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English Version

Construction products - Assessment of release of dangerous substances - Part 1: Guidance for the determination of leaching tests and additional testing steps

Produits de construction - Evaluation de l'émission de substances dangereuses - Partie 1: Guide pour la spécification des essais de lixivation et des étapes supplémentaires d'essai

Bauprodukte - Bewertung der Freisetzung von gefährlichen Stoffen - Teil 1: Leitfaden für die Festlegung von Auslaugprüfungen und zusätzlichen Prüfschritten

This Technical Specification (CEN/TS) was approved by CEN on 25 February 2014 for provisional application.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (CEN/TS 16637-1:2014) has been prepared by Technical Committee CEN/TC 351 “Construction Products - Assessment of release of dangerous substances”, the secretariat of which is held by NEN.

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 Technical Specification deals with the determination and use of test methods for leaching of construction products taking specific situations into account. It specifies preconditions under which leaching tests for monolithic products and for granular products need to be selected.

Background information on characterization of leaching behaviour of construction products can be found in Technical Reports provided by CEN/TC 351 (i.e. CEN/TR 16098 [1], and CEN/TR 16496 [2]).

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this Technical Specification: 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

This informative introduction describes the interactions and interrelations between the release tests developed to assess the release of dangerous substances from construction products into soil, surface water and groundwater in the framework of the Mandate M/366. The horizontal test methods developed under the Mandate M/366 are intended to be used to show compliance with notified regulations. The tests cover the release of substances from construction products and in particular, those that are regulated in notified regulations in one or more EU member states.

CEN/TS 16637-1 specifies how the CEN Technical Product Committees and EOTA experts are to determine the appropriate leaching test for the determination of the release of Regulated Dangerous Substances from a construction product into soil, surface water and groundwater.

CEN/TS 16637-2 describes a horizontal test to assess surface dependent release from monolithic, plate-like or sheet-like construction products while FprCEN/TS 16637-3 (in preparation) will describe a horizontal test to assess release from granular construction products. The test methods can be used for both steps in the hierarchy (type testing and factory production control) and are supposed to be used as the reference test for the intended uses and conditions specified in CEN/TS 16637-1. In this hierarchy of testing conditionally “indirect tests” can be used, but are not specified.

The release of substances upon contact with water results in a potential risk to the environment during the intended use of construction products. The intent of these tests is to identify the leaching behaviour of construction products and thereby allow assessments of the release of Regulated Dangerous Substances from such products to soil, surface water and groundwater under intended conditions of use in relation to CE marking and assessment and verification of constancy of performance.

Technical Product Committees are expected to apply the test standards developed in CEN/TC 351 for their products in order to test the potential release of Regulated Dangerous Substances to soil, surface water and groundwater. CEN/TS 16637-1 is intended to provide clear procedures to determine which test method is appropriate for a given product. CEN/TS 16637-1 aims to provide the information, needed in a CEN Technical Product Committee, on how to deal with the relevant test method(s) to enable the producer to declare a performance in the CE marking as a result of the test. CEN Technical Product Committees are referred to the informative Annex A and Annex B of CEN/TS 16637-1 and to CEN/TR 16098 [1], for background information on the following aspects:

a) identification of the products addressed in the product standards which have relevance with respect to the release of dangerous substances into soil, surface water and groundwater (products only applied in the interior of buildings are not subject to testing for these properties);

b) description of the intended conditions of use of the construction product (e.g. above ground exposed to the precipitation, or shielded from direct infiltration, in surface or groundwater) in respect to the release of dangerous substances into soil, surface water and groundwater;

c) identification of main release mechanisms.

Impact assessment is not part of the work of CEN/TC 351.

In addition to existing validation results, in 2011 CEN/TC 351 began an extensive research program on robustness validation of the existing tank leaching and percolation tests. This was carried out by a consortium of European experts on 20 construction products to unify differences from the protocols of the different CEN Members and to check the influence of testing conditions on the test result (e.g. temperature, flow rate, renewal scheme, etc. [3]). The results of the research program confirmed the robustness of the horizontal tests known from former works. Conclusions from the program have been implemented into the Technical Specifications for the test methods. However, the performance of the leaching test regarding repeatability and reproducibility is dependent on the tested construction product and on the testing conditions. When these Technical Specifications of the horizontal leaching tests are adopted by CEN, the leaching tests referred to in

these Technical Specifications will not yet be fully validated. No data will be available on repeatability and reproducibility for the range of construction products. For other, sometimes comparable, matrices performance data are available from national as well as EU validation studies.

1 Scope

(1) This Technical Specification allows the identification of the appropriate leaching test method for the determination of the release of Regulated Dangerous Substances from construction products into soil, surface water and groundwater. This document provides a stepwise procedure for the determination of appropriate release tests, including:

a) guidance for the identification of construction products potentially emitting Regulated Dangerous Substances;

b) determination of the test method based on general product properties;

c) choice of the test method using specific product properties.

(2) Furthermore, this Technical Specification gives general guidance for CEN Technical Product Committees on basic aspects (sampling, sample preparation and storage, eluate treatment, analysis of eluates and documentation) to be specified in the relevant product standards.

(3) Metallic products, coatings on metallic products and organic coatings for metals are not considered in the determination scheme of this Technical Specification since the test method in CEN/TS 16637-2 (tank test) is not appropriate for the testing of these construction products due to a different release mechanism (solubility control).

NOTE Metallic products are excluded from the scope of CEN/TS 16637-2 because the principles of that test (diffusion) are not obeyed by these products. Metallic products have shown pH dependent solubility control, which means that metals released from the oxidation layer on the metal until the maximum possible solubility level at the prevailing pH conditions in the surrounding water is reached (more water in contact with the same metal surface means more metals released and more time does not lead to more release due to solubility control). Maximum level of release can often be reached in minutes to hours. More generally, it can be stated that expression of results for metallic surfaces in mg/(m2·s) is always “conditional”, i.e. dependent on the local conditions at which the measurements were done, such as the volume of water relative to the surface area. For impact assessment, it is necessary to understand the above mentioned effects and to capture these effects in a test reflecting the dominant release mechanism. However, such a test method is currently unavailable. If the intrinsic leaching behaviour is known, release under specified local conditions could be determined by modelling. Furthermore, no notified regulations exist for metallic products at the time these Technical Specifications have been published.

(4) It is assumed that intermittent contact with water (e.g. exposure to rainwater) is tested - by convention - as permanent contact. For some coatings, (e.g. some renders with organic binders according to EN 15824) in intermittent contact to water, physical and chemical properties might be altered in permanent contact with water. These products are not considered in the determination scheme of this Technical Specification since the test method in CEN/TS 16637-2 is not appropriate for the testing of these construction products.

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.

CEN/TS 16637-2:2014, *Construction products — Assessment of release of dangerous substances — Part 2: Horizontal dynamic surface leaching test*

3 Terms and definitions

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