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The Probe

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RMG-4015

Are you looking for an easy-to-use instrument to measure the depth of surface cracks in metals which you have detected by Magnetic Particle Testing (MT) or Penetrant Testing (PT)? You want to evaluate the extension, the orientation or the inclination angle of the crack so you are able to make a decision on a possible rework on the specimen? Or you want to monitor the growth of a crack over operating time?

Then we recommend the crack depth gauge RMG 4015 from Karl Deutsch of Germany.

Advantages of the RMG 4015

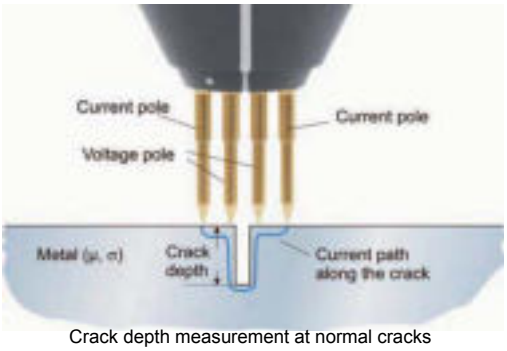
Since alternating current (AC) is used, the measurement takes advantage of the skin effect: The current is urged to flow close to the surface and thus follows the contour of the crack to a great extent. An additional advantage: Due to low pulsed current the required result is achieved and possible burnt contact spots on the specimen can be avoided. The small, battery-operated handheld unit combines current generation, measurement technique and microprocessor-based evaluation and can be taken along conveniently to any job site.

The **RMG 4015** is optimized for the use on steel, iron and austenitic material. A material specific calibration adapts the instrument to distinct electrical and magnetic properties. For this purpose the **RMG 4015** offers various calibration methods: In the simplest case it is sufficient to execute a comparison measurement at a crack-free spot of the specimen. Higher precision is achieved by means of a comparison measurement at a reference notch with a depth close to the expected crack depth. A multiple point calibration over reference notches with varying depth covering the whole measuring range leads to the best results.

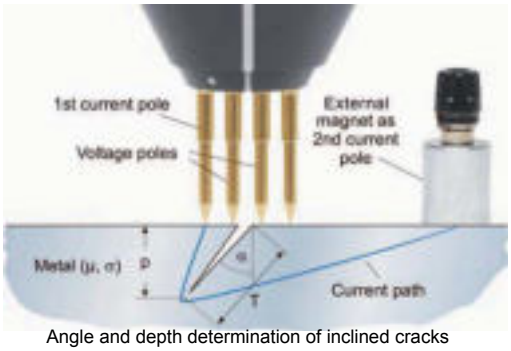
The crack depth gauge **RMG 4015** can also be used on copper, brass, aluminium or other metallic material (however measuring range and resolution might be reduced). For difficult applications it is possible to adapt a special probe to specific requirements (on request).

Measurement Technique

The **RMG 4015** uses the potential drop method with alternating current: Via two current poles located left and right to the crack a constant alternating current is passed into the work piece. The voltage drop between two additional poles positioned left and right to the crack is proportional to the crack depth. Conditions for a reliable measurement: The electrical and magnetic properties of the material surrounding the crack are sufficiently homogenous. The width of the crack has almost no influence on the measurement (Fig. left). For a crack depth measurement of inclined cracks the frequency of the alternating current is automatically lowered so that the electric current covers a wider area in the work piece. Depending on the position of the external current pole (positioned either left or right with respect to the crack) different voltage drops result which are used to calculate the angle □ (Right).



Crack depth measurement at normal cracks



Angle and depth determination of inclined cracks

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News – What's NEW!

NEW!! High Definition VideoScope – From Only $3,900.00

Borescope Cameras with 5.7" High Definition Colour LCD Screen !

Features:

- Optional Articulating Probes
- Model HDV610 - 5.5mm dia. with 1m flexible cable
- Model HDV620 - 5.8mm dia. with 1m semi-rigid cable
- 5.7" colour LCD TFT with **high definition** 640 x 480.
- Mini, **high-resolution** water-proof (IP57) camera head.
- Rugged water and damage resistant housing (IP67/2m).
- Non-slip ergonomic handles for ambidextrous use.
- SD memory card included to store >14,600 images.
- Video recording (up to 4 hours) with Voice annotation.
- AV output , viewing images & video directly on a monitor
- Video & Image transfer via the SD card or USB output
- An optional wireless transmitter (HDV-WTX) up to 30m.

Specifications

Focus distance 60mm; Macro: 15mm - Field of View 65° - LCD Screen Type 5.7" colour TFT - Pixels 640 x 480 (High Definition) SD Card 1GB (included) - Operating 4 hours

HDV610 and HDV620 Include: • VideoScope, SD memory card, 3.7V rechargeable Li-Polymer battery, patch cable, AC adaptor, USB and AV cables, camera with cable, and hard carrying case.

