AS 60068.2.49—2004

Australian Standard™

Environmental testing

Part 2.49: Tests—Guidance to Test Kc: Sulphur dioxide test for contacts and connections

STANDARDS AUSTRALIA

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Australian Chamber of Commerce and Industry
Australian Electrical and Electronic Manufacturers Association
Electrical Compliance Testing Association
Electrical Regulatory Authorities Council
Energy 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 2.49 of that series.

This Standard is identical with, and has been reproduced from, IEC 60068-2-49:1983, *Basic environmental testing procedures* – Part 2-49: *Tests—Guidance to Test Kc: Sulphur dioxide test for contacts and connections*.

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) 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 where 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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1 Introduction

Satisfactory performance during the desired lifetime of contacts and connections depends on many parameters, some of them determined by their design (type, materials, forces, etc.) and others by the environment in which they have to function. Concerning the effects of the environment, special attention shall be paid to the polluting substances contained – usually in very small amounts – in the atmosphere. IEC 60068-2-42 relates to one of the most important pollutants found especially in urban and industrial atmospheres, namely, sulphur dioxide (SO_2).

2 Sulphur dioxide in the atmosphere

Atmospheric corrosion of metals is usually brought about by humidity and by pollution products in the atmosphere. One of the main sources of pollution is the combustion products of fossil fuels. Of these combustion products, the corrosive constituent present in the largest quantity is sulphur dioxide (SO_2); sulphur trioxide (SO_3), oxides of nitrogen and chloride have also been detected but in much lower concentrations.

Tables I and II show that the concentration of sulphur dioxide in the free atmosphere in urban and industrial locations is generally in the range of 1 to 100 × 10^{-9} parts by volume, but in local areas may reach peaks of 10^{-6} parts by volume or more.

In a humid atmosphere, sulphur dioxide will corrode all except precious metals and silver and can have a pronounced effect on the performance of temporary contacts. In extreme cases, contacts can go open-circuit as a result of corrosion products building up and preventing a metal-to-metal contact.

3 Object and scope of the test

3.1 Types of contacts and connections

As this test is specifically intended for certain types of contacts and connections (other than those of the welded or soldered type), a short description of these types of contacts and connections is considered to be useful.

Contacts and connections may be divided into two types: permanent or temporary. In both cases, metal surfaces are held together by an external force.

In the case of permanent connections, the force is very great and will usually cause permanent deformation of the metals and it is possible that a form of local welding takes place. Such connections are not intended to be made and broken during their lifetime. Examples of permanent connections are crimp and wrap joints.