The Measure of Experience

X-RAY Fluorescence Measuring Instruments for Coating Thickness Measurement and Materials Analysis

Experience counts

Whether you are measuring coating thickness or performing materials analysis, FISCHER offers the ideal instruments for most applications.

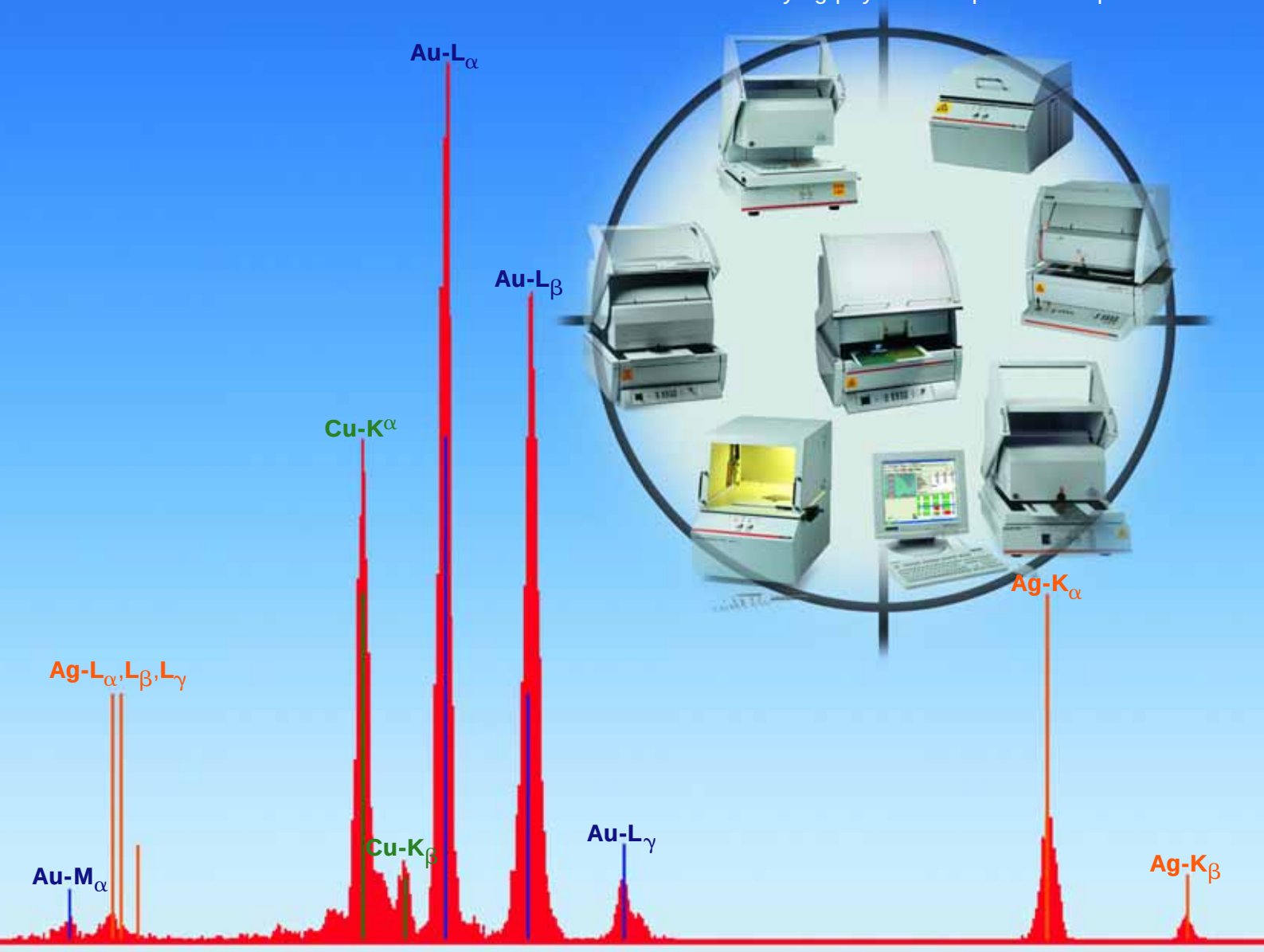
For nearly 25 years, pioneering work has been done for the continuous development of the FISCHERSCOPE® X-RAY product line. Numerous patents, such as the autofocus system and the transparent collimator, are a testament to this work.

The capabilities of these measuring instruments are driven by the WinFTM® V.6 control software. This easy-to-use software sets the benchmark in terms of versatility and accuracy.

You too can profit from our experience.

