AS 60068.2.59—2003
IEC 60068-2-59:1990

AS 60068.2.59

Australian Standard™

# Environmental testing
# Part 2.59: Test methods—Test Fe: Vibration—Sine beat method



Standards Australia

This Australian Standard was prepared by Committee EL-026, Protective Enclosures and Environmental Testing for Electrical/Electronic Equipment. It was approved on behalf of the Council of Standards Australia on 23 April 2003 and published on 19 June 2003.

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The following are represented on Committee EL-026:

Australian Chamber of Commerce and Industry

Australian Electrical and Electronic Manufacturer's Association

Electrical Compliance Testing Association

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Electricity Supply Association of Australia

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# Environmental testing
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# PREFACE

This Standard was prepared by the Standards Australia Committee EL-026, Protective Enclosures and Environmental Testing for Electrical/Electronic Equipment.

The objective of this Standard is to provide the electrotechnology industry with a complete set of environmental test procedures published as a series under AS 60068 *Environmental testing*. This Standard is Part 2.59 of that series.

This Standard is identical with, and has been reproduced from, IEC 60068-2-59:1990, *Environmental testing – Part 2-59: Test methods—Test Fe: Vibration—Sine-beat method*.

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

(b) In the source text 'this international standard' should read 'this Australian Standard'.

(c) A full point should be substituted for a comma when referring to a decimal marker.

(d) Any French text on figures should be ignored.

In this Standard, the following print types are used:

– requirements proper: in arial type;

– *test specifications: in italic type;*

– explanatory matter: in smaller arial type.

Any international Standard referenced should be replaced by an equivalent Australian Standard when one is available. The availability of equivalent Australian Standards can be determined either from the Standards Australia catalogue or from the Standards Australia website (www.standards.com.au).

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## INTRODUCTION

This standard details methods for testing components, equipments and other electrotechnical products (hereinafter referred to as “specimens”) which in service can be subjected to pulsating or oscillating forces of short duration caused, for example, by seismic or explosive phenomena or by vibration in machinery.

In this test the specimen is excited at fixed frequencies with a preset number of sine beats (see figure 1). These fixed test frequencies are predetermined frequencies, 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.

Specification writers will find in clause 12 a list of details to be considered for inclusion in specifications and, in annex A, the guidance.

## RELATED DOCUMENTS

The following international standards are directly referred to in this standard

IEC 60068, *Environmental testing*

IEC 60068-1: 1988, *Part 1: General and guidance*

IEC 60068-2-6: 1982, *Part 2: Tests – Test Fc and guidance: Vibration (sinusoidal)*

IEC 60068-2-47: 1982, *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 60068-3-3: 1991, *Part 3: Guidance – Section Three: Seismic test methods for equipments*

ISO 2041: 1975, *Vibration and shock – Vocabulary*

NOTES

STANDARDS AUSTRALIA

# Australian Standard

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## 1 Object

To provide a standard procedure for determining, by the sine-beat method, the ability of a specimen to withstand specified severities of transient vibration.

## 2 General description

The purpose of this test is to determine mechanical weakness and/or degradation in specified performance and to use this information, in conjunction with the relevant specification, to decide whether a specimen is acceptable or not. It may also be used in some cases, to demonstrate the mechanical robustness of specimens and/or to study their dynamic behaviour.

The extent to which a specimen has to function during vibration or merely to survive conditions of vibration shall be stated in the relevant specification.

Procedures are described for conducting the test and for the measurement of the vibration at given points. The requirements for the vibration motion and for the choice of severities (including frequency range, test levels, sine-beat cycles and number of sine beats) are also detailed.

It is emphasized that vibration testing always demands a certain degree of engineering judgement and both supplier and purchaser should be fully aware of this fact. The writer of the relevant specification is expected to select the testing procedure and the values of severity appropriate to the specimen and its use.

For the purpose of this test the specimen is always fastened to the vibration table.

In order to facilitate the use of this standard, references are given in the main part where the reader is invited to refer to annex A; additionally the clause numbers in the main part are referred to in annex A which also gives specific information on the correlation between sine beats of displacement, velocity and acceleration.

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

## 3 Definitions

The terms used are generally defined in ISO 2041 and in IEC 60068-1 or IEC 60068-2-6. Where, for the convenience of the reader, a definition from one of those sources is included here, the derivation is indicated. Departures from the definitions in those sources are also indicated.

The additional terms and definitions that follow are also applicable for the purpose of this standard.