

PRODUCT INFORMATION



KOERZIMAT[®] 1.097 MS

MS MEASURING SYSTEMS



proof.

During the production process of steel, hard metals and powder metallurgical components magnetic values such as coercive field strength H_cJ , weight-specific saturation polarization σ_s and the volume-specific saturation polarization J_s correlate to a variety of important process parameters and material properties.

With the KOERZIMAT 1.097 MS FOERSTER offers a measuring system for the precise, automatic and economic measurement of the weight-specific saturation polarization σ_s and the volume-specific saturation polarization J_s . As the measurement is geometry-independent it enables especially for testing of specimen with complex shape.

TESTING METHOD

- Withdrawal method in accordance with IEC-60404-14

MEASUREMENT

- Weight-specific saturation polarization σ_s [$T \cdot m^3/kg$]
- Volume-specific saturation polarization J_s [Tesla]
- Magnetic portion MA [%]
- Dissolved tungsten in cobalt W [%]
- Magnetic dipole moment j [$Vsm / T \cdot m^3$]
- Magnetic phase of high-alloy steels MP [%]

APPLICATIONS

- Hard metal testing acc. to ASTM B886
- Quality control of sintering process of hard metals
- Determination of carbon content [Eta-Phase] in hard metals
- Determination of the portion of dissolved tungsten in cobalt in hard metals
- Determination of the free iron, cobalt or nickel content in metal powder or hard metals
- Determination of the saturation polarization J_s in Tesla for soft magnetic components designed for magnetic circuits
- Indirect density control of powder-metallurgically produced soft-magnetic materials
- Research and development of new alloys and magnetic materials
- Determination of the theoretic magnetic phase of alloy steel according to Hoselitz
- Indirect determination of martensite/austenite or ferrite in stainless steel/dual phase steel

MODE OF OPERATION

The KOERZIMAT 1.097 MS systems consist of a strong permanent magnet (Halbach array) with a big air gap for loading the test specimen.

A pneumatic or manual test specimen feeder provides the specimen into the homogenous area of the magnet. By withdrawing the specimen the magnetic dipole moment j is measured by means of the Helmholtz coils and a fluxmeter.

To determine the weight- or volume-specific saturation polarization, a precision scale is needed. The mass of the specimen is determined and directly be transferred to the KOERZIMAT controller. For the determination of the volume-specific saturation polarization J_s the volume/density of the specimen is additionally required.

SPECIMEN MASS AND SENSITIVITY OF THE MEASURING SYSTEM

Depending on the measurement range selected following maximum specimen mass can be measured:

- Pure cobalt (Co)	16 g (standard)	40 g (extended)
- Pure iron (Fe)	12 g (standard)	30 g (extended)

The smallest possible specimen mass is:

- Pure cobalt (Co)	0,5 mg (MS 31x69)	0,1 mg (MS 26x60)
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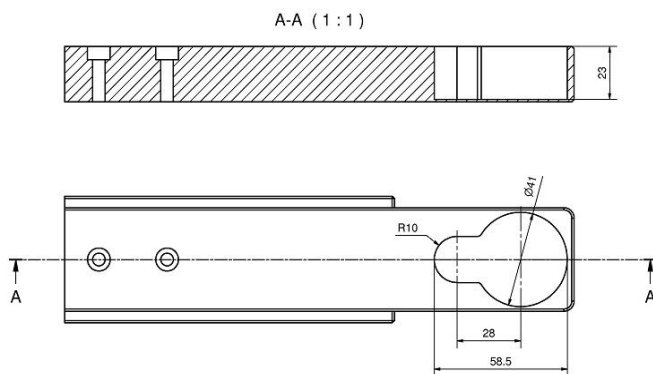
KOERZIMAT 1.097 MS 31X69



FEATURES

- High sensitivity for small test specimen $\geq 1g$
- Measurement of large test piece weights up to 200g
- Compact, lightweight design by Halbach array
- Pneumatic test specimen feeder incl. slide
- Geometry-independent measurement
- Automatic slide compensation
- Loading and fitting of the test specimen by test inserts
- Calibration traceable to national standards [PTB]
- Accessory kit with inserts for test piece fitting

