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Trajnostnost gradbenih objektov - Okoljske deklaracije za proizvode - Pravila za kategorije proizvodov za beton in betonske elemente

Sustainability of construction works - Environmental product declarations - Product Category Rules for concrete and concrete elements

Nachhaltigkeit von Bauwerken - Umweltproduktdeklarationen - Produktkategorieregeln für Beton und Betonelemente

Contribution des ouvrages de construction au développement durable - Déclarations environnementales sur les produits - Règles régissant la catégorie de produits pour le béton et les éléments en béton

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Contribution des ouvrages de construction au développement durable - Déclarations environnementales sur les produits - Règles régissant la catégorie de produits pour le béton et les éléments en béton

Nachhaltigkeit von Bauwerken - Umweltproduktdeklarationen - Produktkategorieregeln für Beton und Betonelemente

This European Standard was approved by CEN on 19 September 2022.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents	Page
European foreword.....	4
Introduction	5
1 Scope.....	6
2 Normative references.....	6
3 Terms and definitions	7
4 Abbreviations	11
5 General aspects.....	11
5.1 Objective of this PCR.....	11
5.2 Types of EPD with respect to life cycle stages covered.....	11
5.3 Comparability of EPD for construction products	13
5.4 Additional information	13
5.5 Ownership, responsibility and liability for the EPD.....	13
5.6 Communication formats.....	13
6 Product Category Rules for LCA.....	13
6.1 Product category	13
6.2 Life cycle stages and their information modules to be included	13
6.2.1 General.....	13
6.2.2 A1-A3, Product stage, information modules	13
6.2.3 A4-A5, Construction process stage, information modules.....	14
6.2.4 B1-B5, Use stage, information modules related to the building fabric.....	14
6.2.5 B6-B7, use stage, information modules related to the operation of the building.....	15
6.2.6 C1-C4 End-of-life stage, information modules	15
6.2.7 D, Benefits and loads beyond the system boundary, information module	15
6.3 Calculation rules for the LCA.....	15
6.3.1 Functional or declared unit.....	15
6.3.2 Functional unit.....	15
6.3.3 Declared unit	15
6.3.4 Reference service life (RSL).....	16
6.3.5 System boundaries	16
6.3.6 Criteria for the exclusion of inputs and outputs.....	23
6.3.7 Selection of data.....	23
6.3.8 Data quality requirements.....	23
6.3.9 Developing product level scenarios	23
6.3.10 Units	31
6.4 Inventory analysis	31
6.4.1 Collecting data.....	31
6.4.2 Calculation procedures	31
6.4.3 Allocation of input flows and output emissions.....	31
6.5 Impact assessment.....	32
7 Content of the EPD	32
7.1 Declaration of general information.....	32
7.2 Declaration of environmental indicators derived from LCA.....	32
7.2.1 General.....	32
7.2.2 Rules for declaring LCA information per module.....	32
7.2.3 Indicators describing environmental impacts based on Life Cycle Impact Assessment....	33

7.2.4	Indicators describing resource use and environmental information based on Life Cycle Inventory (LCI).....	33
7.2.5	“Information on biogenic carbon content”	33
7.3	Scenarios and additional technical information	33
7.3.1	General	33
7.3.2	Construction process stage	33
7.3.3	B1-B7 use stage	35
7.3.4	End-of-life	35
7.4	Additional information on release of dangerous substances to indoor air, soil and water during the use stage	36
7.5	Aggregation of information modules	36
8	Project report.....	36
9	Verification and validity of an EPD.....	36
	Annex A (normative) Requirements and guidance on the reference service life.....	37
	Annex B (informative) Waste	38
	Annex C (informative) Characterization factors for GWP, ODP, AP, EP, POCP and ADP	39
	Annex D (informative) End of life formulae	40
	Annex E (informative) Schemes to be applied for data quality assessment of generic and specific data	41
	Annex F (informative) Scenarios.....	42
	Annex G (informative) CO ₂ uptake by carbonation — Guidance on calculation	48
G.1	General	48
G.2	Potential CO ₂ uptake for totally carbonated concrete	51
G.3	Use stage, (module B) method of calculation of CO ₂ uptake.....	52
G.3.1	Standard method	52
G.3.2	Simplified method	57
G.4	End of life, module C	57
G.4.1	Standard method	57
G.4.2	Simplified method	58
G.5	Beyond the system boundary, module D.....	58
G.6	Additional information.....	58
G.7	Regional, national or product specific calculation	59
G.8	References.....	59
	Bibliography	60

EN 16757:2022 (E)

European foreword

This document (EN 16757:2022) has been prepared by Technical Committee CEN/TC 229 “Precast Concrete Products”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2023, and conflicting national standards shall be withdrawn at the latest by April 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 16757:2017.

