PD CEN/TR 18043:2024

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Construction products: Assessment of release of dangerous substances — Pros and cons of methods for communicating the potential release of dangerous substances into soil, groundwater or surface water and indoor air

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National foreword

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English Version

Construction products: Assessment of release of dangerous substances - Pros and cons of methods for communicating the potential release of dangerous substances into soil, groundwater or surface water and indoor air

Produits de construction: Évaluation de l'émission de substances dangereuses - Avantages et inconvénients des méthodes de communication de l'émission potentielle de substances dangereuses dans le sol, les eaux souterraines ou les eaux de surface et dans l'air intérieur

Bauprodukte: Bewertung der Freisetzung von gefährlichen Stoffen - Vor- und Nachteile von Verfahren zur Kommunikation der möglichen Freisetzung von gefährlichen Stoffen in den Boden, das Grund- oder Oberflächenwasser und die Innenraumluft

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European foreword

This document (CEN/TR 18043:2024) 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.

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Introduction

Since 1 July 2013, the Construction Products Regulation (CPR) is fully in force replacing the former Construction Products Directive (CPD). The goals of the Regulation are the same as those of the Directive: to foster the free movement and use of construction products in the internal market.

The CPR requires, *inter alia*, the implementation of Basic Work Requirement No 3 on Hygiene, Health and Environment into harmonized product standards. Such requirements are not new and known to construction products also under the former Construction Products Directive (CPD). In single countries in Europe, manufacturers of construction products are required by law to comply with limits for the potential release of dangerous substances. These limits are notified and therefore existing.

The implementation of BWR3 into harmonized product standards (hEN) under the CPR is very much depending on horizontal European test standards, which are under development by CEN/TC 351. They will replace the test procedures used by now in national regulations regarding BWR3. The horizontal test procedures for BWR3 today are published as CEN/TSs and will be available as EN in autumn 2023. As a result, the implementation will need to be considered in the revision of harmonized product standards.

According to Article 6 (d) of the CPR the results can be expressed by “levels”, “classes” or in a “description”. Due to existing requirements with limit values in the Member States the expression of results via levels or classes will result in long lists of regulated substances compared to relatively small lists of technical parameters. The use of descriptions for the communication of results on BWR3 is unlikely to be accepted due to the nature of existing requirements with limit values on content and release.

The options for declaring results on BWR3 will impact the competition of construction products as not for all materials requirements exist or are not required for regular testing in the single Member States, and unified limits are not likely to be defined by the EC. Only in one Member State all construction products need to be tested. Results on BWR3 are provided in all Member States in a neutral format, mostly in form of a test report, which allow an acceptable proof of performance on one hand and non-stigmatizing information on the other hand.

The examples in this report are based on requirements for fly ash for concrete based on preparatory work in CEN/TC 104/WG 4 to implement BWR3 requirement for release into soil and ground into the harmonized standard. For the communication of test results it serves as an example for all construction products with testing needs due to existing requirements.

This report is to inform about pros and cons of communication systems as defined in the CPR by focusing political, technical and market related aspects with political aspects covering requirements on EU and national level, technical aspects dealing with test procedures and markets aspects dealing with fulfilling legal requirements (parameters, test procedures) and offering materials to customers. When the single actors (EC on CPR; CEN/TC 351 on horizontal test procedures; Member States on requirements) are legally correct and consistent in itself, the outcome of all works will result in distortion of markets and acceptance problems of well-known resources.

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1 Scope

This document describes the pros and cons for the different methods for reporting the potential release of dangerous substances into soil, groundwater or surface water and indoor air, which are:

— level (or declared values); and

— classes;

as defined in the Construction Products Regulation (CPR).

