

Hip & Spine Implant Wear Simulator Overview

Designed and developed in response to the growing demand for ever more aggressive adverse testing of both hip and spinal implants. Working together with CRITT-MDTS, the independent French wear testing house, the Prosim Hip & Spine Wear Simulator was developed with a number of key objectives in mind:

- Design and build a simulator that fully meets the requirements of both ISO 14242-1 (2012) and ISO 18192-1 (2011)
- Capable of going well beyond existing ISO requirements for adverse wear testing
- Strictly follows anatomical loading, applied through the acetabular cup (hips)
- Strictly follows anatomical movement, applied through the femoral head (hips)
- Delivers precise, accurate and repeatable microseparation (hips)

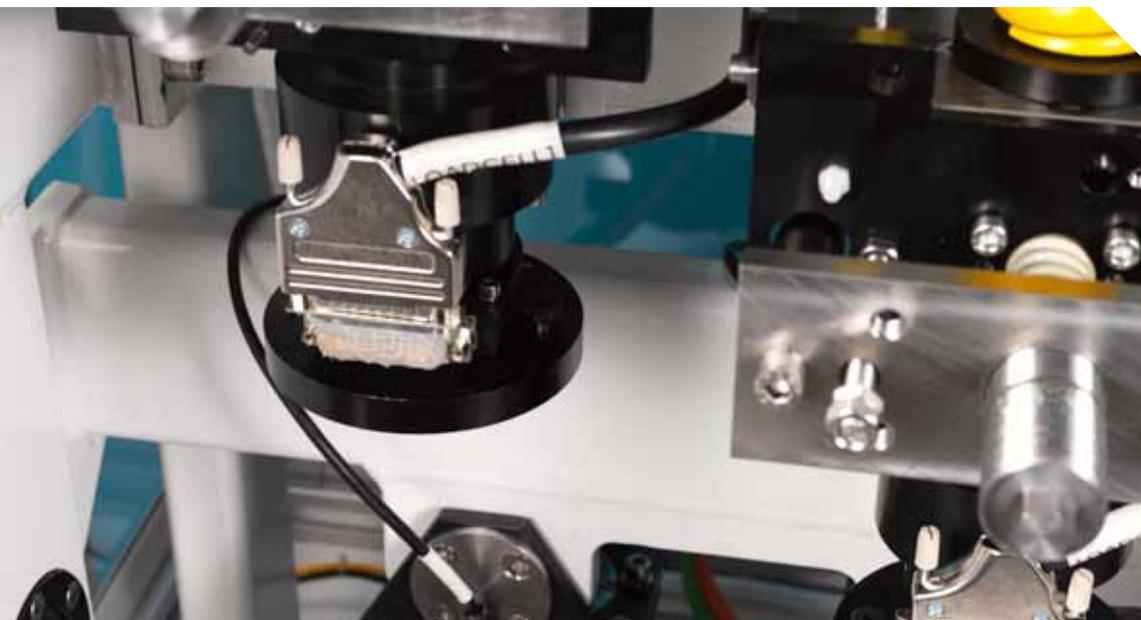
The Prosim Hip & Spine Wear Simulator is a multi-station machine designed for

the reliable and repeatable testing of both hip and spinal implants, providing designers and developers of replacement hip joints and intervertebral discs with a cost-effective and accurate means of generating wear and friction data under realistic in-vivo simulated conditions.

All axes of the Prosim Hip & Spine Wear Simulator are electromechanically driven, using a combination of motors, drives and gear boxes. This enables the simulator very closely to follow any demand waveform however demanding it may be.

Empirical data generated by our simulators over the last fifteen years supports the assertion that the patterns of wear of hip implants tested in Prosim Hip Implant Wear Simulators accurately mirrors that of the wear of implants extracted from humans after years of use.

The Prosim Hip & Spine Wear Simulator enables up to six implants to be tested simultaneously plus two implants to be load soaked, to produce an accurate emulation of in-vivo hip joint and spinal intervertebral disc movement and wear.



Six-axis load cells provide monitoring of all forces and torques applied to the cup or upper vertebral body in the six-station hip and spine simulator



Hip & Spine Implant Wear Simulator Overview

The Prosim Hip & Spine Wear Simulator includes numerous features and benefits:

- Up to six hip or spinal implants can be tested simultaneously
- Up to two hip or spinal implants can be load soaked
- Axial Loading of up to 5kN
- Flexion-Extension range of +/-60°
- Abduction-Adduction motion range of +/- 20°
- Interior-Exterior Rotation range of +/-30°
- Microseparation displacement of the acetabular cup up to 5mm (hip)
- Operating frequency of motions programmable up to 2.0Hz
- Each station equipped with a six axis load cell
- Each station fitted with a XY table to allow alignment of the centres of rotation
- A dedicated heater system for each station maintains serum temperature at 37°C +/- 2°C
- Capable of running programmed sequences combining walking, jogging and periods of rest
- Easy to use Windows operator screen
- Real-time logging of position and load allows instant verification of test cycle
- Clinically and physiologically representative testing

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



Six-station hip and spine simulator with close-up view of the dual soak-stations

