# Product Category Rule (PCR) Guidance for Building-Related Products and Services

## Part B: Designated Steel Construction Product EPD Requirements

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Product Category Rule (PCR) Guidance for Building-Related Products and Services Part B: Designated Steel Construction Product EPD Requirements, UL 10010–34

Second Edition, Dated August 26, 2020

***Summary of Topics***
***The Second Version of the Part B: Designated Steel Construction Product EPD Requirements, UL 10010–34 has been issued.***

**Publisher:**
UL Environment

### Tracking of versions

| Version | Comments | History |
|---|---|---|
| 1.0 | Publication of PCR Designated Steel Construction Products to conform with ISO 21930:2007 under Scientific Certification Systems (SCS). | May 5, 2015 |
| 2.0 | Creation of PCR Part B for Designated Steel Construction Products to conform with ISO 21930:2017 and UL Part A. | August 26, 2020 |



This PCR is valid for a period of five (5) years, set to expire in August, 2025.

## I. Background Information and Acknowledgements

These sub-category Product Category Rules (PCR) were developed to address the product specific rules for the creation of Environmental Product Declarations (EPD) for "designated steel construction products" and includes all fabricated structural steel, cold-formed steel sections, and concrete reinforcing steel products used and/or sold in North America. North America includes Canada, Mexico, and the United States. At the discretion of the Program Operator, this PCR may be applicable to other steel construction products not specifically described herein. The products within scope are collectively referenced throughout this PCR as "steel construction products". When used to self-reference this document, "PCR" refers to "sub-category PCR."

Other documents considered in the development of this PCR include:

- Hot-Rolled Structural Steel Sections - Life cycle inventory methodology report, thinkstep, September, 2015.
- Fabricated Structural Steel - Environmental product declaration supporting background report, thinkstep, September, 2016.
- Final Report: Life Cycle Assessment of Cold-Formed Steel Studs/Track Manufactured in U.S. and Canada, SCS Global Services, December 2015.
- Life Cycle Assessment of MBMA Primary and Secondary Structural Steel and Wall and Roof Panel Products, Final Report, Athena Sustainable Materials Institute, April, 2013.
- North American Product Category Rule for Designated Steel Construction Products, v1. SCS. May 2015.
- PCR Guidance-Text for Building Related Products and Services. Part B: Requirements on the EPD for Structural Steel. IBU. version 1.6, November 2017.[1]
- Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment December 2018, version 3.2)
- ISO 21930: 2017 - Sustainability in building construction -- Environmental declaration of building products
- EN 15804: 2012-04 - Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction product.

This PCR assumes a minimum 75 year building service life to be consistent with ASHRAE 189.1 (2017, section 9.5.1.2.b) and International Green Construction Code 2018 section 901.5.1.2.

**Interested Parties**

This Part B has been prepared with input from the following stakeholders:

- American Institute of Steel Construction (AISC)
- American Iron and Steel Institute (AISI)
- ArcelorMittal
- Concrete Reinforcing Steel Institute (CRSI)

[1] Compared to the IBU PCR, this PCR is broader in scope, is applicable to North America, and references the core UL Part A.

- Canadian Sheet Steel Building Institute (CSSBI)
- Corrugated Steel Pipe Institute (CSPI)
- Metal Building Manufacturers Association (MBMA)
- Nucor Corporation
- Steel Deck Institute (SDI)
- Steel Framing Industry Association (SFIA)
- Steel Joist Institute (SJI)
- Steel Tube Institute (STI)

**Governance**

There are a number of representatives of steel manufacturers participating in the creation of this Product Category Rule ("PCR") for steel construction products, including those listed in the previous section. These parties represent a majority of the companies in the steel construction product industry. Moreover, the manufacturing parties participating in the PCR update represent the vast majority of the steel construction products sold in North America in the product categories included in this PCR. The very purpose and function of a trade association is to inform its members of important industry developments and to represent their interests in projects such as the update of a PCR affecting their products. This is important because it effectively demonstrates that a large percentage of the steel construction product industry is represented in the effort to renew the PCR.

