



SLOVENSKI STANDARD SIST EN 60068-2-18:2002

01-maj-2002

Environmental testing - Part 2-18: Tests - Tests R and guidance: Water

Environmental testing -- Part 2-18: Tests - Tests R and guidance: Water

Umweltprüfungen -- Teil 2-18: Prüfungen, Prüfung R und Leitfaden: Wasser

Essais d'environnement -- Partie 2-18: Essais - Essais R et guide: Eau

Ta slovenski standard je istoveten z: **EN 60068-2-18:2001**

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ICS:

19.040	Preskušanje v zvezi z okoljem	Environmental testing
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EUROPEAN STANDARD

EN 60068-2-18

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2001

ICS 19.040

English version

Environmental testing
Part 2-18: Tests - Tests R and guidance: Water
(IEC 60068-2-18:2000)

Essais d'environnement
Partie 2-18: Essais - Essais R et guide:
Eau
(CEI 60068-2-18:2000)

Umweltprüfungen
Teil 2-18: Prüfungen, Prüfung R und
Leitfaden: Wasser
(IEC 60068-2-18:2000)

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This European Standard was approved by CENELEC on 2000-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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 document 104/170/FDIS, future edition 2 of IEC 60068-2-18, prepared by IEC TC 104, Environmental conditions, classification and methods of test, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60068-2-18 on 2000-11-01.

The following dates were 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) 2001-08-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-11-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A, B, C, D and E are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60068-2-18:2001 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. Mai	1991 1993

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NORME
INTERNATIONALE
INTERNATIONAL
STANDARD

CEI
IEC

60068-2-18

Deuxième édition
Second edition
2000-10

BASIC SAFETY PUBLICATION
PUBLICATION FONDAMENTALE DE SÉCURITÉ

Essais d'environnement –

Partie 2-18:

Essais – Essai R et guide: Eau

STANDARD PREVIEW
iTech Environmental testing –
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Part 2-18:

Tests – Test R and guidance: Water

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

CODE PRIX
PRICE CODE

W

*For price, see current catalogue
Pour prix, voir catalogue en vigueur*

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ENVIRONMENTAL TESTING –

Part 2-18: Tests – Test R and guidance: Water

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60068-2-18 has been prepared by IEC technical committee 104: Environmental conditions, classification and methods of test.

This second edition cancels and replaces the first edition published in 1989 and its amendment 1 (1993). This second edition constitutes a technical revision.

It has the status of a basic safety publication in accordance with IEC Guide 104.

The text of this standard is based on the following documents:

FDIS	Report on voting
104/170/FDIS	104/176/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

Annexes A, B, C, D and E are for information only.

The committee has decided that the contents of this publication will remain unchanged until 2012. At this date, the publication will be:

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

INTRODUCTION

It is the intention of this part of IEC 60068 to fulfil the function of a basic publication¹⁾ by making water tests available to product committees.

A number of water tests are described in other IEC publications. Some of them are well established, for example, the test for classification of the second characteristic numeral of the IP Code, clause 4 of IEC 60529.

This standard incorporates the majority of the most widely used tests, as well as making available further methods and increasing the number of severities.

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<https://standards.iteh.ai/catalog/standards/sist/da882dc3-cdb0-4b31-a54c-596c50f8d6ac/sist-en-60068-2-18-2002>

¹⁾ IEC Guide 108:1994, *The relationship between technical committees with horizontal functions and product committees and the use of basic publications*

ENVIRONMENTAL TESTING –

Part 2-18: Tests – Test R and guidance: Water

1 Scope and object

This part of IEC 60068 provides methods of test applicable to products which, during transportation, storage or in service, may be subjected to falling drops, impacting water or immersion. The primary purpose of water tests is to verify the ability of enclosures, covers and seals to maintain components and equipment in good working order after and, when necessary, under a standardized dropfield or immersion in water.

These tests are not corrosion tests and should not be considered and used as such.

The effects of a large temperature difference between the water and the specimen, such as increased water ingress resulting from pressure changes, as well as thermal shock, are not simulated.

Established water tests in other standards are not intended to simulate natural rainfall and their quoted intensities are too high to be adopted for that purpose. Therefore, in addition to the high-intensity severities, Test R includes an artificial rain test based upon natural conditions but not taking into account high wind speeds generally associated with natural rain.

Guidance is given on the applicability of the tests and the severities to be selected.

[SIST EN 60068-2-18:2002](https://standards.iteh.ai/catalog/standards/sist/da882dc3-cdb0-4b31-a54c-596c50f8d6ac/sist-en-60068-2-18-2002)

[https://standards.iteh.ai/catalog/standards/sist/da882dc3-cdb0-4b31-a54c-](https://standards.iteh.ai/catalog/standards/sist/da882dc3-cdb0-4b31-a54c-596c50f8d6ac/sist-en-60068-2-18-2002)

2 Normative references [596c50f8d6ac/sist-en-60068-2-18-2002](https://standards.iteh.ai/catalog/standards/sist/da882dc3-cdb0-4b31-a54c-596c50f8d6ac/sist-en-60068-2-18-2002)

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 60068. For dated references, subsequent amendments to, or revisions of, these publications do not apply. However, parties to agreements based on this part of IEC 60068 are encouraged to investigate the possibility of applying the most recent edition of the normative documents indicated below. For undated references, the latest edition of the normative documents referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*

3 Definitions

For the purposes of this part of IEC 60068, the following definitions apply.

