

## Product Overview

Innovative, Top Quality Measurement Technology





 Coating Thickness



 Material Analysis



 Nanoindentation

## Knowledge, Competence, Experience

Since 1953, FISCHER has created and produced increasingly innovative, powerful and versatile technologies for measuring coating thickness and nanoindentation, as well as for material analysis and testing. Today, FISCHER instruments are used all around the globe – wherever trueness, precision and reliability are essential.

## Research and Development

Building leading-edge products requires a strong focus on research and development. All FISCHER products are developed and manufactured at the company's facilities in Germany, where one in five employees works in R&D.

Highly qualified specialists – with advanced degrees in physics, chemistry, electronics, engineering and computer science – continually develop new products and processes to meet the ever-changing demands of the market. FISCHER also cooperates closely with universities and research institutes.

## "Made in Germany" Quality

Keeping its manufacturing predominantly in-house allows FISCHER to fulfil its customers' expectations with truly superior products. In FISCHER's modern, high-tech production facilities, close attention is paid to even the tiniest of details in order to ensure consistently high quality.

Here at FISCHER, "Made in Germany" is more than just a merchandise mark: it is a point of employee pride and an integral part of the company philosophy.

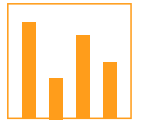
## Product Assortment

FISCHER instruments cover a comprehensive range of measuring and analysis tasks that are relevant in diverse industries. For each application, the appropriate method is employed for maximum precision and accuracy: whether magnetic induction or eddy current, coulometry, nanoindentation or x-ray fluorescence – FISCHER always has the right technology for the purpose.

Industrial enterprises, research centres and academic institutions worldwide depend on the reliability and accuracy of their instruments. FISCHER meets this challenge with its rigorous quality standards and commitment to develop and produce the most technically advanced – yet easy to use – measurement systems and software on the market.



COATING THICKNESS



MATERIAL ANALYSIS



NANOINDENTATION



MATERIAL TESTING



 Material Testing

## Coating Thickness Measurement and Material Analysis



Whether the coating is painted or electroplated, onto magnetic or non-magnetic materials – you will find the right tool for precise, mobile thickness measurement in FISCHER's wide assortment of powerful hand-held instruments.

For extra versatility, FISCHER's stationary multi-measurement systems with network capabilities and modular design can perform material analyses in addition to measuring coating thickness.

Whatever your measurement application needs, and across a wide variety of substrates: With the appropriate FISCHER instruments and probes, you are perfectly equipped for the task at hand!



### **FISCHER DataCenter Software**

The FISCHER DataCenter software significantly enhances the functionality of FISCHER handheld instruments. With just a few keystrokes, measurement data can be transferred to a PC for storage and archival. A variety of evaluation and statistical functions are also available, such as histogram, sum frequency, etc. as well as various chart and table presentation options. The DataCenter's report generator makes it easy to design customised templates incorporating proprietary elements such as logos, pictures or scanned forms.



Small, handy and robust: The non-destructive measurement instruments of the MPO and MPOR series quickly determine coating thicknesses with the degree of precision that one has come to expect from FISCHER. With their wear-resistant probe tips, a backlit graphics display and an additional display on the top, these compact and lightweight instruments are ideal companions for on site applications. Geometry and permeability of the specimen exert relatively little influence on the measurement results. In addition, these instruments feature precise, Helmut Fischer developed conductivity compensation for non-magnetic substrate materials. Whether surfaces are rough or smooth, it can measure even thin coatings precisely.

The instruments operate according to the magnetic induction method (PERMASCOPE, for measurement on ferrous substrates), the eddy current method (ISOSCOPE, for non-ferrous substrates) – or both (DUALSCOPE): Whether aluminium or iron, the substrate material is automatically detected by the DUALSCOPE's measuring system, which selects the appropriate measurement method.

**PERMASCOPE® MPO** with integrated probe for measuring thickness of coatings on steel and iron.

**DUALSCOPE® MPO** with integrated probe for measuring thickness of coatings on virtually all metal substrates.

Above and beyond the range of functions the MPO-series instruments provide, the MPOR-series also offers a comfortable graphics display, storage capacity for up to 10,000 individual readings, and special modes for measuring anticorrosion coatings according to IMO PSPC and SSPC-PA2 guidelines. Using the USB interface, the instruments can be connected to a PC and the measurements conveniently evaluated and recorded using FISCHER DataCenter software. The permanently attached cable probe of the FP models makes measuring easy and precise even in hard-to-reach places and on a range of different specimen shapes.

**PERMASCOPE® MPOR** and **MPOR-FP** with integrated probe or cable probe for coating thickness measurements on steel and iron.

**DUALSCOPE® MPOR** and **MPOR-FP** with integrated probe or cable probe for coating thickness measurements on virtually all metal substrates.

**ISOSCOPE® MPOR** with integrated probe designed specifically for high-precision measurements of thin coatings on virtually all non-ferrous metals.

**DUALSCOPE® MPORH-FP** with cable probe, designed specifically for measurements of thicker metal or protective coatings on steel and iron.



COATING THICKNESS



Container: Corrosion protection coatings



Facade sections: Anodised coatings on aluminium



Measurement of corrosion protection coatings in harsh environments



The robust and modern handheld measuring devices of the DMP family are used in numerous industries for almost any measurement requirement. Thanks to an interchangeable probe, the devices are extremely flexible for non-destructive coating thickness measurement and ideal for quality control.

The instruments' modular design allows individual assembly of the appropriate measurement system for the respective measuring task. Besides differently equipped instruments, numerous high-precision probes are also available. In addition, each DMP device is equipped with the intuitive Tactile Suite software for simplest data transfer, extensive evaluation options and convenient data export.

