HELMUT FISCHER offers you significant advantages for all coating thickness measurement applications with its new family of electromagnetic hand-held instruments. The modular design of the system components offers:

- differently equipped instrument models
- for measurements according to both the magnetic induction and the Eddy current methods
- with a broad selection of different probe models.

The coating thickness measuring instrument best suited for a measurement application can be selected depending on the application itself and the demand for measurement data processing and documentation.

Regardless of the instrument you choose, you receive:

- a powerful, state-of-the-art instrument
- that is highly accurate,
- easy and uncomplicated to use
- measures a broad range of applications.

The large LCD display – by default in all instruments available – not only features a large display of the reading but informs the user about all essential measurement parameters.

In addition, context-sensitive information notes on two display lines, simplifies the use of the instrument.
Hand-held instruments operating according to the magnetic induction and Eddy current methods have become the industry standard for fast, accurate and nondestructive coating thickness measurement on steel or nonferrous metals. Use of these portable, light-weight hand-held instruments has steadily increased, particularly where corrosion protective coatings are involved.

**Why take measurements?**

One of the most important quality criteria in surface finishing is the adherence to defined coating thickness specifications. Quality control is imperative for both suppliers and purchasers for obvious reasons.

**Which coatings can be measured?**

- Nonmagnetic coatings on ferromagnetic substrates (using the magnetic induction method according to DIN EN ISO 2178, ASTM B499), e.g., zinc, chromium, copper, tin, or paint, plastics, enamel on iron or steel.
- Electrically nonconductive coatings on nonferrous metals (using the Eddy current method according to DIN EN ISO 2360, ASTM B244), e.g., paint, enamel, or plastics on aluminum, brass, or zinc and anodic coatings on aluminum.

Depending on the probe and instrument used, coating thicknesses can be measured in ranges up to 25 mm (1.0”). In some instances, even thicker coatings can be measured (up to 70 mm/2.75”).

**Who can make measurements?**

Neither special skills nor special knowledge are required. Particular emphasis has been given to a clear and unambiguous display and instrument design and to easy keyboard operation. If special questions arise concerning an application, FISCHER is committed to assist, both with specific information and through FISCHER seminars conducted on a regular basis.

**How long does a measurement take?**

It only takes a few seconds. If no calibration is required, the operator only needs to position the probe, read the coating thickness measurement, and if applicable, save the result with the push of a button. Measurement data storage enables immediate statistical evaluation of the measurement series.

**How are measurements taken?**

The measurement probes contain pick-up elements which generate the magnetic induction or eddy current probe signal. The probe is placed on the test specimen and supplies the signal which is proportional to the coating thickness to the instrument. The measurement signal is processed, displayed and evaluated by the instrument and may also be transmitted to other devices via a serial interface. Calibration procedures take the application specific measurement conditions into account.

**Where can you measure?**

Practically anywhere. The entire system (consisting of the instrument and the probe) is small, pocket-sized and highly portable.

There is no need for an external electrical power supply; the instruments are ready to take measurements at any time.

This enables in the most simple way measurements on site, for example, the determination of the thickness of anodized coatings on aluminum parts of house facades or of paint or zinc coatings on steel constructions (see image on the title page).
System Concept

The FISCHER System combines all essential components, measurement application, measurement capture and measurement processing on a LCD display.

System Components

Measurement Capture

An assortment of smart probes for various applications is available. A selection is shown in this publication.

Each FISCHER smart probe consists of a measuring element, a memory chip, and a connector. The measuring element supplies a signal relative to the coating thickness; the design and shape of the probe are dependent on the measurement conditions. Calibration data are stored in the memory chip. This makes an application specific calibration residing in the probe itself. Finally, the connector allows for a quick and easy connection to any of the available FISCHER hand-held and bench top instruments.

Measurement Data Output

The FISCHER system offers the following options for measurement data output:

- Data display choices: Depending on the instrument version, single readings or batch mean results and statistical evaluation data can be displayed.
- Instruments with serial interface can be connected to a PC and integrated into a data network or to a printer.

