

---

---

**Solvents for paints and varnishes —  
Demineralized water for industrial  
applications — Specification and test  
methods**

*Solvants pour peintures et vernis — Eau déminéralisée pour  
l'application industrielle — Spécification et méthodes d'essai*

STANDARDSISO.COM : Click to view the full PDF of ISO 23321:2019



STANDARDSISO.COM : Click to view the full PDF of ISO 23321:2019



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2019

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  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword .....	iv
<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 Requirements</b> .....	<b>1</b>
<b>5 Example of the determination of the colony content</b> .....	<b>2</b>
5.1 Apparatus .....	2
5.2 Materials .....	2
5.3 Sterilization of the tap before sampling of water .....	2
5.4 Sampling .....	3
5.5 Procedure .....	3
5.6 Evaluation .....	3
5.7 Disposal of the overgrown contact slides .....	3
<b>6 Test report</b> .....	<b>3</b>
<b>Bibliography</b> .....	<b>5</b>

STANDARDSISO.COM : Click to view the full PDF of ISO 23321:2019

## 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 35, *Paints and varnishes*, Subcommittee SC 9, *General test methods for paints and varnishes*.

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).

# Solvents for paints and varnishes — Demineralized water for industrial applications — Specification and test methods

## 1 Scope

This document specifies the properties and requirements for demineralized water used as solvent for paints and varnishes industrial applications, e.g. production of electro-deposition coating materials, water-based coating materials, water-based resins and plastics dispersions.

This document is not applicable to water for analytical use.

NOTE See ISO 3696.

## 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 3696:1987, *Water for analytical laboratory use — Specification and test methods*

ISO 4618, *Paints and varnishes — Terms and definitions*

ISO 10304-1, *Water quality — Determination of dissolved anions by liquid chromatography of ions — Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate*

ISO 15091, *Paints and varnishes — Determination of electrical conductivity and resistance*

ISO 19396-1, *Paints and varnishes — Determination of pH value — Part 1: pH electrodes with glass membrane*

ISO 19396-2, *Paints and varnishes — Determination of pH value — Part 2: pH electrodes with ISFET technology*

## 3 Terms and definitions

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

#### **demineralized water**

water of which the mineral matter or salts have been removed by deionization

## 4 Requirements

Demineralized water used as a solvent for paints and varnishes for industrial applications shall conform to the requirements specified in [Table 1](#).

**Table 1 — Requirements and test methods for demineralized water**

Property			Requirement	Test method
Appearance			clear, without foreign matter	visually
Electrical conductivity	at 25 °C	µS/cm	max. 20	ISO 15091
pH-value	at 23 °C		5 to 8	ISO 19396-1 or ISO 19396-2
Chloride content		mg/l	max. 3	ISO 10304-1
Evaporation residue		mg/kg	max. 5	ISO 3696:1987, 7.5, 2 h at 110 °C
Colony content		CFU	without findings	to be agreed between the interested parties A suitable test-strip method is described in <a href="#">Clause 5</a> . Any other suitable meth- od may be used.

## 5 Example of the determination of the colony content

### 5.1 Apparatus

5.1.1 **Glass tubes with screw cap** for the determination of the bacterial count.

5.1.2 **Heating cabinet**, heatable up to 200 °C.

5.1.3 **Incubator**.

5.1.4 **Refrigerator**.

### 5.2 Materials

5.2.1 **Media** for the determination of the total colony count (media for liquids). Media are perishable; observe use-by date by all means.

### 5.3 Sterilization of the tap before sampling of water

Ensure that no contamination from the outer surface of the tap reaches the sample. Scrape off any dirt (scale slime, grease or other extraneous matter) and fully open and close the tap repeatedly to rinse out the dirt from the tap. Disinfect the tap preferentially by flaming (after flaming and opening the tap, a sizzling noise should occur). Subsequently, open the tap to half-flow and flush until constant water temperature is reached. Then place the open sample bottle in the water flow and fill it under aseptic conditions.