You can choose from the following models:

- **DELTA**SCOPE® DMP10 and DMP30 for coating thickness measurements on steel and iron using the magnetic inductive measuring method.
- **ISO**SCOPE® DMP10 and DMP30 designed for measurements of electrically insulating coatings on virtually all non-ferrous metals using the eddy current method.

- **DUAL**SCOPE® DMP20 and DMP40 for measuring the coating thickness on virtually all metal substrates using the magnetic induction or eddy current method.
- Also part of the DMP instrument series are the **FERIT**SCOPE® DMP30, for precise measurement of ferrite content, and the **SR**-SCOPE® DMP30, for reliable measurement of copper thickness on printed circuit boards.

**All DMP devices feature a robust all-aluminum housing with IP64, display with Gorilla Glass, limit monitoring via light and sound, data transfer via USB-C, and a replaceable and quickly rechargeable battery.**

The entry-level models **DMP10** and **DMP20** have a memory of up to 10,000 readings in one measurement task. Thanks to the USB-C interface, the recorded measured values can be transferred with the Tactile Suite and evaluated and exported on a PC.

The comfort models **DMP30** and **DMP40** offer memory for up to 250,000 readings in 2,500 applications, additional limit monitoring via vibration, as well as data transfers via USB-C or Bluetooth.



Paint on iron



Anodised coatings

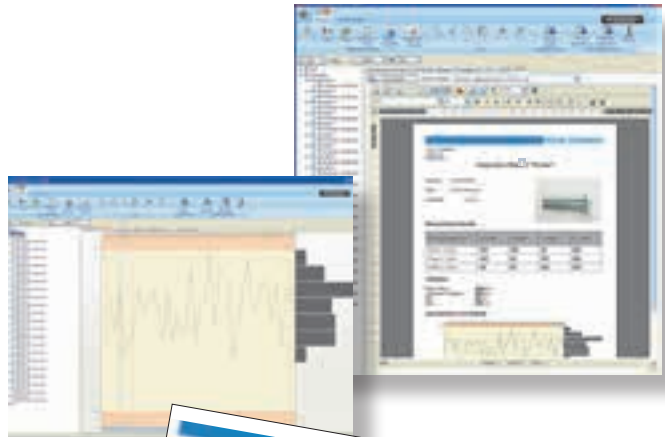


Tactile Suite



The **DUALSCOPE® FMP100** is a powerful and user-friendly tool suited for a wide variety of measurement challenges. Incorporating both magnetic induction and eddy current methods and outfitted with a wide range of high-precision probes, it is particularly useful for performing diverse measurement tasks under frequently changing conditions. Its Windows™ CE operating system with graphical user interface, high-resolution touchscreen display, memory capacity for storing several thousand measuring applications and extensive evaluation and statistical functions make it the perfect solution for professional coating thickness measurements. Whether used for automotive, electroplating or anodising applications, or for testing heavy-duty corrosion protection or fine coatings, this instrument meets the highest standards for precision and trueness in all situations.

The **DUALSCOPE® H FMP150** is further equipped with a third measurement principle, the magnetic method, which also makes it possible to take precise measurements of thick, nonmagnetic but conductive coatings on steel and iron, as well as nickel coatings on nonferrous metals.



COATING THICKNESS

With the optionally available inspection plan software, **FISCHER DataCenter IP**, individual test plans can be created on a PC and transferred to the measurement instrument. The operator is then guided step-by-step through the measurement sequence of the inspection plan, visually assisted by stored images, sketches and technical drawings. Once data acquisition is complete, the readings are sent back to the PC where they can easily be logged and extensively evaluated, thereby readying the handhelds for new measurements. In this way the compact and convenient **FMP100** and **FMP150** instruments turn into powerful, multi-functional data terminals.



Measuring paint coating on steel



Measurement with support stand on curved anodised parts



Measurement of auto body paint thickness using the Dual Probe FD13H



COATING THICKNESS

### PHASCOPE® PMP10

Primarily used in the electroplating and PCB industry for quality control of metal coatings on various substrate materials, the PMP10 can precisely measure the thickness of nickel, zinc or copper coatings on steel, despite very rough surfaces, as well as the copper coatings on printed circuit boards – even in PCB through-holes.

The **PMP10 Duplex** was specifically developed for the automotive industry to measure duplex coatings (e.g. paint/zinc on steel): Both values are acquired in one measurement procedure and displayed separately. It can also measure paint coatings on aluminium.



*Measuring the copper thickness on printed circuit boards*





### COULOSCOPE® CMS2

CMS2 instruments quickly measure nearly all metallic coatings – even multi-coatings – on any substrate material, with high precision. They work by deplating using the coulometric method. Due to their ease of use and menu-based user interface, they are ideal for production monitoring in the electroplating industry or for incoming inspection of finished parts.

The **CMS2 STEP** is used for standard-conforming STEP test measurements of individual coatings and potential differences, e.g. for quality control of multilayer nickel coatings.

STEP (Simultaneous Thickness and Electrochemical Potential determination) is a method for simultaneously measuring individual coating thicknesses and determining electrochemical potential differences between the individual layers of a nickel coating system. The coating thickness is measured according to the coulometric method; the potential profile is recorded using an AgCl-coated silver reference electrode.



MATERIAL TESTING



COULOSCOPE® CMS2 STEP: Cr/Ni/  
Cu/ABS



COATING THICKNESS



### FISCHERSCOPE® MMS® PC2

The stationary multi-measurement system with built-in Windows™ CE and network capability is ideally suited for non-destructive, high-precision coating thickness measurements and material testing.

