



PD 6521 : 1988

IEC 68-4 : 1987

UDC 621.3.002.6.001.4 : 620.169.1 : 621.3.04(048)

1/9

© British Standards Institution. No part of this publication may be photocopied or otherwise reproduced without the prior permission in writing of BSI

Summaries of test methods for environmental testing of electrotechnical products

Résumés d'essais fondamentaux climatiques et de robustesse mécanique des produits électrotechniques

Zusammenstellung von Prüfverfahren für die Umweltprüfung von elektrotechnischen Geräten

Contents

	Page		Page
National foreword		2. General	3
Committees responsible	Inside front cover	3. Definitions	4
	Back cover	4. Lists of test summaries	6
Clause		5. Lists of guidance documents	10
1. Object	3	6. Test summaries	Sheets A-1 to Z-4

National foreword

This Published Document, which has been prepared under the direction of the General Electrotechnical Engineering Standards Committee, is identical with IEC 68-4 : 1987 'Basic environmental testing procedures. Part 4 : Information for specification writers — Test summaries', published by the International Electrotechnical Commission (IEC). Although the content of the IEC standard is not judged suitable for publication as a British Standard, because not all the IEC test procedures have been approved by the United Kingdom and implemented in BS 2011, specification writers and others with similar needs may find it a useful reference text.

The lists under the heading 'Cross-references' serve as guides to the corresponding Parts of BS 2011 for the publications referred to in 4.1 and 5.1.

Where IEC 68-2 is implemented in BS 2011, the number of the corresponding Part of BS 2011 will consist of '2.1' followed by the designatory letter of the test in the case of test summaries, or of '2.2' or '3' followed by the designatory letter of the appropriate test in the case of guidance documents.

It is emphasized most strongly that it is not intended that these test summaries should form the definitive basis of what is to be included in a specification. Furthermore, the summaries are not intended for personnel performing tests or assessing the results of tests.

Terminology and conventions. The text of the international standard has been approved as suitable for publication as a Published Document without deviation. Some terminology and certain conventions are not identical with those used in British Standard publications; attention is drawn especially to the following.

Wherever sheet numbers are quoted, they are IEC sheet numbers.

Cross-references. The following lists indicate the Parts of BS 2011 that are identical or technically equivalent to the IEC standards referred to in 4.1 and 5.1. However, implementation of amendments and revisions in the British Standard may not have taken place due to the time involved and so the exact degree of correspondence can only be determined by reference to the appropriate Part of BS 2011. In most, but not all, cases CENELEC harmonization exists (HD 323) and details can be found in the *CENELEC Catalogue*.

List of test summaries

NOTE 1. The list given below is in the order of the list in 4.1.

IEC standard	Part of BS 2011	IEC standard	Part of BS 2011
68-2-1	2.1A	68-2-32	2.1Ed
68-2-2	2.1B	68-2-34	2.1Fd
68-2-3	2.1Ca	68-2-35	2.1Fda
68-2-5	2.1Sa	68-2-36	2.1Fdb
68-2-6	2.1Fc	68-2-37	2.1Fdc
68-2-7	2.1Ga	68-2-38	2.1Z/AD
68-2-10	2.1J	68-2-39	2.1Z/AMD
68-2-11	2.1Ka	68-2-40	2.1Z/AM
68-2-13	2.1M	68-2-41	2.1Z/BM
68-2-14	2.1N	68-2-42	2.1Kc
68-2-17	2.1Q	68-2-43	2.1Kd
68-2-20	2.1T	68-2-45	2.1XA
68-2-21	2.1U	68-2-50	2.1Z/AFc
68-2-27	2.1Ea	68-2-51	2.1Z/BFc
68-2-29	2.1Eb	68-2-52	2.1Kb
68-2-30	2.1Db	68-2-54	2.1Ta
68-2-31	2.1Ec		

List of guidance documents

NOTE 2. The list given below is in the order of the list in 5.1.

