SLOVENSKI STANDARD
oSIST prEN 17662:2021

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Izvedba jeklenih in aluminijastih konstrukcij - Okoljske deklaracije za proizvode - Pravila za kategorije proizvodov, ki dopolnjujejo EN 15804 za jeklene, železne in aluminijaste gradbene proizvode za konstrukcijska dela

Execution of steel structures and aluminium structures - Environmental Product Declarations - Product category rules complementary to EN 15804 for Steel, Iron and Aluminium structural products for use in construction works.

Ausführung von Stahltragwerken und Aluminiumtragwerken - Umweltproduktdeklarationen - EN 15804 ergänzende Produktkategorieregeln für tragende Produkte aus Stahl, Aluminium und Metall für den Einsatz in Bauwerken

Exécution des structures en acier et des structures en aluminium - Déclarations environnementales sur les produits - Règles complémentaires à la norme EN 15804 régissant les catégories de produits en acier, en fer et en aluminium utilisés dans les ouvrages de construction

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Execution of steel structures and aluminium structures - Environmental Product Declarations - Product category rules complementary to EN 15804 for Steel, Iron and Aluminium structural products for use in construction works.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17662:2021) has been prepared by Technical Committee CEN/TC 135 “Execution of steel structures and aluminium structures”, the secretariat of which is held by SN.

This document is currently submitted to the CEN Enquiry.

Introduction

As in EN 15804:2012+A2:2019, in addition:

This European Standard provides rules for Environmental Product Declarations (EPD) for steel and aluminium structural elements which are used in buildings and civil engineering works. It complements the core product category rules for all construction products and services as established in EN 15804:2012+A2:2019.

This document:

- gives precision to the material specific system boundaries, including mandatory modules C and D
- specifies the use of modules A1 and A3
- gives precision to when and where to include impact from coatings
- gives precision to when and how to report additional indicators
- gives precision to allocation procedures for multi-output processes along the steel and aluminium manufacturing process chain
- gives precision to allocation procedures for re-use and recycling
- provides in Annexes G, H, and I, default data and scenarios for transport, reuse and re-cycling, and erection/deconstruction
- gives guidance in Annex L for downstream companies on how to use an Environmental Product Declaration, EPD, from a supplier

1 Scope

This document provides product category rules (c-PCR), that are complementary to EN 15804:2012+A2:2019, for Type III environmental declarations for steel components and aluminium components fabricated from steel or aluminium constituent products to be used for structural purposes in buildings and civil engineering works, where their characteristic affects the mechanical resistance and stability of these construction works or parts thereof. The structures can be built-in structures or open structures. This document also provides guidance for other metal construction products where a specific PCR as EN standard does not exist.

This document is intended to be used in conjunction with EN 15804:2012+A2:2019.

This document can be used also for non-structural metal products or metal parts thereof where a specific PCR as EN standard does not exist.

This document 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.

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

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

EN 1090-1:2009+A1:2011, *Execution of steel structures and aluminium structures - Part 1: Requirements for conformity assessment of structural components*

EN ISO 14044:2006, *Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006)*

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.

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

3.1
recycled metals
metals produced from secondary materials which substitutes primary materials

Note 1 to entry: E.g. recycled metal ingot or slab.

Note 2 to entry: Recycled metals are typically produced from metal scrap which are secondary materials for recycling. The fraction of recycled metal within a product can vary from low proportion to high depending on the sourcing of its production, e.g. fraction of virgin metal vs fraction of metal scrap.

3.2
reused metal products and metal components
products or components recovered from previous use which substitutes new products/components

Note 1 to entry: Examples of reused metal products and metal components are reused structures (beams and columns), sandwich panels, corrugated roofing sheets.

3.3
semi-finished product
product that needs further processing to be used as a construction product

Note 1 to entry: A semi-finished product can also be called an intermediate product.

4 Abbreviations

EPD	Environmental product declaration
PCR	Product category rules
LCA	Life cycle assessment
LCI	Life cycle inventory analysis
LCIA	Life cycle impact assessment
RSL	Reference service life
ESL	Estimated service life
c-PCR	Complementary product category rules
CF	Characterization factor
ND	Not declared
PEF	Product environmental footprint
BF	Blast furnace
BOF	Basic oxygen furnace
DRI	Direct reduced iron
HM	Hot metal

5 General aspects

5.1 Objectives of the Complementary PCR

As in EN 15804:2012+A2:2019.

