SLOVENSKI STANDARD
SIST EN 16058:2012

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Vpliv kovinskih materialov na pripravo pitne vode - Dinamično preskuševališče za ocenjevanje površinskih premazov s plastmi niklja - Dolgoročna preskusna metoda

Influence of metallic materials on water intended for human consumption - Dynamic rig test for assessment of surface coatings with nickel layers - Long-term test method

Einfluss metallischer Werkstoffe auf Wasser für den menschlichen Gebrauch - Dynamischer Prüfstandversuch für die Beurteilung von Oberflächenbeschichtungen mit Nickelschichten - Langzeit-Prüfverfahren

Influence des matériaux métalliques sur l'eau destinée à la consommation humaine - Banc d'essai dynamique pour l'évaluation des revêtements de surface ayant des couches de nickel - Méthode d'essai à long terme

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ICS:

13.060.20	Pitna voda	Drinking water
67.250	Materiali in predmeti v stiku z živili	Materials and articles in contact with foodstuffs

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English Version

Influence of metallic materials on water intended for human consumption - Dynamic rig test for assessment of surface coatings with nickel layers - Long-term test method

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 16058:2012) 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of an identical text or by endorsement, at the latest by November 2012, and conflicting national standards shall be withdrawn at the latest by November 2012.

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 European Standard is one of a series of test methods that supports associated product standards.

With respect to potential adverse effects on the quality of water intended for human consumption caused by metallic materials, attention is drawn to the fact that the relevant national regulations remain in force until the adoption of verifiable European acceptance criteria. Water intended for human consumption is hereafter referred to as "drinking water" and means the same as the definition given at Article 2(1) of the Council Directive 98/83/EC on the quality of water intended for human consumption.

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, 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

Contact between metallic materials and drinking water can cause metal release to the water. Metal released from product surfaces in contact with drinking water is caused by corrosion of any metal films or layers present on the products and the bulk material.

Metal release from the bulk material depends on the composition of the material. The bulk material can release metals for a long period. This long term behaviour depends on the formation of protective layers of corrosion products on the surface of the material. It is possible to test materials to assess their behaviour in releasing metals from the bulk material (EN 15664-1 and -2) so that products made of accepted materials do not have to be tested for this characteristic.

The metal release from metal layers due to coating or other production processes depends on the characteristics of those processes. Therefore products must be tested for metal release due to the presence of films or layers on the surface of products.

The test method given in this standard is designed to provide information on nickel release over time from surfaces of products having a coating containing nickel which are in contact with drinking water. This nickel coating may be added intentionally or part formed unintentionally i.e. it might appear due to electrostatic conditions in the process. For testing nickel release caused by the bulk material the test procedure according to EN 15664-1 and -2 is required.

This test is based on EN 15664-1, *Influence of metallic materials on water intended for human consumption — Dynamic rig test for assessment of metal release — Part 1: Design and operation*. It includes alternating periods of once-through flow and stagnation in a rig, simulating the conditions in a domestic distribution system.

For the commonly used chrome plating process of sanitary tap ware, preliminary research indicates that the water composition does not significantly influence the release of nickel from such surface nickel layers. The use of this method in product testing might give more information about the influence of water composition.

If this test method is used to measure the release of other metals it must be taken into account that the water composition has a strong influence on the results.

1 Scope

This European Standard specifies a procedure to determine the release of nickel from nickel layers or a coating containing nickel on inner surfaces of products which are intended to come into contact with drinking water[1)].

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 12502-1:2004, *Protection of metallic materials against corrosion — Guidance on the assessment of corrosion likelihood in water distribution and storage systems — Part 1: General*

EN 15664-1:2008, *Influence of metallic materials on water intended for human consumption — Dynamic rig test for assessment of metal release — Part 1 Design and operation*

EN ISO 8044:1999, *Corrosion of metals and alloys — Basic terms and definitions (ISO 8044:1999)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 8044:1999, EN 12502-1:2004 and the following apply.

3.1
test rig
assembly of a number of test lines and one control line

Note 1 to entry: See Clause 5 and Annex A, Figure A.1.