The MMS PC2 can be operated using either the large, high-resolution colour touchscreen or with an keyboard and a mouse. It features LAN and USB ports for integration into automated production processes. In addition, it can operate up to eight probes in parallel.

The modular design of the MMS PC2 not only allows for customised instrument configurations, it can be retrofitted as needed using any of the numerous modules and probes available for this purpose. Depending on the task, a variety of different measurement methods can be employed, such as eddy current, magnetic or magnetic induction, or electrical resistance. The thickness of nearly all coating materials on metal substrates can be measured, as well as metallic coatings on electrically non-conductive materials. It can also determine the conductivity of non-ferrous metals and the ferrite content in austenitic or duplex steel.

Equipped with the modules appropriate for the measuring task at hand, the MMS PC2 can be utilised flexibly in incoming inspection, final inspection or in production. It offers extensive measurement data presentation capabilities for continuous quality and process monitoring. Automated measurement runs are easy to set up, as the measuring system can directly control a motor-driven support stand or XY-stage and can be integrated via I/O module into automated manufacturing processes.



*Back of the MMS PC2. Eight module slots are available.*

Depending on the application, you can assemble your FISCHERSCOPE® MMS® PC2 with the following modules.

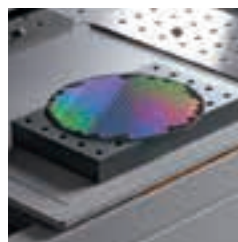
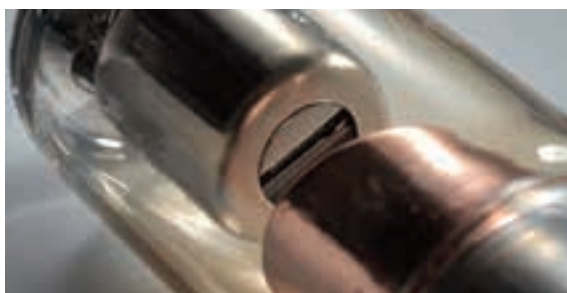
Applications	Module boards							Measuring method
	PERMASCOPE®	SIGMASCOPE® / PHASCOPE® 1	SIGMASCOPE® / PHASCOPE® 2	PHASCOPE® DUPLEX	NICKELSCOPE®	SR-SCOPE®	TEMPERATURE	
<b>Coating thickness measurement – electromagnetic measuring methods</b>								
Electrically nonconductive coatings on nonferrous metals	✓			✓				Eddy current measuring method DIN EN ISO 2360
Electrically nonconductive coatings on ferromagnetic substrate materials (steel or iron)	✓							Magnetic induction measuring method DIN EN ISO 2178
Duplex coatings in heavy corrosion protection (zinc thicknesses $\geq 70 \mu\text{m}$ )	✓							Magnetic induction measuring method DIN EN ISO 2178 Eddy current measuring method DIN EN ISO 2360
Corrosion protection coatings (zinc thicknesses approx. $5 - 20 \mu\text{m}$ )				✓				Magnetic induction measuring method DIN EN ISO 2178 Phase sensitive eddy current method DIN EN ISO 21968
Coatings of Cu, Zn, Ni on ferromagnetic substrate materials (steel or iron)		✓						Phase sensitive eddy current method DIN EN ISO 21968
Metal coatings with high electrical conductivity on substrate materials of low conductivity (e.g. Cu/Ms)		✓						
Individual thicknesses of a lacquer/zinc coating system (duplex coating) on thin metal sheets in a measurement process (zinc thicknesses $5 - 20 \mu\text{m}$ )				✓				
Copper on PCB material (Cu/Iso)		✓						Phase sensitive eddy current method DIN EN ISO 21968
Copper coatings in PCB holes			✓					
Galvanic nickel coatings on nonferrous metals or electrically nonconductive substrate material					✓			Magnetic method (DIN EN ISO 2178)
Non-magnetic thick coatings in the mm range (Cu, Al, Pb) on ferromagnetic substrate materials (steel or iron)					✓			
Copper coating thickness on laminates or multilayers, not affected by underlying copper coatings						✓	✓	Electrical resistance method DIN EN 14571

- Substrate material nonferrous metals
- Substrate material PCB material
- Ferromagnetic substrate materials
- Nonferrous metals and electrically nonconductive substrate materials



COATING THICKNESS

## Coating Thickness Measurement and Material Analysis



Whether for high-precision coating thickness measurements or exact material analysis, the broad assortment of FISCHER X-ray fluorescence measurement systems has the optimal instrument for any application. In addition to many innovations and patents, the FISCHERSCOPE X-RAY product line integrates more than 30 years of experience and continued development.

Determining single or multiple coatings on the smallest structures or on large components, trace analysis according to RoHS, testing of jewellery and gold or inline measurements in continuous production – FISCHERSCOPE X-RAY instruments can do it all. In the laboratory as on the factory floor.

And the intelligence controlling these instruments is called WinFTM®. It not only makes operation easy, it sets the standard in functional diversity and precision.



#### FISCHERSCOPE® X-RAY XAN®

The user-friendly X-ray fluorescence measurement systems of the XAN series are perfect for material analysis in business and production, research and development.

Special **XAN** instruments equipped with proportional counter tube detectors and optimised for the requirements of the gold and jewellery industries allow fast, non-destructive tests for authenticity and can accurately determine the exact gold content. Detailed analyses of gold and precious metal alloys are straightforward.