IEC standard	Part of BS 2011	IEC standard	Part of BS 2011
68-2-9	2.2Sa	68-2-53	2.2Z/AFc & Z/BFc
68-2-28	2.2C & D	68-3-1	3A & B
68-2-33	2.2N	68-3-1A	Supplement No. 1 to Part 3A & B
68-2-44	2.2T	68-3-2	2.2Z/AM & Z/BM
68-2-46	2.2Kd		

A related British Standard for IEC 260 : 1968 is BS 3718 : 1964 'Specification for laboratory humidity ovens'.

Summaries of test methods for environmental testing of electrotechnical products

1. Object

To provide information in summarized form on the individual environmental tests in IEC Publication 68-2 to serve the purposes of specification writers and others when a knowledge of the detailed provisions of the complete standards is not required.

It should be particularly borne in mind by all concerned with laboratory testing that these summaries are not intended to be a substitute for the relevant complete standards.

2. General

The standards in Publication 68-2 for the individual environmental tests are based on the general considerations, including definitions and guidance, to be found in Publication 68-1. That standard gives an explanation of the method used to designate the various tests.

The uniform presentation of these summaries on a single page has resulted in varying degrees of 'reduction' of original texts which themselves vary widely in length and complexity. Although, in order to facilitate the use of the summaries in this publication, the presentation has been made as consistent as possible, it should be remembered that the original texts are of different dates and are the responsibility of IEC Technical Committee No. 50 or its Sub-Committees.

Tolerances have been omitted from these summaries; they can be found in Publication 68-2.

The information in Sub-clauses 2.1, 2.2 and 2.3, although not necessarily applicable to all the summaries, is of general application.

2.1 *Guidance*

Many of the standards in Publication 68-2 contain guidance on the application of the testing procedure and much of this is of particular value to specification writers and others who are not required to have a knowledge of the detailed provisions of a Test. In the case of these standards, the summaries will make no specific reference to guidance.

There are other cases, for example solar radiation testing (Publication 68-2-5), where guidance is to be found in another standard in the Publication 68-2 series (Publication 68-2-9 in the case of the example), or - and then described as 'background information' - in a standard in the Publication 68-3 series. In these cases, reference is made in the summary to the other standards concerned irrespective of their degree of relevance for specification writers in order that they can indicate fully in their specifications the sources of detailed information which laboratories will require. The standard will then be listed in Clause 5.

2.2 Storage

Guidance on the application of Tests in the Publication 68-2 series to simulate the effects of storage, from short-term to long-term, is given in Publication 68-2-48, to which reference should be made in appropriate cases.

2.3 Mounting

The mounting requirements for specimens to be subjected to certain of the vibration and shock tests covered by the summaries, namely shock and bump (Test Ea, Publication 68-2-27; Test Eb, Publication 68-2-29), sinusoidal and random vibration (Test Fc, Publication 68-2-6; Test Fd, Publications 68-2-34, 68-2-35, 68-2-36 and 68-2-37) and steady-state acceleration (Test Ga, Publication 68-2-7), are the subject of Publication 68-2-47, to which attention should be drawn in relevant specifications. This applies also, of course, when dealing with 'combined' or 'composite' tests, as defined in Clause 3, embodying one or more of the tests mentioned.

3. Definitions

The following list of generally-applicable definitions is based, with some editing, on those given in Publication 68-1.

For other definitions, refer to Publications 68-1 and 68-2.

3.1 Test

Complete series of operations implied by its title, normally comprising the following operations, when required:

- a) pre-conditioning;
- b) initial examination and measurements;
- c) conditioning;
- d) recovery;
- e) final examination and measurements.

Note. - Intermediate measurements may be required during conditioning and/or recovery.

3.1.1 *Pre-conditioning*

Treatment of a specimen with the object of removing or partly counteracting the effects of its previous history.

3.1.2 *Conditioning*

Exposure of a specimen to environmental conditions in order to determine the effect of such conditions on the specimen.

3.1.3 *Recovery*

Treatment of a specimen, after environmental conditioning, in order that the properties of the specimen may be stabilized before measurement.

