



# SLOVENSKI STANDARD

## SIST ISO 23404:2021

01-marec-2021

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**Informatika in dokumentacija - Papirji in kartoni za konzerviranje - Merjenje vpliva hlapnih snovi na celulozo v papirju**

Information and documentation -- Papers and boards used for conservation -- Measurement of impact of volatiles on cellulose in paper

**iTeh STANDARD PREVIEW**

Information et documentation -- Papiers et cartons utilisés pour la conservation -- Mesure de l'impact des substances volatiles sur la cellulose du papier

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**Ta slovenski standard je istoveten z: ISO 23404:2020**

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**Information and documentation —  
Papers and boards used for  
conservation — Measurement of  
impact of volatiles on cellulose in paper**

*Information et documentation — Papiers et cartons utilisés pour la  
conservation — Mesure de l'impact des substances volatiles sur la  
cellulose du papier*

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# Contents

Page

<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Principle</b> .....	<b>2</b>
<b>5 Apparatus</b> .....	<b>3</b>
<b>6 Preparation of apparatus</b> .....	<b>4</b>
6.1 Glass vials and vessels.....	4
6.2 Vial storage.....	4
<b>7 Sampling</b> .....	<b>4</b>
<b>8 Conditioning</b> .....	<b>4</b>
<b>9 Determination of the dry matter content</b> .....	<b>4</b>
<b>10 Preparation of the samples</b> .....	<b>5</b>
10.1 Test vial.....	5
10.2 Control vial.....	5
10.3 Sealing leak indicator.....	5
10.4 Reference paper.....	5
10.5 Vial sealing.....	6
<b>11 Procedure</b> .....	<b>6</b>
11.1 Number of vials.....	6
11.2 Accelerated ageing.....	6
11.3 Reference paper test pieces removal and reconditioning.....	6
11.4 Measurements of the limiting viscosity number of reference paper test pieces.....	7
<b>12 Calculations</b> .....	<b>7</b>
12.1 Calculation of viscosity-average degree of polymerization ( $DP_v$ ) of the reference paper test pieces.....	7
12.2 Test validation.....	7
12.2.1 Validation of the control.....	7
12.2.2 Validation of the test.....	8
12.3 Expression of results.....	8
<b>13 Report</b> .....	<b>8</b>
<b>Bibliography</b> .....	<b>9</b>

## ISO 23404:2020(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 46, *Information and documentation*, Subcommittee SC 10, *Requirements for document storage and conditions for preservation*.

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

According to ISO 16245<sup>[1]</sup>, materials used for storage boxes and file covers in archives and libraries “*shall not contain or form any substances which may be harmful to the documents being stored*”. Although ISO 16245 specifies important material properties as alkalinity and resistance to oxidation, as well as absence of, for example, optical brighteners and plasticizers, it does not provide a suitable method for evaluating potential effects of volatiles formed and emitted by the specific material which are the subject of this document.

This document can serve as a suitable tool for a completion of ISO 16245.

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# Information and documentation — Papers and boards used for conservation — Measurement of impact of volatiles on cellulose in paper

## 1 Scope

This document describes a test method for conservation materials which can evaluate their impact on cellulose as the main constituent of paper-based collections caused by emission of their volatile compounds.

NOTE This test can be extended to museum artefacts.

This document is applicable to papers and boards used for conservation and storage of cellulose based items.

It is not applicable to parchment-based items.

It does not evaluate the effects due to direct contact between the papers and boards used for conservation and the collections.

## 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 186, *Paper and board — Sampling to determine average quality*

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 638, *Paper, board and pulps — Determination of dry matter content — Oven-drying method*

ISO 5351, *Pulps — Determination of limiting viscosity number in cupri-ethylenediamine (CED) solution*

ISO 14487, *Pulps — Standard water for physical testing*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

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

### 3.1

#### conservation

preservation measures and action applied to prevent, arrest or delay deterioration of a document or other material object

[SOURCE: ISO 5127:2017, 3.12.1.01]

## ISO 23404:2020(E)

### 3.2

#### reference paper

specified material used for the evaluation of the impact of boards and papers on cellulose

### 3.3

#### lot

aggregate of paper or board of a single kind with specified characteristics produced under conditions that are presumed uniform, and available for sampling at one time

Note 1 to entry: A lot comprises one or more nominally identical units. Where the material to be tested has already been incorporated into a manufactured article (for example a packing case), the lot is the aggregate of such articles of a single kind, of specified characteristics.

[SOURCE: ISO 186:2002, 3.1]

### 3.4

#### standard water

water purified to electrical conductivity  $\leq 0,25$  mS/m at 25 °C

[SOURCE: ISO 14487:1997, 3.1]

### 3.5

#### viscosity-average degree of polymerization

$DP_v$

average number of anhydroglucose units (monomers of cellulose) in the cellulose macromolecule, determined by measuring the viscosity of solutions in cupri-ethylenediamine (CED)

[SOURCE: ISO/TS 18344:2016, 3.3, modified — "Viscosity" has been added to the term, and the determination process has been added to the definition.]

### 3.6

#### limiting viscosity number

$[\eta]$

limiting value of the viscosity number at infinite dilution

$$[\eta] = \lim_{\rho \rightarrow 0} \left( \frac{\eta - \eta_0}{\eta_0 - \rho} \right)$$

Note 1 to entry: Limiting viscosity number is measured in millilitres per gram.

Note 2 to entry: In the literature, the term intrinsic viscosity is often used and is equal to the limiting viscosity number. There is no general conversion factor between the limiting viscosity number in ml/g and other viscosities, determined by other methods and expressed in millipascal seconds (mPa·s).

[SOURCE: ISO 5351:2010, 3.5]

### 3.7

#### loss of $DP_v$

arithmetic mean of the *viscosity-average degree of polymerization* (3.5) of an exposed sample of reference paper against the viscosity-average degree of polymerization of an unexposed sample of same paper

## 4 Principle

Studies have shown that neutral or alkaline papers and boards can emit volatiles (such as acids, aldehydes, sulfur-containing compounds, etc.) that may depolymerize paper cellulose and therefore weaken it<sup>[2][3][4]</sup>.

This test method consists of measuring the impact of volatile compounds emitted by the tested material on a reference paper made of pure cellulose. These volatile compounds are developed by exposure at elevated temperature in closed vessels<sup>[5][6]</sup>.