- ▶ Test specimen chamber approx. 41 x 58.5 x 23 mm



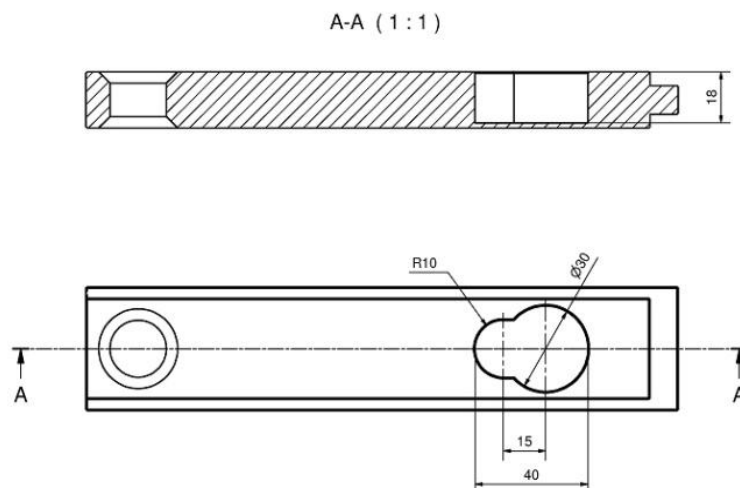
KOERZIMAT 1.097 MS 26X60

FEATURES



- Highest sensitivity for very small specimen $\geq 0,5g$
- Measurement of large test piece weights up to 50g
- Compact, lightweight design by Halbach array
- Manual operation of the test specimen slide
- Test specimen slide for round bars $\varnothing 3-10mm / 10-15mm$
- Geometry-independent measurement
- Automatic slide compensation
- Loading and fitting of the test specimen by test inserts
- Calibration traceable to national standards [PTB]
- Accessory kit with inserts for test piece fitting

- Test specimen chamber about 30 x 40 x 18 mm



KOERZIMAT CONTROLLER / SOFTWARE MS

The compact KOERZIMAT Controller with MS Software forms a unit as a display and user interface for the MS measuring. The KOERZIMAT MS Software runs under Windows 8 Pro. Intuitive touchscreen functionalities are available and assist the handling of the measuring control. All measuring data are stored in a database and can be printed in a report or exported in a text file for further processing.



FEATURES

- User interface language: GERMAN, ENGLISH, JAPANESE
- WINDOWS 8 country settings/languages online selectable
- Touchscreen operation
- Clearly structured display elements for measuring adjustments, value output in listed form
- Series measurement graphics, histogram, sorting groups and statistics
- Generating, print out and export of measured values/ statistics
- Password protected user levels for administration of functions and user access

TECHNICAL SPECIFICATION

KOERZIMAT 1.097 MS 31X69

Display elements	8 LEDs for status display
Maximum specimen mass	approx. 200 g
Dimensions of the test specimen chamber (W x L x H)	41 x 58,5 x 23 mm
Magnetic flux density	1,15 T
Homogeneous area	Ø = 32 mm, h = 21 mm
Temperature coefficient	$12,5 \times 10^{-8} \text{ Tm}^3/\text{kgK} \approx 0,625 \text{ mg Co/K}$
Noise	$5 \times 10^{-8} \text{ Tm}^3/\text{kg} \approx 0,25 \text{ mg Co}$
Sensitivity	$1 \times 10^{-7} \text{ Tm}^3/\text{kg} \approx 0,5 \text{ mg Co}$ i.e. 1g specimen with 10 % cobalt content (100 mg) provides a measuring value 200 times higher than the sensitivity limit of the system
Measurement uncertainty when calibrating with Ni standard	< 0,5 % of measured value
Linearity (% of full range)	$\pm 0,1 \%$
Temperature range	+5 °C to +45 °C
Measuring time	approx. 10 s (without weight determination)
Interface LAN	100 MBit
Interface I/O-Port	15-pin (Start button and 4 PLC input/outputs, 24 V)
Power supply	Plug-in power supply unit 100 to 240 VAC, 50/60 Hz
Power consumption	approx. 2 W
Compressed air connection	By quick-coupling with filter regulating unit 6 bar
Dimensions measuring system (W x H x L)	approx. 265 x 280 x 460 mm
Mass	approx. 29 kg
Protection class	IP53
Testing standard / testing method	IEC 60404-14 / ASTM B886

