TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

# CEN/TR 16045

November 2010

ICS 91.100.01

English Version

# Construction Products - Assessment of release of dangerous substances - Content of regulated dangerous substances - Selection of analytical methods

Produits de construction - Evaluation des émissions de substances dangereuses - Contenu en substances dangereuses réglementées - Sélection des méthodes analytiques

Bauprodukte - Bewertung der Freisetzung von gefährlichen Substanzen - Inhalt von geregelten gefährlichen Substanzen - Auswahl von analytischen Verfahren

This Technical Report was approved by CEN on 5 June 2010. It has been drawn up by the Technical Committee CEN/TC 351.

CEN members are the national standards bodies of 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 and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Management Centre: Avenue Marnix 17, B-1000 Brussels**



Ref. No. CEN/TR 16045:2010: E

# Contents

Page

**Tables**





**Figures**

## Foreword

This document (CEN/TR 16045:2010) 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.

Under Work Item 6, Mandate M/366 describes the need for CEN standards to test the chemical content of construction products. However, in the first meeting of CEN/BT WG 176, the predecessor to CEN/TC 351 (June 2005, Gouda, The Netherlands), it was decided that a Technical Report (TR) should be drafted first. This TR was for administrative reasons given work item (WI) number 14. The background and guidelines for carrying out this work are outlined in Annex A of this report:

— a wide range of methods exist, focus will be on existing documents;

— one of the criteria for the selection of standard test methods could be the information on validation;

— content determination should not be used for certification of emissions unless this is the only practicable or legally correct solution.

It is emphasized that the focus of the CPD is on the release of dangerous substances, not on content. Content testing may only be applied for product release/emissions certification of a material if emissions testing is prohibitively expensive or when it is specifically required by regulation – for example in the case of banned substances such as certain metals or asbestos.

However, content testing may be useful as a complementary quick screening method for in-house quality control of product emissions (e.g. as a routine check of product uniformity/conformity). Content tests can also be relevant within the scope of the continuous surveillance by the approved bodies or further testing of samples by the manufacturer (see Annex III of the CPD).

Content testing methods may or may not be relevant to predicting the release to soil, surface and groundwater or the emission into indoor air. However, there are precedents for content-testing-type methods being used as a guide to release and emissions.

An example for this concept is the German "regulation" for cementitious materials in contact with drinking water, which includes content values for some trace elements in cements as screening test (German DVGW Worksheet W 347, [2]). These values are not a criterion for exclusion, but the meaning is that leaching tests for trace elements on test pieces (mortar or concrete) are only necessary if the total trace element content in the cement is above these values.

Other examples of standards committees and industries that have followed this route in relation to compounds that could emit into indoor air include paints and varnishes (ref.: EN ISO 17895), wood-based panels (ref.: EN 120 and EN 717-2), toy testing (ref.: EN 71-11:2005, Annex B), the car industry for interior trim components (e.g. Method VDA 278 and similar standards) and hard disk drive manufacturers (various company-specific test protocols for emissions from PC components). Most of these methods use gas extraction at elevated temperatures combined with GC-MS as the analytical approach. This methodology has the advantage that it is similar to the analytical approach used in formal emissions test methods, which means that, in some instances, there is a degree of qualitative and quantitative

correlation between the content-type test method and reference emissions test methods. There are however limitations. The VOC content will unlikely bear any relationship to an emission profile in the case of composite construction products or materials in which the VOCs are encapsulated or otherwise locked-in to the product to prevent emission. Content testing is also not relevant to assessing secondary emissions.

Because of the similarity of the analytical methods for digests and eluates from leaching, for reasons of completeness and efficiency (no separate report necessary) the analysis of eluates from leaching is also covered in this Technical Report. To make a separate report would lead to an almost full duplication of the present report. The additional benefit of addressing both aspects is the coherence that is becoming obvious from Figure 1.

# 1 Scope

This Technical Report describes appropriate standard test methods for the determination of the content of regulated dangerous substances in construction products. Because of the similarity of the analytical methods for digests and eluates from leaching, the analysis of eluates from leaching is also covered.

This Technical Report is relevant to all substances covered by the provisions of the main body of Mandate M/366, i.e. those included in the work programme for the emission into indoor air, and release to surface water, ground water and soil.

The list of regulated substances provided by the Commission in document "Indicative list of regulated dangerous substances" [1] defines the substances, for which analytical methods for content will in principle be needed. This report will be limited to this list.

NOTE 1 Sampling for content analysis is addressed by applying the relevant product standards and or by applying WI 00351013, *Construction products — Assessment of release of dangerous substances — Complement to sampling* (TR 4) [7] in case the sampling protocol for technical properties does not adequately address requirements in testing posed by the assessment of release to soil, surface and groundwater.

NOTE 2 Based on this selection of appropriate test methods from other fields, horizontal test methods for analysing the chemical content of construction products will be developed as ENs.

NOTE 3 In Annex B a compilation is given of the content regulations for construction products for health or environmental reasons.

# 2 Abbreviations, terms and definitions

NOTE In this paragraph some of the abbreviations and terms used in this report, are defined.

## 2.1 Abbreviations

AES atomic emission spectrometry

CPD construction products directive

DOC dissolved organic carbon

DS dangerous substances

HPLC high-performance liquid chromatography, high-pressure liquid chromatography

ICP inductively coupled plasma

GC gas chromatography

MS mass spectrometry

OES optical emission spectrometry

SVOC semi-volatile organic compounds

TD thermal desorption

TOC total organic carbon

VOC volatile organic compounds