Measurement Processing

A total of six basic instrument versions are available:

- ISOSCOPE® MP0R, DUALSCOPE® MP0R and MP0RH. Cost-effective hand-held instruments with integrated probes, data memory, statistical evaluation and radio transmission.
- DUALSCOPE® MP0R-FP and MP0RH-FP. Cost-effective hand-held instruments with separate probe, permanently connected by a cable, measurement data memory, statistical evaluation and radio transmission.
- ISOSCOPE® MP10E, DELTASCOPE® MP10E. Cost-effective hand-held instruments with plug-in type smart probes and digital measurement display.
- DUALSCOPE® MP20E-S. Hand-held measuring instrument with plug-in type probes with statistical evaluation capabilities, RS232 interface, suitable for magnetic induction and eddy current measurements.
- ISOSCOPE® MP30E-S, and MP30E-R, DELTASCOPE® MP30E-S and MP30E-R. Hand-held instruments with plug-in type smart probes, measurement data memory and statistical evaluation features, radio or RS232 interface.
- DUALSCOPE® MP40E-S and MP40E-R. Hand-held instrument, for eddy-current and magnetic induction coating thickness measurement; with plug-in type smart probes, measurement data memory, statistical evaluation, and radio or RS232 interface.

The combination of these components offers the optimal solution to many measurement applications.
System FISCHER: Family of Instruments

Hand-held instruments cover a broad range of application-specific measurement tasks. The first criterion for instrument selection is the coating/substrate material combination. The magnetic induction method is used for nonmagnetic coatings on iron or steel; the eddy current method for electrically non-conductive coatings on nonferrous metals. The FISCHER program offers a complete family of instruments for both test methods: magnetic induction instruments have the model names DELTASCOPE® and PERMAC- SCOPE®, Eddy current instruments the name ISOSCOPE®. The DUALSCOPE® includes both test methods.

The functions and features integrated in the instrument provide another selection criterion. The display of the measurement may be sufficient for some applications. More frequently the measurement data needs to be stored and evaluated according to certain categories. The data storage feature allows for the full statistical evaluation of the measurement series by the instrument. For the most demanding applications, the operator requires a hand-held instrument with the power of a laboratory grade measurement system. Even such an instrument is available from FISCHER.

**ISOSCOPE® MPOR**
**DUALSCOPE® MPOR and MPORH**
**DUALSCOPE® MPOR-FP and MPORH-FP**

The instrument versions MP0R and MP0R-FP are available if the accessibility of the measurement area does not require a separate probe. However, if measurements are to be made on parts with complex shapes, requiring a simple instrument consistently with the same measurement probe type, then the MPOR-FP or the MP0R-H-FP are the ideal choice.

- The ISOSCOPE® MPOR is used to measure paint, lacquer, synthetic or anodized coatings on all NF-materials such as aluminum, copper, brass and on stainless steel.
- The DUALSCOPE® MP0R or MP0R-FP are used to measure NF-coatings (e.g. chrome, copper, zinc) on iron and steel as well as paint, lacquer, enamelled or synthetic coatings on iron and steel or on nonferromagnetic metals.
- DUALSCOPE® MP0RH or MP0RH-FP for the measurement of electrically nonconducting coatings with several millimeters thickness on steel or on nonferromagnetic metals.

### Key features:
- Ergonomic design with two backlit displays for optimum viewing of the readings in any measurement position
- Pocket size and low weight
- Integrated, spring-supported measurement probe for one-hand operation (version MPOR and MPORH) or via cable for directly connected probes (versions MPOR-FP and MPORH-FP)
- Quick selection of functions via user-friendly menu
- Specification limits
- Optical and acoustical signals for measurement accept or limit violation
- Automatic On/Off function
- Memory for up to 1000 measurements is retained even without power supply
- Statistical evaluation
- Ready to measure right away without calibration
- Automatic material recognition (for all DUALSCOPE® types)
- Freely selectable offset value for automatic addition or subtraction of a constant value
- Two-point calibration when geometry or material changes
- Menu-selection of measurement units (µm or miles)
- Radio transmission of the readings (optional radio receiver required)

### Measurement of paint, lacquer or anodized coatings on Al.

### Measurement with the DUALSCOPE® MPOR-H-FP with the separate probe, it is easy to measure the coating thickness also on small or curved surface areas.
Unlike the previously described MP0R instrument models, the MP10E series models use plug-in type smart probes. Instruments can be adapted to particular applications by selecting appropriate probe models:

- **ISOSCOPE® MP10E** models are used to measure nonconductive coatings such as paint, anodizing, enamel or plastic coatings on nonferrous metals or stainless steel, and anodic coatings on aluminum.
- **DELTASCOPE® MP10E** models are used to measure nonferrous metal coatings (e.g., chromium, copper, zinc, etc.), and paint, enamel or plastic coatings on iron and steel.

