

**FISCHERSCOPE® X-RAY XDLM® 231**  
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X-ray fluorescence spectrometer for manual or automated coating thickness measurements and analyses on pc-boards, electronics components and mass-produced parts.



## Description

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The FISCHERSCOPE®-X-RAY XDLM® instruments are universally applicable energy-dispersive x-ray spectrometers. They represent 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. Elements in the range from chlorine (17) to uranium (92) are detected.

The XDLM x-ray spectrometers have an excellent long-term stability, which among other things is reflected in a significantly reduced calibration effort.

The instruments of the XDLM series are especially well suited for measuring and analyzing thin coatings, even at small concentrations, in quality assurance and process control. 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

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The FISCHERSCOPE X-RAY XDLM are designed as user-friendly bench-top instruments. According to the intended use, different versions are available:

XDLM 231: Plane support stage, motor-driven Z-axis

XDLM 232: Manually operable X/Y stage, motor-driven Z-axis

XDLM 237: Motor-driven X/Y stage that moves into the loading position automatically, when the protective hood is opened. Motor-driven programmable Z-axis

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 measurement procedure in process. Fine adjustments can be made directly at the instrument manually or using a joystick - or from the PC using a mouse and the keyboard.

A gap in the housing allows for measurements on large flat specimens, which do not fit in the measuring chamber, e.g. large pc-boards.

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 and alloys
Element range	Chlorine (17) to Uranium (92)
Design	Bench-top unit with hood opening upwards
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 Default (523-440): Ø 0.1 mm, Ø 0.2 mm, 0.05 x 0.05 mm, 0.2 x 0.03 mm Optional (523-366): Ø 0.1 mm, Ø 0.2 mm, Ø 0.3 mm, 0.3 x 0.05 mm, Optional (524-061): Ø 0.1 mm, Ø 0.2 mm, 0.3 x 0.05 mm, 0.05 x 0.05 mm, others on request
Primary filter	3x changeable (Standard: Nickel, Aluminum, no filter)
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 0.1 mm with aperture 0.05 x 0.05 mm
Measuring distance, e.g., for measurements in recesses	0 ... 20 mm, in the calibrated range using the patented DCM method 20 ... 80 mm, in the non-calibrated range using the patented DCM method

## X-ray detection

X-ray detector	Proportional counter
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## 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

	<b>XDLM 231</b>	<b>XDLM 232</b>	<b>XDLM 237</b>
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)
Usable sample placement area	463 x 500 mm	420 x 450 mm	300 x 350 mm
Z-axis	Electrically adjustable	Electrically adjustable	Programmable
Travel Z-axis	140 mm	140 mm	140 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	Standard: Fischer WinFTM <sup>®</sup> LIGHT Optional: Fischer WinFTM <sup>®</sup> BASIC, PDM <sup>®</sup> , SUPER

## 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
	Special XDLM product modification and XDLM technical consultation on request

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