



SLOVENSKI STANDARD

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Nadomešča:
SIST EN 1420-1:2000

Vpliv organskih snovi na pitno vodo - Ugotavljanje vonja in okusa vode v vodovodnih inštalacijah

Influence of organic materials on water intended for human consumption - Determination of odour and flavour assessment of water in piping systems

Einfluss von organischen Werkstoffen auf Wasser für den menschlichen Gebrauch - Bestimmung des Geruchs und Geschmacks des Wassers in Rohrleitungssystemen

Influence des matériaux organiques sur l'eau destinée à la consommation humaine - Détermination de l'odeur et de la saveur de l'eau dans les réseaux de conduites

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EUROPEAN STANDARD

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Influence of organic materials on water intended for human consumption - Determination of odour and flavour assessment of water in piping systems

Influence des matériaux organiques sur l'eau destinée à la consommation humaine - Détermination de l'odeur et de la saveur de l'eau dans les réseaux de conduites

Einfluss von organischen Werkstoffen auf Wasser für den menschlichen Gebrauch - Bestimmung des Geruchs und Geschmacks des Wassers in Rohrleitungssystemen

This European Standard was approved by CEN on 27 November 2015.

CEN 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 CEN-CENELEC Management Centre or to any CEN member.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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EN 1420:2016 (E)**European foreword**

This document (EN 1420:2016) has been prepared by Technical Committee CEN/TC 164 “Water supply”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by July 2016, and conflicting national standards shall be withdrawn at the latest by July 2016.

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

This document supersedes EN 1420-1:1999.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

With regard to the former edition EN 1420-1:1999, the following changes were made:

- the test method for TON /TFN according to EN 1622 has been specified,
- a procedure for the panel qualification has been introduced,
- the preparation of the migration waters has been specified and is now in accordance with EN 12873-1,
- the scope of the standard has been extended: all organic products in contact with drinking water (including coatings and side applied products) can be tested according to this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

In respect of potential adverse effects on the quality of the water intended for human consumption, arising from contact with materials used for conveying and distribution, it is recalled to mind that, national regulations remain in force.

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EN 1420:2016 (E)**1 Scope**

This European Standard specifies a procedure for obtaining a migration water to determine odour and flavour for products made from organic materials intended to come in contact with water for human consumption (drinking water) and used in piping systems. Such products include pipes, fittings, ancillaries and coatings.

This standard is applicable to products to be used under various conditions for the transport, storage and distribution of water intended for human consumption and raw water used for the manufacture of water intended for human consumption.

This standard specifies a test method comprising of a set of procedures. The use may be dependent on the relevant national regulations and/or the system or product standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1622:2006, *Water quality — Determination of the threshold odour number (TON) and threshold flavour number (TFN)*

EN 12873-1:2014, *Influence of materials on water intended for human consumption — Influence due to migration — Part 1: Test method for factory-made products made from or incorporating organic or glassy (porcelain/vitreous enamel) materials* (standards.iteh.ai)

EN 12873-2, *Influence of materials on water intended for human consumption — Influence due to migration — Part 2: Test method for non-metallic and non-cementitious site-applied materials*

EN ISO 7393-2, *Water quality — Determination of free chlorine and total chlorine — Part 2: Colorimetric method using N, N-diethyl-1, 4-phenylenediamine, for routine control purposes (ISO 7393-2)*

3 Terms and definitions

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

3.1 odour
organoleptic attribute perceptible by the olfactory organ on sniffing certain volatile substances (EN ISO 5492)

3.2 flavour
complex combination of the olfactory, gustatory and trigeminal sensations perceived during tasting which may be influenced by tactile, thermal, painful and/or kinaesthetic effects (EN ISO 5492)

3.3 threshold odour number
TON
dilution ratio beyond which the diluted sample does not have any perceptible odour

[SOURCE: EN 1622:2006, 3.3]

3.4**threshold flavour number****TFN**

dilution ratio beyond which the diluted sample does not have any perceptible flavour

[SOURCE: EN 1622:2006, 3.4]

3.5**test water**

water without any perceptible odour and flavour used for testing purposes prepared as described in 5.1.1 and 5.1.2

3.6**migration water**

test water which has been in contact with a test piece under specified conditions

3.7**blank water**

test water which has been kept at the same specified conditions as migration water but without contact with the test piece

3.8**prewashing water**

tapwater without any odour and flavour and a chlorine content less than 0,05 mg/l as Cl₂

3.9**testing panel**

group of people meeting the relevant requirements of EN 1622

3.10**product**

manufactured item, in its finished form

3.11**site-applied product**

product where the final surface in contact with drinking water is prepared on site

3.12**fitting, ancillary**

complete functional unit made up of one or more components and materials, parts of which are in contact with drinking water

EXAMPLES Taps, valves, water filters.