These instruments display the coating thickness readings only. However, no capability for storing or evaluating measurement data is provided.

**Characteristic Features:**

- Large LCD display for measurement and evaluation data as well as icons for status display and operation notes on display lines.
- Easily exchangeable plug-in type smart measurement probes.
- Automatic probe recognition.
- Automatic measurement capture when probe contacts specimen.
- Acoustic signals indicate measurement acceptance.
- Lockable keyboard.
- Continuous measurement data display to quickly determine the coating thickness distribution by means of surface scan.
- Immediately ready to measure.
- Simple calibration adjustment to the test area geometry with the ZERO key.
- Additional corrective calibration with one or two calibration foils.
- Master calibration for highest measurement accuracy if the material and geometric properties of the test piece are unusual.
- Corrective and master calibration are stored in the connected probe.
- Selection between automatic shut-off 4 minutes after the last measurement or continuous operation.
- Unit of measurement selectable between U.S. and metric units.
- Various status message displays (for instance, a warning message when the battery voltages is low).
- Eight selectable display languages.

Fig. left: Measurement of the thickness of paint or lacquer coatings on aluminum using the ISOSCOPE® MP10E.

Fig. right: Measurement of zinc coatings using the DELTASCOPE® MP10E.
DUALSCOPE® MP20E-S

This instrument uses both the magnetic induction and the Eddy current test method. If coatings are to be measured on ferromagnetic and nonferromagnetic metal substrate materials, and if one application memory is sufficient, then the DUALSCOPE® MP20E-S provides a very low-cost solution for an instrument with plug-type probes. The instrument features the following measurement capabilities:

- NF metal coatings of zinc, chromium or copper as well as paint, enamel or plastic coatings on steel and iron.
- Paint and plastic coatings on NF metals or stainless steel and anodized coatings on aluminum.

The DUALSCOPE® MP20E-S includes a bidirectional RS232 interface. The measurements of a measurement series can be stored, evaluated according to popular statistical methods, and output to a printer or transferred to a PC. Minimum, maximum, mean value and standard deviation are displayed with the push of a button. The number of measurements in the current test series appears on the display in addition to the coating thickness reading.

Normally the instruments are immediately ready to measure. Normalization by measuring the uncoated part is generally sufficient when switching to a new measurement application involving the same substrate material but different geometry and test area. Use the ZERO function to determine the new zero point to quickly establish a valid calibration. If the ferromagnetic properties of the material change, use the CAL function to adapt the calibration to the new material. This requires the use of one or two calibration foils in addition to the bare substrate measurement. The calibration is stored in the probe and is available for immediate recall at any time.

Characteristic Features:

- Large LCD display for measurement and evaluation data as well as icons for status display and operation notes on display lines.
- All magnetic induction, Eddy current and DUAL (suitable for both measurement methods) probes can be connected.
- Automatic probe recognition.
- Automatic material recognition.
- Automatic measurement capture when probe contacts test piece.
- Acoustic signals indicate measurement acceptance.
- Lockable keyboard.
- Statistical evaluation of measurement series and display of minimum, maximum, mean value, number of measurements, standard deviation, date and time.
- Continuous measurement data display to quickly determine the coating thickness distribution by means of surface scan.
- Immediately ready to measure.
- Simple calibration adjustment to the test area geometry with the ZERO key.
- Additional corrective calibration with one or two calibration foils.
- Master calibration for highest measurement accuracy if the material and geometric properties of the test piece are unusual.
- Corrective and master calibration are stored in the connected probe.
- Selection between automatic shut-off 4 minutes after the last measurement or continuous operation.
- Unit of measurement selectable between U.S. and metric units.
- Various status message displays (for instance, a warning message when the battery voltage is low).
- Eight selectable display languages.

Fig. left: DUALSCOPE® MP20E-S with Eddy current probe to measure coating thickness on NF metals.