3.2 *Specimen*

Product designated to be tested in accordance with the procedures of Publication 68.

Note.- The term 'specimen' includes any auxiliary parts or systems that are integral functional features of the specimen, for example systems for cooling and heating.

3.2.1 *Heat-dissipating specimen*

Specimen with the hottest point on its surface, measured in free air conditions and under the air pressure specified in Sub-clause 5.3.1 of Publication 68-1, more than 5 °C above the ambient temperature of the surrounding atmosphere after temperature stability has been reached.

3.2.2 *Non-heat dissipating specimen*

Specimen other than as defined in Sub-clause 3.2.1

3.3 *Relevant specification*

Set of requirements to be satisfied by a product, indicating the procedure(s) necessary to determine whether the requirements given are satisfied.

3.4 *Severity*

Set of parameters for the conditioning of the specimen.

3.5 *Combined test*

Test in which two or more test environments act upon the specimen simultaneously.

3.6 *Composite test*

Test in which the specimen is exposed to two or more test environments in close succession.

4. Lists of test summaries

To facilitate the finding of the required summary, the summaries are listed in numerical order in Sub-clause 4.1 and in alphabetical order in Sub-clause 4.2. The Sheets for the individual summaries are filed in alphabetical order.

Note. - The reference to any publication refers to the edition of the standard identified by its date on the corresponding test summary sheet and to all the amendments similarly identified.

4.1 *Numerical list*

<i>IEC Publication</i>	<i>Test designation and title</i>	<i>Sheet</i>
68-2-1	Tests A: Cold (including First Supplement 68-2-1A)	A/B-1
68-2-2	Tests B: Dry Heat (including First Supplement 68-2-2A)	A/B-1
68-2-3	Test Ca: Damp Heat, Steady State	C-1
68-2-5	Test Sa: Simulated Solar Radiation at Ground Level	S-1
68-2-6	Test Fc and Guidance: Vibration (Sinusoidal)	F-1
68-2-7	Test Ga and Guidance: Acceleration, Steady State	G-1
68-2-10	Test J: Mould Growth	J-1
68-2-11	Test Ka: Salt Mist	K-1
68-2-13	Test M: Low Air Pressure	M-1
68-2-14	Test N: Change of Temperature	N-1
68-2-17	Test Q: Sealing	Q-1 to Q7
68-2-20	Test T: Soldering	T-1, T-3, T-4
68-2-21	Test U: Robustness of Terminations and Integral Mounting Devices	U-1 to U-5
68-2-27	Test Ea and Guidance: Shock	E-1
68-2-29	Test Eb and Guidance: Bump	E-2
68-2-30	Test Db and Guidance: Damp Heat, Cyclic (12 + 12-hour Cycle)	D-1

<i>IEC Publication</i>	<i>Test designation and title</i>	<i>Sheet</i>
68-2-31	Test Ec: Drop and Topple, primarily for Equipment-type Specimens	E-3
68-2-32	Test Ed: Free Fall	E-4
68-2-34	Test Fd: Random Vibration Wide Band - General Requirements	F-2
68-2-35	Test Fda: Random Vibration Wide Band - Reproducibility High	F-2
68-2-36	Test Fdb: Random Vibration Wide Band - Reproducibility Medium	F-2
68-2-37	Test Fdc: Random Vibration Wide Band - Reproducibility Low	F-2
68-2-38	Test Z/AD: Composite Temperature/Humidity Cyclic Test	Z-1
68-2-39	Test Z/AMD: Combined Sequential Cold, Low Air Pressure and Damp Heat Test	Z-4
68-2-40	Test Z/AM: Combined Cold/Low Air Pressure Tests	Z-3
68-2-41	Test Z/BM: Combined Dry Heat/Low Air Pressure Tests	Z-3
68-2-42	Test Kc: Sulphur Dioxide Test for Contacts and Connections	K-3
68-2-43	Test Kd: Hydrogen Sulphide Test for Contacts and Connections	K-3
68-2-45	Test XA and Guidance: Immersion in Cleaning Solvents	X-1
68-2-50	Tests Z/AFc: Combined Cold/Vibration (Sinusoidal) Tests for both Heat-dissipating and Non-heat-dissipating Specimens	Z-2
68-2-51	Tests Z/BFc: Combined Dry Heat/Vibration (Sinusoidal) Tests for both Heat-dissipating and Non-heat-dissipating Specimens	Z-2
68-2-52	Test Kb: Salt Mist, Cyclic (Sodium Chloride Solution)	K-2
68-2-54	Test Ta: Soldering. Solderability Testing by the Wetting Balance Method	T-2
68-2-55	Test Ee and Guidance: Bounce	E-5