Equipped with a silicon drift detector, the **XAN 250** instruments can analyse thin coatings, complex alloys and the composition of powders, liquids and dust – which is why they are ubiquitous in laboratories and testing institutes, as well as in precious metal refineries and customs offices. The instruments' excellent repeatability precision allows for accuracies comparable to cupellation.



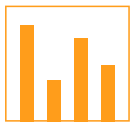
#### GOLDSCOPE SD®

With its GOLDSCOPE SD® series, Fischer offers a tailored solution for the non-destructive testing of gold and precious metals. Both the hardware and the software of the robust GOLDSCOPE SD® series are specially designed to meet the requirements of the jewelry and gold business. The benefit to you: unbeatable value for your money! With these models, you only buy what you really need for testing gold, jewelry and precious metals.

All GOLDSCOPE SD® models feature the well known Fischer precision. They are equipped with the WinFTM® software, which has the most important measuring tasks for testing of gold and precious metals already pre-programmed. The GOLDSCOPE SD® family offers the right solution for your testing needs with silicon PIN or silicon drift detectors, various apertures as well as smaller or bigger chambers.



COATING THICKNESS



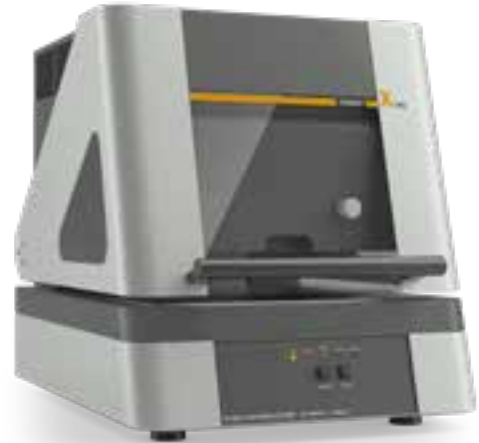
MATERIAL ANALYSIS



Gold jewellery



Gold content determination



#### FISCHERSCOPE® X-RAY XUL® and XULM®

The XUL-series instruments are compact X-ray fluorescence systems for coating thickness measurements and material analysis. Because the X-ray source and detector are underneath the measurement chamber, samples are simply positioned directly on the support table.

Despite their compact dimensions, the **XUL** instruments feature a large-volume measurement chamber and are ideal for testing electroplated parts such as screws, bolts or nuts or for measuring decorative coatings. The metal content of electroplating baths can also be analysed quickly and easily.

The **XULM** is designed for measurements on small structures. Equipped with a micro-focus tube and automatically changeable apertures and multiple filters, it is particularly well suited for measurements on delicate parts such as plugs, contacts and wires as well as for manual measurements on PCB-boards. Therefore special PCB instruments with extended support plates are available.

#### FISCHERSCOPE® X-RAY XDL® and XDLM®

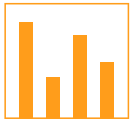
The instruments of the XDL series are equipped with proportional counter tube detectors and are used in quality assurance, incoming inspections and production monitoring. They are also suited for measurements on large specimens with complex shapes due to the easily accessible measurement chamber. The XDL instruments can be equipped with simple support devices or various XY-stages and a Z-axis, and therefore can also be used for automated batch testing.

Typical applications are measurements of electroplating coatings as well as functional coatings in the electronics and semiconductor industries. XDL instruments can also quickly and precisely measure corrosion protection or decorative coatings such as chrome on nickel/copper. In addition, the composition of galvanic baths can be analysed.

The **XDLM**, with its micro-focus tube, is ideal for measurements on very small structures such as coatings on plug contacts and other electronic components.



COATING THICKNESS



MATERIAL ANALYSIS



Corrosion protection: Zn/Fe



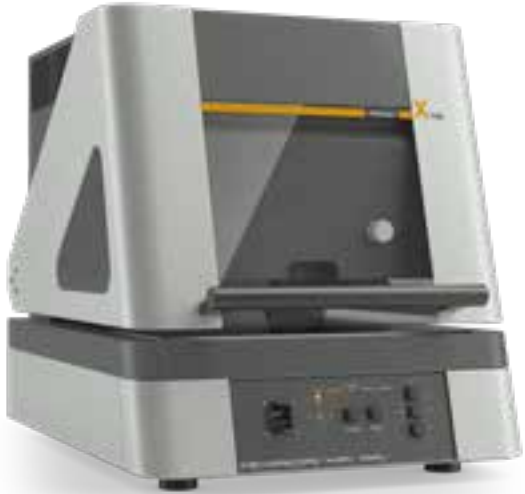
Showerhead: Cr/Ni/Cu/ABS



Printed circuit boards:  
Au/Ni/Cu/PCB



Connectors: Au/Ni/CuSn6



### FISCHERSCOPE® X-RAY XDAL®

The XDAL measurement systems with silicon PIN detectors and micro-focus tubes provide reliable analysis results and coating thickness readings even for small concentrations and thin coatings. They are used in incoming goods inspection, production monitoring and in research and development. XDAL instruments are equipped with exchangeable apertures and filters and a fast, programmable XY-stage. This allows for automatic travel to defined measurement positions and automated batch measurements.

Typical applications for the XDAL include the analysis of hard material coatings, for example on drills and cutters, material analyses of alloys, and the measurement of very thin coatings in the electronics and semiconductor industries. Also "high reliability" examinations in aerospace technology or testing electronic products for RoHS compliance – for example, determining the lead content in solder layers – is possible with the XDAL.