Only if flaming is not possible, disinfect the tap by other adequate methods. To disinfect the mouth of a plastic tap, after thorough cleaning, dip it for 2 min to 3 min in a beaker with hypochlorite solution,  $\rho(\text{ClO}^-) \approx 1 \text{ g/l}$ , ethanol, volume fraction of 70 %, or isopropanol, volume fraction of 70 %. Alternatively, a swap or a wash bottle or similar device may be used to disinfect the outside and as much of the inside as possible (see ISO 19458:2006, 4.4.1.3[1]).

## 5.4 Sampling

For the determination of the colony count, fill the samples into glass bottles with ground-in stoppers. Prior to this, sterilize the glass bottles and ground-in stoppers in the heating cabinet at 200 °C for 1 h.

After bottling, store the samples in the refrigerator and carry out the determination as soon as possible. It is easier to dip the contact slides directly into the demineralized water or to pour the demineralized water over them and to neglect sampling.

## 5.5 Procedure

Detach the screw cap from the tube. Either

- dip the medium holder into the demineralized water under test and move up and down several times, or
- pour the demineralized water to be tested over the medium holder in case of low sample quantities.

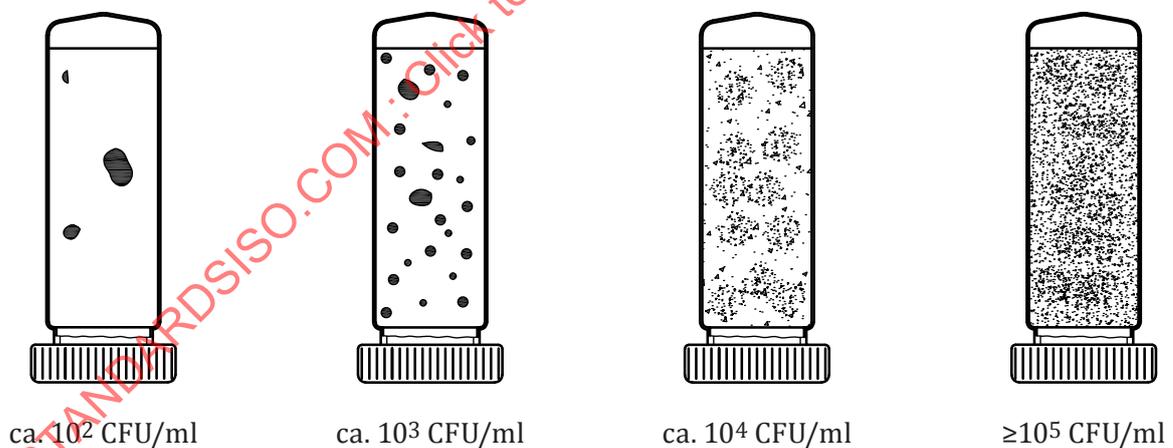
Put the medium holder into the tube and close. Subsequently, incubate the filled tube (contact slide) at 30 °C for three days.

Observe the instructions of use for the contact slides.

## 5.6 Evaluation

The incubated medium shall be compared to the figures given in [Figure 1](#). The colony-forming units (CFU) per millilitre demineralized water are given below the related figures.

The test report shall contain the total colony count in CFU/ml, the type of medium, the duration of incubation, and the incubation temperature.



**Figure 1 — Comparison of bacterial growth on the medium - Degree of contamination**

## 5.7 Disposal of the overgrown contact slides

Overgrown contact slides shall be destroyed, e. g. autoclaving, burning, or immersing in a suitable disinfectant and let set in accordance with the directions for use.

## 6 Test report

The test report shall contain at least the following information:

- a) the type and identification of the tested water;

## ISO 23321:2019(E)

- b) a reference to this document, i.e. ISO 23321:2019;
- c) the appearance;
- d) the conductivity;
- e) the pH value;
- f) the turbidity;
- g) the colony count;
- h) the chloride content;
- i) the evaporation residue;
- j) the date of the test.

STANDARDSISO.COM : Click to view the full PDF of ISO 23321:2019