The main changes are:

- implementation of changes brought by the publication of EN 15804:2012+A2:2019;
- change of the numbering of Annexes AA and BB into Annexes F and G respectively.

NOTE Personal statements in this document are in the sense of equality to interpret for all genders.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Introduction

The European Standard EN 15804:2012+A2:2019 provides core rules for all construction products and services.

It provides a structure to ensure that all Environmental Product Declarations (EPD) of construction products, construction services and construction processes are derived, verified and presented in a harmonized way.

This European Standard provides additional rules for Environmental Product Declarations (EPD) specifically for concrete and concrete elements. It complements the core rules for all construction products and services as established in EN 15804:2012+A2:2019.

An EPD communicates verifiable, accurate, non-misleading environmental information for products and their applications, thereby supporting scientifically based, fair choices and stimulating the potential for market-driven continuous environmental improvement.

The standardization process has taken place in accordance with ISO 14025. All common issues are covered horizontally for all product types in order to minimize vertical (branch specific) deviations. All common issues are covered horizontally for all concrete and concrete elements in order to minimize intra-sectorial deviations.

EPD information is expressed in information modules as defined in EN 15804:2012+A2:2019, which allow easy organization and expression of data packages throughout the life cycle of concrete and concrete elements. The approach requires that the underlying data should be consistent, reproducible and comparable.

In line with EN 15804:2012+A2:2019 the EPD is expressed in a form that allows aggregation (addition) to provide complete information for buildings. This standard does not deal with aggregation at the building level nor does this standard describe the rules for applying EPD in a building assessment.

The standard deals with a limited number of quantifiable parameters as predefined in EN 15804:2012+A2:2019. Future revisions of EN 15804 may lead to the incorporation in this standard of additional predetermined parameters. This European Standard provides the means for developing a Type III environmental declaration of concrete and concrete elements in the context of the suite of standards that are intended to assess the sustainability of construction works.

This suite of standards includes:

- EN 15643, *Sustainability of construction works — Framework for assessment of buildings and civil engineering works*
- EN 15978, *Sustainability of construction works — Assessment of environmental performance of buildings — Calculation methods*
- EN 15804:2012+A2:2019, *Sustainability of construction works — Environmental product declaration — Core rules for the product category of construction products*
- CEN/TR 15941, *Sustainability of construction works — Environmental product declarations — Methodology for selection and use of generic data*
- EN 15942, *Sustainability of construction works — Environmental product declarations — Communication format — Business to business*
- CEN/TR 16970:2016, *Sustainability of construction works — Guidance for the implementation of EN 15804*

EN 16757:2022 (E)**1 Scope**

This document complements the core rules for the product category of construction products as defined in EN 15804:2012+A2:2019 and is intended to be used as a c-PCR in conjunction with that standard.

This c-PCR applies to products within the scope of CEN/TC 104 and CEN/TC 229, but it may be applicable to other concrete products until they have product specific c-PCRs.

This document applies to concrete and concrete elements for building and civil engineering, but excludes autoclaved aerated concrete and resin bound concrete. Apart from Annex G, it may be used as guidance for glass fibre reinforced concrete.

This document defines the parameters to be reported, what EPD types (and life cycle stages) to be covered, what rules to be followed in order to generate Life Cycle Inventories (LCI) and conduct Life Cycle Impact Assessment (LCIA) and the data quality to be used in the development of EPDs.

In addition to the common parts of EN 15804:2012+A2:2019, this document for concrete and concrete elements:

- defines the system boundaries;
- defines the modelling and assessment of material-specific characteristics;
- defines allocation procedures for multi-output processes along the production chain;
- defines allocation procedures for reuse and recycling;
- includes the rules for calculating the LCI and the LCIA underlying the EPD;
- provides guidance/specific rules for the determination of the reference service life (RSL);
- gives guidance on the establishment of default scenarios;
- gives guidance on default functional units for concrete elements.

This document is intended to be used either for cradle to gate with options or cradle to grave assessment, provided the intentions are properly stated in the system boundary description.

Within the construction works context, a cradle to grave declaration delivers a more comprehensive understanding of the environmental impact associated with concrete and concrete elements.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 206:2013+A2:2021, *Concrete — Specification, performance, production and conformity*

EN 15804:2012+A2:2019, *Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15804:2012+A2:2019 and the following apply.

