The Probe

KK&S INSTRUMENTS - October / December 2011 Issue

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Echometer - Ultrasonic Thickness Gauge

The new generation of the **ECHOMETER** series can now measure **wall thickness and sound velocities** in one instrument and therefore offers many advantages for the operator. This innovative dual-use Echometer has been re-designed by Karl Deutsch the well-known supplier of testing instruments and testing systems in Germany.

The new **ECHOMETER 1075** has state-of-the-art manufacturing technology and modern design built in. Special attention has been paid to the outstanding features and ease of operation for this light-weight and compact instrument (115 g) (12 x 6,5 x 2,5 cm). Additional protection for instrument is ensured by a rubber holster which also prevents slippage during handling and offers an integrated leg for self support. A clear-text menu is shown on the large illuminated graphics display. Low current consumption for a long battery lifetime makes the **ECHOMETER 1075** a flexible tool for every-day use. The choice of application, thickness gauging or velocity measurement is now a simple task.

The **ECHOMETER 1075** measuring range depends on the ultrasonic probe fitted but can be between 0.7 to 400 mm for wall thickness. For the measurement of sound velocity, all materials between 100 to 20 000 m/s can be tested. To avoid errors when entering a known wall thickness for the sound velocity measurement, an interface is provided to attach the electronic Vernier Calliper (optional). The mechanically measured wall thickness is then transferred in an automated, fast and error-free manner.

The **ECHOMETER 1076** '**Data**' will transfer the measured values via PC-interface into the optional "EchoStat". PC programme for further processing.

- **Echometer -** Simple & Accurate
- **Echometer -** Large numerical display
- **Echometer -** 3 sensitivity levels
- **Echometer -** 3 display modes
- **Echometer -** Selectable mm or inch
- **Echometer -** 3 Models available
- **Echometer -** 4 Probes available
- **Echometer -** Calliper available
- **Echometer -** Limits acoustical & optical
- **Echometer -** Silicone Armour & Stand
- **Echometer -** Velocity & Thickness gauges
- **Echometer -** optional data Software
- **Echometer -** Australian calibration
- **Echometer -** Australian Spares
- **Echometer -** Splash Resistant to IP 54
- **Echometer -** German Quality

For further Echometer features or a price, reply to this email or contact us on 02 88503755 or www.kks.com.au

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Product Profile - Sigmatest

SIGMATEST® 2.069 -

Conductivity Measurement of non-ferromagnetic Metals

The **SIGMATEST® 2.069** is an eddy current instrument that measures the electrical conductivity of non-ferromagnetic metals based on the complex impedance of the measuring probe.

The measuring range for the instrument is established by calibration.

When unknown test pieces are measured, the instrument converts the complex impedance value to an electrical conductivity value.
The electrical conductivity value is indicated on the instrument's LCD display.

Sigmatest Specs.

- **Five measuring frequencies: 60, 120, 240, 480, 960 kHz**
- **Internal and external temperature compensation**
- **Measurement possible up to 0.5 mm distance from the test item**
- **Measurement range from 0.5 to 65 MS/m (1 - 112 % IACS)**
- **20 measurements per second**
- **Remote control via RS-232 port or Ethernet port**

Applications range from;

- **Material-mix testing,**
- **Sorting of metals and alloys,**
- **Quality control inspection,**
- **Aircraft maintenance inspection,**
- **Determination of heat damage,**
- **Monitoring the condition of highly stressed parts,**
- **Determining physical and technological material properties,**
- **In-process inspection in industrial, metallurgical, and metalworking plants,**
- **Verification of the age-hardening condition of aluminium used in aircraft construction.**

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News - New Products

Karl Deutsch Launch their New LED UV / White Light for Fixed installations
Model - 3846

Via the operating panel on the front side the lamp is switched on/off and the type of illumination may be selected from UV and white light. LED's show the current operating status conveniently and distinctively.

The LED's have a UV A irradiation with a strict limitation to a wave length of 365 nm. Hazard by UV B / UV C irradiation thus is nearly impossible, even with defective protection glass. The LED technique renders filter glass redundant.