4.2 *Alphabetic list*

<i>Test designation</i>	<i>IEC Publication</i>	<i>Title</i>	<i>Sheet</i>
A, Aa, Ab, Ad	68-2-1	Tests A: Cold (including First Supplement 68-2-1A)	A/B-1
B, Ba, Bb, Bc, Bd	68-2-2	Tests B: Dry Heat (including First Supplement 68-2-2A)	A/B-1
Ca	68-2-3	Test Ca: Damp Heat, Steady State	C-1
Db	68-2-30	Test Db and Guidance: Damp Heat Cyclic (12 + 12-hour Cycle)	D-1
Ea	68-2-27	Test Ea and Guidance: Shock	E-1
Eb	68-2-29	Test Eb and Guidance: Bump	E-2
Ec	68-2-31	Test Ec: Drop and Topple, primarily for Equipment-type Specimens	E-3
Ed	68-2-32	Test Ed: Free Fall	E-4
Ee	68-2-55	Test Ee and Guidance: Bounce	E-5
Fc	68-2-6	Test Fc and Guidance: Vibration (Sinusoidal)	F-1
Fd	68-2-34	Test Fd: Random Vibration Wide Band - General Requirements	F-2
Fda	68-2-35	Test Fda: Random Vibration Wide Band - Reproducibility High	F-2
Fdb	68-2-36	Test Fdb: Random Vibration Wide Band - Reproducibility Medium	F-2
Fdc	68-2-37	Test Fdc: Random Vibration Wide Band - Reproducibility Low	F-2
Ga	68-2-7	Test Ga and Guidance: Acceleration, Steady State	G-1
J	68-2-10	Test J: Mould Growth	J-1
Ka	68-2-11	Test Ka: Salt Mist	K-1

<i>Test designation</i>	<i>IEC Publication</i>	<i>Title</i>	<i>Sheet</i>
Kb	68-2-52	Test Kb: Salt Mist, Cyclic (Sodium Chloride Solution)	K-2
Kc	68-2-42	Test Kc: Sulphur Dioxide Test for Contacts and Connections	K-3
Kd	68-2-43	Test Kd: Hydrogen Sulphide Test for Contacts and Connections	K-3
M	68-2-13	Test M: Low Air Pressure	M-1
N, Na, Nb, Nc	68-2-14	Test N: Change of Temperature	N-1
Q	68-2-17	Test Q: Sealing	Q-1
Qa		Test Qa: Sealing of Bushes, Spindles and Gaskets	Q-2
Qc		Test Qc: Container Sealing, Gas Leakage	Q-3
Qd		Test Qd: Container Sealing, Seepage of Filling Liquid	Q-4
Qf		Test Qf: Immersion	Q-5
Qk		Test Qk: Sealing Tracer Gas Method with Mass Spectrometer	Q-6
Ql		Test Ql: Bomb Pressure Test	Q-7
Sa	68-2-5	Test Sa: Simulated Solar Radiation at Ground Level	S-1
T		Test T: Soldering	
Ta	68-2-20	Test Ta: Solderability of Wire and Tag Terminations	T-1
	68-2-54	Test Ta: Soldering. Solderability Testing by the Wetting Balance Method	T-2
Tb	68-2-20	Test Tb: Resistance of Components to Soldering Heat	T-3
Tc	68-2-20	Test Tc: Solderability of Printed Boards and Metal-clad Laminates	T-4

