

Development of Harmonised European Standards for Measuring Emissions from Construction Products in CEN¹ from the Perspective of the Environmental Organisations – Part 1

(CEN TC 351 - Assessment of release of dangerous substances under the Construction Products Directive (CPD) - Emission to indoor air, soil, surface water and ground water)

Many construction materials contain substances that are classified as dangerous according to European chemicals legislation. A number of dangerous substances have already been banned for various reasons. For example, PCB and PCP were banned after causing significant health problems for building users as a result of being released from construction materials into indoor air. Both heavy metals and organic substances such as wood preservatives have been found to leach out of construction products, a finding that is associated with the undesirable input of these substances into water, soil and ground water.

Other dangerous substances include reaction products such as prepolymers, for example, which only fully develop into a final reaction product through the action of atmospheric oxygen or curing agents, for example. In these cases, it is necessary to demonstrate that the dangerous substances will not leach out or be released in gaseous form, or that the levels that are in fact emitted do not pose any serious health concerns.

The authoritative basis for assessment of the environmental or health implications of emissions is essentially provided by national legislation such as the (German) Chemicals Prohibition Regulation (*Chemikalienverbotsverordnung*) or pertinent environmental laws.

The European Construction Products Directive² is designed to harmonise traditional technical requirements such as fire protection and structural stability as well as previously rather more neglected requirements relating to issues such as hygiene, health and environmental protection in a manner that enables the emergence of a common European market for construction products (i.e. ensuring that national bans on certain substances do not create trade barriers, for example).

To this end, the EU commission issued around 30 mandates to CEN and approximately 20 mandates to the European Organisation for Technical Approvals (EOTA) between 1993 and 1999 instructing them to develop product standards (CEN) and technical approval guidelines (EOTA). Within the remit of CEN alone, this involved commissioning the development of around 500 harmonised construction product standards, though without due consideration being given to environmental and health aspects. These aspects have only begun to be addressed recently (see below).

To date, more than 200 harmonised product standards have been developed (cf. <http://ec.europa.eu/enterprise/newapproach/standardization/harmstds/reflist/construc.html>),

The construction material requirements to be taken into account according to articles 3 and 12 of the Construction Products Directive are defined in interpretative document No. 3 "Hygiene, Health and the Environment". This document stipulates that construction products are to be subjected to appropriate testing to clarify which emissions of harmful substances are to be dealt with **during the period of use of the building** (i.e. solely during the phase of use!!) On the basis of this information, the member states can then define requirements and create product classes that must be fulfilled for specific applications. The relevant aspects are the following:

¹ Comité Européen de Normalisation – European Committee for Standardization

² Council Directive 89/106/EEC of 21 December 1988, OJ L 40, 11.2.1989

- emission of dangerous substances to the indoor environment (e.g. VOC (volatile organic compounds), inorganic and organic particles and fibres, radioactive substances);
- release of dangerous substances into outdoor air, soil and water in the immediate vicinity of the building.

The European Commission's Guidance Paper H entitled „A harmonized approach relating to dangerous substances under the Construction Products Directive“ is designed to aid in the drafting of technical specifications when it comes to taking into account requirements regarding the emission of dangerous substances from construction products. (cf. ³)

As a means of illustrating the regulations being sought, the stipulations for formaldehyde emissions from wooden materials represent a useful example. In Germany, only so-called E1 boards are now approved for use in indoor environments. However, E2 boards may still be employed if the products they are used to create are destined to be used in industrial environments and exclusively outdoors. Although a number of European member states have similar regulations (such as Sweden and Austria for example), this does not hold true for certain other member states.

In practice, the traditions of the building industry within the European member states, the very different tolerances developed in regard to the health and environmental aspects of construction materials and the lack of harmonised testing methods meant that the Essential Requirements 3 “Hygiene, health and the environment” of the CPD (“ER 3”) were **not** rendered in concrete terms for the first generation of the harmonised standards.

Nevertheless, in concert with the European Commission (in order to ensure there are no further delays in implementing the Construction Products Directive), CEN has brought into force the harmonised standards supplemented by a standard formulation in Annex ZA. This formulation specifies that all European and national provisions on dangerous substances must additionally be taken into account. Annex ZA also makes reference to the database on dangerous substances in construction products that is currently under construction (see below). Nonetheless, the question was left open as to **how** implementation should be effected.

