

TRIBOLOGY · ELECTROMECHANICAL SIMULATOR

# Pin on Plate Tribometer.

A three kinematic + one soak station machine designed for the reliable and repeatable study of tribometer material wear. Meets the apparatus requirements of ASTM F732-00 (2011).

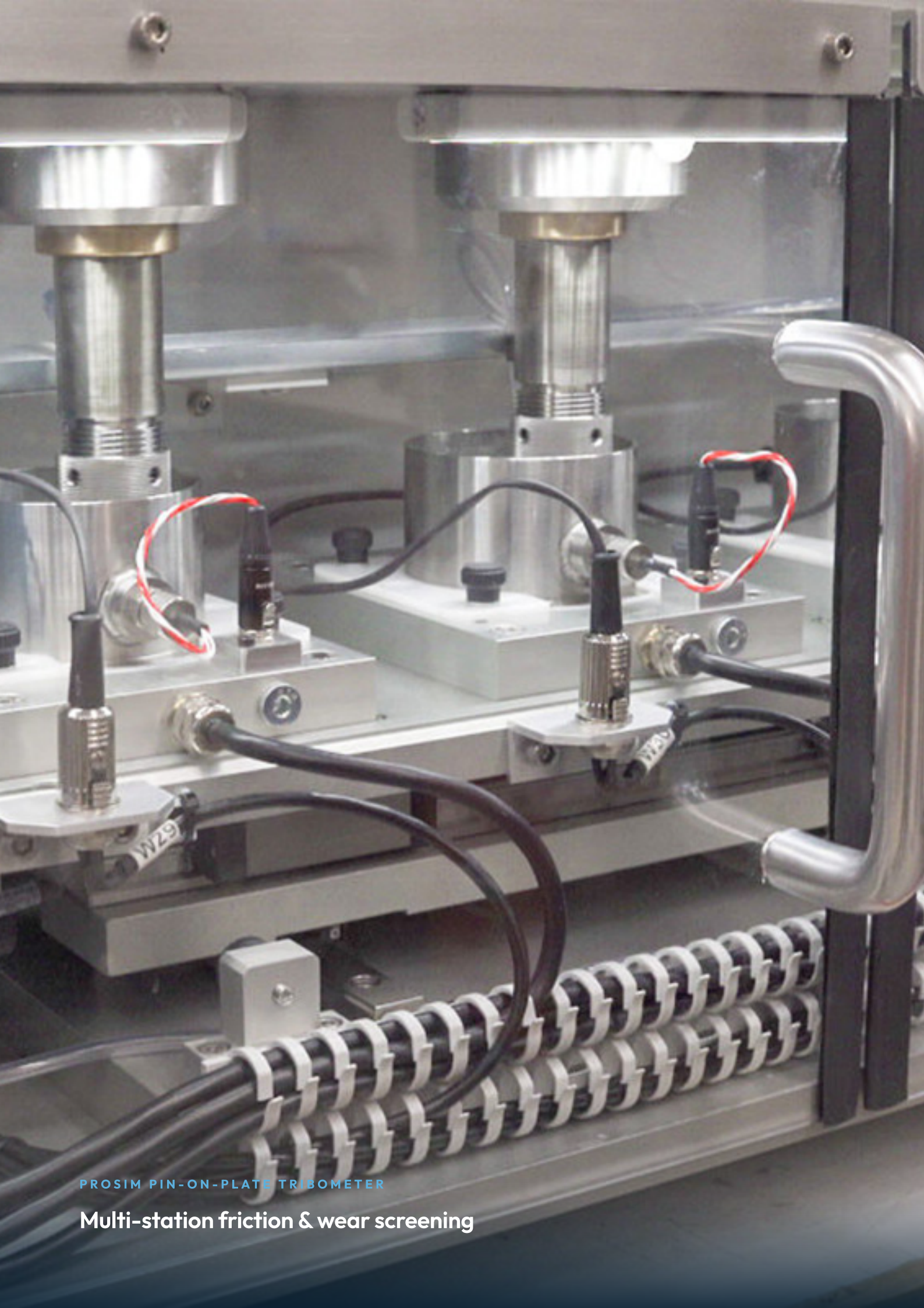
ASTM F732-00 (2011)

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**3 + 1**

KINEMATIC + SOAK STATIONS

**120 RPM**MAXIMUM PIN ROTATION,  
PROGRAMMABLE**300 N**STATIC MASS AXIAL LOADING (Z  
AXIS)



PROSIM PIN-ON-PLATE TRIBOMETER

Multi-station friction & wear screening

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— ABOUT PROSIM

# A research partnership turned *global product range*.

ProSim, a division of Simulation Solutions Group, designs and manufactures advanced electromechanical wear and fatigue simulators for orthopaedic implant testing, in long standing partnership with the University of Leeds.

Since the 1990s, ProSim, a division of the Simulation Solutions Group, has been at the forefront of orthopaedic implant wear testing through a long standing partnership with the University of Leeds. Together, we have developed advanced wear and fatigue simulators with over 100 stations of testing capacity across leading global orthopaedic manufacturers and testing houses.

