Australian Standard™

Environmental testing

Part 2.39: Tests—Test Z/AMD: Combined sequential cold, low air pressure and damp heat test

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 21 October 2003 and published on 1 December 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 to supersede AS 1099.2Z/AMD, *Basic environmental testing procedures for electrotechnology,* Part 2Z/AMD: *Tests—Test Z/AMD—Combined sequential cold, low air pressure and damp heat test.*

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 2.39 of that series.

This Standard is identical with, and has been reproduced from, IEC 60068-2-39:1976, *Environmental testing – Part 2-39: Tests—Test Z/AMD: Combined sequential cold, low air pressure and damp heat test*.

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'.

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(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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1 Object

To provide a standard environmental test procedure consisting of the application of cold, low air pressure and damp heat; the first two conditions in combination and the second condition combining with the third during the sequential transition from the first. The tests employed are Test A and Test M, but although introduction of moisture is not exactly in accordance with Test D, this letter has been used in the identification Z/AMD as being the most appropriate and informative.

The test is intended for components and equipment used in aircraft, particularly in zones that are unheated and unpressurized.

2 General description of the test

The test simulates the conditions encountered within unpressurized and non-temperature-controlled zones of an aircraft during ascent and descent. A non-heat-dissipating component that incorporates elastomeric seals (such as a plug-and-socket connector) will experience hardening of the seals and contraction of materials as it becomes cold, and may suffer failure of such seals, with consequent loss of internal pressure, as the surrounding air pressure decreases. When the aircraft descends into a humid atmosphere and the air pressure increases again, the cold component suffers frosting and the humid atmosphere itself, or free water formed by the melting of the frost may be driven into the component by the differential pressure and be trapped inside by the seals as they recover their normal elasticity. The same sequence may cause water or ice to accumulate inside a piece of equipment with an unsealed but closely fitting cover and no drain holes.

3 Description of test apparatus

3.1 The test chamber must be capable of subjecting the specimen to simultaneous low temperature and low pressure within the range of severities prescribed by Test A and Test M respectively. It must incorporate heaters that can raise the ambient temperature within the chamber from the extreme cold condition to between 30 °C and 35 °C in a period of not more than 1 h. It must also incorporate means of admitting water vapour to, or generating water vapour within, the working space containing the specimen during the time that the temperature is being raised, while at the same time maintaining a substantially constant low air pressure.

3.2 As the test is concerned with the ingress of moisture and as this is frequently detected by a lowering of insulation resistance, leads to the specimen shall be taken through the chamber wall without break or junction and through pressure-tight seals. The leads themselves must be of appropriate size and insulation for sealing to the specimen.

3.3 If the specimen contains moving parts, the movement of which may be prevented by the formation of ice inside the specimen, means must be provided in the chamber for monitoring such movement either mechanically or electrically.