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Vattenförsörjning – Materials påverkan på dricksvatten – Bestämning av klorförbrukning – Provningsmetod

**Influence of organic materials on water intended for human
consumption – Determination of the chlorine demand – Test
method**



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Denna standard ersätter SS-EN 14718:2006, utgåva 1.

The European Standard EN 14718:2014 has the status of a Swedish Standard. This document contains the official version of EN 14718:2014.

This standard supersedes the Swedish Standard SS-EN 14718:2006, edition 1.

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EUROPEAN STANDARD

EN 14718

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2014

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Supersedes EN 14718:2006

English Version

Influence of organic materials on water intended for human consumption - Determination of the chlorine demand - Test method

Influence des matériaux organiques sur l'eau destinée à la consommation humaine - Détermination de la demande en chlore - Méthode d'essai

Einfluss organischer Materialien auf Wasser für den menschlichen Gebrauch - Bestimmung der Chlorzehrung - Prüfverfahren

This European Standard was approved by CEN on 18 October 2014.

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Contents

Page

Foreword.....	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle.....	6
5 Reagents.....	6
5.1 Sodium hypochlorite solution	6
5.2 Test water	6
5.3 Rinsing water	6
5.4 Cleaning liquids for apparatus	6
6 Apparatus for chlorine demand assessment.....	7
6.1 Materials	7
6.2 Test vessels.....	7
6.3 Equipment	7
7 Procedural constraints.....	7
8 Samples of products and test pieces	7
8.1 Factory made products	7
8.1.1 General.....	7
8.1.2 Samples and test pieces of factory made products.....	8
8.2 Site applied products	8
8.2.1 General.....	8
8.2.2 Samples and test pieces of site applied products	9
8.3 Surface-area-to-volume ratio (<i>S/V</i>).....	9
9 Preparation of test water and apparatus.....	10
9.1 Test water	10
9.2 Preparation of apparatus	10
9.3 Cleaning of the glassware	10
9.4 Cleaning of stainless steel.....	10
10 Test procedure	10
10.1 General.....	10
10.2 Flushing	10
10.3 Stagnation	11
10.4 Pre-washing.....	11
10.4.1 General.....	11
10.4.2 Flushing	11
10.4.3 Rinsing.....	11
10.5 Determination of chlorine demand	11
10.5.1 General.....	11
10.5.2 Contact water	11
10.5.3 Blank waters.....	11
10.6 Determination of free chlorine.....	11
11 Expression of results	12
11.1 Description of the calculation	12
11.2 Validation of the test results.....	12
11.2.1 General.....	12
11.2.2 Validation of duplicate samples	12
11.2.3 Validation of blank tests	12

11.2.4	Validation of test samples	13
12	Test report	13
Annex A (normative)	Procedure for establishing the suitability of apparatus and test water	14
Annex B (informative)	Arrangement for flushing large diameters pipes	15

Foreword

This document (EN 14718:2014) 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 June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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

This document supersedes EN 14718:2006

In this second edition, along with editorial corrections, an error in Formula (2) in 11.2.3 has been corrected.

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.

1 Scope

This European Standard specifies a method for determining the chlorine demand of organic materials intended for use in contact with drinking water.

This European Standard is applicable to factory made and site applied products used for the distribution, transport and storage of drinking water.

This European Standard does not cover the use of high levels of chlorine to disinfect products when they are put into service.

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 ISO 7393-2:2000, *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 7393-2:1985)*

3 Terms and definitions

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

3.1

chlorine demand

ability of a material in contact with chlorinated water to remove/reduce the concentration of free chlorine in the water compared with a reference sample

[SOURCE: EN ISO 7393-2:2000, 2.1]

3.2

test water

water used for testing purposes prepared with a free-chlorine content as described in 5.2

3.3

rinsing water

test water without added chlorine

3.4

contact water

test water (see 3.2) which has been in contact with a test piece under specified conditions

3.5

blank water

test water (see 3.2) which has been kept at the same specified conditions (e.g. temperature, contact time, contact with any sealing material) as contact water but without contact with the test piece

3.6

flushing water

tap water

3.7

product

manufactured item, in its finished form

3.8**sample**

one or more units, or a specified quantity of a product, selected from a batch or lot

3.9**test piece**

sample or portion of it which is tested to obtain a single test result

3.10**factory made product**

product made in a factory under controlled conditions as part of the manufacturing process

3.11**site applied product**

manufactured item for application on-site and subsequent contact with water

Note 1 to entry: In this context, the product is the final prepared surface that comes into contact with water.

