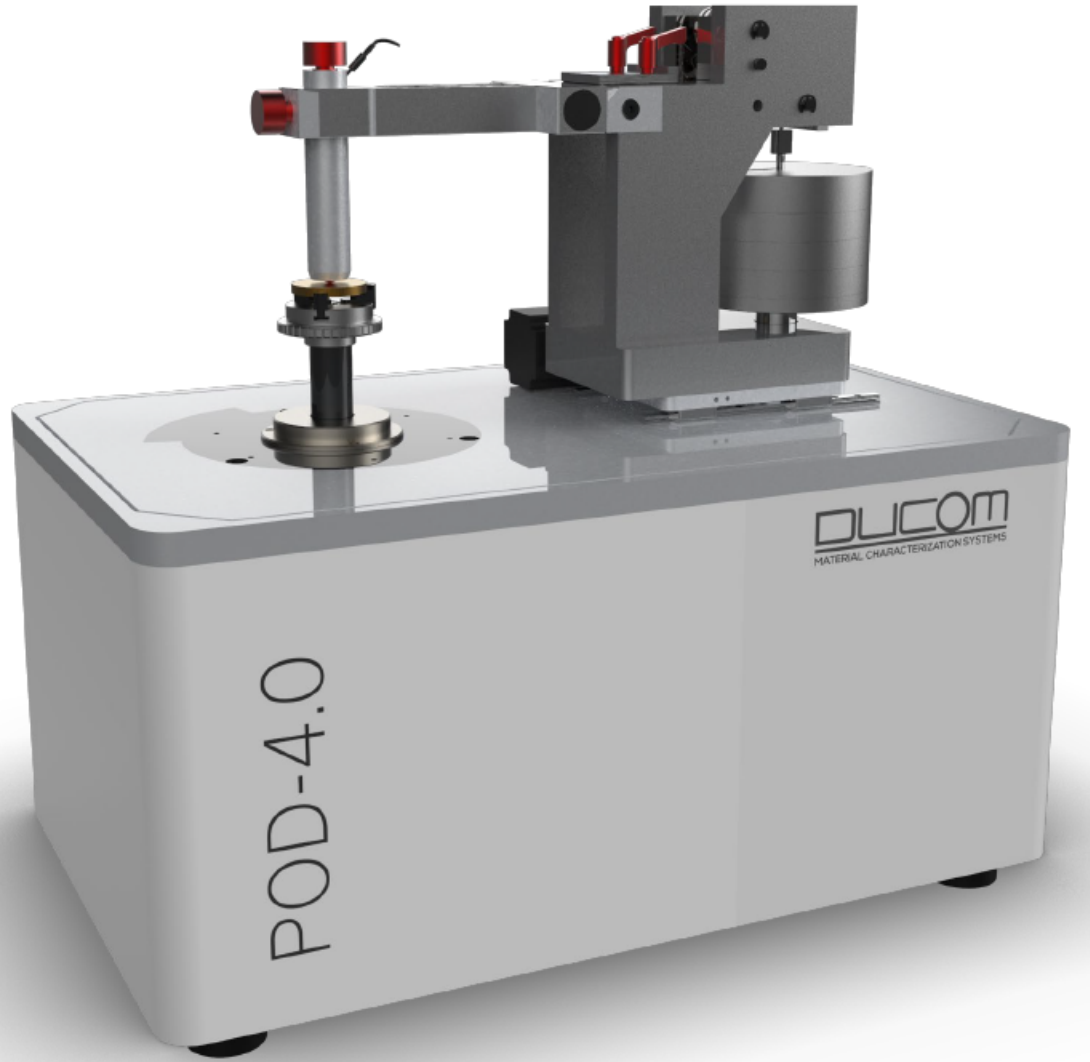
DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

Loading Systems – Manual

A highly stiff, modular loading architecture sits on top of a high precision wear track adjustment system. This loading architecture fully decouples load mounting from the pin/ball and the instrumented friction force arm to drastically reduce vibrations and jitter in the mechanical system, thereby improving tribometer performance.

