



# FISCHERSCOPE<sup>®</sup> X-RAY SERIES

X-ray fluorescence for coating thickness measurement and material analysis

**fischer**<sup>®</sup>



“ Swiss watches, coatings from STS and Fischer measuring instruments are a perfect match – because each one is focused on the best quality. ”

*Frédéric Saulcy, CEO at Saulcy Traitement de Surface, CH*



## Trust the number 1: World's best measurement technology and service performance

Sometimes the smallest detail determines success. As structures shrink but the demands on them grow, rigorous quality control takes on a whole new level of importance. Whether for coating thickness measurement or material analysis - Helmut Fischer is your partner of choice for precise and reliable measurement technology in the field of X-ray fluorescence analysis. With our FISCHERSCOPE® X-RAY systems we offer highly efficient measurement solutions to make your work easier.

According to our motto "Measuring Made Easy", a measuring challenge is easy to solve if you, as a customer, have the right tool. More than just instruments: we offer the best quality, we rely on a detailed needs analysis, competent advice and commissioning as well as an individual service concept. The majority of our instruments - from individual parts to software - are developed and produced in Germany.

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The company headquarters in Sindelfingen

## Helmut Fischer – Measuring Made Easy

The knowledge and will of the entrepreneur Helmut Fischer, his inventive genius and his irrepensible will to implement are the driving force of an exemplary company development.

In 1953, this success story began with the founding of a two-man company in Stuttgart. Today, Helmut Fischer is a global player at the forefront of industrial measurement technology. Constant development and permanent innovation are our declared goals - then and now.

### Innovation and expertise

The claim to build technically leading products coupled with a strong awareness of innovation, is the basis for continuously new metrological solutions at Fischer. Our high-tech instruments accurately measure coating thicknesses down to the nanometer range. Numerous companies from a wide range of industries have trusted our expertise for many years.

### Customized product solutions

Our portfolio is diverse: from simple handheld devices for quick measurements on the go to XRF analysis in electroplating or gold trading to fully integrated high-end systems that automatically monitor production. Helmut Fischer's measuring and analyzing instruments can be found wherever precision, reliability and ease of use are required.

### Excellent customer service

With 21 subsidiaries worldwide and an extensive dealer network, we ensure optimal customer support. Experienced employees from sales, the application laboratory and the service department provide you with individual advice and support on site with fast response times. Seminars and product training are an integral part of Helmut Fischer's versatile service portfolio.

### Quality "Made in Germany"

As a premium supplier and technology leader, Fischer does not compromise on quality. That is why we develop and produce the majority of our components for the FISCHERSCOPE® X-RAY instruments ourselves at our Sindelfingen site. We also demonstrate our quality standards through our certification according to ISO 9001.

### Climate protection and sustainability

Beyond the legal requirements, we are continuously working on optimizing processes and procedures in order to minimize our environmental impact and to constantly optimize our environmental performance following ISO 14001. Whether recycling or upcycling - corresponding material and energy savings are also not only to the benefit of the environment, but also of our customers.

## HOW IT ALL BEGAN...



1953

### The ambitious start

Helmut Fischer proudly looks back on a long and successful company history which began in 1953. At the age of only 22, Helmut Fischer founded the company "Schuhmann and Fischer" in a small workshop in Stuttgart together with his mentor and former physics teacher Schuhmann.

### The expansion

Three years later, Helmut Fischer founded the company of the same name with headquarters in Sindelfingen. Bolstered by the German economic miracle of the 1950s and 1960s, the Swabian one-man operation became an international company.



1982

### The innovations

At the beginning of the 1980s, Fischer greatly expanded its product range. In 1981, the first XRF X-ray fluorescence measuring instrument was launched. Thanks to many patented innovations, which still exist today, the instruments quickly established themselves in the industry. Further measuring and test instruments from the fields of nanoindentation and scratch testing followed.

### The technical progress

We continue to succeed in developing new measuring instruments by significantly developing the components used in order to support and encourage the technical progress of our customers. The extensive range of components ensures a high degree of customization.



TODAY

### The life's work

It has always been important to Helmut Fischer to build instruments that will last for years, the same goes for the company itself. Our declared goal is to develop measuring instruments that offer our customers added value and optimally support them in the performance of their work. This focus shapes our work, day after day.

### The foundation

After five decades at its helm, Helmut Fischer transferred his company shares to the Helmut Fischer Foundation, which has ensured the continuity of the company and supported artists and young scientists since 2003.

# THE FISCHER ADVANTAGE

**Focus made by Fischer:** As one of only two manufacturers of polycapillary optics in the world, we make it possible to focus a large part of the primary radiation onto a very small measuring spot

*FOR EVERY REQUIREMENT THE RIGHT DEVICE SOLUTION*

**Detectors:** You can choose from three different detector types for the optimal solution of your measurement task: proportional counter tube, silicon PIN diode and silicon drift detector

*ELEMENT ANALYSIS UP TO 24 ELEMENTS SIMULTANEOUSLY*

**Particularly safe:** Full-protection instruments in accordance with current radiation protection legislation

*CALIBRATION EX WORKS*

*BUILT TO LAST: ROBUST CONSTRUCTION FOR PARTICULARLY HIGH DEMANDS*

**Software:** Most powerful application software for coating thickness measurement and material analysis on the market

*MEASUREMENTS POSSIBLE FROM ABOVE, BELOW OR FLEXIBLE*

**Comprehensive service:** From personal advice to preventive maintenance including repair and spare parts management to training at your site

*THREE TABLE CONFIGURATIONS AVAILABLE FOR YOUR NEEDS*

**X-ray tubes:** Selection of different X-ray tubes for optimal measurements of your application

**Control panel:** Proven and intuitive operating concept for easy handling of the instrument

*HIGHEST QUALITY - MADE IN GERMANY*



## Many applications, a solution for everyone

**Printed circuit boards:** Our XRF systems comply with the IPC-4552-A/B and IPC-4556 standards. The measurement results are accurate and reproducible for the specified thickness range. HASL, electroless nickel and other critical coating systems can be measured quickly and accurately.

**Applications:** ENIG, ENEPIG, phosphorus content determination, solder alloys

**Electronic components:** Reliably control electronic components, such as compositions and layer thicknesses of lead-free solders during reflow soldering and analyses on SMD components.

**Applications:** Solder pads: Gold, silver, tin/tin alloy layers, under-nickel plating, palladium or palladium alloy layers

**Lead Frames:** Determine the layer thickness and composition of complex multilayer coating systems on lead frames with repeatability and non-destructive accuracy.

**Applications:** Thinnest gold, silver and palladium coatings, solder alloys

**Large components:** Our instruments offer you the possibility to measure large samples quickly and reliably.

**Applications:** Material analysis, zinc (nickel) on iron, chrome coating systems, electroless nickel on aluminum

**Tools:** Hard coatings only function efficiently as wear protection if the coating thickness, composition and surface hardness are correct. Testing instruments from Fischer use various methods, such as X-ray fluorescence, to precisely determine the coating thickness of TiN coatings and other hard metals or carbide coatings.

**Applications:** Hard chrome, titanium nitride, titanium carbonitride, Titanium aluminum nitride, chromium nitride, zirconium nitride

**Connector contacts:** Functional surfaces on connector contacts from a size of approx. 20 µm can be measured precisely and non-destructively. These could be, for example, contact points, crimping surfaces or press-fit zones.

**Applications:** (Hard) gold, silver, tin (alloy) layers, under-nickel plating, base material analysis

**Metal finishing:** Measure the coating thickness and composition of the corrosion protection layer non-destructively and reliably.

**Applications:** Zinc, copper, ZnNi, nickel, chromium, decorative surfaces

**Semiconductor / Wafer:** Clean room suitable, fast and precise XRF measuring instruments for layer thickness measurement and structural analysis of modern 2.5D-/3D-packaging solutions. The instruments are available as benchtop or fully automated.

**Applications:** Solder bumps, thin film metallizations, smallest structures

**Jewelry:** Whether in the watch industry, in the gold trade or in the jewelry sector - wherever precious metals are used, Fischer instruments have proven their worth thanks to non-destructive and highly precise measurements.

**Applications:** Silver, gold, palladium, platinum, nickel, titanium

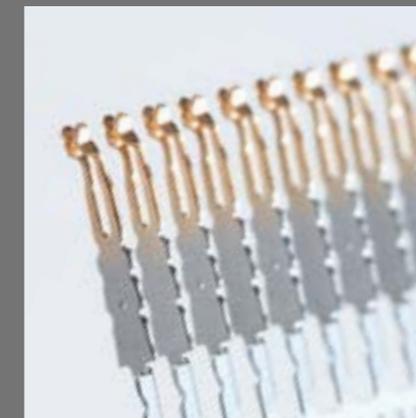
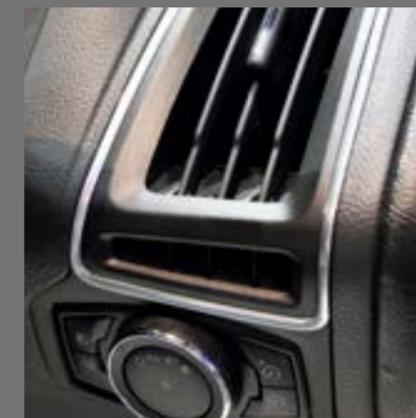
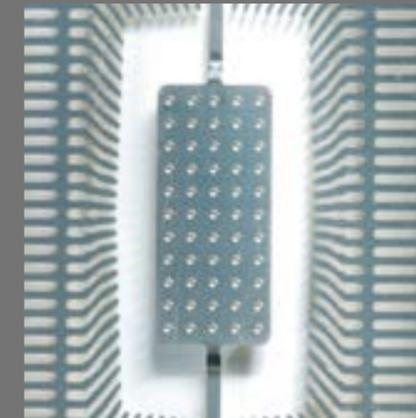
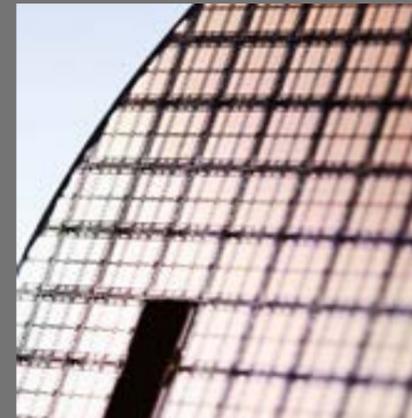
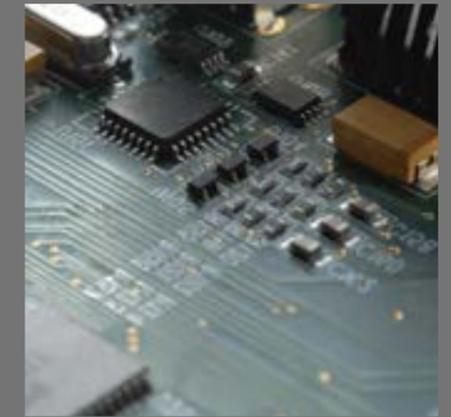
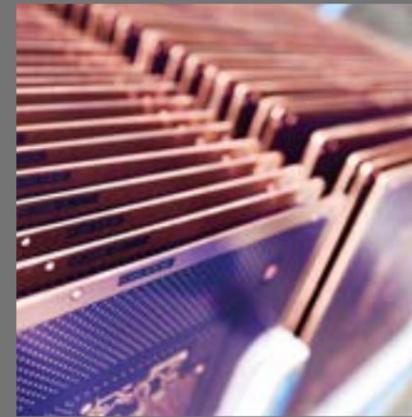
**Sanitary:** Clear results in a short time: Precise measurement of all common multilayer systems. In our product portfolio of X-ray fluorescence analysis instruments, we have just the right instrument for you.

