



SLOVENSKI STANDARD

SIST EN 2591-403:2012

01-oktober-2012

Nadomešča:
SIST EN 2591-403:2001

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

Ta slovenski standard je istoveten z: EN 2591-403:2012

ICS:

49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems
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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 2591-403

August 2012

ICS 49.060; 49.090

Supersedes EN 2591-403:1998

English Version

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

Série aérospatiale - Alliage de 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 23 March 2012.

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.

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

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Foreword

This document (EN 2591-403:2012) 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 February 2013, and conflicting national standards shall be withdrawn at the latest by February 2013.

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 supersedes EN 2591-403:1998.

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.

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EN 2591-403:2012 (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, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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: Tests — Test Fh: Vibration, broadband random and guidance*

3 Preparation of specimens

3.1 Preparation

Specimens shall be prepared according to the technical specification.

3.2 Technical details - Technical specification

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

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

4 Method A – Sinusoidal vibration

4.1 EN 60068-2-6

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

4.2 Apparatus

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

4.3 Initial measurements

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

4.4 Procedure

4.4.1 Endurance

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

4.4.2 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.

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4.5 Preferred vibration levels

4.5.1 General

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

4.5.2 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.

4.5.3 Level 2

Over the frequency range 5 Hz to 3 000 Hz, constant amplitude of 1,0 mm, or constant acceleration of 10 g, (cross-over frequency 70.5 Hz) whichever is the lesser,

4.5.4 Level 3

Over the frequency range 5 Hz to 3 000 Hz, constant amplitude of 1,0 mm, or constant acceleration of 10 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.

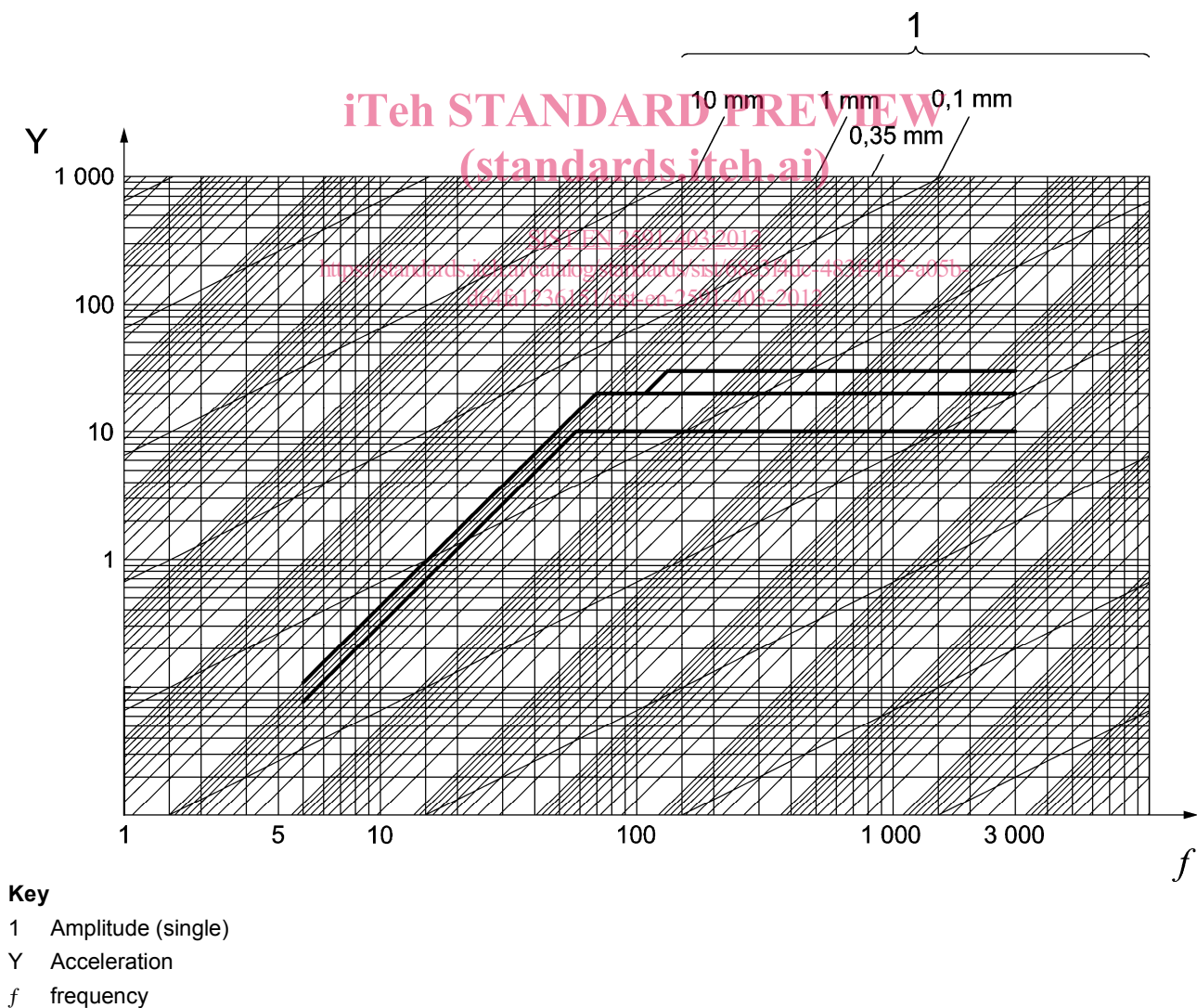


Figure 1 — Sinusoidal vibration (Nomograph)

5 Method B – Random vibration

5.1 EN 60068-2-64

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

5.2 Apparatus

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

5.3 Initial measurements

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

5.4 Procedure

The vibration test shall be performed in accordance with 8.1 Method 2 of EN 60068-2-64. Initial, and final response investigations are not required.

5.5 Preferred vibration levels

5.5.1 Vibration monitoring

The vibration magnitude shall be monitored as near as possible to the specimen fixing points to confirm compliance with the specified vibration curve at all measuring points.

The specimens shall be vibrated in each of the three axes perpendicular between them, one axis being parallel to the coupling axis.

Unless otherwise specified measurements to EN 2591-204 (Method B) shall be carried out on contacts and (if applicable) the shielding connection.

No discontinuity higher or equal to 1 μ s shall be observed. Discontinuities lower than 1 μ s are admissible provided their repetition rate does not exceed 1 Hz.

5.5.2 Random vibration severity

The test severity is given by a combination of spectral shape, spectral density, duration and temperature.

5.5.3 Spectral shape and density

See Figure 2 and Table 1 or Figure 3 and Table 2.