

# SLOVENSKI STANDARD

## SIST EN 3373-001:2022

01-julij-2022

Nadomešča:

SIST EN 3373-001:2008

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**Aeronavtika - Kabelski čevlji in spojne tulke za spajanje s stiskanjem na električne vodnike - 001. del: Tehnična specifikacija**

Aerospace series - Terminal lugs and in-line splices for crimping on electric conductors - Part 001: Technical specification

Luft- und Raumfahrt - Kabelschuhe und Stossverbinder zum Crimpen von elektrischen Leitern - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Cosses et prolongateurs pour sertissage sur conducteurs électriques - Partie 001 : Spécification technique

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**Ta slovenski standard je istoveten z: EN 3373-001:2022**

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**ICS:**

49.060

Letalska in vesoljska  
električna oprema in sistemi

Aerospace electric  
equipment and systems

**SIST EN 3373-001:2022**

**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 3373-001**

May 2022

ICS 49.060

Supersedes EN 3373-001:2007

English Version

**Aerospace series - Terminal lugs and in-line splices for  
crimping on electric conductors - Part 001: Technical  
specification**

Série aérospatiale - Cosses et prolongateurs pour  
sertissage sur conducteurs électriques - Partie 001 :  
Spécification technique

Luft- und Raumfahrt - Kabelschuhe und Stossverbinder  
zum Crimpen von elektrischen Leitern - Teil 001:  
Technische Lieferbedingungen

This European Standard was approved by CEN on 4 October 2020.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

<b>Contents</b>	<b>Page</b>
European foreword .....	3
<b>1 Scope</b> .....	<b>4</b>
<b>2 Normative references</b> .....	<b>4</b>
<b>3 Terms and definitions</b> .....	<b>4</b>
<b>4 General</b> .....	<b>5</b>
4.1 Physical characteristics .....	5
4.2 Functional characteristics .....	5
4.2.1 Recommended cables.....	5
4.2.2 Crimping tools.....	5
<b>5 Tests</b> .....	<b>5</b>
5.1 General.....	5
5.2 Special tests.....	5
5.2.1 Crimping at low temperature .....	5
5.2.2 Sleeve strength .....	6
5.2.3 Sealing.....	6
5.2.4 Flammability.....	6
5.3 Qualification tests for crimped connections on copper cable .....	6
5.4 Qualification tests for crimped connections on aluminium cable .....	13
<b>6 Quality assurance</b> .....	<b>15</b>
6.1 General.....	15
6.2 Product Qualification Types .....	15
6.2.1 General.....	15
6.2.2 Type 1 — Qualifications using the crimp tool tools and tie dies given in the product standard .....	15
6.2.3 Type 2 — Qualification of a crimp device using the applicants own tool design.....	16
6.3 Initial qualification conditions.....	16
6.3.1 General.....	16
6.3.2 Sampling and definition of samples .....	16
6.3.3 Preparation of specimens .....	16
6.3.4 Programme of qualification tests.....	23
6.4 Acceptance and inspection conditions.....	24
6.5 Quality control .....	24
6.6 Maintaining qualification.....	24
<b>Bibliography</b> .....	<b>25</b>

## European foreword

This document (EN 3373-001:2022) has been prepared by the Aerospace and Defence Industries Association of Europe — Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this document has received the approval of the National Associations and the Official Services of the member countries of ASD-STAN, prior to its presentation to CEN.

This document shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

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

This document supersedes EN 3373-001:2007.

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

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## 1 Scope

This document specifies the general characteristics, the conditions of qualification, acceptance and quality assurance, as well as the test programs and groups for terminal lugs and in-line splices designed for crimping on copper and copper alloy conductors and on aluminium and aluminium alloy conductors.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2083, *Aerospace series — Copper or copper alloy conductors for electrical cables — Product standard*

EN 2242, *Aerospace series — Crimping of electric cables with conductors defined by EN 2083, EN 4434 and EN 2346*

EN 2591, \* *Aerospace series — Elements of electrical and optical connection — Test methods*

EN 3719, *Aerospace series — Aluminium or aluminium alloy conductors for electrical cables — Product standard*

EN 4434, *Aerospace series — Copper or copper alloy lightweight conductors for electrical cables — Product standard (Normal and tight tolerances)*

IEC 60050-581, *International Electrotechnical Vocabulary (IEV) — Part 581: Electromechanical components for electronic equipment*<sup>1</sup>

## 3 Terms and definitions

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For the purposes of this document, the terms and definitions given in IEC 60050-581 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

\* All parts quoted in this document.