5.2 Types of EPD with respect to life cycle stages covered

As in EN 15804:2012+A2:2019.

5.3 Comparability of EPD for construction products

As in EN 15804:2012+A2:2019.

5.4 Additional environmental information

5.4.1 General

As in EN 15804:2012+A2:2019.

5.4.2 Additional impact indicators

As in EN 15804:2012+A2:2019, in addition:

The following additional environmental impact indicators in EN 15804:2012+A2:2019 shall not be declared in the EPD except if mandatory in the country of declaration:

- Eco-toxicity (Freshwater)
- Human toxicity, cancer effects
- Human toxicity, non-cancer effects

NOTE 1 Under the current EN15804:2012+A2:2019 the additional indicators are optional, due to e.g. lack of accuracy or representativeness of the underlying models.

The additional impact indicator designated in EN 15804:2012+A2:2019 as 'Potential incidence of disease due to Particulate Matter emissions (PM)' should not be declared when doubt has been identified about the reliability of source data.

NOTE 2 See also Annex K.

5.4.3 Additional information on carbon offset, carbon storage and delayed emissions

As in EN 15804:2012+A2:2019.

5.4.4 Additional information not derived from LCA

As in EN 15804:2012+A2:2019.

5.5 Ownership, responsibility and liability for the EPD

As in EN 15804:2012+A2:2019.

5.6 Communication formats

As in EN 15804:2012+A2:2019.

6 Product Category Rules for LCA

6.1 Product category

The product category referred to in this standard includes all construction products and construction services for buildings and other construction works covered by the scope.

Product examples are:

- Hot rolled open sections (H, I, L, T, U))
- Cold formed hollow sections
- Hot finished hollow sections

- Welded sections of hot rolled plates or sections mentioned above
- Cold formed open sections (C, I, L, T, U))
- Cold formed structural sheets
- Steel and/or aluminium in multi-material structural products

The product category to which this standard refers, also includes metal construction products and metal parts in construction products covered by other product standards.

Product examples are:

- Steel and aluminium frames for windows and doors, and steel doors
- Piles
- Sheet piling
- Cladding and roofing sheets
- Steel and aluminium sheets in metal-faced insulating sandwich panels
- Reinforcing and pre-stressing steel (rebars)

6.2 Life cycle stages and their information modules to be included

6.2.1 General

As in EN 15804:2012+A2:2019, in addition:

NOTE A guidance for LCA-calculation is given in Annex F.

Impacts from transport in all life cycle modules shall be included where relevant.

Unless specific data are calculated, the default data given in Annex G shall be used.

6.2.2 A1-A3, Product stage, information modules

As in EN 15804:2012+A2:2019, in addition:

For the supply chain of steel products and aluminium products all material production processes such as mining and metal production shall be reported in A1 and all product manufacturing processes before the construction site shall be reported in A3. Distribution between A1 and A3 is given in Table 1.

Table 1 — Processes reported in modules A1 and A3 a)

Processes	A1	A3
Ingot, slab, bloom, billet and powder production including upstream processes	x	
Coil, plate, bar, wire and profile production including upstream processes	x	
Coating and surface treatment of coil, plate, bar and wire	x	
Foundry casting including rinsing but excluding machining including upstream processes	x	
Forging		x
Additive manufacturing		x
Profiling and forming		x
Cutting, piercing, blanking and machining		x
Welding, soldering, gluing etc		x
Coating and surface treatment of material other than coil, plate, bar and wire		x
Other processes taking place before transport to the building site		x
a all transport steps between processes within and between A1 and A3 shall be included and reported in A2		

6.2.3 A4-A5, Construction process stage, information modules

As in EN 15804:2012+A2:2019, in addition:

NOTE Default data for module A5 is given in Annex I.

6.2.4 B1-B5, Use stage, information modules related to the building fabric

As in EN 15804:2012+A2:2019, in addition:

If coating is included in modules A1, A3 or A5, and the service life is known, then B2 should be declared for necessary refurbishment of the coating during the service life.

6.2.5 B6-B7, use stage, information modules related to the operation of the building

As in EN 15804:2012+A2:2019.