FISCHERSCOPE® X-RAY instruments offer

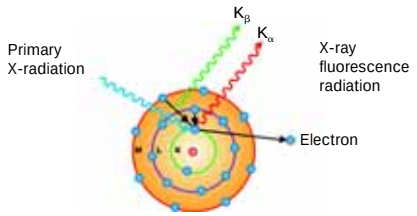
- High-precision coating thickness measurement and materials analysis.
- Measurement method: Energy dispersive X-ray fluorescence (EDXRF) according to ASTM B 568 and DIN EN ISO 3497.
- Automated measurement capability for economic operation.
- Complete model range from inexpensive standard instruments to very sophisticated high-end measuring systems.
- Top-notch service before and after the purchase.
- Application consultation based on knowledge of the underlying physics and practical experience.



Tracing Success

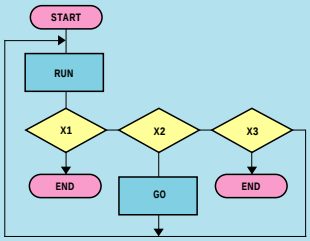
Competency and experience
For nearly 25 years, HELMUT FISCHER has been developing, manufacturing and distributing X-ray fluorescence instruments for coating thickness measurement and materials analysis. By now, thousands of FISCHERSCOPE® X-RAY instruments are used by customers worldwide. Even instruments of the very first generation are still operating as perfectly as on their first day – evidence for the exceptionally high reliability of the instrument designs. Experiences and ideas of costumers are continuously integrated into our development. This is an important reason for the international technological leadership role of HELMUT FISCHER and its X-ray development team. The great component manufacturing depth in our own plants ensures the highest quality and minimizes supplier dependence. In this manner, FISCHER is able to flexibly implement particular customer specifications.

The measurement method
Physical principle of the energy-dispersive X-ray fluorescence method (EDXRF):
The radiation of an X-ray tube excites the sample to emit X-ray fluorescence radiation, which is characteristic for each element. The detector registers the energy spectrum. The elements contained in the sample can be identified through the characteristic energies of the peaks of the spectrum. The concentrations of the elements, or the coating thicknesses, respectively, are determined by the intensity of their radiation portions. A proportional counter tube or a semiconductor detector delivers the measuring signal.

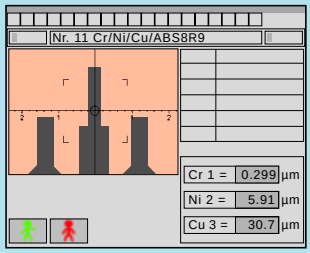


The measurement and control software WinFTM® Version 6 (short: ”V.6”)
WinFTM® V.6 BASIC features the full functionality and enables the measurement of up to 24 individual measurement parameters in one sample. The lower-cost WinFTM® V.6 LIGHT version features the same functionality as the V.6 BASIC, except that it can measure only a maximum of 4 independent measurement quantities simultaneously (coating thickness). It can do analysis measurements with max. 5 measurement quantities.

TASK programming for automated measurements
Even untrained workers can start complex measurement sequences with the click of the mouse on an icon or with the push of a button. A Task routine is a program written by the user for a measurement sequence.
- IF queries and loops are possible.
- Several products can be used in combination.



Complete overview due to picture-in-picture display of measurement data and video image of the specimen or the measurement spot.
- Video images can be stored in bmp or jpg formats.
- Electronically inserted true-to-scale crosshairs.
- Measurement spot- and location true-to-scale at any measurement distance.



mq factor = reliability check for the measurement
The mq factor is used to avoid erroneous measurements and evaluation errors.
- The mq factor is a measure for the conformity between the measured and the theoretical spectrum.
- The mq factor allows the user to evaluate the quality of the measurement result.

Multiple functions and simple operation
WinFTM® V.6 BASIC and V.6 LIGHT offer both multiple functions and simple operation. Untrained operators can utilize the multiple functions of the X-ray instruments after brief training.

Experienced users of WinFTM® V.6 can solve the most complex measurement technology and analysis challenges. The capabilities are limited only by physics itself.

Solutions for any area of application
Due to the large range of detectable elements from aluminum to uranium, the range of application for the X-ray instruments stretches from industrial applications to research and science.
Regardless whether the measurement

applications are of a metallurgical, geological, forensic or other analytical nature, almost any sample dimension or condition can be measured (solids, powders, pastes, liquids).

Large measurement chamber with complete safety system

Advantages: High operational reliability and no more expensive repairs!

- Protective device with light curtain sensors for the z-axis.
- Sensor devices protect all sensitive parts of the measuring head if the specimen were to be positioned incorrectly.

Supply slot for panel-shaped specimens

- Large panel-shaped specimens that would otherwise not fit into the measuring chamber can be inserted through the slot between the hood of the measuring chamber and the base of the instrument. This allows for the automatic analysis of even very large printed circuit board panels.

