

Product Information

High Temperature Extensometers for Creep Testing Creep Tensile on Metals



Figure 1: MP-4rod-extensometer
metal-version



Figure 2: MP-4rod-extensometer
ceramic-version

4-Rod-Extensometer 31-400 Ceramic and Metal version

Application

- Tensile creep testing
- Designed for use with HT-furnaces
- Determination of creep strain acc. to ISO 204 and ASTM E 139
- Temperature up to 850°C with metal version
- Temperature up to 1.100°C with ceramic version

Characteristics

- 2-side measurement acc. to recommendation of ISO 204 and ASTM E 139 with 2 analogue or digital gauges outside the furnace
- Electronic averaging of the 2 sensor signals
- Axial entry from bottom side of furnace
- Flexible gauge length

Specimen Shapes

- Round specimen with threaded head and small collars
- Flat pin loaded dumbbell specimen with small collars
- Curved pin loaded dumbbell specimen with small collars

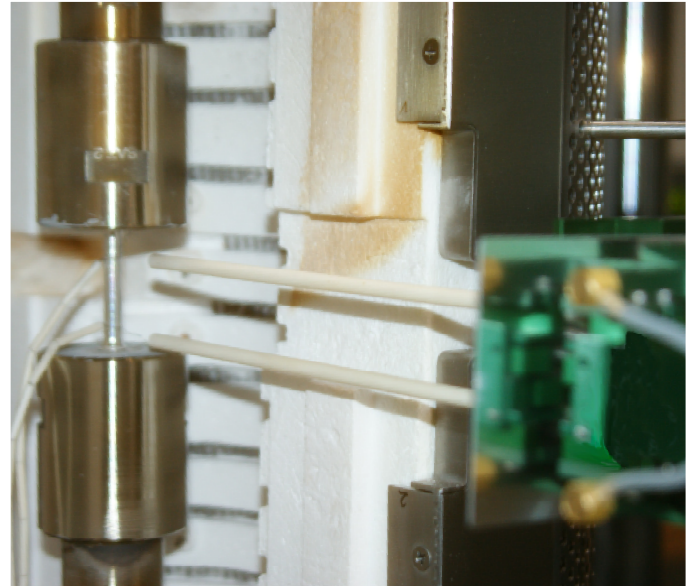


Figure 3: High Temperature Extensometer

High Temperature Extensometer 3548

Application

- Tensile creep testing
- Designed for use with HT-furnaces and induction heating systems
- Determination of creep strain acc. to ISO 204 and ASTM E 139
- Temperature up to 1.200°C

Characteristics

- Single-side measurement with analogue gauge outside the furnace
- Side entry from front side of furnace through furnace slot
- Fixed (selectable) gauge length

Specimen Shapes

- Round specimen with threaded head and cylindrical test section
- Flat pin loaded dumbbell specimen
- Curved pin loaded dumbbell specimen

Product Information

High Temperature Extensometers for Creep Testing Creep Tensile on Metals

4-Rod-Extensometer 31-400 Ceramic and metal version

Accessories for temperatures up to 850°C
Inserts for different specimen shapes and sizes

- Round specimen: Ø 4 mm to Ø 10 mm
- Flat specimen: 4 x 10-15 mm, 6 x 10-22 mm
- Curved specimen: 0...6 mm x 12,5 mm,
w=16,5 mm

Accessories for temperatures up to 1.100°C
Inserts for different specimen shapes and sizes

- Round specimen: Ø 4 mm to Ø 16 mm
- Flat specimen: 4 x 10-15 mm, 6 x 10-22 mm
- Curved specimen: 0...15 mm x 12,5 mm,
w=16,5 mm

Further accessories on request.



Figure 4: Round Specimen with Collars



Figure 5: Curved Specimen with Collars

Technical Data

- Max. Temperature (metal): 850°C
- Max. Temperature (ceramic): 1.100°C
- Accuracy Class:
 - analogue: Class 1 according ISO 9513, Class C acc. to ASTM E83, calibration from 100 µm
 - digital: Class 0,5 acc. ISO 9513, Class B-1 acc.to ASTM E83, calibration from 20 µm
- Axial gauge length:
 - ceramic version: adjustable from 18 - 50 mm
 - metal version: adjustable from 10 - 50 mm (optional: extension up to 100 mm available)
- Measurement Range:
 - analogue: 5, 10, 20, 50 mm
 - digital: 10, 30, 50 mm
- Resolution: 0,1 µm (digital), < 0,05 µm (analogue)

High Temperature Extensometer 3548

Accessories

Feeler arms for different specimen shapes

Technical Data

- Hot mounting on samples possible
- May be left on through to specimen failure
- Compliant with ASTM class B-1 and ISO 9513, class 0,5
- High purity alumina ceramic rods
- Mount with load frame mounting brackets
- Up to 1200°C
- Initial gauge length: 10mm or 25mm or 50 mm
- Measurement Range: +/- 10% or +/- 20% or + 100% / - 5%
- Innovative slide mount allows the extensometer to engage the specimen once the test temperature has been achieved
- Includes spare set of ceramic rods