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

As in EN 15804:2012+A2:2019, in addition:

The production of the secondary raw material, i.e. metal scrap, usually includes

- Collection and transport of end-of-life products and packages;
- Dismantling of components; Shredding and sorting;

This stage also includes provision of all materials, products and related energy and water use.

NOTE Default data for module C1 is given in Annex I.

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

As in EN 15804:2012+A2:2019, in addition:

Examples of processes are:

- The conversion of metal scrap into a recycled cast metal, i.e. slab/billet/ingot. This usually includes melting/remelting, refining and casting and if needed metallurgical treatment.
- The reuse of products. This usually includes storage of dismantled products and refurbishment.

This stage also includes transportation operations and provision of all materials, products and related energy and water use.

6.2.8 End of life and use of secondary material

Building products or materials for reuse or recycling can occur in all stages of a life cycle.

Scrap generated in modules A1-A3 shall, unless otherwise justified, be treated as closed loop recycling and not considered as secondary material input coming from outside the system boundary.

Secondary materials exiting modules A5, B and C shall, unless otherwise justified, be considered in module D. Waste processing up to end of waste state for reuse and recycling shall be reported in the modules where they occur as illustrated in Table 2.

The use of secondary material can give rise to burdens in modules A1-A3 as described in Table 3.

For the reuse scenario the product does not necessarily become a waste. For the recycling scenario the end of waste state is normally reached when the scrap is sent to or enters the re-processing facility to be re-melted, according to the table above, and does not necessarily follow the actual legal status in a given country.

NOTE 1 for some metals like copper, very clean scrap can reach the point of substitution prior to melting

NOTE 2 In most reuse and recycling scenarios a fraction of the product is lost and can be reported in module C4.

NOTE 3 Default rates of reuse and recycling and losses are given in Annex H.

Table 2 — Reuse and recycling scenarios for modules C1, C2, C3 and D

	Processes taking place in each module			
	C1 Disassembly or demolition	C2 Transport	C3 Waste processing in preparation for reuse and recycling	D Benefits and loads from reuse/recycling
Reuse scenario	Disassembly, initial sorting	Transport to stockholder /fabricator	No further processing needed to reach end of waste state	Cutting to size/ refurbishment/ finishing to the point of substitution. Benefits of substitution of a primary product of equivalent function
Recycling scenario	Demolition/disassembly, initial sorting	Transport to treatment facility	Further separation/sorting of scrap types, cutting to size or shredding and/or baling	Transport to metal re-processor, re-melting and casting. Benefit of substituted primary cast metal ingot/slab

Table 3 — Processes for reuse of products and recycling of secondary materials in modules A1-A3

	Processes taking place in each module		
	Module A1 Raw material extraction and material processing	Module A2 Transport to manufacturing	Module A3 Product manufacture
Secondary product input for reuse	None	Additional transport to manufacturer	Cutting to size, fabrication /finishing for final application
Secondary material input for recycling	Transport to metal reprocessor, re-melting and casting, material processing (semi-finished)	Transport to manufacturer	Product manufacturing /fabrication

6.3 Calculation rules for the LCA

6.3.1 Functional or declared unit

As in EN 15804:2012+A2:2019, in addition:

Declared unit shall be used for construction products covered by EN 1090-1.

Other construction products also covered by this standard may use declared unit or functional unit depending on the nature of the product.

6.3.2 Functional unit

As in EN 15804:2012+A2:2019.

6.3.2.1 General

As in EN 15804:2012+A2:2019.

6.3.2.2 Performance in a functional unit

As in EN 15804:2012+A2:2019.

6.3.3 Declared unit

As in EN 15804:2012+A2:2019, in addition:

Declared unit shall be:

- 1 kg: for construction products covered by EN 1090-1.

6.3.4 Reference service life (RSL)

6.3.4.1 General

As in EN 15804:2012+A2:2019.

6.3.4.2 Scenarios for RSL and functional unit

As in EN 15804:2012+A2:2019.

6.3.5 System boundaries

6.3.5.1 General

As in EN 15804:2012+A2:2019.

6.3.5.2 Product stage

As in EN 15804:2012+A2:2019.

6.3.5.3 Construction stage

As in EN 15804:2012+A2:2019.

6.3.5.4 Use stage

6.3.5.4.1 General

As in EN 15804:2012+A2:2019.