



# SLOVENSKI STANDARD SIST ISO 187:2023

01-julij-2023

---

**Papir, karton, lepenka in vlaknine - Standardna atmosfera za kondicioniranje in preskušanje ter postopek za nadzor atmosfere in kondicioniranje vzorcev**

Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

Papier, carton et pâtes — Atmosphère normale de conditionnement et d'essai et méthode de surveillance de l'atmosphère et de conditionnement des échantillons

<https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023>

**Ta slovenski standard je istoveten z: ISO 187:2022**

---

**ICS:**

85.040	Vlaknine	Pulps
85.060	Papir, karton in lepenka	Paper and board

**SIST ISO 187:2023**

**en,fr,de**



INTERNATIONAL  
STANDARD

ISO  
187

Third edition  
2022-10

---

---

**Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples**

*Papier, carton et pâtes — Atmosphère normale de conditionnement et d'essai et méthode de surveillance de l'atmosphère et de conditionnement des échantillons*

*(standards.iteh.ai)*

[SIST ISO 187:2023](https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023)

<https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023>



Reference number  
ISO 187:2022(E)

© ISO 2022

# iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST ISO 187:2023

<https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023>



## **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

<b>Contents</b>		Page
<b>Foreword</b> .....		<b>iv</b>
<b>Introduction</b> .....		<b>v</b>
<b>1</b>	<b>Scope</b> .....	<b>1</b>
<b>2</b>	<b>Normative references</b> .....	<b>1</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>1</b>
<b>4</b>	<b>Principle</b> .....	<b>1</b>
<b>5</b>	<b>Standard atmosphere</b> .....	<b>1</b>
<b>6</b>	<b>Conditioning procedure</b> .....	<b>2</b>
	6.1 Preconditioning of the sample.....	2
	6.2 Conditioning.....	2
	6.3 Testing.....	2
<b>7</b>	<b>Test report</b> .....	<b>2</b>
<b>Annex A (normative) Measurement of temperature and relative humidity</b> .....		<b>3</b>
<b>Annex B (informative) Interdependence of temperature and relative humidity</b> .....		<b>4</b>
<b>Bibliography</b> .....		<b>7</b>

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

[SIST ISO 187:2023](https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023)

<https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023>

## ISO 187:2022(E)

## 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 documents 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 2, *Test methods and quality specifications for paper and board*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 172, *Pulp, paper and board*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 187:1990), which has been technically revised.

The main changes are as follows:

- introduction has been revised;
- normative references have been removed;
- definition of conditioning has been revised;
- content has been added to [Clause 5](#) and [Clause 6](#);
- [Annex A](#) has been simplified.

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](http://www.iso.org/members.html).

## Introduction

The physical properties of paper are affected by its moisture content which, in turn, is dependent on the relative humidity (RH) of the surrounding atmosphere and its history. In order that tests can be made on paper in a defined physical state, it is brought into equilibrium in an atmosphere of standardized temperature and relative humidity.

The moisture content of a given paper in equilibrium with a given atmosphere varies according to whether the equilibrium is reached by sorption or by desorption of moisture and how far the moisture content is from its equilibrium value. This hysteresis influences those physical properties that change with moisture content. Preconditioning paper from low relative humidity and then bringing it into the standard atmosphere will avoid most of the hysteresis effect. Typically, the variation in the moisture content of a given sample is less than 0,15 % when the sample is later conditioned to 50 % RH and 23 °C. Unless otherwise specified, the equilibrium condition should be attained from a low relative humidity.

For a number of years, three standard test atmospheres have been in common use:

20 °C/65 % RH;

23 °C/50 % RH;

27 °C/65 % RH.

Since 1993, the atmosphere of 23 °C /50 % RH has been considered the ISO standard test atmosphere for testing of pulp, paper, and board. However, this atmosphere can be difficult to attain in some countries located in tropical zones, and in such countries the 27 °C /65 % RH atmosphere is permitted.

(standards.iteh.ai)

[SIST ISO 187:2023](https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023)

<https://standards.iteh.ai/catalog/standards/sist/a97a45de-2dc9-4eab-8f2b-5f1dfd8874d9/sist-iso-187-2023>





# Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples

## 1 Scope

This document specifies the standard atmospheres for conditioning and testing pulp, paper and board, the conditioning procedure and the procedures for measuring the temperature and relative humidity.