<i>Test designation</i>	<i>IEC Publication</i>	<i>Title</i>	<i>Sheet</i>
U	68-2-21	Test U: Robustness of Terminations and Integral Mounting Devices	
Ua ₁		Test Ua ₁ : Tensile	U-1
Ua ₂		Test Ua ₂ : Thrust	U-2
Ub		Test Ub: Bending	U-3
Uc		Test Uc: Torsion	U-4
Ud		Test Ud: Torque	U-5
XA	68-2-45	Test XA and Guidance: Immersion in Cleaning Solvents	X-1
Z/AD	68-2-38	Test Z/AD: Composite Temperature/Humidity Cyclic Test	Z-1
Z/AFc	68-2-50	Tests Z/AFc: Combined Cold/Vibration (Sinusoidal) Tests for Both Heat-dissipating and Non-heat-dissipating Specimens	Z-2
Z/AM	68-2-40	Test Z/AM: Combined Cold/Low Air Pressure Tests	Z-3
Z/AMD	68-2-39	Test Z/AMD: Combined Sequential Cold, Low Air Pressure, and Damp Heat Test	Z-4
Z/BFc	68-2-51	Tests Z/BFc: Combined Dry Heat/Vibration (Sinusoidal) Tests for Both Heat-dissipating and Non-heat-dissipating Specimens	Z-2
Z/BM	68-2-41	Test Z/BM: Combined Dry Heat/Low Air Pressure Tests	Z-3

5. Lists of guidance documents

Many of the publications referred to in Sub-clauses 4.1 and 4.2 contain guidance on the execution or application of the test procedure. In some cases, there is reference to other publications, containing guidance only, which are listed in Sub-clauses 5.1 and 5.2.

Note. - The reference to any publication refers to the edition of the standard identified by its date on the corresponding test summary sheet and to all the amendments similarly identified.

5.1 Numerical list

<i>IEC Publication</i>	<i>Test designation</i>	<i>Title</i>	<i>Sheet</i>
68-2-9	Sa	Guidance for Solar Radiation Testing	S-1
68-2-28	Ca, Db, Z/AD	Guidance for Damp Heat Tests	C-1, D-1, Z-1
68-2-33	N	Guidance on Change of Temperature Tests	N-1
68-2-44	T	Guidance on Test T: Soldering	T-1, T-3, T-4
68-2-46	Kd	Guidance to Test Kd: Hydrogen Sulphide Test for Contacts and Connections	K-3
68-2-49	Kc	Guidance to Test Kc: Sulphur Dioxide Test for Contacts and Connections	K-3
68-2-53	Z/AFc and Z/BFc	Guidance to Tests Z/AFc and Z/BFc: Combined Temperature (Cold and Dry Heat) and Vibration (Sinusoidal) tests	Z-2
68-3-1	A and B	Background Information: Section One - Cold and Dry Heat Tests	A/B-1
68-3-1A	A and B	First Supplement to Publication 68-3-1	A/B-1
68-3-2	Z/AM and Z/BM	Background Information: Section Two - Combined Temperature/Low Air Pressure Tests	Z-3
(260)	(Ca and Db)	Test Enclosures of Non-injection Type for Constant Relative Humidity	(C-1, D-1)
(355)	(Kb, Kc, Kd)	An Appraisal of the Problems of Accelerated Testing for Atmospheric Corrosion	(K-2, K-3)