**Applications:** Chromium coating system, complex geometries, zinc die casting, copper alloys

**RoHS:** Measuring instruments for the detection of lowest concentrations of heavy metals thanks to the sensitive silicon drift detectors. The measuring process is non-contact, non-destructive and simple. In addition, our measuring instruments offer a wide range of options for documenting the measurement results and generating reports. Our instruments measure quickly compared to chemical analysis and are excellent for screening.

**Decorative chromium coatings:** To ensure that trim is visually flawless not only at delivery but also after years of use, the layer structure must be monitored with regard to the thicknesses of the individual layers.

**Applications:** Decorative chrome coating systems on plastic substrates



# ENVIRONMENT

## UNIVERSAL MEASURING ENVIRONMENTS

- Production: Can be integrated in various production environments
- Clean room: Manufacturing under conditions of the clean room class 100
- Laboratory: Research, development, medical laboratories and pharma
- Quality assurance: Incoming goods inspection and process control
- In the retail store: Testing at the purchase of precious metals
- Detached: Mobile use with portable measuring device indoors and outdoors



- Handy X-ray fluorescence instruments
- Small benchtop instruments for places with little space
- Large instruments modularly scalable with plenty of space for your samples, for smallest measuring spots, (partial) automation possible
- Automated systems - individually tailored to your requirements

**TAILOR-MADE:  
THE OPTIMAL INSTRUMENT  
SOLUTION FOR YOUR APPLICATION**

# DIMENSION

# MEASURING DIRECTION

## ADVANTAGES OF THE DIFFERENT MEASURING DIRECTIONS



### Top down

- Image recognition with autofocus possible
- Precise positioning
- Automated measuring equipment monitoring
- Large measuring area



### Bottom up

- Time saving since focusing is often not necessary
- Compact instrument dimensions
- Optional with manual table



### Flexible

- Measurement on very large components possible
- Most compact instrument
- Mobile measurements possible
- Battery operation



### Fixed table

- Cost-effective
- Compact



### Manual XY table

- Simple and accurate positioning of the sample by hand
- Manual approach to multiple samples



### Automatic XY table

- Controllable, also partially automated, via software
- Several samples can be measured in succession
- Automated image and pattern recognition via software
- Programming of measuring points, line or area scans

## SERVED UP



# MEASURING TABLE

# DETECTOR

THE RIGHT DETECTOR FOR EVERY APPLICATION

## Proportional counter tube

- For coating thickness measurements and simple material analysis
- Very large active detector area for high count rates
- Insensitive to the sample-orientation and the measuring distance
- Ideal for complex shapes with recesses and different measuring distances



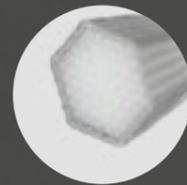
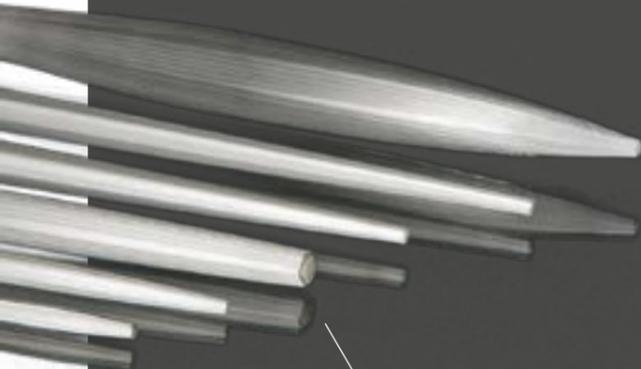
## Silicon PIN (PIN)

- For demanding coating thickness measurements and material analysis
- Ideal for measuring thin layers
- High energy resolution



## Silicon drift detector (SDD)

- Measurement in the nanometer range and of complex multilayer tasks
- Highest energy resolution and detection sensitivity
- Phosphorus determination of NiP coatings and RoHS screening
- Best for measurement of light elements (Al, Si, P, Cl)



- Smallest spot sizes down to  $10\ \mu\text{m}^*$  for measurements on smallest components and microstructures  
\* Spot size: Full width at half maximum (FWHM) Mo-K $\alpha$
- The microfocus of the polycapillary amplifies the XRF density on microstructures up to 10.000-fold compared to collimator optics
- Measuring instruments with polycapillaries are characterized by short measuring times when measuring smallest structures

HIGH INTENSITIES FOR SMALLEST MEASURING SPOTS

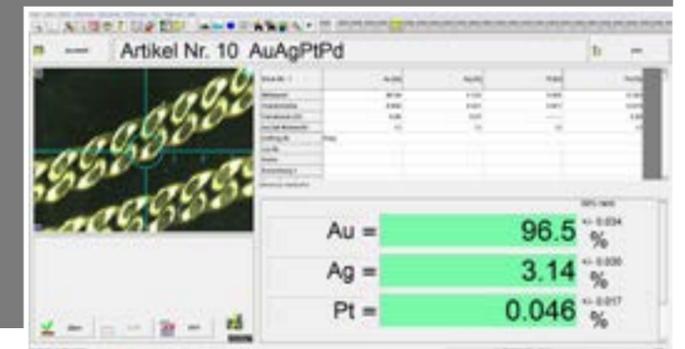
# POLYCAPILLARY



# SOFTWARE

THE MOST COMPREHENSIVE SOFTWARE ON THE MARKET

- Universal software for coating thickness measurement as well as material and bath analysis
- Standard-free and accurate measurement based on fundamental parameter analysis
- Fischer-patented automatic distance compensation method in the software
- Predefined measurement routines for standard tasks
- Programming of complex measurement sequences including pattern recognition
- Convenient calibration functions
- Data export to quality management systems
- Measuring equipment monitoring
- Statistical functions with statistical process control (SPC)
- Fully customizable reports and creation of individual measurement protocols
- Calculation of estimated measurement uncertainty



- Distance-dependent measured (DCM) value correction without additional calibrations
- Quick and convenient adjustment of the measuring distance, also stepless
- Measurements with the smallest possible distance and thus optimized counting rate
- Simple measurement of complex geometric shapes and in recesses
- Absolute safety: switch-off plate and light barrier protect the detector from component collision - and thus your investment

SIMPLE AND QUICK ADJUSTMENT OF THE MEASURING DISTANCE



# DISTANCE CONTROL

# Product overview table

Measuring direction	View	Product family	Short characteristics
 Measuring bottom up		<b>XUL</b> 210/220	Robust model series for fast coating thickness measurement and determination of metal content of electroplating baths as well as the composition of simple alloy layers
		<b>XULM</b> 240  PCB	Flexible measuring instruments for coating thickness measurement, also for filigree parts such as connectors, contacts or wires; special solution for printed circuit boards possible
		<b>XAN</b> 215 220/222 250/252	Universal instruments for fast, precise metal and gold analysis, coating thickness measurement and RoHS screening (XAN 250)
		<b>GOLDSCOPE SD</b> 510/515 520 550	Special instruments for analysis and verification of gold and other precious metals
 Measuring top down		<b>GOLDSCOPE SD 600</b>	Special instrument for fast, cost-effective and non-destructive analysis of jewelry, coins and precious metals, also suitable for larger parts
		<b>XDL</b> 210/220/230/240	Robust instruments for quality control of galvanized bulk parts and for bath analysis
		<b>XDLM</b> 231/232/237/ PCB 220 PCB 200/210	Universal instruments for the inspection of small parts and small structures, for example in the electronics industry, for measurements of light metals, hard coatings and thin electroplated coatings; special solutions for printed circuit boards possible
		<b>XDAL</b> 237 PCB 237 SDD	Model series for applications in the area of thin and very thin coatings; also for material analysis (e. g. RoHS screening); special solutions for printed circuit boards possible  SDD version with high count rates for highest precision and shorter measuring times
		<b>XDAL 600</b>	Easy-to-use and compact measuring instrument, specialized in the measurement of thin and very thin layers; also for material analysis (including RoHS screening)
		<b>XDV-SDD</b>	Premium model for universal use - from inspection of very thin or complex layers to RoHS screening at very low detection limits
		<b>XDV-μ</b> <b>XDV-μ PCB</b> <b>XDV-μ WAFER</b> <b>XDV-μ LD</b> <b>XDV-μ LEAD FRAME</b>	Model series optimized for microanalysis for measurement on smallest components and structures; also for checking complex multilayer systems; special solutions for wafers, lead frames and printed circuit boards possible
 Mobile		<b>XAN 500</b>	Flexible handheld instrument for precise coating thickness measurement and material analysis on bulky parts or in hard-to-reach places
		<b>Customized solution and automation</b>	Modular XRF benchtop instrument scalable, tailored to your requirements FISCHERSCOPE® X-RAY 4000, 5000