## 2 Normative references

There are no normative references in this document.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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/>

### 3.1

#### relative humidity

**RH** ratio, expressed as a percentage, of the actual water vapour content of the air to the water vapour content of air saturated with water vapour at the same temperature and pressure

### 3.2

#### conditioning

process of establishing a reproducible moisture content equilibrium of a sample in an atmosphere of specified temperature and relative humidity

Note 1 to entry: This equilibrium is considered to be attained when the results of two consecutive weighings of the sample, carried out at an interval of time of not less than 1 h, do not differ by more than 0,25 %.

## 4 Principle

Exposure of a sample to a specific conditioning atmosphere in such a manner that a reproducible state of moisture content equilibrium is reached.

## 5 Standard atmosphere

The standard atmosphere for testing pulp, paper and board shall be  $(23 \pm 1) ^\circ\text{C}$  and  $(50 \pm 2) \% \text{RH}$ . In tropical countries, an atmosphere of  $(27 \pm 1) ^\circ\text{C}$  and  $(65 \pm 2) \% \text{RH}$  can be used.

A test atmosphere shall be deemed to be within the requirements of this document if all the test results determined as described in Annex A are within the prescribed limits.

Even short-term excursions of temperature or humidity beyond these limits, to the extent that the equilibrium moisture content of the sample will be affected, are not permitted. Whenever the test

## ISO 187:2022(E)

atmosphere is known to have been outside the limits and if there is any chance that the moisture content of samples has been changed by such excursions, all samples shall be reconditioned repeating [Clause 6](#) before any further testing is done. If the samples have been subjected to a relative humidity exceeding 75 %, they shall be discarded as dried-in strain in the sample can have been released, causing a permanent change in properties.

For laboratory sheets prepared according to ISO 5269-1 or to ISO 5269-3 using the conventional sheet former, if it is known or suspected that the relative humidity has fallen below the lower limit, to the extent that the moisture content can have decreased, the sheets shall be discarded and new samples prepared. If this is not possible and the samples are tested, the circumstance shall be reported.

## 6 Conditioning procedure

### 6.1 Preconditioning of the sample

For tests in which the hysteresis of the equilibrium moisture content can lead to important errors, the sample shall be pre-conditioned for 24 h in air of relative humidity between 10 % and 35 % and a temperature not above 40 °C before conditioning. Laboratory sheets prepared in the conventional sheet former (see ISO 5269-1 and ISO 5269-3) shall not be preconditioned. Ensure that the water content of the air in the pre-conditioning atmosphere is lower than in the conditioning atmosphere.

### 6.2 Conditioning

The specimens of the sample shall be held such that the conditioning air has free access to all their surfaces so that their moisture contents attain a state of equilibrium with the water vapour in the atmosphere. This equilibrium is considered to be attained when the difference of two consecutive weighings ( $M_n$  and  $M_{n+1}$ ) of the specimens of the sample at least 1 h apart is lower or equal to 0,25 % of the mass  $M_n$ . The interval between weighings needs to be longer for higher grammage papers and the degree of agreement expected between successive weighings should take account of the known cycling characteristics of the test room.

Handle preconditioned and conditioned sheets or specimens as little as possible; especially avoid touching or breathing on test areas.

**NOTE** With good air circulation a conditioning period of 4 h is usually sufficient for paper. A minimum time of 5 h to 8 h will be required for higher grammage papers. Boards of higher grammage and specially treated materials can require a conditioning period of 48 h or longer.

### 6.3 Testing

Unless allowed by the individual ISO Standard, test specimens in the standard testing atmosphere.

## 7 Test report

The test report of a testing that is done in this standard atmosphere shall include the following information:

- a) reference to this document, i.e. ISO 187:2022;
- b) the conditioning atmosphere used;
- c) the time for which the sample was conditioned;
- d) whether the sample was preconditioned before conditioning;
- e) any deviation, by agreement or otherwise from this document;
- f) the date of the test.