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Standards

Irish Standard  
I.S. EN 16602-70-08:2015

## Space product assurance - Manual soldering of high-reliability electrical connections

**I.S. EN 16602-70-08:2015**

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## Space product assurance - Manual soldering of high-reliability electrical connections

Assurance produit des projets spatiaux - Soudage manuel  
des connexions électriques à fiabilité élevée

Raumfahrtproduktsicherung - Manuelles Löten von hoch-  
zuverlässigen elektrischen Verbindungen

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## **Table of contents**

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<b>Foreword .....</b>	<b>9</b>
<b>Introduction.....</b>	<b>10</b>
<b>1 Scope.....</b>	<b>11</b>
<b>2 Normative references .....</b>	<b>12</b>
<b>3 Terms, definitions and abbreviated terms.....</b>	<b>13</b>
3.1 Terms from other standards.....	13
3.2 Terms specific to the present standard .....	13
3.3 Abbreviated terms.....	20
<b>4 Principles of reliable soldered connections.....</b>	<b>22</b>
<b>5 Preparatory conditions .....</b>	<b>23</b>
5.1 Calibration .....	23
5.2 Facility cleanliness.....	23
5.3 Environmental conditions.....	23
5.4 Lighting requirements .....	24
5.5 Precautions against static discharges .....	24
5.5.1 General.....	24
5.5.2 Precautions against ESD during manufacturing .....	24
5.5.3 Protective Packaging and ESD Protection .....	25
5.5.4 Packing and filler materials .....	26
5.6 Equipment and tools.....	26
5.6.1 General.....	26
5.6.2 Brushes.....	26
5.6.3 Cutters and pliers.....	26
5.6.4 Bending tools .....	27
5.6.5 Clinching tools.....	27
5.6.6 Insulation strippers.....	28
5.6.7 Soldering irons and resistance soldering equipment .....	29
5.6.8 Soldering tools .....	30

<b>6</b>	<b>Materials selection .....</b>	<b>31</b>
6.1	General.....	31
6.2	Solder .....	31
6.2.1	Form .....	31
6.2.2	Composition .....	31
6.3	Flux .....	32
6.3.1	Rosin-based fluxes.....	32
6.3.2	INH1 corrosive acid flux .....	33
6.3.3	Application of flux.....	33
6.4	Solvents.....	34
6.5	Flexible insulation materials.....	34
6.6	Terminals.....	35
6.6.1	Materials .....	35
6.6.2	Tin-, silver- and gold-plated terminals.....	35
6.6.3	Shape of terminals .....	35
6.7	Wires .....	35
6.8	PCBs .....	36
6.8.1	Boards .....	36
6.8.2	Gold finish on conductors.....	36
6.9	Component lead finishes .....	36
6.10	Adhesives (staking compounds and heat sinking), encapsulants and conformal coatings.....	36
<b>7</b>	<b>Preparation for soldering.....</b>	<b>38</b>
7.1	General.....	38
7.1.1	Tools.....	38
7.1.2	Components.....	38
7.2	Preparation of conductors, terminals and solder cups.....	38
7.2.1	Insulation removal.....	38
7.2.2	Surfaces to be soldered .....	39
7.2.3	De-golding of gold-plated leads and terminals.....	40
7.2.4	Constraints on degolding and pretinning methods.....	41
7.2.5	Pretinning of stranded wires.....	42
7.2.6	Pre-tinning of component leads and solid-wire conductors.....	42
7.3	Preparation of the soldering bit .....	43
7.3.1	Fit.....	43
7.3.2	Maintenance .....	43
7.3.3	Plated bits .....	43

**EN 16602-70-08:2015 (E)**

7.3.4	Tip in operation .....	43
7.4	Maintenance of resistance-type soldering electrodes .....	44
7.5	Handling (work station) .....	44
7.6	Storage (work station) .....	44
7.6.1	Components .....	44
7.6.2	PCBs .....	44
7.6.3	Materials requiring segregation .....	44
7.7	Preparation of PCBs for soldering .....	45
7.7.1	Process .....	45
7.7.2	Demisturization methods .....	45
7.7.3	Storage of prepared PCBs .....	45
<b>8</b>	<b>Mounting of components .....</b>	<b>46</b>
8.1	General requirements .....	46
8.1.1	Introduction .....	46
8.1.2	Heavy components .....	46
8.1.3	Metal-case components .....	46
8.1.4	Glass-encased components .....	47
8.1.5	Stress relief of components with bendable leads .....	47
8.1.6	Stress relief of components with non-bendable leads .....	48
8.1.7	Reinforced plated-through holes .....	50
8.1.8	Lead and conductor cutting .....	50
8.1.9	Solid hook-up wire .....	50
8.1.10	Location .....	50
8.1.11	Conformal coating, cementing and encapsulation .....	50
8.2	Lead bending requirements .....	51
8.2.1	General .....	51
8.2.2	Conductors terminating on both sides of a non-plated-through hole .....	51
8.3	Mounting of terminals to PCBs .....	52
8.4	Lead attachment to PCBs .....	53
8.4.1	General .....	53
8.4.2	Clinched leads .....	53
8.4.3	Stud leads .....	55
8.4.4	Lapped round leads .....	56
8.4.5	Lapped ribbon leads .....	56
8.5	Mounting of components to terminals .....	56
8.6	Mounting of connectors to PCBs .....	58
<b>9</b>	<b>Attachment of conductors to terminals, solder cups and cables .....</b>	<b>59</b>