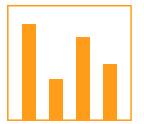
### FISCHERSCOPE® X-RAY XDV®-SDD

The XDV-SDD is designed to meet the highest demands in coating thickness measurement and material analysis. With its modern silicon drift detector it is particularly suited for the non-destructive determination of coatings with thicknesses of just a few nanometres and for precise trace analysis. It is ideal for measurements on PC-boards and electronic components according to RoHS and WEEE requirements, for the determination of complex multi-coating systems, as well as for measurements of electroplated or vapour-deposited coatings in the electronics and semiconductor industries. The phosphorus content in electroless nickel coatings can also be determined with the XDV-SDD.

In order to create ideal excitation conditions for every measurement, the XDV-SDD features electrically interchangeable apertures and six primary filters. It is universally applicable and, due to its fast, programmable XY-stage, also suitable for automated measurements, e.g. in quality control.



COATING THICKNESS



MATERIAL ANALYSIS



HSS drills: TiN/Fe



PCB assemblies: Lead test



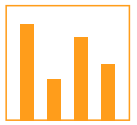
Passivation layers: Cr/Zn/Fe



Plug contacts: Au/Ni/CuSn6



COATING THICKNESS



MATERIAL ANALYSIS

### FISCHERSCOPE® X-RAY XDV-μ

The XDV-μ is equipped with innovative polycapillary X-ray optics to focus the X-rays, enabling both very small measurement spots and high excitation intensity. Thus, the XDV-μ is particularly well suited for the measurement of thin coatings and analysis on structures smaller than 100 μm. The silicon drift detector guarantees highly accurate analysis as well as good detection sensitivity. Reliable positioning and a razor-sharp presentation of even the smallest measurement spots are possible due to the high-resolution video optics.

The XDV-μ is perfect for high-precision measurements of coating systems on printed circuit boards, lead frames, thin wires and wafers, as well as for material analysis on small structures and components in the electronics and semiconductor industries. It is used mainly for research and development tasks in the laboratory, but also excels in production monitoring, for process qualification, and quality assurance.

The device is available in customized versions for measurement on printed circuit boards, lead frames and wafers.

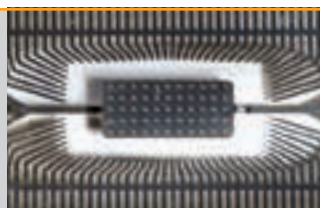
### FISCHERSCOPE® X-RAY XAN® 500

The FISCHERSCOPE® X-RAY XAN® 500 is the most versatile X-ray fluorescence system available in the market. As a handheld device, it is perfect for inspecting coatings on bulky parts like airplane parts, pipes or turbine blades in a running production line. In addition, the XAN® 500 can do more than just measure on large parts. With the optionally available measurement box, the device can be transformed into a desktop instrument in just a few simple steps.

Despite its small size, the FISCHERSCOPE® X-RAY XAN® 500 is in no way second to laboratory equipment. The modern silicon drift detector is capable of accurate and precise measurement results even with short measuring times. Even complex measuring tasks involving multiple layers are performed reliably – and quickly. How? The clever little device detects thickness and composition of the layer in a single measurement step.



Wire: Sn/Cu



Lead frame: Au/Pd/Ni/CuFe



Measurement box



Measuring cell





**FISCHERSCOPE® X-RAY for Inline Measurements**

These X-ray fluorescence systems for continuous coating thickness measurement and analysis are specifically geared towards quality control in an ongoing manufacturing process.

**FISCHERSCOPE® X-RAY 4000**

Equipped with a fast traversing unit, this series is ideally suited for taking measurements at several locations or when the measuring head needs to travel automatically and precisely.

The FISCHERSCOPE® X-RAY 4000 instruments are used mainly in strip electroplating for the measurement on mass-produced and stamped parts. In addition, the hot-dip galvanisation on steel strips and metal coatings on foils can be measured precisely during production.

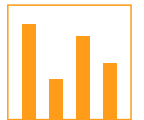
**FISCHERSCOPE® X-RAY 5000**

This model series is specifically designed as a flange measuring head for integration into a production line. It allows for continuous, non-destructive inline analysis of alloys and the measurement of very thin coatings and coating systems on objects with large surface area directly in an ongoing manufacturing process. Using a cooled standard flange allows the instrument to be attached to a vacuum chamber, whereby the integrated cooling circuit enables measurements even on hot substrates.

For example, in the photovoltaic industry, the FISCHERSCOPE® X-RAY 5000 instruments can determine the thickness and composition of CIGS, CIS, or CdTe coatings on different substrate materials such as glass, metal or plastic. They are also used for the analysis of thin coatings on metal strips and foils as well as for process monitoring at sputter and electroplating plants.



COATING THICKNESS



MATERIAL ANALYSIS



Sensor contacts: Au/Ni/CuFe



Full strip: Au/Ni/CuSn6



CIGS: CuInGaSe/Mo/foil



#### FISCHERSCOPE® X-RAY XDV®-µ SEMI

Designed for quality control in the semiconductor industry, the FISCHERSCOPE® XDV®-µ SEMI series stands out for its handling of wafers. It gently picks up the wafers from the FOUP or SMIF boxes and positions them safely in the encapsulated measuring chamber. The measurement takes place automatically. Thanks to image recognition, the specified measuring positions are reliably inspected.

The analysis of such tiny structures as solder bumps and contact areas requires the smallest measuring spots. That is why XDV®-µ SEMI systems are equipped with polycapillary optics. This bundles the X-rays onto a measuring spot of only 10 - 20 µm FWHM. An XDV®-µ SEMI system therefore allows the microstructures to be characterized much more precisely than conventional devices.