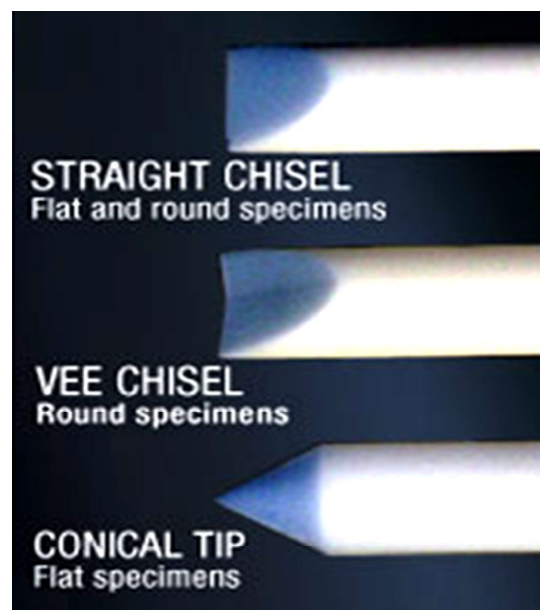


Figure 6: Feeler Arms

Product Information

High Temperature Extensometers for Creep Testing Creep Crack Growth on Metals



Figure 7: Rod-in-Tube Extensometer

Rod-in-Tube Extensometer 31-500

Application

- Creep Crack Growth
- Determination of creep crack growth (CCG) in metals acc. to ASTM E 1457
- Displacement measurement of force-line deflection (FLD) during the test

Specimen Shapes

- CT specimen acc. to ASTM E 1457

Technical Data

- Temperature: Ambient up to 1200°C
- Gage Length: 3...10mm
- Measurement range: 5mm
- Adapted for use with CT specimen
- According to ASTM E 1457
- Rod-tube design
- Materials: ceramics and IN738LC



Figure 9: CT-Specimen



Figure 8: DCPD-Extensometer

Crack Growth Measurement System DCPD

Application

- Creep Crack Growth
- Determination of creep crack growth (CCG) in metals acc. to ASTM E 1457
- Measurement of crack size/length during the test
- Temperature up to 1.100°C

Specimen Shapes

- CT specimen acc. to ASTM E 1457 (See Fig. 8)

Technical Data

- Accuracy power source adjustable 0 - 20A
- Analogue output 0 - 10V
- Analogue measurement module for testControl Electronics
- Set of HT-resistant connecting cables
- Software-modul with full integration of crack growth measurement in testXpert

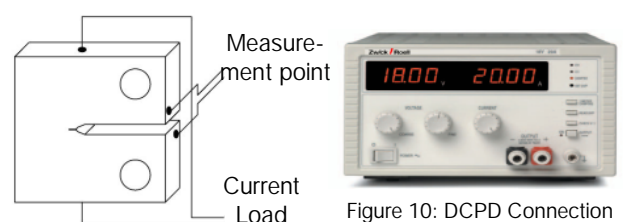


Figure 10: DCPD Connection

Product Information

High Temperature Extensometers for Creep Testing Creep Compression and Bending on Ceramics

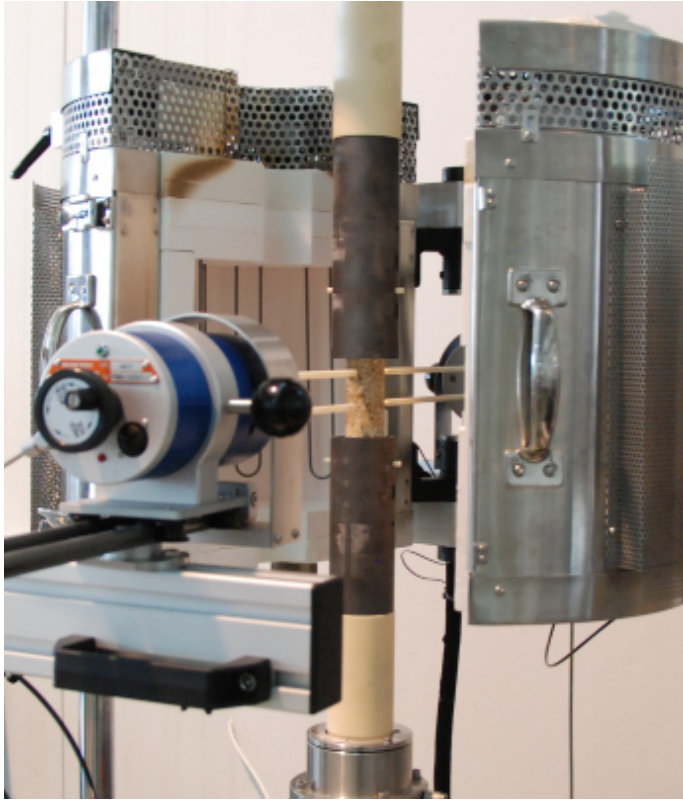


Figure 11: HT-Extensometer PMA-12

HT-Extensometer PMA-12 for Creep Tests up to 1.500°C

Application

- Compression test on ceramic material/refractory
- Single side measurement of deflection
- Double side measurement of deflection with two systems

Characteristics

- Easy operation due to swivel-sledge mechanics and adjustment wheel for the HT-sensor-arms
- Fast test setup
- No need for collar-rings to set the gauge length L_0
- Gauge length is adjustable stepless by the user

Technical Data

See product information PMA-12/V//1



Figure 12: HT-Deflection Measuring Device PMA-06

HT-Deflection Measuring Device PMA-06 for Creep Tests up to 1.500°C

Application

- Compression test on ceramic material
- Flexure test on ceramic material
- Single measurement of compression deflection from bottom side
- Single measurement of bending deflection from bottom side

Characteristics

- Easy setting of sensor arms by the use of adjustment wheel
- Fast test setup
- Measuring of deflection by means of reference sensor arms for compensation of thermal caused elongation of the measuring sensor arm and for counting deflection within the linear field of the bending momentum of the stressed specimen.

Technical Data

See product information PMA-06/V6