In addition, the pros and cons of additional methods based on discussion in CEN/TCs and WGs are described, which are:

— categories; and

— manufacturer's declaration.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

4 Political aspects

4.1 Construction Products Regulation

The Construction Products Regulation's (CPR) Basic Work Requirement 3: *Hygiene, health and the environment*, states the construction works must be designed and built in such a way that they will, throughout their life cycle, not be a threat to the hygiene or health and safety of workers, occupants or neighbours, nor have an exceedingly high impact, over their entire life cycle, on the environmental quality or on the climate during their construction, use and demolition, in particular as a result of any of the following:

a) the giving-off of toxic gas;

b) the emissions of dangerous substances, volatile organic compounds (VOC), greenhouse gases or dangerous particles into indoor or outdoor air;

c) the emission of dangerous radiation;

d) the release of dangerous substances into ground water, marine waters, surface waters or soil;

e) the release of dangerous substances into drinking water or substances which have an otherwise negative impact on drinking water;

f) faulty discharge of waste water, emission of flue gases or faulty disposal of solid or liquid waste;

g) dampness in parts of the construction works or on surfaces within the construction works.

The CPR states further that the declaration of performance must:

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— express the performance of construction products in relation to the essential characteristics of those products in accordance with the relevant harmonized technical specifications (Article 6 Clause 1.);

— list the essential characteristics as determined in the harmonized technical specification for the declared intended use or uses (Article 6, Clause 3 (b));

— contain, where applicable, the performance of the construction product, by levels or classes, or in a description, if necessary based on a calculation in relation to its essential characteristics determined in accordance with Article 3(3) (Article 6 Clause 3 (d));

— contain the performance of those essential characteristics of the construction product which are related to the intended use or uses, taking into consideration the provisions in relation to the intended use or uses where the manufacturer intends the product to be made available on the market (Article 6 Clause 3 (e)).

Article 6, Clause 3(d) provides options to declare the performance of a construction by levels or classes or in a description. The definitions are given in Article 1:

— 'level' means the result of the assessment of the performance of a construction product in relation to its essential characteristics, expressed as a numerical value;

— 'class' means a range of levels, delimited by a minimum and a maximum value, of performance of a construction product.

For the declaration of the performance on BWR3 'level' is similar to 'declared value'. In both cases, with declared values as well with classes, all parameters given in the provisions at the place of use (see Article 6, Clause 3(e)) must be declared (see Figure 1 and Figure 2).

The third option given in the CPR to declare the results via 'description' is not defined and normally only used when no test procedures are available.

4.2 National provision/existing regulations

In single Member States there are specific regulations on the potential release of dangerous substances into soil, groundwater or surface water and indoor air. The relevant safety levels are either laid down in the relevant European legislation (chemicals, workers protection, environment) or in national laws (i.e. building codes, specific requirements for construction products or materials) (see [CP-DS]). There are only two EU countries, Germany and the Netherlands, which have notified regulations placed on the DG GROWTH website (https://ec.europa.eu/growth/tools-databases/cp-ds/index_en.htm).

The notified regulations in the CP-DS database include the Dutch Soil Quality Decree system, which is a statistically based system where the rate of testing is a function of the closeness of the measured values to the regulatory limit value, and the German Administrative Provision – Technical Building Rules" which include "Requirements on constructions regarding impact on soil and water" specifying requirements on constructions regarding environmental protection. The German Regulation defines an evaluation based on content and release (not a constant between different products) and the product needs to meet defined limit values. This system is also used in other Member States. Beside parameters and limit values, also the conformity evaluation systems in CEN Member Countries with notified regulations are significantly different.

4.3 Test data

To be able to declare a performance for an essential characteristic test data are needed with test procedures defined the in the harmonized product standard and listed in the Declaration of Performance.

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Such testing will need to be undertaken in competent laboratories. Depending on the level of the Assessment and Verification of Constancy of Performance (Annex V of the CPR) accreditation of the laboratory is required.

4.4 Declaration of results

The Construction Products Regulation [EC/305/2011] defines the ways in which the manufacturer declare performance by levels or classes. In national regulations parameters and limit values are defined which must be met to place a product on the market. If the producer declares a value, the value will not exceed the declared value.