#### FISCHERSCOPE® MMS® Automation

The FISCHERSCOPE® MMS® Automation forms the basis for automated quality control in a wide range of applications. The measuring system is unique on the market and consists of three main parts. The actual measurement is done using probes, which can be mounted on a robot arm or in a measuring station. The probe signals are transmitted to the MMS® module. The modules are the heart of the system: they determine which measurement method is used. From here the digitalized signals are passed on to the base unit. The base unit is mounted in the control cabinet and is responsible for monitoring the measurement. It communicates with higher-level units via a PROFINET interface.



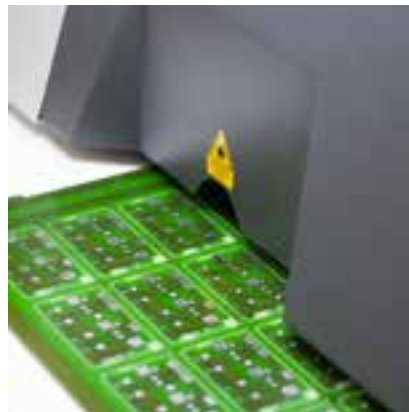
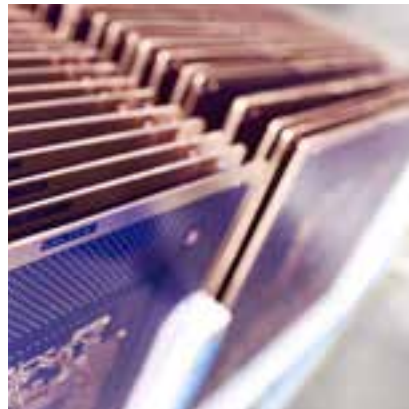
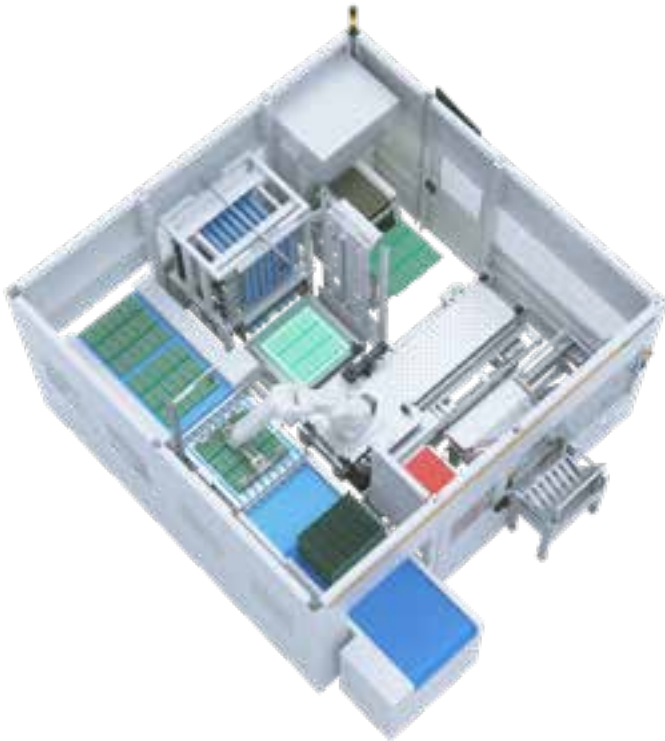
COATING THICKNESS



MATERIAL ANALYSIS



Wafers up to 300 mm diameter



### FISCHERSCOPE® PCB Automation

Fischer offers a complete automation solution to create robust and flexible measuring solutions that meet the strict requirements of a running production line. The PCB Automation is no different. At the core of the PCB Automation is the X-RAY.

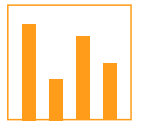
The X-RAY uses Energy Dispersive X-Ray Fluorescence Analysis (ED-XRF) which is a method for measuring the thickness of coatings and for analysing materials. ED-XRF is a very universal method offering some outstanding advantages. It covers virtually all metallic elements and works non-destructively and without contact. Measurements can be completed very quickly and without extensive sample preparation.

Fischer offers a range of detectors, optics, filters and measuring tables with every X-RAY. Furthermore, features such as pattern matching and programmable measurements for manual operation can be implemented to enhance the X-RAY. All X-RAY components are perfectly synchronized to create one of the leading measurement instruments available on the market.

The FISCHERSCOPE® PCB Automation is the perfect solution for electroplating companies specialized in plating precious metals which are looking to enhance their quality control. By reducing the time required to accurately measure the plating thickness of PCBs, electroplating companies are able to provide higher quality products at a faster turnaround time to their customers.



COATING THICKNESS



MATERIAL ANALYSIS

Material failure can have disastrous consequences. For this reason, materials and workmanship must be tested for safety, reliability and longevity.

Whether for determining the quality of weld seams in steel constructions testing tank coatings or aluminium airplane structures for fatigue – FISCHER's proven measurement technology is in demand.





### FERITSCOPE® FMP30

Wherever austenitic or duplex steels must withstand heat, aggressive substances and high pressure, the ferrite content plays a crucial role. Especially when it comes to on site measurements in chemical plants, energy utilities and process engineering plants, the advantages of the Fischer handheld devices become very evident. A range of probes are available for the FERITSCOPE FMP30, with which you can reliably determine ferrite content, even in hard-to-reach areas.

With the magnetic induction method, the ferrite content between 0.1 and 80% Fe or in the ferrite number range from 0.1 to 110 FN can be measured quick and easy on site.



### SIGMASCOPE® SMP350

For measuring the electrical conductivity of non-ferrous metals or non-magnetisable metals such as aluminium, copper and stainless steel according to the eddy current method. Moreover, based on the measured conductivity, conclusions can be drawn about the hardness and strength of heat-treated materials. Heat damage and material fatigue can be determined as well.



