

# KOERZIMAT<sup>®</sup> 1.097 HCJ



**HCJ Measuring  
Systems**



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Testing Equipment Since 1969!

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# KOERZIMAT® 1.097 HCJ PRODUCT INFORMATION

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  $\sigma_s$  and the volume-specific saturation polarization  $J_s$  correlate to a variety of important process parameters and material properties.

With the KOERZIMAT® 1.097 HCJ FOERSTER offers a measuring system for the precise, geometry-independent, and fast measurement of the coercive field strength  $H_cJ$ . As the measurement is geometry-independent it allows for testing of specimens with complex shape.

## TESTING METHOD

- Open circuit acc. to IEC 60404-7 and EN 10330

## MEASUREMENT

- Coercive field strength  $H_cJ$  (A/m, Oe)
- Relative Remanence  $J_r$  ( $\mu T$ )

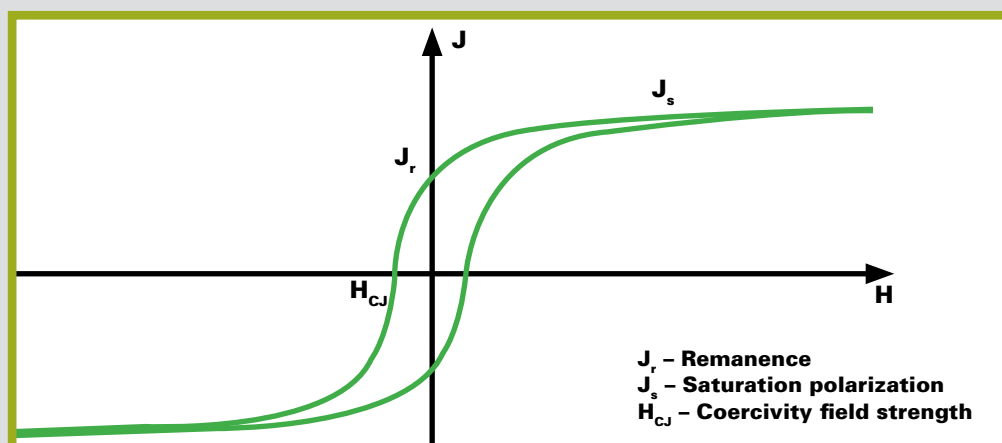
## APPLICATIONS

- Hard metal testing acc. to DIN ISO 3326, ASTM B887
- Quality control of the sintering process for hard metals
- Determination of carbon content and grain size of hard metals
- Quality control of metal powders for the production of magnets or hard metals
- Quality control of the annealing and mechanical stress condition of soft magnetic components [SMC]
- Control of electromechanical components in the electronics-, automotive, computer and clock industries; core loss for polarity reversal can be concluded from this
- Monitoring of the magnetic properties during the production of components and materials influenced by i.e. mechanical machining, final annealing, sealing in plastic, cutting, molding and forming.
- Monitoring the magnetic properties of thermal treated steel



## MODE OF OPERATION

The KOERZIMAT 1.097 HCJ measuring system can be applied for measurement methods employed with magnetically hard or soft material. The coercive field strength HCJ is determined in the KOERZIMAT coil according to EN 10330 and IEC 60404-7 in an open magnetization circuit. To do so, the specimen is magnetized to saturation in the HcJ coil. The polarization of the specimen is measured by fluxgates (FOERSTER-probes) and then an opposing field is built up until the polarization is zero. The strength of the opposing field H at which the polarization in the specimen is zero is the coercive field strength HCJ.



For magnetization into saturation polarization  $J_s$ , a magnetization field of up to 200 kA/m is available. Additionally a pulse magnetization of 450 kA/m for hard magnetic specimen with  $H_{cJ}$  more than 50 kA/m is available as an option.

The KOERZIMAT coils, with an inner diameter of 40 mm or 60 mm are equipped with a magnetic screen for suppression of interfering external static and dynamic magnetic fields. This allows the measurement of the magnetic polarization independent from the earth magnetic field and disturbances resulting from industrial environment.

Due to the magnetic screen very small residual fields can be determined and therefore very small specimen sizes (i.e. steel ball from a ball pen) will be measured very precise.

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## Specimen mass and sensitivity of the measuring system

Due to the given distance of the specimen to the measuring sensors, the sensitivity limits only depend on the respective volume of the magnetizable material.

Almost geometry-independent the following maximum specimen dimensions are possible:

Coil 40 (Ø max. 40 mm)	$L \leq 130$ mm (measuring position $\pm 20$ mm) $L \leq 90$ mm (measuring position $\pm 40$ mm)
Coil 60 (Ø max. 60 mm)	$L \leq 80$ mm (measuring position $\pm 20$ mm) $L \leq 40$ mm (measuring position $\pm 40$ mm)

Using the KOERZIMAT internal probe, it is possible to measure extremely small and low magnetized components with a magnetic stray flux  $< 0.02 \mu\text{T}$ .





