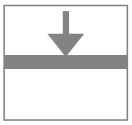
FISCHERSCOPE® X-RAY XDAL®



MEASUREMENT FROM TOP TO BOTTOM

In its design, the FISCHERSCOPE X-RAY XDAL measurement system corresponds to the XDLM. The difference is in the type of detector. With the XDAL, a Peltier-cooled silicon PIN detector is used with an energy resolution that is significantly better than that of the proportional counter tube used in the XDLM. This instrument is, therefore, suited for general materials analysis, trace analysis and for measurement of thin coatings.

The X-ray source is a micro-focus tube that can resolve small target areas. However, due to the relatively small active detector area (as compared to the proportional counter tube), the XDAL has only limited suitability for very small structures or measurement spots because only low intensities are measured. Similar to the XDLM, apertures and filters can be changed automatically in order to create the optimum excitation conditions for different measuring applications.

The FISCHERSCOPE X-RAY XDAL has a large measurement chamber which accommodates specimens with complex geometries. The motor-driven, adjustable Z-axis allows for sample heights of up to 140 mm. For large, flat samples such as PC Boards, the housing has openings on the side (C-slot).

The measuring system is equipped with a fast, programmable XY-stage, so surfaces can be examined easily in the mapping mode. Also, serial measurements on components, e.g. leadframes, or the measurement of multiple and varied components can be quickly programmed and executed automatically.

High reliability: Pb (>3%) in electronic components

PCB assemblies: Lead test

Because the XY-stage travels automatically to the loading position when the hood is opened (pop-out function), quick positioning of the sample is simple. A laser pointer shows the measuring position on the specimen.

Examples from practical applications
The FISCHERSCOPE X-RAY XDAL is used to determine Pb in tin-lead solder coatings. In this application, the thickness of the SnPb coating must be determined correctly in order to analyse the concentration of Pb. For "high reliability" applications in the aeronautics and space industry, the alloy Pb content must be at least 3% to avoid the formation of whiskers.

On the other hand, for electronics products in daily use, the RoHS standard applies, which restricts the Pb content of the solder to a maximum of 1000 ppm. Although the detection limit for Pb in solder coatings with the XDAL depends on the thickness, it is usually sufficiently low that both requirements are easily met by the XDAL.

Characteristics

- Micro-focus X-ray tube with W-anode and beryllium window. Maximum operating conditions: 50 kV, 50W
- Peltier-cooled silicon PIN diode as X-ray detector
- Aperture: 4-x automatically exchangeable, Ø 0.1 mm to Ø 0.6 mm
- Primary filter: 3-x automatically exchangeable
- Adjustable measuring distance 0 – 80 mm
- Programmable XY-stage
- Video camera for optical observation of the measurement location along the axis of the primary X-ray beam. Crosshairs with calibrated scale (ruler) and display of the measurement spot
- Design-approved, fully protected instrument compliant with the German X-ray ordinance § 4 Para. 3

Typical fields of application

- Materials analysis of coatings and alloys (also thin coatings and low concentrations) Incoming goods inspection, manufacturing monitoring
- Research and development
- Electronics industry
- Connectors and contacts
- Gold, jewellery and watch industries
- Measurement of thin Au and Pd coatings of only a few nanometres in printed circuit board manufacturing
- Trace analysis
- Determination of lead (Pb) for "high reliability" applications
- Analysis of hard material coatings

HSS-drill: TiN/Fe

Cutter: TiN/Fe