

# Thermal shock testing

Find potential design and production faults within a product that would be caused expansion and contractions of parts and components due to temperature variations. When done in the development phase of a product it will be cost effective while improving its durability and robustness, and help you deliver a more reliable end product and can help maintain compliance.

At Nemko, we have extensive experience and the latest technology for performing thermal shock testing.

Thermal shock testing exposes your products to two extreme air temperatures with a rapid transition between. Such exposure will test the expansion rates of parts and components, the bonding strength of various materials. Repeated exposure can lead to material fatigue, weaken of bonds, cracks, ruptures, peeling of coating.

## **Thermal shocking is use commonly to evaluated and checking the following:**

- Evaluating PCB mounting reliability after a change in lead-free solder or another connection material
- Evaluating reliability after a change in mounting format such as BGA or CSP
- Evaluating connection resistance by connector temperature variation
- Checking for cracks by thermal deformation of molded plastic parts
- Checking for cracking, peeling or seal leaks in bonded materials
- Evaluating combinations of different material types such as plastic with inserted nuts
- Screening processes before product shipment

During thermal shock testing it is possible to change temperatures at rate of more than 100°C in seconds. The test chamber's extreme temperatures can range from -80°C to +200°C. It is essential to set up testing using the proper conditions, including choosing the correct maximum and minimum temperatures, to avoid invalid results.

Nemko uses both single and multiple chamber to perform the thermal shock tests, depending on the size of the product. Small and medium sized products are tested in multiple chambers, with separate hot and cold chambers and an elevator between them, which results in more rapid rate of temperature changes.

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