3.1 rain

precipitation in the form of waterdrops. Both the amount that falls and the actual falling action of the waterdrops are often called rainfall

3.2**drizzle**

precipitation in the form of very small, numerous and uniformly dispersed waterdrops that may appear to float while following air currents

3.3**raindrop**

drop of water having a diameter greater than 0,5 mm falling through the atmosphere

3.4**drizzledrop**

drop of water having a diameter of 0,2 mm to 0,5 mm falling through the atmosphere

3.5**rainfall or drizzle intensity (R)**

amount that falls per unit of time. Rainfall intensity (R) is given in millimetres per hour (mm/h) where 1 l/(m².h) equals 1 mm/h

3.6**median volume diameter (D_{50})**

diameter of a drop whose size is such that 50 % of the volume of water reaching the ground is comprised of smaller (or larger) drops:

$$D_{50} = 1,21 R^{0,19} \text{ (mm)}$$

where R is the rainfall intensity, see above

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4 Survey of water tests

SIST EN 60068-2-18:2002

4.1 General

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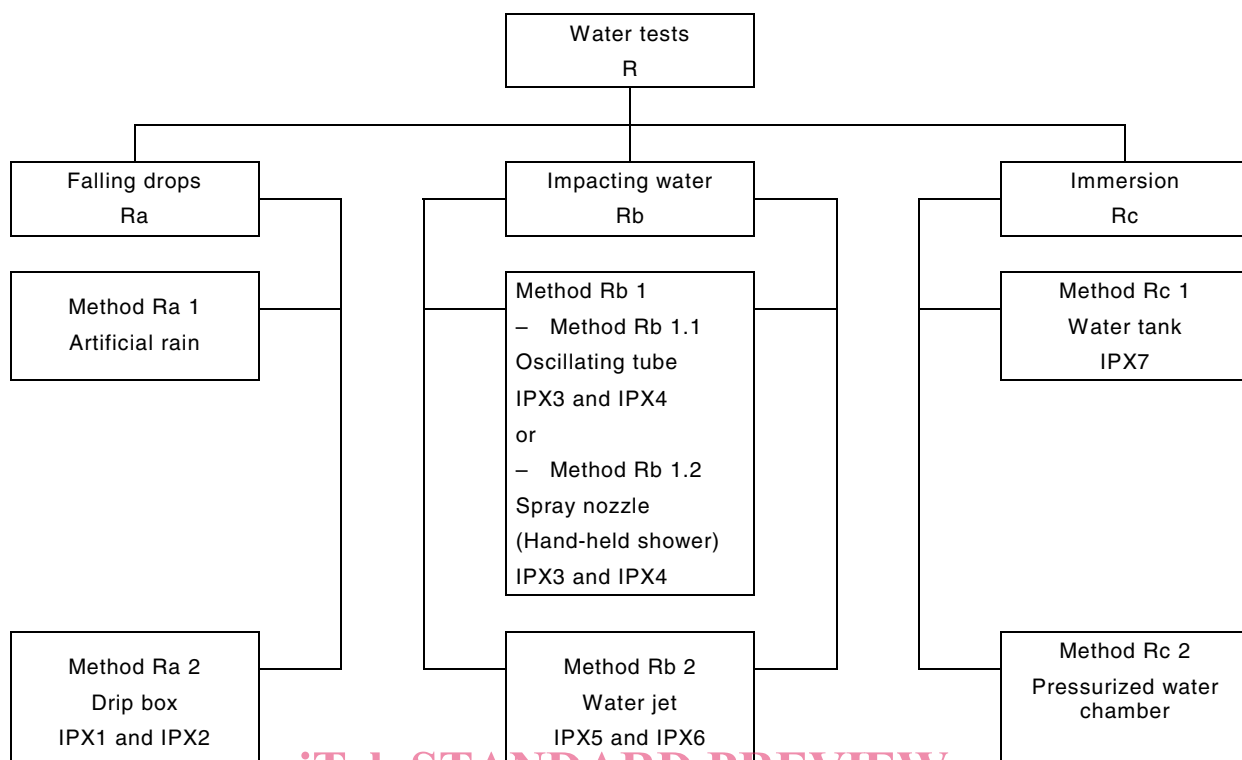
This survey indicates the general structure of the various tests included in this standard.

The structuring of the different tests is given in figure 1.

4.2 Description of Tests R: Water

The water tests are structured into three groups.

- Ra: "Falling drops" which, in principle, is a test with artificial rain and a test simulating falling drops from condensation or leakage.
- Rb: "Impacting water" where water jets impinge upon the test specimen with a certain force and may assume any angle towards the test specimen.
- Rc: "Immersion" where the test specimen is immersed in water to specified depths or equivalent pressures.



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IEC 206/2000

Figure 1 – Structuring of test methods and equivalence with the IP Code of IEC 60529

5 Test Ra: Falling drops

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5.1 Object

This test is applicable to products which, during transportation, storage or in service may be exposed to vertical falling drops, the origin of these being, for example, natural rain, seepage or condensation. It shall be clearly stated in the relevant specification whether a product hereinafter referred to as a specimen has to function during testing or merely to survive conditions of falling drops. In either case, the relevant specification shall always prescribe the acceptable tolerances in performance.

5.2 Method Ra 1: Artificial rain

5.2.1 General description of the test

The test specimen is mounted on an appropriate fixture or base support. It is then subjected to falling waterdrops, which simulate natural rain.

The basic requirements for the test apparatus are:

- Drop-generating nozzle or nozzles (see C.2.1 and figure C.1).
- Fixture for the specimen

The fixture shall simulate as far as possible the mounting of the specimen when in service; for example, for wall-mounted equipment the fixture shall simulate a wall.