

Space product assurance — Verification and approval of automatic machine wave soldering

The European Standard EN 14612:2003 has the status of a
British Standard

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National foreword

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Space product assurance - Verification and approval of automatic machine wave soldering

Assurance produits des projets spatiaux - Validation et
approbation du brasage automatique à la vague

This European Standard was approved by CEN on 27 June 2003.

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Foreword

This document (EN 14612:2003) has been prepared by Technical Committee CEN/TC CST02 "Space product assurance — Verification and approval of automatic machine wave soldering", the secretariat of which is held by CMC.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2004, and conflicting national standards shall be withdrawn at the latest by February 2004.

It is based on a previous version¹⁾ prepared by the ECSS Product Assurance Working Group, reviewed by the ECSS Technical Panel and approved by the ECSS Steering Board. The European Cooperation for Space Standardization (ECSS) is a cooperative effort of the European Space Agency, National Space Agencies and European industry associations for the purpose of developing and maintaining common standards.

Requirements in this Standard are defined in terms of what shall be accomplished, rather than in terms of how to organize and perform the necessary work. This allows existing organizational structures and methods to be applied where they are effective, and for the structures and methods to evolve as necessary without rewriting the standards.

The formulation of this Standard takes into account the existing ISO 9000 family of documents.

Annex A is normative. Annex B is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1) ECSS-Q-70-07A.

Introduction

Wave soldering is regarded as a critical process that will find limited application during the assembly of components on to printed circuit boards (PCBs) intended for spacecraft. The preferred procedure is by manual soldering to the requirements of ECSS-Q-70-08. Generally the small number of identically designed circuits does not warrant the setting up of unique machine parameters for each individual layout.

1 Scope

This specification defines the basic requirements for the verification and approval of automatic machine wave soldering for use in spacecraft hardware. The process requirements for wave soldering of double-sided and multilayer boards are also defined.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 13701:2001, *Space systems — Glossary of terms*.

ECSS-Q-70-08, *Space product assurance - The manual soldering of high-reliability electrical connections*.

ECSS-Q-70-10, *Space product assurance - Qualification of printed circuit boards*.

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13701:2001 and the following apply.

3.1.1

ionisable contaminant

process residues such as flux activators, fingerprints, etching and plating salts, that exist as ions and when dissolved, increase electrical conductivity

3.1.2

machine oil

liquid compounds formulated for use as oil in wave-soldering equipment

NOTE They serve primarily to provide a barrier between the atmosphere and molten solder, thereby reducing the oxidation (drossing) of the solder. Certain oils also reduce the surface tension of molten solder, thereby enhancing the wetting characteristics of the solder

3.1.3

measling

condition existing in the base laminate of a printed circuit board in the form of discrete white spots or “crosses” below the surface of the base laminate, reflecting a separation of fibres in the glass cloth at the weave intersection