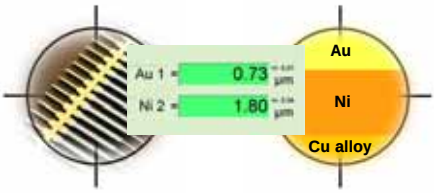
XY(Z) measuring stage and manual specimen supports

There is a large selection of non-motor-driven specimen supports and programmable XY(Z) measuring stages. Properties of the maintenance-free XY(Z) measuring stages:

- Optimal, fast handling of specimens
- Large XY(Z) travel
- High positioning accuracy

Coating thickness measurement

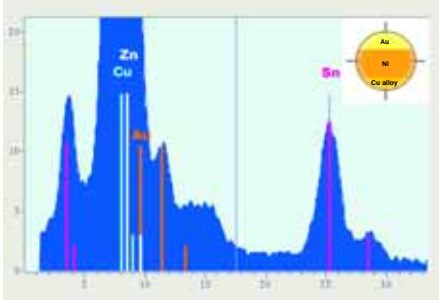
- WinFTM® V.6 BASIC can determine up to 24 individual characteristic parameters of a sample relating to coating thickness and element concentration simultaneously in one measurement step.



- Under certain conditions, individual elements may even appear multiple times in different layers of the coating system.
- Very thin coatings down to the 10-nanometer range can be measured.
- Complex multi-coating systems can be analyzed with high accuracy, often even standard-free.

Coating and materials analysis

- Quantitative analysis of the alloy composition of coatings.
- Individual coatings can be composed of up to 24 elements. Up to 24 coatings can be analyzed in one coating system (with V.6 BASIC).



- Even buried layers can be analyzed, including the carrier material.
- Material analysis of up to 24 elements.

Standard-free measurements and traceability

The fundamental parameter method allows for the standard-free measurement of all physically sensible coating systems and analysis samples. The measurement accuracy can be increased by using up

Deutscher Akkreditierungs Rat

DKD-K-33101
Accredited acc. to
DIN EN ISO/IEC 17025

to 64 calibration standards per application. This, in turn, secures the traceability of the measurement results as well.

DKD certified calibration standards

Many calibration standards are available with a DKD calibration certificate because of the accreditation through the Deutsche Kalibrierdienst – DKD [*German Calibration Service*].

Superior X-RAY measuring instruments

FISCHERSCOPE® X-RAY XDAL®

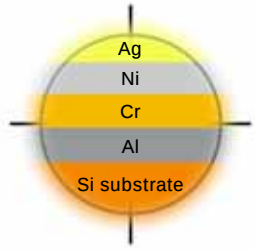
This spectrometer enjoys the advantages of a large, high-precision XY(Z)-measuring stage in combination with a semiconductor detector. Its high energy resolution allows the XDAL® to provide reliable analysis results and coating thickness measurements with short measuring times.

Version XDAL®-FD

A fast analog pulse processor (FD "Fast Detector") up to 10,000 cps allows for processing of very high count rates. This increases the repeatability precision while keeping the same measuring time.

Version XDAL® T9

A very fast, precise and large XY-stage allows for optimized specimen handling. Even large specimen can be inspected automatically. Dimensional comparison: cf. XDL® A9/T9, next page.



FISCHERSCOPE® X-RAY XAN®

A high-performance spectrometer in a remarkably low price range. Thanks to the high energy resolution of its semiconductor detector, the XAN® allows for reliable analyses and coating thickness measurements with short measuring times.

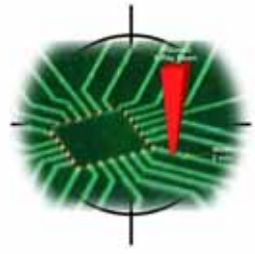
Versions XAN®-FD and XAN®-DPP

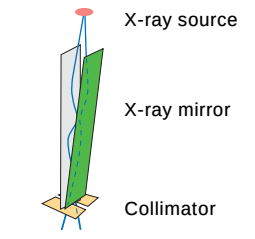
A fast analog pulse processor (FD "Fast Detector"; up to 10,000 cps), or a digital pulse processor (DPP; up to 100,000 cps), respectively, allows for processing of very high count rates. This increases the repeatability precision while keeping the same measuring time.
Version XAN®-FD BC: With increased measuring chamber height (248 mm instead of 86 mm).

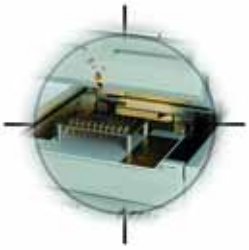
FISCHERSCOPE® X-RAY XDVM®-µ

When the task is the measurement of the finest surface structures on miniaturized components or pc boards, the solution is the XDVM®-µ. With its novel patented mirror X-ray optics, this instrument can generate very small test spots with high radiation intensity. In this manner, measurements of structures only a few tens of micrometers are possible.

