



KOERZIMAT 1.097 MS

Systems for measuring the saturation polarization σ_s and J_s



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Reliably determine saturation polarization. The KOERZIMAT 1.097 MS is a measuring system for the fast and precise determination of mass-specific saturation polarization σ_s and volume-specific saturation polarization J_s . Measurement is performed according to IEC 60404-14 using the pull-off method in an open magnetic circuit and is largely independent of sample geometry. This allows even complex-shaped samples to be tested without requiring a predefined geometry.

The measuring system uses a powerful permanent magnet in a Halbach arrangement to saturate the sample. As the sample is withdrawn from the homogeneous magnetic field, its magnetic dipole moment is measured using a pair of Helmholtz coils and a fluxmeter. The sample mass is additionally taken into account to calculate σ_s , while the sample volume or density is required to determine J_s .

Typical applications include quality control of hard metals according to ASTM B886, monitoring the degree of sintering and carbon balance, and determining the amount of tungsten dissolved in cobalt as well as the free iron, cobalt or nickel content in powders and hard metals. The system is also suitable for characterizing soft magnetic components, investigating new alloys and determining magnetic phases in steel alloys.

With the MS 26 × 60 for particularly small samples and the MS 31 × 69 for larger sample masses, two system variants are available for different testing requirements.

YOUR ADVANTAGES AT A GLANCE

Precise saturation measurement: Determination of magnetic properties in accordance with IEC 60404-14

Versatile material analysis: Determination of σ_s , J_s , magnetic dipole moment, magnetic material content and magnetic phase

Largely geometry-independent: Measurement of complex-shaped samples without requiring a predefined sample geometry

High sensitivity: MS 26 × 60 for particularly small samples and low magnetic material content

Large sample space: MS 31 × 69 for sample masses up to approx. 200 g

Consistent measuring conditions: Strong, homogeneous magnetic field generated by compact Halbach magnet systems

Automatic compensation: Compensation for the magnetic influence of the sample holder

Traceable calibration: Calibration traceable to national standards (PTB)

TECHNICAL INFORMATION

MEASURED QUANTITIES:	j, σ_s , J _s , magnetic material content MA, W, magnetic phase MP
TEST METHOD:	Pull-off method according to IEC 60404-14
MAX. SAMPLE MASS:	— approx. 50 g (MS 26 × 60) — approx. 200 g (MS 31 × 69)
SAMPLE SPACE (W × L × H):	— 30 × 40 × 18 mm (MS 26 × 60) — 41 × 58.5 × 23 mm (MS 31 × 69)
MAGNETIC FLUX DENSITY:	— ≥ 1.00 T (MS 26 × 60) — ≥ 1.05 T (MS 31 × 69)
HOMOGENEOUS FIELD RANGE:	— $\varnothing 26 \times 16$ mm (MS 26 × 60) — $\varnothing 32 \times 21$ mm (MS 31 × 69)
SENSITIVITY:	— 2×10^{-11} Vsm ≈ 0.1 mg Co (MS 26 × 60) — 1×10^{-10} Vsm ≈ 0.5 mg Co (MS 31 × 69)
MEASUREMENT UNCERTAINTY:	< 0.5% of measured value (calibration with Ni standard)
LINEARITY:	$\pm 0.1\%$ of full-scale value
MEASUREMENT TIME:	— 3 s (MS 26 × 60) — approx. 10 s (MS 31 × 69), excluding mass determination
MEASURING ELEMENT:	Helmholtz coil pair with fluxmeter
SAMPLE HOLDER:	— manual (MS 26 × 60) — pneumatic (MS 31 × 69)
INTERFACE:	LAN 100 Mbit; additional I/O port for MS 31 × 69
SYSTEM DIMENSIONS (W × H × L):	— approx. 172 × 217 × 230 mm (MS 26 × 60) — approx. 265 × 280 × 460 mm (MS 31 × 69)
WEIGHT:	— approx. 13.9 kg (MS 26 × 60) — approx. 29 kg (MS 31 × 69)
DEGREE OF PROTECTION:	IP53
AMBIENT TEMPERATURE:	+5 to +45 °C
POWER SUPPLY:	100 – 240 V, 50/60 Hz
COMPRESSED AIR SUPPLY:	6 bar (MS 31 × 69 only)

NORMS

ASTM B886: Describes the method for determining the saturation magnetism of sintered hard metals.

EN IEC 60404-14: Describes the determination of the magnetic saturation dipole moment j_S using moment coils in open magnetic circuits. The method described above is advantageous as it provides the option to perform measurements regardless of the geometry of the sample. It is not required to manufacture special measuring samples.



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