

Space product assurance - Crimping of high-reliability electrical connections

Táto norma obsahuje anglickú verziu európskej normy. This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/15

Obsahuje: EN 16602-70-26:2014

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN 16602-70-26

October 2014

ICS 49.060; 49.140

English version

Space product assurance - Crimping of high-reliability electrical connections

Assurance produit des projets spatiaux - Sertissage des connexions électriques à fiabilité élevée

Raumfahrtproduktsicherung - Quetschen von hochzuverlässigen elektrischen Verbindungen

This European Standard was approved by CEN on 11 April 2014.

CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN and CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN and CENELEC members are the national standards bodies and national electrotechnical committees of 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 United Kingdom.





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

Table of contents

Forew	ord		5			
1 Scop	e		6			
2 Norn	native r	eferences	8			
3 Term	ns, defii	nitions and abbreviated terms	9			
3.1	Terms	defined in other standards	9			
3.2	Terms	specific to the present standard	9			
3.3	Abbrev	eviated terms10				
4 Princ	ciples		11			
5 Requ	uiremer	nts	12			
5.1	Prepar	atory conditions	12			
	5.1.1	Facilities	12			
	5.1.2	Tools and equipment	13			
5.2	Crimping operations for specific interconnections		14			
	5.2.1	General	14			
	5.2.2	Material selection	15			
	5.2.3	Process review and documentation	15			
	5.2.4	Connector barrel and single wire crimping	16			
	5.2.5	Connector barrel and multiple wire crimping	16			
	5.2.6	Ferrule shield crimping	17			
	5.2.7	Lug and splice wire crimping	18			
5.3	Requirements for new crimp configurations					
	5.3.1	General	19			
	5.3.2	Test procedure	19			
	5.3.3	Sealing and marking	20			
5.4	Test methods		21			
	5.4.1	General	21			
	5.4.2	Voltage drop	21			
	5.4.3	Tensile strength	23			
	5.4.4	Metallography	26			

5.5	Quality assurance		
	5.5.1	General	26
	5.5.2	Personnel training and certification	27
	5.5.3	Workmanship	29
	5.5.4	Visual inspection	30
	5.5.5	Shift performance inspection and test	31
	5.5.6	Calibration of crimping tools	31
	5.5.7	Records	32
	5.5.8	Nonconformance	33
5.6	Docum	nent requirements	33
Annex	A (info	ormative) Crimp configurations and tools	34
Biblio	graphy		40
Figure	es		
Figure	1-1: Spe	cific interconnections in this Standard	7
Figure	5-1: Exa	mple of a typical connector barrel and single wire crimping	16
Figure	5-2: Exa	mple of a typical connector barrel and multi-wire crimping	17
Figure	5-3: Exa	mple of a typical ferrule shield crimping	18
Figure	5-4: Exa	mples of typical lug and splice wire crimping	19
Figure	5-5: Typ incr	ical plots showing variation in crimp termination characteristics with easing indentation depth	21
Figure	5-6: Mea	asurement of voltage drop across a crimped termination	22
Figure	5-7: Qua	ality control during crimping operation	28
Figure	5-8: Visi	ble workmanship standards	29
Figure	5-9: Wor	kmanship examples and crimp micro-sections	29
Figure .	A-1 : Co	nfined irregular-octagon crimp (compactive)	35
Figure .	A-2 : Dir	npled confined octagon crimp (compactive)	35
Figure .	A-3 : Re	gular-hexagon crimp (compactive)	35
Figure .	A-4 : Se	micircular one- or two-indent crimp (dispersive)	35
Figure .	A-5 : Fo	ur-indent crimp (dispersive)	35
Figure .	А-6 : Тур	oical test fixture for testing lug and splice crimps	39
Tables	5		
Table 5	5-1: Equi	pment for verification process	14
Table 5	5-2: Volta	age drop test requirements	23
Table 5		uired ultimate axial strength for compactive and dispersive crimped	25
	,		

STN EN 16602-70-26: 2015

EN 16602-70-26:2014 (E)

Table A-1 : Guideline for selector setting - Four-indent crimp (dispersive) Single wire (Crimping tool 22520/2-01)	37
Table A-2 : Guideline for selector setting - Four-indent crimp (dispersive) -Two wires (Crimping tool 22520/2-01)	38
Table A-3: Guideline for die selection (ferrule coaxial shield crimping)	38

Foreword

This document (EN 16602-70-26:2014) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN.

This standard (EN 16602-70-26:2014) originates from ECSS-Q-ST-70-26C.

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 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.

1 Scope

This Standard specifies:

- Requirements for the following crimping wire terminations intended for high reliability electrical connections for use on customer spacecraft and associated equipment operating under high vacuum, thermal cycling and launch vibration:
 - removable contacts, single wires
 - removable contacts, multiple wires
 - coaxial connectors, ferrules
 - lugs and splices.

NOTE These are the most common used crimping wire termination and are represented in Figure 1-1.

• The general conditions to be met for the approval of terminations other than the above mentioned ones.

NOTE Additional forms of crimps, not covered in this standard, are listed (not exhaustively) in the informative Annex A.

- Product assurance provisions for both the specific and the generic terminations mentioned above.
- Training and certification requirements for operators and inspectors (clause 5.5.2), additional to those specified in ECSS-Q-ST-20.

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

Lugs and splices

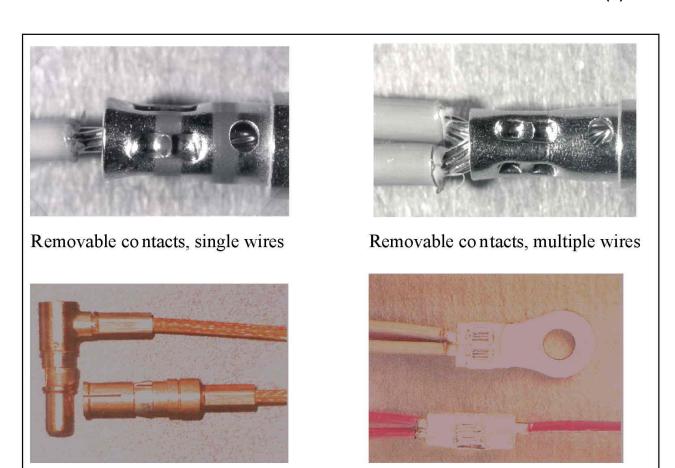


Figure 1-1: Specific interconnections in this Standard

Coaxial connectors, ferrules

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 revisions 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 most 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 16602-20	ECSS-Q-ST-20	Space product assurance - Quality assurance
EN 16602-60	ECSS-Q-ST-60	Space product assurance - Electrical, electronic and electromechanical (EEE) components
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 16602-70-38	ECSS-Q-ST-70-38	Space product assurance - High-reliability soldering for surface-mount and mixed technology
EN 16602-70-71	ECSS-Q-ST-70-71	Space product assurance - Data for selection of space materials and processes
	MIL-DTL-22520G	Crimping tools, terminal hard, wire termination, general specification for
	NASA-STD-8739.4/CHG3 09/05/2006	Crimping, Interconnection cables, harnesses and wiring
	SAE-AS-7928A 02/01/2008	Terminals, lugs, splices, conductor, crimp style, copper, general specification for
	SAE-AS-81824 08/01/1998	Splices, electric, permanent, crimp style, copper, insulated, environment resistant

koniec náhľadu – text ďalej pokračuje v platenej verzii STN