

PRODUCT INFORMATION



# KOERZIMAT<sup>®</sup> 1.097

HCJ / J-H Measuring Systems

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proof.

With the KOERZIMAT® 1.097 HCJ FOERSTER offers a measuring system for the precise, geometry-independent and fast measurement of the coercive field strength HcJ.

As the measurement is geometry-independent it enables especially for testing of specimen with complex shape.

### Testing Method

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

### Measurements- HCJ

- Coercive field strength HcJ
- Relative Remanence Jr

The extension module J-H measurement offers the possibility to determine the complete J-H Hysteresis on soft magnetic steel incl. the initial curve.

### Measurements - J-H

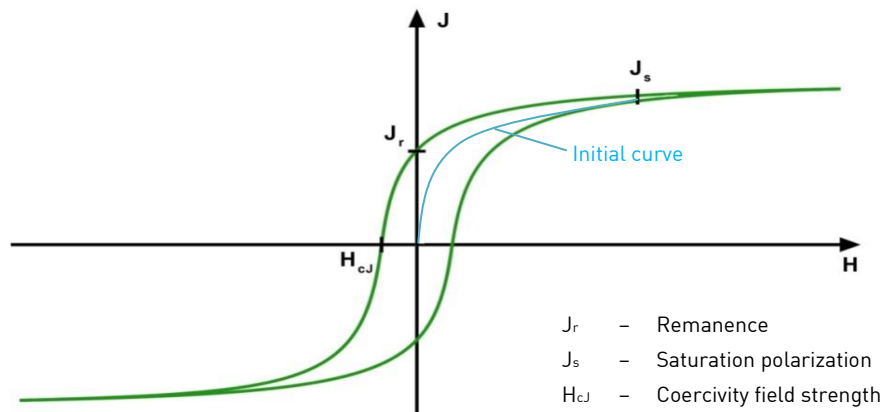
- Complete hysteresis J-H
- Hmax and Jmax
- Remanence Jr
- Coercive field strength HcJ
- Relative Permeability  $\mu_r$  (H)
- Hysteresis loss W

### Applications

- Hard metal testing acc. to DIN ISO 3326, ASTM B887
- 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]
- Determination of the J-H hysteresis, relative permeability, hysteresis loss on round soft magnetic steel bar probes
- Control of electromechanical components in the electronics-, automotive, computer and clock industries; core loss for polarity reversal to 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  $H_{cJ}$  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  $H_{cJ}$  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  $H_{cJ}$ .



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.

By use of the appropriate  $J$ -sensor the  $J$ - $H$  hysteresis incl. the initial curve for round bars with diameters from 6 to 16 mm can be determined very easily. There is no need to prepare grinded test bars.



## KOERZIMAT 1.097 HCJ/ J-H



### Features

- Fast and precise measuring
- Simple specimen fitting on the specimen slide
- Temperature monitored compensation of the coil
- Magnetic screening of the detection coil

### KOERZIMAT 1.097 HCJ

- No special specimen preparation needed
- Geometry-independent measuring
- Coverage of the complete specimen volume
- Specimen chamber with a diameter up to 60 mm
- Highest sensitivity even for smallest test specimen by means of the internal probe
- Large measuring range up to 100 kA/m
- Calibration traceable to national standards [PTB]



### KOERZIMAT 1.097 J-H

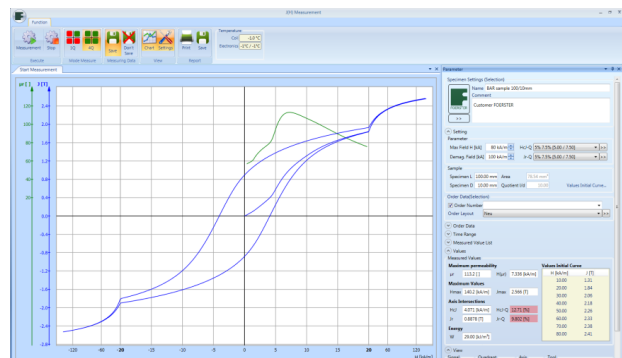
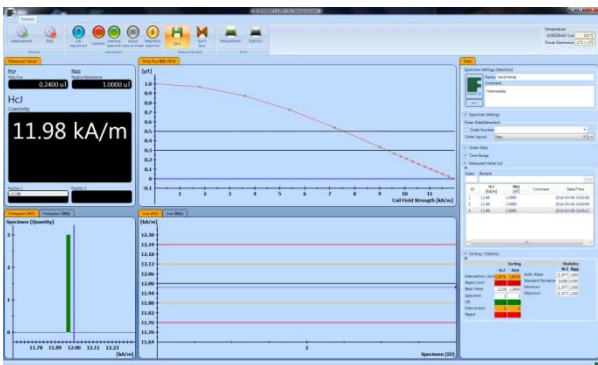
- Easiest sample preparation
- Magnetisation in the open magnetic circuit
- No mechanical load of the probes
- Complete magnetic saturation of the probe up to 150 kA/m
- Measuring range  $\mu_r$  100 - 2500



## KOERZIMAT Controller / Software HcJ / J-H

The compact KOERZIMAT Controller with HcJ Software and an optional J-H extension kit form a unit as a display and user interface for the HcJ (J-H) measuring. The KOERZIMAT HcJ (J-H) Software runs under Windows 8 Pro / 10. Intuitive touch screen functionalities are available and assist the handling of the measuring control.