TECHNICAL SPECIFICATION

KOERZIMAT 1.097 MS 26x60

Display elements	8 LEDs for status display
Maximum specimen mass	approx. 50 g
Dimensions specimen space (W x L x H)	30 x 40 x 18 mm
Homogeneous area	$\varnothing = 26 \text{ mm}$, $h = 16 \text{ mm}$
Magnetic flux density	1,15 T
Temperature coefficient	$2,5 \times 10^{-8} \text{ Tm}^3/\text{kgK} \approx 0,125 \text{ mg Co/K}$
Noise	$1 \times 10^{-8} \text{ Tm}^3/\text{kg} \approx 0,05 \text{ mg Co}$
Sensitivity	$2 \times 10^{-8} \text{ Tm}^3/\text{kg} \approx 0,1 \text{ mg Co}$ i.e. 1g specimen with 10 % cobalt content (100 mg) provides a measuring value 1000 times higher than the sensitivity limit of the system
Measurement uncertainty when calibrating with Ni standard	< 0,5 % of measured value
Linearity [% of full range]	$\pm 0,1 \%$
Temperature range	+5 °C bis +45 °C
Measuring time	3 s (without weight determination)
Interface LAN	100 MBit
Power supply	Plug-in power supply unit 100 to 240 VAC, 50/60 Hz
Power consumption	approx. 2 W
Dimensions measuring system (W x H x L)	approx. 172 x 217 x 230 mm
Mass	approx. 13.9 kg
Protection class	IP 53
Testing standard / Testing method	IEC 60404-14 / ASTM B886

STANDARD KITS

KOERZIMAT 1.097 MS 26x60

Consisting of:

- KOERZIMAT 1.097 MS 26x60 mm
- Accessory-Kit 26 x 60

KOERZIMAT 1.097 MS 31x69

Consisting of:

- KOERZIMAT 1.097 MS 31x69 mm
- Accessory-Kit 31x69

KOERZIMAT CONTROLLER + KOERZIMAT MS SOFTWARE

Consisting of:

- 23" Touch screen
- Processor: Intel Quad Core, 2,90 GHz Turbo, 6 MB, HD Graphics 2500
- Memory : 4 GB (1x4 GB) 1600 MHz DDR3 Non-ECC
- Hard drive: 500 GB serial ATA III Hybrid
- 4 x USB 2.0 and 4 x USB 3.0 (of which 1 for dongle)
- VGA-output
- 1 x LAN, 1 x HDMI
- CD/DVD-drive
- Optical mouse with USB cable
- USB keyboard
- Language preferences (only for touch keyboard)
- Language recognition, if activated
- WINDOWS 8.1 PRO 64 BIT operating system
- KOERZIMAT MS software MS with dongle

ADDITIONAL SOFTWARE OPTION

KOERZIMAT MS SOFTWARE -MAGNETIC PHASE-

[not included in standard KOERZIMAT MS-Software]

CALIBRATION STANDARDS

CALIBRATION STANDARD MS NICKEL

with certificate

CALIBRATION STANDARD MS IRON

with certificate

ANALYTICAL SCALE / DENSITY KIT

ANALYTICAL SCALE XS204DR

With high wind guard – Brand: METTLER TOLEDO

Weighing range: 0...220g

Reading precision: 0,1 mg

DENSITY KIT FOR XS204DR

Brand: METTLER TOLEDO

SPECIMEN SLIDE FOR KOERZIMAT 1.097 MS 26 X 60

SPECIMEN SLIDE FOR ROUND BARS WITH Ø 3-10 MM

SPECIMEN SLIDE FOR ROUND BARS WITH Ø 10-15 MM

IMPRINT



Reg.-No. 001159 QM08

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KOERZIMAT® 1.097 MS
MS Measuring systems
Order number.: 201 678 8
Edition: 09/2015

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