

## FISCHERSCOPE® X-RAY XDV®-μ

X-Ray Fluorescence Measuring Instrument with a Polycapillary X-Ray Optics for Measurements on Very Small Components and Structures



# FISCHERSCOPE® X-RAY XDV®-μ®

## Description

The FISCHERSCOPE X-RAY XDV-μ is a universally applicable energy-dispersive x-ray measuring instrument. It is particularly well suited for non-destructive analyses and measurements of coating thicknesses on very small components and structures, even with complex coating systems.

Typical fields of application:

- Measurements on very small flat components and structures such as printed circuit boards, contacts or lead frames
- Analysis of very thin coatings, e.g., gold/palladium coatings of  $\leq 0.1 \mu\text{m}$  (0.004 mils)
- Measurement of functional coatings in the electronics and semiconductor industries
- 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 primary filters. The modern silicon drift detector achieves high accuracy and good detection sensitivity. Due to the innovative polycapillary x-ray optics, the instrument measures using an extremely small measurement spot yet with a very high excitation intensity.

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 specimens and coating systems without calibration.

For measurements on large printed circuit boards, the instrument can be equipped with a larger sample stage.

## Design

The FISCHERSCOPE X-RAY XDV-μ 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 housing features a slot in the side allowing for the measurement of even large components, e.g., pc-boards. 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. A high-resolution color video camera simplifies the precise determination of the measurement spot.

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 X-RAY XDV-μ instrument fulfills DIN ISO 3497, ASTM B 568, IPC4552 and IPC4556.

## General Specification

Intended use	Energy dispersive x-ray fluorescence measuring instrument (EDXRF) to measure thin coatings and coating systems on very small flat structures
Design	Bench-top unit with hood opening upwards and housing with a slot on the side X/Y- and Z-axis electrically driven and programmable Motor-driven changeable filters
Measuring direction	Top down
Element range	Aluminum Al (13) to Uranium U (92) – up to 24 elements simultaneously

## X-Ray Source

X-ray tube	Standard: Micro focus tube with tungsten target and beryllium window Optional: Micro focus tube with molybdenum target and beryllium window
High voltage	Three steps: 10 kV, 30 kV, 50 kV
Primary filter, 4x changeable	Ni 10 µm (0.4 mils); free; Al 1000 µm (40 mils); Al 500 µm (20 mils)
X-ray optics	Polycapillary

## Polycapillary/Detector Options

	Standard 20 µm nicht halo-free*	20 µm halo-free*	10 µm halo-free*
Measurement spot, fwhm at Mo-K <sub>α</sub>	appr. Ø 20 µm (0.8 mils)	appr. Ø 20 µm (0.8 mils)	appr. Ø 10 µm (0.4 mils)
X-ray detector	Peltier-cooled silicon-drift-detector (SDD)		
Effective detector area	20 mm <sup>2</sup> (0.03 in <sup>2</sup> )	50 mm <sup>2</sup> (0.08 in <sup>2</sup> )	50 mm <sup>2</sup> (0.08 in <sup>2</sup> )
Measuring distance between specimen surface to lower edge of measuring head	fest, ca. 4 – 5 mm	fest, ca. 4 – 5 mm	fest, ca. 1,2 – 2 mm

\* For halo-free capillaries, the radiation intensity for all energies of the x-radiation is concentrated on the nominal measurement spot. For capillaries, indicated as non halo-free, radiation intensity with high energies (E > 20 keV) can cover a significantly larger area than the nominal measurement spot.

## Sample Stage

	Standard	Option Supporting Plate PCB
	Fast, programmable XY-stage with pop-out function	Fast, programmable XY-stage with pop-out function and large placement area for measurements on PCBs
Usable sample placement area	Width x depth: 370 mm x 320 mm (14.6 in x 12.6 in)	Width x depth: 620 mm x 530 mm (24.4 in x 20.9 in)
Usable maximum travel	X/Y-axis: 250 mm x 220 mm (9.8 in x 8.7 in) Z-axis: 140 mm (5.5 in)	
Max. travel speed X/Y	60 mm/s	
Repeatability precision X/Y	direction-independent: ≤ 5 µm (0.2 mils) max., ≤ 2 µm (0.08 mils) typ.	
Max. sample weight	5 kg (11 lb), with reduced precision max. 20 kg (44 lb)	
Max. sample height	135 mm (5.3 in)	

## Video Microscope

	High-resolution CCD color camera for optical monitoring of the measurement location, manual focusing and auto-focus, crosshairs with a calibrated scale (ruler) and spot-indicator, adjustable LED illumination, laser pointer (class 1) to support accurate specimen placement
Zoom factor	Up to 1080x (Optical: 30x, 90x, 270x; Digital: 1x, 2x, 3x, 4x)

## 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: 660 x 835 x 720 mm (26 x 33 x 28.3 in)
Weight	Approx. 135 kg (297 lb)
Interior dimensions of chamber	Width x depth x height: 580 x 560 x 145 mm (22.8 x 22 x 5.7 in)

## Environmental Conditions

Operating temperature	10 °C – 35 °C / 50 °F – 95 °F
Storage/Transport temperature	0 °C – 50 °C / 32 °F – 122 °F
Relative humidity	≤ 95 %, non-condensing

## Evaluation unit

Computer	Windows®-PC
Software	Fischer WinFTM® SUPER

## Standards

CE approval	EN 61010, EN 61326
X-Ray standards	DIN ISO 3497, ASTM B 568, IPC4552, IPC4556
Approval	Individual acceptance inspection as a fully protected instrument 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®-μ	<ul style="list-style-type: none"><li>▪ Select the X-ray tube</li><li>▪ Select the polycapillary/detector option</li></ul>
Options	<ul style="list-style-type: none"><li>▪ Stone plate with damping feet, for vibration damping, if a table is available, including stone plate and 8 damping feet (1001671)</li><li>▪ Vibration damped table, for vibration damping, including table, stone plate and 8 damping feet (1001672)</li><li>▪ Supporting Plate PCB (1002328)</li></ul>
	Special XDV®-μ product modification and technical consultation on request

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