

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Environmental testing –
Part 2-6: Tests – Test Fc: Vibration (sinusoidal)**

**Essais d'environnement –
Partie 2-6: Essais – Essai Fc: Vibrations (sinusoïdales)**



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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	7
4 Requirements for testing.....	10
4.1 Required characteristics	10
4.1.1 Basic motion.....	10
4.1.2 Spurious motion.....	10
4.1.3 Signal tolerance.....	11
4.1.4 Vibration amplitude tolerances	11
4.1.5 Frequency tolerances.....	11
4.1.6 Sweep	12
4.2 Control strategy	12
4.2.1 Single/multipoint control.....	12
4.2.2 Multi-reference control	13
4.3 Mounting	13
5 Severities	13
5.1 Frequency range.....	14
5.1.1 Lower frequency f_1 Hz	14
5.1.2 Upper frequency f_2 Hz	14
5.2 Vibration amplitude.....	14
5.3 Duration of endurance	17
5.3.1 Endurance by sweeping	17
5.3.2 Endurance at fixed frequencies	18
6 Preconditioning.....	18
7 Initial measurements.....	18
8 Testing	18
8.1 General.....	18
8.2 Vibration response investigation.....	19
8.3 Endurance procedures.....	19
8.3.1 Endurance by sweeping	19
8.3.2 Endurance at fixed frequencies	19
9 Intermediate measurements.....	20
10 Recovery	20
11 Final measurements	20
12 Information to be given in the relevant specification.....	20
13 Information to be given in the test report	21
Annex A (informative) Guide to test F_c	23
Annex B (informative) Examples of severities primarily intended for components	36
Annex C (informative) Examples of severities primarily intended for equipment.....	37
Bibliography.....	39

Figure 1 – Nomogram relating vibration amplitude to frequency with lower cross-over frequency (8 Hz to 10 Hz).....	15
Figure 2 – Nomogram relating vibration amplitude to frequency with higher cross-over frequency (58 Hz to 62 Hz).....	16
Figure 3 – Nomogram relating vibration displacement amplitude to frequency (only applicable for frequency ranges with an upper frequency of 10 Hz)	17
Figure A.1 – Generalized transmissibility factors for vibration isolators.....	33
Table A.1 – Number of sweep cycles and associated endurance times per axis	30
Table A.2 – CB response time	31
Table A.3 – CPB response time	32
Table B.1 – Endurance by sweeping – Examples with higher cross-over frequency	36
Table C.1 – Endurance by sweeping – Examples with lower cross-over frequency	37
Table C.2 – Endurance by sweeping – Examples with higher cross-over frequency	38

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL TESTING –

Part 2: Tests – Test Fc: Vibration (sinusoidal)

FOREWORD

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International Standard IEC 60068-2-6 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

This seventh edition cancels and replaces the sixth edition, published in 1995. It constitutes a technical revision.

The major changes with regard to the previous edition concern:

- The agreed wording from IEC technical committee 104 meeting held in Stockholm:2000 on the testing of soft packages.
- Reference to the latest version of IEC 60068-2-47:Mounting
- Simplification of the layout of the standard by replacing some tables with text.
- Addition of the test report requirements (see Clause 13).

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

FDIS	Report on voting
104/439/FDIS	104/449/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all the parts in the IEC 60068 series, under the general title *Environmental testing*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site 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.

INTRODUCTION

This part of IEC 60068 gives a method of test applicable to components, equipment and other articles which, during transportation or in service, may be subjected to conditions involving vibration of a harmonic pattern, generated primarily by rotating, pulsating or oscillating forces, such as occur in ships, aircraft, land vehicles, rotorcraft and space applications or are caused by machinery and seismic phenomena.

This standard consists basically of subjecting a specimen to sinusoidal vibration over a given frequency range or at discrete frequencies, for a given period of time. A vibration response investigation may be specified which aims at determining critical frequencies of the specimen.

The relevant specification shall indicate whether the specimen shall function during vibration or whether it suffices that it still works after having been submitted to vibration.

It is emphasized that vibration testing always demands a certain degree of engineering judgement, and both the supplier and purchaser should be fully aware of this fact. However, sinusoidal testing is deterministic and, therefore, relatively simple to perform. Thus it is readily applicable to both diagnostic and service life testing.

The main part of this standard deals primarily with the methods of controlling the test at specified points using either analogue or digital techniques, and gives, in detail, the testing procedure. The requirements for the vibration motion, choice of severities including frequency ranges, amplitudes and endurance times are also specified, these severities representing a rationalized series of parameters. The relevant specification writer is expected to choose the testing procedure and values appropriate to the specimen and its use.

Certain terms have been defined to facilitate a proper understanding of the text. These definitions are given in Clause 3.

Annex A gives general guidance for the test and Annexes B and C provide guidance on the selection of severities for components and equipment.

ENVIRONMENTAL TESTING –

Part 2: Tests – Test Fc: Vibration (sinusoidal)

1 Scope

This part of IEC 60068 gives a method of test which provides a standard procedure to determine the ability of components, equipment and other articles, hereinafter referred to as specimens, to withstand specified severities of sinusoidal vibration. If an item is to be tested in an unpackaged form, that is without its packaging, it is referred to as a test specimen. However, if the item is packaged then the item itself is referred to as a product and the item and its packaging together are referred to as a test specimen.

The purpose of this test is to determine any mechanical weakness and/or degradation in the specified performance of specimens and to use this information, in conjunction with the relevant specification, to decide upon the acceptability of the specimens. In some cases, the test method may also be used to demonstrate the mechanical robustness of specimens and/or to study their dynamic behaviour. Categorization of components can also be made on the basis of a selection from within the severities quoted in the test.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 60068-1, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-47, *Environmental testing – Part 2-47: Tests – Mounting of specimens for vibration, impact and similar dynamic tests*

IEC 60721-3 (all parts), *Classification of environmental conditions – Part 3: Classification of groups of environmental parameters and their severities*

ISO 2041, *Vibration and shock – Vocabulary*

ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE 1 The terms used are generally taken from ISO 2041 and IEC 60068-1. However, “sweep cycle” (3.4) and “signal tolerance” (3.5) have specific meanings in this standard.

Definitions in alphabetical order:

Actual motion	3.7
Basic motion	3.6
Centred resonance frequency	3.10
Check point	3.2.1