In the development of this document, Part B, participants are responsible for ensuring alignment with Part A and conformance with the scoped standards: ISO 21930, EN 15804[2], and ISO 14025.

**Involvement of Interested Parties**

UL Environment shall be responsible for producing the PCR document by establishing an open consultation process that includes the involvement of interested parties (ISO 21930 Section 5.2 and 6.2.1). Reasonable efforts were made to achieve a consensus throughout the process (ISO 14020:2000, 4.9.1, Principle 8 and cited in both ISO 14025 and ISO 21930), demonstrated by a vote of participating interested parties.

All participating industry associations (AISI, AISC, CRSI, CSSBI, MBMA, SDI, SFIA, SJI, and STI) informed their memberships of the PCR creation through their regularly scheduled association committee meetings, newsletters, e-mail messages, and similar types of outreach. Trade associations operate at the behest of its members, and the fact that trade associations are participating in the update of a PCR for steel construction products is an indication that their memberships are aware of this project and have authorized their association to represent them in this important endeavour.

UL Environment posted an open call for participation in this PCR update in October 2019 via its standards website, social media outlets, and outreach to original committee stakeholders.

**Update Process**

The PCR is valid for a duration of five (5) years from the publication date, at which time it may be revised at the request of industry stakeholders. The PCR may be revised before the five year date if the following occurs in the industry:

- The industry desires an update
- Core governing standards ISO 14040, 14044, 14025, 21930, or EN 15804 are updated with substantial material changes

Note: When the PCR is updated, the Program Operator shall communicate with the original committee, any new EPD participants, and initiate a new public call for interested parties.

[2] There are several compatibility issues with ISO 21930 and EN 15804 which are specifically noted in this Part A (See Section **Error! Reference source not found.**). Whenever compatibility issues arise, whether addressed in this Part A or not, the requirements in ISO 21930 shall take precedence over EN 15804. If it is necessary for an EPD to explicitly conform to EN 15804 and not ISO 21930, this precedence will not apply.

**Public Consultation**

Public consultation was utilized during the PCR review process. The public consultation of the completed draft PCR included a minimum 30-calendar-day period for comments to be submitted to UL Environment. After public comments were submitted, the PCR committee reviewed and developed responses for all comments. All comments from the review panel and public consultation were addressed and satisfactorily resolved by the PCR committee prior to the publication of this PCR.

**Review**

The review process of this Part B PCR included a review through public consultation from May 27 -- June 26, 2020 and a panel review, comprised of the following individuals:

| | | |
|---|---|---|
| **Dr. Tom Gloria, Chair** | **Brandie Sebastian** | **James Littlefield** |
| **Industrial Ecology Associates** | **JBE Consultants** | **Independent Consultant** |

## II. Scope

This document contains the Product Category Rule (PCR) requirements for Steel Construction Product Environmental Product Declarations (EPDs) published in coordination with the ISO 21930 and EN 15804 standards. The requirements for the background Life Cycle Assessment (LCA) project report used to inform the EPD are contained in UL Environment's Part A: Life Cycle Assessment Calculation Rules and Report Requirements. This Part B document, coupled with the Part A, conforms to the ISO 21930, EN 15804[3], and ISO 14025 sustainability standards for EPD reporting in addition to the US Green Building Council PCR Guidance.

**General Guidance**

The scope of this PCR applies to the product group "steel construction products" and includes mill level products, fabricated structural steel, cold-formed steel sections, concrete reinforcing steel products, and other fabricated/manufactured products made primarily of steel used and/or sold in North America according to those listed in Section 10, Appendix.

This PCR applies to products sold and used in the North American market. PCRs and EPDs created for steel products in geographies outside of North America do not necessarily conform with this PCR and are not applicable for use in the North American market.

