

**FISCHERSCOPE® X-RAY XDL® 210**  
**FISCHERSCOPE® X-RAY XDL® 220**  
**FISCHERSCOPE® X-RAY XDL® 230**  
**FISCHERSCOPE® X-RAY XDL® 240**

X-Ray Fluorescence Measuring Instrument for Manual or Automated Coating Thickness Measurements on Protective and Decorative Coatings, Mass-Produced Parts and Printed Circuit Boards



## Description

The FISCHERSCOPE X-RAY XDL are universally applicable energy dispersive x-ray measuring instruments. They are particularly well suited for non-destructive thickness measurements and analysis of thin coatings, for measurements on mass-produced parts and printed circuit boards as well as for the solution analysis.

The instruments are well suited for measurements in quality assurance, incoming inspection and process control.

Typical fields of application:

- Measurement of electroplated 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 printed circuit boards
- Solution analysis in the electroplating

Outstanding accuracy and long-term stability are characteristics of all FISCHERSCOPE X-RAY systems. The necessity of recalibration is considerably reduced, saving time and effort.

A high count rate is achieved by using a proportional counter tube, which allows for precise measurements.

The fundamental parameter method by FISCHER allows for the analysis of solid and liquid specimens as well as coating systems without calibration.

## Design

The FISCHERSCOPE X-RAY XDL instruments are modularly 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 XY-stage, motor-driven Z-axis

XDL 240: Motor-driven XY-stage that moves into the loading position automatically, when the protective hood is opened. Motor-driven programmable Z-axis

A high-resolution colour video camera simplifies the precise determination of the measurement spot. In models equipped with a XY-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 printed circuit boards.

The integrated video-microscope with zoom and crosshairs simplifies sample placement and allows for a precise measuring spot adjustment.

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 FISCHERSCOPE XDL fulfills DIN ISO 3497 and ASTM B 568. It is a fully protected instrument with type approval according to the German regulations „Deutsche Röntgenverordnung-RöV“.

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## General Specification

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Intended use	Energy dispersive x-ray fluorescence measuring instrument (EDXRF) to determine thin coatings and for the solution analysis.
Element range	Titanium (22) to Uranium (92) – up to 24 elements simultaneously with option WinFTM® BASIC
Design	Bench top unit with upwards opening hood
Measuring direction	Top down

## X-Ray Source

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X-ray tube	Tungsten tube with beryllium window
High voltage	Three steps: 30 kV, 40 kV, 50 kV
Aperture (Collimator)	Ø 0.3 mm (11.8 mils), Optional: Ø 0.1 mm (3.9 mils), Ø 0.2 mm (7.9 mils), slot 0.3 x 0.05 mm (11.8 x 2 mils)
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 0.2 mm (7.9 mils)

## X-Ray Detection

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X-ray detector	Proportional counter tube
Measuring distance	0 ... 80 mm (0 ... 3.2 in) Distance compensation with patented DCM method for simplified measurements at varying distances. For particular applications or for higher demands on accuracy an additional calibration might be necessary.

## Sample Alignment

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Video microscope	High-resolution CCD colour 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
Zoom factor	Digital 1x, 2x, 3x, 4x

## Electrical data

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Power supply	AC 115 V or AC 230 V 50 / 60 Hz
Power consumption	max. 120 W, without evaluation PC
Protection class	IP40

## Dimensions

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External dimensions	Width x depth x height [mm]: 570 x 760 x 650 mm, [in]: 22 x 30 x 26
Interior dimensions measurement chamber	Width x depth x height [mm]: 460 x 495 x see max. sample height, [in]: 18 x 19.5 x 26 x see max. sample height
Weight	XDL 210: 94 kg (207 lb); XDL 220: 99 kg (218 lb); XDL 230: 107 kg (235 lb); XDL 240: 120 kg (264 lb)

## Environmental conditions

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Operating temperature	10 °C – 40 °C / 50 °F – 104 °F
Storage/Transport temperature	0 °C – 50 °C / 32 °F – 122 °F
Admissible air humidity	≤ 95 %, non-condensing

# FISCHERSCOPE® X-RAY XDL®

Sample Stage	XDL 210	XDL 220	XDL 230	XDL 240
Design	Fixed sample support	Fixed sample support	Manual XY-stage	Programmable XY-stage
Maximum travel XY	—	—	95 x 150 mm (3.7 x 5.9 in)	255 x 235 mm (10 x 9.2 in)
Travel speed XY	—	—	—	≤ 80 mm/s (3.1 in/s)
Repeatability precision XY	—	—	—	≤ 0,01 mm (0.4 mils) <sup>(*1)</sup>
Usable sample placement area	463 x 500 mm (18.2 x 19.7 in)	463 x 500 mm (18.2 x 19.7 in)	420 x 450 mm (16.5 x 17.7 in)	300 x 350 mm (11.8 x 13.8 in)
Z axis	Fixed Position (Top/Middle/Bottom)	Electrically adjustable	Electrically adjustable	Programmable
Travel Z axis	—	140 mm (5.5 in)	140 mm (5.5 in)	140 mm (5.5 in)
Max. sample weight	20 kg (44 lb)	20 kg (44 lb)	20 kg (44 lb)	5 kg (11 lb) / 20 kg (44 lb) <sup>(*2)</sup>
Max. sample height	155/90/25 mm (6/3.5/1 in)	140 mm (5.5 in)	140 mm (5.5 in)	140 mm (5.5 in)
Laser pointer (class 1) to support accurate sample placement	—	—	Yes	Yes

(\*1) direction-independent      (\*2) with reduced approach travel precision

## Evaluation unit

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

## Standards

CE approval	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
Special XDL product modification and technical consultation on request	

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