Manual Loading Options:

- Low load applications: 0.1 N to 100 N
- High load applications: 5 N to 200 N



DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

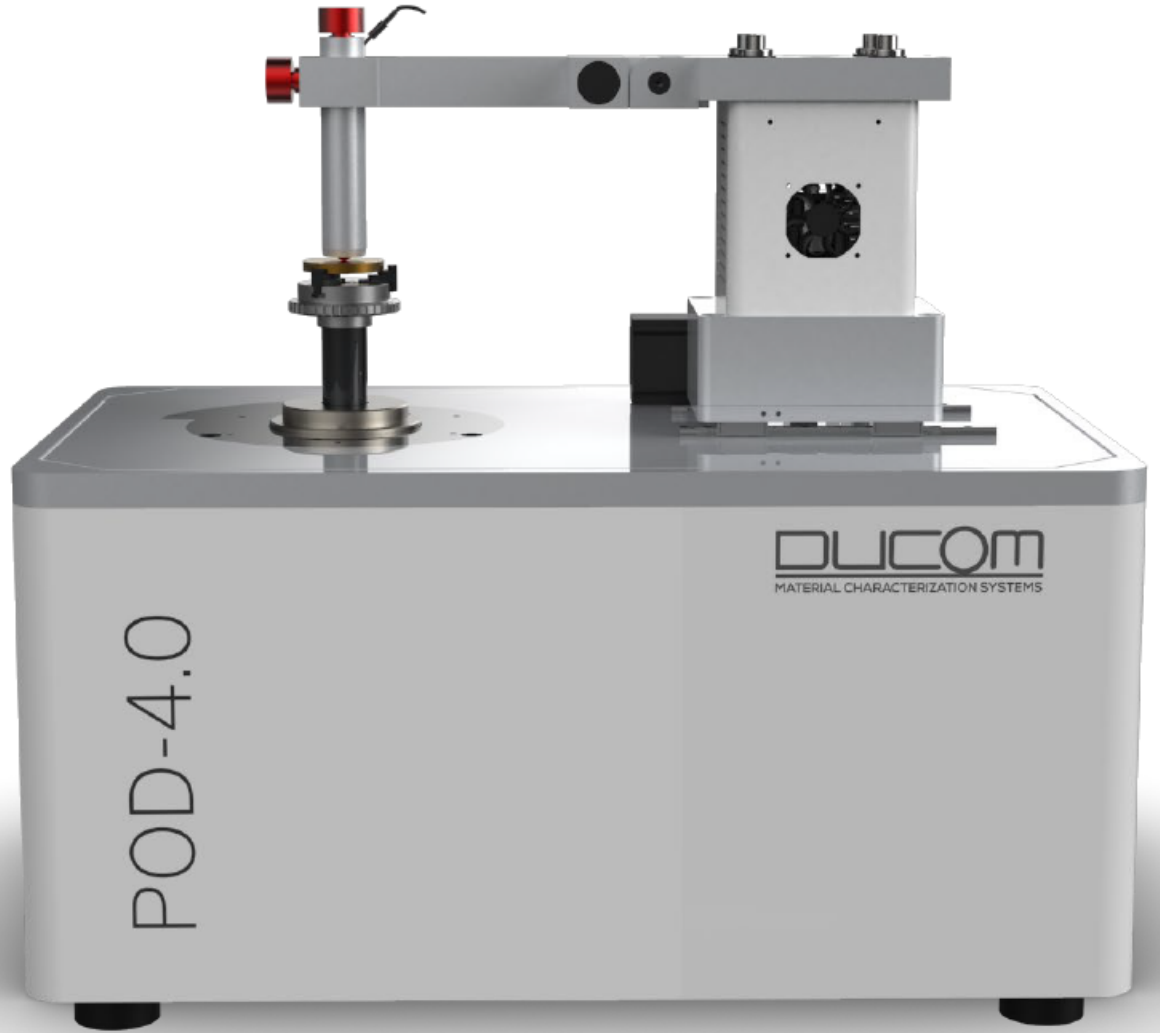
Loading Systems - Automated

The automated loading option is a fully decoupled highly precise loading mechanism that combines accurate loading capabilities with the convenience of a "touch-button" operation. For advanced users, the automated loading option allows the programming of a loading sequence (Ex. Run-in phase preceding the test)

When equipped with automated wear track adjustment, a fully autonomous multitrack wear test can also be programmed.

Automated Loading Options:

- Low load applications: 0.1 N to 100 N
- High load applications: 5 N to 200 N



DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

Drive Architecture

POD-4.0 features a powerful drive architecture that can achieve excellent performance at ultra low speeds to high speeds, opening new dimensions to your tribological research.