## 4 General

### 4.1 Physical characteristics

The forms and dimensions, masses, materials and operating temperature ranges are defined in the product standards.

### 4.2 Functional characteristics

#### 4.2.1 Recommended cables

The terminal lugs and in-line splices shall allow the correct connection (in accordance with EN 2242) of copper cables conforming to EN 2083 or EN 4434 and of aluminium cables conforming to EN 3719.

#### 4.2.2 Crimping tools

The tools which are referred to in the product standards regarding terminal lugs and in-line splices shall be designed so that:

- they ensure the correct positioning of the crimping area;
- they have a full closure mechanism which ensures that the crimping cycle is fully completed;
- the crimping operation does not damage the terminal lug or the in-line splice and does not cause any significant burring;
- a reference mark identifying the gauge is made in the crimping area, if possible.

## 5 Tests

### 5.1 General

Unless otherwise specified, the tests shall be selected from those in EN 2591. These tests are listed in Table 1 and Table 3.

The tests shall be carried out on each combination of gauge, material and plating of the crimp barrel crimped on the appropriate section of each type of cable (material and plating), for each type of crimping tool.

When a crimping barrel is designed to accommodate a range of cables for a specific type of tool or for a type or size of die or stop, the tests shall be carried out on only the smallest and largest permitted cable sections.

To rationalise the test procedures and avoid confusion between the tests for copper and aluminium cables, the tests have been grouped together, and are defined as Group Cu 0, Cu 1, Cu 2, etc. for copper cables and Group Al 0, Al 1, Al 2, etc. for aluminium cables.

For the purposes of these groups, copper and copper alloy cables are included within test Groups Cu 0, Cu 1, Cu 2, etc. Likewise, aluminium and aluminium alloy cables are included within the test Groups Al 0, Al 1, Al 2, etc.

### 5.2 Special tests

#### 5.2.1 Crimping at low temperature

Keep the components (cable, terminal lugs or in-line splices and crimping tools) at a temperature of  $(-15 \pm 2) ^\circ\text{C}$  for 1 h, then crimp at that temperature.

Keep the specimens at a temperature of  $(-65 \pm 2) ^\circ\text{C}$  for 1 h.

**EN 3373-001:2022 (E)**

Recover at  $(20 \pm 5) ^\circ\text{C}$  for 1 h.

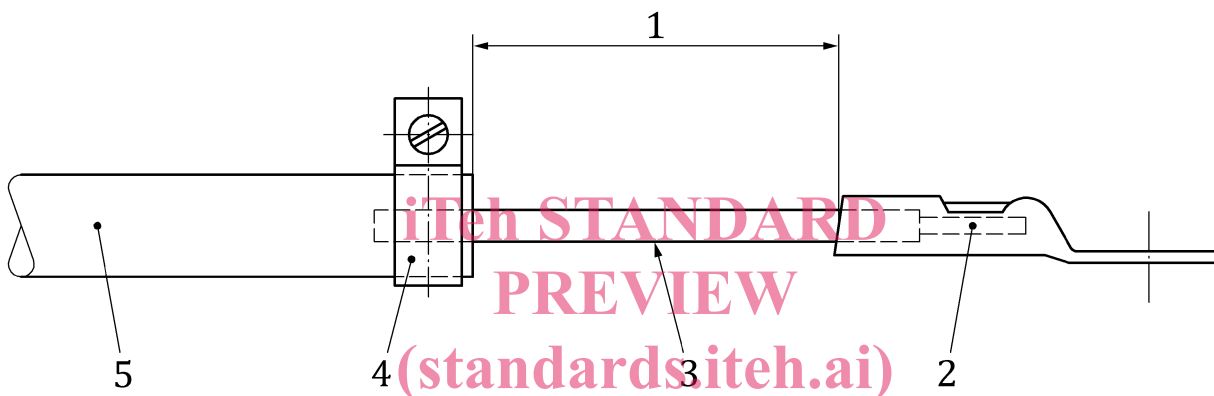
**5.2.2 Sleeve strength**

The insulating sleeve shall have a good grip on the terminal lug barrel before and after crimping and, when held by a fork passed around the crimping barrel, the displacement shall not be more than 1 mm under an axial load of 35 N.

