

APPLICATION NOTE

Application of FISCHER products

AN007en

Thickness Measurement of Conformal Coatings on Printed Circuit Boards

Conformal coating material is applied to electronic circuitry to act as protection against moisture, dust, chemicals, and temperature extremes. Coatings on assemblies which are too thin or totally uncoated and therefore non-protected board parts could result in damage or malfunction of the electronics.

When electronics must withstand harsh environments and added protection is necessary, most manufacturers of circuit boards coat assemblies with a layer of transparent conformal coating. The coating material can be applied by various methods like brushing, spraying and dipping, or by selectively coating via robot. Different methods of curing/drying are available depending on the conformal coating material.

Coating thickness measurement is important to check the necessary protection level. This measurement can be performed with an eddy current method (DIN EN ISO 2360), using the copper layer as conductive background.

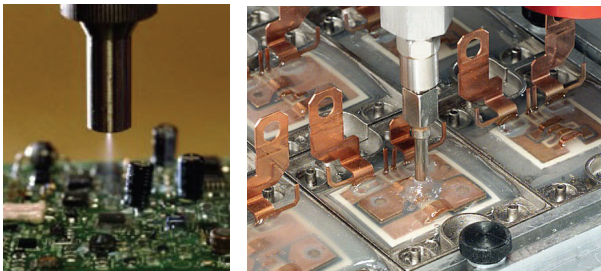


Figure 1: Conformal Coatings are applied to electronic products.

Special properties like the thickness of the copper layer, solder, patch size and coating type might influence the measurements. Therefore FISCHER developed a special probe type FTA3.3-5.6 HF to measure such coatings with the trueness and repeatability typical for FISCHER. For correct measuring a spot/patch size of at least 5 mm is required. Best measurement results are obtained when dedicated measuring spots are integrated into the PCB design.



Figure 2: FMP product family – equipped with the probe FTA3.3-5.6 HF – particularly suitable for measuring the thickness of conformal coatings.

Special features for the thickness measurement of conformal coatings with the probe FTA3.3-5.6 HF – connected either to FMP portable instruments or MMS PC desktop models:

- High frequency to avoid influences caused by the variation of copper thickness
- Large, flat probe-tip prevents indentation of soft coating types
- Automatic conductivity compensation for base material
- Measure on Sn, Ag or uncoated copper
- High accuracy and repeatability

Conformal coating inspection is a critical factor in determining long term reliability of PCBs. The probe FTA3.3-5.6 HF from FISCHER is optimally suited for this application. The probe can be connected to all DUALSCOPE® or ISOSCOPE® FMP portable instruments or FISCHERSCOPE® MMS® PC desktop models.