Fig. right: Magnetic induction probe to measure the paint coating thickness on a steel rotor.
The MP30E models of the hand-held coating thickness measuring instruments are:

- **ISOSCOPE® MP30E-S and MP30E-R models** are used to measure nonconductive coatings such as paint, anodizing, enamel or plastic coatings on nonferrous metals, and anodic coatings on aluminum;

- **DELTASCOPE® MP30E-S and MP30E-R models** are used to measure nonferrous metal coatings (e.g., chromium, copper, zinc, etc.), and paint, enamel, or plastic coatings on iron and steel.

The instruments are equipped with either a bidirectional RS232 interface (Version “S”) or a unidirectional radio interface (Version “R”). This allows for the “S” versions the connection to a printer for the printing of measurement data and for the “R” versions the transfer of measurement data to a computer and using a measurement software program such as the FISCHER PC-DATEX software opens the possibility to integrate this hand-held coating thickness measuring instrument into a powerful workstation with full SPC/SQC capability.

The MP30E model series features statistical evaluation capabilities similar to the DUALSCOPE® MP20E-S. However, in addition to the most common statistical parameters, this model also has the ability to print a histogram, a cumulative frequency distribution chart, and the Cp and Cpk indices (when specification limits are set). Additionally, date and time are displayed and stored with each measurement block.

The auto-averaging mode is advantageous to reduce the effect of surface roughness on the measurement data range. The mean value of an arbitrary number of readings is stored as a single measurement.

Outlier rejection can be enabled to assure the validity of a measurements series statistical evaluation by eliminating outlier measurements which may be caused by faulty placement of the probe.

The additional matrix measurement mode enables simple storing of associated measurement data by respective data block (according to specific feature), allowing individual measurements to be made at different times.

Notes:

- Version “R” can be shipped with a frequency of either 868 MHz or 915 MHz.
- The appropriate radio receiver is necessary to transfer data to the RS232 of a PC

**Characteristic Features:**

- AC line connection is possible as an alternative to battery operation.
- Large LCD display for measurement and evaluation data as well as icons for status display and operation notes on display lines.
- Easily exchangeable plug-in type smart measurement probes.
- Automatic probe recognition.
- Automatic measurement capture when probe contacts specimen.
- Acoustic signals indicate measurement acceptance.
- Lockable keyboard.
- Statistical evaluation of measurement series and display of minimum, maximum, mean value, number of measurements, standard deviation, and date and time.
- Continuous display mode with coating thickness display in an analog bar graph between pre-set specification limits.
- External push button measurement accept, handy for measurements on the inside of small bores.
- Immediately ready to measure.
- Simple calibration adjustment to the test area geometry with the ZERO key.
- Additional corrective calibration with one or two calibration foils.
- Master calibration for highest measurement accuracy if the material and geometric properties of the specimen are unusual.
- Ability to calibrate on a coating of unknown thickness (for magnetic induction method only).
- Master calibration is stored in the connected probe.
- A maximum of 10,000 measurements can be stored in 1,000 blocks in up to 100 applications. The size of a block can either be selected freely or can be fixed.
- Standard and matrix measurement mode.
- Single measurement mode. Only the mean value of several single readings is stored.
- Outlier rejection to eliminate erroneous measurements.
- Correction of previously stored measurements is possible.
- Input of specification limits.
- Bidirectional interface or unidirectional radio interface.
- Selection between automatic shut-off 4 minutes after the last measurement or continuous operation.
- Unit of measurement selectable between U.S. and metric units.
- Various status message displays (for instance, a warning message when the battery voltage is low).
- Eight selectable display languages.
DUALSCOPE® MP40E

DUALSCOPE® MP40E combines the magnetic induction and Eddy current methods in one hand-held instrument, similar to the MP20E-S. This combination enables the user to measure in random order paint, plastic, and organic coatings on nonferrous metals and on steel, and nonferrous metal coatings (such as chromium, copper, zinc, etc.) on steel with one and the same instrument. The attributes of the DUALSCOPE® MP40E correspond to the ones of the MP30E models. Measurement data can be stored according to an application. Measurement series can be printed out or transferred to a PC.

These models also use plug-in type smart probes. A probe suitable for a particular application is connected easily and quickly. The instrument recognizes whether a magnetic induction or an Eddy current probe is connected. If a DUAL probe is used, the instrument even recognizes the material and selects the appropriate measurement method according to DIN.