9.1	General.....	59
9.1.1	Conductors .....	59
9.1.2	Terminals .....	59
9.2	Wire termination .....	59
9.2.1	Breakouts from cables .....	59
9.2.2	Insulation clearance .....	59
9.2.3	Solid hook-up wire.....	60
9.2.4	Stress relief.....	60
9.3	Turret and straight-pin terminals .....	60
9.3.1	Side route .....	60
9.3.2	Bottom route .....	60
9.4	Bifurcated terminals.....	61
9.4.1	General.....	61
9.4.2	Bottom route .....	61
9.4.3	Side route .....	62
9.4.4	Top route .....	63
9.4.5	Combination of top and bottom routes.....	64
9.4.6	Combination of side and bottom routes.....	64
9.5	Hook terminals.....	64
9.6	Pierced terminals.....	65
9.7	Solder cups (connector type).....	66
9.8	Insulation sleeving .....	66
9.9	Wire and cable interconnections .....	67
9.9.1	General.....	67
9.9.2	Preparation of wires .....	67
9.9.3	Preparation of shielded wires and cables .....	67
9.9.4	Pre-assembly .....	68
9.9.5	Soldering procedures.....	68
9.9.6	Cleaning.....	69
9.9.7	Inspection .....	69
9.9.8	Workmanship .....	69
9.9.9	Sleeving of interconnections .....	69
9.10	Connection of stranded wires to PCBs.....	70
<b>10</b>	<b>Soldering to terminals and PCBs.....</b>	<b>72</b>
10.1	General.....	72
10.1.1	Securing conductors .....	72
10.1.2	Thermal shunts .....	72

**EN 16602-70-08:2015 (E)**

10.1.3	High-voltage connections .....	72
10.2	Solder application to terminals .....	73
10.2.1	Soldering of swaged terminals onto PCBs .....	73
10.2.2	Soldering of conductors onto terminals (except cup terminals).....	73
10.2.3	Soldering of conductors onto cup terminals.....	74
10.3	Solder application to PCBs .....	74
10.3.1	Solder coverage .....	74
10.3.2	Solder fillets .....	74
10.3.3	Soldering of component leads to plated-through holes .....	74
10.3.4	Solder application .....	75
10.4	Wicking.....	76
10.5	Solder rework .....	76
10.6	Repair and modification .....	76
<b>11</b>	<b>Cleaning of PCB assemblies .....</b>	<b>77</b>
11.1	General.....	77
11.2	Ultrasonic cleaning .....	77
11.3	Monitoring for cleanliness .....	77
11.3.1	Cleanliness testing .....	77
11.3.2	Testing frequency .....	78
11.3.3	Test limits.....	78
11.3.4	Test method.....	78
<b>12</b>	<b>Final inspection .....</b>	<b>79</b>
12.1	General.....	79
12.2	Acceptance criteria .....	79
12.3	Visual rejection criteria.....	80
<b>13</b>	<b>Verification procedure.....</b>	<b>81</b>
13.1	General.....	81
13.2	Vibration .....	81
13.3	Temperature cycling .....	84
13.4	Microsection .....	84
<b>14</b>	<b>Quality assurance.....</b>	<b>85</b>
14.1	General.....	85
14.2	Data.....	85
14.3	Nonconformance .....	85
14.4	Calibration .....	85
14.5	Traceability .....	86



14.6 Workmanship standards .....	86
14.7 Inspection .....	86
14.8 Operator and inspector training and certification .....	86
<b>15 Workmanship standards.....</b>	<b>88</b>
15.1 Soldered clinched terminals.....	88
15.2 Soldered stud terminals .....	89
15.3 Soldered turret terminals.....	90
15.4 Solder turret terminals .....	91
15.5 Soldered bifurcated terminals .....	92
15.6 Soldered hook terminals .....	93
15.7 Soldered cup terminals .....	94
15.8 Soldered wire to shielded cable interconnections .....	95
<b>Annex A (normative) Report on manual soldering of high-reliability electrical connections - DRD.....</b>	<b>98</b>
<b>Annex B (informative) Solder melting temperatures and choice .....</b>	<b>102</b>
<b>Bibliography.....</b>	<b>103</b>