All measuring data are stored in a database (FOERSTER-owned format – from software version 6.0 upwards) and can be printed in a report or exported in a text file for further processing.




### Features

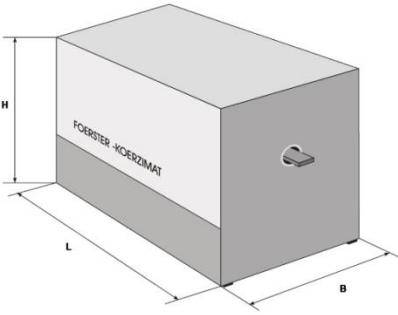
- User interface language: GERMAN, ENGLISH, JAPANESE
- WINDOWS 8 /10 country settings/languages online selectable
- Touchscreen operation
- Clearly structured display elements for measuring adjustments, value output in listed form
- Series measurement graphics, histogram, sorting groups and statistics
- Generating, print out and export of measured values/ statistics
- Password protected user levels for administration of functions and user access
- FOERSTER-owned database format – software version 6.0, storage of measuring data and parameters
- Synchronization of the database whilst measuring HcJ and MS
- Export of data via data interface in XML format (from software version 6.1 upwards)
- Remote-client-program is included in the scope of supply

## 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)<br/>465 x 445 x 220 mm</p> |
| Protection class                           | IP 32   |
| Weight                                     | approx. 18 kg   |

## 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) *         | 450 kA/m  | 350 kA/m      |
| *) Typical for a coil temperature du= 25°C             |   |               |
| Max. measuring field strength                          | 100 kA/m  | 50 kA/m       |
| Homogeneous field area (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>Length (L) x Width (W) x Height (H)<br/>550 x 340 x 420 mm</p> |               |
| Cooling  | by means of two fans  |               |
| Protection class                                       | IP 32   |               |
| Sensor   | Fluxgate ( FÖRSTER-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 |
|--|---------------|

## J Sensor 40 / 60

The available diameters are 6/8/10/12/14/16 mm including integrated fluxmeter and cable connection to the measuring module.

## 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  |

## J –H Measurement

|  |                  |
|--|------------------|
| Measurement modes  | Automatic        |
| Measuring time – complete hysteresis incl. initial curve | Approx. 2 min.   |
| Relative permeability – measuring range                  | $\mu_r$ 100-2500 |

## Standard Kits

### **KOERZIMAT 1.097 HCJ Coil 40**

#### **KOERZIMAT 1.097 HCJ Coil 40 with pulse magnetization**

each package consisting of:

- KOERZIMAT HCJ Measuring module
- KOERZIMAT Coil 40
- accessory kit

### **KOERZIMAT 1.097 HCJ Coil 60**

#### **KOERZIMAT 1.097 HCJ Coil 60 with pulse magnetization**

each package consisting of:

- KOERZIMAT HCJ Measuring module
- KOERZIMAT Coil 60
- accessory kit

### **KOERZIMAT Controller + KOERZIMAT HCJ Software**

consisting of:

- 23,8" Touch screen
- Processor: Intel Core i5-7500, 3,4 GHz, 6 MB, Graphic card
- Memory : 8 GB (1x8 GB) 2400 MHz DDR4 Non-ECC
- Hard drive: 500 GB, 2,5 inch, serial ATA
- 2 x USB 2.0 and 5 x USB 3.0
- 1 x LAN, 1 x HDMI
- DVD-drive
- Optical mouse with USB cable
- USB keyboard
- Language preferences
- Language recognition, if activated
- WINDOWS 10 PRO 64 BIT operating system
- KOERZIMAT HCJ software V6.2.x with dongle

## Additional Options

### **KOERZIMAT 1.097 Internal probe 40**

Slide for internal probe 40

### **KOERZIMAT 1.097 Internal probe 60**

Slide for internal probe 60

### **J-H Software Upgrade**

#### **J Sensor 40**

Probe diameters 6/8/10/12/14/16 mm

#### **Adapter for coil 60**

## Calibration / Reference standards

**HCJ Reference standard soft, approx. 30 A/m**

with certificate

**HCJ Calibration standard hard, approx. 20 kA/m**

with certificate

**J-H Reference standard**

with certificate

# Imprint



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## **Institut Dr. Foerster GmbH & Co. KG**

Division Detection-Systems & Magnetics  
In Laisen 70  
72766 Reutlingen  
Germany

t +49 7121 140-312  
f +49 7121 140-280  
dm@foerstergroup.de

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