FISCHERSCOPE® X-RAY 4000 Series

X-Ray Fluorescence Measuring System for Continuous In-line Measurement and Analysis in Production Processes, on Flat and Stamped Strips, also with Formed and Stamped Contact Areas

Main Features

The instruments of the FISCHERSCOPE X-RAY 4000 series are innovative, energy dispersive x-ray fluorescence measuring systems (EDXRF) for in-line applications in industrial production sites. They are especially designed for continuous non-destructive analysis and measurement of thin layers and layer systems in production lines. Their rugged design specifically meets the tough demands of industrial environments.

Typical fields of application:

- Strip electroplating, e. g. contacts, stamped components
- Measurement on hot-galvanized strips
- Photovoltaic industry
- Metal coatings on foils and strips
- Electronics industry, suppliers
- Process monitoring

As a true in-line measurement system, the FISCHERSCOPE X-RAY 4000 is designed specifically for user-friendliness and minimal setup times. For example, converting from one production line to another is simple due to the easily adjustable conveyor guides. Calibration is automated and therefore quickly carried out.

Performance

The instruments of the FISCHERSCOPE X-RAY 4000 series are available in three versions with different travel path lengths. As an option, the system can also be air-conditioned.

The instruments of the X-RAY 4000 series have a highly flexible system architecture. Thus, they can be adapted to a wide variety of applications with the following modifications:

- X-ray tube with glass window or micro-focus X-ray tube with beryllium window
- Detector: Proportional counter tube, Peltier-cooled silicon PIN diode or silicon drift detector
- X-ray beam orientation: from bottom to top, from top to bottom, or horizontally
- Second measuring head for simultaneous measurement of the front and back of an object

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.

Due to the orientation of the built-in camera's optics along the X-ray beam, which correctly presents the measurement spot's position and size, it is possible to precisely target the relevant measuring points.

Various data interfaces allow for easy integration of all X-RAY 4000 instruments into industrial process control systems.

All X-RAY 4000 measuring systems fulfill DIN ISO 3497 and ASTM B 568.

General Specification

Intended use	Energy dispersive x-ray fluorescence measuring system (EDXRF) to analyze and measure coatings and layer systems continuously in production processes.

Features

Calibration	Fully automated, can be carried out simply and quickly
Process monitoring	Warning flashlight for control of exceeding and underscoring limits helps to control the manufacturing process
Remote control	Via programmed tasks or via various data interfaces
Date Interface	RS232, Command files, OLE automation, TCP/IP, PROFIBUS and PROFINET via OPC
Maximum width of the sample	950 mm (37 in)

X-Ray Source	Proportional Counter Tube	PIN detector	Silicon Drift Detector
High voltage	Three steps 30 kV, 40 kV, 50 kV	Three steps 10 kV, 30 kV, 50 kV	
Primary filter	fix or 3x changeable	fix or 6x changeable	
X-ray tube	Tungsten tube with glass window or microfocus tungsten tube with berylium window		
Aperture (Collimator)	2x changeable: Ø 0.3 mm (12 mils) and 4 mm x 0.12 mm (157 mils x 5 mils), or 4x changeable according to customers' requirements		

X-Ray Detection	Proportional Counter Tube	PIN detector	Silicon Drift Detector
Element range			
• Tungsten tube with glass window	Titanium Ti (22) to Uranium U (92)	—	—
• microfocus tungsten tube	Potassium K (19) to Uranium U (92)	Sulfur S (16) to Uranium U (92	Aluminium Al (13) bis Uranium U (92)
Resolution fwhm for Mn-K_α	approx. 900 eV	up to ≤ 180 eV	up to ≤ 140 eV
Signal processor	analog	digital pulse processor	digital pulse processor
Distance compensation	±3 mm (118 mils) for measurements on glass substrates, with specific applications on glass substrates up to ±5 mm (197 mils)		
Measuring distance	12.5 mm (0.5 in) from the housing, other distances on request		

Electrical data

Power supply	AC 115 V or AC 230 V 50 / 60 Hz
Power consumption	max. 120 W (without evaluation PC)
Protection class	IP50

Dimensions	4100	4200	4300
Installation position	horizontal or vertical	horizontal	horizontal
Weight	120 kg	140 kg	160 kg
Dimensions W x D x H	680 x 386 x 1018mm (27 x 15 x 40 in)	596 x 308 x 1615 mm (23 x 12 x 64 in)	596 x 308 x 2015 mm (23 x 12 x 79 in)
Travel	240 mm (9 in)	620 mm (24 in)	1000 mm (39 in)
Positioning accuracy	≤ 0.02 mm (0.8 mils)	≤ 0.02 mm (0.8 mils)	≤ 0.02 mm (0.8 mils)

Environmental Conditions

Operating temperature	0 °C – 35 °C (32 °F – 95 °F) around the housing
Storage temperature	0 °C – 50 °C (32 °F – 122 °F)
Admissible air humidity	≤ 90 %, non- condensing

Evaluation Unit

Computer	Windows®-PC
Software	For full strips: • Standard: Fischer WinFTM® BASIC including PDM® • Optional: Fischer WinFTM® SUPER For perforated strips (stamped grids): • Standard: Fischer WinFTM® BASIC • Optional: Fischer WinFTM® SUPER including PDM®

Standards

CE approval	EN 61010
X-Ray standards	DIN ISO 3497 and ASTM B 568
Approval	Individual approval. The provisions of local law have to be observed.

Order

FISCHERSCOPE X-RAY 4000	On demand

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