5.2 *Alphabetic list*

<i>Test Designation</i>	<i>IEC Publication</i>	<i>Title</i>	<i>Sheet</i>
A and B	68-3-1	Background Information: Section One - Cold and Dry Heat Tests	A/B-1
Ca	68-2-28	Guidance for Damp Heat Tests	C-1
(Ca)	(260)	Test Enclosures of Non-injection Type For Constant Relative Humidity	(C-1)
Db	68-2-28	Guidance for Damp Heat Tests	D-1
(Db)	(260)	Test Enclosures of Non-injection Type for Constant Relative Humidity	(D-1)
(Kb, Kc, Kd)	(355)	An Appraisal of the Problems of Accelerated Testing for Atmospheric Corrosion	(K-2, K-3)
Kc	68-2-49	Guidance to Test Kc: Sulphur Dioxide Test for Contacts and Connections	K-3
Kd	68-2-46	Guidance to Test Kd: Hydrogen Sulphide Test for Contacts and Connections	K-3
N	68-2-33	Guidance on Change of Temperature Tests	N-1
Sa	68-2-9	Guidance for Solar Radiation Testing	S-1
T	68-2-44	Guidance on Test T: Soldering	T-1, T-3, T-4
Z/AD	68-2-28	Guidance for Damp Heat Tests	Z-1
Z/AFc	68-2-53	Guidance to Tests Z/AFc and Z/BFc: Combined Temperature (Cold and Dry Heat) and Vibration (Sinusoidal) Tests	Z-2
Z/AM	68-3-2	Background Information: Section Two - Combined Temperature/Low Air Pressure Tests	Z-3

<i>Test Designation</i>	<i>IEC Publication</i>	<i>Title</i>	<i>Sheet</i>
Z/BFc	68-2-53	Guidance to Tests Z/AFc and Z/BFc: Combined Temperature (Cold and Dry Heat) and Vibration (Sinusoidal) Tests	Z-2
Z/BM	68-3-2	Background Information: Section Two - Combined Temperature/Low Air Pressure Tests	Z-3

6. Test summaries

The sheets for the individual summaries in this clause are identified by the letters identifying the test(s) considered and are filed in alphabetical order of the related sheet reference. The current sheets with their identifying date of issue are listed below in the order in which they are filed. This list, together with these introductory sentences in Clause 6, will be reissued every time that new individual summaries are added or existing ones are either revised or withdrawn:

<i>Sheet</i>	<i>Issue date</i>	<i>Test designation(s)</i>	<i>IEC Publication(s)</i>
A/B-1	1974	Tests A and Tests B	68-2-1 and 2-2
C-1	1969	Test Ca	68-2-3
D-1	1980	Test Db	68-2-30
E-1	1972	Test Ea	68-2-27
E-2	1968	Test Eb	68-2-29
E-3	1969	Test Ec	68-2-31
E-4	1975	Test Ed	68-2-32
E-5	1987	Test Ee	68-2-55
F-1	1982	Test Fc	68-2-6
F-2	1973	Test Fd	68-2-34, 2-35, 2-36 and 2-37
G-1	1983	Test Ga	68-2-7
J-1	1984	Test J	68-2-10
K-1	1981	Test Ka	68-2-11
K-2	1984	Test Kb	68-2-52
K-3	1982, 1976	Test Kc and Test Kd	68-2-42 and 2-43
M-1	1983	Test M	68-2-13
N-1	1984	Test N	68-2-14
Q-1	1978	Test Q	68-2-17
Q-2	1978	Test Q	68-2-17
Q-3	1978	Test Q	68-2-17
Q-4	1978	Test Q	68-2-17
Q-5	1978	Test Q	68-2-17
Q-6	1978	Test Q	68-2-17
Q-7	1978	Test Q	68-2-17
S-1	1975	Test Sa	68-2-5
T-1	1979	Test Ta	68-2-20

<i>Sheet</i>	<i>Issue date</i>	<i>Test designation(s)</i>	<i>IEC Publication(s)</i>
T-2*	1985	Test Ta*	68-2-54
T-3	1979	Test Tb	68-2-20
T-4	1979	Test Tc	68-2-20
U-1	1983	Test Ua ₁	68-2-21
U-2	1983	Test Ua ₂	68-2-21
U-3	1983	Test Ub ₂	68-2-21
U-4	1983	Test Uc	68-2-21
U-5	1983	Test Ud	68-2-21
X-1	1980	Test Xa	68-2-45
Z-1	1974	Test Z/AD	68-2-38
Z-2	1983	Tests Z/AFc and Tests Z/BFc	68-2-50 and 2-51
Z-3	1976	Test Z/AM and Test Z/BM	68-2-40 and 2-41
Z-4	1976	Test Z/AMD	68-2-39

* Sheet T-1 deals with Methods 1, 2 and 3 of Test Ta from Publication 68-2-20.

