



Probe model **FGABW1.3**

Part no.¹ **604-178**

Applications Measuring the thickness of electrically non-conductive as well as of non-ferrous metal coatings on steel or iron base material (NC/Fe and NF/Fe). The probe is designed for measuring electroplated metal coating thickness in pipes, bore holes and recesses. The measurement data variation is relatively high on rough (e.g., sandblasted) surfaces. For such cases we recommend special probes for measurements on rough surfaces from our probe program.

Examples **Steel or iron base materials (Fe)**

- Paint, varnish or plastic coatings on steel or iron (NC/Fe)
- Copper, brass, zinc, tin and chrome coatings on steel or iron (NF/Fe)

Probe design Single tip angle probe with spring-loaded measuring system

Applications NC/Fe or NF/Fe

***** *The values for measurement range, trueness, repeatability precision and measurement errors are valid for electrically non-conductive coating materials on steel or iron (NC/Fe). The values may differ for measurements on non-ferrous coating materials (NF).*

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.

Measurement range* **Steel or iron base materials (Fe)**

0 ... 2000 µm / 0 ... 78.74 mils

Trueness* **Steel or iron base materials (Fe)**

based on Fischer factory calibration standards	0 ... 100 µm: ≤ 1 µm	0 ... 3.94 mils: ≤ 0.039 mils
	100 ... 1000 µm: ≤ 1 % of nominal value	3.94 ... 39.37 mils: ≤ 1 % of nominal value
	1000 ... 2000 µm: ≤ 3 % of nominal value	39.37 ... 78.74 mils: ≤ 3 % of nominal value

Repeatability precision* **Steel or iron base materials (Fe)**

based on Fischer factory calibration standards	0 ... 100 µm: ≤ 0.3 µm	0 ... 3.94 mils: ≤ 0.012 mils
5 single readings per standard	100 ... 2000 µm: ≤ 0.3 % of reading	3.94 ... 78.74 mils: ≤ 0.3 % of reading

Influence* **Steel or iron base materials (Fe)**

The following values are valid for a coating thickness with a nominal value of 75 µm / 2.95 mils.

The quantity of influences are stated with the expanded measurement uncertainty U with the expanded factor of k = 2 (defines an interval with the confidence level of 95.45 %) - according to ISO/IEC Guide 98-3:2008-09 "Guide to the expression of uncertainty in measurement".

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

Measuring spot  No measurement error within the trueness as of R = 142 mm ± 19 mm / R = 5.59 " ± 0.75 "

Measurement error of -7.5 % for R = 18 mm / R = 0.71 "

Probe requires a minimum of R = 18 mm (support stand necessary) / R = 0.71 "

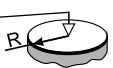
Curvature (R), measurement error from nominal value with reference to master calibration on flat surface

Measuring spot  No measurement error within the trueness as of R = 82 mm ± 6 mm / R = 3.22 " ± 0.24 "

Measurement error of 10 % for R = 8 mm ± 0.7 mm / R = 0.315 " ± 0.028 "

Probe requires a minimum of R = 1 mm (support stand necessary) / R = 0.039 "

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

Measuring spot in the center of the circular surface  No measurement error within the trueness as of R = 9.9 mm ± 0.7 mm / R = 0.389 " ± 0.028 "

Measurement error of 10 % for R = 4.8 mm ± 0.08 mm / R = 0.1890 " ± 0.0031 "

Probe requires a minimum of R = 7 mm (support stand necessary) / R = 0.28 "

Influence*

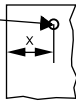
Steel or iron base materials (Fe)

The following values are valid for a coating thickness with a nominal value of 75 µm / 2.95 mils.

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

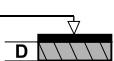
Measuring spot = Probe pole center



No measurement error within the trueness as of $X = 4.3 \text{ mm} \pm 0.4 \text{ mm}$ / $X = 0.169 \text{ "} \pm 0.016 \text{ "}$
Measurement error of 10 % for $X = 1.09 \text{ mm} \pm 0.07 \text{ mm}$ / $X \leq 0.0429 \text{ "} \pm 0.0028 \text{ "}$

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

Measuring spot



No measurement error within the trueness as of $D = 1 \text{ mm} \pm 0.25 \text{ mm}$ / $D = 0.0394 \text{ "} \pm 0.0098 \text{ "}$
Measurement error of 10 % for $D = 0.39 \text{ mm} \pm 0.02 \text{ mm}$ / $D = 0.0153 \text{ "} \pm 0.0008 \text{ "}$

Base material

Influence on base material (Fe) permeability in regard to Fischer calibration standards (master calibration):

No measurement error within the trueness as of ferrite content of $138 \text{ FN} \pm 0.07 \text{ FN}$

Measurement error of 10 % for ferrite content of $119.6 \text{ FN} \pm 0.7 \text{ FN}$

Admissible ambient temperature at operation

-10 °C ... +40 °C / +14 °F ... +104 °F

Admissible specimen temperature

max. +40 °C / max. +104 °F

Probe tip material

PVD coated steel

Probe tip replaceable

Yes, by a Fischer service center

Probe tip radius

0.75 mm / 29.53 mils

Measuring method

Magnetic induction method according to ISO 2178, ASTM D7091

Scope of delivery

Probe; metal plate NF/FE for instrument check; calibration foil set 605-414 (metal plate NF/FE for instrument check, 2 calibration foils with thicknesses of approx. 13 µm/0.51 mils (CuBe) and 250 µm/9.84 mils)

Support stand adapter

600-077

Options

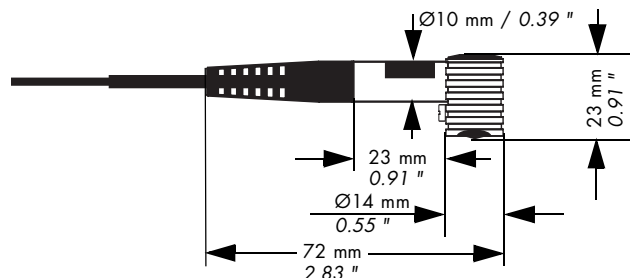
- Calibration foils: Various foil thickness are available up to 600 µm / 23.62 mils
- Master calibration set 601-597 including 4 foils ((metal plate NF/FE, 4 calibration foils with thicknesses of approx. 13 µm/0.51 mils (CuBe), 75 µm/2.95 mils, 250 µm/9.84 mils and 1000 µm/39.27 mils)

FGAB1.3 works with:

Hand-held instruments: All DUALSCOPE® and DELTASCOPE® FMP series

Bench top instruments: FISCHERSCOPE® MMS® PC and FISCHERSCOPE® MMS® PC2 with PERMASCOPE® F-Probe module (12-pin connecting socket)

Dimensions



Cable length: 1.5 m / 59.06", other cable lengths on request¹

¹ FGABW1.3 probes with special cable lengths have own part no. and probe model names. This data sheet also applies to these probes.