The MTS 632.59 High Temperature Axial Extensometer is designed for use with a high temperature furnace to measure strain at high temperature during tension, compression and through-zero fatigue testing applications. High purity, large grain-size vistal ceramic or silicon carbide extension rods are used to extend into the hot zone surrounding the specimen to minimize creep, thermal expansion errors and conduction losses from the specimen. These axial extensometers include features that allow you to test at high temperatures without damaging your specimen. These features include a parallel flexure system, to provide friction free accommodation of specimen and grip expansion while your furnace heats up, and a unique counter balanced design to allow strain control at very low extension rod contact forces. These low forces reduce localized stresses on your sensitive specimens.

In addition to high temperature capabilities, the 632.59 High Temperature Axial Extensometers are designed for extremely accurate strain measurements. Nonlinearity is 0.2% of the travel range or less and maximum hysteresis is within 0.08% of the maximum travel range. This exceptional accuracy and linearity is provided by a cross-flexure design which ensures true center-point bending throughout the entire travel range of the extensometer. This design also provides lateral stability, requires low activation force and helps maintain calibration of the unit over long periods of use.

These extensometers are available in U.S. customary or SI metric units and as an option, can be configured for vacuum applications. Their water-cooled design provides excellent thermal stability. Configured properly, they may also be used as the controlling transducer. Contact MTS for application information.

**FEATURES**

**Low Extension Rod Contact Forces**
- Low contact forces protect your specimen by reducing localized stresses, especially on sensitive specimens.

**Exceptional Accuracy**
- Nonlinearity is 0.2% of the travel range, or less, and maximum hysteresis is within 0.08% of the maximum travel range.

**Easy Test Setup**
- Setup for your test can be done at ambient temperatures.

**Cross-Flexure Design**
This unique feature of all MTS extensometers assures true center-point bending and provides these important testing benefits:
- High natural frequencies, to facilitate fatigue testing.
- Exceptional linearity, especially for through-zero travel.
- Extended travel capability, allowing measurement of post-yield behavior up to specimen fracture.
- No levers, hinges or pivot points that can be damaged during operation.
632.59 High Temperature Axial Extensometers

SPECIFICATIONS

Maximum Travel
- US customary units: ±0.100 in
- SI Metric units: ±2.50 mm

Maximum Nonlinearity
- 0.2% of range

Maximum Hysteresis
- 0.08%

Contact Force Against Specimen (standard)
- 100 grams

Maximum Operating Frequency
- 1 Hz

Maximum Temperature
- With Vistal Ceramic Extension Rods
  - Short Term (up to one hour): 1600°C (2900°F)
  - Long Term: 1450°C (2640°F)
- With Silicon Carbide Extension Rods
  - Short Term (up to one hour): 1650°C (3000°F)
  - Long Term: 1500°C (2730°F)

Maximum Excitation Voltage
- 10 Vdc

Bridge Resistance
- 1,000Ω

Approximate Clearance
- With Vistal Ceramic Extension Rods
  - U.S. Units: 5.35 in
  - SI Units: 136 mm
- With Silicon Carbide Extension Rods
  - U.S. Units: 6.38 in
  - SI Units: 162 mm

Load Unit Mounting Bracket
- Rigid, lightweight mounting brackets are available to mount the heat shield and Extensometer to the column of a load unit. Standard mounting brackets are available for use with the MTS 657 High Temperature Furnace and for mounting on most MTS load units. Special mounting brackets can be built for non-MTS furnaces and load units.

Accesories

Extensometer Accessories
These items are not included as part of the Extensometer Package, but may be ordered separately:

Mating Connector
- The Amphenol connector may be purchased alone or with the extension cable.

Extension Rods
- Replacement extension rods are available in either vistal ceramic or silicon carbide materials in several specimen geometries.

Calibration
- Each extensometer ordered may be calibrated by MTS using our automated calibration system. In addition, the extensometer and associated conditioning electronics may be returned to MTS for repair and recalibration.

Cooling
- The 632.59 Extensometer is a water cooled unit. Tap water or a closed-circuit coolant supply system passes water through the heat shields and sensor frame parts to maintain the extensometer sensor unit at a constant temperature. Cooling water flow through the large heat shield should be at least 0.13 gpm (500cc/min). Cooling water flow through the sensor unit/heat shields should be between 0.04 to 0.05 gpm (150 to 200 cc/min) with a supply pressure at 10 psi (70 kPa) normal and 12 psi (80 kPa) maximum. The cooling water temperature to the sensor unit/heat shields must be controlled to within 1.8°F (1°C) throughout the test for the extensometer to meet these published specifications.

Notes:
1 Hysteresis is measured over the ± maximum travel range and is specified as a percent of this full range.
2 Other contact forces are available. Contact MTS for more information.
3 Strain is the deflection per unit of gage length (inches/inch or millimeters/millimeter).

<table>
<thead>
<tr>
<th>Model</th>
<th>Gage Length</th>
<th>Maximum Strain</th>
<th>Activation Force (Max.)</th>
<th>Weight</th>
</tr>
</thead>
</table>
| 632.59B-01| 1.000 in    | ±10%           | 45 g                    | 12 lbs.
| 632.59B-04| 0.500 in    | ±20%           | 45 g                    | 12 lbs.
| 632.59C-01| 25 mm       | ±10%           | 60 g                    | 5.4 kg |
| 632.59C-04| 12 mm       | ±20%           | 45 g                    | 5.4 kg |

Specifications Subject to Change Without Notice
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