

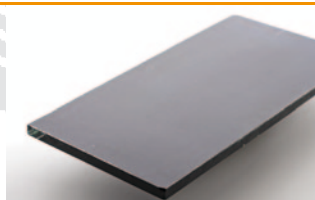
FISCHERSCOPE® X-RAY 5000



The FISCHERSCOPE X-RAY 5000 series is specifically designed as a flange measuring head for integration into a production line. It is ideally suited for continuous, non-destructive inline analyses of alloys and the measurement of thin coatings on large-area products directly in an on-going production process. In contrast to the X-RAY 4000 series, the X-RAY 5000 does without changers for filter and aperture and without a camera system, because these are often unnecessary for objects with large surface area.

The X-RAY 5000 can be customised for the purpose at hand: X-ray source, primary filter and semiconductor detector can be adapted optimally to suit the intended application.

The measurements can be carried out in air or in vacuum. As an option, the flange can also be supplied in a water-cooled design, which makes performing measurements even on very hot substrate materials (surface temperatures up to 500°C) unproblematic.



CIGS: $\text{CuInGaSe}/\text{Mo}/\text{glass}$

Depending on the design, measuring distances between 60 and 150 mm can be selected: Under certain circumstances, distance fluctuations of up to one centimetre, for example caused by wavy specimens, may be compensated for during the measurement using the WinFTM software.

Calibration is quickly and easily completed on a workpiece master directly in the production process. Extensive calibration of the pure element library – as with the bench-top instruments – is possible but not necessary. The repeatability precision of the X-RAY 5000 instruments is excellent due to its large apertures, state-of-the-art semiconductor detectors and digital pulse processor. The instrument's outstanding long-term stability also drastically reduces the need for re-calibration, saving time and resources.

The FISCHERSCOPE X-RAY 5000 measuring head has a very compact design and can be integrated directly into production lines using a standardised flange. The entire mechanical design is focused on maximum robustness and serviceability. For example, the instrument can be serviced while operating in a production line under vacuum, without having to break the vacuum.



To integrate the X-RAY 5000 measurement system into a superordinate process control system, open interfaces according to industry standards, e.g. OPC, are available.

Examples from practical applications

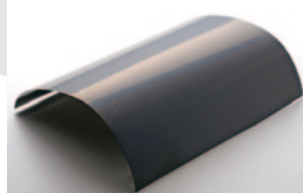
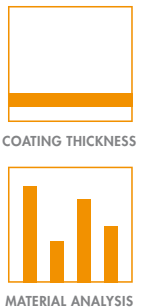
In the solar industry, for example, the FISCHERSCOPE X-RAY 5000 determines the thickness and composition of CIGS, CIS, or CdTe coatings on different substrate materials such as glass, metal or plastic.

Characteristics

- X-ray tube with W-anode and glass window or micro-focus X-ray tube with W-anode and beryllium window, optional Rh or Mo-anode. Maximum operating conditions: 50 kV, 50W
- Peltier-cooled silicon PIN diode or Silicon drift detector as X-ray detector
- Aperture: fixed Ø 1 mm, Ø 2 mm, Ø 4 mm or Ø 8 mm (with SDD also Ø 11 mm)
- Primary filter: fixed
- Measuring distance: 60 – 100 mm or 100 – 150 mm

Typical fields of application

- Photovoltaics (CIGS, CIS, CdTe)
- Analysis of thin coatings on metal strip, metal foils and plastic films
- Continuous production
- Process monitoring of sputter and electroplating production lines
- Large-area measurement



CIGS: $\text{CuInGaSe}/\text{Mo}/\text{foil}$