Irish Standard
I.S. EN 15664-1:2008+A1:2013

Influence of metallic materials on water intended for human consumption - Dynamic rig test for assessment of metal release - Part 1: Design and operation

I.S. EN 15664-1:2008+A1:2013

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Influence of metallic materials on water intended for human consumption - Dynamic rig test for assessment of metal release - Part 1: Design and operation

Influence des matériaux métalliques sur l'eau destinée à la consommation humaine - Banc d'essai dynamique pour l'évaluation du relargage de métaux - Partie 1 : Conception et fonctionnement

Einfluss metallischer Werkstoffe auf Wasser für den menschlichen Gebrauch - Dynamischer Prüfstandversuch für die Beurteilung der Abgabe von Metallen - Teil 1: Auslegung und Betrieb

This European Standard was approved by CEN on 28 October 2007 and includes Amendment 1 approved by CEN on 12 October 2013.

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Foreword

This document (EN 15664-1:2008+A1:2013) 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of an identical text or by endorsement, at the latest by May 2014, and conflicting national standards shall be withdrawn at the latest by May 2014.

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 includes Amendment 1 approved by CEN on 12 October 2013.

This document supersedes EN 15664-1:2008.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] ⟨A1⟩.

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

The standard has been prepared under the mandate given to CEN by the Commission of the European Communities and the European Free Trade Area [A1] *deleted text* ⟨A1⟩.

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.

This European Standard has been drafted in accordance with the CEN *Internal Regulations, Part 3*.

This European Standard is Part 1 of a series dealing with the test method to determine the release of metals from metallic products into drinking water comprising:

— *Part 1: Design and operation*;

[A1]

— *Part 2: Test waters*. ⟨A1⟩

Part 1 describes a test method to produce contact waters for the assessment of metal release from metallic materials.

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

The main application of metallic materials in water supply is within the domestic installation. The test method given in this standard is designed to provide information on metal release over time from metallic materials into drinking water.

The test is based on a programme of alternating periods of once-through flow and stagnation in a rig, simulating the conditions in a domestic distribution system.

The test conditions are more relevant than conditions of continuous through-flow or sit and soak tests and are applicable to all metallic materials in distribution systems.

Internal corrosion of metallic products in water conveying systems generally leads to the build-up of layers, which might or might not be protective. The factors influencing corrosion are described in EN 12502-1. Type and rate of the production of corrosion products and the rate of metal release can depend on:

- characteristics of the metallic material;
- characteristics of the water;
- design and construction;
- pressure testing and commissioning;
- operating conditions and duration of operation.

Corrosion product layers begin to form as soon as a metallic material comes into contact with water. Their properties depend on the factors noted above and for a given water/material combination especially on the operating conditions. It is not possible to reproduce the conditions of an actual installation in tests by constant once-through flow or circulation of water. The flow regime (3.16) used in this test simulates the operating conditions in domestic drinking water installations where stagnation times of water considerably exceed the times of through-flow.

An assessment by testing is possible only if the influence of the flow regime (3.16) and the operation period (3.19) is taken into consideration. A compilation of data are needed, which has been determined under defined conditions over a prolonged period of time. In most cases, metal release decreases with operation time. For some alloying elements and impurities, however, an increase in their release can be observed.

1 Scope

This European Standard specifies a procedure to determine the release of metals from metallic materials used in construction products intended to come into contact with drinking water[1)].

The test can be used for three purposes:

a) assess a material as a reference material for a category of materials using the results of several investigations in different waters covering a broad range of water compositions;

b) assess a material for approval by way of comparative testing;

c) obtain data on the interaction of local water with a material.

2 Normative references

〚A1〛 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. 〚/A1〛

EN 1484, *Water analysis — Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)*

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*

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 25813, *Water quality - Determination of dissolved oxygen — Iodometric method (ISO 5813:1983)*

EN 25814, *Water quality — Determination of dissolved oxygen — Electrotechnical probe method (ISO 5814:1990)*

EN 27888, *Water quality — Determination of electrical conductivity (ISO 7888:1985)*

EN ISO 6878, *Water quality — Determination of phosphorus — Ammonium molybdate spectrometric method (ISO 6878:2004)*

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

〚A1〛 EN ISO 9963 (all parts), *Water quality — Determination of alkalinity (ISO 9963, all parts)* 〚/A1〛

EN ISO 10304-1, *Water quality — Determination of dissolved fluoride, chloride, nitrite, orthophosphate, bromide, nitrate and sulphate ions, using liquid chromatography of ions — Part 1: Method for water with low contamination (ISO 10304-1:1992)*

EN ISO 11885, *Water quality — Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (ISO 11885:1996)*

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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.