3.2
line
for a test rig equipped with end point device products: Continuous part between a check valve and the free outlet(s)

for a test rig equipped with in-line devices products: Continuous part between a check valve and the corresponding flow regulator

3.3
test line
line containing one product for end point devices or up to five products for in-line devices

3.4
control line
line containing a single length of pipe made on an inert material for the purposes of the test

3.5
dummy line
pipe made of an inert material for the purpose of the test used for the conditioning run of a newly built test rig

1) Water intended for human consumption is referred to as "drinking water" and means the same as the definition given at Article 2(1) of the Council Directive 98/83/EC on the quality of water intended for human consumption. Luxembourg, Office for Official Publications of the European Communities. 3 November 1998.

3.6
product
product as manufactured with the process parameters which are used in normal production

3.7
end point device
product used to control the flow of water and releasing it to the atmosphere

EXAMPLES Taps for kitchen and wash basins.

3.8
in-line device
product used in a drinking water system that is not a tube or pipe, e.g. valve used to control the flow of water in an installation system but not dispensing to atmosphere

EXAMPLE Ball valves.

3.9
local water
drinking water from a particular supply zone

3.10
test water
water used for testing purposes

Note 1 to entry: See 7.1.

3.11
contact water
test water which has been in contact with a test line

3.12
control water
test water which has been in contact with a control line

3.13
flow regime
consecutive alternating periods of flow, at a given flow rate, and stagnation of the test water in the test rig

3.14
representative water sample
volume of water in the test line containing metals released from the product(s) to be tested

3.15
period of operation or operation period *(T)*
period of time during which the flow regime is operated for a particular test

Note 1 to entry: Time is expressed in weeks.

3.16
stagnation time (*t*)
period of time when the test water is static in the test rig

Note 1 to entry: Time is expressed in hours.

3.17
run-time curve
graphical representation of the relationship between the concentration after 4 hours of stagnation, over the period of operation (*T*)

4 Principle

Representative samples of endpoint and inline devices to be tested are installed in a test rig which is operated for 26 weeks under controlled conditions of water quality, temperature and flow regime.

Water samples are taken at specified operation periods after 4 h stagnation time throughout the whole of the test and analyzed for the nickel concentrations.

The products for testing shall be representative for the products intended to be placed on the market. If the same product might come from several manufacturing (plating) operations samples of each plant shall be tested.

5 Test rig

The test rig shall be constructed in accordance with Annex A in addition to the requirements given in this clause.

For in-line devices, a total of fifteen representative samples of the product to be tested shall be installed in a minimum of three test lines of a test rig (see Figure A.1).

For endpoint devices, five test lines each containing one representative sample of the product to be tested shall be installed in a test rig (see Figure A.2).

In addition to the test lines one control line shall be installed and operated in the same way as the test lines.

With the exception of the products under test, all materials used in the test rig that come into contact with the test water shall be inert for the purpose of the test.

Precautions shall be taken to ensure there is no transformation or contamination of the surface of products to be tested during preparation for installation or during the installation itself.

End point devices: where there are hoses or pipes for cold and hot water inlets, both shall be fed with the test water. The valves shall be set to fully open in mixed water position for the duration of the test.

In-line devices: where these are valves e.g. ball valves, they shall be set in half-open position. Other adjustable products shall be set accordingly or to a partially open position.

The product samples shall be marked so that each sample can be identified. The manufacturer shall also disclose the standard operating conditions and range of process parameters of the complete plating process.

6 Operation

6.1 General

The test rig shall be operated for 26 weeks under controlled conditions of water quality, temperature and flow regime. It shall be operated at a room temperature of (20 ± 5) °C and shall not be thermally insulated. Temporary deviations of the temperature shall be recorded. The temperature of the test water shall be in the range from 10 °C to 25 °C. The test water supply shall be able to maintain a supply pressure of at least 1.5 bar over the whole period of the test.

The regular daily operation of the test rig shall be automatically controlled in accordance with the flow regime shown in EN 15664-1:2008, Annex B, Table B.1. The flow rate shall be (5 ± 0,5) l/min.

For a newly built test rig, conditioning (6.2) and for in-line devices fractional sampling according to EN 15664-1 shall be carried out before using it for testing.