 Detector	 Primary filter	 Apertures	 Aperture type/size *	 C-slot	Page
Proportional counter tube	1	1	Ø 0.3 mm*	✓	<b>18</b>
Proportional counter tube	3	4  1	Ø 0.1 / 0.2 mm; 0.05 × 0.05 mm; 0.2 × 0.03 mm* Ø 0.1 mm* XULM PCB: Ø 0.1 mm	✓	<b>18</b>
PIN SDD SDD	- 1 6	1 1 4	Ø 1 mm* Ø 1 mm* Ø 0.2 / 0.6 / 1 / 2 mm*	—	<b>20</b>
PIN SDD SDD	- 1 6	1 1 4	Ø 1 mm* Ø 1 mm* Ø 0.2 / 0.6 / 1 / 2 mm	—	<b>22</b>
SDD	3	4	Ø 0.2 / 0.6 / 1 / 2 mm*	—	<b>24</b>
Proportional counter tube	1	1	Ø 0.3 mm*	✓	<b>26</b>
Proportional counter tube	3  1	4  1	Ø 0.1 / 0.2 mm 0.05 × 0.05 mm; 0.2 × 0.03 mm* Ø 0.1 mm*	✓	<b>26</b> <b>34 (PCB)</b>
PIN SDD	3 3	4 4	Ø 0.1 / 0.3 / 0.6 mm 0.5 × 0.15 mm*	✓	<b>28</b> <b>36 (PCB)</b>
SDD	3	4	Ø 0.1 / 0.3 / 1 / 3 mm*	—	<b>24</b>
SDD	6	4	Ø 0.2 / 0.6 / 1 / 3 mm*	—	<b>30</b>
SDD	4	Poly-capillary	Ø 20 μm Standard** Ø 20 μm halofree** Ø 10 μm halofree** Ø 60 μm halofree** Ø 50 μm halofree**	✓	<b>32, 36, 38</b>
SDD	1	1	Ø 2 mm	—	<b>40</b>
					<b>42 - 47</b>

\* Standard size, optional sizes on request, \*\* Full width at half maximum (FWHM) (for Mo-K<sub>α</sub>)

# FISCHERSCOPE® X-RAY XUL® / XULM®

**Quick-measure design:**

The sample is placed and ready for measurement in just a few steps

**Good prospects:** Largest measurement window on the market

**Also for large samples:**

Hood with C-slot allows large, flat samples



**Testing of multiple measuring points:** Even with large-area samples, measuring points are possible on the entire sample area

**Balanced:** Optimal cost-benefit ratio

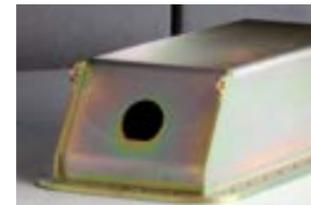
**Commissioning:** Extremely fast and simple



Nuts and bolts (XUL®)

## Entry-level model with a focus on speed

The instruments of the FISCHERSCOPE® X-RAY XUL® and XULM® series are the right solution for fast coating thickness determination in electroplating. There, a large number of samples must pass through quality control as efficiently as possible. For this reason, the XUL series is designed to enable bulky samples to be positioned manually in the measuring chamber. There is also the option of a manual XY stage, facilitating the exact alignment of small parts. An intuitive control panel on the front of the unit further simplifies handling.



Corrosion protection: Zn/Fe



Fittings: Ni/Cu/Fe

**Features**

- Robust entry-level instrument for coating thickness measurement and determination of metal content in electroplating baths
- XUL® set-up with bottom up measuring direction
- Standard X-ray tube (XUL®) or microfocus tube (XULM®)
- 4-fold changeable apertures (XULM®)
- 3-fold changeable filter (XULM®)
- Proportional counter tube detector for short measuring times, particularly large measuring distances and complex geometries
- Up to 17 cm sample height possible
- Fully protected instrument with type approval according to current radiation protection legislation

The XUL® series allows measuring spots of 0.5 mm diameter. This makes the robust instruments perfect for measurements on nuts, screws and other galvanically finished surfaces. Many common applications for this instrument are in the corrosion protection industry. Connectors, contacts, wires and PCBs are the domain of the FISCHERSCOPE® X-RAY XULM® family.

# FISCHERSCOPE® X-RAY XAN®

## Quick-measure design:

The sample is placed and ready for measurement in just a few steps

**Versatile:** For trade, industry and laboratory applications

**DPP+ digital pulse processor:** Even faster analysis results and better performance (not available with XAN® 215)



**RoHS analysis:** Reliable determination of hazardous substances

**Commissioning:** Extremely fast and simple



Noble metal inspection

## The system for a wide range of applications

The focus of the FISCHERSCOPE® X-RAY XAN® family is on fast and precise material analysis of precious metals and gold alloys. In addition, these instruments are used for the determination of heavy metal trace elements and other hazardous substances within the scope of the RoHS directive. This is particularly important for electronics and other manufacturing industries.

The XAN® 215 with a powerful PIN detector is suitable for analyzing simple gold alloys that contain only a few other elements such as silver and copper. For more complex alloys, instruments with a silicon drift detector (e. g. XAN® 220) are a better choice. With their much higher resolution, they can distinguish between gold and platinum, for example in the analysis of dental alloys and melted precious metal alloys.

RoHS screening also requires higher resolutions as well as different primary filters. Ideal for this: XAN® 250 with fixed sample support or the XAN® 252 with manually operated XY stage.

### Features

- Universal instrument for metal and precious metal analysis, coating thickness measurement on simple shaped samples and RoHS screening
- XAN form factor with measuring bottom up
- Microfocus tube with tungsten anode
- 4-fold changeable apertures (XAN® 250, 252)
- 6-fold changeable filter (XAN® 250, 252)
- Various semiconductor detectors ensure very good detection accuracy and high resolution: silicon PIN and silicon drift detector
- DPP+ digital pulse processor for higher count rates and significantly reduced measuring times
- Different measuring table options: fixed or manually operable
- Up to 17 cm sample height possible (XAN® 222, 252)
- Fully protected instrument with type approval according to current radiation protection legislation (XAN® 215, 220, 250)



Adjusting the sample



Video image displays the measuring spot exactly

# FISCHERSCOPE® GOLDSCOPE SD®

**Your safety:** Short measuring times or better repeatability of your measurement results

**Quick-measure design:** The sample is placed and ready for measurement in just a few steps

**Versatile:** Ideal for pawnshops, gold buying, test laboratories and jewelry manufacturers



**DPP+ digital pulse processor:** Fast and precise measurement results

**Balanced:** Optimal cost-benefit ratio

**Commissioning:** Extremely fast and easy, measuring tasks are already pre-programmed



Gold jewelry

## Analysis, value determination and authenticity testing

With the GOLDSCOPE SD® family, Fischer offers tailored solutions for the non-destructive testing of gold and precious metals. All GOLDSCOPE SD® models are equipped with the WinFTM® software, which has the most important measuring tasks for the testing of gold and precious metals.

The GOLDSCOPE SD® family offers the right solution for your testing needs: Entry-level instruments with silicon PIN detectors are intended for use in stores and pawnshops to check the composition of jewelry and dental gold. The GOLDSCOPE SD® 510 model is particularly space-saving: the laptop can be easily placed on top of the device.

For test laboratories and jewelry manufacturers, the series offers instruments with a silicon drift detector and changeable apertures. Thus, the GOLDSCOPE SD® family also fulfills more exacting demands.



Authenticity testing



Determination of value

### Features

- Compact and robust benchtop instrument for fast, cost-effective and non-destructive analysis of jewelry, coins and precious metals
- Hardware and software aligned to measuring tasks related to gold and precious metals
- Especially space-saving with the GOLDSCOPE SD® 510 version
- Measuring direction with measuring bottom up
- 4-fold changeable apertures (GOLDSCOPE SD® 550)
- 6-fold changeable filter (GOLDSCOPE SD® 550)
- Various semiconductor detectors ensure very good detection accuracy and high resolution: silicon PIN and silicon drift detector
- DPP+ digital pulse processor for higher count rates and significantly reduced measuring times
- Fully protected instrument with type approval according to current radiation protection legislation

# GOLDSCOPE SD® 600 / FISCHERSCOPE® XDAL® 600

**Your safety:** Short measuring times or better repeatability of your measurement results

**Quick-measure design:** The sample is placed and ready for measurement in just a few steps

**Versatile:** Ideal for pawnshops, gold buying, test laboratories and jewelry manufacturers



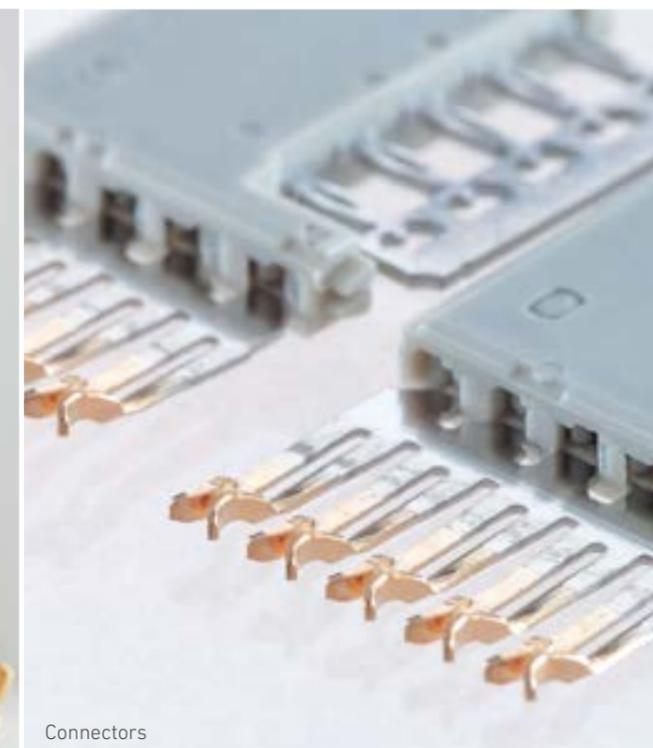
**DPP+ digital pulse processor:** Fast and precise measurement results

**Balanced:** Optimal cost-benefit ratio

**Commissioning:** Extremely fast and easy, measuring tasks are already pre-programmed on the XDAL® 600



Gold jewelry



Connectors

## Analysis, value determination and authenticity testing

### GOLDSCOPE SD® 600

The GOLDSCOPE SD® 600 is tailor-made for non-destructive gold and jewelry testing as well as precious metal analysis. Predefined measurement tasks (gold setup) simplify the application for you. The silicon drift detector ensures high-resolution analyses of alloys and layers such as gold on sterling silver or rhodium on gold alloys.

#### Features

- Robust benchtop instrument for analysis of jewelry, coins and precious metals
- Measuring direction with measuring top down
- Microfocus tube with tungsten anode
- 4-fold changeable apertures
- 3-fold changeable filter
- Silicon drift detector 20 mm<sup>2</sup> for highest precision on thin layers as well as peltier cooling
- DPP+ digital pulse processor for higher count rates and significantly reduced measurement times
- Manually adjustable sample stage for fast and easy sample positioning

### FISCHERSCOPE® X-RAY XDAL® 600

The FISCHERSCOPE® X-RAY XDAL® 600 is designed for non-destructive measurement of very thin layers and material analysis. This instrument is characterized by its compact design, simple handling and operation with a silicon drift detector that allows for the highest performance.