The DUALSCOPE® MP40E-S features a bi-directional RS232 interface. This permits the transfer of measurement data from the DUALSCOPE® MP40E-S to a PC, for instance to generate a control chart with SPC/SQC software. The instrument can also be controlled entirely from a computer. The key functions can all be addressed via the RS-232 interface allowing for remote control and integration of the instrument in a fully automatic measurement system.

With the DUALSCOPE® MP40E-R measurement data can be transferred wireless across a distance of up to 20 m, e.g., directly into an EXCEL® spreadsheet using a unidirectional radio interface.

Measurement of a dual layer (paint or laquer/zinc-layer on iron) with the EDX10 probe.

Measurement of paint or layer thickness on a curved surface with the ETD3.3 probe.

Notes:
- Version "R" can be shipped with a frequency of either 868 MHz or 915 MHz.
- The appropriate radio receiver is necessary to transfer data to the RS232 of a PC.

Characteristic Features:
- AC line connection is possible as an alternative to battery operation.
- Large LCD display for measurement and evaluation data as well as icons for status display and operation notes on display lines.
- All magnetic induction, Eddy current and DUAL (suitable for both measurement methods) probes can be connected.
- Automatic probe recognition.
- Automatic material recognition.
- Automatic measurement capture when probe contacts test piece.
- Acoustic signals indicate measurement acceptance.
- Lockable keyboard.
- Statistical evaluation of measurement series and display of minimum, maximum, mean value, number of measurements, standard deviation, and date and time.
- Continuous display mode with coating thickness display in an analog bar graph format between pre-set specification limits.
- External start.
- Immediately ready to measure.
- Simple calibration adjustment to the test area geometry with the ZERO key.
- Additional corrective calibration with one or two calibration foils.
- Master calibration for highest measurement accuracy if the material and geometric properties of the specimen are unusual.
- Ability to calibrate on a coating of unknown thickness (for magnetic induction method only).
- Master calibration is stored in the connected probe.
- A maximum of 10,000 measurements can be stored in 1,000 blocks in up to 100 applications. The size of a block can either be selected freely or can be fixed.
- Standard and matrix measurement mode.
- Single measurement mode. Only the mean value of several single readings is stored.
- Outlier rejection to eliminate erroneous measurements.
- Correction of previously stored measurements is possible.
- Input of specification limits.
- Selection between automatic shut-off 4 minutes after the last measurement or continuous operation.
- Unit of measurement selectable between U.S. and metric units.
- Various status message displays (for instance, a warning message when the battery voltage is low).
- Eight selectable display languages.
System Fischer: Standard Smart Probes

Standard Probes

The probe supplies a measurement signal relative to the coating thickness. Proper probe selection and the quality of the probe determine the accuracy of the measurement for any particular application.

Within the FISCHER System, every smart probe works with every instrument (provided that the measurement method of probe and instrument are the same). This unlimited ability to combine allows the operator to cover diverse measurement applications simply by changing probes.

The many different applications require probes of different design and shape. The FISCHER System family of smart probes includes many different designs. A general distinction can be made between standard probes and custom probes. FISCHER develops custom probes for specific measurement applications that are not covered satisfactorily by standard probes. The company's application engineers are constantly working on new solutions.

When using a standard probe, model selection is determined by a number of criteria. The first criterion is the coating/substrate material combination. This determines the measuring method of the probe – Eddy current or magnetic induction. The use of dual measurement probes are increasing in popularity. They operate according to both measurement methods and can be connected to either the DUALSCOPE® MP20E-S or MP40E. The EDX10 probe is designed for the measurement of dual layers (paint or laquer/zinc-layer on iron). The table to the right features a selection of available probes.

Geometric conditions of the measurement area determine the shape of the probe. Radial, axial, and right angle probes are available. The ETD3.3 Eddy current probe is ideal for curved surfaces. This unique probe gives correct thickness readings even on curved surfaces.

In the end, the probe that promises the optimal result is determined by a number of other aspects. Very important are the thicknesses of the coating to be measured and of the substrate. Coating hardness and surface roughness needs to be taken into consideration; often, two-pole probes exhibit better results on particularly rough surfaces. Other considerations are the curvature and size of the measurement area.