The standard version XDVM®-µ is equipped with a proportional counter tube as the detector.
Version XDVM®-µ-SD: With Si-PIN semiconductor detector
Version XDVM®-µ-SD-C: With Si-PIN semiconductor detector and polycapillary X-ray optics.



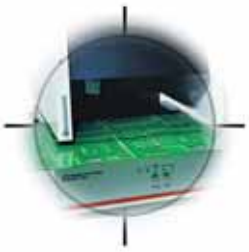




FISCHERSCOPE® X-RAY XDVM®-W

The XDVM®-W simplifies the application of the X-ray fluorescence method and makes it very versatile. The ultra highprecision XY(Z) measuring stage with its large travel enables automated measurements of the finest structures.

It is ideally suited for (large volume) measurements of screws, contact strips, pc-boards, ...



FISCHERSCOPE® X-RAY XDL®-B / XDLM®-C4

A practical, user-friendly measuring instrument in a particularly economical design.

The large measurement chamber allows the measurement of large specimens with irregular surface contours.

Model series XDL® A9/T9: A particularly large measuring chamber allows for the measurement of extremely large specimens.

Dimensional comparison A9/T9 vs standard models

FISCHERSCOPE® X-RAY XUL® / XULM®

X-ray tube and detector are arranged underneath the measuring chamber – as with the very successful predecessor model series X-RAY 1000/1010/1020.

The measurement direction is from bottom to top, which has great practical advantages with many measurement applications.

This significantly simplifies routine inspections of small components: Positioning is done in no time at all and measurements can be started without long focussing.

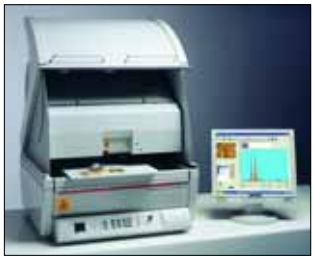
FISCHERSCOPE® X-RAY XDV®-SD

Instrument Models at a Glance

RoHS screening on XY(Z) stage

Technical Highlights

- Ideal sample positioning and handling.
- 6 primary filters allow for optimum excitation conditions through adaptation of the primary X-ray spectrum.
- Excellent energy resolution of the measured spectrum using a highly sensitive semiconductor detector.
- Extremely short measuring times due to the high X-ray intensity (largest collimator diameter 3 mm) and processing of the X-ray fluorescence information in an innovative digital pulse processor.
- Analysis on very fine surface structures such as printed conductors. Collimator diameters available from 0.1 mm to 3 mm.



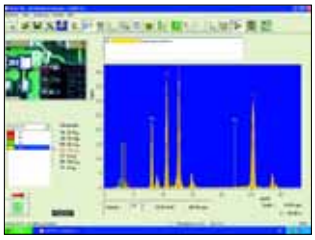
Assay determination of gold jewelry

Applications

All measurement applications for coating thickness measurement and general materials analyses that are relevant in practical situations, e.g., incoming inspection and QA can be solved with this instrument.

This instrument has been developed specifically for the challenges in connection with RoHS / WEEE analyses as well as the assay determination of gold and other precious metals.

A repeatability precision of 0.5 ‰ can be achieved for **gold analyses**.

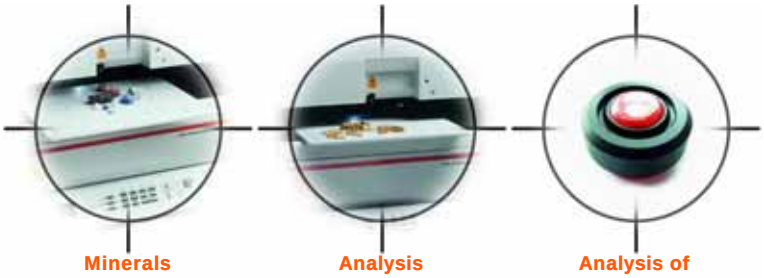


RoHS analysis of a pc-board

RoHS / WEEE

- Up to 24 individual characteristic values of a sample with regard to coating thickness and element concentration can be determined simultaneously during one measurement.
- Very thin coatings down into the 10-nanometer range can be measured.
- Most often, complex multi-coating systems can be analyzed standard-free (without calibration) with great accuracy.
- The measurement accuracy can be raised to a maximum by using up to 64 calibration standards per application.

