ElectroForce® test instruments incorporate proprietary linear motion
technologies and WinTest® controls to provide a revolutionary
approach to mechanical fatigue and dynamic characterization. The
ElectroForce family of test instruments provides a full range of force
and performance capabilities for a variety of test applications.

The 3330 system provides static to 100 Hz performance with a
load envelope of ±3000 N, allowing versatile performance for a
variety of test applications such as durability testing of orthopaedic
implant devices and dynamic characterization of engineered
materials and components.

First in the Material Testing Industry
The ElectroForce High Accuracy Displacement Sensor is the first use
in the material testing industry of a new technology that provides
displacement resolution of a nanometer and accuracies in the range
of microns. This allows for reliable tests of 10x smaller displacement
amplitudes over the full range of motion of the system with no
additional sensors required.

Applications
The ElectroForce Series II 3330 test instrument is well-suited for a variety
of tests that include ASTM and ISO standards tests for:
- Automotive components
- Fracture mechanics
- Component durability
- Orthopaedic implants
- Consumer products
- Prosthetics
- Cyclic fatigue studies

Test Types
The design of new materials and products requires a thorough assessment of material properties and
complete performance evaluation within the intended end-use service environment. A variety of basic and advanced testing techniques are
available in the 3200 to meet this need.
- Tension/Compression
- Bending
- Stress Relaxation
- Torsion
- Creep
- Shear
- Pulsatile
ElectroForce® test instruments perform a broad range of materials testing tasks. These requirements range from simple static tests used to acquire tensile, compressive or bending data, to more complex fatigue and fracture mechanics testing applications often found in the following industries and application areas:

- Electronics and Microelectronics
- Smart Materials
- Automotive
- Aerospace
- Universities and National Labs
- Polymers, Plastics, and Composites
- Tire and Rubber

ElectroForce testing systems provide a multi-purpose, high performance, clean and reliable product platform that’s well-suited for use in research activities that require mechanical testing.

Optional ElectroForce DMA software provides the capability for a ElectroForce materials testing system to do double duty as a DMA/DMTA instrument with much higher force and displacement capability than what traditional DMA instruments offer, allowing larger specimens to be tested for DMA properties.
The majority of the biomaterials testing applications of our customers have some unique feature. It may be the type of loading that needs to be applied, the measurements taken, the test setup in the software, the fixtures required for sample attachment, or the environmental conditions provided during the test. These challenges coupled with the ElectroForce® team’s application expertise have led to the design and development of a wide breadth of biomedical materials testing solutions.

Examples include:

- Bone and Cartilage
- Tendon and Ligament
- Spine
- Dental
- Blood Vessels and Heart Valves
- Pericardium and Heart Muscle
- Hydrogels and Scaffolds
- Skin and other Native Tissues and Organs
- Tissue-engineered Construct Stimulation and Characterization

Whether your test specifications require replication of physiological or pathological conditions or other regulatory inputs, TA ElectroForce strives to offer complete materials testing solutions either through our large selection of existing capabilities or through the development of customized products and services.

**Biologics**

ElectroForce multi-specimen fatigue testing systems can be used for high cycle fatigue life characterization of coronary and vascular device structures, and evaluation of device materials for s/n curve development. In addition, the test systems can provide controlled loading for small soft structures and devices such as:

- Septal Occluders
- Stents and Grafts
- Nitinol Structures
- Aneurysm Clips
- Percutaneous Heart Valves
- Annuloplasty Devices
- Vena Cava Filters and Structures
- Dental Implants
- Small Joint Implants
- Sutures
- Contact Lenses
- Biosensors

TA ElectroForce has configured a multi-specimen test system utilizing the versatility of the ElectroForce 3330 test instrument. These uniaxial dynamic systems, configured with multi-specimen fixtures, employ dynamic linear motors that achieve high frequency load or displacement control to simulate stress levels of specific materials or specific geometries or design areas of the medical devices.
## 3330 Base System (table top)
- **Force Capacity**
  - Peak/max sine: ± 3000 N
  - Static or RMS: ± 2100 N (continuous)
- **Frequency**
  - 0.0001 - 100 Hz
- **Displacement**
  - 25 mm
- **Motor Velocity**
  - Static to 2.0 m/s
- **Min Ramp Rate**
  - 0.013 micron/s
- **Test Space Size**
  - Vertical = 0 - 52.5 cm (with load cell)

## 3330 Torsion Option (floor standing)
- **Torque Capacity**
  - Peak/max sine: ± 24 N-m
  - Static or RMS: ± 24 N-m (continuous)
- **Frequency**
  - 0.0001 - 100 Hz
- **Rotation**
  - +/- 10 revolutions
- **Motor Velocity**
  - Static to 6000 deg/s
- **Min Ramp Rate**
  - 0.0036 deg/s
- **Test Space Size**
  - Vertical = 0 - 43 cm (with load cell)

## 3330 High Torque Option (floor standing)
- **Torque Capacity**
  - Peak/max sine: ± 49 N-m
  - Static or RMS: ± 42 N-m (continuous)
- **Frequency**
  - 0.0001 - 100 Hz
- **Rotation**
  - +/- 10 revolutions
- **Motor Velocity**
  - Static to 6000 deg/s
- **Min Ramp Rate**
  - 0.0036 deg/s
- **Test Space Size**
  - Vertical = 0 - 43 cm (with load cell)

### Facility Information
- **Table top dimensions:** Height = 123 cm, Width = 62 cm, Depth = 44 cm.
- **Floor standing option:** Height = 185 cm, Width = 70.5 cm, Depth = 56 cm.
- **Extended column option:** adds 30 cm to the test space and frame height.
- **Weight:** 118 kg. Extended column adds 6 kg to the base system. Floor standing torsion options add approximately 130 kg to the base.

*Specifications are subject to change.

### Software and Accessory Options
ElectroForce® carries an extensive line of test equipment accessories. ElectroForce test instruments can be integrated with a variety of specimen fixtures, measurement transducers, environmental chambers, saline baths and optional software. Contact the ElectroForce Systems Group for test frame options and accessory packages to meet your specific testing needs.

### Grips/platens
- Tension/Torsion Grips
- Wedge Grips
- DMA Grips
- Tissue Grips - Thermal-Electrically Cooled
- BioDynamic® Tensile Grips
- Compression Platens
- BioDynamic Compression Platens
- 3 and 4 Point Bend

### Sensors
- Force/Torque
- Displacement/Rotation
- Strain
- Pressure
- Chemical

### Fixtures and Chambers
- Multispecimen Fixture
- Saline Baths
- BioDynamic Chamber
- Hot/Cold Chambers

### Software Options
- Advanced Security Suite
- Dynamic Mechanical Analysis
- Dynamic Link Libraries
- Advanced Function Generation

### Digital Video Extensometer

### Lifetime Customer Support
We're committed to your testing success, and ElectroForce has taken this commitment to a new level by offering free technical phone and e-mail support so you can keep your testing program moving forward. Timely and effective technical support can be critical to reach your testing goals. When you need help, we want to make it easy to get answers.

- Commitment to on-time instrument delivery
- Timely installation provided by our qualified field engineer team
- Thorough training during installation to assure your testing productivity
- Ongoing live web training classes for new users without charge

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