Magnetic Induction Probes

<table>
<thead>
<tr>
<th>Shape</th>
<th>Model</th>
<th>Measurement range</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EGAB1.3</td>
<td>0-2000 µm 0-80 mils</td>
<td>601-793</td>
</tr>
<tr>
<td></td>
<td>EGABW1.3</td>
<td>0-2000 µm 0-80 mils</td>
<td>601-964</td>
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<td></td>
<td>EGABI1.3-150</td>
<td>0-1000 µm 0-40 mils</td>
<td>601-932</td>
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<tr>
<td></td>
<td>EGB2</td>
<td>0-5 mm 0-200 mils</td>
<td>602-023</td>
</tr>
<tr>
<td></td>
<td>EGA2H</td>
<td>0-1500 µm 0-60 mils</td>
<td>602-121</td>
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<tr>
<td></td>
<td>EKB10</td>
<td>0-8 mm 0-320 mils</td>
<td>602-225</td>
</tr>
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</table>

Eddy Current Probes

<table>
<thead>
<tr>
<th>Shape</th>
<th>Model</th>
<th>Measurement range</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ETA3.3H</td>
<td>0-1200 µm 0-48 mils</td>
<td>602-128</td>
</tr>
<tr>
<td></td>
<td>EAW3.3</td>
<td>0-1200 µm 0-48 mils</td>
<td>602-025</td>
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<tr>
<td></td>
<td>EA13.3-150</td>
<td>0-800 µm 0-32 mils</td>
<td>602-026</td>
</tr>
<tr>
<td></td>
<td>EA9</td>
<td>0-3.5 mm 0-140 mils</td>
<td>601-965</td>
</tr>
<tr>
<td></td>
<td>EA30</td>
<td>0-20 mm 0-800 mils</td>
<td>602-027</td>
</tr>
<tr>
<td></td>
<td>ETD3.3</td>
<td>0-800 µm 0-32 mils</td>
<td>602-607</td>
</tr>
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</table>

Dual Measurement Probe

<table>
<thead>
<tr>
<th>Model</th>
<th>NF/Fe</th>
<th>ISO/NF</th>
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<tbody>
<tr>
<td>ED10</td>
<td>0-1100 µm 0-44 mils</td>
<td>602-796</td>
</tr>
<tr>
<td>EDX10</td>
<td>0-800 µm 0-32 mils</td>
<td>602-084</td>
</tr>
</tbody>
</table>

For a complete overview of our probe product line see the separate brochure "Probes and Measurement fixtures".
Instrument settings should be performed by qualified personnel only; the settings can be protected against unauthorized changes.

Partial keypad lockout ensures that calibrations are performed by authorized personnel only. The operator cannot change the stored calibration.

This results in a separation of supervisor and operator functions.

Instrument versions with serial interface offer the possibility of application-specific data management and SPC/SQC software data acquisition with external PC.

Instrument models MP30E and MP40E allow for application-related corrective calibration, a maximum of 10,000 measurement data to be stored in up to 100 applications. Storage management of the measurement data is dynamic, that is, any number of measurements can be stored in each application as long as the total number does not exceed 10,000.

Version MP20E-S includes a common application memory for both measuring methods for max. 10,000 measurements.

Version MP10E offers no capacity for storing measurements.

With all instrument versions, the master characteristic is stored permanently in the probe plug.

Bi-directional data transfer between the MP20E-S, MP30E-S or MP40E-S and a PC enables measurement data acquisition and storage on the hard disk of a PC. In addition, all key functions of the instrument are available from the computer for remote control applications. This allows for integration of the instrument in a fully automated measurement system. For instance, if the geometry of the test area changes, the required application can be selected, and the correct test area specific calibration can be made available automatically. With the unidirectional radio interface of the instrument version "R", measurement data can be transferred wireless to a PC across distances of up to 20 m.
**Measurement data storage capability**

The MP30E and MP40E model series have two basically different measurement data storage modes:

- **Standard Measurement Data Storage Mode** single measurements are taken consecutively on the same part by the operator, for example on a screw head, and are then grouped with BLOCK-RES into a local mean. The resulting mean value then represents the local coating thickness of the significant surface according to ISO 2064. This measurement data storage mode is especially well suited for the coating thickness measurements of electroplated coatings.

