INFORMATION

X-Ray Fluorescence Meaurement For "High Reliability" Electronic Compoments

Aviation, Aerospace, and Military users of commercial off the shelf components are faced with a potentially dangerous parts shortage. It is possible that electronics thought to contain 3% tin lead specified for high reliability applications will be mislabeled and replaced with 0% lead components. As a result, tin-whiskers could occur resulting in dangerous consequences.

The newly implemented EU directives WEEE and RoHS will drastically change the types of components supplied to many industries including electronic equipment, printed circuit boards, and plastics. Those categories of electrical and electronic equipment that are exempt from WEEE RoHS face an even tougher and more critical challenge which could be the difference between life and death.

As of July 2006, the use of lead containing solders in some electronic and electrical equipment will be prohibited. Exempt from this ban are parts for "High Reliability" military, aerospace, and aviation applications.

Since the "High Reliability" portion of the overall market for solder is quite small, many suppliers are converting their production lines to the manufacture of only lead-free solder. As a result there are far fewer sources for the 3% lead solder that for decades has been the standard means of preventing tin whiskers. Without tin/lead solder, parts exposed to harsh environments such as high humidity, vibration, and temperature variation could short circuit causing fatal failures.

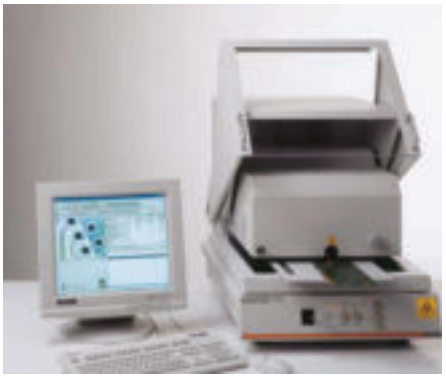
How does one guarantee a critical part contains at least 3% lead?

Ensuring a critical part contains at least 3% lead or other alloying elements can be accomplished with X-ray fluorescence measurement instruments. A quick, reliable, and non-destructive method for critical component identification for >3% lead has been developed by Fischer Technology. Using X-ray fluorescence combined with the state of the art Win FTM® 6 Software components can be clearly identified. By using this method, one can avoid the risks that might result should a parts supplier change to lead-free solder while maintaining the same part number. In addition, XRF measurement eliminates the risk that mixed lots in which some parts contain the necessary lead while others are lead-free are shipped without being identified. Also, the X-ray fluorescence equipment will ensure in rework and repair situations that a lead-free component is not used to replace a required lead containing product.

Our material analysis instruments FISCHERSCOPE® X-RAY XAN® and XDAL® help you target components that are lead-free using X-ray fluorescence in many different fields of applications. They provide an effective solution giving accurate levels of lead solder in products such as printed circuit boards and all electrical and electronic equipment. The instruments are easy to operate and safe. They provide fast, reliable, and easily readable results which can be obtained by operators with very little experience. If the part contains the necessary percentage of lead, the part is immediately identified as passing.

A screening process can be implemented to alleviate the risk of mixed lots. In addition the X-ray fluorescence equipment is capable of identifying the contents of the hazardous substances Pb, Hg, Cd, Cr and Br described in the EU directives WEEE and RoHS.

A high resolution video camera is included in the measuring instrument. This optical system, together with some variable collimators which control the X-ray beam, enables the analysis of the smallest specimen. The XDAL® instrument provides an extremely easy and user-friendly way to enable automatic measurements of specimens on a large scale. Apart from the screening of the parts, the XRF also enables an accurate quantitative analysis. Our detection limits are Pb, Hg, Br < 10 ppm; Cd, Cr < 20 ppm. The measuring time, dependant on the object, ranges from 50 s - 200 s.

FISCHERSCOPE®X-RAY		
Instrument type	XAN®	XDAL
Key applications	General analytics Analysis of alloys Coating analysis	Same use as XAN®, in addition: Automated measurements using an XY measuring stage. Lateral distribution analysis.
Measurement direction	From bottom to top	From top to bottom
Detector	PIN semiconductor diode with high energy resolution	
Collimators (A collimator is an aperture for shaping the primary X-ray beam. It determines the size of the measurement spot on the specimen.)	4 round collimators: 0.2 / 0.6 / 1.0 / 2.0 mm	Collimators: round: 0.1 / 0.3 / 0.6 mm slot-shaped: 0.5 x 0.15 mm
Measuring stage	Fixed specimen support	Programmable XY measuring stage, travel 256 x 230 mm

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