

FISCHERSCOPE[®] X-RAY XDL[®] 210
FISCHERSCOPE[®] X-RAY XDL[®] 220
FISCHERSCOPE[®] X-RAY XDL[®] 230
FISCHERSCOPE[®] X-RAY XDL[®] 240

X-ray fluorescence spectrometer for manual or automated coating thickness measurements on protective and decorative coatings, mass-produced parts and pc-boards



Description

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

A high count rate is achieved by using a proportional counter tube, which allows for precise measurements. 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 XDL 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 XDL series are especially well suited for measurements in quality assurance, reception inspection and production monitoring.

Typical areas of application are:

- Measurement of electro-plated mass-produced parts
- Inspection of thin coatings, e.g., decorative chromium-plating
- Analysis of functional coatings in the electronics and semiconductor industries
- Automated measurements, e.g., on pc-boards
- Solution analysis in the electroplating

Design

The FISCHERSCOPE X-RAY XDL spectrometers are designed as user-friendly bench-top instruments. According to the intended use, different versions are available with different support stages and with fixed or adjustable Z-axis.

XDL 210: Plane support stage, fixed Z-axis

XDL 220: Plane support stage, motor-driven Z-axis

XDL 230: Manually operable X/Y stage, motor-driven Z-axis

XDL 240: Motor-driven X/Y stage that moves into the loading position automatically, when the protective hood is opened. Motor-driven Z-axis with two speeds

A high-resolution color video camera with powerful magnification simplifies the precise determination of the measurement location and visualizes the measurement procedure in process. In models equipped with a X/Y stage a laser pointer serves as a positioning aid and supports the quick alignment of the sample to be measured.

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.

XDL 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 and for the solution analysis.
Element range	Chlorine Cl (17) to Uranium U (92) – up to 24 elements simultaneously
Design	Bench-top unit with hood opening upwards
Measuring direction	From top to bottom

X-ray source

X-ray source	Tungsten tube with beryllium window
High voltage	Adjustable 30 kV, 40 kV, 50 kV
Aperture (collimator)	Ø 0.3 mm (optional Ø 0.1 mm, Ø 0.2 mm, slot 0.3 mm x 0.05 mm)
Measurement spot	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 0.16 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
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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
Zoom faktor	20x ... 180x (optical: 20x ... 45x; digital: 1x, 2x, 3x, 4x)

Sample support stage

	XDL 210	XDL 220	XDL 230	XDL 240
Design	Fixed sample support	Fixed sample support	Manual X/Y-stage	Programmable 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 ^(*)
Usable sample placement area	463 x 500 mm	463 x 500 mm	420 x 450 mm	300 x 350 mm
Z-axis	Fixed Position (Top/Middle/Bottom)	Electrically adjustable	Electrically adjustable	Electrically adjustable
Travel Z-axis	-	140 mm	140 mm	140 mm
Max. sample mass	20 kg	20 kg	20 kg	5 kg / 20 kg ^(**)
Max. sample height	155/90/25 mm	140 mm	140 mm	140 mm
Laser pointer to support accurate sample placement	-	Yes	Yes	Yes

(*) unidirectional

(**) with reduced approach travel precision

FISCHERSCOPE X-RAY XDL

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	XDL 210: 90 kg; XDL 220: 95 kg; XDL 230: 105 kg; XDL 240: 120 kg
Interior dimensions measurement chamber	Width x depth x height [mm]: 460 x 495 x (see max. sample height)

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 XDL 210	604-492
FISCHERSCOPE X-RAY XDL 220	604-494
FISCHERSCOPE X-RAY XDL 230	604-496
FISCHERSCOPE X-RAY XDL 240	604-498



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