Environmental Product Declarations - Product category rules for structural steel products for use in construction works
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Product Declarations - Product category rules for structural steel products for use in construction works</td>
<td>1</td>
</tr>
<tr>
<td>Foreword</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>1 Scope</td>
<td>6</td>
</tr>
<tr>
<td>2 Normative references</td>
<td>7</td>
</tr>
<tr>
<td>3 Terms and definitions</td>
<td>7</td>
</tr>
<tr>
<td>4 Abbreviations</td>
<td>8</td>
</tr>
<tr>
<td>5 General aspects</td>
<td>8</td>
</tr>
<tr>
<td>5.1 Objective of this PCR for structural steel products for use in construction works</td>
<td>8</td>
</tr>
<tr>
<td>5.2 Types of EPD with respect to life cycle stages covered</td>
<td>8</td>
</tr>
<tr>
<td>5.3 Comparability of EPD for construction products</td>
<td>10</td>
</tr>
<tr>
<td>5.4 Additional information</td>
<td>10</td>
</tr>
<tr>
<td>5.5 Ownership, responsibility and liability for the EPD</td>
<td>10</td>
</tr>
<tr>
<td>5.6 Communication formats</td>
<td>10</td>
</tr>
<tr>
<td>6 Product Category Rules for LCA</td>
<td>10</td>
</tr>
<tr>
<td>6.1 Product category</td>
<td>10</td>
</tr>
<tr>
<td>6.2 Life cycle stages and their information modules to be included</td>
<td>10</td>
</tr>
<tr>
<td>6.2.1 General</td>
<td>10</td>
</tr>
<tr>
<td>6.2.2 A1-A3, Product stage, information modules</td>
<td>10</td>
</tr>
<tr>
<td>6.2.3 A4-A5, Construction process stage, information modules</td>
<td>10</td>
</tr>
<tr>
<td>6.2.4 B1-B5, Use stage, information modules related to the building fabric</td>
<td>10</td>
</tr>
<tr>
<td>6.2.5 B6-B7, use stage, information modules related to the operation of the building</td>
<td>11</td>
</tr>
<tr>
<td>6.2.6 C1-C4 End-of-life stage, information modules</td>
<td>11</td>
</tr>
<tr>
<td>6.2.7 D, Benefits and loads beyond the system boundary, information module</td>
<td>11</td>
</tr>
<tr>
<td>6.3 Calculation rules for the LCA</td>
<td>11</td>
</tr>
<tr>
<td>6.3.1 Functional unit</td>
<td>11</td>
</tr>
<tr>
<td>6.3.2 Declared unit</td>
<td>11</td>
</tr>
<tr>
<td>6.3.3 Reference service life (RSL)</td>
<td>11</td>
</tr>
<tr>
<td>6.3.4 System boundaries</td>
<td>11</td>
</tr>
<tr>
<td>6.3.5 Criteria for the exclusion of inputs and outputs</td>
<td>13</td>
</tr>
<tr>
<td>6.3.6 Selection of data</td>
<td>13</td>
</tr>
<tr>
<td>6.3.7 Data quality requirements</td>
<td>13</td>
</tr>
<tr>
<td>6.3.8 Developing product level scenarios</td>
<td>13</td>
</tr>
<tr>
<td>6.3.9 Units</td>
<td>13</td>
</tr>
</tbody>
</table>
6.4 Inventory analysis ........................................................................................................................................... 13
6.4.1 Collecting data ............................................................................................................................................... 13
6.4.2 Calculation procedures ............................................................................................................................... 14
6.4.3 Allocation of input flows and output emissions ............................................................................................ 14
6.5 Impact assessment ........................................................................................................................................... 17
7 Content of the EPD ............................................................................................................................................. 17
7.1 Declaration of general information .................................................................................................................. 17
7.2 Declaration of environmental parameters derived from LCA ......................................................................... 17
7.2.1 General .......................................................................................................................................................... 17
7.2.2 Rules for declaring LCA information per module ......................................................................................... 17
7.2.3 Parameters describing environmental impacts .......................................................................................... 18
7.2.4 Parameters describing resource use ........................................................................................................... 18
7.2.5 Other environmental information describing different waste categories and output flows .................... 18
7.3 Scenarios and additional technical information ............................................................................................ 18
7.3.1 General ........................................................................................................................................................ 18
7.3.2 Construction process stage ........................................................................................................................ 18
7.3.3 B1-B7 use stage ......................................................................................................................................... 19
7.3.4 C1-C4 End-of-life ...................................................................................................................................... 21
7.4 Additional information on release of dangerous substances to indoor air, soil and water during the use stage ......................................................................................................................................................... 21
7.4.1 Indoor air ..................................................................................................................................................... 21
7.4.2 Soil and water ............................................................................................................................................ 21
7.5 Aggregation of information modules ............................................................................................................ 21
8 Project report ..................................................................................................................................................... 21
8.1 General .......................................................................................................................................................... 21
8.2 LCA-related elements of the project report .................................................................................................... 22
8.3 Documentation on additional information .................................................................................................... 22
8.4 Data availability for verification ..................................................................................................................... 22
9 Verification and validity of an EPD ...................................................................................................................... 22
Annex A (normative) Requirements and guidance on the reference service life ................................................. 23
Annex B (informative) Waste ............................................................................................................................. 24
B.1 End-of-waste .................................................................................................................................................. 24
B.2 Properties of hazardous waste for Table 5 ...................................................................................................... 24
Annex C (normative) Characterisation factors for GWP, ODP, AP, EP, POCP and ADP .................................... 25
Bibliography ......................................................................................................................................................... 26
Nordic Proposal for EN xxxxx based on EN 15804:2012+A1:2013 (E)

