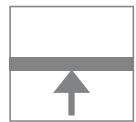


# FISCHERSCOPE® X-RAY XUL®/XULM®



MEASUREMENT FROM  
BOTTOM TO TOP

With the FISCHERSCOPE X-RAY XUL and XULM series, the X-ray source and the detector are located below the measurement chamber, allowing for fast and easy positioning of the samples. Furthermore, the viewing window facilitates positioning, and large controls on the instrument front simplify handling, which is especially helpful when measuring large quantities of parts in daily production.

Despite their compact size, these instruments feature a high-volume measurement chamber, so that even big objects can be measured. An opening in the housing (C-slot) allows for measurements on large, flat samples such as printed circuit boards that might otherwise not fit into the measurement space.

The sample is placed directly on the flat support, or for even higher orientation precision, on the optionally available manual XY-stage.

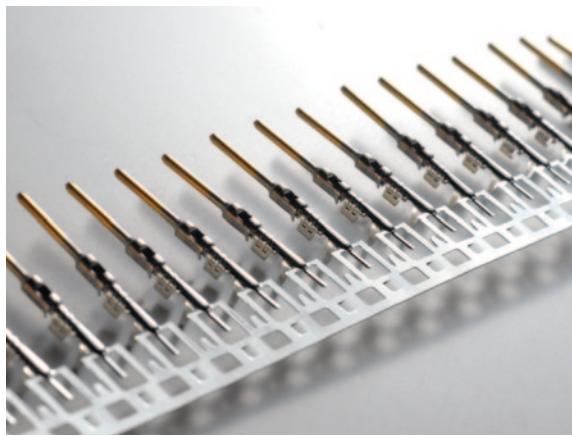
The XUL and XULM instruments are both equipped with proportional counter tube detectors; however they differ in their X-ray tubes, filters and apertures. The robust and cost-effective XUL is furnished with one aperture and one fixed filter. The standard built-in X-ray tube has a larger primary beam spot; therefore, the smallest useful aperture is 0.3 mm. Because of beam divergence, only measurement spots of about 0.7 mm – 1 mm can be resolved.



Measurement on PCBs:  
Au/Ni/Cu/PCB

Gold jewellery

The XULM is used for smaller structures. It is furnished with a micro-focus tube that also allows for small measurement spots down to about 100 µm, while the proportional counter tube detector still allows for relatively high count rates. Very good repeatability precision can be achieved even at short measuring times. Additionally, the XULM instruments feature automatically interchangeable apertures and multi-filters to flexibly create optimum excitation conditions for various measuring applications.



#### Examples from practical applications

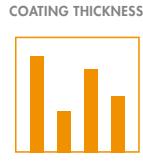
The XULM instruments are very well suited for measurements on fragile parts such as connectors, contacts or wires, as well as for measurements of coatings on printed circuit boards such as Au, Ni and Cu. Even thin gold coatings just 80 nm thick can be measured with a measurement spot of Ø 0.25 mm, achieving a repeatability precision of only 2.5 nm at 20 sec.

#### Characteristics

- X-ray tube with W-anode and glass window or micro-focus X-ray tube with W-anode and beryllium window. Maximum operating conditions: 50 kV, 50W
- Proportional counter tube as X-ray detector
- Aperture: fixed or 4-x automatically exchangeable, 0.05 x 0.05 mm to Ø 0.3 mm
- Primary filter: fixed or 3-x automatically exchangeable
- Adjustable measuring distance 0 – 27.5 mm
- Fixed sample support or manual 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

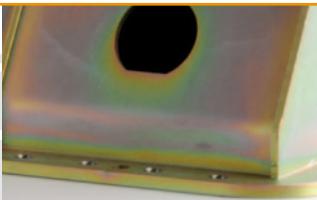
#### Typical fields of application

- Measurement of coatings such as Au/Ni/Cu/PCB or Sn/Cu/PCB in the PC Board industry
- Coatings on connectors and contacts in the electronics industry
- Decorative coatings Cr/Ni/Cu/ABS
- Electroplated coatings such as Zn/Fe, ZnNi/Fe as corrosion protection on mass-produced parts (screws and nuts)
- Jewellery and watch industry
- Determination of the metal content of electroplating baths
- Especially for easy handling of large and/or flexible PCBs an extended sample support is available



COATING THICKNESS

MATERIAL ANALYSIS



Corrosion protection: Zn/Fe



Automotive: Cr/Ni/Cu/ABS