



## Emission of dangerous substances from construction products into indoor air – Role of the Construction Products Directive (CPD)

### *What is the Construction Products Directive?*

The Construction Products Directive [1, 2] is European legislation that was developed with the objective of ensuring free circulation and use of construction products in the Internal Market of the European Union. Member States require that construction works are designed and executed so as not to endanger the safety of persons, domestic animals and property. However there is a disparity in the requirements of the Member States and this hinders trade within the Community. In order to remove barriers to trade, the Directive provided for the establishment of harmonised standards for construction products. Work is on going to develop standards to assess performance against the essential characteristics of hygiene health and environment, including emissions of dangerous substances to indoor air.

Currently under discussion are proposals to simplify some requirements of the CPD under a new Construction Products Regulation (CPR). This is not expected to change requirements for harmonised standards concerning dangerous substances.

### *What are dangerous substances?*

According to European legislation, dangerous substances are defined by Directive 67/548/CEE and following amendments [2]. In the context of the Construction Products Directive the term “dangerous substances” means substances, preparations and radioactive substances that may present a danger for man and the environment during normal use of construction products when installed in construction works. The CPD states in Annex I that “the construction work, must be designed and built in such a way that it will not be a threat to the hygiene or health of the occupants or neighbours, in particular as a result of any of the following:

- the giving-off of toxic gas;
- the presence of dangerous particles or gases in the air;
- the emission of dangerous radiation;
- pollution or poisoning of the water or soil;
- faulty elimination of waste water, smoke, solid or liquid wastes;
- the presence of damp in parts of the works or on surfaces within the works.

The Commission has recently established a database of dangerous substances relevant to construction products that are regulated at national and EU level and member states are presently populating it with information relevant to specific regulations [3].



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### ***What new requirements will be required with respect to emissions to indoor air?***

At European level requirements for harmonised testing and labelling of construction products are being developed under the CPD. DG Enterprise in cooperation with the European standards organisation (CEN) is working with national standardization bodies to implement mandates under this Directive. The second generation of harmonised product standards under the CPD requires harmonised test methods for determining release or emission of dangerous substances to satisfy the requirements of Essential Requirement 3 of the CPD, Hygiene, health and the environment. Two scenarios are envisaged – release to soil and groundwater and release to indoor air - under mandate M/366 issued to CEN [5], within Work package 5 (horizontal standards: emission scenarios to indoor air) new horizontal standards are being developed. These horizontal standards will define test methods applicable to all construction products covered by the CPD (with some possible exceptions).

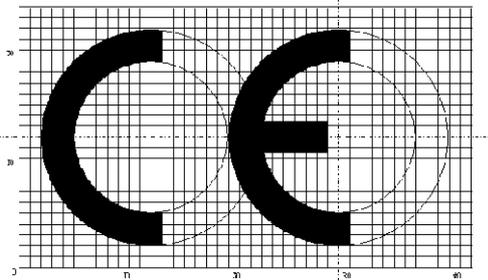
### ***What new standards will be issued?***

Three horizontal European standards will be developed:

1. Horizontal standard on the methods for generation of emission of dangerous substances from construction products into indoor air in standardized testing facilities.
2. Horizontal standard on the measurement of regulated dangerous substances in indoor air samples as generated from construction products in the standardized testing facilities.
3. Horizontal standard on the measurement of radiation and radioactive emissions from construction products.

### ***Will this require development of new test methods?***

CEN established a new technical committee (TC351) in 2007 to undertake the work of developing the standards concerning release of regulated dangerous substances to soil, water and air and it established a working group (WG2) specific to indoor air. A new WG within TC351 is being established in 2010 to take forward the topic of radiation and radioactive emissions. A proposal for a fourth horizontal standard on assessment for potential growth of relevant micro-organisms on construction products in the indoor environment is not currently being taken forward.



As priority for their work, WG2 have addressed the first two of the three proposed standards and are proposing that these should be contained within a single European standard (EN). The aim of the proposed EN 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 construction products can be evaluated according to the horizontal concept specified in mandate M/366. Therefore the proposed EN relies strongly on the ISO 16000 series of standards concerning determination of emissions of volatile organic compounds (VOCs) from building and furnishing products [6-10].

The information about emissions produced by applying the EN is intended to be used for CE marking of construction products and attestation of conformity. The responsibility of product specification is with the technical committees responsible for standardisation of the various product types (the 'product TCs').

### ***What is the principle underlying the proposed test methods?***

The determination of emission of dangerous substances into indoor air is to be made under their in use conditions. The determination of emission specified in the proposed EN is associated with a conventional scenario, which defines the climate and ventilation conditions of the air surrounding the product in a reference room. A reference room is needed since it is not possible to evaluate emissions by testing in all possible use situations. The proposed EN method uses a test chamber in which emissions are generated under conditions maintained constant during the test. The key parameters are temperature, humidity, air speed and the rate of air exchange in the test chamber. The test measures the rate of release of dangerous substances from new products at defined times after placement of the product in the chamber. These test conditions have been selected so that the results can be converted to a concentration in the reference room by calculation.

### ***Is it always necessary to undertake a chamber test?***

This proposed EN also refers to a number of "indirect" methods that provide within their specific field of application a result comparable or correlated to the result of the reference chamber method. Such methods may be easier to apply and/or 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. Examples of such tests include the determination of the content of the regulated dangerous substance concerned in the product or a rapid determination of the emission perhaps at elevated temperature. These methods may have a particular application for Factory Production Control testing (FPC).

### ***Will the proposed EN apply to all construction products?***

It will apply to all construction products but currently with one notable exception. For wood-based panels existing national regulation(s) on emissions of formaldehyde specify European standard EN 717-1 for testing formaldehyde emission into indoor air [11]. EN 717-1 specifies fixed dimensions for the test chamber and different climate and ventilation conditions from the proposed EN.

### ***How is the development of the EN progressing?***

A draft EN has been prepared by WG2 (Construction products; Assessment of emissions of regulated dangerous substances from construction products-Determination of emissions into indoor air) and was accepted by TC351 in early 2009. This method is applicable to volatile organic compounds, semi-volatile organic compounds, volatile aldehydes and volatile diisocyanates. As required by mandate M/366 this is to be the subject of a robustness validation programme and amended as required before national bodies are balloted on acceptance.



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## References

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9. EN ISO 16017-1:2000 Indoor, ambient and workplace air– Sampling and analysis of volatile organic compounds by sorbent tube/thermal desorption/capillary gas chromatography–Part 1: Pumped sampling.
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## More information

### The Netherlands

TNO Built environment and Geosciences

Dr Philomena M. Bluysen

[Philo.bluysen@tno.nl](mailto:Philo.bluysen@tno.nl)

### France

CSTB

Dr François Maupetit

[francois.maupetit@cstb.fr](mailto:francois.maupetit@cstb.fr)

### United Kingdom

IEH, Cranfield

Dr Derrick Crump

[d.crump@cranfield.ac.uk](mailto:d.crump@cranfield.ac.uk)

### Denmark

DTI

Dr Thomas Witterseh

[twi@teknologisk.dk](mailto:twi@teknologisk.dk)

### Sweden

Boverket

Sara Gisselson

[Sara.gisselson@boverket.se](mailto:Sara.gisselson@boverket.se)

### Czech Republic

NIPH

Dr Petr Gajdos

[Petr.gajdos@szu.cz](mailto:Petr.gajdos@szu.cz)

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