Foreword

This document has been prepared by Technical Committee.....
Introduction

European standard EN 15804+A1 provides core product category 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 harmonised way.

This European Standard provides rules for Environmental Product Declarations (EPD) specifically for structural steel products for use in construction works. It complements the core product category rules for all construction products and services as established in EN 15804.

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 standardisation process has taken place in accordance with EN ISO 14025. All common issues are covered horizontally for all product types in order to minimise vertical (branch specific) deviations. All common issues are covered horizontally for all structural steel products for in construction works in order to minimise intra sectoral deviations.

EPD information is expressed in information modules, which allow easy organisation and expression of data packages throughout the life cycle of structural steel products. The approach requires that the underlying data should be consistent, reproducible and comparable.

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 predetermined parameters. Future revisions may incorporate additional predetermined parameters.

This European Standard provides the means for developing a Type III environmental declaration of structural steel products and is part of a suite of standards that are intended to assess the sustainability of construction works.

This suite of standards includes:

- EN 15643-1, Sustainability of construction works — Sustainability assessment of buildings — Part 1: General framework;
- EN 15643-2, Sustainability of construction works — Assessment of buildings — Part 2: Framework for the assessment of environmental performance;
- EN 15978, Sustainability of construction works — Assessment of environmental performance of buildings — Calculation method;
- EN 15804, Sustainability of construction works — Environmental product declarations — 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 formats: business to business.
1 Scope

This European standard provides product group specific product category rules (PCR) for Type III environmental declarations for structural steel products for use in construction works and related construction and in-service processes.

This European Standard complements the core rules for the product category of construction products as defined in EN 15804+A1 and is intended to be used in conjunction with EN 15804+A1.

NOTE The assessment of social and economic performances at product level is not covered by this standard.

Additional to the common parts of EN 15804+A1, this European Standard for structural steel products:
— defines the material specific system boundaries, including mandatory Module D,
— defines allocation procedures for multi-output processes along the steel manufacturing process chain,
— defines allocation procedures for re-use and recycling
— provides guidance/specific rules for the determination of the reference service life (RSL)

This standard is intended to be used for cradle-to-gate with options or cradle to grave assessment, provided the intention is properly stated in the system boundary description.
2 Normative references

The following referenced documents are indispensable for the application 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 1090-1, Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components

EN 1090-2, Execution of steel structures and aluminium structures - Part 2: Technical requirements for steel structures

EN 15804, Sustainability of construction works — Environmental product declarations — 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 formats: business to business

EN 15978, Sustainability of construction works — Assessment of environmental performance of buildings — Calculation method


ISO 15686-1, Buildings and constructed assets — Service life planning — Part 1: General principles and framework

ISO 15686-2, Buildings and constructed assets — Service life planning — Part 2: Service life prediction procedures

ISO 15686-7, Buildings and constructed assets — Service life planning — Part 7: Performance evaluation for feedback of service life data from practice


ISO 21930:2007, Sustainability in building construction — Environmental declaration of building products

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15804+A1 and the following apply.