PUBLICATION 68-4: INFORMATION FOR SPECIFICATION WRITERS - TEST SUMMARIES

A
B

COLD: Tests A - Publications 68-2-1 (1974) and Amendment No. 1 (1983) and 68-2-1A (1976).

DRY HEAT: Tests B - Publications 68-2-2 (1974) and 68-2-2A (1976).

See also: Publications 68-3-1: Background Information. Section One - Cold and Dry Heat Tests (1974) and 68-3-1A (1978).

1. INTRODUCTION

Publication 68-2 deals with Cold and Dry heat tests applicable both to heat-dissipating and non heat-dissipating specimens.

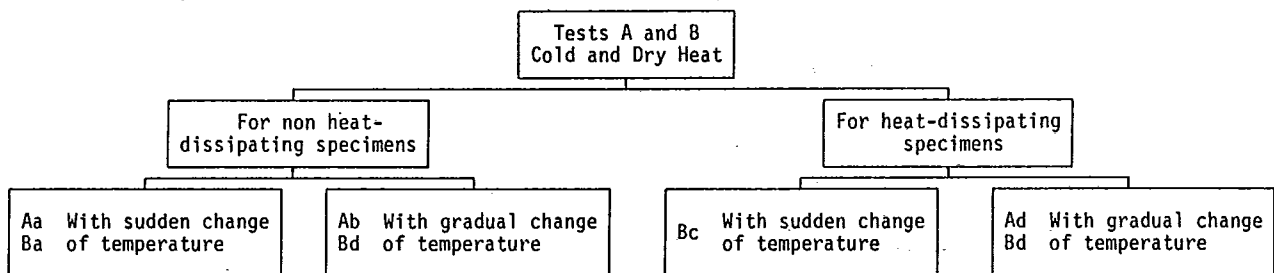
They are subdivided into tests with sudden and gradual change of temperature.

The object of these tests is to determine the ability of components, equipments or other articles to be used or stored at low or high temperature. They do not permit the assessment of the ability of specimens to withstand or operate during temperature variations. In this case, it would be necessary to use Test N: Change of Temperature.

The procedures given in these tests are normally intended for specimens which achieve temperature stability during the performance of the test.

Tests Aa, Ba and Bc shall be used only when it is known that the effects of a sudden change of temperature are not detrimental to the test specimen.

The Cold and Dry heat tests are subdivided as in the block diagram below:



2. GENERAL DESCRIPTION

The specimen is at the ambient temperature of the laboratory when introduced into the chamber. For tests with sudden change of temperature the chamber is at the temperature appropriate to the degree of severity as specified in the relevant specification; and for the tests with gradual change of temperature it is at the temperature of the laboratory. In the latter case the temperature is then changed to the temperature appropriate to the degree of severity specified in the relevant specification.

After temperature stability of the specimen has been reached the specimen is exposed to the test conditions for the specified duration.

Non heat-dissipating specimens under test are normally in non-operating conditions. Forced air circulation is normally used for this test. For heat-dissipating specimens the relevant specification defines the functioning of the specimens under test and testing with no forced air circulation is the preferred method. Forced air circulation may, however, be used when it is difficult or impossible to meet the conditions specified for testing without air circulation. Alternative methods for this case are given in Publication 68-2.

3. SEVERITIES

Tests A: Cold			Tests B: Dry Heat		
Temperature °C		Duration h	Temperature °C ¹⁾		Duration h
-65	-10	2	+200	+100	2
-55	-5	16	+175	+85	16
-40	+5	72	+155	+70	72
-25		96	+125	+55	96

1) In the absence of other considerations temperatures above 200 °C and up to 1000 °C should be chosen from the following values: 250 °C, 315 °C, 400 °C, 500 °C, 630 °C, 800 °C, 1000 °C.

