

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

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 16602-70-07:2014 sisaldab Euroopa standardi EN 16602-70-07:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 16602-70-07:2014 consists of the English text of the European standard EN 16602-70-07:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 08.10.2014.	Date of Availability of the European standard is 08.10.2014.
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English version

## 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

Raumfahrtproduktsicherung - Verifikation und Zulassung  
von Maschinenschwällötverfahren

This European Standard was approved by CEN on 20 March 2014.

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**CEN-CENELEC Management Centre:  
Avenue Marnix 17, B-1000 Brussels**

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## Foreword

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This document (EN 16602-70-07:2014) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16602-70-07:2014) originates from ECSS-Q-ST-70-07C.

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of an identical text or by endorsement, at the latest by April 2015, and conflicting national standards shall be withdrawn at the latest by April 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14612:2003.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document has been developed to cover specifically space systems and has therefore precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

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Wave soldering is regarded as a critical process that can 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-ST-70-08. Generally the small number of identically designed circuits does not warrant the setting up of unique machine parameters for each individual layout.

When wave soldering is identified as a suitable alternative to manual soldering for use in the customer's projects, it can be essential to follow the steps outlined in this document before the final customer's approval is granted. The sequence of main events is shown in Figure 4-1. Each step is fully completed and the details recorded, so that a dossier is compiled for each manufacturer's assembly line. All dossiers are kept updated by the approval authority and serve as a reference for the approval authority's Project Engineers.

A general qualification is not granted for wave soldering. Wave soldering lines that have been previously verified (see also clause 5.2) can be also approved for use on named projects, but this depends entirely on the specific project requirements. Project process approval is requested, as for all materials and critical processes, by means of ECSS-Q-ST-70.

# 1

## Scope

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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.

This standard may be tailored for the specific characteristic and constraints of a space project in conformance with ECSS-S-ST-00.



## 2

## Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS Standard. For dated references, subsequent amendments to, or revision of any of these publications do not apply. However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

EN reference	Reference in text	Title
EN 16601-00-01	ECSS-S-ST-00-01	ECSS system - Glossary of terms
EN 16602-10-09	ECSS-Q-ST-10-09	Space product assurance – Nonconformance control system
EN 16602-70	ECSS-Q-ST-70	Space product assurance - Materials, mechanical parts and processes
EN 16602-70-08	ECSS-Q-ST-70-08	Space product assurance - Manual soldering of high-reliability electrical connections
EN 16602-70-10	ECSS-Q-ST-70-10	Space product assurance - Qualification of printed circuit boards
EN 16602-70-28	ECSS-Q-ST-70-28	Space product assurance - Repair and modification of printed circuit board assemblies for space use