SLOVENSKI STANDARD
SIST EN 60068-2-64:2008/A1:2020

01-februar-2020

Okoljski preskusi - 2-64. del: Preskusi - Preskus Fh: Vibracije, naključne širokopasovne (digitalni nadzor), in vodilo - Dopolnilo A1 (IEC 60068-2-64:2008/A1:2019)

Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random (digital contol) and guidance (IEC 60068-2-64:2008/A1:2019)

Umgebungseinflüsse - Teil 2-64: Prüfverfahren - Prüfung Fh: Schwingen, Breitbandrauschen und Leitfaden (IEC 60068-2-64:2008/A1:2019)

Essais d'environnement - Partie 2-64: Essais - Essai Fh: Vibrations aléatoires à large bande et guide (IEC 60068-2-64:2008/A1:2019)

Ta slovenski standard je istoveten z: **EN 60068-2-64:2008/A1:2019**

ICS:

19.040	Preskušanje v zvezi z okoljem	Environmental testing

SIST EN 60068-2-64:2008/A1:2020 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60068-2-64:2008/A1

November 2019

ICS 19.040

English Version

Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance (IEC 60068-2-64:2008/A1:2019)

Essais d'environnement - Partie 2-64: Essais - Essai Fh: Vibrations aléatoires à large bande et guide (IEC 60068-2-64:2008/A1:2019)

Umgebungseinflüsse - Teil 2-64: Prüfverfahren - Prüfung Fh: Schwingen, Breitbandrauschen (digital geregelt) und Leitfaden (IEC 60068-2-64:2008/A1:2019)

This amendment A1 modifies the European Standard EN 60068-2-64:2008; it was approved by CENELEC on 2019-11-13. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment 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 CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC 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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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

Ref. No. EN 60068-2-64:2008/A1:2019 E

European foreword

The text of document 104/848/FDIS, future IEC 60068-2-64/A1, prepared by IEC/TC 104 "Environmental conditions, classification and methods of test" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60068-2-64:2008/A1:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-08-13
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-11-13

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

Endorsement notice

The text of the International Standard IEC 60068-2-64:2008/A1:2019 was approved by CENELEC as a European Standard without any modification.

IEC 60068-2-64

Edition 2.0 2019-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Environmental testing –
Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance

Essais d'environnement –
Partie 2-64: Essais – Essai Fh: Vibrations aléatoires à large bande et guide

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FOREWORD

This amendment has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

The text of this amendment is based on the following documents:

FDIS	Report on voting
104/848/FDIS	104/855/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

Add, after the fourth paragraph, the following new paragraph:

The traditional general purpose broad-band random vibration test utilizes waveforms with a Gaussian distribution of amplitudes. However, when so specified, this test procedure can also be utilized with random vibration tests with a non-Gaussian distribution of amplitudes. Such tests are sometimes alternatively known as high kurtosis tests.

Add, after the last paragraph, the following new paragraph:

Annex C is an informative annex giving information on non-Gaussian distribution/high kurtosis tests.

3 Definitions

Add the following new terminological entries:

3.39
kurtosis
4th statistical moment, which provides a measure of the shape of an amplitude distribution

Note 1 to entry: Typically a waveform with Gaussian distribution will have a kurtosis of 3, if considered over an infinite period.

Note 2 to entry: Kurtosis is given by:

$$kurtosis = \frac{1}{N}\sum_{i=1}^{N}\left(x_i - \bar{x}\right)^4 . \frac{1}{\sigma^4}$$

where:

σ is the standard deviation of the N values which describe the waveform;

x_i are individual values representing the waveform described by N such values;

$\bar{x}$ is the mean value of the N values which describe the waveform.

3.40
skewness
3rd statistical moment, which provides a measure of non-symmetry of an amplitude distribution

Note 1 to entry: Typically a waveform with Gaussian distribution will have a skewness of 0, if considered over an infinite period.

