



# SLOVENSKI STANDARD

## SIST EN 2591-403:2019

01-januar-2019

Nadomešča:

SIST EN 2591-403:2012

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**Aeronavtika - Elementi električnih in optičnih povezav - Preskusne metode - 403.**  
**del: Sinusna in naključna nihanja**

Aerospace series - Elements of electrical and optical connection - Test methods - Part 403: Sinusoidal and random vibration

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren - Teil 403: Sinus- und rauschförmige Schwingungen

Série Aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 403 : Vibrations sinusoidales et aléatoires

**Ta slovenski standard je istoveten z: EN 2591-403:2018**

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**ICS:**

49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems
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**SIST EN 2591-403:2019**

**en,fr,de**

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EUROPEAN STANDARD

EN 2591-403

NORME EUROPÉENNE

EUROPÄISCHE NORM

October 2018

ICS 49.060; 49.090

Supersedes EN 2591-403:2012

English Version

## Aerospace series - Elements of electrical and optical connection - Test methods - Part 403: Sinusoidal and random vibration

Série Aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 403 : Vibrations sinusoïdales et aléatoires

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren - Teil 403: Sinus- und rauschförmige Schwingungen

This European Standard was approved by CEN on 11 September 2017.

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. 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 member.

**iTeh STANDARD PREVIEW**

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 member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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 (EN 2591-403:2018) 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, prior to its presentation to CEN.

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 2019, and conflicting national standards shall be withdrawn at the latest by April 2019.

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 2591-403:2012.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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**EN 2591-403:2018 (E)****1 Scope**

This European Standard specifies a method of determining the ability of elements of connection to withstand sinusoidal or random vibrations of specified severities.

It will be used together with EN 2591-100.

This test is based on EN 60068-2-6 and EN 60068-2-64.

**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 2591-100, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 100: General*

EN 2591-101, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 101: Visual examination*

EN 2591-201, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 201: Contact resistance – low level*

EN 2591-202, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 202: Contact resistance at rated current*

EN 2591-204, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 204: Discontinuity of contacts in the microsecond range*

EN 2591-408, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 408: Mating and unmating forces*

EN 60068-2-6, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal)*

EN 60068-2-64, *Environmental testing — Part 2-64: Test methods — Test Fh: Vibration, broad-band random (digital control) and guidance*

**3 Terms and definitions**

No terms and definitions are listed in this document.

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

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

## 4 Preparation of specimens

### 4.1 Preparation

Specimens shall be prepared according to the technical specification.

### 4.2 Technical details – Technical specification

Unless specified in the technical specification, the following details shall be stated:

- mounting method, type of cable and definition of specimen wiring;
- specimens mated or unmated and fitted with protective covers (if applicable);
- number of mating and unmating operations (if applicable);
- type of accessories to be fitted on specimens;
- initial measurements and requirements, (if applicable);
- fixing points of sensors on specimens (if applicable);
- test severity:
  - sinusoidal or random vibration curve (method A Figure 1 or method B Figure 2 or Figure 3);
  - temperature (maximum, minimum and ambient);
  - duration.
- mating and unmating forces;
- applicable contact resistance test (EN 2591-201 or EN 2591-202);
- final measurements (if applicable).

## 5 Method A – Sinusoidal vibration

### 5.1 EN 60068-2-6

This test method is to be performed in accordance with the requirements of EN 60068-2-6.

### 5.2 Apparatus

The vibration apparatus shall meet the requirements Clause 4 of EN 60068-2-6.

### 5.3 Initial measurements

Initial measurements shall be carried out as specified in the technical specification.

**EN 2591-403:2018 (E)****5.4 Procedure****5.4.1 Endurance**

The specimens shall be subjected to endurance by sweeping as detailed in EN 60068-2-6, 8.2.1 at the levels specified in the product standard.

**5.4.2 Test duration**

The entire frequency range of 5 Hz to 3 000 Hz and return to 5 Hz shall be swept in 20 min. This cycle shall be performed 12 times in each of three axes so that test duration shall be approximately 12 h.

**5.5 Preferred vibration levels****5.5.1 General**

The product standard should indicate one or more of the following severities.

**5.5.2 Level 1**

Over the frequency range 5 Hz to 3 000 Hz, constant amplitude of 0,7 mm, or constant acceleration of 10 g, (cross-over frequency 59,6 Hz) whichever is the lesser.