3.1 xxxxxx

xxxxxxxxxxxx
4 Abbreviations

As EN 15804+A1

5 General aspects

5.1 Objective of this PCR for structural steel products for use in construction works

An EPD according to this standard provides quantified environmental information for a structural steel product for use in construction works or related service on a harmonized and scientific basis covered by the following European Standards:

- EN 1090-1
- EN 1090-2

This European Standard also provides information on health related emissions to indoor air, soil and water during the use stage of the building. The purpose of an EPD in the construction sector is to provide the basis for assessing buildings and other construction works, and identifying those, which cause less stress to the environment.

Thus, the objective of this PCR for structural steel products for use in construction works in conjunction with EN 15804+A1 is to ensure:

— the provision of verifiable and consistent data for an EPD, based on LCA;

— the provision of verifiable and consistent product related technical data or scenarios for the assessment of the environmental performance of buildings;

— the provision of verifiable and consistent product related technical data or scenarios potentially related to the health of users for the assessment of the performance of buildings;

— that comparisons between construction products are carried out in the context of their application in the building;

— the communication of the environmental information of construction products from business to business;

— the basis, subject to additional requirements, for the communication of the environmental information of construction products to consumers.

Declarations based on this standard are not comparative assertions.

NOTE See definition 3.4 and ISO 14044:2006, 5.3* for more information concerning LCA used for comparative assertion.

5.2 Types of EPD with respect to life cycle stages covered

As EN 15804+A1
Figure 1 — Types of EPD with respect to life cycle stages covered and life cycle stages and modules for the building assessment
Nordic Proposal for EN xxxxx based on EN 15804:2012+A1:2013 (E)

5.3 Comparability of EPD for construction products
As EN 15804+A1

5.4 Additional information
As EN 15804+A1

5.5 Ownership, responsibility and liability for the EPD
As EN 15804+A1

5.6 Communication formats
As EN 15804+A1

6 Product Category Rules for LCA

6.1 Product category
The product category referred to in this standard includes structural steel products for use in construction works according to EN 1090 as well as related services for buildings and other construction works. Structural steel products can have shapes and qualities according to EN 1090, and the structures shall have carrying capacity according to EN 1090. The structures are static and part of the building. They can be built-in structures or open structures.

6.2 Life cycle stages and their information modules to be included

6.2.1 General
As EN 15804+A1 other than

To be in compliance with this standard the declaration of the product stage modules A1-A3 and module D is required as a minimum. The declaration of the modules of the other life cycle stages is optional.

NOTE As buildings cannot be recycled to new buildings as such, but steel as construction material can and in practice is recycled back to steel production, building level system boundaries are not applicable to steel construction products without declaring the benefits and loads beyond the system boundaries in module D. Common practice in material LCA used in other industries and areas (e.g. ISO 14044:2006 4.3.4.3) recognize closed loop material life cycles and discarding this information in building level assessments would lead to insufficient declaration of environmental performance of steel. Therefore, if module D is not included in the building level assessment of environmental performance, steel construction products cannot be included in the building level assessment of environmental performance.

6.2.2 A1-A3, Product stage, information modules
As EN 15804+A1

6.2.3 A4-A5, Construction process stage, information modules
As EN 15804+A1

6.2.4 B1-B5, Use stage, information modules related to the building fabric
As EN 15804+A1
6.2.5 B6-B7, use stage, information modules related to the operation of the building

As EN 15804+A1

6.2.6 C1-C4 End-of-life stage, information modules

As EN 15804+A1

6.2.7 D, Benefits and loads beyond the system boundary, information module

As EN 15804+A1

6.3 Calculation rules for the LCA

6.3.1 Functional unit

As EN 15804+A1

6.3.2 Declared unit

As EN 15804+A1 other than

Declared unit shall be 1 kg of hot rolled steel plates and hot finished structural hollow sections, steel beams, girders, columns, trusses, bonds, fixtures made of either hot rolled steel plates or cold-formed tubes and sections or similar structural steel products.

