PD CEN/TS 16516:2013

BSI Standards Publication

# Construction products — Assessment of release of dangerous substances — Determination of emissions into indoor air



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## National foreword

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The UK participation in its preparation was entrusted to Technical Committee B/557, Construction products - Assessment of dangerous substances.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

# Construction products - Assessment of release of dangerous substances - Determination of emissions into indoor air

Produits de construction - Détermination des émissions de substances dangereuses - Détermination des émissions dans l'air intérieur

Bauprodukte - Bewertung der Freisetzung von gefährlichen Stoffen - Bestimmung von Emissionen in die Innenraumluft

This Technical Specification (CEN/TS) was approved by CEN on 25 May 2013 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

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## Foreword

This document (CEN/TS 16516:2013) 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.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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 Technical Specification was developed in the frame of the Mandate M/366 "Development of horizontal standardized assessment methods for harmonised approaches relating to dangerous substances under the Construction Products Regulation (CPR)" addressing the preparation of horizontal measurement/test methods for the determination of emission of regulated dangerous substances from construction products into indoor air. This mandate is a complement to the product mandates granted by the European Commission to CEN under the Construction Products Regulation. The harmonised products standards (hEN) developed in CEN under mandates from the European Commission specify construction product(s) as put on the market and address their intended conditions of use.

This Technical Specification has gone through a robustness validation for identifying how small changes in specific testing parameters can influence the test result. This study also delivered data on repeatability within one testing laboratory (see Annex A). It is planned to convert the TS into an EN standard immediately after publication of this TS taking into account any relevant information provided during that process. This may include data from further round robin tests.

It is vital that such information is clearly linked to a specified product in a product standard. The responsibility of product specification is with the product TCs, as described in CEN/TR 16467. This determination of emission into indoor air is to be carried out on products under their intended conditions of use. The intended use of a construction product is generally specified in the corresponding harmonised product standard. The specific emission rates determined using this Technical Specification are associated with application of the product in a defined European Reference Room under specified climate (temperature and humidity) and ventilation conditions. A reference room is needed since it is not possible to evaluate emissions by testing in all possible use scenarios.

The reference room dimensions, resulting product loading factors as well as climate and ventilation conditions are selected to represent the general indoor environment (see Clause 4). Based on the huge amount of available European experience, it was possible to identify one emission scenario and one reference room and associated set of product loading factors to be used.

This Technical Specification specifies the horizontal reference method for testing the emission (release) of dangerous substances from construction products into indoor air. This method uses a test chamber in which emissions are generated under conditions which are kept constant during the test. These conditions are selected so that the test results can be expressed in terms of chemical concentrations in the air of the reference room (see Clause 7 and Clause 9). It is to be noted that the test chamber is defined in terms of performance requirements. This responds to the requirement of Mandate M/366 for a horizontal approach but still maintains sufficient flexibility in chamber dimensions to ensure representative samples of different materials can be accommodated (see Clause 5). Clause 8 of this Technical Specification specifies how emitted regulated dangerous substances should be analysed.

This Technical Specification also addresses separately (see Clause 11 and Annex B) indirect methods that provide, within their specific field of application, a result that is comparable or that correlates with the result of the reference method. Such methods may be easier to apply and/or be cheaper. They are in accordance with mandate M/366 provided that their comparability or correlation to the reference test method has been demonstrated in their specific field of application. They are especially suitable for Factory Production Control testing (FPC).

The selection of one emission scenario and one reference room for evaluating emissions to indoor air is in general accordance with the approach taken in existing European national regulations and voluntary schemes relating to emissions from construction products into indoor air. It also accords with the horizontal requirements of mandate M/366. The aim of this Technical Specification is not to develop a new testing method but to combine by normative references the use of existing standards complemented, when necessary, with additional and/or modified requirements so that – according to the horizontal concept specified in mandate M/366 – construction products can be evaluated under comparable conditions with regard to emissions into indoor air.

In summary, the horizontal test method specified in this Technical Specification determines the specific emission rate of volatile organic compounds from a construction product into indoor air. This can be converted into a concentration in the air of the reference room by calculation.

This Technical Specification has not been evaluated for the determination of 'steady state' concentration of formaldehyde.

NOTE A European Standard (EN 717-1) exists for the determination of formaldehyde emissions from wood-based panels, in terms of 'steady state' concentration.

## 1 Scope

This Technical Specification specifies a horizontal reference method for the determination of emissions of regulated dangerous substances from construction products into indoor air. This method is applicable to volatile organic compounds, semi-volatile organic compounds, and volatile aldehydes. It is based on the use of a test chamber and subsequent analysis of the organic compounds by GC-MS or HPLC.

NOTE 1 Supplemental information is given on indirect test methods (Annex B) and on measuring very volatile organic compounds (see informative Annex C).

NOTE 2 This Technical Specification describes the overall procedure and makes use of existing standards mainly by normative reference, complemented when necessary with additional or modified normative requirements.

## 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/TR 16220:2011, *Construction products — Assessment of release of dangerous substances — Complement to sampling*

CEN/TR 16496:2013, *Construction Products — Assessment of release of dangerous substances — Use of harmonised horizontal assessment methods*

EN ISO 13137, *Workplace atmospheres — Pumps for personal sampling of chemical and biological agents — Requirements and test methods*

EN ISO 16000-9:2006, *Indoor air — Part 9: Determination of the emission of volatile organic compounds from building products and furnishing — Emission test chamber method (ISO 16000-9:2006)*

EN ISO 16000-11:2006, *Indoor air — Part 11: Determination of the emission of volatile organic compounds from building products and furnishing — Sampling, storage of samples and preparation of test specimens (ISO 16000-11:2006)*

EN ISO 16017-1, *Indoor, ambient and workplace air — Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography — Part 1: Pumped sampling (ISO 16017-1)*

ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*

ISO 16000-3:2011, *Indoor air — Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air — Active sampling method*

ISO 16000-6:2011, *Indoor air — Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MS-FID*

## 3 Terms, definitions and abbreviations

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

NOTE Several of the defined terms on product sampling are closely related, which is also depicted in Figure 1. This figure and the relevant definitions are taken from CEN/TR 16220:2011.