**System Boundary**

The system boundary for EPDs created using this PCR is either:

- Cradle to gate (modules A1-A3) or
- Cradle to gate with options (modules A1-A3, modules C1-C4) or
- Cradle to gate with options (modules A1-A3, modules C1-C4, and module D)

The EPDs produced under this PCR do not cover the operational impacts of the whole building. In most/many applications, steel products have little to no maintenance or replacement and do not result in emissions to air or water. It is the production of these construction products, not the impacts from the operational phase of a whole building, which are the subject of EPDs covered by this PCR.

Care must be taken when assigning system boundaries around A1-A3 based on the operations involved and the end product.

The EPD requirements include:

- ISO 21930:2017 standard

[3] See footnote 2.

- EN 15804:2012+A2:2019 standard (optional)
- ULE General Program Instructions v 2.5, March 2020 (available upon request)
- The calculation rules for the Life Cycle Assessment and Requirements on the Project Report are specified in a separate document as Part A v3.2 of the Product Category Rules, available at https://www.ul.com/offerings/product-category-rules-pcrs

**EPD Updates**

EPDs created using this PCR shall expire five (5) years after publication. An update to the existing EPD, or new EPD, may need to be developed prior to the five year review if any of the following have occurred (non-exhaustive):

1) Significant changes in the manufacturing process;
2) New manufacturers wish to participate but are disqualified for retroactive participation on the basis of provided data (industry-average EPDs);
3) Significant changes or alterations in raw materials;
4) Major regulatory changes that mandate or trigger changes to operational procedures; or
5) Major technological changes.

# III. Industry-Average EPD Requirements

**Industry-Average EPD Scope**

The products represented within a single industry-average EPD created using this PCR are limited to the primary materials defined in the product specification standards in Section 9 that characterize the specific product in commerce.

**Involvement of Interested Parties**

A call for involvement of interested parties in the creation of an industry-average EPD shall be published in at least one industry trade publication. At a minimum, at least three (3) different manufacturing locations from no less than three (3) companies should be involved and represented in an industry-average EPD. The method for determining representativeness shall be justified and described per Section 2.2.2.

**Industry-Average EPD Participation**

A manufacturer qualifies for participation in an industry-average EPD created using this PCR if they provide primary manufacturing data used in calculating the initial EPD average or demonstrate willingness to provide primary manufacturing data during the LCA data collection process.

**Retroactive participation**

When determining a manufacturer's participation eligibility, the EPD Program Operator shall follow the rules and recommendations of the primary sponsor(s) of the industry average EPD and participating manufacturers.

If deemed eligible, a manufacturer desiring retroactive inclusion in the industry average EPD shall provide manufacturing and product data information of the same representativeness submitted in the original industry average EPD to the LCA practitioner. The LCA practitioner will then recommend to the Program Operator a determination for inclusion in the industry average on the basis of results falling within a reasonable range for any impact category. The maximum and minimum should be reported in the LCA background report for each impact category based on the highest and lowest impact product or facility within the original industry-average LCA.

**Governance**

The primary sponsor(s), such as a trade or industry organization shall inform all eligible industry participants through association meetings, newsletters, email messages, and similar types of outreach, including public notices in the trade press publications. Confidential business information shall be collected by a third party or primary sponsor(s) given confidentiality agreements are in place. Data from the third party shall be aggregated with no trace to the original source of data.

The development of an industry-average EPD and/or update of an EPD should involve a series of meetings and exchanges in which all participants are invited and kept apprised of the developments. Notices of these meetings should be given to all possible participants regardless of their commitment to active involvement. Minutes of meetings, along with meeting notices, should be preserved as documentation of the process and due diligence observed in the creation or renewal of the EPD.

**Data Responsibility/Ownership**

Primary sponsor(s) that lead the development of industry-average EPDs may need to collect confidential business information from individual members. This data can include proprietary chemical formulations and processes or other confidential information. In this case, a designated third-party entity such as an LCA practitioner shall be identified as the "industry agent". The industry agent shall be responsible for activities including collection, secure storage and analysis of such data needed for the EPD development, and will preserve the privacy of individual company information while executing these duties.

Per ISO 21930 Section 5.4, the manufacturer, or group of manufacturers, of the construction product is the sole owner of the EPD and is responsible for developing the EPD of the construction product according to the PCR. Only the manufacturer or group of manufacturers is authorized to declare the environmental performance of the construction product using an EPD.