#### Features

- Universal instrument for measurement on smallest structures, very thin multilayers, functional layers and very thin coatings ≤ 0.1 μm
- Measuring direction with measuring top down
- Microfocus tube with tungsten anode
- 4-fold changeable apertures
- 3-fold changeable filter
- Silicon drift detector 20 mm<sup>2</sup> for highest precision on thin layers as well as peltier cooling
- DPP+ digital pulse processor for higher count rates and significantly reduced measurement times
- Manually adjustable sample stage for fast and easy sample positioning

# FISCHERSCOPE® X-RAY XDL® / XDLM®

**Quick-measure design:**

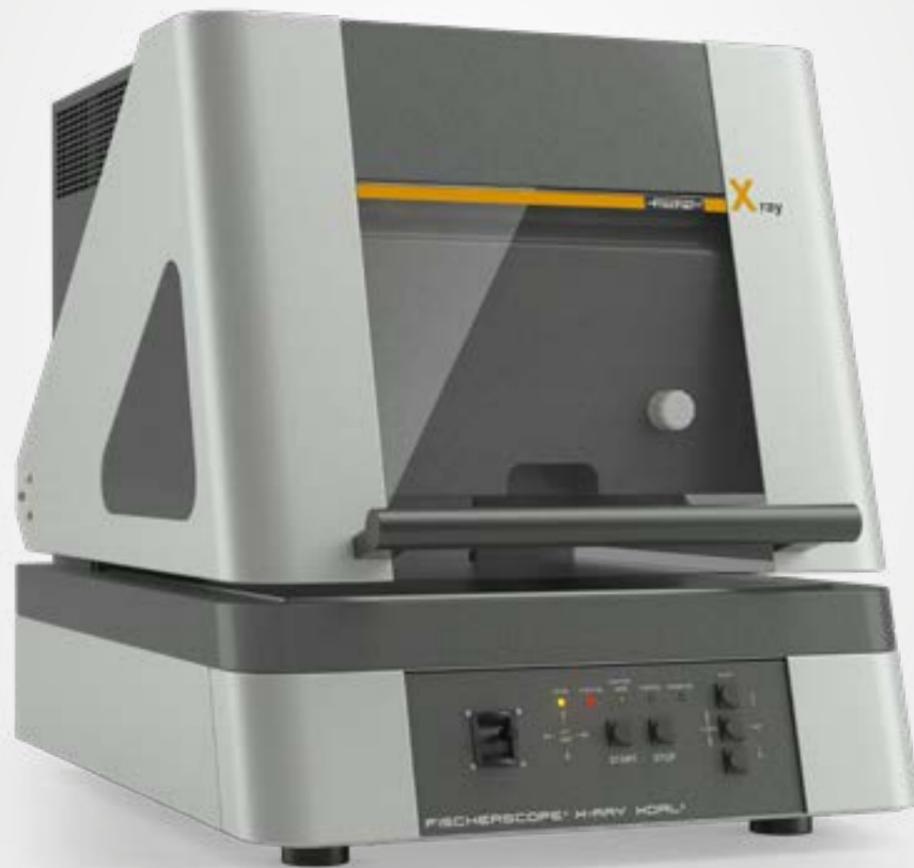
The sample is placed and ready for measurement in just a few steps

**Also for large samples:**

Hood with C-slot

**Built to last:**

Robust design for measurement on mass parts



**Tailor-made:** Different models offer the optimal solution for your application

**Testing of multiple measuring points:** Even with large samples, measuring points are possible on the entire sample surface

**Commissioning:** Extremely fast and simple



Galvanic coatings

## Your ticket into automated measurement

FISCHERSCOPE® X-RAY XDL® and XDLM® instruments are closely related to the XUL® and XULM® series. Detectors, X-ray tubes, apertures and filter combinations are identical. However, the XDL® and XDLM® measure top down.

The XDL® series, predestined for the control of mass-produced galvanized parts and bath analysis, ranges from single benchtop instruments (e.g. XDL® 210 and 220 with fixed sample support) to models with a programmable XY table (XDL® 240). The latter can be used for automated series testing.



Corrosion protection: Zn/Fe

Connectors: Au/Ni/CuSn6

**Features**

- Universal instrument for measurements on galvanic mass parts
- Stepless measuring distance with measuring top down
- Standard X-ray tube (XDL®); microfocus tube (XDLM®)
- 4-fold changeable apertures (XDLM®)
- 3-fold changeable filter (XDLM®)
- Proportional counter tube detector for short measuring times and small measuring spot
- Various measuring table options; models with extended sample support
- Fully protected instrument with type approval according to current radiation protection legislation

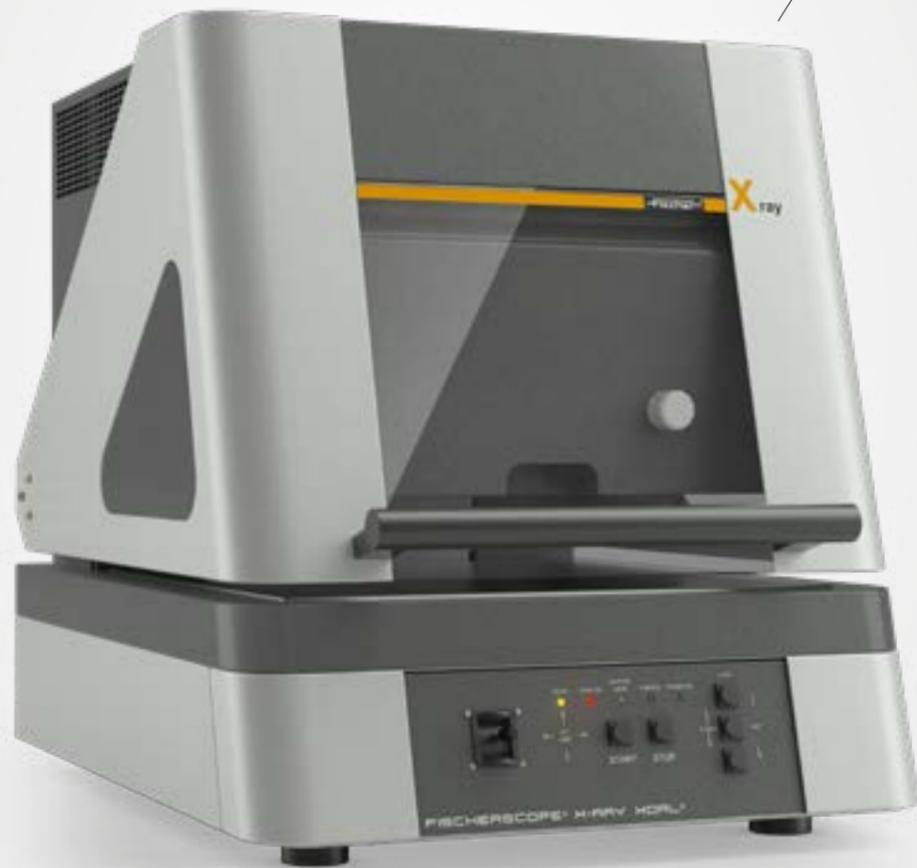
The XDLM® series differs from its sister series XDL® as it is equipped with a microfocus tube and changeable apertures and primary filters. It is the best choice for inspecting many small parts in succession. It is also very useful for the electronics industry. The variable measuring distance of 0 – 80 mm facilitates measuring on irregularly shaped parts like connectors (e.g. XDLM® 237).

# FISCHERSCOPE® X-RAY XDAL®

**One device, many possibilities:** Coating thickness measurement, material analysis and trace analysis

**Fully automatable:** Let your instrument work for you with just one click

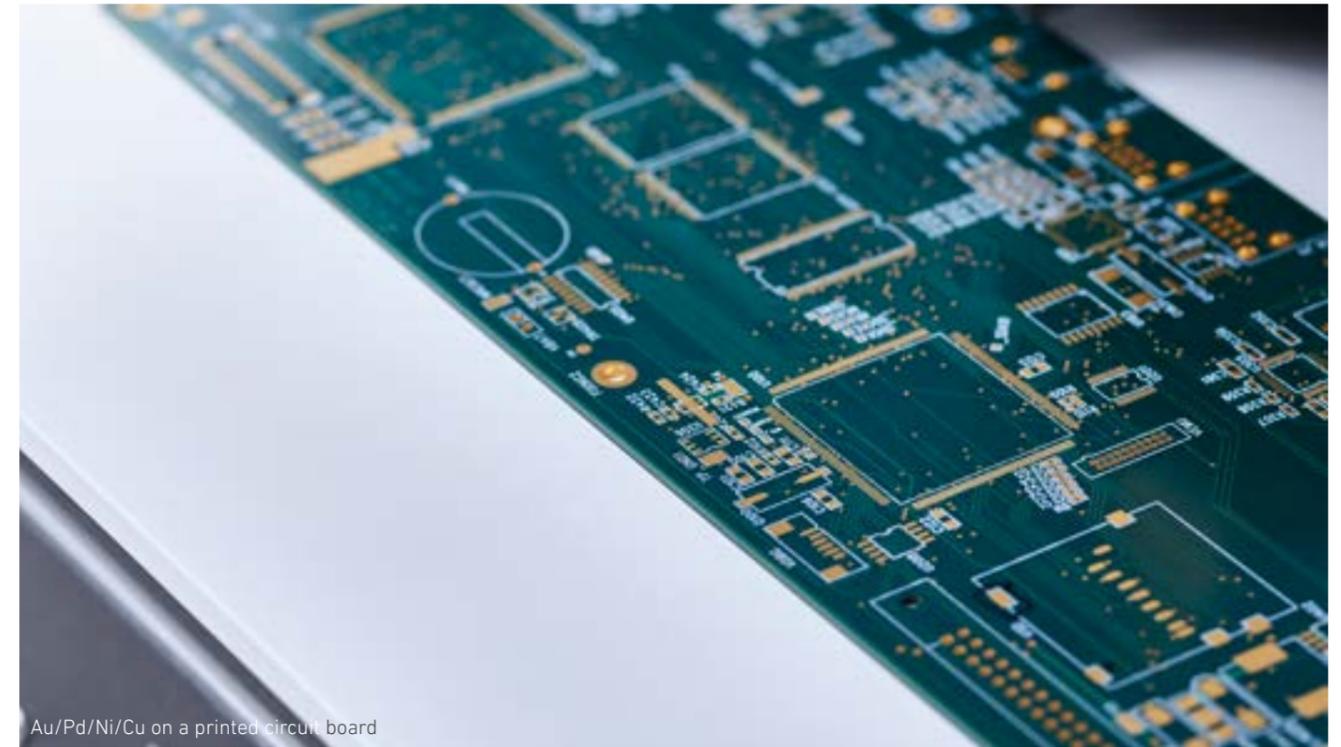
**Compact design:** Very good compromise between performance and space requirements



**Testing of multiple measuring points:** Even with large samples, measuring points are possible on the entire sample surface

**Also for large samples:** Hood with C-slot

**Commissioning:** Extremely fast and simple



Au/Pd/Ni/Cu on a printed circuit board

## The best detectors for thin layers

With its semiconductor detectors and the programmable measuring table, the FISCHERSCOPE® X-RAY XDAL® series is an excellent choice for fast and accurate measurements of solder composition. This makes it possible to eliminate the risk of getting different solder batches via a simple scan at incoming goods inspection.

