

INTERNATIONAL STANDARD

IEC
60068-2-6

Sixth edition
1995-03

BASIC SAFETY PUBLICATION

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

*This **English-language** version is derived from the original **bilingual** publication by leaving out all French-language pages. Missing page numbers correspond to the French-language pages.*



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL TESTING -

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

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

International Standard IEC 68-2-6 has been prepared by sub-committee 50A: Vibration, impact and other dynamic tests, of IEC technical committee 50: Environmental testing.

This sixth edition cancels and replaces the fifth edition published in 1982, amendments 1 (1983) and 2 (1985), and constitutes a technical revision.

It has the status of a basic safety publication in accordance with IEC Guide 104.

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

DIS	Report on voting
50A(CO)232	50A/294/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.

IEC 68 consists of the following parts, under the general title: Environmental testing

- Part 1: General and guidance
- Part 2: Tests
- Part 3: Background information
- Part 4: Information for specification writers - Test summaries
- Part 5: Guide to drafting of test methods

Annexes A, B and C of this standard are for information only.

INTRODUCTION

This part of IEC 68 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 68 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.

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 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 normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 68. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 68 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(721): 1991, *International Electrotechnical Vocabulary (IEV) – Chapter 721: Telegraphy facsimile and data communication*

IEC 68-1: 1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 68-2-34: 1973, *Environmental testing – Part 2: Tests – Test Fd: Random vibration wide band – General requirements**
Amendment 1 (1983)

IEC 68-2-35: 1973, *Environmental testing – Part 2: Tests – Test Fda: Random vibration wide band – Reproducibility High**
Amendment 1 (1983)

IEC 68-2-36: 1973, *Environmental testing – Part 2: Tests – Test Fdb: Random vibration wide band – Reproducibility Medium**
Amendment 1 (1983)

* Tests Fd, Fda, Fdb and Fdc are to be withdrawn in 1998.

IEC 68-2-37: 1973, *Environmental testing – Part 2: Tests – Test Fdc: Random vibration wide band – Reproducibility Low**
Amendment 1 (1983)

IEC 68-2-47: 1982, *Environmental testing – Part 2: Tests – Mounting of components, equipment and other articles for dynamic tests including shock (Ea), bump (Eb), vibration (Fc and Fd) and steady-state acceleration (Ga) and guidance*

IEC 68-2-64: 1993, *Environmental testing – Part 2: Tests – Test Fh: Vibration broad-band random (digital control) and guidance*

IEC 721-1: 1990, *Classification of environmental conditions – Part 1: Environmental parameters and their severities*
Amendment 1 (1992)

ISO 2041: 1990, *Vibration and shock – Vocabulary*

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