The group of manufacturers responsible for developing an industry-average EPD shall be responsible for, including but not limited to, ensuring industry-average EPD updates are made based on the most recent LCA modelling software version and impact assessment version available.

## 1. Content of the EPD

| | |
|---|---|
| EPD Program and Program Operator Name, Address, Logo, and Website | Program Operator Provided |
| General Program Instructions & Version | Program Operator Provided |
| Manufacturer Name and Address | |
| Declaration Number | Program Operator Provided |
| Declared Product & Functional Unit or Declared Unit | |
| Reference PCR and Version Number | |
| Description of product's intended application and use (as Identified when Determining Product RSL, If Applicable) | |
| Product RSL Description (if Appl.) | |
| Markets of Applicability | |
| Date of Issue | Program Operator Provided |
| Period of Validity | Program Operator Provided |
| EPD Type | [Industry-average or product-specific] |
| Dataset Variability | [Industry-average only; mean, median, standard deviation] |
| EPD Scope | [Cradle to gate, cradle to gate with options (specify options) |
| Year(s) of reported primary data | |
| LCA Software & Version Number | |
| LCI Database(s) & Version Number | |
| LCIA Methodology & Version Number | |

| | |
|---|---|
| The sub-category PCR review was conducted by: | Program Operator Provided<br>Program Operator Provided<br>Program Operator Provided |
| This declaration was independently verified in accordance with ISO 14025: 2006. The UL Environment "Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report," v3.2 (December 2018), in conformance with ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017)<br>☐ INTERNAL ☐ EXTERNAL | Program Operator Provided |
| This life cycle assessment was conducted in accordance with ISO 14044 and the reference PCR by: | Program Operator Provided |
| This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by: | Program Operator Provided |

Limitations

The environmental impact results of steel products in this document are based on a declared unit and therefore do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the steel product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted. See Section 3.10 for additional EPD comparability guidelines.

Environmental declarations from different programs (ISO 14025) may not be comparable.

# 2. General Information

The comprehensive requirements for EPD content are specified in Part A, Section 7 and ISO 21930:2017, Section 9 (Clause 9).

## 2.1. Description of Organization

### 2.1.1. Product Specific EPD

The name of the manufacturing entity(ies) as well as the place(s) of production shall be provided. General information about the manufacturing entity(ies) may be provided, such as the existence of quality systems or environmental management systems, according to ISO 14001 or any other environmental management system in place.

### 2.1.2. Industry Average EPD

The name of the sponsoring organization as well as participating manufacturers shall be provided or linked via URL.

## 2.2. Product Description

A narrative description of the product shall be provided that enables clear identification of the product. This description will include:

### 2.2.1. Product Identification

The declared products shall be identified by brand name(s), by material type(s), by production code(s) (if applicable), and by simple visual representation, which may be by photograph or graphic illustration.

Example: Hot-rolled fabricated structural steel sections are used in building, bridge, and industrial projects. These products are rolled shapes such as parallel flange sections, angles, channels and tees that are detailed, cut, drilled, bolted, welded, and otherwise processed at the fabricator in order to prepare them for installation.