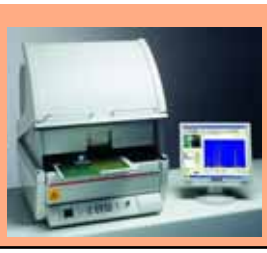
Typical applications



Minerals | Analysis of precious metals | Analysis of electroplating baths

FISCHERSCOPE® X-RAY Instrument models	XAN® XAN®-FD XAN®-FD BC XAN®-DPP 
Instrument type (XRF = X-ray fluorescence)	XRF-Spectrometer with a high energy resolution and an excellent price/performance ratio.
Primary fields of Typical	Materials analysis and coating thickness measurement in the element range Z = 13 (Al) to Z = 92 (U). RoHS and WEEE analytics. Gold assay, jewelry, lab analytics, very thin coatings, solar cells, solution analysis, powder.
Product highlights	Very simple and fast: manual positioning of specimen. Always optimally high signal intensity due to multi-collimator set.
Software [1]	WinFTM® V.6 BASIC & PDM.
Measurement direction	↑ Primary beam bottom to top.
X-ray tube	Micro-focus tungsten tube with Be window. Two primary filters (Ni and Al) can be added.
Collimators	Four collimators with the dimensions: ø 0.2 mm; ø 0.6 mm; ø 1 mm; ø 2 mm. Software-controlled, motor-driven adjustment.
Minimum size of measuring spot	ø 0.3 mm
Usable focal range [2]	0-22 mm
Detector	PIN semiconductor diode with high energy resolution.
Measuring stage	Fixed specimen support with exchangeable insert that is covered with a transparent replaceable foil for free beam transmission.
Stage loading and sample positioning	Sample placed directly on the measuring stage and positioned manually using the video image.
Programmable XY-travel	No programmable stage travel.
Z-axis	No Z-axis, however, optical focussing up to a distance of 22 mm.
Interior dimensions [mm]	W = 320; D = 460; H = 90 (model BC: 248)
Measuring chamber	Large volume chamber with fixed, exchangeable sample support.
Focusing on meas. spot	Visual focussing using rotary knob.
Magnification (in reference to a 19“ Monitor) [3]	Optical: 34-46x Digitally: in steps 1, 2, 3 and 4x Total: 34-184x

[1] PDM Software serves for extended product administration and result documentation.

XDAL® **XDAL®-FD** **XDAL®-T9** 	**XDV®-SD** 	**XDVM®-µ** **XDVM®-µ-SD** **XDVM®-µ-SD-C** 
XRF-Spectrometer with a high energy resolution and programmable XY(Z)-stage.	XRF-Spectrometer with a high energy resolution and programmable XY(Z) stage. The top instrument for users with the highest demands.	XRF coating thickness analyzer with innovative micro-focus X-ray optics for very small measurement spots.
Materials analysis and coating thickness measurement in the element range Z = 13 (Al) to Z = 92 (U). RoHS and WEEE analytics. Gold assay, jewelry, lab analytics, very thin coatings, solar cells, solution analysis, powder.	RoHS and WEEE analytics, Gold assay, jewelry, lab analytics, very thin coatings, solar cells, solution analysis. Element range Z = 13 (Al) to Z = 92 (U).	Coating thickness measurement and materials analysis in the element range XDVM®-µ: Z = 17 (Cl) to Z = 92 (U); XDVM®-µ-SD-(C): Z = 13 (Al) to Z = 92 (U). Pc board testing, lead frames with extremely small structures, raster scans (area profiles).
High-precision, programmable XY(Z)-stage with large travel range. Very large useable interior space.	Large useable interior space. High countrates when using large collimators. Ultra highprecision, programmable XY(Z) -stage with large travel range. Six primary filters for adapting the primary excitation spectrum.	Ultra highprecision, programmable XY(Z)-stage with large travel range. Revolutionary X-ray optics with very small measurement spot for high count rates.
WinFTM® V.6 BASIC & PDM.	WinFTM® V.6 BASIC & PDM.	WinFTM® V.6 BASIC & PDM.
↓ Primary beam top to bottom.	↓ Primary beam top to bottom.	↓ Primary beam top to bottom.
Micro-focus tungsten tube with Be window. Two primary filters (Ni and Al) can be added.	Micro-focus tungsten tube with Be window. Six primary filters can be added.	Micro-focus tungsten tube with Be window. 1 additional primary filter (Ni) can be added.
Four collimators with the dimensions: ø 0.1 mm; ø 0.3 mm; ø 0.6 mm; 0.5 mm x 0.15 mm	Four collimators with the dimensions: ø 0,1 mm; ø 0,3 mm; ø 1 mm; ø 3 mm	---
ø 0.18 mm	ø 0,1 mm	0.02 mm x 0.05 mm
0-20 mm	0-20 mm	0-2.5 mm
PIN semiconductor diode with high energy resolution.	PIN semiconductor diode with high energy resolution.	XDVM®-µ: Xenon-filled proportional counter tube. XDVM®-µ-SD-(C): PIN semiconductor diode.
Motor-driven in X- and Y-direction with joystick, left or right mouse button; moveable and programmable sample support. Laser light spot as positioning aid.	Motor-driven in X- and Y-direction with joystick, left or right mouse button; moveable and programmable sample support. Laser light spot as positioning aid.	Motor-driven in X- and Y-direction with joystick, left or right mouse button; moveable and programmable sample support. Laser light spot as positioning aid.
Measuring stage automatically moves out when opening the cover. Fine positioning using joystick or mouse (Point & Shoot).	Measuring stage automatically moves out when opening the cover. Fine positioning using joystick or mouse (Point & Shoot).	Measuring stage automatically moves out when opening the cover. Fine positioning using joystick or mouse (Point & Shoot).
XDAL®, XDAL®-FD 256 mm x 235 mm [4] $v_{max.}$: 25 mm/s Precision: 0.01 mm XDAL® T9 450 mm x 281 mm [4] $v_{max.}$: 100 mm/s Precision: 0.005 mm	XDAL®-FD 250 mm x 250 mm $v_{max.}$: 25 mm/s Precision: 0.005 mm Additional Y-axis for 400 % stage travel velocity (rapid loading!).	250 mm x 250 mm $v_{max.}$: 25 mm/s Additional Y-axis for 400 % stage travel velocity (rapid loading!). Precision: 0.005 mm
Motorized moveable and programmable detector unit.	Motorized moveable and programmable detector unit.	Motorized moveable and programmable detector unit.
W 460; D 500; H 146 (model T9: 700x580x200)	W = 560; D = 530; H = 140	W = 560; D = 530; H = 130
Slotted design for large flat specimens that would otherwise not fit in the measurement space.	Large volume chamber without slot.	Slotted design for large flat specimens that would otherwise not fit in the measurement space.
Auto-focus or visual focussing.	Auto-focus or visual focussing.	Auto-focus or visual focussing.
Optical: 20-45x Digitally: in steps 1, 2, 3 and 4x Total: 20-180x	Optical: 20-45x Digitally: in steps 1, 2, 3 and 4x Total: 20-180x	Optical: 30 / 92 / 277x Digitally: in steps 1, 2, 3 and 4x Total: 30-1108x

