

AXIAL-TORSION TESTING |

Materials may behave unpredictably when exposed to multiaxial loads, exhibiting different material properties. Characterizing these material properties across a wide spectrum of materials becomes very important, as there is an abundance of products that are designed to be exposed to biaxial loading during normal operating conditions.

Axial-torsion testing machines help characterize biaxial mechanical properties of materials, both in static and dynamic conditions, which helps in choosing the right materials for different applications where components are exposed to axial torsion loading profiles. This requires material research for component design and material verification stages in numerous industries and research to meet safety requirements.

AXIAL-TORSION APPLICATIONS AND RESEARCH AREAS INCLUDE

- Characterization of materials under biaxial stress loading, static or dynamic
- Cumulative damage of turbine blade components under axial-torsion loading
- Fatigue life of biomedical materials and implants

WHY CHOOSE INSTRON?

To meet the challenges of axial-torsion testing, Instron provides a range of axial-torsion machines that cover small implants made of compliant biomaterials, composites and high-performance metals and alloys. Our servohydraulic range provides mid to high axial and torque capacities, while the ElectroPuls® biaxial variants complete the range with smaller axial and torque capacities and an oil-free design, allowing labs that require a contamination free environment to conduct axial-torsion testing. Instron ElectroPuls biaxial systems also open up to testing the longevity of biomedical implants, from hip to orthopedic implants, as our systems can load specimens according to the biaxial stress profiles from actual data and measure the response of different materials and different component designs. Instron strives to provide reliable systems for companies and researchers alike to get a better understanding of materials and components under bi-axial stress profiles and offers a wide range of accessories that will suit your applications.

FEATURES

- A range of machines with different axial and torsional load capacities
- Designed for both dynamic and static testing on a wide variety of materials and components
- Full system integration with Instron electronics and software packages
- Bi-axial extensometers supplied for an integrated solution
- Wide range of axial-torsional grips, fixtures, and high-temperature accessories

CONSISTENT USER EXPERIENCE

Instron axial-torsion machines are compatible with the same electronics, software and user interfaces as other Instron dynamic fatigue systems. Our software packages are designed with the users in mind to keep the user experience as consistent and the transition between different machines as seamless as possible.

- Versatile and ergonomic test space with easy access to controls and grips
- WaveMatrix™3 software for block loading dynamic fatigue testing
- Bluehill® Universal for static tensile, compression testing



CHOOSING THE RIGHT CONFIGURATION

Instron has a series of load frames that have axial-torsional capabilities, with a range from ± 3 kN and ± 25 Nm up to ± 250 kN and ± 2000 Nm capacity that will suit your testing needs. All machines are compatible with the same software packages to keep the transition effortless. E3000 and E10000 ElectroPuls comprise the low capacity linear-rotary electric options, while 8874 hydraulic tabletop system covers the mid-range servohydraulic option and 8850 series with the high load and torque capacities.



ElectroPuls E3000

ElectroPuls E10000

Servohydraulic 8874

Servohydraulic 8852

Servohydraulic 8854

OUR AXIAL-TORSION RANGE

Tabletop Models

- **ElectroPuls E3000** has an axial load capacity of ± 3 kN (± 0.67 kip), torque capacity of ± 25 Nm (± 220 in-lb), actuator stroke of 60 mm (2.4 in) and up to 16 revolutions
- **ElectroPuls E10000** has an axial load capacity of ± 10 kN (± 2.2 kip), torque capacity of ± 100 Nm (± 880 in-lb), actuator stroke of 60 mm (2.4 in) and up to 16 revolutions
- **8874 Servohydraulic System** has an axial load capacity of ± 25 kN (± 5.6 kip), torque capacity of ± 100 Nm (± 880 in-lb), actuator stroke of 100 mm (4 in) and $\pm 130^\circ$

Floor Models

- **8852 Servohydraulic System** with an axial load capacity of ± 100 kN (± 22 kip), torque capacity of ± 1000 Nm (± 8800 in-lb), actuator stroke of 150 mm (6 in) and $\pm 45^\circ$
- **8854 Servohydraulic System** with an axial load capacity of ± 250 kN (± 56 kip), torque capacity of ± 2000 Nm (± 17700 in-lb), actuator stroke of 100 mm (4 in) and $\pm 45^\circ$

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