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JIS C 0035 : 1996
(IEC 68-2-61 : 1991)

Environmental testing
Part 2 : Test methods
Test Z/ABDM : Climatic sequence

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Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Contents

	Page
Introduction	1
1 Object	1
2 Normative references	2
3 Definitions	3
4 Test apparatus	3
5 Severities	3
6 Pre-conditioning	3
7 Initial measurements	3
8 Testing	3
9 Recovery	6
10 Final measurements	6
11 Information to be given in the relevant specification	6
Annex A (informative) Guidance for specification writers	8
Annex B (informative) Guidance for the conduct of the test	9

Environmental Testing

Part 2: Test methods – Test Z/ABDM: Climatic sequence

Foreword as Japanese Industrial Standard

This Japanese Industrial Standard has been prepared based on the 1st edition issued in 1991 of **IEC 68-2-61**, *Environmental Testing, Part 2: Test methods — Test Z/ABDM: Climatic sequence*, without changing the technical contents.

Furthermore, the matters that are indicated by underline (dotted line) do not appear in the original International Standard.

Introduction The value of a sequence of climatic tests, particularly for the testing of components, has been proved by the inclusion of a "climatic sequence" in **JIS C 0010-1993**, *Environmental testing, Part 1: General and guidance*, 7 (Climatic sequence) and Annex B (General guidance).

Informative reference: **JIS C 0010-1993** is identical to **IEC 68-1:1988** *Environmental testing, Part 1: General and guidance*.

With the increasing importance of the **IEC** Quality Assessment System for Electronic Components (**IECQ**) it has become necessary to define the test sequence more precisely than could be done in 7 of **JIS C 0010** with the object of providing for satisfactory reproducibility of the test.

This Standard describes in detail a composite test specifying a "climatic sequence" for specimens of products, primarily components, that is based on clause 7 of **JIS C 0010** and it includes guidance in informative annexes for specification writers and those performing the test.

Note: Test Z/ABDM is a "composite test" as defined in **JIS C 0010** rather than a "sequence" as defined in the same standard. Because of the well-established use of "sequence" in references to 7 of **JIS C 0010** it has been decided that "sequence" should continue to be used in referring to the operations in this composite test.

1 Object This Japanese Industrial Standard provides standard composite test methods for determining the suitability of a specimen when subjected to environmental conditions consisting of a sequence of temperature, humidity and, where required, low air pressure environmental stresses.

The order of application of the stresses and conditions for the change from one step to the next have been chosen to accelerate and amplify degradation mechanisms of the same type as those observed under natural climatic conditions.

Note: Environmental conditions occurring in nature are classified in **IEC 721-2** and **IEC 721-3**.

This Standard may be applied to other electrotechnical products when the degradation mechanisms are the same and the specified requirements for testing can be satisfied. In other cases, it may form a basis for the writing of a similar test.

In this test, specimens are exposed to environmental tests in a standard order and categorized according to the basic code defined in Annex A of **JIS C 0010** except that the third group of digits is used as an indication of the number of cycles in Step 5 of the damp heat cyclic Test Db according to **6** in **JIS C 0027**. In the climatic categories $-/-/56$, $40/-/-$, etc., in this Standard the dashes may be replaced by any of the standard values appropriate to the space as in the following examples: $55/100/56$, $25/085/56$, $40/085/21$. Where any modification is necessary, the relevant specification shall provide the necessary information for each step in the selected method (see 8).

This test is frequently specified to follow other tests involving mechanical stress, for example tests for robustness of terminations, solderability, shock and vibration, as a means of determining whether the sealing of the specimen has been damaged.

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

IEC 68-1:1988 *Environmental testing. Part 1: General and guidance.*

Remarks: **JIS C 0010-1993**, *Environmental testing, Part 1: General and guidance* is identical to **IEC 68-1: 1988**.

IEC 68-2-1: 1990 *Environmental testing. Part 2: Tests — Tests A: Cold.*

Remarks: **JIS C 0020-1995**, *Environmental testing procedures, Part 2: Tests, Tests A: Cold* is identical to **IEC 68-2-1: 1990**.

IEC 68-2-2: 1974 *Environmental testing. Part 2: Tests — Tests B: Dry heat.*

IEC 68-2-2A: 1976 *First supplement.*

Remarks: **JIS C 0021-1995**, *Basic environmental testing procedures, Part 2: Tests, Test B: Dry heat* is identical to **IEC 68-2-2: 1974** and **68-2-2A: 1976**.

IEC 68-2-13: 1983 *Environmental testing. Part 2: Tests — Test M: Low air pressure.*

Remarks: **JIS C 0029-1989**, *Basic environmental testing procedures, Part 2: Tests, Test M: Low air pressure* is equivalent to **IEC 68-2-13: 1983**.

IEC 68-2-28: 1980 *Environmental testing. Part 2: Tests — Guidance for damp heat tests.*

Remarks: **JIS C 0033-1993**, *Environmental testing, Part 2: Tests — Guidance for damp heat tests* is identical to **IEC 68-2-28: 1980**.

IEC 68-2-30: 1980 *Environmental testing. Part 2: Tests — Test Db and guidance: Damp heat cyclic (12 + 12-hour cycle).*

Remarks: JIS C 0027-1988, Basic environmental testing procedures Part 2: Tests, Test Db: Damp heat, cyclic (12+12-hour cycle) is equivalent to IEC 68-2-30: 1980.

IEC 68-3-1: 1974 *Environmental testing. Part 3: Background information. Section One — Cold and dry heat tests.*

IEC 68-3-1A: 1978 *First supplement.*

Remarks: JIS C 0095-1995, Background information, Section One — Cold and dry heat tests is identical to IEC 68-3-1: 1974 and 68-3-1A: 1978.

IEC 721- 2 *Classification of environmental conditions. Part 2: Environmental conditions appearing in nature.*

IEC 721-3 *Classification of environmental conditions. Part 3: Classification of groups of environmental parameters and their severities.*

3 Definitions The terms used are generally defined in IEC 68-5-2: 1990, *Terms and definitions*.

4 Test apparatus The test apparatus is that required for carrying out each of the individual tests, including variants and methods, with the required severities prescribed for the sequence.

When using a single test chamber in which the conditions specified for the different steps in the sequence are successively established, special care is necessary (see B.3 of Annex B).

The use of a test chamber with automatic transfer of the specimen between compartments can, in general, be regarded as equivalent to the use of separate test chambers. Also, with test chambers with automatic transfer, it should be ensured that the recovery conditions at the end of each step are satisfied, particularly for step 2 of method 1 (see 8.2.2).

5 Severities The severity is defined by the temperature of the dry heat test (4.1 of JIS C 0021), the temperature of the cold test (4.1 of JIS C 0020), the air pressure and the duration of exposure, if the optional "low air pressure" step is required (4 in JIS C 0029), and finally, the number of damp heat cycles according to 8.2.5 of this Standard.

6 Pre-conditioning Unless otherwise prescribed by the relevant specification, pre-conditioning is required. The duration of preconditioning shall be at least 1 h under standard atmospheric conditions for testing.

7 Initial measurements The specimen shall be submitted to the visual, dimensional and functional checks prescribed by the relevant specification.

8 Testing

8.1 General description Three methods are standardized. Method 1 is preferred and shall always be used unless otherwise prescribed by the relevant specification.