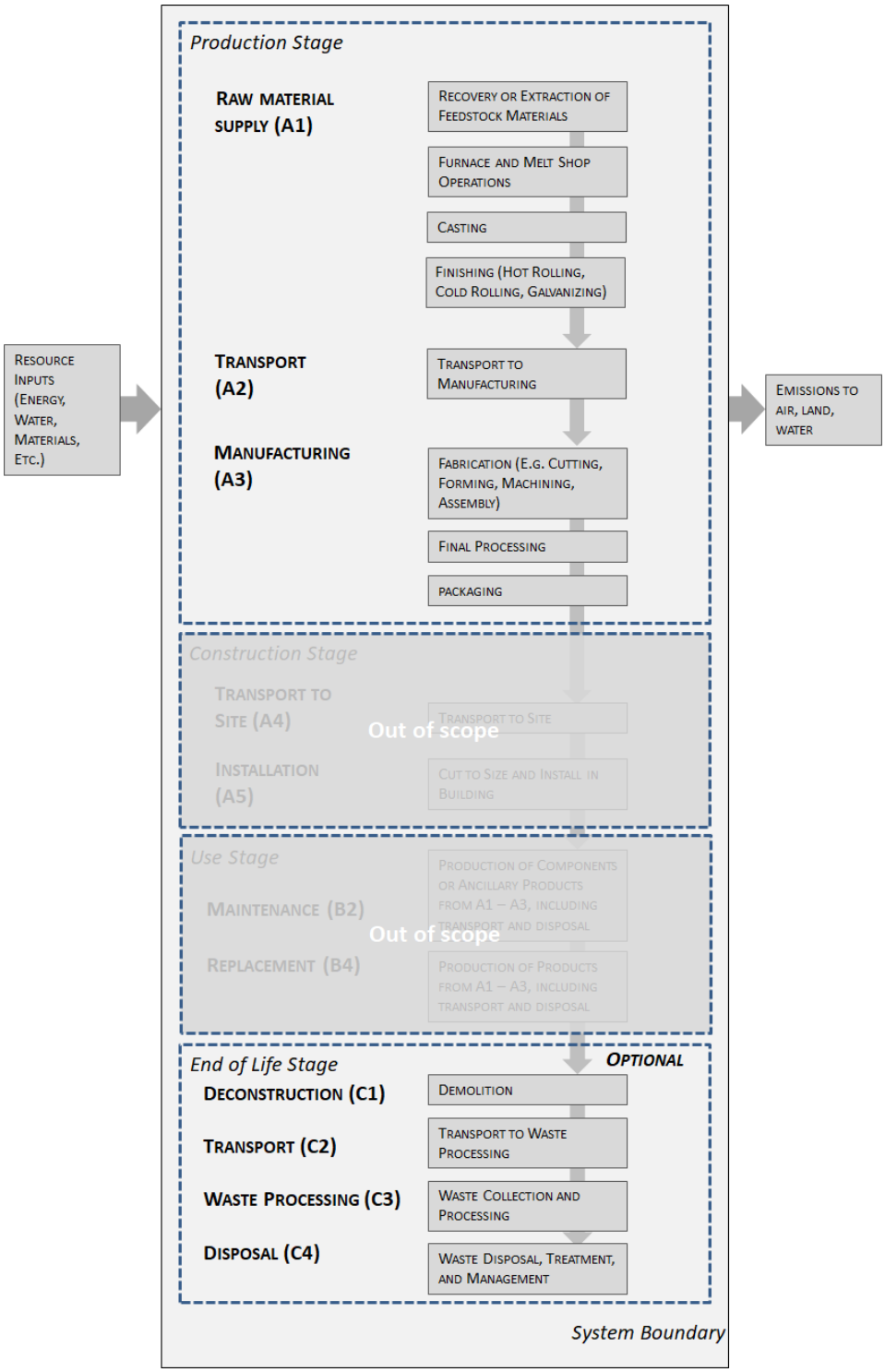
### 2.2.2. Product Specification

Related products grouped and reported as an average product in the same EPD satisfying the variation criteria of Part A, Section 2.5 shall constitute an individual declared product. For each declared product, list the physical characteristics – in the form that the product would be installed – along with the reference to the test standard for each. When pertinent, provide a description of the steel construction product. Other relevant product specification values may be provided here.

### 2.2.3. Flow Diagram

A graphical depiction of a flow diagram illustrating main production processes according to the scope of the declaration shall be included such as the examples in Figure 1.

**FIGURE 1. EXAMPLE PRODUCT FLOW DIAGRAM[4]**




[4] This is an example flow diagram and other products covered in this PCR may differ.

### 2.3 Product Averages for EPDs

#### 2.3.1 Product Specific EPD

The method for creating a company specific individual product/product group EPD shall be described, including the method for determining a weighted average across products based on production volume as described in Part A, Section 2.5.2.