The fact is that the product specifications developed so far contain virtually no guidelines on

- which nationally regulated or prohibited dangerous substances (e.g. asbestos, PCB, carcinogenic mineral fibres) are contained in which product,
- whether these substances can be released at all during the period of use, and
- what measurement methods can be employed to check this.

This is a significant shortcoming when one considers that construction products have been tested for years on the basis of harmonised European standards and have received the CE mark without determining the emissions of dangerous substances to water, soil, air or indoor environments on the basis of harmonised testing methods that would be comparable across Europe.

This means, de facto, that the assessment of the product's conformance with the technical specifications of the harmonised standards and the granting of corresponding technical approvals are carried out without actually putting into practice the requirements of ER 3.

Products tested in this way can accordingly be labelled with the CE mark, regardless of whether or not they emit dangerous substances, and can thus be launched and freely traded within the European internal market.

³ Health and Environmental Criteria in the Implementation of the EU Construction Products Directive (CPD), German Federal Environment Agency (UBA) texts 06.2005, page 7ff

This shortcoming became increasingly apparent and, in 2003, it resulted in the adoption of the recommendations for implementing the essential requirements according to “Hygiene, health and the environment” of the CPD (“ER 3”) for the second generation of standards. The measures defined included the two key points outlined below.

Firstly, the development of harmonised methods of testing to identify the release of dangerous substances from construction products into indoor environments, water, ground water and soil.

These methods of testing must fulfil a series of requirements regarding

- practical applicability to the greatest possible range of product types (so-called horizontal test methods),
- meaningfulness and informative value with regard to the release of a multitude of different substances into the various environmental compartments and into indoor air (e.g. appropriate release scenarios must be defined), and
- their technical suitability (e.g. validity and reproducibility).

Secondly, it became clear that the mandates of the first generation of standards also largely lacked information on which dangerous substances are released from, or contained within, the various construction products. In order to compile this information together with national provisions on dangerous substances in construction products on a Europe-wide basis, thus making it available for the standardisation work, the EU Commission, with the involvement of relevant stakeholders (including ECOS⁴ since 2007), commissioned a general advisory committee (“Commission Expert Group on Dangerous Substances in the Field of Construction Products – EGDS”) to develop the EU database for regulated substances in construction products.

The aim is to make available the provisions of the various member states and of the EU on dangerous substances, the corresponding limit values, information on release behaviour and the corresponding methods of testing for each of the various construction products.

Further clarification is required on the following points:

- Are there any provisions that create barriers to trade for the pan-European market? If so, which provisions?
- Are there any construction products that do not release any dangerous substances and that could therefore be excluded from regular emissions testing (Without Testing (*WT*), Without Further Testing (*WFT*)) in order to limit the cost of testing and the economic burden faced by the European construction materials industry? If so, which products?

In summary, we are faced with an extremely complex range of tasks that must largely be performed in tandem and that cover the following aspects:

1. Development of a list of relevant dangerous substances in construction products, both inorganic and organic, that must be covered by the testing procedures.
2. Definition of the product groups that are to be subject to regular testing and definition of the construction products for which testing is not required at all, or not required on a regular basis.
3. Development of release scenarios for emissions to environmental matrices and to indoor air taking into account the respective installation situation (e.g. contact to groundwater, open or sealed installation within the space).
4. Development of harmonised methods of testing for construction products to identify the release of dangerous substances relevant to construction materials into environmental matrices and indoor air.

⁴ ECOS - European Environmental Citizens' Organisation for Standardisation, representing the environmental organisations in the European standardisation process.

While work on item 1 is being carried out by the EU Commission with the support of the EGDS, CEN was commissioned in the year 2005 to process items 2 to 4 on the basis of the mandate M 366 (http://ec.europa.eu/enterprise/standards_policy/mandates/index.htm) elaborated by the EGDS.

In 2006, **CEN/TC 351** was established under the title “Construction products: Assessment of release of dangerous substances under the Construction Products Directive (CPD) - Emission to indoor air, soil, surface water and ground water”.

Appeal

ECOS is represented as a stakeholder in both bodies by Dr Michael Riess (*BIU* - Office of Integrated Environmental Protection). The representatives of the environmental organisations in Europe wish to encourage ECOS to get actively involved in this issue. To accompany Dr Riess's work on these committees, it would be extremely positive if additional experts with appropriate, detailed technical knowledge could get involved in achieving the greatest possible level of protection in the standards that are to be developed by reading and commenting on the documents. Please contact us if you would like more information on how to get involved.

Dr Michael Riess, Ralf Lottes, December 2008

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