The XDAL® series is also well suited for applications that require testing thin and ultra-thin coatings < 0.05 µm. This allows, for example, expensive materials to be saved and process-reliable production to be carried out. Mass inspection of different components in production control and incoming goods can also be completed.

The instrument version with a 50 mm<sup>2</sup> silicon drift detector is suitable for RoHS measurements.

### Features

- Universal instrument for automated measurements of thin and very thin layers < 0.05 µm and for material analysis in the ppm range
- Stepless measuring distance with measuring top down
- Microfocus tube with tungsten anode
- 4-fold changeable apertures
- 3-fold changeable filter
- Various semiconductor detectors ensure very good detection accuracy and high resolution: silicon PIN and silicon drift detector
- Optionally also available with fixed or manual measuring table
- Fully protected instrument with type approval according to current radiation protection legislation



HSS drill bit: TiN/Fe



High reliability: Pb (> 3 %) in electronic components

# FISCHERSCOPE® X-RAY XDV®-SDD

**Built to last:** Robust design for particularly high requirements

**Fully automatable:** Let your instrument work for you with just one click

**Quick-measure design:** With a few simple steps the sample is placed and ready for measurement. Automated measurements of many parts are possible



**Convinces all along the line:** Outstanding performance and high detection accuracy

**RoHS Analysis:** Reliable determination of pollutants

**Fast:** Thanks to short measuring times, you save valuable time



Pollutant analysis of toys

## The high-caliber all-rounder

FISCHERSCOPE® X-RAY XDV®-SDD models are among the most powerful X-ray instruments. Their silicon drift detector is extremely sensitive to fluorescence radiation of light elements. This permits very low detection limits as well as measurement applications relating to NiP, RoHS and very thin layers <math>< 0.05 \mu\text{m}</math>. This is why the universal XDV®-SDD instrument performs exceedingly well in research and development, laboratory and process qualification settings. Also, its ease of use makes it indispensable in production control.



NiP/Fe: P concentration and layer thickness



Passivation layers: Cr/Zn/Fe

The XDV®-SDD system is especially well suited for precise trace analysis and rapid monitoring of pollutant limit values. For example, in plastics it can be used to determine critical chemical elements such as lead, mercury and cadmium with detection limits of just a few ppm.

### Features

- Universal instrument for the determination of pollutants in the smallest concentrations according to RoHs and for automated measurements of layers, including <math>< 0.05 \mu\text{m}</math>
- Stepless measuring distance with measuring top down
- Microfocus tube with tungsten anode; molybdenum anode optional
- 4-fold changeable apertures
- 6-fold changeable filter
- Silicon drift detector 50 mm<sup>2</sup> for highest precision on thin layers
- Aperture (collimator) up to 3 mm: Highest intensity for shortest measuring time even with difficult samples (thinnest coatings, Si wafers, conversion layers), light elements (fuel cells, Al components)
- Programmable measuring stage for automated measurements on small structures
- Fully protected instrument with type approval according to current radiation protection legislation

# FISCHERSCOPE® X-RAY XDV®-μ / XDV®-μ LD

**Meeting all challenges:**  
Reliable and fast results for ambitious measurement

**Also for large samples:**  
Hood with C-slot

**Most advanced polycapillary optics on the market:** Our in-house manufactured polycapillaries deliver outstanding measurement results with short measuring times



**Fully automatable:** Let your instrument work for you with just one click

**Your safety:** Short measuring times or better repeatability of your measurement results

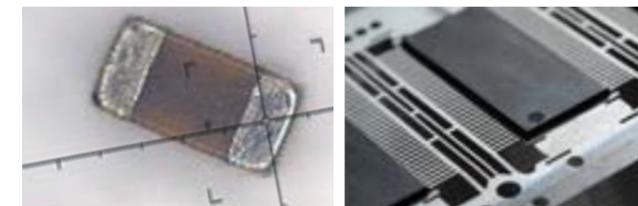
**Accurate and precise:** Positioning of the measuring point on small structures thanks to automatic image recognition

Connectors (XDV®-μ LD)

## Minuscule measuring surface - Highest precision

The FISCHERSCOPE® X-RAY XDV®-μ instruments form Fischer's high-end X-ray fluorescence series, designed for precise coating thickness measurement and material analysis on tiny structures. The instruments are equipped with powerful silicon drift detectors and polycapillary optics, which drastically reduce measuring times and enable repeatable measurements due to the high radiation intensity.

The XDV®-μ instruments are used in particular for applications in the electronics and semiconductor industry such as the measurement of very small structures, e. g. bond surfaces, SMD components or thin wires.



SMD components

Lead frames

The roomy, easily accessible measuring chamber with side cut-outs (C-slot) and expanded sample support facilitates working with large samples. As an entry into the polycapillary world, the cost-effective and versatile XDV®-μ LD model offers more space for complex shaped small test parts with outstanding measurement performance.

Thus, the measuring distance of 12 mm allows precise measurements on assembled PCBs and connectors.

### Features

- Universal instrument for measurements on smallest and flat components and structures as well as complex multilayer systems
- Stepless measuring distance with measuring top down
- Microfocus tube with tungsten anode; molybdenum anode optional
- 4-fold changeable filter
- Polycapillary optics permit particularly small measurement spots 10 - 60 μm FWHM at short measuring times with high intensity
- Silicon drift detector 20 or 50 mm<sup>2</sup> for highest precision on thin layers
- Video system with 3x optical zoom for precise sample positioning
- Precise programmable measuring table for automated measurements on small structures

# FISCHERSCOPE® X-RAY XULM®-PCB / XDLM®-PCB

**PCB experts:** Specialized measuring solutions for printed circuit boards

**Accurate and precise:** Positioning of the measuring point on small structures thanks to automatic image recognition

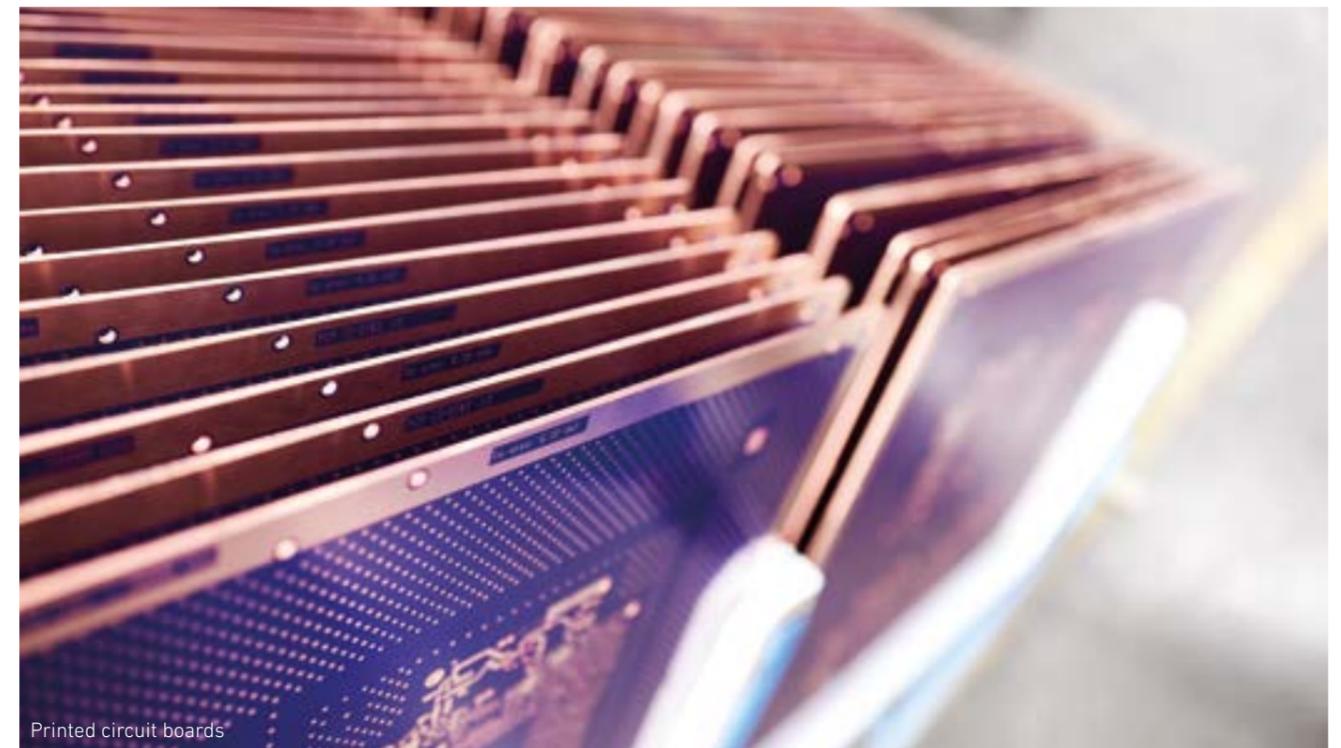
**Quick-measure design:** The sample is placed and ready for measurement in just a few simple steps



**Tailor-made:** Different models offer the optimal solution for your application

**Balanced:** Optimal cost-benefit ratio

**Commissioning:** Extremely fast and simple



Printed circuit boards

## The entry-level series for printed circuit boards

### FISCHERSCOPE® X-RAY XULM®-PCB

The PCB series was specially developed for the measurement and analysis of layer thicknesses on printed circuit boards. The FISCHERSCOPE® X-RAY XULM®-PCB is well suited for simple measuring tasks with a small measuring spot. The XRF spectrometer is equipped with a proportional counter tube detector which allows short measuring times due to its large detector area.

