



**SLOVENSKI STANDARD**  
**oSIST prEN 3838:2020**  
**01-september-2020**

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**Aeronavtika - Zahteve in preskusi pri označevanju električnih kablov v zračnih plovilih za uporabnike**

Aerospace series - Requirements and tests on user-applied markings on aircraft electrical cables

Luft- und Raumfahrt - Anforderungen und Prüfungen der Anwenderkennzeichnung auf elektrischen Luftfahrzeugleitungen

Série aérospatiale - Exigences et essais sur les marquages utilisateurs de câbles électriques aéronautiques

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**Ta slovenski standard je istoveten z: prEN 3838**

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**ICS:**

29.060.20	Kabli	Cables
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

**oSIST prEN 3838:2020**

**en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 3838**

June 2020

ICS

English Version

## Aerospace series - Requirements and tests on user-applied markings on aircraft electrical cables

Série aérospatiale - Exigences et méthodes d'essais sur les marquages utilisateurs de câbles électriques aéronautiques

Luft- und Raumfahrt - Anforderungen und Prüfungen der Anwenderkennzeichnung auf elektrischen Luftfahrzeugleitungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, CEN 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.

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

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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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**

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## European foreword

This document (prEN 3838:2020) 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 Standard 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 is currently submitted to the CEN Enquiry.

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## Introduction

Durability of function-related marking of aircraft electrical cables is of great importance throughout the life of an aircraft, during initial assembly, operation and maintenance operations in service.

Markings should, therefore, be made to a sufficiently high standard to satisfy requirements initially and for the remainder of the expected life marked cable or equipment containing it.

Markings are applied by the user to the cable insulation, jacket or sheath and should not degrade the performance of the cable. They should be applied in accordance with design requirements using a process approved by the Design Authority.

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## 1 Scope

This document specifies tests that are to be performed on markings applied by the user to ensure that their durability is satisfactory and that, after application of markings directly to the cable insulation, jacket or sheath, the cable will meet the performance requirements laid down.

## 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 3475-100, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 100: General*

EN 3475-201, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 201: Visual examination*

EN 3475-302:2006, *Aerospace series - Cable, electrical, aircraft use - Test methods - Part 302: Voltage proof test*

EN 3475-401:2002, *Aerospace series - Cables, electrical, aircraft use - Test Methods - Part 401: Accelerated ageing*

EN 3475-405:2002, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 405: Bending at ambient temperature*

EN 3475-411, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 411: Resistance to fluids*

EN 3475-703:2002, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 703: Permanence of manufacturer's marking*

EN 3475-705, *Aerospace series - Cables, electrical, aircraft use - Test methods - Part 705: Contrast measurement*

EN ISO 4892-3:2016, *Plastics — Methods of exposure to laboratory light sources — Part 3: Fluorescent UV lamps (ISO 4892-3:2016)*

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### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 3475-100 and the following apply.

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

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

#### 3.1

##### marking

identification mark applied directly to the cable insulation, jacket or sheath by any process that meets the requirements of this document

Note 1 to entry: The markings should be in accordance with the design requirements.

#### 3.2

##### aggressive marking system

marking which can deform or damage the insulating layer of a cable

Note 1 to entry: Hot-stamp is defined as such a method. Other methods of marking may be defined as aggressive by the Official Services.

### 4 Qualification tests

#### 4.1 Tests

The tests in Table 1 shall be performed at the introduction of the marking process, at every change in technology or processing technique affecting the cable insulation jacket or sheath or as required by the Official Services.

Tests shall be performed on the sizes for qualification defined in the cable specification for each colour, material and construction of cable, jacket and sheath which will be directly marked.

Before the tests defined in Table 1 are performed on specimens of user marked cable, ensure that the specimens have been subjected to any post marking curing which is normal for the defined marking process.

**Table 1**

Title	Subclause
Visual examination of markings	6.1
Permanence of markings	6.2
Resistance to fluids	6.3
Heat ageing	6.4
Exposure to light	6.5
Marking contrast	6.6
Bending at ambient temperature	6.7



## 4.2 Test sequence

The number of specimens for each test and the sequence of testing shall be as laid down in Table 2.

Each specimen shall be taken sequentially from a continuous length of cable.

**Table 2 — All marking techniques except UV laser marking**

Group	Number of specimens	Tests	
		Title	Subclause
1	5	Visual examination of markings	6.1
		Marking contrast	6.6
		Permanence of markings	6.2
2	1 per fluid	Visual examination of markings	6.1
		Resistance to fluids	6.3
		Marking contrast	6.6
3	3	Visual examination of markings	6.1
		Heat ageing	6.4
		Marking contrast	6.6
4	3	Visual examination of markings	6.1
		Exposure to light	6.5
		Visual examination of markings	6.1
5 <sup>a</sup>	3	Visual examination of markings	6.1
		Bending at ambient temperature	6.7

<sup>a</sup> Group 5 tests only performed on markings made by aggressive marking systems

Table 3 — UV laser marking

Group	Number of specimens	Tests	
		Title	Subclause
1	3	Visual examination of markings	6.1
		Heat ageing	6.4
		Marking contrast	6.6
2	3	Visual examination of markings	6.1
		Exposure to light	6.5
		Visual examination of markings	6.1
3	3	Visual examination of markings	6.1
		Voltage proof test	6.8
		Visual examination of markings	6.1

NOTE the French group proposed to include the Voltage proof test Method 302, but not the test according to Method 303 that would require 10 to 15-m long samples entirely marked.

## 5 Acceptance tests iTeh STANDARD PREVIEW

The tests in Table 3 shall be performed on each production batch of markings. Visual examination shall be made on specimens taken each time production is started (e.g. at start of day or shift), at the beginning and end of each production run and at intervals not exceeding 10 000 m for single core cables and 800 m for multicore and screened cables.

Table 3

Title	Subclause	Applicable
Visual examination of markings	6.1	All marking systems including UV laser markers
Voltage test	6.8 6.8.4.1 or 6.8.4.2 continuously	Tests on aggressive marking systems

## 6 Test methods

### 6.1 Visual examination of markings

#### 6.1.1 Objects

The markings shall be examined to ensure that they are legible and comply with the specified requirements in respect of size and style of print and colour if specified.

#### 6.1.2 Apparatus

A light source which provides an illumination of 500 lx min. on a flat work surface.