6.3.3 Reference service life (RSL)

As EN 15804+A1 other than

Annex B in EN 1090-2 gives guidance for the determination of execution classes taking into account use of the structure (table B.1 in EN 1090-2) and production of the structure (table B.2 in EN 1090-2) and their combination (table B.3 in EN 1090-2) when choosing appropriate execution class. Annex F in EN 1090-2 gives guidance for the execution of corrosion protection of the structural steel products. Descriptions of typical intended use applications (reference in-use conditions) are given in normative Annex A.

6.3.4 System boundaries

6.3.4.1 General

As EN 15804+A1

6.3.4.2 Product stage

As EN 15804+A1 other than

The product stage includes:

— A1 Extraction and processing of raw materials (e.g. mining processes) and biomass production and processing (e.g. agricultural or forestry operations) also including their transport;

— A1 Steel production in steel mill

— A1 Reuse of products or materials from a previous product system;

— A1 Processing of secondary materials used as input for manufacturing the product, but not including those processes that are part of the waste processing in the previous product system;
— A1 Generation of electricity, steam and heat from primary energy resources, also including their extraction, refining and transport;

— A1 Energy recovery and other recovery processes from secondary fuels, but not including those processes that are part of waste processing in the previous product system;

— A2 Transportation up to the manufacturing factory gate and internal transport;

— A3 Production of ancillary materials or pre-products;

— A3 Manufacturing of structural steel construction products and co-products;

— A3 Manufacturing of Packaging;

— A1–A3 processing up to the end-of-waste state or disposal of final residues including any packaging not leaving factory gate with the product.

6.3.4.3 Construction stage

As EN 15804+A1 other than

A4 Transportation from the production gate to the construction site;

— A4–A5 Storage of products, including the provision of heating, cooling, humidity control, etc.;

— A4–A5 wastage of construction products (additional production processes to compensate for the loss of wastage of products);

— A4–A5 waste processing of the waste from product packaging and product wastage during the construction processes up to the end-of-waste state or disposal of final residues;

— A5 Installation of the product into the building including manufacture and transportation of ancillary materials and any energy or water required for installation or operation of the construction site, including lifting equipment, welding, heating of the structures, paints and waste including packaging material waste. It also includes on-site operations to the product.

6.3.4.4 Use stage

6.3.4.4.1 General

As EN 15804+A1

6.3.4.4.2 B1-B5 Use stage information modules related to the building fabric:

— B1 Use of the installed product in terms of any emissions to the environment (not covered by B2-B7)

As EN 15804+A1

— B2 Maintenance

As EN 15804+A1

— B3 repair

As EN 15804+A1 other than

Repair process of the repaired part of a component includes repainting of steel structures.

— B4 Replacement
As EN 15804+A1

— B5 Refurbishment
As EN 15804+A1

6.3.4.3 B6 – B7 use stage information modules related to the operation of the building:
— B6 Energy use to operate building integrated technical systems
As EN 15804+A1
— B7 operational water use by building integrated technical systems
As EN 15804+A1

6.3.4.5 End-of-life stage
As EN 15804+A1 other than

— C3 waste processing includes waste processing for reuse or recycling: cutting, sorting and classifying of scrap classes including wastes in the process.
— C4 waste disposal including physical pre-treatment and management of the disposal site is only relevant for foundations, reinforcement steel used in steel foundations and steel pilings.

6.3.4.6 Benefits and loads beyond the product system boundary in module D
As EN 15804+A1

6.3.5 Criteria for the exclusion of inputs and outputs
As EN 15804+A1

6.3.6 Selection of data
As EN 15804+A1

6.3.7 Data quality requirements
As EN 15804+A1

6.3.8 Developing product level scenarios
As EN 15804+A1

6.3.9 Units
As EN 15804+A1

6.4 Inventory analysis

6.4.1 Collecting data
As EN 15804+A1
6.4.2 Calculation procedures

As EN 15804+A1

6.4.3 Allocation of input flows and output emissions

6.4.3.1 General

As EN 15804+A1

6.4.3.2 Co-product allocation

As EN 15804+A1 other than

Allocation shall be avoided as far as possible by dividing the unit process to be allocated into different sub-processes that can be allocated to the co-products and by collecting the input and output data related to these sub-processes.