## KOERZIMAT 1.097 HCJ

### FEATURES

- No special specimen preparation needed
- Fast and precise measuring
- Simple specimen fitting on the specimen slide
- Geometry-independent measuring
- Coverage of the complete specimen volume
- Specimen chamber with a diameter up to 60 mm
- Highest sensitivity even for the smallest test specimen by means of the internal probe
- Temperature monitored compensation of the coil
- Large measuring range up to 100 kA/m
- Magnetic screening of the detection coil
- Calibration traceable to national standards [PTB]

# KOERZIMAT® 1.097 HCJ PRODUCT INFORMATION



## KOERZIMAT CONTROLLER / SOFTWARE HCJ

The compact KOERZIMAT Controller with HCJ Software forms a unit as a display and user interface for the HCJ measuring. The KOERZIMAT HCJ 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

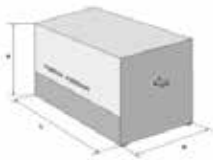
### KOERZIMAT 1.097 HCJ - Measuring Module

Power Supply	230 VAC, 50/60 Hz
Permitted main voltage variation	±10% of nominal value
Permitted main voltage frequency variation	±1 Hz
Power consumption	Momentary for magnetization 3700 VA, average consumption 100 to 800 VA, depending on setting
Permitted ambient temperature range	0 bis +40°C
Dimensions	 <p>Length (L) x Width (W) x Height (H) 465 x 445 x 220 mm</p>
Protection class	IP 32
Weight	approx. 18 kg

# KOERZIMAT® 1.097 HCJ PRODUCT INFORMATION

## TECHNICAL SPECIFICATION

### KOERZIMAT 1.097 HCJ Coil 40/60

	Coil 40	Coil 60
Ø Coil ID, clear width	40 mm	60 mm
Magnetization field strength*	200 kA/m	200 kA/m
with additional pulse magnetization (option)* *) Typical for a coil temperature du= 25°C	450 kA/m	350 kA/m
Max. measuring field strength	100 kA/m	50 kA/m
Homogeneous field area (deviation $\Delta H_c < 1\%$ )(deviation $\Delta H_c < 1\%$ )	170 mm	120 mm
Weight	Approx. 65 kg	Approx. 85 kg
Permitted ambient temperature range	0 bis +40 °C	
Dimensions coil 40 / 60	 <p>450 x 340 x 420 mm Length (L) x Width (W) x Height (H)</p>	
Cooling	by means of two fans	
Protection class	IP 32	
Sensor	Fluxgate ( FOERSTER-Probe)	





## KOERZIMAT-InTERNAL Probe 40 / 60

For specimen with a residual field  $< 0.02 \mu\text{T}$ , we recommend the use of the internal probe.

Max. measuring field strength using the internal probe	up to 25 kA/m
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## HCJ – Measurement

Measurement uncertainty	$< \pm 1 \%$ of the measured value with respect to EN 10330 and IEC 60404-7
Measurement modes	Automatic
Coercive field strength measuring range	auto range 0 to 100 kA/m
Coercive field strength measuring time	3 s (fixed)
Magnetization time	Adjustable from 0.2 bis 40 s
Measurement uncertainty of the measuring field	$\pm 0.2 \%$ of measured value

# KOERZIMAT® 1.097 HCJ PRODUCT INFORMATION

Standard Kits	Order-no.
<p><b>KOERZIMAT 1.097 HCJ Coil 40</b>  <b>KOERZIMAT 1.097 HCJ Coil 40 with pulse magnetization</b>                      each package consisting of:</p> <ul style="list-style-type: none"> <li>• KOERZIMAT HCJ Measuring module</li> <li>• KOERZIMAT Coil 40</li> <li>• accessory kit</li> </ul>	<p><b>1973940</b>  <b>1973959</b></p>
<p><b>KOERZIMAT 1.097 HCJ Coil 60</b>  <b>KOERZIMAT 1.097 HCJ Coil 60 with pulse magnetization</b>                      each package consisting of:</p> <ul style="list-style-type: none"> <li>• KOERZIMAT HCJ Measuring module</li> <li>• KOERZIMAT Coil 60</li> <li>• accessory kit</li> </ul>	<p><b>2016940</b>  <b>2016958</b></p>
<p><b>KOERZIMAT CONTROLLER + KOERZIMAT HCJ Software</b>                      Consisting of:</p> <ul style="list-style-type: none"> <li>• 23" Touch screen</li> <li>• Processor: Intel Quad Core, 2.90 GHz Turbo, 6 MB, HD Graphics 2500</li> <li>• Memory : 4 GB (1x4 GB) 1600 MHz DDR3 Non-ECC</li> <li>• Hard drive: 500 GB serial ATA III Hybrid</li> <li>• 4 x USB 2.0 and 4 x USB 3.0 (of which 1 for dongle)</li> <li>• VGA-output</li> <li>• 1 x LAN, 1 x HDMI</li> <li>• CD/DVD-drive</li> <li>• Optical mouse with USB cable</li> <li>• USB keyboard</li> <li>• Language preferences (only for touch keyboard)</li> <li>• Language recognition, if activated</li> <li>• WINDOWS 8.1 PRO 64 BIT operating system</li> <li>• KOERZIMAT HCJ software V6.0.x with dongle</li> </ul>	<p><b>2016885</b></p>





<b>Additional Software Option</b>	<b>Order-no.</b>
<b>KOERZIMAT 1.097 internal probe 40 Slide for internal probe 40</b>	<b>1092804 1092790</b>
<b>KOERZIMAT 1.097 internal probe 60 Slide for internal probe 60</b>	<b>1092995 1092987</b>

<b>Calibration Standards</b>	<b>Order-no.</b>
<b>HCJ calibration standard soft, approx. 70 A/m with certificate</b>	<b>1622676</b>
<b>HCJ calibration standard hard, approx. 20 kA/m with certificate standard Ms Iron with certificate</b>	<b>1622660</b>

