

Paints and varnishes - Determination of resistance to humidity - Part 2: Condensation (in-cabinet exposure with heated water reservoir) (ISO 6270-2:2025)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>See Eesti standard EVS-EN ISO 6270-2:2025 sisaldab Euroopa standardi EN ISO 6270-2:2025 ingliskeelset teksti.</p> <p>Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 02.07.2025.</p> <p>Standard on kättesaadav Eesti Standardimis- ja Akrediteerimiskeskusest.</p>	<p>This Estonian standard EVS-EN ISO 6270-2:2025 consists of the English text of the European standard EN ISO 6270-2:2025.</p> <p>This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.</p> <p>Date of Availability of the European standard is 02.07.2025.</p> <p>The standard is available from the Estonian Centre for Standardisation and Accreditation.</p>
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EUROPEAN STANDARD

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Paints and varnishes - Determination of resistance to humidity - Part 2: Condensation (in-cabinet exposure with heated water reservoir) (ISO 6270-2:2025)

Peintures et vernis - Détermination de la résistance à l'humidité - Partie 2: Condensation (exposition en enceinte avec réservoir à eau chauffée) (ISO 6270-2:2025)

Beschichtungsstoffe - Bestimmung der Beständigkeit gegen Feuchtigkeit - Teil 2: Kondensation (Beanspruchung in einer Klimakammer mit geheiztem Wasserbehälter) (ISO 6270-2:2025)

This European Standard was approved by CEN on 27 June 2025.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 6270-2:2025) has been prepared by Technical Committee ISO/TC 35 "Paints and varnishes" in collaboration with Technical Committee CEN/TC 139 "Paints and varnishes" the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2026, and conflicting national standards shall be withdrawn at the latest by January 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 6270-2:2018.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 6270-2:2025 has been approved by CEN as EN ISO 6270-2:2025 without any modification.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 139, *Paints and varnishes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 6270-2:2017) and ISO 11503:1995, which have been technically revised.

The main changes are as follows:

- intermittent condensation (IC) cycle from ISO 11503 has been added;
- chamber ventilation and specimen loading requirements have been clarified;
- spacing requirements for specimens have been changed from required to recommendations, and the objective of spacing has been clarified;
- a simplified procedure has been added for condensation verification, and the previous procedure has been moved to [Annex A](#);
- the normative references have been updated.

A list of all parts in the ISO 6270 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document is intended to give consistent conditions and procedures for the conditioning of pre-prepared test specimens which are evaluated for defects. Such defects can develop when they are subjected to humid ambient atmospheres such as constant condensation-water atmospheres or alternating condensation-water atmospheres.

The tests are designed to clarify the behaviour of the test specimens in humid ambient atmospheres and to pinpoint any defects in the protection of the test specimens against corrosion. The testing of coatings in these atmospheres does not necessarily give lifetime prediction data.

After conditioning, the test specimens are evaluated either according to agreed documents [e.g. the appropriate part(s) of the ISO 4628 series] or by procedures agreed between the interested parties.

Paints and varnishes — Determination of resistance to humidity —

Part 2: Condensation (in-cabinet exposure with heated water reservoir)

1 Scope

This document specifies the general conditions and procedures observed when testing coated test specimens by exposing them to constant condensation-water atmospheres or alternating condensation-water atmospheres, in a cabinet with a heated water reservoir. These conditions and procedures ensure that the results of tests carried out in different laboratories are reproducible.

This document does not cover the shape and preparation of the test specimens, the duration of the test and the assessment of the test results.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3270, *Paints and varnishes and their raw materials — Temperatures and humidities for conditioning and testing*

ISO 4618, *Paints and varnishes — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4618 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Designation

The condensation-water test atmospheres are designated as follows:

Test atmosphere	CH	Condensation atmosphere with constant humidity
	AHT	Condensation atmosphere with alternating humidity and air temperature
	AT	Condensation atmosphere with alternating air temperature
	IC	Intermittent condensation

5 Limitations

Temperature and humidity are important parameters affecting test results. Deviations from the requirements specified can lead to results that are not comparable. However, the interested parties may agree upon alternative parameters and these parameters shall be reported.

6 Principle

A coated test specimen is exposed to condensation in a climatic chamber, consisting of a cabinet with a heated water reservoir. The effects of the exposure are evaluated by criteria agreed in advance between the interested parties, these criteria usually being of a subjective nature.

7 Test atmospheres

Condensation-water test atmospheres promote the condensation of atmospheric humidity on the surfaces of test specimens, the temperatures of which are lower than the temperature of the saturated air in the climatic chamber, due to radiation onto the chamber walls or to the cooling of the test specimen.

The atmospheric temperature in the climatic chamber during the condensation process described in this document is (40 ± 3) °C.

The condensation-water test atmosphere can be either a constant-humidity (CH) or an alternating (AHT, AT, IC) atmosphere. If, in addition to the action of the condensation water, the change in atmospheric temperature and the change in atmospheric humidity have an important effect on the test specimens, an alternating atmosphere should be chosen.

The quantity of condensation water formed on the surface of the coating can also exercise an important influence on the action of the water; this quantity will be affected by the ambient temperature in the installation room or by the cooling of the test specimen.

The condensate which drips off the test specimens consists of condensation water and also, in some instances, of solid and liquid constituents of the coating or corrosion products dissolved in the condensation water or mixed with it.

Reproducible results can only be expected if the test procedure and test conditions remain constant for a series of tests.

In the case of alternating atmospheres, a cycle time of 24 h shall be used as a general rule. A shorter cycle time (12 h or 16 h) and a correspondingly shortened time for the two test periods may be used for the AT test atmosphere.

A summary of test atmospheres, cycle durations and conditions is given in [Table 1](#). Other cycles may be used by agreement between the interested parties.