3.101

environmental product declaration

EPD

fr: déclaration environnementale de produit

de: Umweltproduktdeklaration

environmental declaration providing quantified environmental data using predetermined parameters and, where relevant, additional environmental information

[SOURCE: ISO 21930:2017]

3.102

concrete

fr: béton

de: Beton

material formed by mixing cement, coarse and fine aggregate and water, with or without the incorporation of admixtures, additions or fibres, which develops its properties by hydration

[SOURCE: EN 206:2013+A2:2021]

3.103

concrete element

fr: élément en béton

de: Betonelement

part of a construction work made of concrete, either precast or cast on site or a combination of both

3.104

precast (concrete) element

fr: élément préfabriqué (en béton)

de: vorgefertigtes Betonerzeugnis

concrete element cast and cured in a place other than the final location of use (factory produced or site manufactured)

[SOURCE: EN 206:2013+A2:2021]

3.105

precast (concrete) product

fr: produit préfabriqué (en béton)

de: Fertigteil (aus Beton)

product made of concrete and manufactured in accordance with EN 13369 or a specific product standard in a place different from the final destination of use, protected from adverse weather conditions during production

Note 1 to entry: The product is the result of an industrial process under a factory production control system and with the possibility of sorting before delivery.

[SOURCE: EN 13369:2013]

EN 16757:2022 (E)

3.106**ready-mixed concrete**

fr: béton prêt à l'emploi

de: Transportbeton

concrete delivered in a fresh state by a person or body who is not the user; in the sense of this standard it is also:

- concrete produced off site by the user;
- concrete produced on site, but not by the user

[SOURCE: EN 206:2013+A2:2021]

3.107**site-mixed concrete**

fr: béton de chantier

de: Baustellenbeton

concrete produced on the construction site by the user of the concrete for his own use

[SOURCE: EN 206:2013+A2:2021]

3.108**addition**

fr: addition

de: Betonzusatzstoff

finely-divided-inorganic constituent used in concrete in order to improve certain properties or to achieve special properties

Note 1 to entry: The addition could be nearly inert (type I), pozzolanic or latent hydraulic addition (type II).

[SOURCE: EN 206:2013+A2:2021] <https://standards.iteh.ai/catalog/standards/sist/d26ae538-1efc-4da3-abaf-d0b22cdb96e5/sist-en-16757-2023>

3.109**admixture**

fr: adjuvant

de: Betonzusatzmittel

constituent added during the mixing process in small quantities related to the mass of cement to modify the properties of fresh or hardened concrete

[SOURCE: EN 206:2013+A2:2021]

3.110**aggregate**

fr: granulat

de: Gesteinskörnung

granular material of natural, manufactured, or recycled origin used in construction

[SOURCE: EN 12620:2002+A1:2008]

3.111**cement**

fr: ciment

de: Zement

finely ground inorganic material which, when mixed with water, forms a paste that sets and hardens by means of hydration reactions and processes and which, after hardening, retains its strength and stability even under water

[SOURCE: EN 197-1:2011]

3.112**binder**

fr: liant

de: Bindemittel

combination of cement and additions (type I or II)

3.113**clinker**

fr: clinker

de: Klinker

main constituent of most cement, made by heating at high temperature a homogeneous mixture of raw materials (mostly limestone and clay)

3.114**polymer fibre**

fr: fibres polymères

de: Polymerfasern

straight or deformed piece of extruded, orientated and cut material, which are suitable to be homogeneously mixed into concrete

[SOURCE: EN 14889-2:2006]

3.115**steel fibre**

fr: fibres d'acier

de: Stahlfasern

straight or deformed piece of cold-drawn steel wire, straight or deformed cut sheet fibres, melt extracted fibres, shaved cold drawn wire fibres or fibres milled from steel blocks, which are suitable to be homogeneously mixed into concrete

[SOURCE: EN 14889-1:2006]

3.116**reinforcement steel**

fr: armature

de: Bewehrungstahl

steel (wire, strand or bars) subjected to pre- or post-tensioning, and steel (bars, wire, strand, welded mesh fabrics, lattice girder) not subjected to pre- or post-tensioning

EN 16757:2022 (E)

3.117**cubic metre of concrete**

fr: mètre cube de béton

de: Kubikmeter Beton

quantity of fresh concrete which, when compacted in accordance with the procedure given in EN 12350-6, occupies a volume of one cubic metre

3.118**truck mixer**

fr: camion malaxeur

de: Fahrnischer

concrete mixer mounted on a self-propelled chassis capable of mixing and delivering a homogeneous concrete

[SOURCE: EN 206:2013+A2:2021]

3.119**falsework**

fr: étayement

de: Lehrgerüst

temporary support for a part of a structure while it is not self-supporting and for associated service load

3.120**formwork**

fr: coffrage

de: Schalung

structure, permanent or temporary, for containing poured concrete, moulding it to the required dimensions and supporting it until it is able to support itself

3.121**carbonation**

fr: carbonatation

de: Carbonatisierung

chemical reaction between carbon dioxide on one side and calcium hydroxide and hydrated calcium silicate in the concrete on the other side to form calcium carbonates leading to the sequestration of CO₂

3.122**estimated service life**

fr: durée de vie estimée

de: voraussichtliche Nutzungsdauer

service life that a building or an assembled system (part of works) would be expected to have in a set of specific in-use conditions, determined from reference service life data after taking into account any differences from the reference in use conditions

[SOURCE: EN 15978]

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 16757:2023

<https://standards.iteh.ai/catalog/standards/sist/d26ae538-1efc-4da3-aba1-d0b22cdb96e5/sist-en-16757-2023>

4 Abbreviations

For the purposes of this document, the abbreviations given in EN 15804:2012+A2:2019 and the following apply.