— If a process can be sub-divided but respective data are not available, the inputs and outputs of the system under study should be partitioned between its different products or functions in a way which reflects the underlying physical relationships between them; i.e. they shall reflect the way in which the inputs and outputs are changed by quantitative changes in the products or functions delivered by the system;

In the case of joint co-production, where the processes cannot be sub-divided, allocation shall respect the main purpose of the processes studied, allocating all relevant products and functions appropriately. The purpose of a plant and therefore of the related processes is generally declared in its permit and should be taken into account. Processes generating a very low contribution to the overall revenue may be neglected. Joint co-product allocation shall be allocated as follows:

— Allocation shall be based on physical properties (e.g. mass, volume) when the difference in revenue from the co-products is low;

— In all other cases allocation shall be based on economic values;

— Material flows carrying specific inherent properties to substitute specific primary materials, e.g. granulated blast furnace slag to substitute cement in concrete shall be allocated according to the following physical partitioning rules:
Nordic Proposal for EN xxxx based on EN 15804:2012+A1:2013 (E)

### Coke Oven Partitioning Rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>% to Coke &amp; Coke Oven Gas</th>
<th>% to Remaining Coproducts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>82.9</td>
<td>17.1</td>
</tr>
</tbody>
</table>

### Blast Furnace Physical Partitioning Rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>% to Hot Metal</th>
<th>% to Slag</th>
</tr>
</thead>
<tbody>
<tr>
<td>fEHM</td>
<td>94.8</td>
<td>5.2</td>
</tr>
<tr>
<td>100% HM</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>100% Slag</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td>DRI</td>
<td>96</td>
<td>4</td>
</tr>
<tr>
<td>Iron ore</td>
<td>88.6</td>
<td>11.4</td>
</tr>
<tr>
<td>Pellet</td>
<td>92.9</td>
<td>7.1</td>
</tr>
<tr>
<td>Sinter</td>
<td>81.7</td>
<td>18.3</td>
</tr>
</tbody>
</table>

### Partitioning Rules applied to Blast Furnace Process Inputs and Outputs

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>BF slag</td>
<td>100% slag</td>
</tr>
<tr>
<td>BOF slag</td>
<td>100% slag</td>
</tr>
<tr>
<td>DRI</td>
<td>DRI</td>
</tr>
<tr>
<td>Fluorspar</td>
<td>100% slag</td>
</tr>
<tr>
<td>Graded sinter</td>
<td>Sinter</td>
</tr>
<tr>
<td>Iron ore</td>
<td>Iron ore</td>
</tr>
<tr>
<td>Iron scrap</td>
<td>100% HM</td>
</tr>
<tr>
<td>Manganese</td>
<td>100% HM</td>
</tr>
<tr>
<td>Pellet</td>
<td>Pellet</td>
</tr>
<tr>
<td>Scales internal</td>
<td>100% HM</td>
</tr>
<tr>
<td>Serpentine</td>
<td>100% slag</td>
</tr>
<tr>
<td>Silicon</td>
<td>100% HM</td>
</tr>
<tr>
<td>Sinter</td>
<td>Sinter</td>
</tr>
<tr>
<td>Sinter / pellet dust</td>
<td>Sinter</td>
</tr>
<tr>
<td>Soda (sodium carbonate)</td>
<td>100% HM</td>
</tr>
<tr>
<td>Steel scrap external</td>
<td>100% HM</td>
</tr>
<tr>
<td>Steel scrap home</td>
<td>100% HM</td>
</tr>
<tr>
<td>All other inputs</td>
<td>fEHM</td>
</tr>
</tbody>
</table>

Note 1: BF slag as output represents the BF slag, waste for disposal. This is allocated to the hot metal.
NOTE: The partitioning rules given above have been taken from the Appendix 3 of “A methodology to determine the LCI of steel industry co-products”, prepared by EUROFER in co-operation with the World Steel Association, 14th February 2014.

6.4.3.3 Allocation procedure of reuse, recycling and recovery

As EN 15804+A1 other than

The end-of-life system boundary of the structural steel product is set where outputs of the system have reached the end-of-waste state. Therefore, preparations for recycling processes during any module of the product system (e.g. during the production stage, use stage or end-of-life stage) are included up to the system boundary of the respective module until the end-of-waste state.

