

MF



LONGITUDINAL EXTENSOMETER "Clip-On" Model "MINI MFA 2"

The MINI MFA 2 extensometer is suitable for almost all sample types up to \varnothing 25mm (or 25mm x 25mm) and gauge length **(Lo) of 10mm**.

The measurement accuracy corresponds to accuracy class 0.5 according to EN ISO 9513 Standards.

APPLICABLE STANDARDS

EN ISO 9513.

AREA OF APPLICATION

The extensometer **MINI MFA 2** is suitable for almost all types of samples up to \varnothing 25 mm (or 25 mm x 25 mm) and a gauge length (L_0) of 10 mm. Very high resolution and accuracy allow the determination of the Young's modulus (modulus of elasticity), in addition to the yield point $R_p 0.2$. The instrument's accuracy exceeds all requirements of the European Norm EN ISO 9513.

The extensometer permits quick and easy examination of many test samples. Its low weight and minimal activating force make it especially suitable for small and notch sensitive samples. The measurement range amounts to 2 mm in the positive (tensile) direction and 1 mm in the negative (compressive) direction.

The large adjustment range of the clamping force allows for the optimal adaptation to the tested material and the sample dimensions. The knife edges are wear resistant and can be utilized several times over by rotating them and thus increasing their life.



DESIGN AND FUNCTION

The measurement spring is housed in a casing made of high strength aluminum. It is bonded with a temperature-compensated full bridge strain gauge, having a 2 mV/V sensitivity. Mechanical stoppers protect against unintended overloads, even in the case of premature breaking of the sample with the extensometer attached. **The standard MINI MFA 2 has a gauge length L_0 of 10 mm.** With the basic model an extension arm for L_0 50 mm is provided. Further extension arms for L_0 10 to 100 mm can be supplied giving intermediate lengths. The clamping device of the MINI MFA 2 permits fast and problem free clamping and unclamping. The distance between the standard counter rollers is 30 mm. Special fixtures with roller distances adapted to the chosen L_0 can be supplied for very sensitive and small samples. Two MINI MFA can be used with the double clamping device to average the strain of a sample. For the double-side MINI MFA 2 as well as for thin round samples rectangular edges are recommended.

OPERATION

1. Tighten stopper screw lightly.
2. Open clamping device with thumb and forefinger and place the lower knife edge on the sample first, then the top edge.
3. Carefully release the stopper screw (1/8 turning is enough) without moving the MINI MFA 2 on the sample.
4. The measurement can now be started. After clamping, for measurement in the negative (compressive) direction the stopper screw must be retracted (screwed back) more than the expected extension.

The edges, the cover and the clamping device can be disassembled with the supplied TORX screw driver.

TEMPERATURE CHAMBER

A special model of the MINI MFA 2 can be supplied for tests in the temperature range of +1 °C to +200 (260) °C

Standard delivery scope

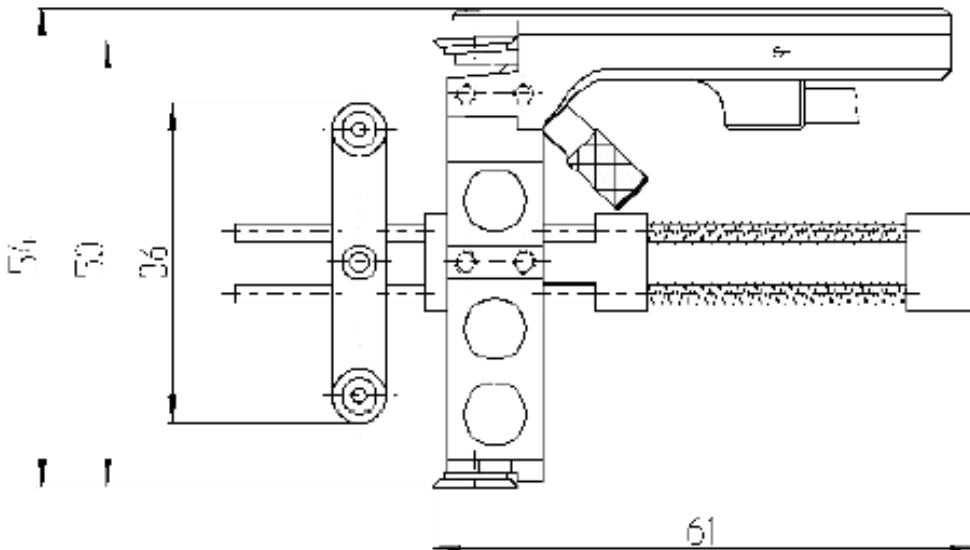
Single - side linear strain gauge

- * 1 MINI MFA 2 with 5 m cable
- * 1 Extension arm, Lo 50 mm
- * 1 Clamping device with cylindrical backing rollers
- * Gauge block 1,6 mm
- * 2 Spare fixing screws
- * 1 TORX screwdriver, T8
- * 1 Test Specification Sheet
- * 1 Storage case