## Figures

Figure 5-1: Profiles of correct and incorrect cutters for trimming leads .....	27
Figure 5-2 Examples of non-approved types of mechanical strippers.....	28
Figure 8-1: Assembly of underfilled TO-39 and TO-59, and adhesively staked CKR06 .....	48
Figure 8-2: Methods for incorporating stress relief with components having bendable leads .....	49
Figure 8-3: Methods for attaching wire extensions to non-bendable leads.....	50
Figure 8-4: Minimum lead bend .....	51
Figure 8-5: Leads with solder termination on both sides .....	52
Figure 8-6: Types of terminal swaging.....	53
Figure 8-7: Clinched-lead terminations - unsupported holes .....	54
Figure 8-8: Clinched lead terminations - plated through-holes .....	54
Figure 8-9: Stud terminations .....	55
Figure 8-10: Methods of through-hole lapped termination.....	57
Figure 8-11: Method of stress relieving parts attached to terminals .....	57
Figure 9-1: Side- and bottom-route connections to turret terminals .....	61
Figure 9-2: Bottom-route connections to bifurcated terminal.....	62
Figure 9-3: Side-route connection to bifurcated terminal.....	63
Figure 9-4: Top-route connection to bifurcated terminal.....	64

**EN 16602-70-08:2015 (E)**

Figure 9-5: Connections to hook terminals .....	65
Figure 9-6: Connections to pierced terminals .....	65
Figure 9-7: Connections to solder cups (connector type).....	66
Figure 9-8: Methods for securing wires.....	69
Figure 9-9: Connection of stranded wires to PCBs .....	71
Figure 10-1: High voltage connection .....	73
Figure 10-2: Minimum acceptable wetting on component side.....	75
Figure 15-1: Soldered clinched terminals .....	88
Figure 15-2: Soldered stud terminals.....	89
Figure 15-3: Soldered turret terminals with twin conductors .....	90
Figure 15-4: Soldered turret terminals with single conductors.....	91
Figure 15-5: Soldered bifurcated terminals.....	92
Figure 15-6 Soldered hook terminals.....	93
Figure 15-7: Soldered cup terminals.....	94
Figure 15-8: Hand-soldered wire to shielded cable interconnections .....	95
Figure 15-9: Hand-soldered wire to shielded wire interconnections .....	96
Figure 15-10: Hand-soldered wire interconnections - details of defects .....	97

**Tables**

Table 6-1: Chemical composition of spacecraft solders .....	32
Table 6-2: Fluxes.....	33
Table 7-1: Clearances for insulation .....	39
Table 7-2: Solder baths for degolding and pretinning .....	41
Table 9-1: Dimensions for Figure 9-9 .....	71
Table 13-1: Sine survey.....	82
Table 13-2: Minimum severity for sine vibration testing .....	83
Table 13-3: Minimum severity for random vibration testing for all applications except launchers .....	83
Table 13-4: Minimum severity for random vibration testing for launcher .....	83
Table B-1 : Guide to choice of solder types .....	102

## Foreword

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This document (EN 16602-70-08:2015) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16602-70-08:2015) originates from ECSS-Q-ST-70-08C.

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 July 2015, and conflicting national standards shall be withdrawn at the latest by July 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 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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The main part of this Standard is based on recommendations from the National Aeronautics and Space Administration and European soldering technology experts. Modifications have been incorporated into the text to provide for the specific requirement of low-outgassing electrical systems which are required by scientific and application satellites. Other additions have been made in the light of recent technological advances and the results of verification test programmes. The methods and workmanship contained in this document are considered to be fully approved for normal spacecraft requirements.

# 1

## Scope

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This Standard defines the technical requirements and quality assurance provisions for the manufacture and verification of manually-soldered, high-reliability electrical connections.

The Standard defines acceptance and rejection criteria for high reliability manufacture of manually-soldered electrical connections intended to withstand normal terrestrial conditions and the vibrational g-loads and environment imposed by space flight.

The proper tools, correct materials, design and workmanship are covered by this document. Workmanship standards are included to permit discrimination between proper and improper work.

The assembly of surface-mount devices is covered in ECSS-Q-ST-70-38.

Requirements related to printed circuit boards are contained in ECSS-Q-ST-70-10 and ECSS-Q-ST-70-11.

Verification of manual soldering assemblies which are not described in this standard are performed by vibration and thermal cycling testing. The requirements for verification are given in this Standard.

This standard does not cover the qualification and acceptance of EQM and FM equipment with hand soldered connections.

The qualification and acceptance tests of equipment manufactured in accordance with this Standard are covered by ECSS-E-ST-10-03.

The mounting and supporting of components, terminals and conductors prescribed herein applies to assemblies designed to operate within the temperature limits of  $-55\text{ }^{\circ}\text{C}$  to  $+85\text{ }^{\circ}\text{C}$ .

For temperatures outside this normal range, special design, verification and qualification testing is performed to ensure the necessary environmental survival capability.

Special thermal heat sinks are applied to devices having high thermal dissipation (e.g. junction temperatures of  $110\text{ }^{\circ}\text{C}$ , power transistors) in order to ensure that solder joints do not exceed  $85\text{ }^{\circ}\text{C}$ .

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

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