FISCHERSCOPE® X-RAY XDLM® 231
FISCHERSCOPE® X-RAY XDLM® 232
FISCHERSCOPE® X-RAY XDLM® 237

X-ray fluorescence spectrometer for manual or automated coating thickness measurements and analyses on pc-boards, electronics components and mass-produced parts.

Description

The FISCHERSCOPE®-X-RAY XDLM® instruments are universally applicable energy-dispersive x-ray spectrometers. They constitute the next step in the development of the proven FISCHERSCOPE X-RAY XDLM-C4 model series. Like their predecessors, they are particularly well suited for non-destructive thickness measurements and analyses of thin coatings as well as for automated measurements on mass-produced parts and pc-boards.

A high count rate is achieved by using a proportional counter tube, which allows for precise measurements. Apertures and primary filters can be changed electrically to create the optimum measuring conditions for each measurement.
Using the Fischer 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 in the range from chlorine (17) to uranium (92) simultaneously.
The XDLM x-ray spectrometers have an excellent long-term stability, which is reflected in a significantly reduced calibration effort, among other things.

The instruments of the XDLM series are predestined for measuring and analyzing thin coatings, even at small concentrations. With the fast, programmable X/Y-stage, it is the fitting measuring instrument for automated sample measurements in quality assurance and production monitoring.

Typical areas of application are:

- Measurement of mass-produced parts
- Inspection of thin coatings with small measurement spots
- Analysis of functional coatings in the electronics and semiconductor industries
- Automated measurements, e.g., on pc-boards

Design

The FISCHERSCOPE X-RAY XDLM are designed as user-friendly bench-top instruments. They all feature an electric Z-axis but differ in their different specimen support stage. The XDLM 231 has a plane support stage, the XDLM 232 a manually operable X/Y stage. The XDLM 237 is equipped with a motor-driven X/Y stage that moves out into the loading position automatically, when the protective hood is opened. A laser pointer serves in all models as a positioning aid and supports the quick alignment of the sample to be measured. A high-resolution color video camera with powerful magnification simplifies the precise determination of the measurement location and visualizes the running measurement procedure. Fine adjustments can be made directly at the instrument manually or using a joystick - or from the PC using a mouse and the keyboard.
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.

XDLM spectrometers are fully protected instruments with type approval according to the German regulations „Deutsche Röntgenverordnung-RöV“.

General Specifications

Intended use	Energy dispersive x-ray fluorescence spectrometer (EDXRF) to determine thin coatings, small structures, traces and alloys
Element range	Chlorine Cl (17) to Uranium U (92) – up to 24 elements simultaneously
Design	Bench-top unit with hood opening upwards Motor-driven changeable apertures and filters Video camera and laser pointer for orienting the sample Z-axis electrically driven and programmable XDLM 232 with manual, XDLM 237 with programmable X/Y stage
Measuring direction	From top to bottom

X-ray source

X-ray source	Micro-focus tungsten tube; with beryllium window
High voltage	Adjustable 30 kV, 40 kV, 50 kV
Apertures (collimators):	4x changeable: Ø 0.1 mm; Ø 0.2 mm; Ø 0.3 mm; slot 0.05 mm x 0.05 mm (others on request)
Primary filter	3x changeable. (Standard: Nickel, Aluminum, free)
Measurement spot	Depending on the measuring distance and on the aperture in use; the actual measurement spot size is shown in the video image. Smallest measurement spot: approx. Ø 0.15 mm
Measuring distance e.g., for measurements in recesses	0 ... 80 mm, in the non-calibrated range using the patented DCM method 0 ... 20 mm, in the calibrated range using the patented DCM method

X-ray detection

X-ray detector	Proportional counter

Sample orientation

Video microscope	High-resolution CCD color camera for optical monitoring of the measurement location along the primary beam axis, manual focusing and auto-focus, crosshairs with a calibrated scale (ruler) and spot-indicator, adjustable LED illumination of the measurement location, laser pointer to support accurate sample placement
Zoom factor	20x .. 180x (Optical: 20x .. 45x; Digital: 1x, 2x, 3x, 4x)

Sample support stage	XDLM 231	XDLM 232	XDLM 237
Design	Fixed sample support	Manual X/Y-stage	Programmable, motor-driven X/Y-stage
Maximum travel X/Y	-	95 x 150 mm	255 x 235 mm
Travel speed X/Y	-	-	≤ 80 mm/s
Repeatability precision X/Y	-	-	≤ 0.01 mm (unidirectional)
Travel Z-axis	140 mm	140 mm	140 mm
Usable sample placement area	463 x 500 mm	420 x 450 mm	300 x 350 mm
Max. sample mass	20 kg	20 kg	5 kg, with reduced approach travel precision 20 kg
Max. sample height	140 mm	140 mm	140 mm

FISCHERSCOPE X-RAY XDLM

Electrical data

Line voltage, line frequency	AC 115 V or AC 230 V 50 / 60 Hz
Power consumption	Max. 120 W (measuring head without PC)
Protection class	IP40

Dimensions

Exterior dimensions	Width x depth x height [mm]: 570 x 760 x 650
Weight	Approx. 120 kg
Interior dimensions measurement chamber	Width x depth x height [mm]: 460 x 495 x 146

Environmental Conditions

Temperature: Operation	10°C – 40°C / 50°F – 104°F
Temperature: Storage/Transport	0°C – 50°C / 32°F – 122°F
Humidity of ambient air	≤ 95 %, non-condensing

Evaluation unit

Computer	PC system with extension cards
Software	Fischer WinFTM®

Standards

CE conformity	EN 61010
X-ray standards	DIN ISO 3497 and ASTM B 568
Approval	Fully protected instrument with type approval according to the German regulations „Deutsche Röntgenverordnung-RöV“

Order

FISCHERSCOPE X-RAY XDLM 231	604-345
FISCHERSCOPE X-RAY XDLM 232	604-346
FISCHERSCOPE X-RAY XDLM 237	604-347

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