[2] For parts with a measurement point positioned behind. [3] depending on the measuring distance. [4] with loading function switched off.

XDVM®-W	**XUL® XULM®**	**XDL®-B XDLM®-C4**
		
Universal XRF coating thickness analyzer with a programmable ultra high precision stage.	XRF coating thickness analyzer with simple operation and an excellent price/performance ratio.	XRF coating thickness analyzer with simple operation and various stage options.
Coating thickness measurement and materials analysis in the element range Z = 17 (Cl) to Z = 92 (U). Connector contacts, pc-boards, for raster scans (area profiles) or coatings with very small measurement spots, fine wires.	XUL®: High volume components with differing geometrics, single readings with minimum positioning effort. XULM®: Particulary well suited for very fine geometries: fine conductors, wires, lead frames.	All areas. Manual and automated measurements. Most universal and most sold XRF instrument. High volume components with differing geometries, also larger parts with measurement spot recessed up to 80 mm.
Ultra highprecision, programmable XY(Z)-stage with large travel range. Very small measurement spot, greatly enlarging optics, large measurement chamber, very fast stage loading.	Manual measuring stage for fast and very easy sample positioning. Compact design. Co-absorber optional.	Measuring stage options with manual or programmable motor drive. Model series XDLM®-C4 with 4x collimator (round and slot-shaped collimators). Co-absorber optional.
WinFTM® V.6 LIGHT & PDM.	WinFTM® V.6 LIGHT	WinFTM® V.6 LIGHT
↓ Primary beam top to bottom.	↑ Primary beam bottom to top.	↓ Primary beam top to bottom.
Micro-focus tungsten tube with Be window. 1 additional primary filter (Ni) can be added.	XUL®: Tungsten tube. XULM®: Micro-focus tungsten tube. Both with Be-window. Two primary filters (Ni and Al) can be added.	XDLM®-C4: Micro-focus tungsten tube; XDL®-B: Tungsten tube. Both with Be-window. Two primary filters (Ni and Al) can be added.
Four collimator positions, exchangeable sizes from 0.03 mm to 0.3 mm.	XUL®: single collimator ø 0.3 mm or optional 0.05 mm x 0.3 mm; XULM®: mot. 4x collimator: ø 0.1 mm; ø 0.2 mm; 0.05 x 0.05 mm; 0.03 mm x 0.2 mm	XDL®-B: single collimator ø 0.3 mm or optional 0.05 mm x 0.3 mm. XDLM®-C4: mot. 4x collimator ø 0.1 mm; ø 0.2 mm; ø 0.3 mm; slot-shaped 0.3 mm x 0.05 mm
0.07 mm x 0.27 mm	XUL®: ø 0.51 mm XULM®: ø 0.15 mm	XDL®-B: 0.34 mm x 0.09 mm XDLM®-C4: 0.10 mm x 0.44 mm
5 mm; 29 mm; 61 mm; 93 mm	0-20 mm	0-80 mm
Xenon-filled proportional counter tube for high count rates.	Xenon-filled proportional counter tube for high count rates.	Xenon-filled proportional counter tube for high count rates.
Motor-driven in X- and Y-direction with joystick, left or right mouse button; moveable and programmable sample support. Laser light spot as positioning aid.	Fixed specimen support or manual XY-stage with exchangeable insert that is covered with a transparent replaceable foil for free beam transmission.	Motorized moveable and programmable specimen support or manual stage. Laser light spot as positioning aid.
Tongue function – additional fast Y-axis for stage delivery; ideal for frequent sample loading. Fine positioning using joystick or mouse (Point & Shoot).	Sample placed directly on the measuring stage and positioned manually using the video image. Manual XY-stage optional.	Motorized versions: stage automatically moves out when opening the cover. Fine positioning using joystick or mouse (Point & Shoot).
250 mm x 250 mm $v_{max.}$: 25 mm/s. Additional Y axis for 400 % stage travel velocity (rapid loading!). Precision: 0.005 mm	No programmable stage travel.	Travel range XDL®-B XYZp T9: 450 mm x 281 mm [4] $v_{max.}$: 100 mm/s Precision: 0.005 mm Additional stage versions with different travel ranges and specifications are offered.
Motorized moveable and programmable detector unit.	No Z-axis, however, optical focussing up to a distance of 27.5 mm.	Versions with fixed, motorized or programmable Z-axis available.
W = 560; D = 530; H = 145	W = 360; D = 380; H = 240	W = 460; D = 500; H = 300
Slotted design for large flat specimens that would otherwise not fit in the measurement space.	Large volume chamber with fixed, exchangeable sample support.	Slotted design for large flat specimens that would otherwise not fit in the measurement space.
Auto-focus or visual focussing.	Visual focussing using rotary knob.	Auto-focus or visual focussing.
Optical: 40-142x Digitally: in steps 1, 2, 3 and 4x Total: 40-568x	Optical: 38-46x Digitally: in steps 1, 2, 3 and 4x Total: 38-184x	Optical: 20-45x Digitally: in steps 1, 2, 3 and 4x Total: 20-180x