Informative module D declares potential benefits of secondary steel material leaving the product system. Module D recognises the “design for reuse, recycling and recovery” concept for buildings by indicating the

Note 2: Purity of HM refers to the iron content of the hot metal and the elements that will stay in the steel.
potential benefits of avoided future use of primary materials (e.g. iron ore, etc.) while taking into account the loads associated with the recycling processes beyond the system boundary.

Where a secondary steel material crosses the system boundary e.g. at the end-of-waste state and as it substitutes primary material in the following product system, the potential benefits or avoided loads shall be calculated based on a specified scenario which is consistent with additional technical information given on scenarios according to 7.3.4 for end-of-life processes and is based on current average technology or practice.

In Module D the net impacts (substitution effects) are calculated assuming EU Internal Market as steel scrap market place as follows:

\[ X = -RR \times (X_{pr} - X_{re}) \times Y + S \]

whereas:

- \( RR \) = recycling rate (EU average: 0.95 as a default)
- \( X_{pr} \) = LCI loads from BOF production (EU average)
- \( X_{re} \) = LCI loads from EAF production (EU average)
- \( Y \) = yield of steel making process (Global average: 1/1.092 as a default, if EU average is not available)
- \( S \) = LCI loads from secondary steel material for preparation to steel manufacturing process after end-of-waste state, including transport

NOTE 2 Avoided impacts from allocated co-products are not part of Module D information, see 6.3.4.6.

6.5 Impact assessment

As EN 15804+A1

7 Content of the EPD

7.1 Declaration of general information

As EN 15804+A1 other than

d) description of the main product components and or materials, including steel grade and applied corrosion protection

NOTE 1 This description is intended to enable the user of the EPD to understand the composition of the product as delivered and also support safe and effective installation, use and disposal of the product.

7.2 Declaration of environmental parameters derived from LCA

7.2.1 General

As EN 15804+A1

7.2.2 Rules for declaring LCA information per module

As EN 15804+A1 other than
Module D shall be addressed in any type of EPD according to this European standard.

### 7.2.3 Parameters describing environmental impacts

As EN 15804+A1

### 7.2.4 Parameters describing resource use

As EN 15804+A1 other than

- Use of non-renewable primary energy resources used as raw materials: Coal used as reducing agent in blast furnace to be declared in this parameter.

- Use of secondary material: External steel scrap to be declared.
  NOTE: The use of external scrap in the product stage modules A1-A3 is not included in module D calculation.

- Net use of fresh water: Fresh water is process water that is used in production which is integrated into the structural steel construction product, evaporated or contaminated and needs treatment before returning to natural system. Cooling water and water used in turbines for power generation are not included in the net use of fresh water.

### 7.2.5 Other environmental information describing different waste categories and output flows

As EN 15804+A1 other than

- Hazardous waste disposed can include e.g. welding slag and shot blasting dust if classified as dangerous waste according to waste directive 2008/98/EC.

- Radioactive waste disposed: Extraction waste to be included (?).

- Materials for energy recovery: used oil and paint waste.

- Exported energy MJ per energy carrier: Blast furnace gas is considered either as co-product or waste depending on the scenario.

### 7.3 Scenarios and additional technical information

#### 7.3.1 General

As EN 15804+A1 other than

As optional life cycle stages shall be declared according to this European Standard, i.e. Module D as minimum (a “cradle-to-gate with options” EPD as described in Figure 1), the scenarios to which the calculated parameters relate shall be specified according to 7.3 and be included in the EPD.

