

## **Sealing of Non-rewirable Products fitted with Thermocouples for Test**

This document gives guidance on the procedures required when sealing or over moulding samples, which have been fitted with thermocouples at an ASTA Accredited Test Laboratory and returned for completion.

This document is applicable to all manufacturers who are required to seal their product samples by overmoulding, staking, welding or any other means, where the samples have been fitted with thermocouples for testing.

### **Why Are Samples Fitted With Thermocouples?**

The tests in British, European and International Standards require the temperature rises of samples to be measured under load conditions. The temperatures of the various parts identified within the standards are measured using fine-wire thermocouples, fitted both inside and outside the test sample.

Thermocouples can be fitted by dismantling samples or by precision drilling, however these methods are not always possible. It may be difficult to achieve without affecting the structure of the samples, so that they are no longer representative of real production.

The manufacturer may be required to supply a number of unsealed samples, fitted with the appropriate flexible cord. The ASTA Accredited Laboratory will fit thermocouples and return them to the manufacturer for sealing.

### **Methods To Be Used When Sealing Samples Fitted With Thermocouples.**

Thermocouple wires can be easily damaged by the processes involved in sealing a non-rewirable product. They may be crushed in a mould tool, disturbed by an ultrasonic welding head or detached by the operator when being removed from the mould tool.

***It is essential that these samples are treated with great care during the sealing stage.***

If the thermocouples become detached, they can only be re-fitted by an ASTA Accredited Laboratory. In the event that they are re-fitted outside the controlled conditions that exist within the ASTA Accredited Laboratory any subsequent testing that is carried out will be considered to be invalid.

Observing the following points should ensure that the thermocouple wires are not damaged during the sealing process;

1. Prior to sealing/moulding, the lie of the wires should be carefully checked to ensure that they are not likely to become trapped within the tools used in the sealing process.

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2. Where the wires lie next to the sheath of a flexible cord, they can be secured in place by scoring a shallow groove in the outer sheath of the flexible cord. The groove should be deep enough to contain the wires. Care must be taken to avoid damage to the conductor insulation, or to the thermocouple wire.

The thermocouple wires may be held in place by insulating tape wrapped around the cord prior to sealing.

3. It is recommended that the thermocouple wires are arranged so that they leave the body of the sealed sample in the region of the cord entry. This will assist in performance of the tests.
4. Where the samples are sealed by over moulding with a thermo-plastic material under high pressure, the thermocouple wires inside the sample may be secured in place by applying a small amount of adhesive to anchor the wires to the inside of the sample's body.

Care must be taken to ensure that no adhesive is placed on or over the junction of the thermocouple wire, since this will have an effect on the test results.

5. Once the appropriate sealing method has been determined it is recommended that one sample is produced and the effectiveness of the procedure verified before proceeding with the remaining test samples. The effectiveness can be examined by verifying the continuity of the thermocouples using a low voltage source (12 or 24V), at very low current. Once the sealing procedure has been verified as being satisfactory, the remaining test samples can be produced and returned to the test laboratory.
6. In despatching the samples care should be taken to ensure that they are not damaged in transit between the manufacturer and the ASTA Accredited Test Laboratory.

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Further information relating to the contents of this document, or on any matter relating to the product test and approval can be obtained directly from ASTA Certification Services.