Subject to changes.

Additional performance features

Performance feature	Advantages	Benefit
FISCHERSCOPE X-RAY measuring system hardware		
Ready to measure at any time	The intelligent design of the measuring instrument ensures measurements can be made continuously. Cooling breaks are not necessary.	The user may start a measurement at any time without the need to wait for the ramp-up of the high voltage for the X-ray tube.
Adapted primary X-radiation	The incident X-ray beam that produces the fluorescence effect from the sample can be modified to suit the measuring application. This is achieved by varying the high voltage and selecting the appropriate primary filter .	Optimal excitation conditions can be set for each measuring application.
XY(Z) measuring stages with a very fast Y-axis	The measuring stage travels significantly faster to and from the measuring position and the loading position than in instruments of a simpler design.	Ideal for quickly changing specimens.
Ergonomic instrument operation	Available operating elements: - Mouse and software command buttons, or - Push buttons on the front control panel.	Each user finds the control elements that are most convenient for him/her for controlling the measurement system. Often used control elements are accessible quickly and easily.
Measurement and control software WinFTM® V.6		
Coating thickness measurement and materials analysis are possible simultaneously	Coating thickness measurement and materials analysis can be performed simultaneously. Alloy layers can be analyzed. In addition, a measurement method that is not influenced by the substrate material is made possible : During the coating thickness measurement, the substrate material is analyzed automatically and simultaneously. Materials underneath a top coating can be analyzed as well, without the need to remove such coatings (as long as the coatings are not too thick).	- Greatest possible application variety. - In many cases, the normalization can be omitted when making measurements on different substrate materials. This makes work easier and saves time! - The reliability of the measurement results is increased by a measurement method that is not influenced by the substrate material.
Calibrated measurements	Using up to 64 calibration standards per measuring application provides measurement results of highest accuracy.	Reliable measurement results. Results are traceable according to DIN EN ISO / IEC 17025.
Standard-free measurements	The fundamental parameter method enables the standard-free measurement of all physically useful samples.	Samples of an unknown composition can be analyzed quickly and simply. Even samples for which calibration standards are not yet available can be measured with high accuracy.
Automatic product selection	A sample with an unknown composition can be assigned automatically to an existing product (measurement parameter) after a short measurement. A fitting product class must have been selected.	Automatic product selection brings more comfort and speed to routine measurements.
The measurement uncertainty can be determined prior to making measurements	The expected measurement uncertainty of a certain measuring application can be calculated in advance without the need for an actual specimen.	The possible measurement range, for example of a novel coating system, can be estimated by specifying a max. admissible measurement uncertainty and measuring time.
Program module for convenient setup of measurement print forms	Due to the user-friendly word processing program of the PDM Software, the user can design his/her own layout of the measurement print forms, including video image and company logo.	Setup of an individually adjusted measurement print form, including statistical evaluations, is possible with little effort.
Perfect presentation and evaluation of several spectra simultaneously	Up to 27 spectra can be presented simultaneously - in any desired combination. This is advantageous for comparison of results of different samples. A certain spectrum can be selected as a reference for the current analytical evaluation.	The spectra required for the evaluation can be clearly shown and hidden.
Overview image of the specimen surface	For a better presentation of the measurement location in the video image, WinFTM® can compile an overview image of the specimen surface from several individual video images. The user can travel directly with the click of the mouse to certain measurement spots within the overall image.	- This simplifies programming of the XY(Z) measurement point coordinates. - Easy orientation on large area specimens. - Using this tool, the user can very easily travel directly to particular coordinates.