#### 7.3.2 Construction process stage

##### 7.3.2.1 A4, Transport to the building site

As EN 15804+A1

##### 7.3.2.2 A5, Installation in the building

As EN 15804+A1
7.3.3 B1-B7 use stage

7.3.3.1 B1-B5 use stage related to the building fabric

As EN 15804+A1 other than

If optional life cycle stages B2-B5 are declared, information given for Table 9 related to these Modules (including applied corrosion protection) shall be consistent with the reference service life data given in Table 10:

Table 9 — use stage related to the building fabric

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit (expressed per functional unit or per declared unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B2 Maintenance</strong></td>
<td></td>
</tr>
<tr>
<td>Maintenance process</td>
<td>Description or source where description can be found</td>
</tr>
<tr>
<td>Maintenance cycle</td>
<td>Number per RSL or year (^{a})</td>
</tr>
<tr>
<td>Ancillary materials for maintenance, e.g. cleaning agent, specify materials</td>
<td>kg / cycle</td>
</tr>
<tr>
<td>Waste material resulting from maintenance (specify materials)</td>
<td>kg</td>
</tr>
<tr>
<td>Net fresh water consumption during maintenance</td>
<td>m(^3)</td>
</tr>
<tr>
<td>Energy input during maintenance, e.g. vacuum cleaning, energy carrier type, e.g. electricity, and amount</td>
<td>kWh</td>
</tr>
<tr>
<td><strong>B3 Repair</strong></td>
<td></td>
</tr>
<tr>
<td>Repair process</td>
<td>Description or source where description can be found</td>
</tr>
<tr>
<td>Inspection process</td>
<td>Description or source where description can be found</td>
</tr>
<tr>
<td>Repair cycle</td>
<td>Number per RSL or year</td>
</tr>
<tr>
<td>Ancillary materials, e.g. lubricant, specify materials</td>
<td>kg or kg / cycle</td>
</tr>
<tr>
<td>Waste material resulting from repair, (specify materials)</td>
<td>kg</td>
</tr>
<tr>
<td>Net fresh water consumption during repair</td>
<td>m(^3)</td>
</tr>
<tr>
<td>Energy input during repair, e.g. crane activity, energy carrier type, e.g. electricity, and amount</td>
<td>kWh / RSL, kWh / cycle</td>
</tr>
<tr>
<td><strong>B4 Replacement</strong></td>
<td></td>
</tr>
<tr>
<td>Replacement cycle</td>
<td>Number per RSL or year</td>
</tr>
<tr>
<td>Energy input during replacement e.g. crane activity, energy carrier type, e.g. electricity and amount</td>
<td>kWh</td>
</tr>
<tr>
<td>Exchange of worn parts during the product's lifecycle, e.g. zinc galvanised steel sheet, specify materials</td>
<td>kg</td>
</tr>
</tbody>
</table>

\(^{a}\): If optional life cycle stages B2-B5 are declared, information given for Table 9 related to these Modules (including applied corrosion protection) shall be consistent with the reference service life data given in Table 10.
Table 9 — (continued)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit (expressed per functional unit or per declared unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B5 Refurbishment</td>
<td></td>
</tr>
<tr>
<td>Refurbishment process</td>
<td>Description or source where description can be found</td>
</tr>
<tr>
<td>Refurbishment cycle</td>
<td>Number per RSL or year</td>
</tr>
<tr>
<td>Energy input during refurbishment e.g. crane activity, energy carrier type, e.g. electricity, and amount if applicable and relevant</td>
<td>kWh</td>
</tr>
<tr>
<td>Material input for refurbishment, e.g. bricks, including ancillary materials for the refurbishment process e.g. lubricant, (specify materials)</td>
<td>kg or kg / cycle</td>
</tr>
<tr>
<td>Waste material resulting from refurbishment (specify materials)</td>
<td>kg</td>
</tr>
<tr>
<td>Further assumptions for scenario development, e.g. frequency and time period of use, number of occupants</td>
<td>Units as appropriate</td>
</tr>
</tbody>
</table>

7.3.3.2 Reference service life

As EN 15804+A1 other than

The reference conditions for achieving the declared technical and functional performance and the declared reference service life shall include the reference service life data as described in Table 10. Descriptions of typical intended use applications (reference in-use conditions) are given in informative Annex A.

