Irish Standard
I.S. EN 60068-2-57:2013

Environmental testing -- Part 2-57: Tests - Test Ff: Vibration - Time-history and sine-beat method (IEC 60068-2 -57:2013 (EQV))

I.S. EN 60068-2-57:2013

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(IEC 60068-2-57:2013)

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CENELEC

European Committee for Electrotechnical Standardization
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Foreword

The text of document 104/595/FDIS, future edition 3 of IEC 60068-2-57, 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 60068-2-57:2013.

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)	2014-02-28
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2016-05-30

This document supersedes EN 60068-2-57:2000 and EN 60068-2-59:1993.

EN 60068-2-57:2013 includes the following significant technical changes with respect to EN 60068-2-57:2000 and EN 60068-2-59:1993:

– editorially combines EN 60068-2-57 and EN 60068-2-59;

– the title has been modified to include a sine beat method.

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Endorsement notice

The text of the International Standard IEC 60068-2-57:2013 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-2-59:1990	NOTE	Harmonised as EN 60068-2-59:1993 (not modified).
IEC 60068-2-81	NOTE	Harmonised as EN 60068-2-81.
ISO/IEC 17025	NOTE	Harmonised as EN ISO/IEC 17025.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60068	Series	Environmental testing	EN 60068	Series
IEC 60068-1	-	Environmental testing - Part 1: General and guidance	EN 60068-1	-
IEC 60068-2-6	2007	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	2008
IEC 60068-2-47	2005	Environmental testing - Part 2-47: Tests - Mounting of specimens for vibration, impact and similar dynamic tests	EN 60068-2-47	2005
IEC 60068-2-64	2008	Environmental testing - Part 2-64: Tests - Test Fh: Vibration, broadband random and guidance	EN 60068-2-64	2008
IEC 60068-3-3	1991	Environmental testing - Part 3: Guidance - Seismic test methods for equipments	EN 60068-3-3	1993
IEC 60068-3-8	-	Environmental testing - Part 3-8: Supporting documentation and guidance - Selecting amongst vibration tests	EN 60068-3-8	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL TESTING –

Part 2-57: Tests – Test Ff: Vibration – Time-history and sine-beat method

FOREWORD

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International Standard IEC 60068-2-57 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

This third edition cancels and replaces the second edition, published in 1999. It also replaces IEC 60068-2-59:1990, which will be withdrawn.

This edition includes only minor technical changes with respect to the previous edition:

– editorially combines IEC 60068-2-57 and IEC 60068-2-59;
– the title has been modified to include a sine beat method.

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

FDIS	Report on voting
104/595/FDIS	104/612/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, published under the general title *Environmental testing*, can be found on the IEC website.

This standard is to be used in conjunction with IEC 60068-1.

The committee has decided that the contents of this publication will remain unchanged until the stability 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 details methods for testing components, equipment and other electrotechnical products (hereinafter referred to as “specimens”) which in service can be subjected to random or oscillating type dynamic forces of short duration, typical examples of which are the stresses induced in equipment as a result of earthquakes, explosions and certain phases of transportation, or by transient, short time vibration in machinery.

The characteristics of these forces and the damping of the specimen may be such that the vibration response of the specimen will not reach a steady-state condition.

The time-history test consists, after any preliminary vibration response investigation with sinusoidal or random vibration, in subjecting the specimen to a vibration (acceleration, velocity or displacement) the time history being specified by a response spectrum with characteristics simulating the effects of the dynamic forces.

A time history may be developed or obtained from

– a natural event (natural time history),
– a random sample
– a synthesized signal } artificial time history.

In general, to adapt to the required testing severity, some modification is necessary.

The use of a time history allows a single test wave to envelop a broadband response spectrum.

It is possible for all the modes of the structure in the excitation axis (or axes) to be excited at the same time and consequently the stresses derived from the combined effects of the coupled modes are generally taken into account.

In the sine beat test, the specimen is excited at fixed frequencies with a preset number of sine beats (see Figure 1). These fixed test frequencies are predetermined test frequencies, or critical frequencies identified by means of a sinusoidal vibration test (IEC 60068-2-6), or both. Pauses are provided between the individual sine beats in order to allow decay of the free response of the specimen.

In Clause 12 specification writers will find a list of details to be considered for inclusion in specifications and, in Annex A, guidance giving necessary extra information.

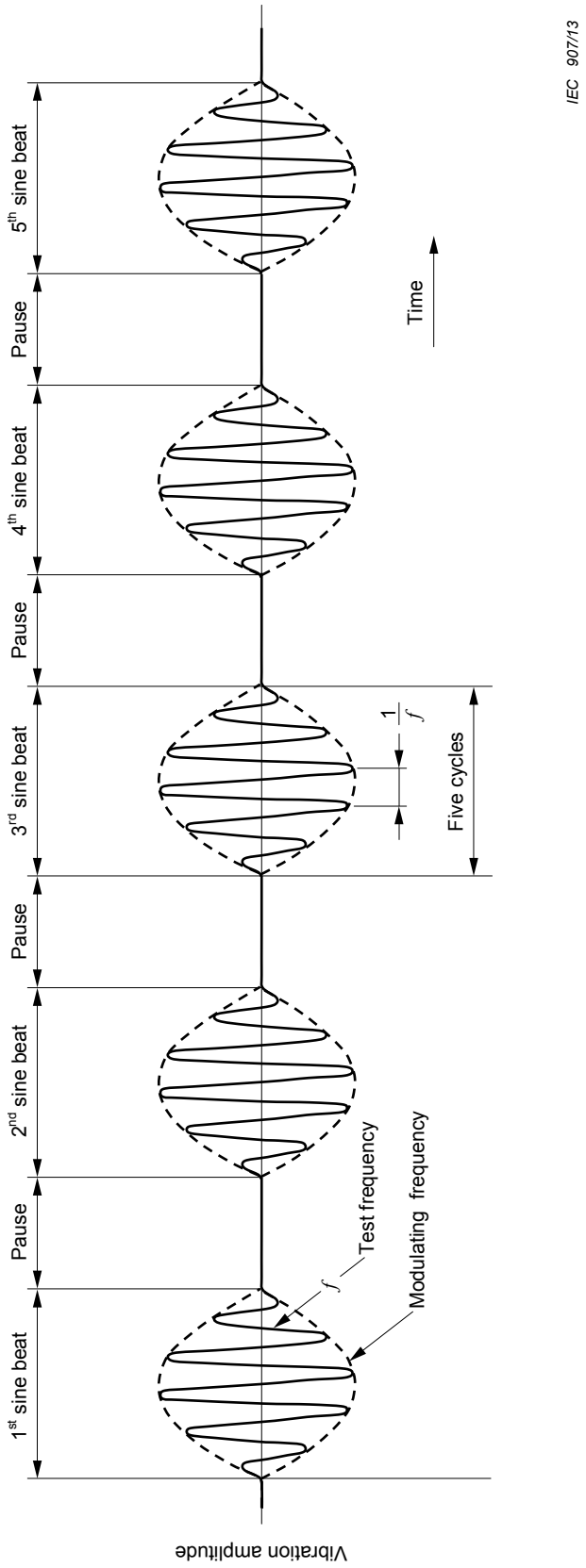

Figure 1 – Sequence of five sine beats with five cycles