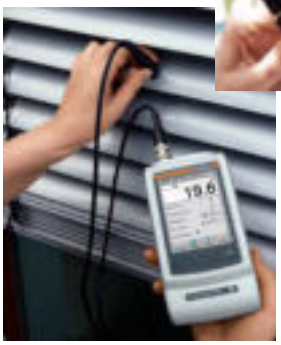
- **considerably longer service life of the illuminates compared to conventional gas discharge lamps**
- **20 high-power UV LED's ensure high UV intensity**
- **no measurable portion of white light in the UV light**
- **risk class 2 (according to EM 6)**
- **selectable UV or white light**
- **instantly ready to operate**
- **sturdy aluminium housing**
- **no hazard by UV B and UV C irradiation (no filter glass required)**
- **fan-less warmth dissipation via the housing - thus no unwanted ambient noise**
- **complies with all DGZfP requirements especially with respect to wave length and intensity**
- **standard mains unit for power supply of up to two lamps - a mains unit for up to six lamps is available optionally.**

Helmut Fischer launch their new Measurement Probe - FTD 3.3

Coating thickness measurement without the influence of geometry

General information on the measurement of curved surfaces

For coating thickness measurement, the eddy current method is extremely sensitive to variations in geometry. Electromagnetic methods are most commonly used for non-destructive coating thickness measurement on ferrous and non-ferrous metal substrates.



The magnetic induction or eddy current method is used depending on the particular application. In both cases, the measuring principle is based on the electromagnetic alternating field of the probes being influenced by the thickness of the coating to be measured.

The spatial extent of the electromagnetic fields is such that the geometry of the test specimen also has an influence on the measuring result. Coatings on convex substrates are excessively measured as the curvature additionally reduces the interaction of the magnetic field with the substrate and a supplementary layer is simulated.

An insufficient coating thickness is measured on concave substrates. For precise measurement of curvatures, calibration must be made on an uncoated original part with identical curvature. Recalibration is necessary in case of curvature variations. For a large number of different parts, this involves considerable calibration effort. Added to this is the fact that uncoated original parts must be available. The eddy current method reacts far more sensitively to part geometry variations than the magnetic induction method.

Remedy:

With the curvature compensated eddy current FTD3.3 probe, paint, lacquer and anodised coatings on any part geometries can be precisely measured with only one calibration. Measurement preparation with the eddy current FTD3.3 probe is far less time consuming than with conventional probes as it compensates substrate curvatures without additional calibration.

For further Product information please reply to this email or contact us on

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Application - Probe Positioning

Probe Influences – Avoiding Errors

Modern coating thickness measuring instruments employing the magnet-inductive method (DIN ISO 2178) or the amplitude-sensitive eddy current method (DIN ISO 2360) should be simple and quick to use by all users. This means:

Apply the measuring probe - read off the value - finished!

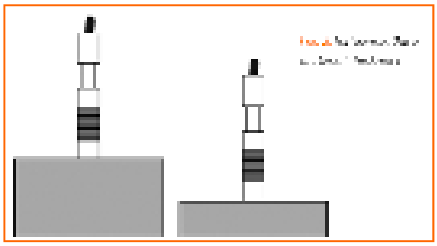
However, it's not that simple for instrument users because both measuring methods are comparative methods of measurement and the signal from a measured object is compared with the calibration standard via the characteristic in the measuring instrument.

The most frequent influences are caused by the size and shape (geometry) of the parts to be measured. The measuring field that moves through the air before the field penetrates the surface of the part (such as the outside diameter or convex curvature), is longer than on a fl at surface or inside diameter (concave surface). Therefore, if the instrument is calibrated on a fl at surface, the results obtained on the outside diameter will be too high and the results on the inside diameter will be too low.

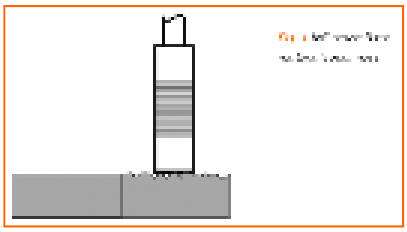
Another influence that needs to be taken into consideration is the base material or substrate thickness. If the base material is not thick enough, the measuring field of the probe will fully

penetrate the part being measured. If the calibration is performed on a thin substrate material, but measurements are taken on a part with a thicker substrate, the readings will be too low. If the calibration is performed on a thicker substrate material but measurements are taken on parts with a thinner substrate, the measurements will be too high.

Users can avoid measuring errors by calibrating on the base material with the same thickness as the parts to be measured.



Further geometrical influences include roughness of the base material and the size of the measuring surface, and distance of the probes to the edges of the part. The effect of influences can be reduced by selecting the appropriate Fischer probe.



To compensate for these influences, the magnetic induction or eddy current instrument should be calibrated according the following "golden rules".

Calibration should take place on the uncoated part of the measuring surface, then on the coated part of which the coating thickness is to be measured.

There are exceptions to this rule in individual cases, which should be given careful consideration and confirmed by trial measurements.

The patented Fischer eddy current probes ETD3.3 and FTD3.3 with curvature compensation are taken as an example to illustrate one exception to the rule.

If calibrated on a flat, non-magnetic object, measurement can be made without influencing the curvature up to a minimum diameter of 4 mm.

HELMUT FISCHER - Dipl.-Phys. Ulrich Sauermann