With Ducoms Advanced Motion Control (AMC) electronics and software, the drive architecture can perform precise, user configurable angular reciprocation, homing and jog operations.

Drive Options:

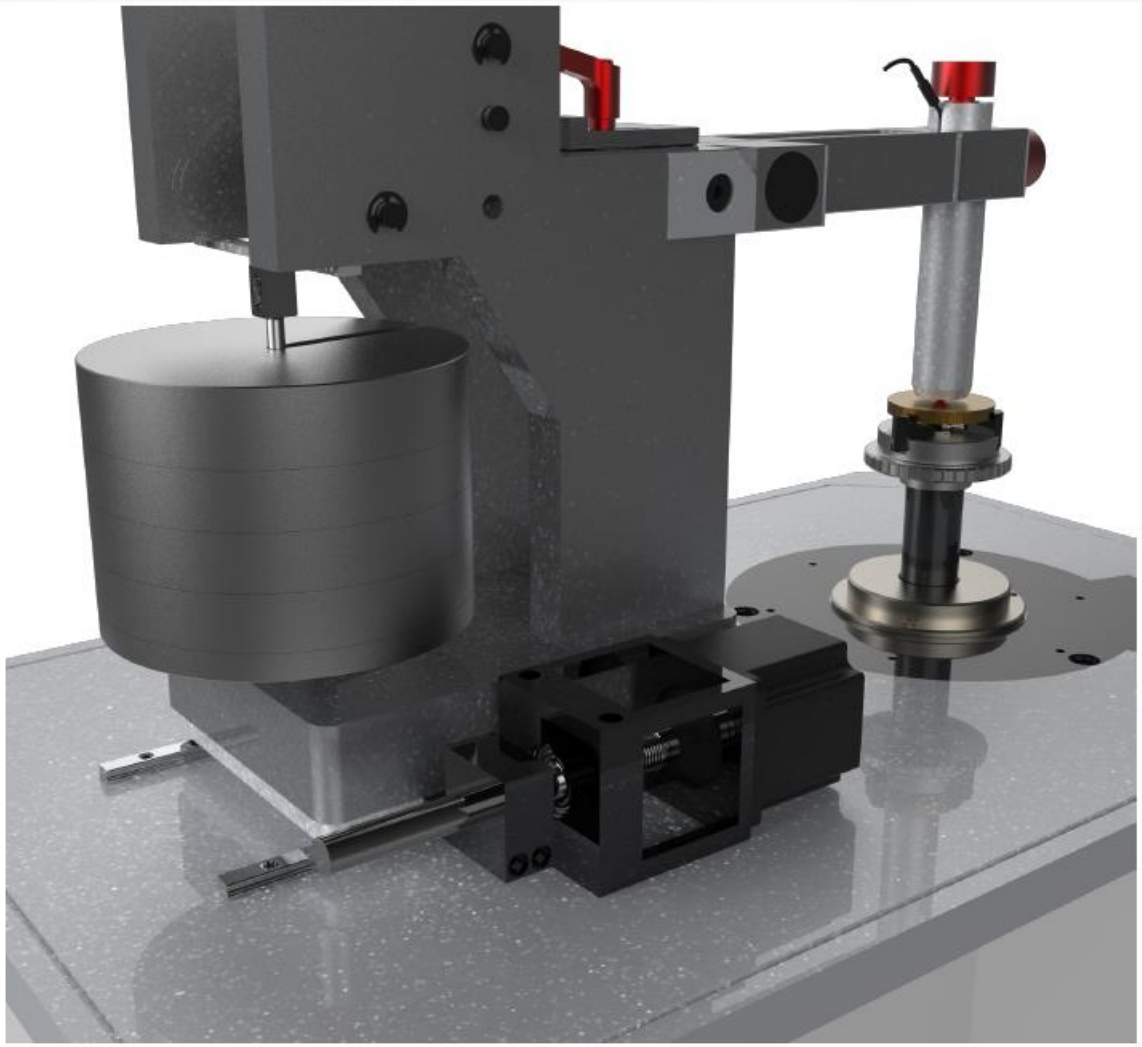
- Standard Drive: 200 to 2000 rpm
- High Performance Drive: 0.1 to 3000 rpm

Advanced Motion Options:

- Advanced Motion Control Package (AMCP): As an add on for HP Drive, The AMCP enables angular reciprocation, jog and homing capabilities.