If classes for dangerous substances were to be introduced, they would comprise the upper limit values (the lower values would always be zero) agreed at the European level and if a producer declares a particular class, the product does not exceed the limit value associated with the class. It has to be noted that for majority of the regulated substances classes have not been defined. By this, the declaration via "levels" or better "declared values" is the only option (see Figure 1).

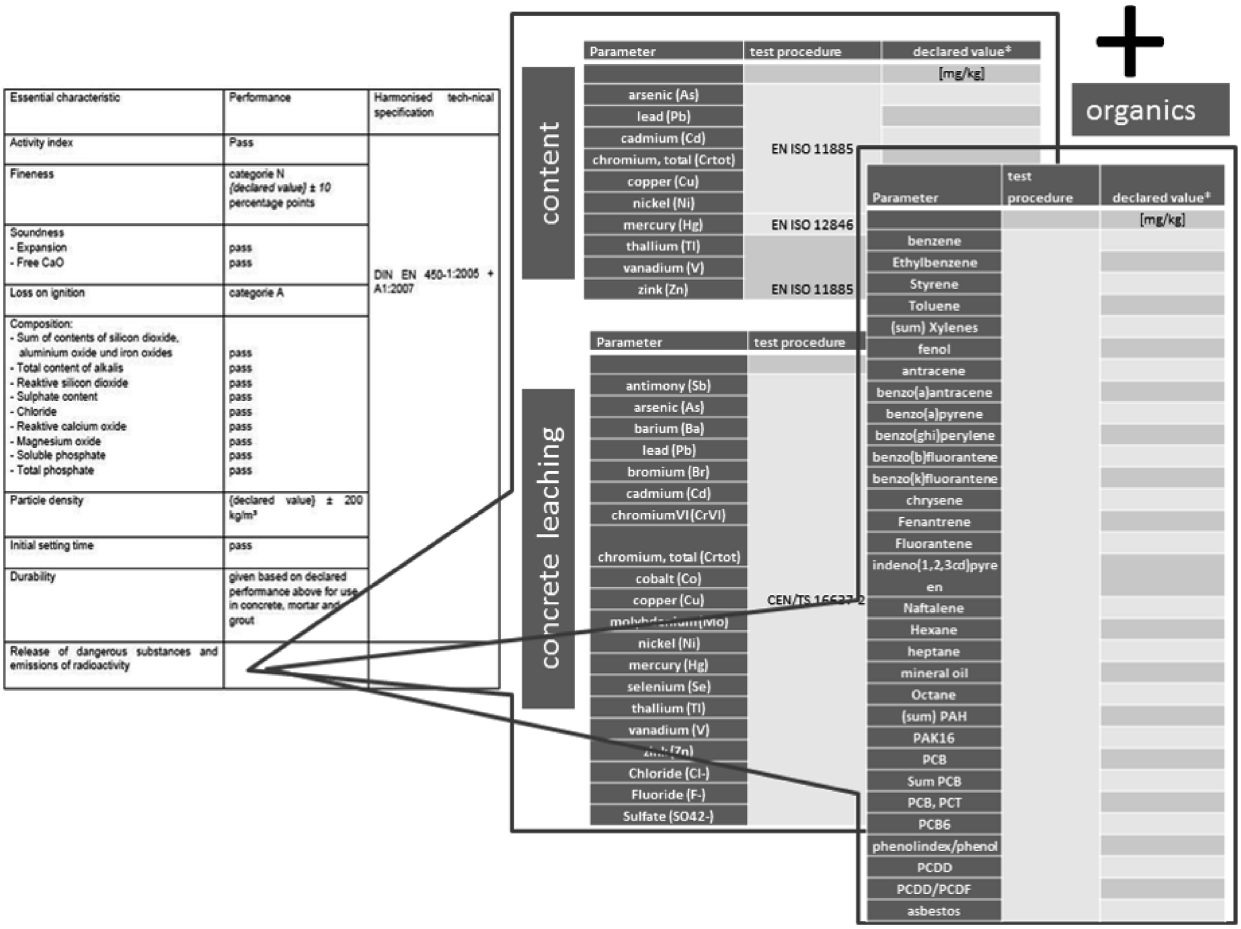

Figure 1 — Example of a declaration of performance using declared values for fly ash according to EN 450-1