### POROSCOPE® HV5, HV20 and HV40

For finding pores and defects, cracks and inclusions in linings and coatings made of enamel, paint, rubber and bitumen, also in containers made of GFK or other plastics.



*FERITSCOPE® FMP30: Ferrite content measurement on weld seams*



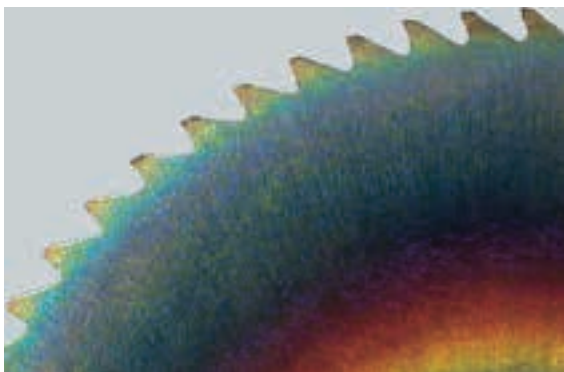
*Measuring the electrical conductivity on aluminium parts*

## Nanoindentation Measurement and Scratch Testing



The tough demands of modern surface technology – to characterise very hard, very thin or visco-elastic coatings and materials – require correspondingly powerful measurement methods and systems.

The FISCHER nanoindentation measuring and scratch testing instruments are capable of making quick, precise and effective measurements where classic methods reach their limits – in the nanometre range.



### FISCHERSCOPE® ST200 & ST30

The FISCHERSCOPE® ST200 and ST30 are Fischer's best-selling automatic scratch-test systems for characterizing hard and soft material layers. Easily check the adhesion and cohesive strength. The instruments are ideal for use in development, quality assurance, incoming goods control and production monitoring. The ST200 has a load range of 0.5 N to 200 N which is perfect for measuring hard material coatings (PVD, CVD). The ST30 has a load of 0.01 N to 30 N which is suitable for measuring soft coatings such as lacquer and polymers.

The devices have a high-resolution microscope for optical evaluation, which can be equipped with up to 3 lenses if required. The acoustic emissions, the tangential force and the penetration depth can also be recorded.



### Nanoindentation Measurement Systems

User-friendly and powerful measurement systems for the precise determination of Martens Hardness according to the load/indentation depth method. In addition, other important materials characteristics such as the Vickers Hardness, the elastic modulus of indentation or the creep behavior can be determined. Main areas of application include paint coatings, electroplated coatings, hard material coatings, polymers, metals and coatings on glass.

#### FISCHERSCOPE® HM2000

The HM2000 series has a test load range between 0.1 and 2000 mN and a distance resolution of less than 100 pm. A support stand model, the **HM2000 S** is an entry level instrument for measuring microhardness and is very well suited for easy-to-position specimens. For automated measurement processes, the **HM2000** with its programmable XY-stage and motorised Z-axis is the appropriate solution. Systems for vibration absorption and various specimen positioning devices are available for both versions.



#### PICODENTOR® HM500

The **HM500** can determine the Martens Hardness, elastic characteristics and material parameters even in the nanometre range. Its high-precision distance resolution in the picometre range and load generation of just a few micronewtons allow for the characterisation of ultra-thin coatings or surface areas with regard to their mechanical properties.

Very thin coatings on sensors, glass and data carriers, ion-implanted surfaces and matrix effects in alloys are among the typical applications of the HM500. With its high-precision, programmable XY-stage for sample positioning, active vibration absorption table and enclosed test chamber, the HM500 is suitable both for scientific evaluations in the laboratory as well as for process and quality control in manufacturing. To visualise even the tiniest material changes in the nanometre range, the HM500 can be extended with an optional AFM (atomic force microscope).



*Eyeglasses: Scratch-proof protection coatings*



*Wafer: Hardness determination on the gold coating*



For virtually every industrial application there is an appropriate FISCHER probe available. These are high-precision devices tailored to the various measuring applications. After years of continuous development and innovation, the FISCHER probe program now encompasses several hundred probes designed to deliver optimal results with the highest accuracy. Of course, FISCHER also offers comprehensive, expert consulting services to assist you in selecting the appropriate probe for any given measurement application.

Special probes have been developed for the eddy current method that can compensate for the influence of curvature on rounded specimens. Furthermore, FISCHER's patented conductivity compensation – used in all eddy current probes – makes it possible to adjust for different conductivities of the substrate material, e.g. aluminium, eliminating time-consuming on site calibration on the actual substrate material while simultaneously achieving very high levels of trueness.

### Probes for Special Applications

When particularly challenging measuring applications – for which only a customised probe can provide precise measurement results – come up, FISCHER experts can develop (upon request) individual probe designs that offer maximal repeatability precision and trueness.

*Cavity probe V3FGA06H for EPD coatings in hard-to-reach cavities, eliminating the need to destroy for example automotive body parts for measuring*



### Accessories

Extensive accessories complement the FISCHER product assortment. Manually and motor-driven support stands, sample holders in a wide variety of designs, protective sleeves for instruments, adapters and much more – everything to facilitate day-to-day use.



*Motorised support stand for automated, reproducible positioning of the probe on the specimen, resulting in a significantly improved repeatability precision*



*Electrolyte solution measurement cell for the quick and easy analysis of electroplating baths*



*Support for cross section polished samples with a diameter of 20, 30, 40 or 50 mm*



*Wristband for MPOR-FP instruments for one-hand operation*

### Calibration and Certification

In addition, FISCHER offers a wide range of calibration standards for each measurement method. These include, for example, pure element foils, single and dual layer standards as well as complete standard sets for different applications, including standards for measuring ferrite content or conductivity, as well as calibration standards made of different materials for all common coating thickness applications.

