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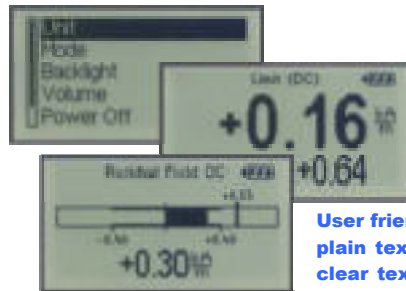
# Cover Story – Magnetic Field Measurement

## DEUTROMETER 3873

**DEUTROMETER 3873: Simple & convenient field strength measurement and monitoring of limit values;** During magnetic particle crack testing work pieces are magnetized by means of a current or a field flow. For a secure indication of cracks a minimum magnetizing field strength must be reached. After completion of the test cycle the work piece usually becomes demagnetized.

The **DEUTROMETER 3873** was designed for professional use to determine both measurements quickly and easily: **The operating mode measures both the magnetizing strength as well as the residual field strength immediately, one after the other.** Manual switching between alternating field and direct field mode is no longer required since the instrument automatically recognizes whether a direct field or an alternating field is present. Thus, false measurements due to incorrect gauge selections are excluded. The simultaneous representation of readings and maximum values as well as the selectable visual and acoustic limit alarm complete the practical qualities of the Deutrometer.

For optimal adaptation to the geometrical conditions you can choose between a 0° and a 90° measuring head. An alternative, paraffin-resistant version makes the probes especially robust and thus suitable for crack detection using oil-based testing agents.



User friendly menu with guidance in plain text. The test readings are in clear text and layout is easily read with the Large Display.

Small 0° and 90° Probes  
Easy access for any test piece



Zero Field Chamber (left) with field-free space and Reference Magnet (right) for reference check of the Deurometer 3873.

### DEUTROMETER 3873 – Advantages & Features

<b>Display:</b>	2 modes; standard indication or bar graph indication, LCD illuminated, 48 x 24 mm, font up to 12.5 mm
<b>Measurements:</b>	Magnetic field strength H and/or induction B (in air) in direct (DC) and alternating fields (AC)
<b>Measuring ranges:</b>	± 80 kA/m or ± 101 mT or ± 1005 G, measurement uncertainty: ± 0.01 kA/m ± 2 % (DC), ± 0.05 kA/m ± 4 % (AC)
<b>Measuring principle:</b>	Hall sensor
<b>Measuring units:</b>	mT, A/cm, kA/m, Gauss
<b>Measuring methods:</b>	- DC = measuring of a direct field with information on the polarity of the magnetic field, - AC = mean (True RMS) in an alternating field
<b>Probe design:</b>	0° or 90° measuring heads, 1m connection cable, on request: paraffin resistant Probe assy. weight 45 g
<b>Battery check:</b>	4-stage battery level indicator, automatic low-limit cut-off, Battery-saving illumination
<b>Keyboard:</b>	4 keys, lettering fluoresces under UV light
<b>Size, weight:</b>	133 mm x 81 mm x 32 mm approx., 150 g (with batteries, w/o protective rubber holster)
<b>Housing:</b>	Splash-proof housing (IP 54)

**Like more Information & Pricing  
02 88503755 - [www.kks.com.au](http://www.kks.com.au)**

## Special – Echometer

Min. **\$425. OFF**  
**Ultrasonic Thickness Gauges**



### **ECHOMETER 1076-Basic. Features:**

- Ex Large Numbers 50 x 27mm display with illumination
  - Made in Germany
  - Sensitivity Adj. to the sound damping of different materials
  - Three display modes: Standard, Difference & Minimum
  - Limit values with acoustical and optical alarm
  - User-friendly menu structure and measuring parameters
  - Wall thickness & Sound velocity modes
  - Velocity 100 to 19,999 m/s range stated in mm steel
  - All parameters remain after switch-off and battery change.
  - Readings in resolutions 0.1 mm, 0.01 mm or 0.001 inch
  - Battery lifetime of up to 130 hours
  - Integrated pop-up stand
  - Automatic recognition of probes
  - Splash-proof housing according to IP 54
  - Miniature probe (10 MHz): 0.5 to 25 mm
  - Standard probe (4 MHz): 1.2 to 250 mm
  - Low frequency probe (2 MHz): 5.0 to 400 mm
- MODELS AVAILABLE are:**  
**Echometer- 1076 Basic,**  
**Echometer- 1076 Data,**  
**Echometer- 1076 TC,**  
**Echometer- 1077 Single Crystal**

**\$425.00 or 15% off any Echometer until March 6th 2015**  
**Simply reply to this email or contact us at**  
**[www.kks.com.au](http://www.kks.com.au)**

## **Pattern Recognition now in FISCHERSCOPE® X-RAY Instruments**

(XRF) with XY Table

With the new pattern recognition feature, all FISCHERSCOPE® X-RAY instruments from Helmut Fischer with programmable XY tables are capable of self positioning samples even in difficult conditions. The newest version of Software WinFTM® stores an image detail (pattern) and searches for it during the measurement. It then readjusts the XY table position, so that the pattern will be found and the measurement will be performed at the correct position. This has many advantages including:

- **Reduction of the operator influence during positioning of the samples**
- **Reduction of the influence of dimensional tolerance of the samples**

In most cases, the X-ray fluorescence test method (XRF) does not require time consuming sample preparation. A simple positioning of the sample in the X-ray beam is mostly sufficient. But if the sample under test has the same or smaller dimensions as the measurement spot size, an exact placement can be difficult for small items, such as:

- Plug contacts on printed circuit boards
- Electrical Connectors
- SMD components

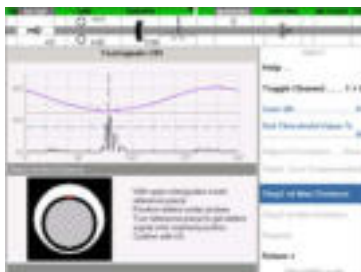


## **New! CIRCOGRAPH® CI / DI # 6.416 & 6.417**

from Institute Dr Foerster of Germany

This New compact model CIRCOGRAPH is used together with the Foerster rotating head Ro20 for testing mainly Small diameter bar and tube.

**CIRCOGRAPH tests for longitudinal defects at the different manufacturing stages of cold forging and drawing of Tube & Bar.**



The CIRCOGRAPH CI / DI comes with the following features:

- One or two test channels
- Clearance compensation
- Easy adjust procedure for clearance compensation
- Frequency range **30kHz – 3MHz**
- Optimized filters for rotational operation
- Display of both channels with each corresponding clearance signal

**Like further Information**  
**[www.kks.com.au](http://www.kks.com.au)**

# Application – “HOTSPOT” test on Drilling Pipes



## Application “HotSpot” with MAGNETOSCOP 1.069 or MAGNETOMAT 1.782

### APPLICATION

#### **Example 1: Deep-bore technology in oil and gas exploration. Drilling pipes in oilfields**

Precise drill-direction monitoring is one of the main tasks in modern deep-bore technology. To guarantee guidance of the drill-bit towards the oilfield to be developed the compass-like navigation unit must not be influenced by magnetic anomalies generated by the drilling pipe. Only in this way can deep-bore sites be operated economically, safely and optimised technically in confined target areas today. For this reason the drilling pipes (drill collars) are subject to precise measurements for magnetic anomalies or **so-called “Hot-Spots”**.

### APPLICATION SETUP

Measurements on solid “drill collars” and drilled “drill collars”  
As a result of the compass-like navigation of bore rods through the mountain, the bore rods may have, according to the API\* specification 7, a maximum deviation from a constant magnetic field of +/- 0.05 $\mu$ T before being used for drilling.

These measurements to identify the magnetic anomalies of austenitic “drill collars”, the so-called “Hot Spots” can be made with both a FOERSTER® MAGNETOSCOP® 1.069 with a differential probe and also with a FOERSTER® MAGNETOMAT® 1.782.

#### **Four different procedures are used to scan the surface of the “drill collars” and drilled “drill collars”:**

1. The differential probe is mounted securely on a bracket parallel to the longitudinal axis of the “drill collars” and the “drill collars” are then channelled past (static HotSpot procedure)
2. The differential probe mounted to a sledge is moved along the “drill collar” to scan the surface (measurement value recording) (dynamic HotSpot procedure).
3. The probe, mounted to a fixed strut, is fed centrally into the tube moving above it and scans the tube (static HotSpot procedure)
4. The probe, mounted to a mobile strut, is fed centrally into a fixed tube and scans the tube (dynamic HotSpot procedure)



Continued



All components used for transporting the “drill collars” or drilled “drill collars” and the accompanying control unit and all other components located within the immediate vicinity of the measurement probe are designed to be antimagnetic.

To comply with the predetermined deviations in accordance with API specification 7 for a constant magnetic field, additional specific environmental conditions must be adhered to by all procedures implemented at the measurement site. Ferromagnetic masses located close to the measurement site must not be moved during the measurement, field generating components such as motors, transformers and the like must be switched off during the measurement.

The “drill collars”/drilled “drill collars” are transported in a stable, modular designed antimagnetic mechanic with multipart sledges e.g. the Foerster Systems Division. From a central operating console the sledges, with programmable speed, are controlled in manual or automatic operation by an antimagnetic cable winch.

In the MAGNETOSCOP example, the MAGNETOSCOP is located in the operator console to log and record measurement values delivered by the differential probe.

A PC with “HotSpot” software installed, and connected to the serial interface on the MAGNETOSCOP, is used to document results, store measured values, displays and generate reports.

The decision whether the expensive drilling procedure of a blank is worthwhile must be determined by measuring several positions on the circumference ( $0^\circ$ ,  $90^\circ$ ,  $180^\circ$  &  $270^\circ$  or alternatively  $0^\circ$ ,  $120^\circ$  &  $240^\circ$ ).

When using a MAGNETOSCOP with a probe the “drill collar” is normally rotated by  $90^\circ$  or  $120^\circ$  after each measurement pass. With the MAGNETOMAT 1.782 several probes can be used in parallel so that only a single measurement pass is necessary to cover the surface.