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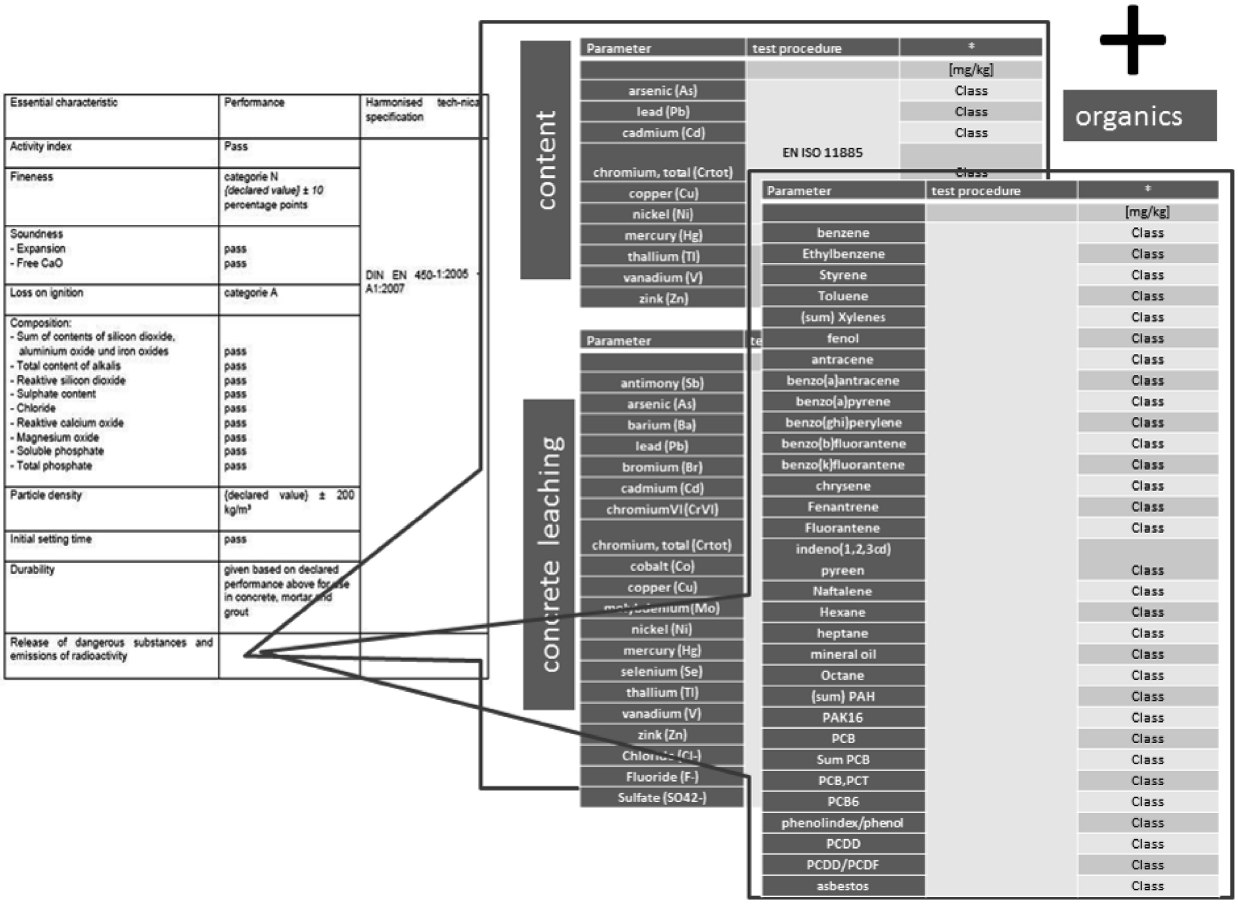

NOTE Classes on release into soil and ground do not exist for construction products.