4 Principle

Initially test pieces are pre-conditioned by washing and rinsing procedures.

Test pieces are then completely filled with or immersed in test water. This filling or immersion procedure is carried out three times on the same test pieces under specified conditions. After each contact period the contact water is immediately analysed to determine the residual content of free chlorine. Blank tests without test pieces are undertaken with the same test water to obtain blank water results.

NOTE If the reduction in the free-chlorine concentration of the test water in contact with the test material is particularly high, the test will have to be repeated using fresh test samples and a reduced S/V test ratio (see 8.3).

The chlorine demand of the material is based on the difference between the free chlorine content of the contact water (see 3.4) and of the blank water (see 3.5).

5 Reagents**5.1 Sodium hypochlorite solution**

Sodium hypochlorite solution, with a concentration of about 0,1 % by mass of free chlorine determined in accordance with EN ISO 7393-2, to be prepared from a commercial solution of sodium hypochlorite (NaOCl).

As this sodium hypochlorite solution is unstable, it shall be prepared on the day of use.

5.2 Test water

Test water shall have a conductivity of < 2 mS/m and a total organic carbon content (TOC) of $< 0,2$ mg/l C (e.g. prepared by reverse osmosis, deionization or distillation, followed by activated carbon filtration) and the addition of sodium hypochlorite solution (see 5.1) to $(1,0 \pm 0,1)$ mg/l of free chlorine. The test water shall be stable in the absence of light, such that the depletion of free chlorine shall not exceed 0,1 mg/l during the contact period i.e. (72 ± 2) h at (23 ± 2) °C, when stored without contact with a test piece.

5.3 Rinsing water

Test water (see 5.2) without added chlorine.

5.4 Cleaning liquids for apparatus

Use one or more of the following cleaning liquids, if appropriate:

- biodegradable detergent;
- hydrochloric acid, 2 mol/l (analytical grade);
- hydrogen peroxide, 3 % vol/vol (analytical grade);
- nitric acid, 1,5 mol/l (analytical grade).

6 Apparatus for chlorine demand assessment

6.1 Materials

Vessels, containers, connectors and stoppers, shall be made of materials which do not consume free chlorine under the conditions of the test (see Annex A).

NOTE Suitable materials include glass and stainless steel.

6.2 Test vessels

Test vessels shall be designed for filling without headspace (ullage). They shall be reserved for chlorine demand testing only and cleaned separately from other items.

6.3 Equipment

Equipment, capable of maintaining the test temperature of (23 ± 2) °C, for the duration of the test.

7 Procedural constraints

Unlike migration tests, the chlorine demand test starts with a fixed concentration of free chlorine and a realistic surface area to volume (S/V) ratio according to Tables 1 and 2.

At the end of each contact period there shall be a minimum concentration of free chlorine (see 11.2.3).

NOTE To ensure the results are reliable it is necessary to limit the reduction of free chlorine by fixing a minimum concentration for free chlorine after the contact period. This is achieved by adapting the best surface area to volume (S/V) ratio.

8 Samples of products and test pieces

8.1 Factory made products

8.1.1 General

8.1.1.1 Sampling of products shall be performed in accordance with the relevant product standard, system standard or the national regulations, where applicable.

8.1.1.2 Care shall be taken that the transport conditions shall not influence the test results.

8.1.1.3 If it is necessary to store samples before testing, they shall be protected from contamination. If the manufacturer provides written storage instructions they shall be followed. The samples shall be stored in their original form as delivered.

Where appropriate, storage containers shall be cleaned using the same procedures used for the test containers.

8.1.1.4 For a product where only part of its surface will come into contact with drinking water, the test piece(s) shall be prepared so that only this part of its surface is exposed to the test water (see 5.2).