#### 2.3.2 Industry Average EPD (if relevant)

The method for creating an industry-average EPD shall be described per Part A, Section 2.5.1.

### 2.4. Application

The designated applications for the referenced product(s) shall be specified. The applications of the declared product(s) shall be described.

### 2.5. Material Composition

The main product components or materials that make up the product shall be described and given in percentage by mass. Materials and components include, but are not limited to, general categories such as steel and coatings.

Statements of material non-inclusion, such as "… is free of …" may not be used. Ancillary materials and additives remaining in the product shall also be declared.

Regulated Hazardous substances and dangerous substances shall be reported per Part A, Section 4.11; there are no additional reporting requirements for this PCR.

Note: This disclosure is intended to enable the user of the EPD to understand the composition of the product in delivery condition and support a safe and effective installation, use and disposal of the product. With appropriate justification, this requirement does not apply to confidential or proprietary information relating to materials and substances that apply due to a competitive business environment or covered by intellectual property rights or similar legal restrictions. It also might not be appropriate for information concerning intangible products.

Note: Steel products used inside the building envelope (e.g. used in load-bearing applications present inside wall structures) do not include materials or substances which may have any potential route of exposure to humans or flora/fauna in the environment.

### 2.6. Properties of Declared Product as Delivered

A link to the final evaluation report/certification/registration may be provided.

## 3. Methodological Framework

The following items shall be specified: the type of EPD with respect to life cycle stages, and the life cycle stages covered and not covered.

### 3.1. Declared Unit

A declared unit shall be applied if the precise function of the product is not stated or not known. The declared unit shall be one (1) metric ton and optionally one (1) short ton for steel construction products. Conversion factors (e.g. density, thickness, surface area, etc.) shall be provided in order to allow the users to conduct further calculations (e.g. transport impacts).

Environmental Impact results based on a declared unit of a steel product do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the steel product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted. See Section 5.1 for additional EPD comparability guidelines.

## 3.2. SYSTEM BOUNDARY

### 3.2.1. GENERAL

The type of EPD shall be specified as cradle to gate or cradle to gate with options (end of life). The modules considered shall be described in brief in the EPD and justified in the LCA as per "System boundaries" outlined in Part A, Section 2.8. It should be apparent as to what processes are considered in what modules per the module descriptions in Part A, Section 2.8. Any relevant aspects or impacts not included in an information module shall be supported with relevant additional environmental information and the omissions shall be justified. Module D is not an information module and shall be reported separately if included in the EPD.

Capital goods and infrastructure flows shall be excluded from the product system boundary.

### 3.2.2. MODULE D

Module D reports the potential benefit or burden from the displacement of primary materials and/or fuels associated with recycling and recovery at end-of-life. When optional Module D is reported in an EPD, the EPD shall explicitly describe the methodology used to calculate the reported values, including the LCI of scrap used in calculations, and shall address any uncertainty or comparability issues relative to these values. If Module D is reported, the EPD shall include the following paragraph:

> ***Interpreting the Results in Module D****: The values in Module D include a recognition of the benefits or impacts related to steel recycling which occur at the end of the product's service life. The rate of steel recycling and related processes will evolve over time. The results included in Module D attempt to capture future benefits, or impacts, but are based on a methodology that uses current industry-average data reflecting current processes.*

## 3.3. ALLOCATION

Part A, Section 3.3 shall be used as the basis for allocation decisions, and mass should be used as the primary basis for co-product allocation in this Part B. Allocation methods deemed more appropriate than on the basis of mass (e.g. economic allocation) may be used but only when justified. The allocations of relevance for calculation (appropriation of impacts across various products) shall be indicated, at least:

- Allocation in the use of recycled and/or secondary raw materials
- Allocation of energy, ancillary and operating materials used for individual products in a factory

whereby reference shall be made to the modules in which the allocations are performed.

