

FISCHERSCOPE® X-RAY XDV®-SDD

X-Ray Fluorescence Measuring Instrument with a Programmable XY-Stage and Z-Axis for Automated Measurements of very thin Coatings and for Trace Analysis



FISCHERSCOPE® X-RAY XDV®-SDD

Main Features

The FISCHERSCOPE X-RAY XDV-SDD is an universally applicable energy-dispersive X-ray fluorescence measuring instrument. With its exceptionally large silicon drift detector (50 mm², 0.08 in² effective detector area) and the large aperture (Ø 3 mm, 118 mils), the XDV-SDD achieves highest accuracy and short measurement time.

Typical fields of application:

- Analysis of very thin coatings, e.g., gold/palladium coatings of $\leq 0.1 \mu\text{m}$
- Measurement of functional coatings in the electronics and semiconductor industries, e.g., coating thickness measurement of gold coatings down to 2 nm on lead frames
- Trace analysis according to RoHS and WEEE requirements
- High-end gold analysis
- Determination of complex multi-coating systems
- Automated measurements, e.g., in quality control
- Meets ENIG/ENEPIG requirements

To create ideal excitation conditions for every measurement, the instrument features electrically changeable apertures and primary filters. With its high-precision, programmable XY-stage, it is the fitting measuring instrument for automated sample measurements.

Outstanding accuracy and long-term stability are characteristics of all FISCHERSCOPE X-RAY systems. The necessity of recalibration is dramatically reduced, saving time and effort.

The fundamental parameter method by Fischer allows for the analysis of solid and liquid specimens as well as coating systems without calibration.

Design

The XDV-SDD is designed as a user-friendly bench-top instrument. It is equipped with a high-precision, programmable XY-stage and an electrically driven Z-axis. The sample stage moves into the loading position automatically, when the protective hood is opened. A laser pointer serves as a positioning aid and supports the quick alignment of the sample to be measured. The integrated video-microscope with zoom and crosshairs simplifies sample placement and allows precise measuring spot adjustment.

The entire operation and evaluation of measurements as well as the clear presentation of measurement data is performed on a PC, using the powerful and user-friendly WinFTM® software.

The FISCHERSCOPE X-RAY XDV-SDD fulfills DIN ISO 3497, ASTM B 568, IPC4552, IPC4556 and ISO 23345. It is a fully protected instrument with type approval according to German radiation protection law.

General Specification

Intended use	Energy dispersive X-ray fluorescence measuring instrument (EDXRF) to determine thin coatings, small structures, trace elements and alloys
Design	Bench top unit with hood opening upwards, X/Y- and Z-axis electrically driven and programmable, Motor-driven changeable apertures and filters, Video camera and laser pointer (class 1) for positioning the sample
Measurement direction	From top to bottom

X-Ray Source

X-ray tube	Micro focus tube with tungsten target and beryllium window
High voltage	Three steps: 10 kV, 30 kV, 50 kV; max. anode current: 1 mA
Aperture (Collimator)	4x changeable
Standard [mm]/[in]	Ø 0.2, Ø 0.6, Ø 1, Ø 3 / Ø 0.008, Ø 0.024, Ø 0.04, Ø 0.12
Optional [mm]/[in]	Ø 0.2, 0.05 x 0.3, Ø 0.15, Ø 1 / Ø 0.008, 0.002 x 0.012, Ø 0.006, Ø 0.04 Ø 0.1, Ø 0.3, Ø 1, Ø 3 / Ø 0.004, Ø 0.012, Ø 0.04, Ø 0.12 others on request
Primary filter	6x changeable (Ni, free, Al 1000 µm (39.4 mils), Al 500 µm (19.7 mils), Al 100 µm (3.9 mils), Mylar® 100 µm (3.9 mils))
Measurement spot size	Depending on the measuring distance and on the aperture, the actual measurement spot size is shown in the video image. Smallest measurement spot: approx. Ø 0.25 mm (9.8 mils)

X-Ray Detection

X-ray detector	Silicon Drift Detector (SDD), peltier-cooled, effective detector area 50 mm ² (0.08 in ²)
Element range	Aluminum Al (13) to Uranium U (92) – up to 24 elements simultaneously
Resolution (fwhm for Mn-K _α)	≤ 140 eV
Measuring distance	0 ... 80 mm (0 ... 3.1 in) Distance compensation with patented DCM method for simplified measurements at varying distances. For particular applications or for higher demands on accuracy an additional calibration might be necessary.

Sample Alignment

Video microscope	High-resolution CCD color camera for optical monitoring of the measurement location along the primary beam axis, Crosshairs with a calibrated scale (ruler) and spot-indicator, Adjustable LED illumination, Laser pointer (class 1) to support accurate specimen placement
Zoom factor	Digital 1x, 2x, 3x, 4x
Focusing	Auto-focus and manually controlled motor focus Manual adjustment of the focal plane in a range from 0 to 80 mm

Sample Stage

Design	Fast, programmable XY-stage with pop-out function
Usable sample placement area	370 x 320 mm (14.6 x 12.6 in)
Max. sample weight	5 kg (11 lb), with reduced approach travel precision 20 kg (44 lb)
Max. sample height	140 mm (5.5 in)
Max. travel	X/Y-axis: 250 mm x 250 mm (9.8 x 9.8 in); Z-axis: 140 mm (5.5 in)
Max. travel speed X/Y	60 mm/s (0.2 ft/s)
Repeatability precision X/Y	direction-independent: ≤ 5 µm (0.2 mils) max., ≤ 2 µm (0.08 mils) typ.

Electrical Data

Power supply	AC 100 – 240 V ±10 % / 50 – 60 Hz max. 180 VA, without evaluation PC
Protection class	IP40

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Dimensions

External dimensions	Width x depth x height [mm]: 660 x 835 x 720 mm, [in]: 26 x 32.9 x 28.3
Weight	approx. 140 kg (308 lb)
Inner dimensions meas.chamber	Width x depth x height [mm]: 580 x 560 x 145 mm, [in]: 22.8 x 22 x 5.7

Environmental Conditions

Operating temperature	10 °C – 40 °C (50 °F – 104 °F)
Storage temperature	0 °C – 50 °C (32 °F – 122 °F)
Relative humidity	≤ 95 %

Evaluation Unit

Computer	Windows®-PC
Software	Standard: Fischer WinFTM® BASIC including PDM Optional: Fischer WinFTM® SUPER

Standards

CE approval	EN 61010, EN 61326
X-Ray standards	DIN ISO 3497, ASTM B 568, IPC4552, IPC4556, ISO 23345
Approval	Fully protected instrument with type approval according to German radiation protection law.

Order

To create an optimal configuration for your needs, please contact your local Fischer representative.

FISCHERSCOPE® X-RAY
XDV®-SDD

- Choose the aperture combination
- Choose the software options

Special XDV product modification and XDV technical consultation on request

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