#### Features

- Robust entry-level instrument for simple measurements of components and structures on printed circuit boards
- Measuring direction with measuring bottom up
- Microfocus tube with tungsten anode
- Fixed aperture
- Fixed filter
- Proportional counter tube detector for short measuring times and small measuring spot
- Fixed, wide measuring table for printed circuit boards up to 610 × 610 mm, optionally with measuring table extension
- Fully protected instrument with type approval according to current radiation protection legislation

### FISCHERSCOPE® X-RAY XDLM®-PCB

The FISCHERSCOPE® X-RAY XDLM® PCB with proportional counter tube is ideal for fast measurement of single measurement tasks with small measuring spot. The main difference between the model series: XDLM has additional functionalities for optimal measuring conditions and are suitable for automated measurements in production control (XDLM® PCB 210 and 220).

#### Features

- Universal entry-level instrument for simple measurements of components and small structures on printed circuit boards
- Measuring direction with measuring top down
- Microfocus tube with tungsten anode
- Fixed or 4-fold changeable apertures
- Fixed or 3-fold changeable filter
- Proportional counter tube detector for short measuring times and small measuring spot
- Various measuring table options: manual pull-out, optional with measuring table extension or programmable, for PCBs up to 610 × 610 mm

# FISCHERSCOPE® X-RAY XDAL®-PCB / XDV®-μ PCB

**Meeting all challenges:**  
Reliable and fast results  
for ambitious measuring  
tasks

**PCB experts:** Specialized  
measuring solutions for  
printed circuit boards,  
fulfill IPC standards

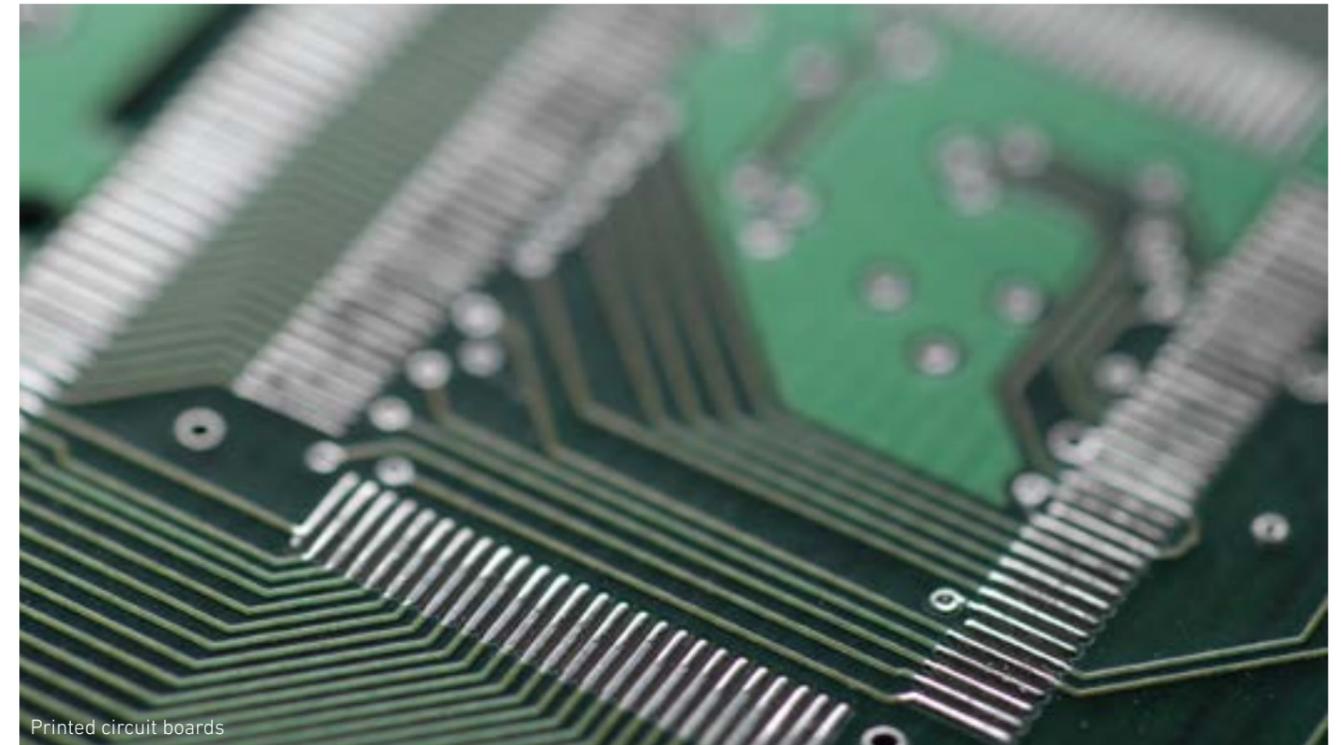
**Most advanced polycapillary  
optics on the market:**  
Our in-house manufactured  
polycapillaries deliver  
outstanding measurement  
results in short measuring  
times (XDV®-μ PCB)



**Fully automatable:**  
Let your instrument  
work for you

**Accurate and precise:**  
Positioning of the mea-  
suring point on small  
structures thanks to  
automatic image recog-  
nition

**Commissioning:** Ex-  
tremely fast and simple



Printed circuit boards

## The professional series for printed circuit boards

### FISCHERSCOPE® X-RAY XDAL®-PCB

Due to the combination of a powerful silicon drift detector, multi-collimator and changeable filters, FISCHERSCOPE® X-RAY XDAL®-PCB instruments are predestined for the measurement of small structures on printed circuit boards. The instruments allow optimal measurement conditions for various applications, e. g. ENIG and ENEPIG.

#### Features

- Universal instrument for measurements on small structures, multilayers, functional layers and thin coatings < 0.1 μm
- Measuring direction with measuring top down
- Microfocus tube with tungsten anode
- 4-fold changeable apertures
- 3-fold changeable filter
- Silicon drift detector 20 or 50 mm<sup>2</sup> for highest precision on thin layers
- Various measuring table options: manual pull-out, optional with measuring table extension or automated, for PCBs up to 610 × 610 mm

### FISCHERSCOPE® X-RAY XDV®-μ PCB

The FISCHERSCOPE® X-RAY XDV®-μ PCB instruments are used for measurements on smallest structures. Thanks to silicon drift detectors and polycapillary optics, the high-end instrument measures with extremely small measuring spot at very high intensity. The instruments meet the IPC requirements for ENIG and ENEPIG.

#### Features

- Universal instrument for automated measurements on smallest structures, multilayers, functional coatings and very thin coatings < 0.1 μm
- Microfocus tube with tungsten anode; molybdenum anode optional
- Measuring direction with measuring top down
- 4-fold changeable apertures
- 4-fold changeable filters
- Polycapillary optics permit particularly small measuring spots Ø approx. 20 or 10 μm
- Silicon drift detector 20 or 50 mm<sup>2</sup> for highest precision on thin layers
- Programmable measuring table for printed circuit boards up to 613 × 610 mm, optionally with vacuum function

# FISCHERSCOPE® X-RAY XDV®-μ WAFER

**Fully integrated solution:** XDV®-μ SEMI combined with wafer handler of your choice

**Most advanced polycapillary optics on the market:** Our in-house manufactured polycapillaries deliver outstanding measurement results at short measuring times

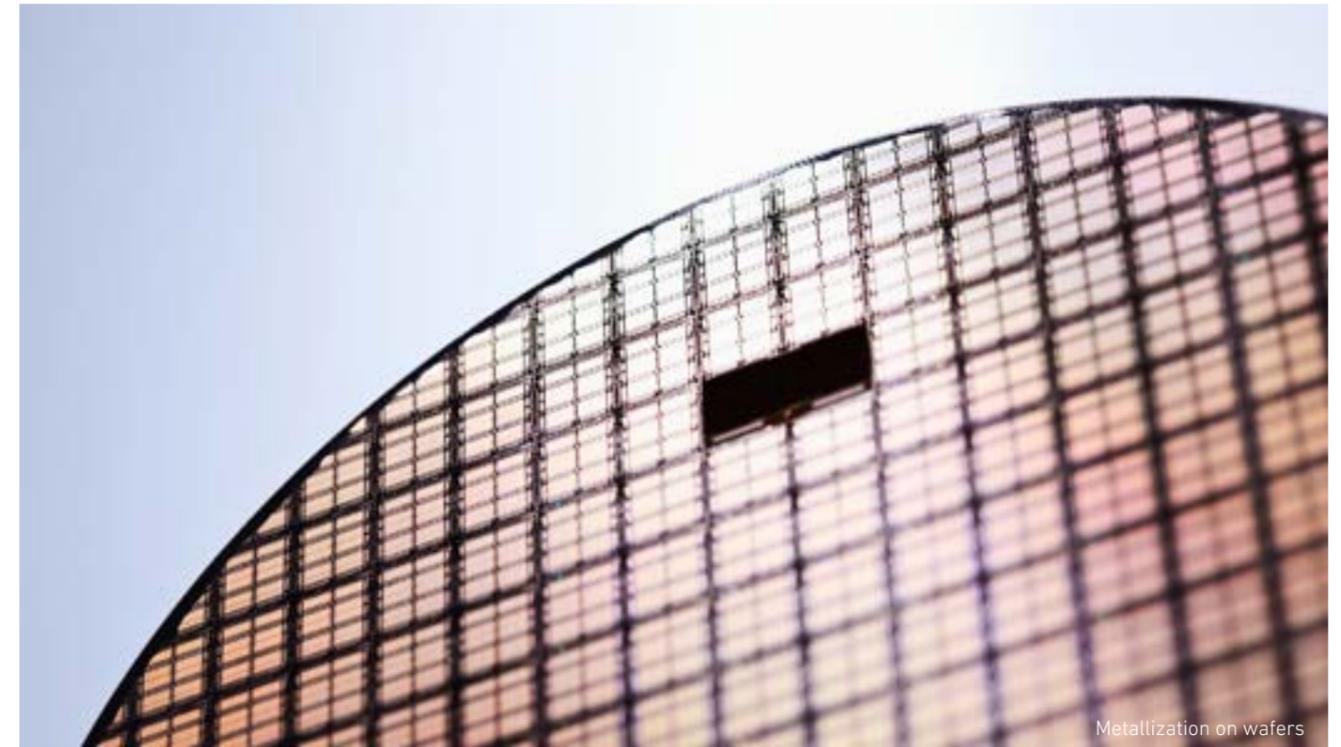
**Meeting all challenges:** Reliable and fast results for ambitious measuring tasks



**Accurate and precise:** Positioning of the measuring point on small structures thanks to automatic image recognition

**Fully automatable:** Let your instrument work for you with just one click

**Your safety:** Short measuring times or better repeatability of your measurement results

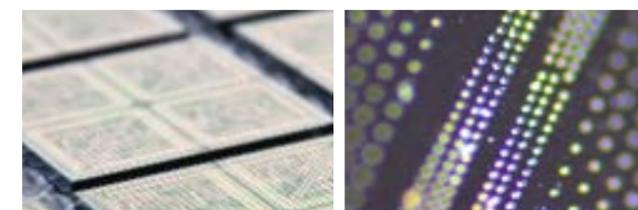


Metallization on wafers

## Cutting-edge technology for wafer applications

Wafers place some of the highest demands on the measurement technology used. Firstly, the surfaces are very sensitive. Secondly, the structures are so small that only special instruments can analyze them.

