FISCHERSCOPE® X-RAY XDV®-µ

X-ray fluorescence spectrometer with a polycapillary x-ray optics for automated measurements and analyses of coating thicknesses and compositions on very small components and structures

Description

The FISCHERSCOPE X-RAY XDV-µ is a universally applicable energy-dispersive x-ray spectrometer. 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.

To create ideal excitation conditions for every measurement, the XDV-µ 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.
The XDV-µ x-ray spectrometer has an excellent long-term stability, which among other things is reflected in a significantly reduced calibration effort.
Using the fundamental parameter method, coating systems as well as solid and liquid samples can be analyzed standard-free. It is possible to detect up to 24 elements simultaneously.

The FISCHERSCOPE X-RAY XDV-µ spectrometer is equipped with a high-precision, programmable X/Y-stage and an electrically driven Z-axis and is thus best suited for automated measurements. A high-resolution color video camera simplifies the precise determination of the measurement spot.

The XDV-µ is designed for measuring and analyzing very thin coatings. With the programmable X/Y-stage and the tongue function for quick loading, it is optimally suited for automated sample measurements.

Typical areas of application are:

- 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 ≤ 0.1 µm
- Measurement of functional coatings in the electronics and semiconductor industries
- Determination of complex multi-coating systems
- Automated measurements, e.g., in quality control

Design

The FISCHERSCOPE X-RAY XDV-µ is designed as a user-friendly bench-top instrument. 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.
The entire operation, the evaluation of the measurement as well as the clear presentation of the measurement data is done on a PC using the powerful and user-friendly WinFTM® Software.

General Specifications

Intended use	Energy dispersive x-ray fluorescence spectrometry (EDXRF) to measure thin coatings and coating systems on very small flat structures
Element range	Aluminum Al (13) to Uranium U (92) – up to 24 elements simultaneously
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 apertures and filters Video camera and laser pointer (class 1) for orienting the sample
Measuring direction	From top to bottom

X-ray source

X-ray source	Micro-focus tungsten tube; optionally micro-focus molybdenum tube
High voltage	Adjustable 30 kV, 40 kV, 50 kV
Primary filter	4x changeable (Ni 10 µm; free; Al 1000 µm; Al 500 µm)
X-ray optics	Polycapillary
Measurement spot	Approx. Ø 20 µm fwhm at Mo-Kα

X-ray detection

X-ray detector	Silicon drift detector with peltier cooling

Sample orientation

Video microscope	High-resolution CCD color camera for optical monitoring of the measurement location Crosshairs with a calibrated scale (ruler) and spot-indicator Adjustable LED illumination of the measurement location Laser pointer (class 1) to support accurate sample placement
Zoom factor	Up to 1080x (Optical: 30x, 90x, 270x; Digital: 1x, 2x, 3x, 4x)
Focusing	Auto-focus and manually controlled motor focus
Sample stage	Fast, programmable X/Y-stage with tongue function
Maximum travel	X/Y-axis: 250 mm x 220 mm; Z-axis: 140 mm
Max. travel speed X/Y	25 mm/s
Repeatability precision X/Y/Z	≤ 0.005 mm (unidirectional)
Usable sample placement area	Width x depth: 370 mm x 320 mm
Max. sample mass	5 kg, with reduced precision max. 20 kg
Max. sample height	135 mm

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Electrical data

Line voltage, line frequency	AC 115 V or AC 230 V 50 / 60 Hz
Power consumption	Max. 120 W
Protection class	IP40

Dimensions

Exterior dimensions	Width x depth x height [mm]: 660 x 835 x 720
Weight	Approx. 135 kg
Interior dimensions measurement chamber	Width x depth x height [mm]: 580 x 560 x 145

Environmental Conditions

Temperature: Operation	20 °C – 25 °C / 68 °F – 77 °F
Temperature: Storage/Transport	0 °C – 50 °C / 32 °F – 122 °F
Humidity of ambient air	≤ 95 %, non-condensing

Evaluation unit

Computer	Windows® PC with extension cards
Software	Standard: Fischer WinFTM® BASIC + PDM® Optional: Fischer WinFTM® SUPER

Standards

CE conformity	EN 61010
X-ray standards	DIN ISO 3497 and ASTM B 568
Approval	Individual acceptance inspection as a fully protected instrument according to the German regulations „Deutsche Röntgenverordnung-RöV“.

Order

FISCHERSCOPE X-RAY XDV-µ	604-259
	Special XDV product modification and XDV technical consultation on request

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