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

Wear Track



The POD-4.0 is offered with two wear track options. When equipped with a manual wear track adjustment module, users can set the position of their static specimen using a micrometer head.

The automated wear track adjustment module allows users to set wear track using the software, bringing convenience to your testing workflow. An added advantage of the automated wear track is its ability to automatically calculate sliding speed and log wear track information for reporting and future use.

Wear Track Options:

- Manual Wear Track: 50 mm travel (max)
- Automated Wear Track: 50 mm travel (max)

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

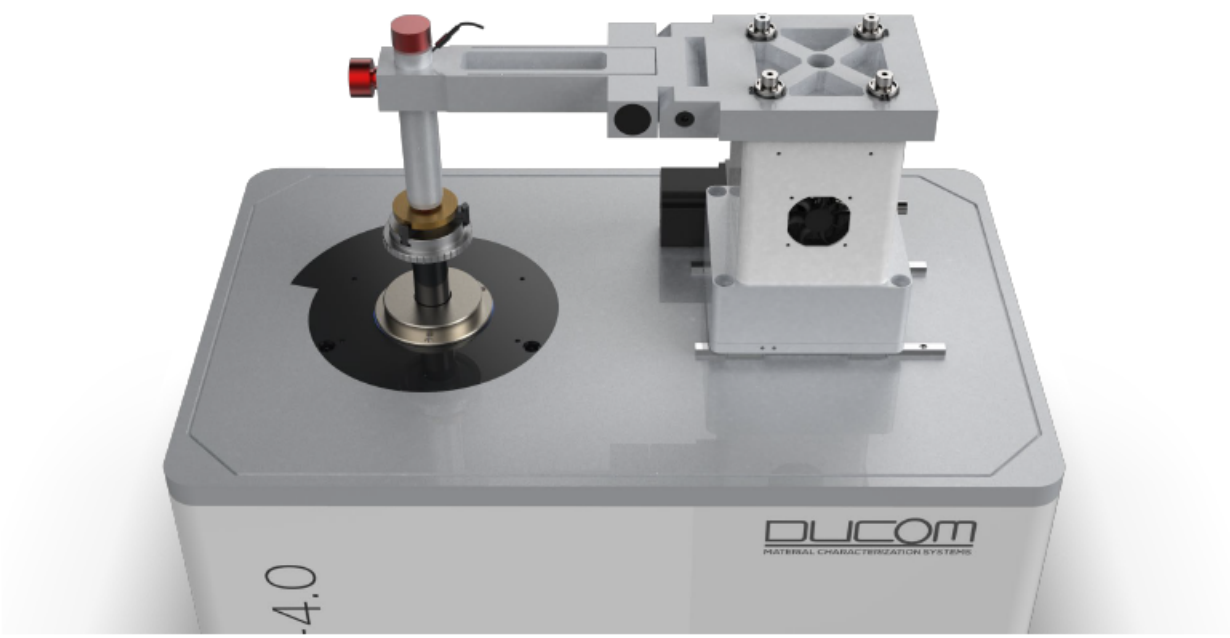
Friction Force Measurement

A unibody friction arm that is optimized for stiffness during loading but allowing calculated compliance for friction measurement is used for precise friction measurement.

The friction arm is thermally engineered to minimize heat transfer to sensors when used with the Ducom High Temperature Module. Dual friction force measurement sensors minimize thermal drift.

Friction Force Measurement Options:

- Low load applications: up to 100 N
- High load applications: up to 200 N



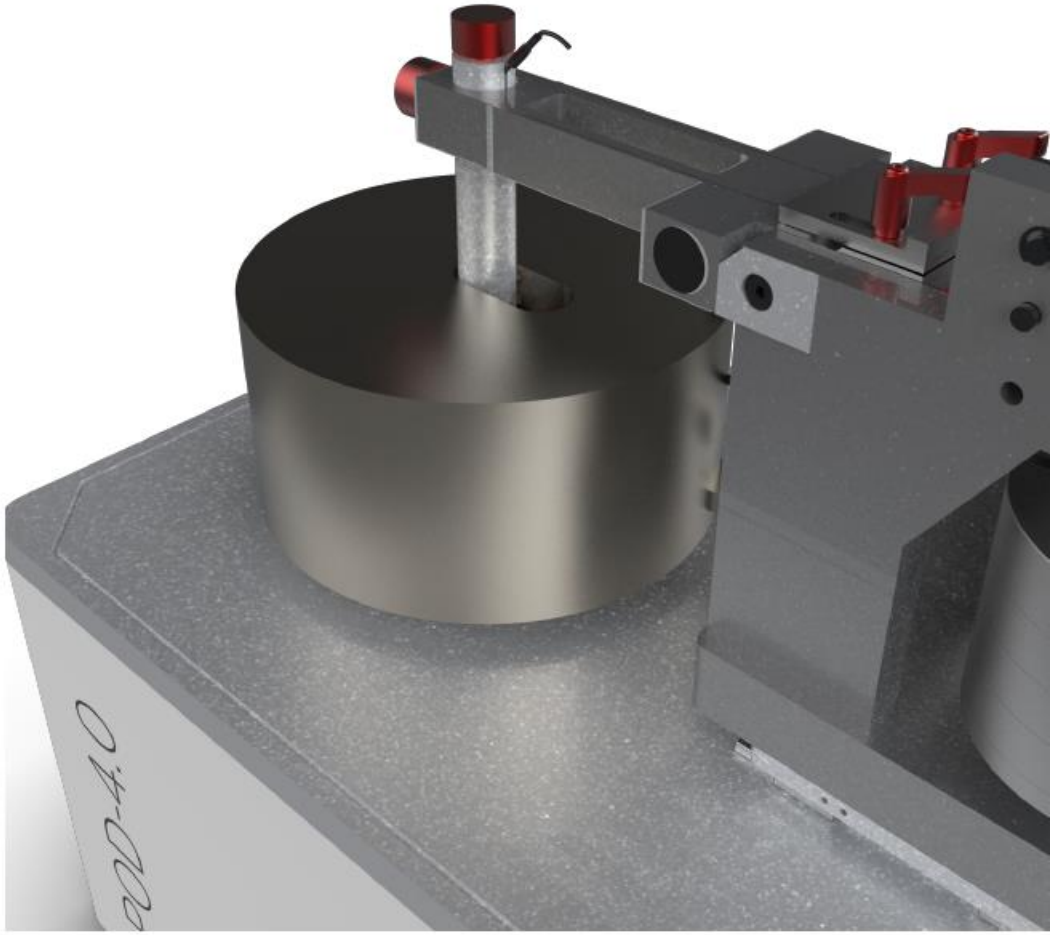
DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

High Temperature

The High Temperature Module comprises of a custom high temperature furnace that enables heating capabilities of up to 1,000 deg C. This module is engineered to provide reliable operation, stable and homogenous specimen temperatures.