Table 1 — Condensation test atmospheres

Test atmosphere		Cycle duration		Conditions in working chamber after reaching equilibrium		
Type	Code	Test period(s)	Total	Air temperature	Relative humidity	
Constant-humidity condensation atmosphere	CH	From warm-up to end of exposure	—	$(40 \pm 3) ^\circ\text{C}$	Approx. 100 % with condensation on test specimens	
Alternating condensation atmosphere	With alternation of humidity and air temperature	AHT	8 h including warm-up	24 h	$(40 \pm 3) ^\circ\text{C}$	Approx. 100 % with condensation on test specimens
			16 h including cooling down (climatic chamber open or ventilated)		Approaching ambient	Approaching ambient
	With alternation of air temperature	AT	8 h including warm-up	24 h	$(40 \pm 3) ^\circ\text{C}$	Approx. 100 % with condensation on test specimens
			16 h including cooling down (climatic chamber closed)		Approaching ambient	Approx. 100 % (approximately saturated)
	With alternation of humidity and air temperature	IC	16 h including warm-up	24 h	$(40 \pm 3) ^\circ\text{C}$	Approx. 100 % with condensation on test specimens
			8 h including cooling down (climatic chamber open or ventilated)		$(23 \pm 5) ^\circ\text{C}$	$(50 \pm 20) \%$

NOTE 1 Set points and operational fluctuations can either be listed independently of each other, or they can be listed in the format “set point \pm operational fluctuations”. The set point is the target condition for the sensor used at the operational control point as programmed by the user. Operational fluctuations are deviations from the set point at the control point as indicated by the readout of the calibrated control sensor during equilibrium operation and do not include measurement uncertainty. At the operational control point, the operational fluctuation cannot exceed the listed value at equilibrium. When a standard calls for a particular set point, the user programmes that exact number. The operational fluctuations specified for the set point do not imply that the user is allowed to programme a set point higher or lower than the exact set point specified.

NOTE 2 Ambient conditions are dependent on laboratory environment. Allowed laboratory environments are described in [8.2](#).

8 Apparatus

8.1 Climatic chamber

In order to create the warm and humid atmospheres associated with this method, the chamber shall be vapour-tight except for ventilation provisions to prevent pressurization.

The term vapour-tight does not imply that the chamber is designed to be pressure-tight, only that obvious leak points shall be avoided.

The material of the inner walls shall be corrosion-resistant and shall not affect the test specimens. The climatic chamber is usually equipped with a floor trough which acts as the receptacle for the quantity of water prescribed in [9.1](#). The climatic chamber shall be controlled by heating the water in the floor trough.

If the quantity of heat introduced via the water is insufficient to raise the air temperature in the climatic chamber to the required level, then additional heating can be employed.

The heating-up time will depend on the nature and quantity of the test specimens, and also on the ratio of the surface of the water in the floor trough to the surface of the walls of the climatic chamber, and on the

water temperature. The water temperature should preferably not exceed 60 °C in order to prevent excessive vapour formation.

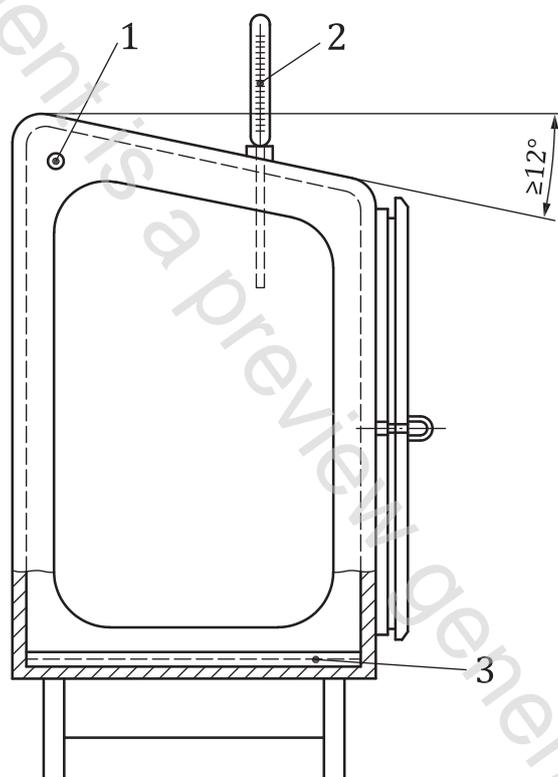
The dimensions of the climatic chamber and the arrangement of its temperature-measuring and control equipment can be chosen freely, provided that the test conditions according to [Clause 8](#) and [9.3](#) are observed and that the temperature is measured.

The climatic chamber shall have a door or other aperture for specimen loading which is capable of providing a vapour seal to maintain saturated humidity conditions. The chamber shall also include an aperture which allows the pressure inside the chamber to remain in equilibrium with laboratory ambient conditions.

Climatic chambers intended to perform the IC cycle shall have a means for controlling temperature and relative humidity in accordance with [Table 1](#) and [9.5.5](#).

An example of a climatic chamber is shown in [Figure 1](#).

Climatic chambers not equipped with water-filled floor troughs shall be fitted out in such a way that adequate formation of condensation water on the test specimens is achieved.



Key

- 1 pressure-relief aperture
- 2 temperature-measuring device
- 3 floor trough filled with water

Figure 1 — Example of a climatic chamber

8.2 Installation of the climatic chamber

The climatic chamber shall be installed in a room with an ambient atmosphere containing no corrosive constituents (e.g. it shall not be installed in a chemical laboratory), at a room temperature of (23 ± 5) °C and at a relative atmospheric humidity of max. 75 %, in such a way that it is protected against draughts and solar