- **Matrix Measurement Data Storage Mode** the number of applications and blocks are predefined. Consecutive measurements can be stored in different, individually selectable applications and blocks. This measurement storage mode is ideal for coating thickness measurement applications, where different parts have to be measured always on specific surface areas, and where the measurement data from the corresponding surfaces are to be grouped into sequential blocks. This measurement mode is used for example in the automobile industry, steel construction, etc.

**Measurement Data Storage Mode**

In the **Standard Measurement Data Storage Mode** the number of applications and blocks are predefined. Consecutive measurements can be stored in different, individually selectable applications and blocks. This measurement storage mode is ideal for coating thickness measurement applications, where different parts have to be measured always on specific surface areas, and where the measurement data from the corresponding surfaces are to be grouped into sequential blocks. This measurement mode is used for example in the automobile industry, steel construction, etc.

**Measurement Data Documentation**

The bi-directional RS232 interface of the "S" version, which can be configured to different peripheral instruments, offers extensive documentation possibilities. It is possible to print individual readings, with statistical evaluation, histogram, as well as Cp- and Cpk indices during the measurement process, as well as at a later time. Block results and final results are printed with date and time. Using the RS232 interface or using a radio transmitter of the "R" versions, all measurement data can be transferred to a PC for further evaluation.

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### Standard Measurement Data Storage Mode

<table>
<thead>
<tr>
<th>APPL 1 =</th>
<th>APPL 2 =</th>
<th>APPL N =</th>
<th>additional applications (max. 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part 1</td>
<td>Part 2</td>
<td>Part N</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Calibration for part 1</th>
<th>Calibration for part 2</th>
<th>Calibration for part I</th>
<th>Calibration for part N</th>
</tr>
</thead>
</table>

**Function of:**
- **Final-RES** calculates statistical parameters for all stored measurements including blocks of an application. If product specification limits are entered the number of measurements violating the limits is shown. With fixed number of measurements per block, Cpk and Cpk are also calculated.
- **Block-RES** calculates the local coating thickness of the significant surface using the mean. The resulting mean value then represents the local coating thickness of the significant surface according to ISO 2064.

**Measurement data can be stored by the PC.**

All individual readings, measurements blocks, as well as individual blocks with statistical parameters, histograms, etc. can be printed immediately during measurement or at a later date.

**Date and time are stored.**

**Measurement data can be transferred to a PC for further evaluation.**

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### Matrix Measurement Data Storage Mode

<table>
<thead>
<tr>
<th>Production line</th>
<th>Production line 2</th>
<th>Production line 3</th>
</tr>
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</table>

- **Function of:**
- **Final-RES** calculates statistical parameters for all stored measurements including blocks of an application. If product specification limits are entered the number of measurements violating the limits is shown. With fixed number of measurements per block, Cpk and Cpk are also calculated.
- **Block-RES** calculates the local coating thickness of the significant surface using the mean. The resulting mean value then represents the local coating thickness of the significant surface according to ISO 2064.

**Same data storage – and evaluation capabilities as with the standard measurement data storage mode**

**Each measurement can be selected individually and can be remeasured (this is also possible in the standard measurement mode).**

**“Linkage”**, the calibration of the first opened application can be transferred automatically to all other applications.
Custom Designs, Fixturing Devices

The term custom designs covers special designs and problem specific solutions. The common thread is the electromagnetic measuring method. There are different reasons to develop custom designs, for instance:

- Special probes become necessary when the standard probes cannot be used – for any number of reasons.
- Custom designs may help, if positioning of the probe on the surface to be measured proves problematic.
- Special fixtures can help to make measurements more efficient; this may lead to custom designs.
- The electromagnetic measuring method can also be used for applications not related to coating thickness measurement, for example the measurement of the total thickness of a sheet or foil material. This requires special devices, in this case a suitable metal backing plate or roller.

So far, FISCHER has developed many custom designs. A few examples are listed below. The number of custom designs increases constantly.

- Low profile two-pole probe to measure coatings on the inside of small diameter bores or tubing.
- Special probe for thickness measurement of plastic coatings on female threads.
- Fixturing device V5GW2/TW3 for right angle probes to take measurements in hard to reach areas.
- Measurement fixture for screws to measure the thickness of electroplated coatings on metallic fasteners according to DIN ISO 4042 using the magnetic induction method.
- Piston ring measuring table V4EK54 to measure chromium coatings on piston rings and oil rings.
- Measuring stand V12 with magnetic sliding table for accurate small parts positioning.
- Measuring stand V12-AM with automatic probe positioning. Through soft touch positioning, even thin and soft paint and organic coatings can be measured accurately and reproducibly.