Note 2 to entry: Skewness is given by:

$$skewness = \frac{1}{N}\sum_{i=1}^{N}\left(x_i - \bar{x}\right)^3 . \frac{1}{\sigma^3}$$

where:

σ is the standard deviation of the N values which describe the waveform;

x_i are individual values representing the waveform described by N such values;

$\bar{x}$ is the mean value of the N values which describe the waveform.

3.41
beta distribution
family of continuous probability distributions defined on the interval [0, 1] parametrized by two positive shape parameters, denoted by α and β, that appear as exponents of the random variable and control the shape of the distribution

SEE: Figure 4.

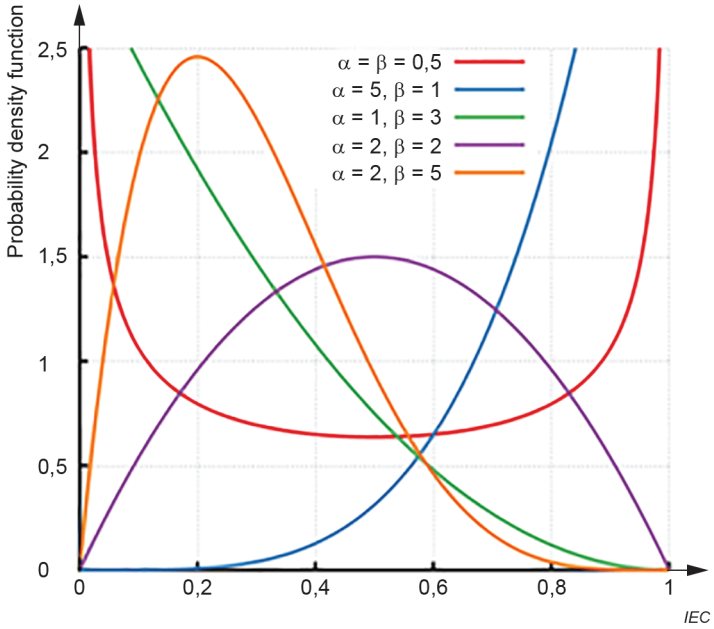


Figure 4 – Examples of the beta distribution with different *α* and *β* values

4 Requirements for test apparatus

4.1 General

Add, at the end of 4.1, the following new paragraph:

For non-Gaussian testing, the test apparatus shall be able to produce a signal with a specified probability distribution and crest factor. Generally, non-Gaussian random vibration testing requires shaker and amplifier systems that are designed for Gaussian random vibrations but with increased crest factor capabilities.

4.6.2 Distribution

Add, after Figure 2, the following new paragraph:

For non-Gaussian tests, the time history shall be recorded and the statistical characteristics of crest factor, skewness, kurtosis and amplitude probability distribution established, see Clause C.3. If required by the test specification, additional analysis of the time history shall be undertaken. The measurement time for kurtosis, skewness and amplitude probability distribution should be long enough to obtain statistically acceptable results.

5 Severities

Replace, in the second paragraph, the first two sentences with the following:

Each parameter shall be specified by the relevant specification. They shall be:

Add, at the end of the second paragraph, after list item d), the following new text:

For non-Gaussian vibration testing the test severity is determined by the same parameters as for broad-band Gaussian vibration testing but with the addition of:

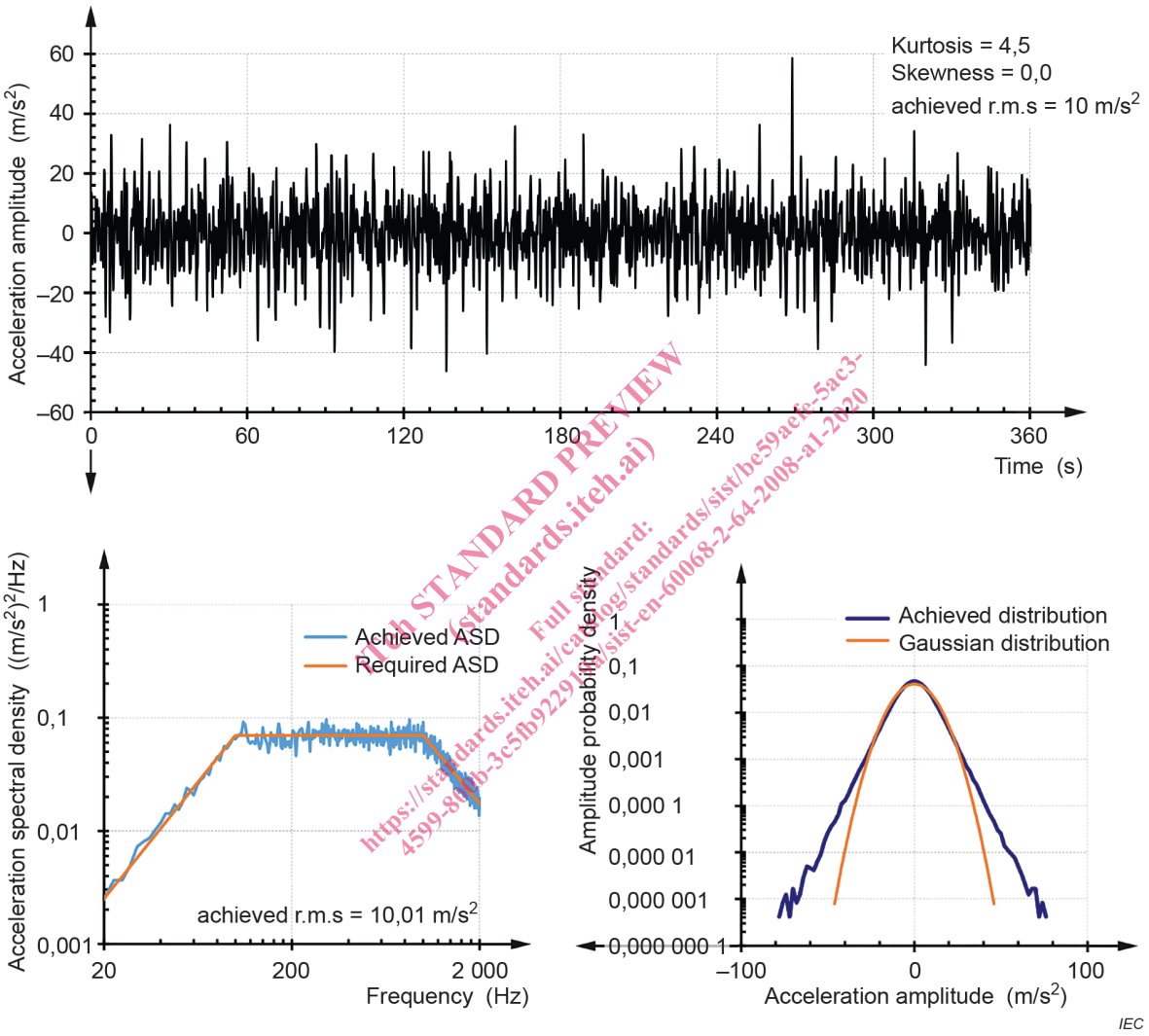
– the type of non-Gaussian testing to be undertaken (see Annex C),
– the required probability distribution or kurtosis (and skewness if applicable),

– the required crest factor.

8.4.1 General

Add, at the end of 8.4.1, the following new text and Figure 5:

For non-Gaussian vibration testing, the time history shall be recorded and the kurtosis, skewness (if applicable) and amplitude probability density shall be established as required by the relevant specification (see also Figure 5).



Key

Kurtosis = 4,5 (see 3.39)

Skewness = 0 (see 3.40)

Figure 5 – Time history of non-Gaussian excitation – Probability density function compared with Gaussian (normal) distribution

11 Information to be given in the relevant specification

Replace the existing list item h) with the following new list item h):

h) Crest factor* / amplitude distribution, kurtosis and skewness (if applicable)/drive signal clipping amplitude