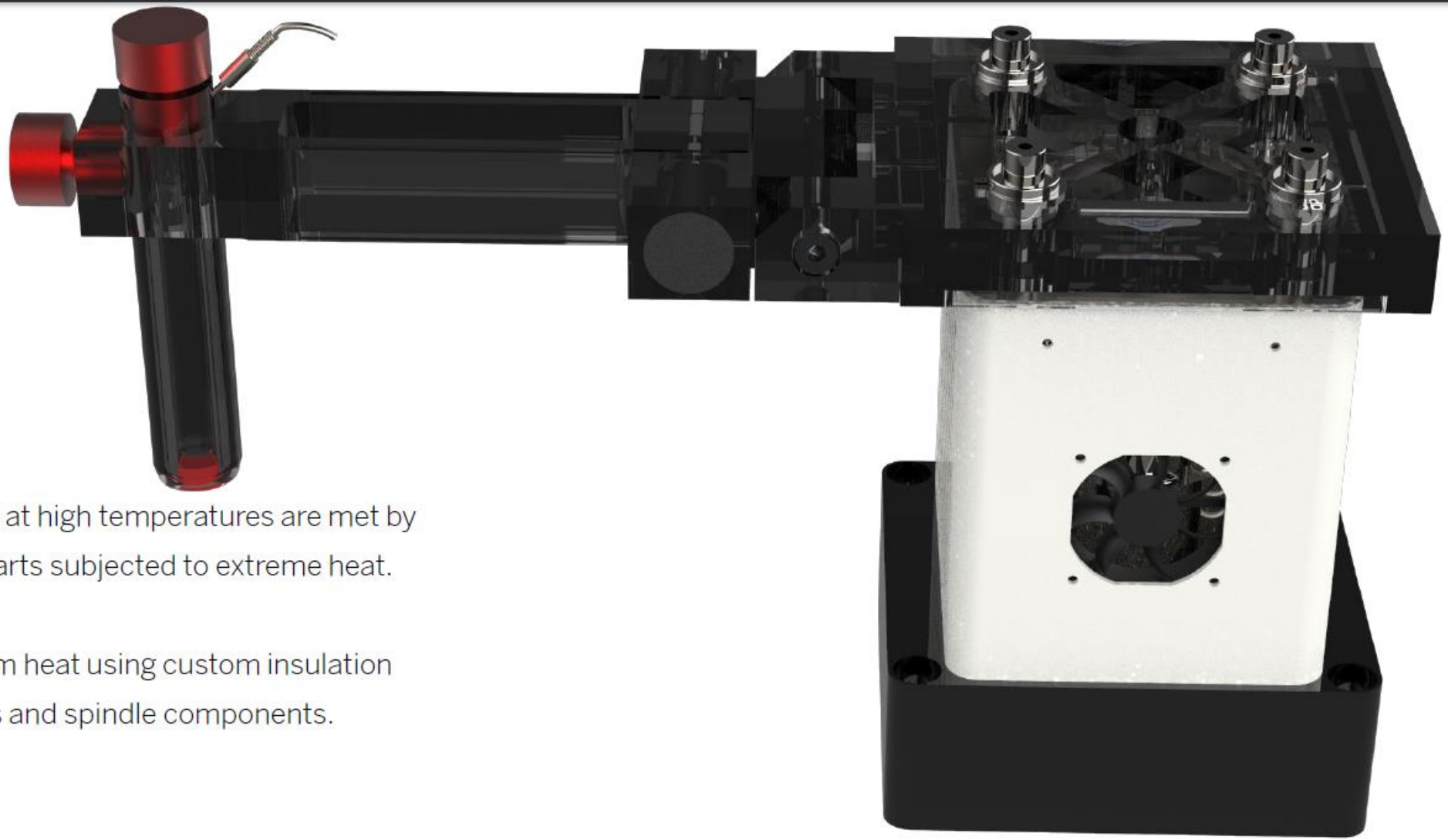
Integrated safety sensors ensure furnace safety. The furnace is offered in two variants:

Water cooled furnace (requires chiller, occasional maintainence)
SuperInsulator furnace (requires no utilities, maintenance free)



DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

SuperAlloy Construction



The demands of reliable operation at high temperatures are met by a full SuperAlloy construction of parts subjected to extreme heat.

Drive architecture is protected from heat using custom insulation elements and specialized bearings and spindle components.

