

FISCHERSCOPE[®] X-RAY XDV[®]-SDD

X-Ray Fluorescence Measuring Instrument
with a Programmable X/Y-Stage and Z-Axis
for Automated Measurements of very thin
Coatings and for Trace Analysis



Main Features

The FISCHERSCOPE X-RAY XDV-SDD is a universally applicable energy-dispersive x-ray fluorescence measuring instrument. It is especially well suited for measuring and analyzing very thin coatings or small concentrations in the trace analysis. With its high-precision, programmable X/Y-stage, it is the fitting measuring instrument for automated sample measurements.

Typical fields of application are:

- Analysis of very thin coatings, e.g., gold/palladium coatings of $\leq 0.1 \mu\text{m}$
- Trace analysis on pc boards according to RoHS and WEEE requirements
- Gold analysis
- Measurement of functional coatings in the electronics and semiconductor industries
- Determination of complex multi-coating systems
- Automated measurements, e.g., in quality control

To create ideal excitation conditions for every measurement, the instrument features electrically changeable apertures and primary filters. The modern silicon drift detector achieves high accuracy and good detection sensitivity.

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

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

Design

The XDV-SDD is designed as a user-friendly bench-top instrument. It is equipped with a high-precision, programmable X/Y-stage and an electrically driven Z-axis. 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 integrated video-microscope with zoom and crosshairs simplifies sample placement and allows 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 X-RAY XAN 220 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“.

General Specification

Intended use	Energy dispersive x-ray fluorescence spectrometer (EDXRF) to determine thin coatings, small structures, trace elements and alloys
Element range	Aluminum Al (13) to Uranium U (92) – up to 24 elements simultaneously
Design	Bench top unit with hood opening upwards, X/Y- and Z-axis electrically driven and programmable, Motor-driven changeable apertures and filters, Video camera and laser pointer (class 1) for positioning the sample
Measurement direction	From top to bottom

X-Ray Source

X-ray tube	Micro focus tube with tungsten target and beryllium window
High voltage	Three steps: 10 kV, 30 kV, 50 kV
Aperture (Collimator)	Ø 0.2 mm (7.9 mils), Ø 0,6 mm (23.6 mils), Ø 1 mm (39.4 mils), Ø 3 mm (118 mils), others on request
Primary filter	6x changeable (Ni, free, Al 1000 µm (39.4 mils), Al 500 µm (19.7 mils), Al 100 µm (3.9 mils), Mylar® 100 µm (3.9 mils)
Measurement spot size	Depending on measurement distance and aperture Measurement spot size ≈ aperture size + 10% The actual measurement spot size is shown in the video image. Smallest measurement spot: approx. Ø 0.25 mm (9.8 mils)

X-Ray Detection

X-ray detector	Silicon Drift Detector (SDD), peltier-cooled
Resolution (fwhm for Mn-K _α)	≤ 140 eV
Measuring distance	0 ... 20 mm (0 ... 0.8 in) Distance compensation with patented DCM method for simplified measurements at varying distances. For particular applications an additional calibration might be necessary.

Sample Alignment

Video microscope	High-resolution CCD color camera for optical monitoring of the measurement location along the primary beam axis, Crosshairs with a calibrated scale (ruler) and spot-indicator, Adjustable LED illumination, Laser pointer (class 1) to support accurate specimen placement
Zoom factor	Digital 1x, 2x, 3x, 4x
Focusing	Auto-focus and manually controlled motor focus Manual adjustment of the focal plane in a range from 0 to 80 mm

Sample Stage

Design	Fast, programmable X/Y-stage with tongue function
Usable sample placement area	370 x 300 mm (14.6 x 11.8 in)
Max. sample weight	5 kg (11 lb), with reduced approach travel precision 20 kg (44 lb)
Max. sample height	140 mm (5.5 in)
Max. travel	X/Y-axis: 250 mm x 220 mm (9.8 x 8.7 in); Z-axis: 140 mm (5.5 in)
Max. travel speed X/Y	25 mm/s (82 ft/sec)
Repeatability precision X/Y/Z	≤ 0.005 mm (0.2 mil) unidirectional

FISCHERSCOPE[®] X-RAY XDV[®]-SDD

Electrical Data

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

Dimensions

External dimensions	Width x depth x height [mm]: 660 x 835 x 720 mm, [in]: 26 x 32.9 x 28.3
Weight	approx. 140 kg (308 lb)
Inner dimensions meas.chamber	Width x depth x height [mm]: 580 x 560 x 145 mm, [in]: 22.8 x 22 x 5.7

Environmental Conditions

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

Evaluation Unit

Computer	Windows [®] -PC
Software	Standard: Fischer WinFTM [®] BASIC including PDM [®] Optional: Fischer WinFTM [®] 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 XDV-SDD	604-447
	Special XDV product modification and XDV technical consultation on request

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Helmut Fischer GmbH Institut für Elektronik und Messtechnik, 71069 Sindelfingen, **Germany**, Tel. +49 70 31 30 30, mail@helmut-fischer.de
Fischer Instrumentation (GB) Ltd, Lymington/Hampshire SO41 8JD, **England**, Tel. +44 15 90 68 41 00, mail@fischergb.co.uk
Fischer Technology, Inc., Windsor, CT 06095, **USA**, Tel. +1 (860) 683 07 81, info@fischer-technology.com

Helmut Fischer AG, CH-6331 Hünenberg, **Switzerland**, Tel. +41 41 785 08 00, switzerland@helmutfischer.com
Fischer Instrumentation Electronique, 78180 Montigny le Bretonneux, **France**, Tel. +33 1 30 58 00 58, france@helmutfischer.com
Helmut Fischer S.R.L., Tecnica di Misura, 20099 Sesto San Giovanni (Milano), **Italy**, Tel. +39 0 22 55 26 26, italy@helmutfischer.com
Fischer Instruments, S.A., 08018 Barcelona, **Spain**, Tel. +34 9 33 09 79 16, spain@helmutfischer.com
Helmut Fischer Meettechniek B.V., 5627 GB Eindhoven, **The Netherlands**, Tel. +31 40 248 22 55, netherlands@helmutfischer.com
Fischer Instruments K.K., Saitama-ken 340-0012, **Japan**, Tel. +81 4 89 29 34 55, japan@helmutfischer.com
Fischer Instrumentation (Far East) Ltd, Kwai Chung, N.T., **Hong Kong**, Tel. +852 24 20 11 00, hongkong@helmutfischer.com
Fischer Instrumentation (S) Pte Ltd, Singapore 658065, **Singapore**, Tel. +65 62 76 67 76, singapore@helmutfischer.com
Nantong Fischer Instrumentation Ltd, Shanghai 200333, **P.R. China**, Tel. +86 21 32 51 31 31, china@helmutfischer.com
Fischer Measurement Technologies (India) Pvt. Ltd, Pune 411036, **India**, Tel. +91 20 26 82 20 65, india@helmutfischer.com

www.helmut-fischer.com