Today, ProSim offers a comprehensive suite of electromechanical simulators for both medical and industrial tribological and wear fatigue testing. Our flexible, cost effective approach has enabled

us to expand into both mature and emerging global markets.

We work closely with customers and academic partners to design simulators that exceed appropriate standards, replicating real world conditions, wider ranges of motion, and higher loads to better understand adverse wear. At the heart of ProSim is a 30 year legacy of innovation, trusted collaboration, and a relentless drive to push the boundaries of fatigue research.

Through participation in major European research initiatives like the Lifelong Joints Project, ProSim has consistently pushed the boundaries of implant wear research.

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**OVERVIEW**

# Pin on Plate Tribometer.

The ProSim Pin on Plate Tribometer is a multi station machine designed for the reliable and repeatable study of tribometer material wear. The machine meets the apparatus requirements of ASTM F732-00 (2011), Wear Testing of Polymeric Materials Used in Total Joint Prostheses.

The counterface is fitted in a sample cup that is fitted with a lubricant level sensor. The nominal size of the counterface is a disc of diameter 57 mm and thickness 3 mm. As standard, 316 grade stainless steel counterfaces, polished to  $R_a = 0.4 \mu\text{m}$ , are supplied for each station of the machine. The lower surface of the sample cup has an integrated heater and temperature control system that maintains the lubricant temperature at  $37^\circ\text{C} \pm 2^\circ\text{C}$ .

The counterface has an alignment feature that allows it to be removed for examination and then refitted in the same orientation. A station specific valve top up system maintains the lubricant levels throughout the test.

ProSim is able to offer customisation of its simulators to meet a client's specific testing requirements.

**AT A GLANCE**

STANDARD  
**ASTM F732-00**

KINEMATIC STATIONS  
**3**

SOAK STATIONS  
**1**

X Y MOTION  
**up to 25 mm**

PIN ROTATION  
**up to 120 RPM**

AXIAL LOAD  
**up to 300 N (Z axis)**

## — FEATURES

# Features *and benefits.*

Every capability published for the Pin on Plate Tribometer, sourced from the ProSim product page and product documentation.

- Multi station machine for the reliable and repeatable study of tribometer material wear
- Meets ASTM F732-00 (2011), wear testing of polymeric materials in total joint prostheses
- Frequency of motion programmable up to 2 Hz
- Counterface fitted in a sample cup with lubricant level sensor
- Nominal counterface: disc of diameter 57 mm and thickness 3 mm
- 316 grade stainless steel counterfaces, polished to  $Ra = 0.4 \mu m$  as standard
- Integrated heater + temperature control maintains lubricant at  $37^{\circ}C \pm 2^{\circ}C$
- Counterface alignment feature, removable for examination, refitted in the same orientation
- Station specific valve top up system maintains lubricant levels
- Up to 50 programmable profiles
- Backed by ProSim service & support, install, training, follow-up, PM, remote support



## — SPECIFICATION

# Technical *specification.*

Complete machine specification for the Pin on Plate Tribometer.

| PARAMETER                   | VALUE                                                   |
|-----------------------------|---------------------------------------------------------|
| Configuration               | 3 kinematic + 1 soak station                            |
| Kinematic motion            | Programmable X Y, sinusoidal up to 25 mm                |
| Motion profile              | Linear / circular / elliptical (X or Y)                 |
| Pin rotation                | Up to 120 RPM, programmable                             |
| Axial loading (Z axis)      | User added static mass, up to 300 N                     |
| Frequency of motion         | Programmable up to 2 Hz                                 |
| Activity profiles           | Up to 50 programmable profiles                          |
| Counterface dimensions      | 57 mm Ø × 3 mm thickness                                |
| Counterface material (std.) | 316 grade stainless steel                               |
| Counterface finish (std.)   | Ra = 0.4 µm                                             |
| Counterface alignment       | Removable, refit in same orientation                    |
| Lubricant temperature       | 37°C ±2°C                                               |
| Heating                     | Integrated per station, with temperature control        |
| Lubricant level             | Sensor + station specific top up valve                  |
| Drive                       | Electromechanical (motors, drives, gearboxes)           |
| Customisation               | Additional stations, different configurations supported |
| Standard                    | ASTM F732-00 (2011)                                     |

Specification is indicative, exact configuration is confirmed at quotation. ProSim is able to offer customisation of its simulators to meet a client's specific testing requirements.

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## APPLICATIONS

# Applications.

Common use cases for the Pin on Plate Tribometer.

**01****Polymeric material wear testing**

Wear testing of polymeric materials used in total joint prostheses per ASTM F732-00.

**02****Bearing surface screening**

Cost effective screening of bearing surface combinations before full joint simulator testing.

**03****Lubricant studies**

Per station lubricant management supports controlled studies of lubrication regime effects.

**04****Material qualification**

Repeatable wear characterisation at physiologically representative load and temperature.

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## CUSTOMISATION

ProSim is able to offer customisation of its simulators to meet a client's specific testing requirements. We are always happy to look at the customisation of existing equipment or design and build projects to a customer's specifications.

— TRIBOLOGY · ASTM F732

# Arrange a *consultation.*

If you have any specific requirements not fully addressed here, please get in touch. ProSim is always happy to discuss customisation of existing equipment or design and build projects.

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