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

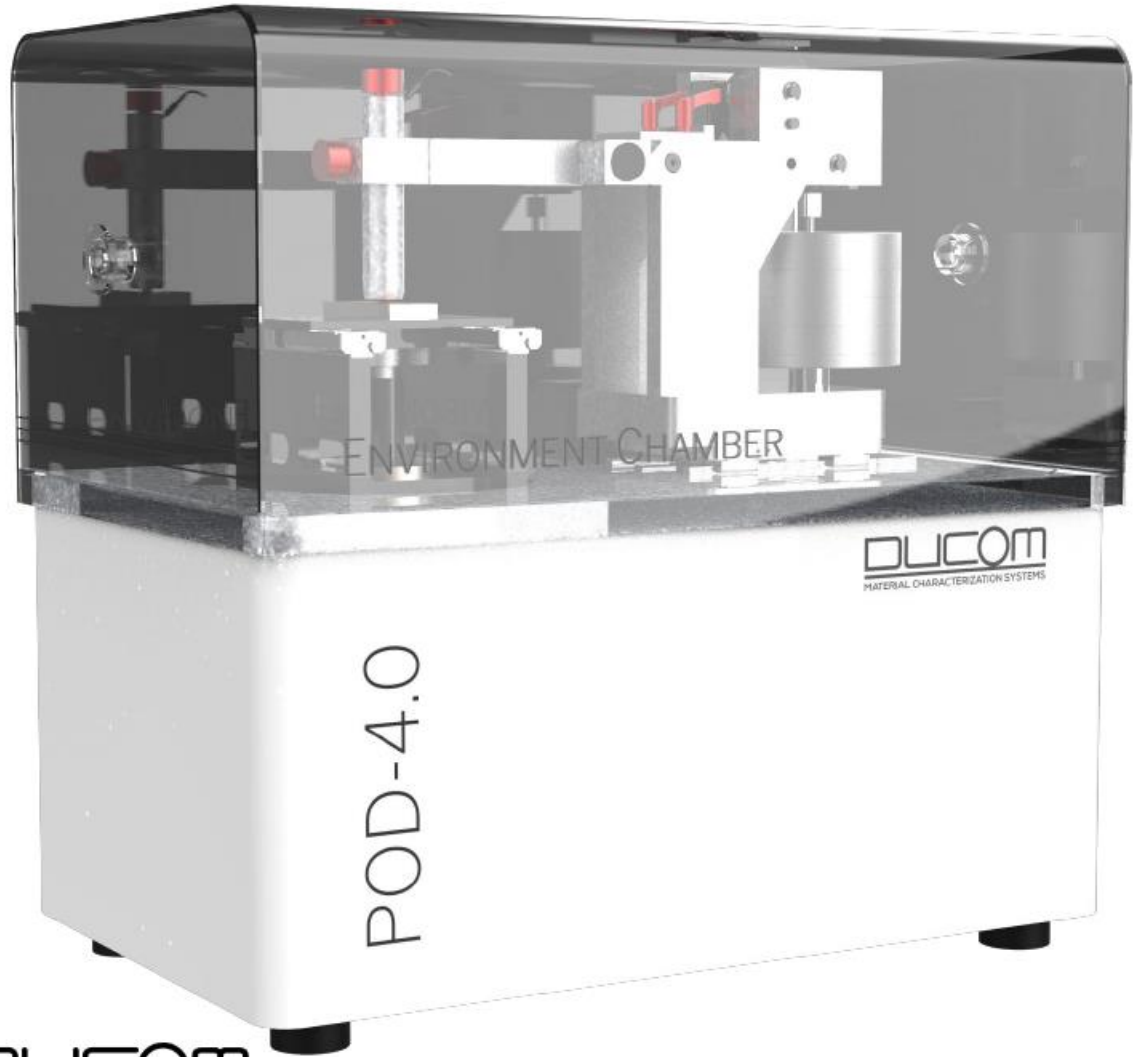
Linear Reciprocating Module

The Linear Reciprocating Module (LRM) is a highly capable module for the POD-4.0 that converts rotary movement to a precise linear movement.

With easy mounting, users can conveniently replace rotary attachment with the LRM for precise and easy friction measurement.

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

Environment Chamber



The Environment Chamber is a break resistant enclosure equipped with two ports, one for inlet and the other for outlet. Clear construction allows for viewing of the test specimen during test. The enclosure is fully removable, making accessing the test area for sample setup easy and safe while drastically reducing diskspace requirement.

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

Technical Specifications

Parameter	Specifications	
Normal Force Range	0.1 N to 100 N	5 to 200 N
Friction Force Range	Up to 100 N	Up to 200 N
Speed	Standard: 200 to 2000 rpm / HP Drive: 0.1 to 3000 rpm	
Motor Torque	2 Nm	
Oscillatory Motion (Angular)	Movement: +/- 5 to +/- 150 deg Frequency: 0.01 to 10 Hz	
Oscillatory Motion (Linear)	Movement: Up to 25 mm stroke Frequency: 10 Hz	

Features:

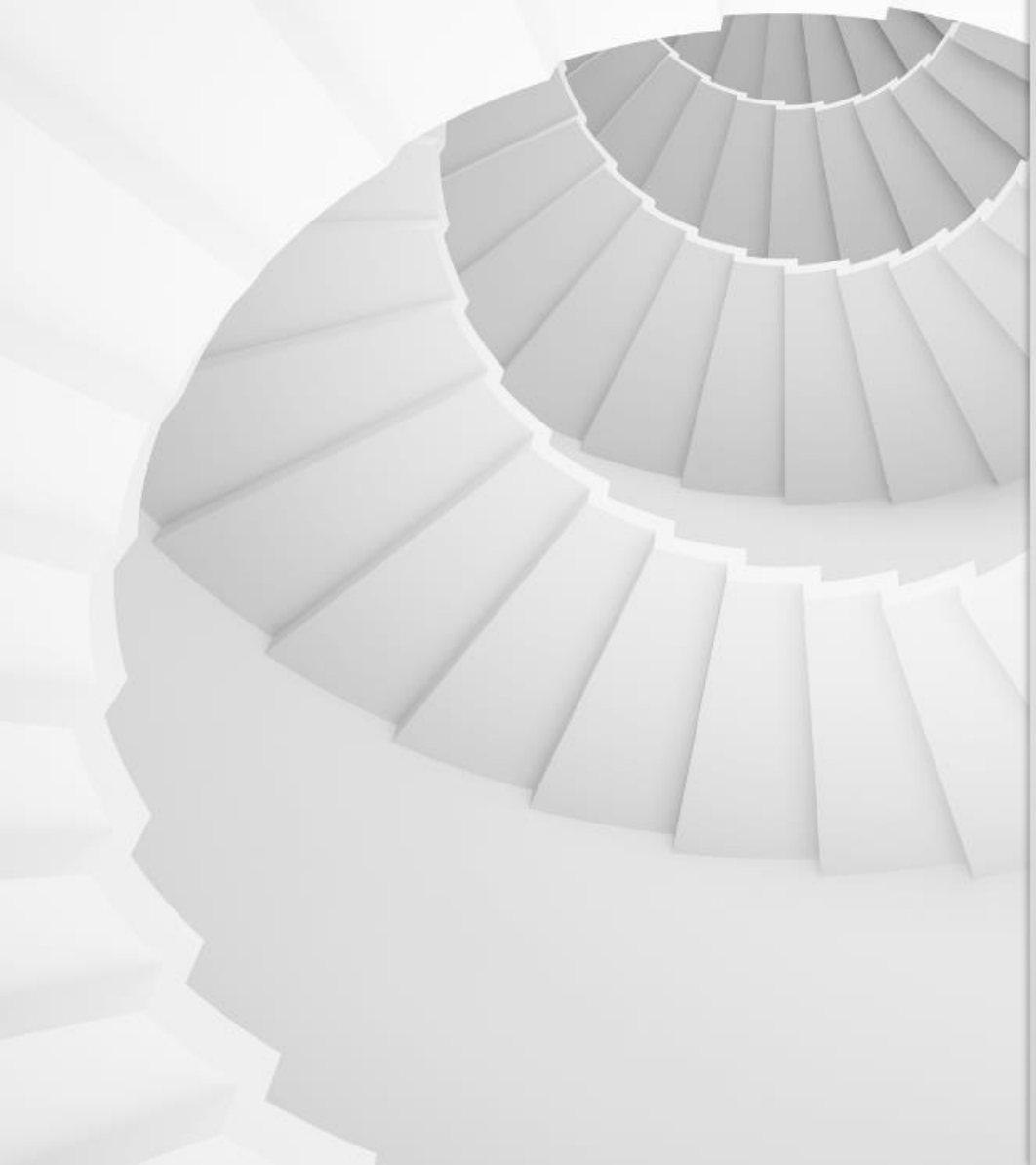
- Real time DAQ (1kHz)
- User configurable DAQ rate
- Real time display of Friction Force vs. Time, Cycles and Sliding Distance
- High precision homing *(with HP Drive + AMCP)*
- Integrated software module for Hertzian contact pressure, contact radius and contact area
- Integrated RH and ambient temperature sensors
- Automated report generation

Upgrade Options:

- Electrical Contact Resistance (ECR)
- Lubricant cup with heating (120 deg C)
- Universal holder *(for rotating specimen up to 54 mm dia., ambient temperature only)*
- Stylus profilometer
- Temperatures up to 1000 deg C on the rotary module
- Temperatures up to 400 deg C on the linear reciprocation module
- Low temperature module up to -40 deg C
- Environment chamber with inert gas purging and vacuum
- Acoustic emission sensor

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS

DUCOM
MATERIAL CHARACTERIZATION SYSTEMS



Future Ready

The POD-4.0 is Digital Enabled. When connected to a valid subscription of MOOHA users can view the health of their instrument, access live data from anywhere in the world and access detailed history and test data at any time.

** MOOHA and its addons are only available for purchase online.*