## **Recommended equipment**

### **Example 1/procedure 1 static HotSpot procedure solid blanks**

- Antimagnetic table unit which supports the mobile 3-element sledge unit on which the “drill collars” are transported
- Antimagnetic electrically powered cable-winch unit which moves the sledges
- Operator console for manual and automatic operation in both directions of motion
- Antimagnetic fixed mounting for the differential probe which is mounted close to the surface and parallel to the longitudinal axis of the “drill collars”
- MAGNETOSCOP 1.069 with differential probe and mains adaptor or alternative
- MAGNETOMAT 1.782 with electronic box and power supply
- With the MAGNETOMAT solution the “drill collar” can be examined by several differential probes in a single measurement scan to reduce the measurement time.
- Commercially available PC with HotSpot software installed
- MAGNETOSCOP connection cable or MAGNETOMAT electronic box PC

Continued

### Example 1/procedure 2 static HotSpot procedure drilled “drill collars”

- Components as above

However, in place of the antimagnetic differential probe mounting for measuring the external surface a fixed mandrel is required for drilled “drill collars”. The differential probe is again mounted parallel to the longitudinal axis of the drilled “drill collar” and moved centric for the measurement through the bore which moves over the “drill collar”.



Antimagnetic table with mobile sleds

### Example 1/procedure 3 Dynamic HotSpot procedure solid blanks

- Antimagnetic table unit with roller-conveyer to position the “drill collar” at the measurement point
- Mobile, antimagnetic mounting with displacement sensor for the differential probe mounted parallel to the longitudinal axis and close to the drill-collar’s surface
- Differential probe
- Control for the roller-conveyer and special mounting bracket
- MAGNETOSCOP 1.069 with differential probe and mains adaptor or alternative
- MAGNETOMAT 1.782 with electronic box and power supply
- With the MAGNETOMAT solution the “drill collar” can be examined with several differential probes in a single measurement scan to reduce the measurement time
- Commercially available PC with HotSpot software installed
- MAGNETOSCOP connection cable or MAGNETOMAT electronic box PC



Drilled “drill collar” with mandrel for centric internal measurement with differential probe – static HotSpot procedure



### Example 1/procedure 4 dynamic HotSpot procedure drilled “drill collars”

- Antimagnetic table unit with roller-conveyer to position the “drill collar” at the measurement point.
- Mobile, antimagnetic mandrel as mounting with displacement sensor for the differential-probe mounted parallel to the longitudinal axis and for the centric passage through the drilled “drill collar”
- Differential probe
- Control for the roller-conveyer and special mounting bracket
- MAGNETOSCOP 1.069 with differential probe and mains adaptor
  - or alternative
- MAGNETOMAT 1.782 with electronic box and power supply
- With the MAGNETOMAT solution the “drill collar” can be examined with several differential probes in a single Measurement scan to reduce the measurement time
- Commercially available PC with HotSpot software installed
- MAGNETOSCOP connection cable or MAGNETOMAT electronic box PC

Continued

## “HOTSPOT” DATA LOGGING SOFTWARE

The “HotSpot” data logging software can be used with two different Foerster measurement systems. These are:

1. “HotSpot” with MAGNETOSCOPE®
2. “HotSpot” with MAGNETOMAT®

“HotSpot” is a Windows® based analysis software for continuous digital recording, representation and documentation of analogue magnetic measurement values to identify, for example, so-called distinctive magnetic “Hot Spots” on elongated materials or to measure the residual field-strength on antimagnetic components.

As the solution for customer demands both measurement systems can fundamentally be used with “HotSpot” applications. The decision as to which version is used is based on the specific individual requirements and the customer’s preferences.

### For the MAGNETOSCOPE

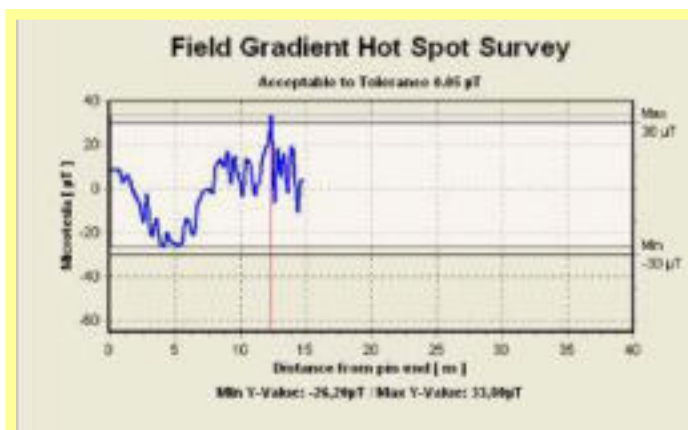
- Mobile measurement device
- Functions with one sensor
- Limited sample rate of 10Hz
- Serial interface

### For the MAGNETOMAT

- Static measurement system
- Network compatible (several sensors)
- High sample rate
- Can be used with displacement sensors



### MAGNETOMAT



**Have any questions or like further details, contact us now !**

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