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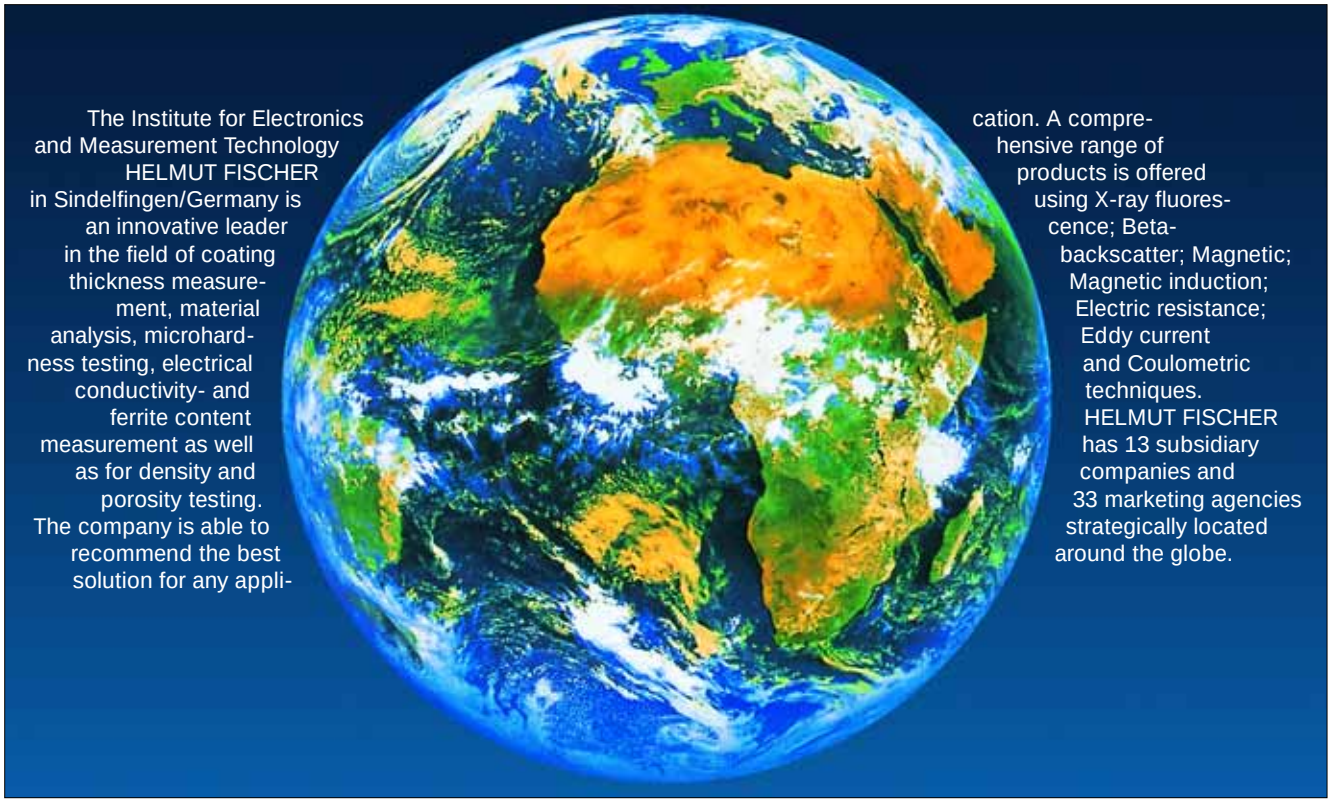

DUALSCOPE® MP40E-R to measure coating thickness on ferromagnetic, as well as nonferromagnetic materials with automatic recognition and selection of the measurement method. Integrated radio transmitter.

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

The information in this brochure contains only general descriptions and performance features that do not always apply as written, or that may be changed due to continuous development of the products. The desired performance features are binding only if they are expressly agreed upon in the contract.

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