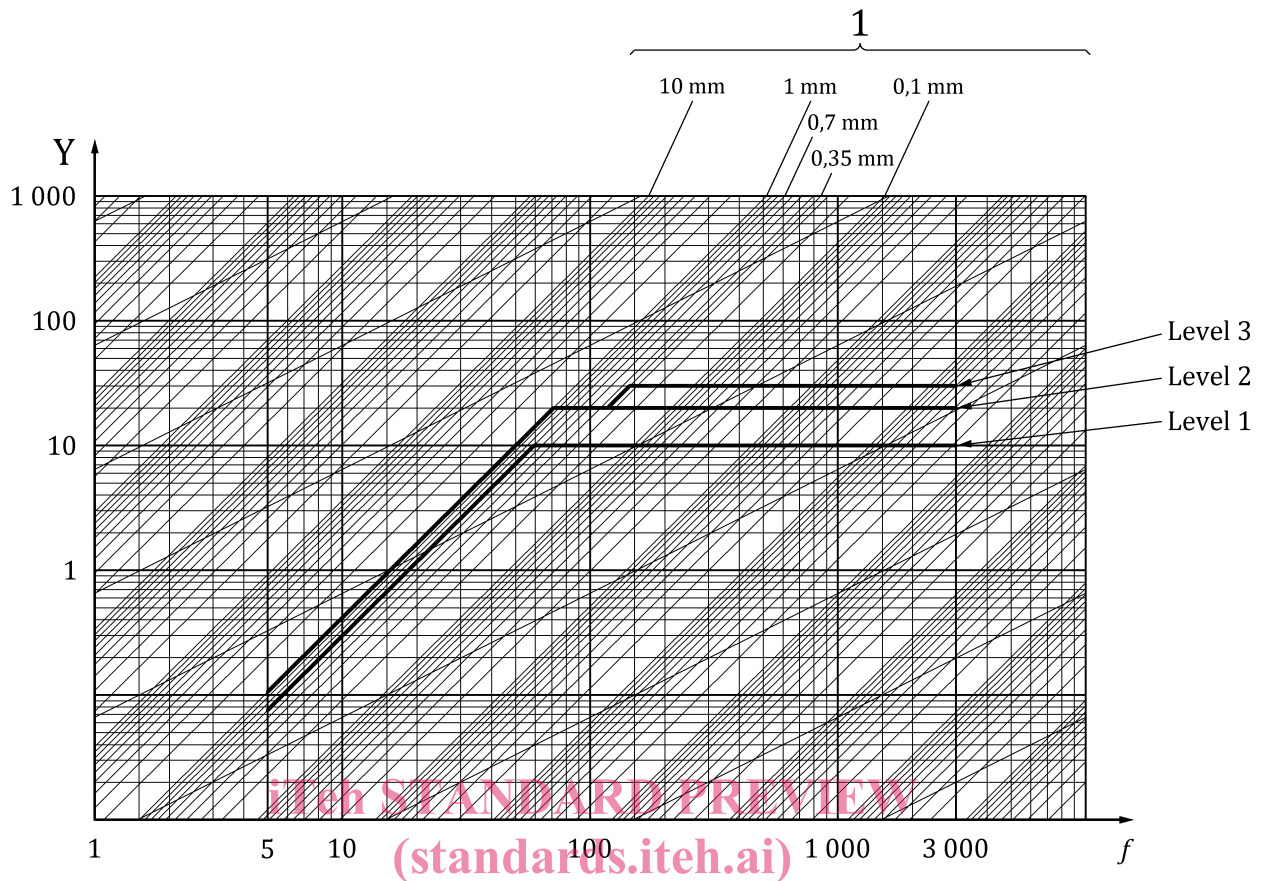
**5.5.3 Level 2**

Over the frequency range 5 Hz to 3 000 Hz, constant amplitude of 1,0 mm, or constant acceleration of 20 g, (cross-over frequency 70,5 Hz) whichever is the lesser.

**5.5.4 Level 3**

Over the frequency range 5 Hz to 3 000 Hz, constant amplitude of 1,0 mm, or constant acceleration of 20 g, (cross-over frequency 70,5 Hz) whichever is the lesser up to a frequency of 119,1 Hz, followed by constant amplitude of 0,35 mm, or 30 g, (cross-over frequency 145,9 Hz) whichever is the lesser.





### Key

- 1 Amplitude (single) [SIST EN 2591-403:2019](https://standards.iteh.ai/catalog/standards/sist/55debd45-7999-4514-97bb-fce0b4589bc6/sist-en-2591-403-2019)  
 2 Level 3  
 3 Level 2  
 4 Level 1  
 f Frequency  
 Y Acceleration

**Figure 1 — Sinusoidal vibration (Nomograph)**

## 6 Method B – Random vibration

### 6.1 EN 60068-2-64

This test method is to be performed in accordance with the requirements of EN 60068-2-64.

### 6.2 Apparatus

The vibration apparatus shall satisfy the requirements for testing of Clause 4 of EN 60068-2-64.

### 6.3 Initial measurements

They shall be carried out as specified in the technical specification.