Australian Standard®

Fire hazard testing

Part 5.3: Corrosion damage effects of fire effluent—Leakage-current and metal-loss test method

This Australian Standard® was prepared by Committee EL-053, Fire hazard testing—Electrotechnical equipment. It was approved on behalf of the Council of Standards Australia on 23 May 2006.
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The following are represented on Committee EL-053:

- Australian Electrical and Electronic Manufacturers Association
- Australian Information Industry Association
- Electrical Compliance Testing Association
- Electrical Regulatory Authorities Council
- Energy Networks Association

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through public comment period.

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PREFACE

This Standard was prepared by the Standards Australia Committee EL-053, Fire hazard testing—Electrotechnical equipment.

The objective of this series of standards is to provide the electrotechnology industry and standards writing committees with a series of standards which give guidance on assessing the fire hazard of electrotechnical products.

This Standard is identical with, and has been reproduced from IEC/TS 60695-5-3, Ed 1.0 (2003), *Fire hazard testing - Part 5.3: Corrosion damage effects of fire effluent - Leakage-current and metal-loss test 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 'IEC/TS 60695-5-3' should read 'AS 60695.5.3'.

(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.

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.

Any International Standard referenced should be replaced by an equivalent Australian Standard where one is available. The availability of equivalent Australian Standards can be determined either from the Standards Web Shop at www.standards.com.au or from the annual printed catalogue of Australian Standards.

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INTRODUCTION

The deposition of fire effluent on electrotechnical products can cause degradation through several mechanisms. These mechanisms include

a) development of leakage currents;

b) loss of metal through electrochemical and chemical reactions; and

c) fouling of contacts.

Separate test methods have to be used to investigate the effects of each of these three mechanisms. This test method measures leakage current and metal loss.

This test method has been developed for use in material and product evaluation, design purposes or research and development. The material may comprise test specimens of the various components used in end products.

This test method is applicable to various categories of materials and is used to determine the propensity of the material's combustion products to cause corrosion damage. The development of leakage current paths is measured by observing the response of a standard target to deposited combustion products in different per cent relative humidity conditions. Metal-loss corrosion damage is measured by observing the response of metal-foil targets or standard resistance targets to the fire effluent.

This technical specification should be used to measure and describe the response of defined targets to the effluent produced from 1 g samples exposed to heat and flame under controlled conditions. It should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. The effects of smoke ageing such as particle coagulation and details of specific electronic equipment printed circuit board design or components are not investigated.

NOTES

STANDARDS AUSTRALIA

Australian Standard

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1 Scope

This part of IEC 60695 describes test methods which measure corrosion damage effects, on targets, of fire effluent from the combustion of test specimens. Both leakage current and metal loss can be measured by using appropriate targets.

The decomposition model used in this technical specification is suitable for simulating fire scenarios, such as oxidative non-flaming decomposition, a smouldering fire, a developing fire with flame formation, and a fully developed fire.

This technical specification deals with different test methods which are not equivalent. The test methods are useful for product development and assessment because they allow the user to evaluate different characteristics of fire effluents, which generally are not correlated.

One of the responsibilities of a technical committee is, wherever applicable, to make use of basic safety publications in the preparation of its publications (see IEC Guide 104).

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60754 (all parts), *Test on gases evolved during combustion of materials from cables/ electric cables*

IEC Guide 104:1997, *The preparation of safety publications and the use of basic safety publications and group safety publications*

ISO/IEC 13943:2000, *Fire safety – Vocabulary*

ISO 9122-1:1989, *Toxicity testing of fire effluents – Part 1: General*

3 Terms and definitions

For the purposes of this part of IEC 60695, definitions taken from ISO/IEC 13943, together with the following definitions, apply.

3.1
corrosion damage
physical and/or chemical damage or impaired function caused by chemical action

[ISO/IEC 13943, definition 25]