Probe family FAI3.3 Data Sheet

Probe models[1]	**FAI3.3-150**	**FAI3.3-260**
Part no.	604-187	604-336
Measurement task	**Coating thickness on non-ferromagnetic metal base materials**; NC/NF	
Applications	Measuring the thickness of electrical non-conducting coatings on non-ferromagnetic metal base materials (NC/NF).	
Example	■ Paint, varnish or plastic coatings on aluminium, copper or brass (NC/NF)	
Features	■ Especially suited for measurements in bore holes, pipes or grooves ■ Preferably for measurements on smooth or polish surfaces ■ Available with various shark lengths (L) ■ The probes measure with a high-precision conductivity compensation developed by Helmut Fischer, so different electrical conductivities of the base material (particularly various aluminium alloys) have no effect on the coating thickness measurement.	
Note	To achieve a very small measurement uncertainty, externally triggered measurement acquisition should be used when measuring small inside diameters.	
Restriction	Smallest permissible inside diameter: 16 mm (0.63 ")	
Measuring range	0 ... 800 µm (0 ... 31.49 mils)	
*	*The specifications for trueness and repeatability precision apply to ambient and specimen temperatures at the time of calibration. The values for trueness and repeatability may increase compared to the values specified here if the temperature during measurement differs from the temperature during calibration.*	
Trueness*	**Non-ferromagnetic metal base materials (NF)**	
based on Fischer factory calibration standards at 20 °C (68 °F) for specimen and ambient temperature	1 ... 100 µm: ≤ 2 µm (0.04 ... 3.49 mils: ≤ 0.08 mils) 100 ... 800 µm: ≤ 2 % of reading (3.49 ... 31.49 mils: ≤ 2 % of reading)	
Repeatability precision*	**Non-ferromagnetic metal base materials (NF)**	
based on Fischer factory calibration standards at 20 °C (68 °F) for specimen and ambient temperature, 5 single readings per standard	1 ... 100 µm: ≤ 0.6 µm (0.04 ... 3.94 mils: ≤ 0.024 mils) 100 ... 800 µm: ≤ 0.6 % of reading (3.94 ... 31.49 mils: ≤ 0.6 % of value)	
Influence*	**Aluminium base material**	

The following values are valid for a coating thickness with a nominal value of 100 µm (3.94 mils).

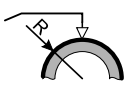
Curvature (R), measurement deviation from nominal value with reference to a calibration on flat surface

Measuring spot

Measurement deviation ≥ 10 % for R ≤ 27.5 mm (R ≤ 1.08 ")
Probe needs a minimum of R = 8 mm (support stand necessary) (R = 0.32 ")

Curvature (R), measurement deviation from nominal value with reference to a calibration on flat surface

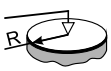
Measuring spot



Measurement deviation ≥ 10 % for R ≤ 25 mm (R ≤ 0.98 ")
Probe needs a minimum of R = 1 mm (support stand necessary) (R = 0.04 ")

Edge distance (R), specification from probe tip center, measurement deviation from nominal value

Measuring spot in the center of the circular surface



Measurement deviation ≥ 10 % for R ≤ 2 mm (R = 0.08 ")
Probe needs a minimum of R = 1 mm (support stand necessary) (R = 0.04 ")

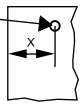
Probe family FAI3.3

Influence*	**Aluminium base material**

The following values are valid for a coating thickness with a nominal value of 100 µm (3.94 mils).

Edge distance (X), specification from probe tip center, measurement deviation from nominal value

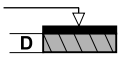
Measuring spot = Probe pole center



No specification

Base material thickness (D), measurement deviation from nominal value

Measuring spot



Measurement deviation ≥ 10 % for D ≤ 0.09 mm (D ≤ 3.54 mils)

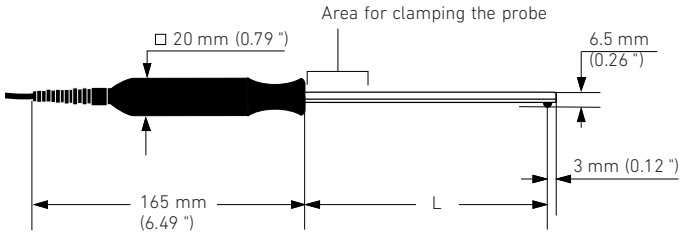
Base material	Influence of the el. conductivity of the base material (NF) in the range from 30 to 100 % IACS: Measurement deviation ≤ 2 %, valid for the total measurement range
Ambient temperature at operation	-10 °C ... +40 °C (+14 °F ... +104 °F)
Specimen temperature	max. +40 °C (max. +104 °F)

Design

Single tip inside probes with spring-loaded measuring system

Probe pole
- Material: Sapphire
- Radius: 1.2 mm (47.2 mils)
- Replaceable by Fischer service center

Dimensions (all dimensions are approximate values)



Probe cable
Cable length: 1.5 m (59.06 "), other cable lengths on request[1]
Bending radius: ≥ 30 mm (≥ 1.18 ")

Lift-off distance between 2 measurements
≥ 3.2 mm (≥ 0.13 ")

Probe models[1]	**FAI3.3-150**	**FAI3.3-260**
L (other lengths on request)	150 mm (5.91 ")	260 mm (10.24 ")

Measuring method	Amplitude-sensitive eddy current test method according to ISO 2360, ASTM D7091
Probes work with	■ Hand-held instruments: all DUALSCOPE® and ISOSCOPE® hand-held instruments of the FMP series ■ Bench top instruments: FISCHERSCOPE® MMS® PC and FISCHERSCOPE® MMS® PC2 with F-Module PERMASCOPE® (604-293, 12-pin connecting socket)
Scope of delivery	Probe, calibration foil set 605-416 (metal plate NC/NF for instrument check, 2 calibration foils with thicknesses of approx. 23 µm (0.91 mils) and 350 µm (13.78 mils))
Options	■ Calibration foils: various foil thicknesses are available up to 800 µm (31.5 mils) ■ Manufacturer Certificate M according to DIN 55350-18:1987-07 (only in connection with measuring instrument) ■ Support stand V12 BASE, 604-420, with mechanical probe lowering device; suitable probe clamp 601-691, order separately ■ Support stand V12 MOT, 604-374, with motorized probe lowering device for highest repeatability; suitable probe clamp 601-691, order separately

[1] *FAI3.3 probes with special cable lengths have own part no. and probe model names. This data sheet also applies to these probes.*