FISCHERSCOPE® X-RAY XDV®-μ WAFER models are designed specifically for automated analysis of microstructures and to meet the needs of the semiconductor industry. Typical measuring tasks include the characterization of base metallizations, material analysis of solder bumps and coating thickness measurement on contact surfaces.



Solder bumps

Small structures

Testing of such tiny structures requires minuscule measuring spots. That is why XDV®-μ WAFER instruments are equipped with polycapillary optics. They focus the X-ray onto a measuring spot of just 10 – 20 μm. A XDV®-μ WAFER system thus allows for much more precise characterization of the individual microstructures than any conventional instruments can.

### Features

- Special instrument for automated measurements of thin layers and multilayer systems on wafers with diameters from 6 - 12 inches
- Stepless measuring distance with measuring top down
- Microfocus tube with molybdenum anode; tungsten anode optional
- 4-fold changeable filter
- Polycapillary optics permit particularly small measuring spots of 10 or 20 μm FWHM at short measuring times with high intensity
- Silicon drift detector 20 mm<sup>2</sup> or 50 mm<sup>2</sup> for highest precision on thin layers
- Precise, programmable measuring table with vacuum wafer chuck for automated measurements on small structures

# FISCHERSCOPE® X-RAY XAN® 500

**Two in one:** Mobile, universal instrument for coating thickness measurement and material analysis in laboratory quality

**Precise and exact:** Three-point support and geometry enable secure contact with the sample



**Mobile use:** Can be used flexibly indoors and outdoors

**Full flexibility:** Variable measuring direction for measuring bulky objects or even small parts

**Long operating time:** Battery charge last for up to six hours of operation



Corrosion protection in aircraft construction

## The specialist for field duty

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 with short measuring times. Even complex measuring tasks involving multiple layers are performed reliably – and quickly. How? The compact device detects thickness and composition of the layer in a single measuring step.



Measuring box



Measuring cell

Thanks to its three-point support, the XAN® 500 can be positioned securely on the surface, so layer thicknesses can be determined with repeatable accuracy. The results are shown directly on the display. For data evaluation, the handheld unit is equipped with the full version of WinFTM software that is offered with all of Fischer's other X-ray systems. As calibration samples may not be readily available, the WinFTM's fundamental parameter analysis offers standard free measurement capabilities to measure without prior calibration.

### Features

- Mobile and universal handheld instrument for precise coating thickness measurement and material analysis – even with difficult material combinations
- Weight 1.9 kg
- Up to six hours operating time with one battery charge
- Portable measurement box transforms the system into an XRF benchtop instrument
- Air cooled mini X-ray tube
- Fixed aperture
- Measuring spot Ø 3 mm
- Silicon drift detector for highest precision on thin layers
- Data evaluation via Bluetooth connection with full WinFTM® software
- Capable of bath analysis; liquid measuring cell is available option
- For outdoor use with IP54 protection rating

# FISCHERSCOPE® X-RAY MODULAR CHAMBER

**Think big:** Large chamber for large samples

**Tailor-made:** Different models offer the optimal solution for your application and requirements; flexible and modularly scalable

**Reliable:** Precise measurement through measuring points on the entire sample surface



**Configurable:** Size and design according to your requirements

**Proven software:** Fischer WinFTM software guarantees you most comprehensive functionalities and measurement applications

**Two in one:** Robust enclosure and proven Fischer measurement technology



Crankshaft

## Measurements on large-volume samples

The Modular Chamber enables precise measurements and analysis on large-volume workpieces that exceed the sample sizes of Fischer's standard X-ray instruments. The Modular Chamber combines a large housing with Fischer's proven XRF measurement technology. You get the measurement technology of your choice mounted in a chamber customized for your needs. FISCHERSCOPE® instruments of the XDL®, XDLM® and XDAL® series can be integrated.

The Modular Chamber offers maximum flexibility. Matching your sample, the support is available as a standard table or adapted support plate. The large, easily accessible measuring chamber allows convenient hand-ling of samples and can be configured in any size. The functional overall system comes with a stable underframe as an available option.

As standard, the chamber is equipped with metal sheets on the sides and Plexiglas panes in the front.



With underframe



Without underframe

### Features

- Large special enclosure for the integration of Fischer X-ray instruments for coating thickness measurements and material analysis on large-volume workpieces
- Integration of FISCHERSCOPE® X-RAY instruments XDL®, XDLM® and XDAL®
- Measuring direction with measuring top down
- Different X-ray tubes depending on the instrument
- Different apertures depending on the instrument
- Different filters depending on the instrument
- Various detectors ensure very good detection accuracy and high resolution: proportional counter tube, silicon PIN or silicon drift detector
- Different measuring table options: fixed or programmable
- Standard chamber size with approx. 1 m<sup>3</sup> and 1.5 m<sup>3</sup> or tailor-made

# FISCHERSCOPE® X-RAY 4000

**Tailor-made:**  
Individually adaptable to your application

**Programmable:** Approach measuring points precisely and change measuring task at the same time

**Inline measurement in real time:** Precise and fast measurement around the clock



**Easy to operate:** Strip for adjustment and operating panel easily accessible

**Compact design:** Traversing axis and measuring head in one unit

**DPP+ digital pulse processor:** Fast and precise measurement results



Electroplated stamped strip

## Inline measurement with maximum endurance

The FISCHERSCOPE® X-RAY 4000 series is developed for the continuous and non-destructive analysis and measurement of layers and layer systems in manufacturing processes. Designed for industrial requirements, the inline measuring system is used in production sites for the measurement of electroplated layers on solid and stamped strips. It also works with formed and stamped contact surfaces and measures the electrical contacts on strip materials or on membranes for fuel cells.



Stamped strip



Fuel cell membrane

### Features

- Robust inline instrument for measurement on solid strips, stamped grids or coated membranes, from a few millimeters up to one meter wide
- Microfocus tube with tungsten anode; molybdenum anode optional
- 2-fold or 4-fold changeable apertures
- 6-fold changeable filter
- Silicon drift detector 50 mm<sup>2</sup> for highest precision on thin layers
- DPP+ digital pulse processor for higher count rates and significantly reduced measurement times
- Hardware and software aligned to measuring tasks related to inline measurement
- Horizontal or vertical installation position
- Various interfaces for process control

Thanks to simple handling, automated calibration and minimum set-up times, converting from one product to another is simple due to the easily adjustable conveyor guides. The programmable axis of the measuring head allows reliable measurements at different positions of the product to be measured.

# FISCHERSCOPE® X-RAY 5000

**Tailor-made:** Individually adaptable to your application

**Does not break a sweat:** Sample temperatures up to 250 °C (482 °F) thanks to water cooling



**Compact design:** Small measuring head with all necessary components



**Low wear:** No moving parts

**Vacuum compatible:** Can be mounted on vacuum chambers

**DPP+ digital pulse processor:** Even faster analysis results and better performance



Solar panel quality control

## Inline measurement for utmost precision for thinnest layers

The FISCHERSCOPE® X-RAY 5000 is the perfect for non-destructive analysis and measurement of thin coatings on large-area products and substrates, such as in photovoltaics, fuel cells, on glass panels, films and tapes and very hot surfaces. The instruments of this series form modular units that can be easily integrated into manufacturing production lines. Their rugged design specifically meets the tough demands of industrial environments and for continuous operation.



X-RAY 5000 Scanner



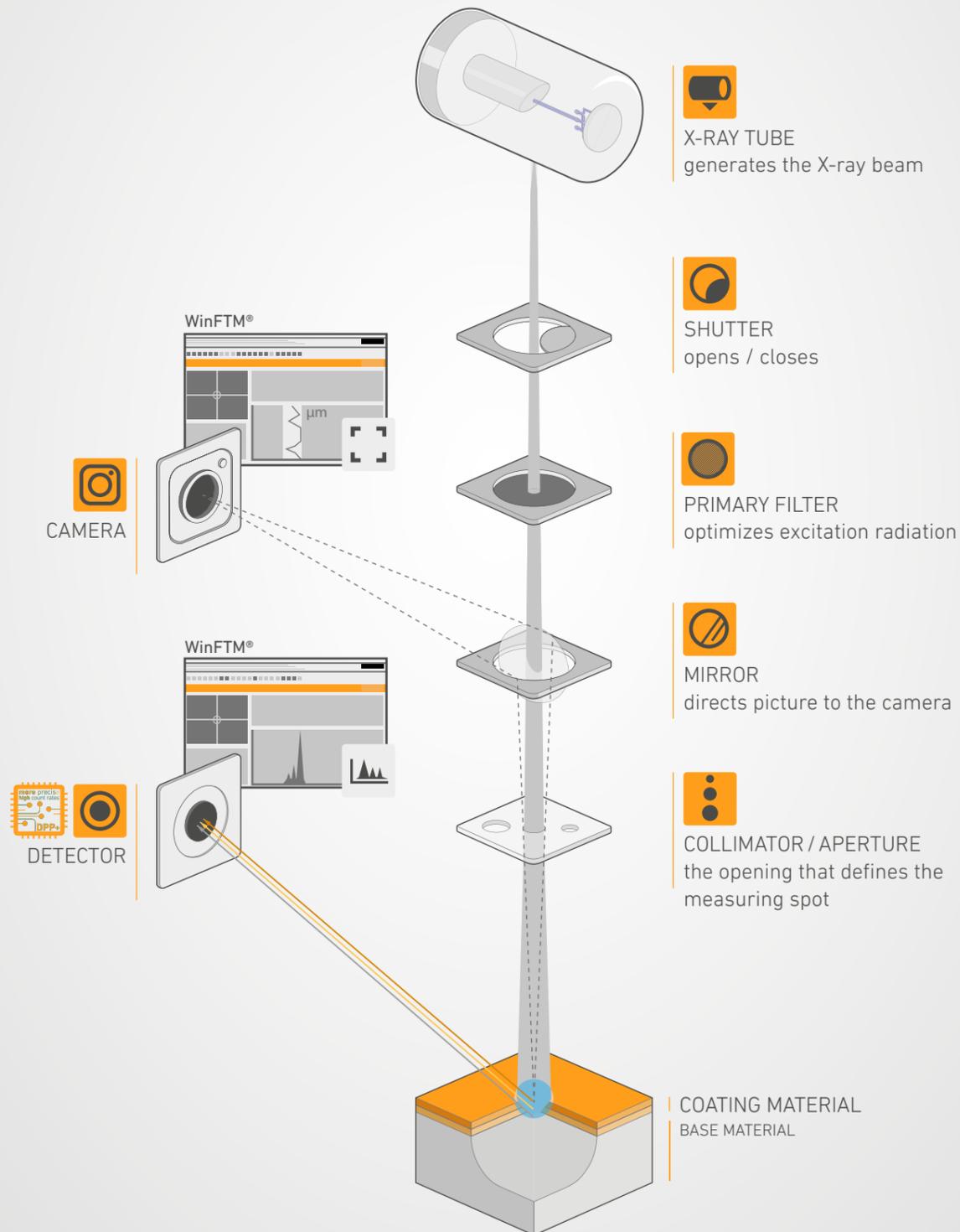
Inline coating thickness measurements on steel bands, e. g. Cu/Fe