Table 10 — Reference Service Life

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit (expressed per functional unit or per declared unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Service Life</td>
<td>Years</td>
</tr>
<tr>
<td>Declared product properties (at the gate) steel grade and finishes, applied corrosion protection, etc.</td>
<td>Units as appropriate</td>
</tr>
<tr>
<td>Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes, applied Execution Class in accordance with EN 1090-2</td>
<td>Units as appropriate</td>
</tr>
<tr>
<td>An assumed quality of work, when installed in accordance with the manufacturer’s instructions, applied Execution Class in accordance with EN 1090-2</td>
<td>Units as appropriate</td>
</tr>
<tr>
<td>Outdoor environment, (for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature</td>
<td>Units as appropriate</td>
</tr>
<tr>
<td>Indoor environment (for indoor applications), e.g. temperature, moisture, chemical exposure</td>
<td>Units as appropriate</td>
</tr>
<tr>
<td>Usage conditions, e.g. frequency of use, mechanical exposure</td>
<td>Units as appropriate</td>
</tr>
<tr>
<td>Maintenance e.g. required frequency, type and quality and replacement of components</td>
<td>Units as appropriate</td>
</tr>
</tbody>
</table>
7.3.3.3 B6, use of energy and B7, use of water

As EN 15804+A1

7.3.4 C1-C4 End-of-life

As EN 15804+A1 other than

The following information (Table 12) shall be provided in the EPD as additional technical information as a minimum according to this European Standard to specify the end-of-life scenarios used related to end-of-life processes. Scenarios shall only model processes e.g. recycling systems that have been proven to be economically and technically viable.

**Table 12 — End-of-life**

<table>
<thead>
<tr>
<th>Processes</th>
<th>Unit (expressed per functional unit or per declared unit of components products or materials and by type of material)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection process specified by type</td>
<td>kg collected separately</td>
</tr>
<tr>
<td></td>
<td>kg collected with mixed construction waste</td>
</tr>
<tr>
<td>Recovery system specified by type</td>
<td>kg for re-use</td>
</tr>
<tr>
<td></td>
<td>kg for recycling</td>
</tr>
<tr>
<td></td>
<td>kg for energy recovery</td>
</tr>
<tr>
<td>Disposal specified by type</td>
<td>kg product or material for final deposition</td>
</tr>
<tr>
<td>Assumptions for scenario development, e.g. transportation</td>
<td>units as appropriate</td>
</tr>
</tbody>
</table>

7.4 Additional information on release of dangerous substances to indoor air, soil and water during the use stage

7.4.1 Indoor air

As EN 15804+A1

7.4.2 Soil and water

As EN 15804+A1

7.5 Aggregation of information modules

As EN 15804+A1

8 Project report

8.1 General

As EN 15804+A1
8.2 LCA-related elements of the project report
As EN 15804+A1

8.3 Documentation on additional information
As EN 15804+A1

8.4 Data availability for verification
As EN 15804+A1

9 Verification and validity of an EPD
As EN 15804+A1
Annex A  
(normative)

Requirements and guidance on the reference service life

As EN 15804+A1 other than as informative addition:

A.1 Descriptions of examples of typical intended use applications  
(reference in-use conditions)

Special attention should be paid to typical intended use applications where the products would not  
be suitable because of the conditions of environment.

(PROPOSALS ON GENERAL TEXT ARE WELCOMED DURING PUBLIC CONSULTATION)
Annex B
(informative)

Waste

B.1 End-of-waste

Figure B.1 — Decision-tree for end-of-waste

B.2 Properties of hazardous waste for Table 5

As EN 15804+A1
Annex C
(normative)

Characterisation factors for GWP, ODP, AP, EP, POCP and ADP

As EN 15804+A1

Table C.1 — Characterisation factors concerning abiotic depletion (fossil fuels)
As EN 15804+A1

Table C.2 — Characterisation factors concerning abiotic depletion for non fossil resources
As EN 15804+A1

Table C.3 — Characterisation factors concerning acidification potential of soil and water
As EN 15804+A1

Table C.4 — Characterisation factors concerning depletion potential of the stratospheric ozone layer
As EN 15804+A1

Table C.5 — Characterisation factors concerning global warming potential
As EN 15804+A1

Table C.6 — Characterisation factors concerning eutrophication potential
As EN 15804+A1

Table C.7 — Characterisation factors concerning formation potential of tropospheric ozone
As EN 15804+A1

Table C.8 — Sources for life-cycle impact assessment (LCIA) models
As EN 15804+A1
Bibliography

[1] EN 15603, Energy performance of buildings — Overall energy use and definition of energy ratings


[16] EUROSTAT 2001


[18] A methodology to determine the LCI of steel industry co-products, EUROFER in co-operation with the World Steel Association, 14th February 2014