**5.2.3 Sealing**

The cable shall be placed in a tube connected to a compressed air supply; the pressure shall be increased in  $\times 10^5$  Pa stages every 5 min up to  $2 \times 10^5$  Pa and maintained at this value for 1 h (see Figure 1).

The specimen shall be immersed with the end of the barrel approximately 50 mm below the water level. There shall not be any leakage in the crimping area.

**Key**

- 1 60 mm to 100 mm
- 2 Terminal lug
- 3 Cable
- 4 Collar clamp
- 5 Compressed air supply pipe

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**Figure 1 — Assembly for the sealing test**

**5.2.4 Flammability**

The specimen shall be suspended in a still air chamber above a Bunsen burner with a 100 mm-long tube and an internal diameter of  $(9,5 \pm 0,5)$  mm.

The end of the 25 mm blue flame produced by the Bunsen burner shall be applied for 20 s to half the length of the insulation of the specimen.

There shall be no flame or incandescence 15 s after the flame is withdrawn.

**5.3 Qualification tests for crimped connections on copper cable**

See Table 1.

NOTE Where a requirement for an individual test is not quoted, see Table 7 for sequence of further tests.



Table 1 (1 of 2)

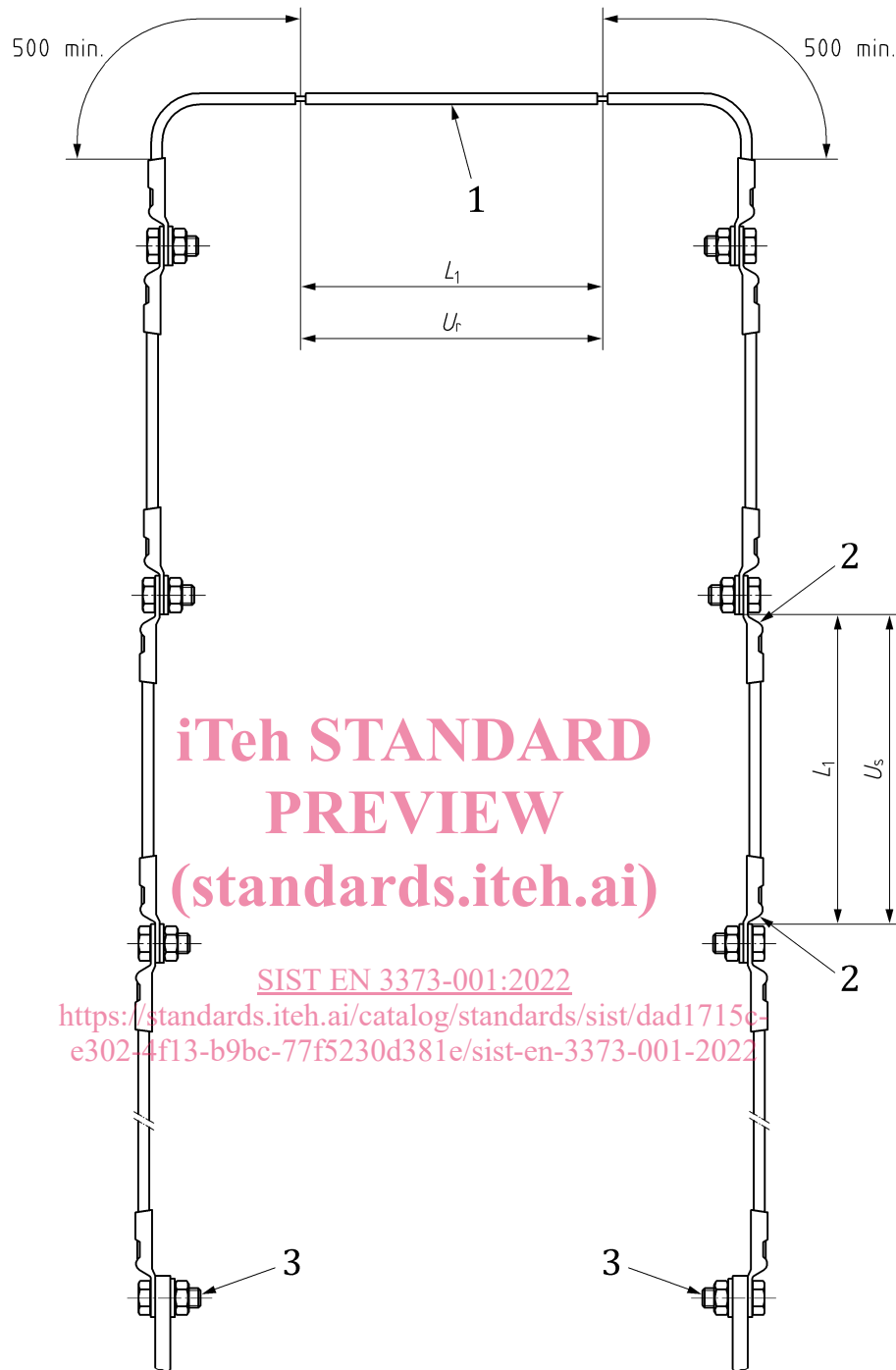
	Designation of the test	Details
EN 2591-101	Visual examination	With the naked or normally corrected eye on crimped specimens. An optical magnification of 6 (six) to 10 may be used if required. Check that: <ul style="list-style-type: none"> <li>the combined section of cable/barrel size or in-line splice/crimping tool conforms;</li> <li>the form and position of crimping are correct;</li> <li>there are no major cracks or burrs on the barrel;</li> <li>the cable core is correctly inserted in the barrel;</li> <li>the cable core and insulation are not damaged;</li> <li>the identification marks stamped on the crimp by the die are correct (if applicable).</li> </ul>
EN 2591-102	Examination of dimensions and mass	Before crimping, dimensions and masses shall conform to the requirements of the product standard.
EN 2591-206	Measurement of insulation resistance	The insulation resistance measured between the outer surface of the insulating sleeve and the cable core shall be a minimum of 1 000 MΩ.
