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TECHNICAL REPORT

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Environmental testing – Part 3-15: Supporting documentation and guidance – Vacuum-assisted reflow soldering

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IEC TR 60068-3-15 has been prepared by technical committee 91: Electronics assembly technology. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
91/1916/DTR	91/1930/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60068 series, published under the general title *Environmental testing*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

As defined in ISO 857-2, reflow soldering is a joining process using an additional metal (solder) with a liquidus temperature of 450 °C or less, in which solder paste or preforms are reflowed.

Reflow soldering can be carried out with the technical processes of convection (air or nitrogen), condensation (vapour phase), radiation (e.g. infrared) or contact heat.

Sometimes it is not possible to achieve the required void level for an assembly only with methods listed above despite the use of all technical possibilities.

Regarding void-induced asymmetrical stress constellations, a reduction of voiding can lead to a mitigated stress condition within the solder joints.

Various technical requirements only tolerate very small void dimensions. To achieve these requirements, vacuum-assisted soldering can be applied with the above mentioned reflow soldering processes.

In some product applications, a hermetic seal is required. The reliable fulfilment of this requirement is very demanding to the process technology especially complex assemblies. Vacuum-assisted soldering creates significantly more consistency in the results here.

Further benefits of vacuum-assisted soldering are improved thermal management or high frequency performance (contour adaptation, mitigation of blow holes).

Vacuum-assisted soldering, however, requires a different equipment with more complex structure and process control. Since the vacuum process has an impact on the process time, the suitability of the components and solder paste that are used need to be checked.

ENVIRONMENTAL TESTING –

Part 3-15: Supporting documentation and guidance – Vacuum-assisted reflow soldering

1 Scope

This part of IEC 60068 describes vacuum-assisted soldering considering the thermal profiling, soldering methods, suitability of the components and vacuum features of soldering systems. It is based on practical experiences from manufacturers, component, material, and soldering systems suppliers. It supports manufacturers by providing information about the functionality of vacuum and effect of vacuum on components performance.

2 Normative references

There are no normative references in this document.