GGBS	Ground Granulated Blastfurnace Slag
PFA	Pulverised Fly Ash
FA	Fly Ash

5 General aspects

5.1 Objective of this PCR

The objective of this PCR is to provide common rules specific for concrete and concrete elements for the application of EN 15804:2012+A2:2019, for building and civil engineering works.

In addition to the objectives of EN 15804:2012+A2:2019 this document aims to:

- define the parameters to be declared and the way in which they are collated and reported;
- describe which stages of a product's life cycle are considered in the EPD and which processes are to be included in the life cycle stages;
- define rules for the development of scenarios, including the rules for calculating the Life Cycle Inventory and the Life Cycle Impact Assessment underlying the EPD, including the specification of the data quality to be applied;
- communicate EPDs and environmental information about concrete and concrete elements;
- ensure that comparisons between construction products are carried out in the context of their use in the building on the basis of the functional unit.

5.2 Types of EPD with respect to life cycle stages covered

EN 15804:2012+A2:2019 shall apply.

iTeh STANDARDS PREVIEW
 https://standards.iteh.ai/catalog/standards/sist/en-16757-2023/sist-en-16757-2023

CONSTRUCTION WORKS ASSESSMENT INFORMATION																	
CONSTRUCTION WORKS LIFE CYCLE INFORMATION														SUPPLEMENTARY INFORMATION BEYOND CONSTRUCTION WORKS LIFE CYCLE			
A1 - A3 PRODUCT STAGE			A4 - A5 CONSTRUCTION PROCESS STAGE		B1 - B7 USE STAGE							C1 - C4 END OF LIFE STAGE				D BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Raw material supply	Transport	Manufacturing	Transport	Construction - Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse, recovery, recycling, potential	
scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario
Cradle to gate with modules C1-C4 and module D	Mand.	Mand.	Mand.									Mand.	Mand.	Mand.	Mand.	Mandatory	
Cradle to gate with options, modules C1-C4 and module D	Mand.	Mand.	Mand.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Mand.	Mand.	Mand.	Mand.	Mandatory	
Cradle to grave and module D	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mand.	Mandatory	
Cradle to gate ²	Mand.	Mand.	Mand.														
Cradle to gate with options ²	Mand.	Mand.	Mand.	Opt.	Opt.												

Key

- 1 replacement of components, parts or systems
- 2 only possible if the conditions to exclude the declaration of modules C1-C4 and module D are met

SOURCE: EN 15804:2012+A2:2019

Figure 1 — Types of EPD with respect to life cycle stages covered and life cycle stages and modules for the building assessment

5.3 Comparability of EPD for construction products

EN 15804:2012+A2:2019 shall apply.

5.4 Additional information

EN 15804:2012+A2:2019 shall apply.

5.5 Ownership, responsibility and liability for the EPD

EN 15804:2012+A2:2019 shall apply.

5.6 Communication formats

EN 15804:2012+A2:2019 shall apply.

6 Product Category Rules for LCA

6.1 Product category

The product category referred to in this standard includes concrete and concrete elements for building and civil engineering works.

6.2 Life cycle stages and their information modules to be included

6.2.1 General

In addition to the text of EN 15804:2012+A2:2019:

As all life cycle stages (from A1 to C4), and module D, shall be included when assessing a construction work (building or civil engineering), it is recommended that EPDs prepared cover the same life cycle, i.e. cradle to grave and module D.

A general description of the life cycle stages is given in Figure 1.

6.2.2 A1-A3, Product stage, information modules

In addition to the text of EN 15804:2012+A2:2019:

NOTE Concrete and concrete elements can contain the following constituents or products (not exhaustive list):

- aggregates;
- cement;
- water;
- admixtures;
- additions;
- fibres;
- reinforcing steel (for precast concrete elements).

When the full LCI of constituents is not available, impact indicators and aspects from the EPDs complying to EN 15804:2012+A2:2019 for the constituents or for ready-mixed concrete, covering modules A1 to A3, can be used for the assessment of module A1 of the concrete or concrete element. If transport is included,