4. INFORMATION TO BE GIVEN IN THE RELEVANT SPECIFICATION

The relevant specification shall identify the test to be used (including the following details) taking account of Clause 1 of this summary.

- | | |
|--|---|
| a) Pre-conditioning. | f) Measurements and/or loading during conditioning. |
| b) Initial measurements. | g) Recovery if non-standard. |
| c) Details of mounting or supports. | h) Final measurements. |
| d) State of specimen including cooling system during conditioning. | i) Any deviation in procedure as agreed upon between customer and supplier. |
| e) Severity, temperature and duration of exposure. | |

PUBLICATION 68-4: INFORMATION FOR SPECIFICATION WRITERS - TEST SUMMARIES

Ca

DAMP HEAT, STEADY STATE: Test Ca - Publication 68-2-3 (1969) and Amendment No. 1 (1984).

See also: Publication 68-2-28: Guidance for Damp Heat Tests (1980) (and Publication 260: Test Enclosures of Non-injection Type for Constant Relative Humidity (1968)).

1. INTRODUCTION

The object of this test is to determine the suitability of components, equipment or other electrotechnical products for use and storage under conditions of high relative humidity.

This test is primarily intended to permit the observation of the effects of high humidity at constant temperature over a prescribed period.

2. GENERAL DESCRIPTION

Specimens are exposed to a damp heat environment which is maintained at a temperature of 40 °C and a relative humidity of 93%.

3. SEVERITIES

The exposure time is chosen from the following:

- 4 days
- 10 days
- 21 days
- 56 days

4. INFORMATION TO BE GIVEN IN THE RELEVANT SPECIFICATION

- a) Pre-conditioning procedure.
- b) Electrical and mechanical checks to be made prior to the test.
- c) State of the specimen as introduced into the chamber.
- d) Severity.
- e) Loading during conditioning.
- f) Electrical and mechanical checks to be made during conditioning and the period(s) after which they shall be performed.
- g) Special precautions to be taken regarding removal of surface moisture.
- h) Recovery conditions if other than standard.
- i) Electrical and mechanical checks to be made at the end of the test, the parameters to be measured first, and the maximum period allowed for the measurement of these parameters.

PUBLICATION 68-4: INFORMATION FOR SPECIFICATION WRITERS - TEST SUMMARIES

Db

DAMP HEAT, CYCLIC (12 + 12-HOUR CYCLE): Test Db - Publication 68-2-30 (1980) and Amendment No. 1 (1985).

See also: Publication 68-2-28: Guidance for Damp Heat Tests (1980) (and Publication 260: Test Enclosures of Non-injection Type for Constant Relative Humidity (1968)).

1. INTRODUCTION

The object of this test is to determine the suitability of components, equipments or other electrotechnical products for use and storage under conditions of high humidity when combined with cyclic temperature changes and, in general, producing condensation on the surface of the specimen.

2. GENERAL DESCRIPTION

This test comprises one or more temperature cycles between 25 °C and the upper temperature of the cycle in which the relative humidity is maintained at a high level.

Two variants of the cycle are given; they are identical except for the temperature fall period. During this part of the cycle, variant 2 allows wider tolerances of relative humidity and rate of temperature fall.

3. SEVERITIES

The severity is chosen from the following:

- a) upper temperature: 40 °C,
number of cycles: 2, 6, 12, 21, 56;
- b) upper temperature: 55 °C,
number of cycles: 1, 2, 6.

4. INFORMATION TO BE GIVEN IN THE RELEVANT SPECIFICATION

- a) Severity.
- b) Initial measurements.
- c) State of the specimen during conditioning.
- d) Details of mounting or supports.
- e) Variant 1 or 2.
- f) Intermediate measurements.
- g) Recovery conditions.
- h) Special precaution to be taken regarding removal of surface moisture.
- i) Electrical and mechanical checks to be made at the end of the test, the parameters to be measured first, and the maximum period allowed for the measurement of these parameters (final measurements).