FISCHER is able to offer certified, traceable calibration standards since it is approved as a calibration laboratory for mass per unit area measurements by the German Akkreditierungsstelle GmbH [German Accreditation Body] according to DIN EN ISO/IEC 17025:2005.



## FISCHER worldwide

Knowing what their customers need and want is a must for anyone trying to succeed in today's globalised markets. Because we at FISCHER think of ourselves as partners to our customers, we attach great importance to providing them excellent advice and working in close cooperation with them. This is why the Helmut Fischer Group maintains its worldwide presence through own companies and qualified distribution partners; there is one near you.

In keeping with our high standards of quality and customer satisfaction, all members of the Helmut Fischer Group are certified according to DIN EN ISO 9000.



### Service

Good service and efficient customer support are just as important to FISCHER as technically advanced and innovative products. For this reason, FISCHER has established a dense and tightly-linked global network of service partners staffed with highly qualified personnel. Offering extensive services such as setup, maintenance, training, calibration and so forth, FISCHER supports you in every aspect of your instruments and their use. This is how FISCHER guarantees the reliability and precision of its products. Worldwide.



- Subsidiary
- Dealer

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### Application Laboratories

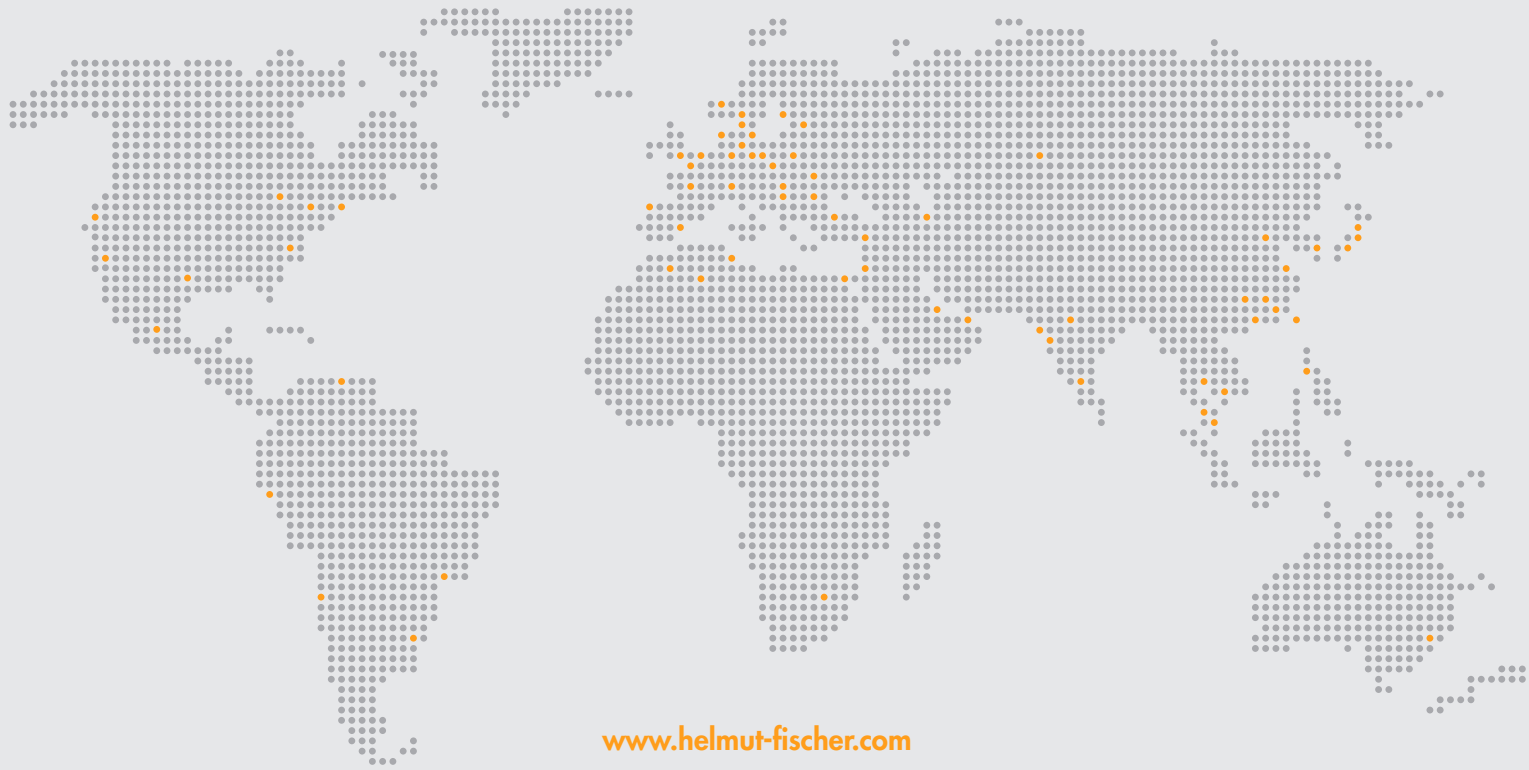
More and more, demanding applications require highly qualified application advice. FISCHER addresses this need through its strategically located Application Laboratories around the world (Germany, Switzerland, China, USA, India, Japan and Singapore).



### Training and Seminars

Because we want you to derive maximum benefit from our products, FISCHER's specialists are happy to share their practical know-how: starting with seminars and training sessions on metrological basics, through the optimal use of the instruments, to expert symposia on special topics.

# Global Sales Global Application Global Service



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