Product Information
Extensometer for High-temperature and Creep Testing
Tensile on Metals

4-Rod-Extensometer with axial entry in ceramic or metal version

Application
• Tensile creep testing
• Designed for use with high-temperature furnaces
• Determination of creep strain according to ISO 204 and ASTM E139
• Metal version: temperature up to 850°C
• Ceramic version: temperature up to 1,200°C

Specimen Shapes
• Round specimen with threaded head and collars in parallel length
• Flat pin loaded dumbbell specimen with collars in parallel length
• Pipe-segment specimen with pin and collars in parallel length

Advantages/features
• 2-side measurement according to ISO 204 and ASTM E139 with 2 analogue (LVDT) or digital (incremental) gauges outside the furnace
• Electronic averaging of the 2 sensor signals
• Axial entry from bottom side of furnace
• Flexible gauge length \( L_0 \)
• Extensometer requires specimen with collars

Accessories
Inserts for round, flat and pipe-segment specimen shapes necessary and available.

Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Max. temperature metal</th>
<th>ceramic</th>
<th>Accuracy Class:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>850°C</td>
<td>class 1 according to ISO 9513 and class C according to ASTM E83</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,200°C</td>
<td>class 0.5 according to ISO 9513 and class B-2 according to ASTM E83</td>
</tr>
<tr>
<td>Axial gauge length metal</td>
<td>adjustable from 10 - 50 mm</td>
<td></td>
<td>adjustable from 18 - 50 mm</td>
</tr>
<tr>
<td></td>
<td>(optional: extension up to 100 mm available)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Range:</td>
<td>analogue</td>
<td>5, 10, 25, 50 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>digital</td>
<td>12, 30 mm</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td></td>
<td>&lt; 0.1 µm</td>
<td></td>
</tr>
</tbody>
</table>
**Product Information**
Extensometer for High-temperatures and Creep Testing
Tensile on Metals

**High-Temperature Extensometer with side entry**

**Application**
- Tensile creep testing
- Tensile testing
- Designed for use with high-temperature furnaces and induction heating systems
- Determination of creep strain according to ISO 204 and ASTM E139
- Determination of tensile strain according to ISO 6892-2
- Temperature up to 1,200°C/1,600°C

**Specimen Shapes**
- Round specimen with threaded head
- Round specimen with shoulder head
- Flat specimen with pin
- Pipe-segment specimen with pin

**Advantages/features**
- Single-side measurement with DMS outside the furnace
- Side entry due to furnace slot
- Gauge length adjustable in steps (spacers required), measurement range fixed to basic gauge length
- Mount with load frame mounting brackets
- Hot mounting on samples possible
- May be left on through to specimen failure
- High purity alumina ceramic rods

**Accessories**
- Feeler arms for different specimen shapes
- Spacers for different gauge lengths

**Description**

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. temperature</td>
<td>1,200°C / 1,600°C</td>
</tr>
<tr>
<td>Accuracy Class:</td>
<td>class 0.5 according to ISO 9513 and class B-2 according to ASTM E83</td>
</tr>
<tr>
<td>Initial gauge length</td>
<td>10 - 50 mm in steps</td>
</tr>
<tr>
<td>Measurement Range:</td>
<td>+/-10%(^1) or +/-20%/-10% or +50%/-10% or +100%/-5%(^2)</td>
</tr>
<tr>
<td>Resolution</td>
<td>&lt; 0.1 µm</td>
</tr>
</tbody>
</table>

\(^1\) Not available with 10 mm and 12.5 mm initial gauge length
\(^2\) Not available with 50 mm initial gauge length
Product Information
High-Temperature Extensometer for Creep Testing
Creep Crack Growth on Metals

Rod-in-Tube Extensometer with axial entry

Application
- Creep Crack Growth (CCG)
- Determination of creep crack growth in metals according to ASTM E1457
- Displacement measurement of force-line deflection (FLD) during the test

Specimen Shapes
CT-specimen according to ASTM E1457

Advantages/features
- Adapted for use with CT-specimen
- Rod-tube design
- Materials: ceramics (rods) MAR-246 2.4676 (replaceable inserts)

Description
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum temperature</td>
<td>Ambient up to 1,200°C</td>
</tr>
<tr>
<td>Accuracy Class</td>
<td>Class 0.5 according to ASTM E1457</td>
</tr>
<tr>
<td>Gauge length</td>
<td>3 - 10 mm</td>
</tr>
<tr>
<td>Measurement Range</td>
<td>Typically 5 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 µm</td>
</tr>
</tbody>
</table>

Crack Growth Measurement System DCPD

Application
- Creep Crack Growth (CCG)
- Determination of creep crack growth in metals according to ASTM E1457
- Measurement of crack size/length during the test

Specimen Shapes
CT-specimen according to ASTM E1457

Advantages/features
- Software-modul with full integration in testXpert II and testXpert III
- Continuous and pulsed mode of operation
- Set of HT-resistant connecting cables

Description
<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum temperature</td>
<td>Up to 1,100°C</td>
</tr>
<tr>
<td>Power source</td>
<td>Adjustable from 0 - 20 A</td>
</tr>
<tr>
<td>Analogue output</td>
<td>0 - 10 V</td>
</tr>
<tr>
<td>Resolution</td>
<td>&lt; 0.1 mV</td>
</tr>
</tbody>
</table>
Product Information
Extensometer for High-temperature and Creep Testing
Tensile, Compression and Bending on Ceramics and Metal

**HT-Extensometer with side entry**

**Application**
- Tensile test on metal
- Compression test on ceramic material/refractory
- Determination of tensile strain according to ISO 6892-2

**Advantages/features**
- Easy operation due to swivel-sledge mechanics and adjustment wheel for the high-temperature feeler arms
- Rapidly ready for testing
- Easy contacting of the high-temperature sensor arms
- No need for specimen with collars
- Gauge length is adjustable steplessly

**Specimen Shapes**
- Round specimen with threaded head
- Round specimen with shoulder head
- Flat specimen with pin
- Pipe-segment specimen with pin

**Description**

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<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Max. temperature</td>
<td>up to 1,500°C</td>
</tr>
<tr>
<td>Accuracy Class:</td>
<td>class 0.5 according to ISO 9513</td>
</tr>
<tr>
<td>Gauge length</td>
<td>6 - 50 mm</td>
</tr>
<tr>
<td>Measurement Range:</td>
<td>± 10 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>&lt; 0.1 µm</td>
</tr>
</tbody>
</table>

All data at ambient temperature.

**HT-Deflection Measuring Device with axial entry**

**Application**
- Compression test on ceramic material
- Flexure test on ceramic material
- Measurement of compression and deflection from bottom side

**Advantages/features**
- Easy setting of sensor arms by the use of adjustment wheel
- Rapidly ready for testing
- Measuring of compression and deflection by means of axially placed feeler arms

**Specimen Shapes**
- Compression test: cylindrical or rectangular specimen with ø or edge length of 14 mm and max. height 2 x ø or edge length
- Bending test: rectangular specimen (3 x 4 x 45 mm) according to ASTM C1211 Form B

**Description**

<table>
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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. temperature</td>
<td>up to 1,500°C</td>
</tr>
<tr>
<td>Accuracy Class:</td>
<td>class 1 according to ISO 9513</td>
</tr>
<tr>
<td>Measurement Range:</td>
<td>1 / 5 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>&lt; 0.15 µm</td>
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</tbody>
</table>

We reserve the right to make technical changes in the course of ongoing development.