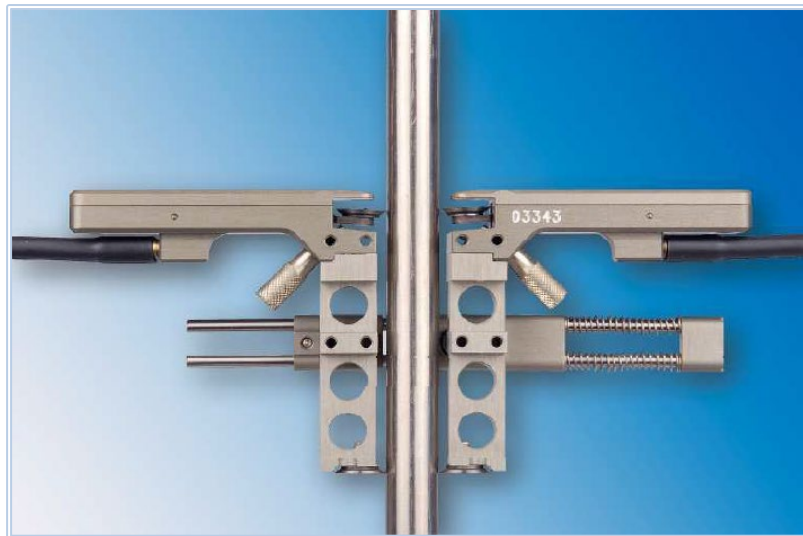
Spare parts and accessories

Single - side linear strain gauge

- ✓ Extension arms Lo 10 mm to 100 mm (not adjustable)
- ✓ Carrier with cylindrical counter rollers 10-100mm (not adjustable)
- ✓ Clamping device
- ✓ Circular knife edge, 9,5 mm
- ✓ Rectangular knife edge, 6 x 9,5 mm
- ✓ Fastening screw M2,5 x 3 T8 for upper edge
- ✓ Screw M2,5 x 6 T8 for lower measuring edge
- ✓ Clamping device



Picture 1: MINI MFA 2 Extensometer with Lo 50mm



Picture 2: Mini MFA 2 double - side

Standard delivery scope

Double - side linear strain gauge

- * 1 Double side MINI MFA 2 with connector
- * and 5 m cable
- * 2 Extension arm, Lo 50 mm
- * 1 Double Clamping device
- * 1 Gauge Blocks 1,6 mm
- * 3 Spare fixing screws, M2,5 T8
- * 1 TORX screwdriver, T8
- * 1 Test Specification Sheet
- * 1 Storage case

Spare parts and accessories

Double - side linear strain gauge

- ✓ Extension arms pair for Double – side
- ✓ Carrier with cylindrical counter rollers (30mm distance from centre to centre for clamping of only one Mini MFA2)
- ✓ Circular knife edge, 9,5 mm
- ✓ Rectangular knife edge, 6 x 9,5 mm
- ✓ Fastening screw M2,5 x 3 T8 for upper edge
- ✓ Screw M2,5 x 6 T8 for lower measuring edge
- ✓ Clamping device

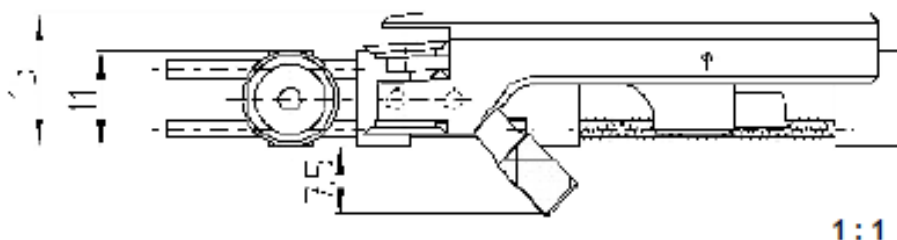
CALIBRATION

- 1.** The measurement spring of the MINI MFA 2 must rest on the lightly tightened stopper screw.
- 2.** The measurement amplifier is set to zero in this position of the measurement spring.
- 3.** The 1.6 mm gauge block is now inserted between the measurement spring and the stopper screw. Care has to be taken, so that the gauge block lies horizontally on the measurement spring and does not touch the casing of the MINI MFA 2.
- 4.** The strain gauge amplifier is set to its full range value in this position of the measurement spring. The exact value is given in the test specification chart provided along with each instrument. (Example: The deflection resulting from the 1.6 mm gauge block between the measurement spring and the stopper screw is 2.0549 mm = 10.27 V. Thus, the deflection of 2.000 mm corresponds to 10.00 V)
- 5.** Repeat points 1 to 4 and readjust the amplifier if necessary

RECOMMENDATION

For more demanding requirements on calibration, the following instruments are recommended.

- ✓ KMF 3 for sensitivity calibration.
- ✓ KMF 1 and KMF 01 for sensitivity calibration and linearity check.



Picture 3: Mini MFA 2 with Lo 10 mm and special clamping device with one counter roller Ø 10 mm

TECHNICAL DATA OF THE EXTENSOMETER "MINI MFA 2"

Accuracy class EN ISO 9513	0.2
Measuring principle	Strain gauge full bridge
Range in tensile direction MFA 2	2 mm (3 mm)
Range in compressive direction	1 mm (not with 3 mm)
Display error (full display range) *	0.2 %
Indication error *	0.6 m
Error in initial measuring instrument length	50 µm
Sensitivity	2 mV/V
Rated resistance of bridge	350 Ohm
Max. voltage input	10 V
Actuation force	10 - 60 cN
Standard initial instrument measuring length	10 and 50 mm
Accessories for gauge length	10 to 100 mm
Standard temperature range	+1 °C to + 60 °C
Type for temperature chamber	-50 °C to + 200 (260) °C
Weight of single-side MFA	45 g
Weight of double-side MFA	70 g

* The larger value is permissible

Diameter range for round samples	0 to 25 mm
Thickness range for flat samples	0 to 25 x 25 mm
Cable length	5 m

Rango de diámetro para probetas de ensayo redondas	0 a 25 mm
Rango de espesor para probetas de ensayo planas	0 a 25 x 25 mm
Longitud del cable	5 m