Designed for automation, the measuring heads can be easily mounted on vacuum chambers via an ISO 250F flange or integrated inline in atmosphere. Calibration is quick and easy during the production process. With large apertures and state-of-the-art detectors, you benefit from excellent repeatability. The measuring heads can be integrated into existing lines or supplied as a complete customized turnkey solution.

### Features

- Robust inline instrument for analysis and measurement of thinnest layers and layer systems in the running process with connection to the production control system
- Microfocus tube with tungsten anode; molybdenum anode optional
- Fixed aperture (configurable)
- Fixed filter (configurable)
- Silicon drift detector 50 mm<sup>2</sup> for highest precision on thin layers as well as Peltier cooling
- DPP+ digital pulse processor for higher count rates and significantly reduced measurement times
- For measurements in vacuum or air
- Available option: Water cooling for sample temperatures up to 250 °C (482 °F)
- Variable mounting position possible
- Various interfaces enable connection to PLC

# Who wants to know exactly: The anatomy of the X-ray instrument



X-ray fluorescence analysis is a clean, non-contact, non-destructive and fast measurement method working for all elements of technical relevance. It is based on the phenomenon that atoms, when excited by primary X-rays, release energy in the form of element-specific fluorescence radiation. The spectrum of the emitted radiation provides information about the makeup of the sample. This enables both analysis of the material composition and measurement of a coating's thickness.



**X-ray tube:** The X-ray tube generates the primary X-ray radiation. More advanced models have a high-resolution microfocus tube. Devices thus equipped allow for smaller measuring spots.



**Shutter:** Integrated into the beam path, the shutter is a safety device. It prevents primary radiation from entering the measuring chamber. The system only unlocks for the duration of the measurement, and only when the lid is closed. This prevents the risk of harm to the operator.



**Primary filter:** Depending on the filter used, the excitation conditions can be adjusted for different measuring tasks.



**Camera / Mirror:** The mirror directs the image to the camera. This allows the positioning of the measuring spot to be monitored.



**Collimator / Aperture:** The aperture restricts the diameter of the primary beam, ensuring that a measuring spot of defined size is excited. With smaller apertures the majority of the primary radiation is shielded from the sample. Polycapillaries, on the other hand, focus the entire X-ray radiation onto a tiny surface, allowing for short measuring times even with small measuring spots.



**Detector:** Its quality determines for which measuring tasks an instrument is suitable. Fischer offers three types of detectors:

**Proportional counter tube:** The detector for simple measuring tasks is predestined for the measuring thicker layers with small measuring spots.

**Silicon PIN diode (PIN):** The mid-range detector can be used for both material analysis and coating thickness measurement of more complex measurement tasks.

**Silicon drift detector (SDD):** The strengths of this modern semiconductor detector lies in its ability to measure very thin layers and perform trace analysis in the ppm range.

**Digital Pulse Processor (DPP):** The in-house developed Fischer DPP is a high-tech component that processes very high pulse and counting rates. It amplifies the events recorded by the detector. Together with the detector, the DPP is responsible for very high stability and energy resolution. Regardless of the number of pulses per second.





# Standards you can rely on

## The right measurement is what counts

Only a well-calibrated measuring instrument delivers correct results. For this reason, Fischer places top priority on accuracy for its calibration standards. Our in-house calibration laboratory produces traceable standards that are recognized all over the world.

Whether coating thickness measurement or material analysis - with well over 500 different calibration standards, Fischer has the right standard for every application. With ready-made sets for corrosion protection, printed circuit boards and RoHS, you are set for special measuring tasks.

Calibration standards are available either as coated base material or as foils. Foil standards can be combined with other materials for further adherence to your measuring task. Our experts will gladly help you to find the right calibration strategy.



They meet the highest quality standards of state metrological institutes like the Physikalisch-Technische Bundesanstalt (PTB), the National Institute of Standards and Technology (NIST) or the National Institute of Metrology (NIM).

With internationally recognized calibration and analysis certificates, you gain certainty while bolstering your customers' confidence in your products.

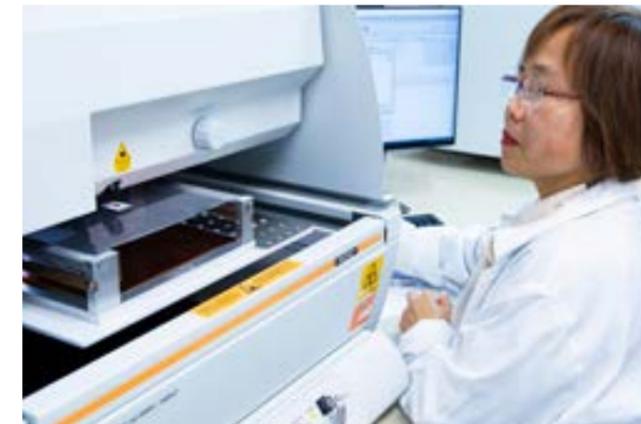
## Unique service: your product as an individual calibration standard

Benefit from your customized calibration standard and have your sample certified as a calibration standard by our measurement experts.

In addition to in-house manufactured, certified standards, Helmut Fischer's calibration laboratory also offers the certification of specific customer material according to ISO/IEC 17025. So you can use your workpieces for process control, quality control or development - thanks to the DAkkS calibration certificate!

Contact us and we will be happy to advise you on your individual, customized solution:  
[sales@helmut-fischer.com](mailto:sales@helmut-fischer.com).

## Safety through our accredited test laboratory



Fischer runs several accredited calibration laboratories. The speciality: Fischer is the first and only company with an own calibration laboratory in Germany to be accredited according to DIN EN ISO/IEC 17025 for the mechanical measurand "mass per unit area".

Such standards are used to calibrate X-ray fluorescence instruments for measuring layer thickness.



## A reliable partner for the entire life of your instrument

### In every respect, we are there for

- Telephone hotline and online support
- Regional service centers - worldwide
- Onsite service in 21 countries
- Qualified X-ray service specialists
- Individual product training
- Customized inspection contracts
- Recertification and calibration service for reliable measurement results
- Individualized task programming
- Provision of rental equipment

### For maximum availability of your X-ray instrument

At Fischer, service and customer proximity are of utmost importance. Our experts are there to assist you worldwide with advice and support throughout the entire product life cycle. You can rest assured that you will get the help you need quickly. Further support is available from our application laboratories in Germany, Switzerland, China, India, USA, Japan and Thailand. These labs support you in working out the best measurement strategy or defining a suitable measurement program.

### Our recommendation: regular inspections

To ensure the longevity of your X-ray instruments, and that wearing parts are replaced when needed, we recommend regular inspections - preferably on an annual basis. Our standard packages automatically include inspections according to ISO 9001 and IATF 16949. We also offer customized contracts to suit your specific needs.

All inspections are carried out on your premises by our specially trained service personnel. This keeps downtime to the absolute minimum. If the maintenance and calibration phase is expected to take longer, we are happy to provide rental equipment to bridge the gap.

“ At Fischer, the customer relationship does not end with the sale of an instrument – that is only when it begins. ”

*Paul Comer, Technical Director at Graphic Plc, England*



Do you need technically sound advice?  
Then contact us!  
[sales@helmut-fischer.com](mailto:sales@helmut-fischer.com)



## Everything concerning your measuring task

### Application advice from experts for precise measurement results

The equation for successful quality managements is: the right measurement technology paired with the appropriate measuring method. These traits combined with the correct application of the equipment creates reliable, valid, and controlled measurements. For all scientific and technical questions regarding your measuring task, our application laboratories are ready to assist you.

In seven application laboratories in Germany, Switzerland, China, USA, India, Japan and Thailand and at our Fischer representatives, specialists from the fields of physics and engineering are available to provide you with advice and assistance. Whether helping to choose the right measuring instrument, developing an in-depth measuring strategy or defining the right measurement program, a consultation with the experts at Fischer will help you to solve even the most complex measurement challenges.

Learn about our product portfolio onsite at one of our application laboratories. Our devices are also available for you to test. All application laboratories are well connected, both among themselves and with universities, educational institutions and the industry.

This is how we make sure that the latest technology is available to you worldwide. And we ensure that we find the right answer to your every question.

### Our services at a glance

- Professional technical advice via email
- Telephone and in person in the application laboratory
- Realization of feasibility studies to identify optimal measurement solutions
- Development of internal test specifications
- Contract measurements with inspection report according to ISO 17025
- Training on specific topics such as calibration, pattern recognition and programming of automatic measurements
- Sample measurement live: We measure your sample and you participate live
- Creation of customer-specific measuring tasks

## Global application support where we have a presence



The solution for your application questions is always within arm's reach – worldwide. Visit Fischer at one of our application laboratories or get local application support at your Fischer representative.

### CHINA

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Hong Kong, Taiwan

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