AS 60068.2.65—2003
IEC 60068-2-65:1993

Australian Standard™

Environmental testing

Part 2.65: Tests—Test Fg: Vibration, acoustically induced

[IEC title: Environmental testing—Part 2-65: Methods of test—Test Fg: Vibration, acoustically induced]

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.

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

Electrical Regulatory Authorities Council

Electricity Supply Association of Australia

Testing Interests (Australia)

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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 2.65 of that series.

This Standard is identical with, and has been reproduced from, IEC 60068-2-65:1993, *Environmental testing – Part 2-65: Methods of test—Test Fg: Vibration, acoustically induced*.

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).

The terms 'normative' and 'informative' are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

CONTENTS

Page

INTRODUCTION

Acoustic noise may produce significant vibration in components and equipment. In the acoustic noise field, pressure fluctuations impinge directly on the specimen and the response may be different to that produced by mechanical excitation.

Items particularly sensitive to acoustic noise include relatively lightweight items whose dimensions are comparable to an acoustic wavelength in the frequency range of interest and whose mass per unit area is low, such as dish antennas and solar panels, electronic devices, printed circuit boards, wiring, optical elements, etc.

This test is applicable to components, equipment and other products, hereinafter referred to as “specimens”, which are liable to be exposed to and/or required to function in conditions of high sound pressure levels. It should be noted that, under service conditions, the specimen may be subjected to simultaneous mechanical and acoustical excitation.

High sound pressure levels may be generated by jet engines and other aircraft propulsion systems, rocket motors, high-powered gas circulators, etc. This standard deals with acoustic testing in compressible gases and can also be used to simulate the excitation response caused by turbulence resulting from high-velocity separated gas flows.

Testing for the effects of vibration caused by acoustic noise demands a certain degree of engineering judgement and this should be recognized both by the manufacturer/supplier and the purchaser of the specimen. Based on the guidance provided in this part of IEC 60068 the writer of the relevant specification is expected to select the most appropriate method of test and values of severity, taking account of the nature of the specimen and its intended use.

Since the acoustic levels occurring during testing are high enough to be potentially damaging to human hearing, appropriate measures need to be taken to reduce preparatory operation and the noise exposure of operators performing the test, to a level regarded as permissible from the standpoint of hearing conservation.

STANDARDS AUSTRALIA

Australian Standard

Environmental testing
Part 2.65: Tests—Test Fg: Vibration, acoustically induced

1 Object

To provide standard procedures and guidance for conducting acoustic tests in order to determine the ability of a specimen to withstand vibration caused by a specified sound pressure level environment to which it is, or is liable to be, subjected. For sound pressure level environments of less than 120 dB acoustic tests are not normally required.

To determine mechanical weakness and/or degradation in the performance of specimens and to use this information, in conjunction with the relevant specification, to decide their acceptability. In some cases, the methods of test may also be used as a means of establishing the mechanical robustness or fatigue resistance of specimens.

This part of IEC 60068 describes the procedures for conducting tests and for measurement of the sound pressure levels within the acoustic noise field and considers the need for measurement of the vibration responses at specified points on the specimen. It also gives guidance for the selection of the acoustic noise environment, spectrum, sound pressure level and duration of exposure.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60068. 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 60068 are encouraged to investigate the possibility of applying the most recent editions of the normative documents listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050(151): 1978, *International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices*

IEC 60050(801): 1994, *International Electrotechnical Vocabulary (IEV) – Chapter 801: Acoustics and electro-acoustics*

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

IEC 60651: 1979, *Sound level meters*

ISO 266: 1975, *Acoustics – Preferred frequencies for measurements*

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

ISO 2671: 1982, *Environmental tests for aircraft equipment – Part 3.4: Acoustic vibration*