AS 60068.2.33—2003
IEC 60068-2-33:1971
IEC 60068-2-33:1971/Amd 1:1978

Australian Standard™

Environmental testing

Part 2.33: Tests—Guidance on change of temperature tests

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 10 April 2003 and published on 16 May 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)

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about Standards can be found by visiting the Standards Australia web site at www.standards.com.au and looking up the relevant Standard in the on-line catalogue.

Alternatively, the printed Catalogue provides information current at 1 January each year, and the monthly magazine, *The Australian Standard*, has a full listing of revisions and amendments published each month.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Contact us via email at mail@standards.com.au, or write to the Chief Executive, Standards Australia International Ltd, GPO Box 5420, Sydney, NSW 2001.

This Standard was issued in draft form for comment as DR 02604.

Australian Standard™

Environmental testing

Part 2.33: Tests—Guidance on change of temperature tests

First published as AS 60068.2.33—2003.

Published by Standards Australia International Ltd
GPO Box 5420, Sydney, NSW 2001, Australia

ISBN 0 7337 5258 6

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 2.33 of that series.

This Standard is identical with, and has been reproduced from, IEC 60068-2-33:1971, *Environmental testing—Part 2-33: Tests—Guidance on change of temperature tests* incorporating Amendment 1:1978.

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).

CONTENTS

NOTES

STANDARDS AUSTRALIA

Australian Standard

Environmental testing
Part: 2.33: Tests—Guidance on change of temperature tests

1 Introduction

This Recommendation gives guidance to designers and testing personnel on the specification and use of change of temperature tests.

A change of temperature test is intended to determine the effect on the specimen of a change of temperature or a succession of changes of temperature.

It is not intended to show effects which are due only to the high or low temperature. For these effects, the dry heat test or the cold test should be used.

The effect of such tests is determined by:

– values of high and low conditioning temperature between which the change is to be effected;
– the conditioning times for which the test specimen is kept at these temperatures;
– the rate of change between these temperatures;
– the number of cycles of conditioning;
– the amount of heat transfer into or from the specimen.

2 Field conditions of changing temperature

In electronic equipment and components, only gradual changes of temperature usually occur. Parts inside an equipment will undergo slower changes of temperature than those on an external surface of the equipment when it is not switched on.

Rapid changes of temperature may be expected:

– when equipment is transported from warm indoor environments into cold open air conditions or vice versa;
– when equipment is suddenly cooled by rainfall or immersion in cold water;
– in externally mounted airborne equipment;
– or under certain conditions of transportation and storage.

Components will undergo stresses due to changing temperature when high temperature gradients build up in an equipment after switching on; e.g. in the neighbourhood of high wattage resistors, radiation can cause rise of surface temperature in neighbouring components while other portions are still cool.

Artificially cooled components may be subjected to rapid temperature changes when the cooling system is switched on.

Rapid changes of temperature in components may also be induced during manufacturing processes of equipment.