Custom design: low profile measurement probe EKB10

Custom design for paint thickness measurement on female threads.

Right angle probe with guiding device V5GW2/TW3, measurement fixture for screws.

Piston ring measuring table V4EK54, stand V12 with magnetic sliding table, measuring stand V12-AM for automated measurements.
### Software, Options

#### MP-NAME Software

This optional Windows® software is intended for the naming of applications and measurement data blocks when used in matrix mode for all hand-held instruments type MPxxE-S, except MP20E-S. Up to 16 character long names can be entered from the PC for transfer to the hand-held unit.

The entered names will be displayed in the alphanumeric display of the unit. The naming of applications and measurement data blocks assures the error free selection and processing of measurement data.

#### PC-DATEX and PC-DATACC

This is the ideal software to transfer, process and document measurement data under modern quality control systems. As an add-in module for Microsoft® EXCEL 97 and ACCESS 97 and later, it enables direct online or offline transfer of measurement data to spreadsheets.

#### Optional Accessories:

<table>
<thead>
<tr>
<th>Name</th>
<th>Order Number</th>
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<tbody>
<tr>
<td>Radio receiver RS232 868 MHz for all MP0R and MP30E-/MP40E-R versions</td>
<td>603-467</td>
</tr>
<tr>
<td>Radio receiver RS232 915 MHz for all MP0R-US and MP30E-/MP40E-R-US versions</td>
<td>603-544</td>
</tr>
<tr>
<td>Printer FMP3040</td>
<td>602-890</td>
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<tr>
<td>Carrying case MP0D/30/40</td>
<td>602-120</td>
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<tr>
<td>Line charger FMP3040</td>
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<tr>
<td>AC POWER SUPPLY MPxE-S (220V)</td>
<td>602-819</td>
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<td>Battery charger</td>
<td>600-226</td>
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<tr>
<td>NiCd battery</td>
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<td>Placement support</td>
<td>600-025</td>
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<td>Instrument case</td>
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<td>MP-NAME Software</td>
<td>602-966</td>
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<td>PC-DATACC Software</td>
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<td>RS232 interface</td>
<td>602-341</td>
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<td>Measurement stand V12-AM</td>
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<td>Measurement stand V12</td>
<td>602-260</td>
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<tr>
<td>Screw-type quick-connect support</td>
<td>600-815</td>
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<td>Chucking fixture for inside probes</td>
<td>601-691</td>
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<tr>
<td>Chucking fixture for right angle probes</td>
<td>600-077</td>
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<tr>
<td>Measurement fixture for screws</td>
<td>602-916</td>
</tr>
<tr>
<td>Piston ring measuring table V4EKB4</td>
<td>602-312</td>
</tr>
</tbody>
</table>

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**Measurements of the copper platings in boreholes of printed circuit boards using the PHASCOPE® PMP10 and the ESL080 probe.**

**DUALSCOPE® MP40E and printer FMP3040 including accessories in carrying case with shoulder strap for convenient on site measurements.**

**Conductivity measurement with the SIGMASCOPE® SMP10.**

**PHASCOPE® PMP10 for fast and precise coating thickness measurements according to the phase-sensitive Eddy current method.**

**FERITSCOPE® MP50E for the determination of the delta ferrite content.**
The Institute for Electronics and Measurement Technology
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in Sindelfingen/Germany is an innovative leader in the field of coating thickness measurement, material analysis, microhardness testing, electrical conductivity, and ferrite content measurement as well as for density and porosity testing. The company is able to recommend the best solution for any application. A comprehensive range of products is offered using X-ray fluorescence; beta backscatter; magnetic; magnetic induction; electric resistance; eddy current and Coulometric techniques. HELMUT FISCHER has 12 subsidiary companies and 32 marketing agencies strategically located around the globe.

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FISCHERSCOPE® X-RAY XDL®-B used to measure the coating thickness and to analyze electroplated coatings.

FISCHERSCOPE® MMS® PC. Universal measurement system for magnetic, magnetic inductive, eddy current and beta backscatter method coating thickness measurements and general materials testing.

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