

## Clip-On Extensometer Series MFA-20

The MFA-20 Clip-On Extensometer is often used for testing of metallic materials including Rebar and specimens with scale testing due to its robust design and quick and easy change of gauge lengths

Suitable for determining the yield point and deformation for samples above 4 mm diameter and 15 mm width.



### Key Features

- Extreme robust design
- Quick and easy change of gauge lengths between 40 mm to 200 mm in steps of 5 mm
- Easy to use
- Class 0.5 according to ISO 9513
- Adjustable clamping force

### Design and Function

The gauge length can be adjusted very quickly and precisely from 50 to 200 mm in 10 (5) mm-steps by shifting the lower knife edge holder.

The attachment can be done without any problems with one hand. The parallel positioning of the MFA 20 in respect to the axis of round samples is guaranteed by centering between the two double knife edges (see top view of the drawing).

The MFA 20 consists of two casing halves which moves parallel and easily towards each other on play-free guidance bars. The upper casing overlaps the lower casing for the total extension so that the parallel guide and the measuring system are protected from damage and dust. A measuring spring with a temperaturecompensated full bridge strain gauge serves as the measuring system for the MFA 20. The knife edge holders and the clamping device can be positioned easily by loosening just one knurled screw. Alignment pins fix them in their exact position.

In order to achieve a symmetrical position of the counter rollers with respect to the knife edges, the counter roller fixture can be turned and the clamping device shifted in three steps. The initial gauge length can be adjusted up to 140 mm with the upper extension arm and up to 200 mm with both the upper and lower extension arms in steps of 10 mm. Even intermediate lengths like e.g. 55 to 195 mm may be obtained

by additional shifting of the upper and lower knife edges (see diagram). The clamping device is compatible to that of the MFA 2/05. Opening width and clamping force are continually adjustable. For initial gauge lengths greater than 100 mm the holder which belongs to the extension arm and has the greater distance between the counter rollers must be used.

The casing is made of a high strength aluminium alloy and has a long lasting and scratch-resistant hard anodized surface. For the small parts argon tan and stainless steel are used. The round knife edges can be utilized along the entire perimeter by rotating them. Thereby a longer lifetime is achieved.

The measuring arms are made of a high strength aluminium alloy. Along with ball bearings which have been tensioned to prevent play the measuring arms are placed on the rotation point. This results in a simple but stable design which being easy to operate is suitable for testing of a large number of specimens.

The measuring spring attached to the upper arm transfers the movements of the measuring direction only onto a fine, lapped surface of the lower arm. This prevents any form of distortion from either the clamping force or any other kind of force. The measuring spring is absolutely protected by means of stops against any excess in the measuring path or the breaking of test pieces while the MFA is in operation. Two tried and tested clamping devices facilitate a quick and precise clamping of the unit onto the test pieces.

As each measuring arm has its own counter roller the relative distance travelled by the backing rollers corresponds to the measuring path. Due to this only very slight counter forces effect the test pieces. The measuring instrument provides a suspending point for the compensation of weight for specially not sensitive test pieces. The Le of the equipment can be extended to up to 100 mm by the use of exchangeable gauge length adapters. The blades and the clamping devices are attached to a common carrier so that they can be exchanged simultaneously. On the measuring spring there is an application of a temperature compensated DMS-full bridge which is calibrated to 2mV/V for the nominal measuring path.

The round measuring blades can be used along their entire circumference via rotation thus enabling an even longer period of use.

## Operation

For clamping the MFA 20 open the clamping device with thumb and fore finger. While mounting care has to be taken that the lower knife edges are placed on the sample first. The measurement can be started then. No unlocking or adjustments have to be made to operate the MFA 20.

## Recommendation

If the  $L_e$  has to be changed very often to intermediate lengths an additional set of knife edge holders may be useful and time-saving.

Type MFA	20
Accuracy class EN ISO 9513	0.5
Accuracy class ASTM E83	B1
Measurement principle	strain-gauge
Measuring Travel	20 mm
Gauge length (L0) with accessories	40 - 100 mm 40 - 200 mm
Option for gauge length 40 mm	available
Linearity error include. hysteresis	0.2 %
Indication error (rel.)*	0.5 %
Indication error *	1.5 $\mu$ m
Error in gauge length (L0)	0.5 %
Sensitivity	1 mV/V
Operating temperature range	1 – 60 °C
Weight	approx. 480 g

\* The larger of the values is admissible

Sample Dimensions	
Specimen diameter	Ø4 mm to Ø30 mm with optional clamping device from Ø4 mm to Ø60 mm
Flat specimen	15 x 1 mm to 30 x 30 mm with optional clamping device up to 60 mm thickness and 60 mm width

Parts supplied	
MFA-20 for gauge lengths 40 to 100 mm in 5 mm steps	
Clamping device with cylindrical counter rollers distance 30 mm	
Knife edge holder (upper)	
Knife edge holder (lower)	
Spare fastening scrws M3x8 T10	

Accessories	
04101-1	Clamping Device for specimen Ø4 mm to Ø60 mm and flat specimen 60 x 60 mm
04 102-140	Length Adapter for gauge lengths up to 140 mm in steps of 20 mm adjustable
04 102-160	Gauge Length Adapter for gauge lengths up to 160 mm in steps of 20 mm adjustable
04 102-200	Gauge Length Adapter for gauge lengths up to 200 mm in steps of 20 mm adjustable
04 102-300	Gauge Length Adapter for gauge lengths up to 3
04 103-0-1	Lower Knife Edge Holder including two (2) knives
04 103-0-2	Upper Knife Edge Holder including two (2) knives
04-104-100	Counter-Roller Holder with distance 100 mm

