



SLOVENSKI STANDARD

SIST EN 60068-2-39:2001

01-september-2001

Environmental testing - Part 2: Tests - Test Z/AMD: Combined sequential cold, low air pressure and damp heat test

Environmental testing -- Part 2: Tests - Test Z/AMD: Combined sequential cold, low air pressure and damp heat test

Umweltprüfungen -- Teil 2: Prüfungen - Prüfung Z/AMD: Kombinierte Prüfung mit aufeinanderfolgender Kälte, niedrigem Luftdruck und feuchter Wärme

Essais d'environnement -- Partie 2: Essais - Essai Z/AMD: Combiné séquentiel de froid, basse pression atmosphérique et chaleur humide

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Ta slovenski standard je istoveten z: EN 60068-2-39:1999

ICS:

| | | |
|--------|-------------------------------|-----------------------|
| 19.040 | Preskušanje v zvezi z okoljem | Environmental testing |
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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 60068-2-39

April 1999

ICS 19.040

Supersedes HD 323.2.39 S1:1988

English version

Environmental testing
Part 2: Tests - Test Z/AMD: Combined sequential cold,
low air pressure and damp heat test
(IEC 60068-2-39:1976)

Essais d'environnement
Partie 2: Essais - Essai Z/AMD: Combiné
séquentiel de froid, basse pression
atmosphérique et chaleur humide
(CEI 60068-2-39:1976)

Umweltprüfungen
Teil 2: Prüfungen - Prüfung Z/AMD:
Kombinierte Prüfung mit
aufeinanderfolgender Kälte, niedrigem
Luftdruck und feuchter Wärme
(IEC 60068-2-39:1976)

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 60068-2-39:1976, prepared by SC 50B (transformed into IEC TC 104 "Environmental conditions, classification and methods of test), was approved by CENELEC as HD 323.2.39 S1 on 1977-03-01.

This Harmonization Document was submitted to the formal vote for conversion into a European Standard and was approved by CENELEC as EN 60068-2-39 on 1999-04-01.

The following date was fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2000-04-01

Endorsement notice

The text of the International Standard IEC 60068-2-39:1976 was approved by CENELEC as a European Standard without any modification.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2: Tests — Test Z/AMD:

Combined sequential cold, low air pressure and damp heat test

FOREWORD

- 1) The formal decisions or agreements of the IEC on technical matters, prepared by Technical Committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.

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PREFACE

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This publication has been prepared by Sub-Committee 50B, Climatic Tests, of IEC Technical Committee No. 50, Environmental Testing.

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A first draft was circulated at the request of IEC Technical Committee No. 48, Electromechanical Components for Electronic Equipment, and discussed at the meeting held in Munich in 1973. As a result of this meeting, a draft, Document 50B(Central Office)176, was submitted to the National Committees for approval under the Six Months' Rule in August 1974.

The following countries voted explicitly in favour of publication:

| | |
|----------------|----------------------------|
| Australia | Poland |
| Austria | Portugal |
| Belgium | Romania |
| Canada | South Africa (Republic of) |
| Czechoslovakia | Spain |
| Denmark | Switzerland |
| Egypt | Turkey |
| France | Union of Soviet |
| Hungary | Socialist Republics |
| Israel | United Kingdom |
| Japan | United States of America |
| Norway | |

BASIC ENVIRONMENTAL TESTING PROCEDURES

Part 2 : Tests —Test Z/AMD :

Combined sequential cold, low air pressure and damp heat test

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.

4. Testing procedure

General

4.1 The leads to the specimen shall be assembled with any associated seals and, as noted in Sub-clause 3.2 above, shall be of appropriate size and insulation. The specimen shall be mounted in the chamber in its normal working attitude as prescribed in the relevant specification.

4.2 When plug-and-socket connectors are being tested, they shall be in the mated condition unless otherwise required by the relevant specification. The latter shall also indicate whether all or only a proportion of the ways of a multi-way connector are to be wired.

4.3 If the relevant specification requires demonstration of functional performance at any time during or at the end of the test, such demonstration shall first be made with the specimen mounted in the test chamber, ready for test.

4.4 Unless otherwise prescribed by the relevant specification, the specimen shall be switched off while the chamber temperature is being lowered or raised to the required value.

5. Preconditioning

The specimen under test shall be preconditioned as prescribed in the relevant specification.

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6. Initial measurements

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The specimen shall be visually inspected and electrically and mechanically checked as required by the relevant specification.

7. Conditioning

The specimen, while being at the ambient temperature of the laboratory, shall be introduced into the chamber in the unpacked, switched off, “ready for use” state, in its normal position or as otherwise specified.

7.1 The air temperature in the chamber shall be decreased at a rate not exceeding 1 °C/min (averaged over 5 min) to the value prescribed in the relevant specification, which shall be one of the temperatures given in Test A.

When this value is reached and equilibrium has been attained between the specimen and its surroundings, a functional check or any necessary measurements shall be made in accordance with the relevant specification.

7.2 With the temperature still maintained at the prescribed low value, the air pressure in the chamber shall be reduced at a rate not exceeding 150 mbar/min until the low pressure value prescribed in the relevant specification, which shall be one of those given in Test M, has been attained. A functional check or any necessary measurements shall be made in accordance with the relevant specification.

7.3 With the pressure still maintained at the prescribed low value, the chamber temperature shall be raised at an approximately uniform rate that will bring it to 30 °C or room ambient, whichever is higher, in a period of not more than 1 h. At the same time, steam shall be admitted to or generated in the chamber at a rate sufficient to cause frost to form on the specimen.