NEW! Probe, Measurement of Sprayable Acoustic Material

In the automotive industry, a great deal of effort goes into reducing vehicle weight by using lighter components. An example is the use of SAM (sprayable acoustic material) coatings in vehicle interiors. These locally applied insulation layers replace the larger and heavier soundproofing mats previously used. However, in order to meet the targets for sound protection, weight, clearance and cost, the thickness of these coatings must be carefully monitored.

Typically, these SAM coatings are between 2 and 4.5 mm thick, very often located in places that are difficult to reach, and found on top of either aluminium or steel – that is, on both ferrous and non-ferrous substrates.

Developed by FISCHER for just this measurement task, the FA14 probe employs the eddy current method, which is effective for measuring non-conductive coatings of up to 5 mm thickness on conductive base materials. But above and beyond these fundamental specifications, the FA14's compact elbow design also makes it possible to take accurate readings even in very close areas: The sensor has an external casing with a total diameter of 20 mm, and its field focus is optimised such that measurements can be taken – without edge influence – on spots no bigger than the probe itself.

Of course, as do all FISCHER eddy current probes, the FA14 compensates for conductivity. In practice, this means that differences in the conductivity of the base material, e.g. when various aluminium alloys are used, exert no influence on the coating thickness measurement. The probe of FA14 can be connected to the handheld instruments of the FMP-family, either DUALSCOPE® or ISOSCOPE®.

Have any questions or like a price, contact us on -

Ph 02 88503755 - contact@kks.com.au - www.kks.com.au

Application – Hardness, Pencil vs Instrument

Determining the Surface Hardness of Paint Coatings – Pencil Testing vs. Instrumented Indentation Testing

Until recently, quick scratch testing with pencils to determine the hardness of paint coatings has been commonplace. However, the reliability and reproducibility of this method is questionable. Because of the stringent quality standards in the coating industry, it is necessary to be able to test the hardness of paint coatings reliably.

Determining the 'pencil hardness' – or better put, the scratch resistance by means of marking with pencils – according to Wolff Wilborn or DIN ISO 15184 is a method commonly used in the coating industry. With this method, pencils of different hardness are moved at a certain angle and with a controlled force across the paint surface to be tested. The 'pencil hardness' of the coating is defined by two consecutive levels of pencil hardness, where the softer one leaves only a writing track, while the harder one actually causes a tangible deformation of the paint coating.

Fig. 1: FISCHERSCOPE® HM2000 S for the determination of the Martens Hardness

The shortcomings of this procedure lie in the poor reproducibility of the measurements. For one, the material under test will not always manifest the same properties, since pencil hardness is not clearly defined in any standard and there are distinct differences between individual manufacturers. Furthermore, the operator influence is significant. Thus, it is often impossible to interpret the results unambiguously.

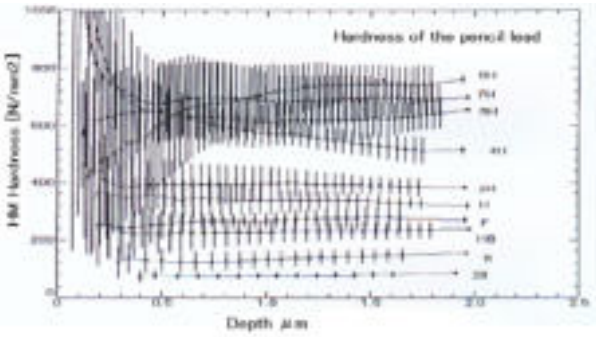

Fig. 2: Comparison of the Martens Hardness of pencils of different hardneses, shown with the standard deviation of the measurements

If one correlates the various pencil hardness with their Martens Hardness, the limitations of the method become even more obvious. Fig. 2 shows the results of multiple measurements on pencils of various hardness levels.

Broad overlapping is apparent when one considers the standard deviations of the individual test series. In fact, especially in the upper range, the nominal hardness (B, HB, F, H, etc.) of pencils is not a dependable indicator of their actual hardness.

The FISCHERSCOPE® HM2000 S can measure the hardness of paint coatings directly and accurately. In addition, other characteristics can be determined, such as creep and relaxation behavior, as well as the modulus of elasticity. All of these hardness parameters provide a true indication of the paint quality.

FISCHERSCOPE® hardness measurement systems demonstrate that the actual hardness of a pencil can vary significantly from its nominal hardness, meaning *the pencil is not a dependable measuring device*. Therefore, a method employing a pencil as its key instrument cannot be expected to reliably assess the hardness of anything. For directly determining the surface hardness of e.g. paint coatings, the FISCHERSCOPE® HM2000 S, for example, will give you the same accurate, precise results – every time.