Figure 2 — Example of a declaration of performance using classes for fly ash according to EN 450-1

4.5 Interaction with other directives and regulations

Aims for protection of health and safety of workers and of the environment are not only defined for products but also to waste materials covered by the Waste Directive [2008/98/EC]. The Directive sets the basic concepts and definitions related to waste management, including definitions of waste, recycling and recovery. The use of waste materials as construction materials is practiced in the Member States since decades and due to the new definitions for by-products and end-of-waste in the Directive are also subject of requirements of the REACH Regulation [EC/1907/2006]. Waste management and use of secondary material are also covered in the new Circular Economy Action Plan of the European Commission [COM/2020/98].

The existing experiences for use of secondary materials are part of the notified regulations. At present, the information regarding BWR3 is communicated in test reports which is considered a “neutral format”. With the requirements for communication via levels and classes the use of such materials is possible but will be impacted as not for all materials (natural as well as secondary) requirements exist, except in one Member State. In addition, acceptance problems need to be considered for marketing aspects such as serving tenders and acceptance in decision making processes at customer side as they need to check whether declared values are fit for use in the Member State. The informative Annex A provides additional guidance.

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By this, aims defined in especially the EC Regulation on Circular Economy are counteracted. To avoid such a situation industry proposes to express the results via “categories” or via a “manufacturers declaration”. The informative Annex B provides additional information.

5 Technical aspects

5.1 Horizontal test procedures

CEN/TC 351 “Construction products: Assessment of release of dangerous substances” developed Technical Specifications for harmonized test methods over the past years which are necessary for the implementation of BWR3 into harmonized product standards (e.g. EN 450 for fly ash for concrete or EN 13242 for aggregates for unbound and hydraulically bound materials). For the basic evaluation of bound and unbound products three horizontal test methods are developed in the EN 16637 series.

EN 16637, *Construction products: Assessment of release of dangerous substances*, consists of the following parts:

— *Part 1: Guidance for the determination of leaching tests and additional testing steps;*

— *Part 2: Horizontal dynamic surface leaching test;*

— *Part 3: Horizontal up-flow percolation test.*

Before the test methods could achieve the status of European Standards (EN), robustness testing and round robin tests were necessary [Wiens et al., 2019].

Another method handles the testing of the release of volatile organic compounds into indoor air (EN 16516). For testing radioactivity a horizontal test standard was developed and published as CEN/TS 17216 which will become an EN after validation. Also a method on dose assessment of emitted gamma radiation from construction product was developed and published as EN 17637.

This document does not cover fully with emission to indoor air and ionizing radiations but the declaration methods in this document are also relevant to the declaration of performance of these emissions. An example for declaration of results on indoor air for floor covering is given in the informative Annex D.

5.2 Relevant scenarios

To have the potential to release dangerous substances into soil, groundwater or surface water and indoor air, the tests need to be carried out taking into consideration relevant scenarios of release. EN 16637-1 provides a guidance for selection of basic test procedures for assessment of the release of monolithic (e.g. in concrete) and granular construction products (e.g. as aggregate for filling). Also existing requirements indicate the test principles to be used for evaluation

With this, it has to be noted that the way of evaluation is partly based on testing constituents although considering the final use in products. As such constituents can be used in many different products, it makes economic sense to test the constituent in, for example, a set concrete matrix and not the numerous concretes in which it will be used.

5.3 Expression of test results: declared value

Although the CPR provides for the declaration of the performance by level (i.e. declared value) there is no consensus on the meaning of ‘level‘ or ‘declared value’. Some countries such as the Netherlands treat declared values in a statistical way and the declared value is a value that is unlikely to be exceeded. However, in other Member States, e.g. Germany, the declared value is a hard limit that must not be exceeded. With both approaches, the manufacturer is expected to have information to justify the use of the material in the place of use.

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