

# ElectroForce® 5500 Test Instrument

## Advanced Stimulation and Characterization of Biomaterials and Tissues in a Compact System

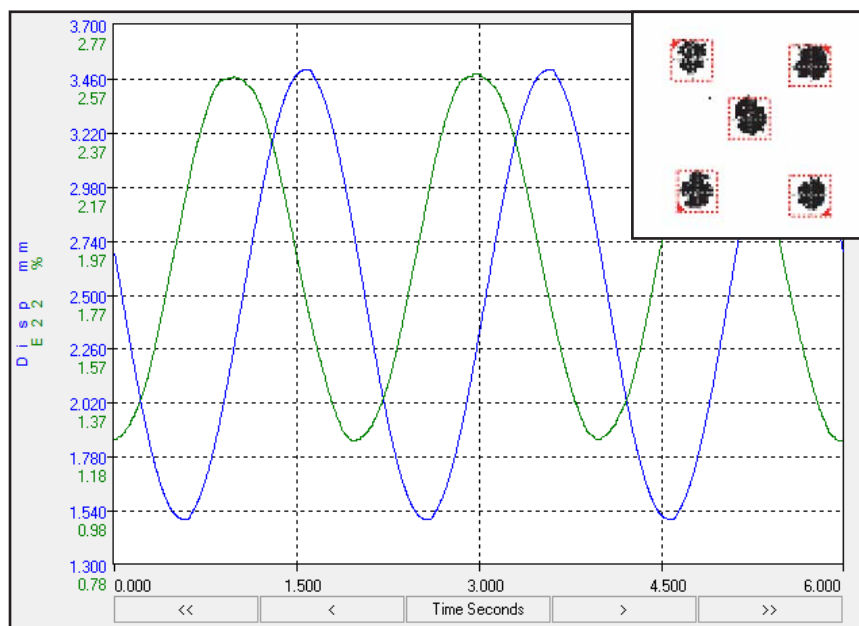
The ElectroForce® 5500 test instrument combines precision with a versatile design to accommodate the characterization and stimulation of tissues, biomaterials and tissue engineered constructs. The adaptable system features a compact frame for use on a tabletop or inside of a standard cell culture incubator. The frictionless design of the patented moving magnet linear motor ensures precise control over displacement or load in the WinTest® software package.

Complex waveforms can easily be defined to run physiological loading protocols. For example, users can import profiles that mimic tissue loading under different states such as the stress of articular cartilage during a gait cycle. Dynamic Mechanical Analysis (DMA) software is also available to automate the characterization and calculation of viscoelastic material properties. For example, material data analysis properties such as tan delta and complex modulus, are automatically calculated for a range of controlled parameters.

In addition to force and displacement sensors, a Digital Video Extensometer (DVE) can be incorporated to monitor and control strain based on Green-Lagrange calculations. The DVE includes a digital video camera, camera stand and LED light to record the movement of markers on a sample during loading. Video capture and analysis software are included for real-time calculations and monitoring of primary, secondary and shear strains.



ElectroForce® 5500 Test Instrument



Digital Video Extensometer Camera Tracks 5 Markers and  
Software Calculates Green-Lagrange Strain

### System Options

#### Software

- Dynamic Mechanical Analysis
- Advanced Function Generation for Custom Waveforms

#### Bioreactors and Chambers

- 24 Sample Compression Bioreactor
- Customer-provided Bioreactors

#### Sensors

- Digital Video Extensometer
- Low Force Load Cells

#### Fixtures

- Tensile Grips
- DMA Grips
- Compression Platens
- 3 & 4 Point Bend

The ElectroForce® 5500 test instrument is designed to fit inside of a standard cell culture incubator, and all cables fit through a standard incubator port. The test frame features an overhead motor so that any spills can be easily cleaned without damage to the system. To ensure sterile contact with the sample, autoclavable fixtures are available, such as tensile grips, compression platens and bend fixtures. The system features standard mounting threads and can be easily adapted to accommodate customer-provided bioreactor chambers and fixtures. The sleek, clean design and compact size of the 5500 test instrument is well-suited for the testing and stimulation of biological constructs inside of a cell culture incubator.



**24-Well Plate with Hydrogel Disc Specimens**



**24-Well Plate Compressive Loading Fixture with the ElectroForce® 5500 Test Instrument**

The base test system contains a telescopic shaft so that samples of various sizes can be mounted in the adjustable test space. This standard shaft can also be removed to accommodate larger fixtures and chambers, such as the 24-well plate fixture for compressive loading. This removable multi-specimen fixture includes an enclosure so that samples can be mounted under a flow hood before the fixture is transferred to the test system. Rows of compression pins can be locked in the retracted state for unloaded control samples. The maximum sample height per well is 5 mm and each platen assembly weighs 5 grams with pins in the unlocked state.



**High-Fidelity Control**  
with small loads and displacements



**Clean Technology**  
suitable for use inside of a cell culture incubator



**Ease of Use**  
adaptable for custom fixtures and bioreactors



**Lifetime Customer Support**  
from our team of dedicated engineers

<b>5500 Base System Specifications</b>	
<b>Peak/Max Load</b>	<b>±200 N</b>
<b>Max Frequency</b>	<b>20 Hz</b>
<b>Max Displacement</b>	<b>13 mm</b>
<b>Frame Height</b>	<b>50.1 cm</b>
<b>Frame Width</b>	<b>20.3 cm</b>
<b>Frame Depth</b>	<b>26.9 cm</b>
<b>Max Vertical Test Space (Shaft)</b>	<b>15.0 cm</b>
<b>Max Vertical Test Space (No Shaft)</b>	<b>26.7 cm</b>
<b>Frame Weight</b>	<b>13.9 kg</b>

*Specifications subject to change*