3.13**membranes**

elastomer as used in pressure relief devices

3.14**sample**

one or more units, or a specified quantity, drawn from a batch or lot, selected at random for inspection

EN 1420:2016 (E)**3.15****test piece**

sample or portion of sample that is conditioned, treated or otherwise prepared to be tested to obtain a single test result

3.16**panel coordinator**

person responsible for the qualification of the members of the odour/flavour panel (panellists) and the check of the reliability of the determined TON-/TFN-results

4 Principle

Following a defined pretreatment procedure of flushing, stagnation with test water and then prewashing, the surface of the test pieces, exposed in practice to drinking water, is brought into contact with test waters.

The migration procedure is carried out under specified conditions as follows: test pieces are put in contact with chlorinated and where required unchlorinated test waters for 72 h at 23 °C (cold water test), or put in contact with unchlorinated test water for 24 h at a temperature of 60 °C (warm water test) or 85 °C (hot water test). If warm or hot water test is required, additionally a cold water test shall be performed.

NOTE The choice of the type of test water (chlorinated and/or chlorine-free), the temperature of the test water, the number of additional migration periods will be specified in product standards or national regulations.

After this contact the migration water is assessed by a test panel to determine the TON and TFN (see Clause 11).

Additional information concerning the temperature to be used in the test and the sequence of extraction periods is given in Clause 10.

5 Reagents**5.1 Waters to be used for testing.**

5.1.1 Test water shall be without any perceptible odour and flavour, and conform to the reference water in EN 1622.

5.1.2 Chlorinated test water shall consist of test water (5.1.1) with a free chlorine content of $(1 \pm 0,2)$ mg/l as Cl₂ after addition of sodium hypochlorite solution (5.2). When chlorinated test water is dechlorinated after 72 h (see 11.1) with sodium thiosulfate (5.3) or ascorbic acid (5.4), it shall have no perceptible odour and flavour.

5.2 Sodium hypochlorite solution.

Sodium hypochlorite solution, prepared from a technical or general purpose reagent grade of sodium hypochlorite (NaOCl), using test water (5.1.1) and having a known concentration of about 0,1 % by mass of free chlorine determined in accordance with EN ISO 7393-2.

This sodium hypochlorite solution is unstable and should be prepared on the day of use.

5.3 Sodium thiosulfate solution.

Sodium thiosulfate solution, comprising a solution of 3,5 g per litre of sodium thiosulfate pentahydrate (Na₂S₂O₃·5H₂O) analytical grade, stored in the absence of light at a temperature below 10 °C, for a maximum of 1 week. 2 ml of this solution will neutralize 1 mg l⁻¹ of residual chlorine in 1 l of water.

Occasionally this solution causes odours/flavours that interfere with analyses. An alternative (5.4) is available.

5.4 Ascorbic acid solution.

Ascorbic acid solution, comprising a solution of 4,0 g per litre of L (+)-ascorbic acid analytical grade, stored in the absence of light at a temperature below 10 °C, for a maximum of one month. 2 ml of this solution will neutralize 1 mg l⁻¹ of residual chlorine in 1 l of water.

5.5 1-Butanol (analytic reagent grade).

5.6 2-Methoxy-2-methylpropane (Methyl-*tert*-butyl ether, MtBE) (analytic reagent grade).

5.7 Methanol (analytic reagent grade).

5.8 Cleaning liquids for glassware:

5.8.1 Hydrochloric acid, concentrated (30 % mass per volume) analytical reagent grade.

5.8.2 Hydrochloric acid solution, prepared by slowly adding (0,5 ± 0,01) l of concentrated hydrochloric acid (5.8.1) to (0,5 ± 0,01) l of test water (5.1.1).

NOTE Care is needed because preparing the solution may generate heat.

5.8.3 Nitric acid, concentrated (65 % mass per volume) analytical reagent grade.

5.8.4 Nitric acid solution, (2 % mass per volume) is prepared by slowly adding (0,15 ± 0,01) l of concentrated nitric acid (5.8.3) to (5,0 ± 0,1) l of test water (5.1.1).

NOTE Care is needed because preparing the solution may generate heat.
<https://standards.iec.ch/catalog/standards/sist/8511/4ac-8831-4250-b4cf-7613bc840847/sist-en-1420-2016>

5.8.5 Hydrogen peroxide, 3 % vol/vol (analytical reagent grade).

6 Apparatus

6.1 Vessels, containers, stoppers and connectors, shall consist of a material, such as glass, PTFE or stainless steel, that is inert under the specific test conditions.

The material PTFE should only be used when there is a small contact area with the test water. Thus PTFE is unsuitable for containers.

6.2 Plates stainless steel, mild steel, sand-blasted glass or concrete/cement-mortar plates, for testing certain site-applied products. The plates shall be covered completely by the test material.

6.3 Equipment capable of maintaining the appropriate migration temperature, e.g (23 ± 2) °C, (60 ± 2) °C or (85 ± 2) °C.

6.4 500 ml Erlenmeyer flasks with ground stoppers shall be used for the presentation of the dilution series to the panellists.