EN 2591-217	Voltage drop under specified current for terminal lugs and in-line splices	See Figure 2 and Figure 3.
EN 2591-218	Ageing of terminal lugs and in-line splices by temperature and current cycling	Test current as per Table 2. Requirement: see EN 2591-218.
EN 2591-219	Voltage strength for insulated terminal lugs and in-line splices	Test applicable to terminal lugs and in-line splices with insulated barrels. Requirement: see EN 2591-219.
EN 2591-301	Endurance at temperature	Method B. 120 h in a dry heat chamber at a temperature 15 °C above the operating temperature of the terminal lug or in-line splice. Test applicable terminal lugs and in-line splices with insulated barrels.
EN 2591-305	Rapid change of temperature	$T_A$ = operating temperature of the terminal lug or in-line splice plus 15 °C $T_B$ = -65 °C
EN 2591-307	Salt mist	48 h unless otherwise specified in the product standard. Check that no flaking of the protective treatment has occurred.

Table 1 (2 of 2)

	Designation of the test	Details
EN 2591-314	Immersion at low air pressure	The in-line splice, fitted with its sealing accessories, shall be immersed in the solution. The ends of the cables shall protrude from the solution with neither the sealing accessories nor the crimps being subjected to any stress. Pressure of chamber 4 kPa.
EN 2591-315	Fluid resistance	Test applicable to terminal lugs and in-line splices with insulated barrels.
EN 2591-403	Sinusoidal and random vibration	Method A. Assembly as per Figure 4. No sign of fracture. Applicable to terminal lugs only.
EN 2591-417	Tensile strength (crimped connection)	See Figure 5. The specimen shall not break at a value less than those specified in Table 2.
EN 3373-001	Crimping at low temperature	See 5.2.1.
EN 3373-001	Sleeve strength	See 5.2.2.
EN 3373-001	Flammability	See 5.2.4. Test applicable to terminal lugs and in-line splices with insulated barrels.

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**Key**

- 1 Reference cable
- 2 Measurement point
- 3 Supply terminal

**Figure 2 — Assembly for measuring the voltage drop in terminal lugs in accordance with EN 2591-217**