## 3.4. CUT-OFF RULES

Cut-off rules as specified per the Part A, Section 2.9 shall be used and documented in the EPD and LCA report. All known mass and energy flows shall be reported. No known flows should be deliberately excluded. Environmental impacts are associated with the creation of scrap and these impacts may be optionally reported in Module D.

## 3.5. DATA SOURCES

Data sources shall be documented per Part A, Section 3.1.

All steel datasets shall be the most recent, representative, regional-average datasets published by AISI or Worldsteel, unless data is available from the specific steel supplier for the construction product covered by the EPD. Any deviation from the requirements of ISO 21930:2017 (e.g. physical allocation for co-products) in background datasets shall be justified and described.

In situations where secondary data is used to represent a key unit process, secondary data shall include a regionally appropriate electricity supply mix.

### 3.6. DATA QUALITY

An evaluation shall be provided regarding data quality, including temporal, geographical, technological representativeness, and completeness and shall follow the requirements outlined in Part A, Section 3.1.1.

### 3.7. PERIOD UNDER REVIEW

The period under review and ensuing averages shall be documented.

### 3.8. COMPARABILITY AND BENCHMARKING

Comparison of EPD results between non-competitive[5] products may be conducted per the requirements in Part A, Section 9.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified.

When comparing EPDs that include Module D, the calculation method(s) used to determine impacts and benefits must be identical.

Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison.

Environmental impact results based on a declared unit of a steel product do not provide sufficient information to establish comparisons. The results shall not be used for comparisons without knowledge of how the physical properties of the steel product impact the precise function at the construction level. The environmental impact results shall be converted to a functional unit basis before any comparison is attempted.

### 3.9. ESTIMATES AND ASSUMPTIONS

Key assumptions and estimates in throughout Section 3 and 4 should be included in the LCA and EPD.

### 3.10. UNITS

SI units are required for all LCA results. Other units commonly used in a regional market may be optionally included in addition to the required SI units.

## 3. Technical Information and Scenarios

The following information shall be reported for declared modules. Irrelevant or non-applicable modules and tables may be excluded in the EPD; additional information may also be listed if necessary.

The following technical information is a basis for the declared modules or may be used for developing specific scenarios in the context of a building assessment if modules are not declared (MND).

### 4.1. MANUFACTURING

The manufacturing process and locations shall be described and illustrated using a simple flow-chart. If the EPD applies to several locations producing the same product or a series of vertically integrated processes, the production processes for all locations shall be described and reference to quality management systems may be included.

### 4.2. DISPOSAL

The possible disposal channels shall be indicated in accordance with disposal routes and waste classification referenced in Part A, Section 2.8.5 and 2.8.6.

[5] Here, non-competitive means a product comparison with an industry average or comparison between two products manufactured by the same producer.

**TABLE 1. END OF LIFE (C1-C4)**

| Name | | Value | Unit |
|---|---|---|---|
| Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation) | | | |
| Collection process (specified by type) | Collected separately | | kg |
| | Collected with mixed construction waste | | kg |
| Recovery (specified by type) | Reuse | | kg |
| | Recycling | | kg |
| | Landfill | | kg |
| | Incineration | | kg |
| | Incineration with energy recovery | | kg |
| | Energy conversion (specify efficiency rate) | | |
| Disposal (specified by type) | Product or material for final deposition | | kg |
| Removals of biogenic carbon (excluding packaging) | | | kg $CO_2$ |

### 4.3. BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

Refer to Section 3.2.2 for discussion and describe methodology used to calculate Module D, if reported. Note that information modules C1 to C4 shall be declared when module D is declared.

**TABLE 2. BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D), RELEVANT SCENARIO INFORMATION**

| Name | Value | Unit |
|---|---|---|
| Recycling rate of product | | % |
| Recycled content of product | | % |

## 5. Environmental Indicators Derived from LCA

### 5.1. LCA RESULTS FROM LCIA

In Table 3, "Description of the system boundary," all declared modules shall be indicated with an "X".

Modules A1, A2, and A3 shall be declared as separate modules.

Industry average EPDs shall report information on the statistical distribution of results for all TRACI indicators, including range, median and mean. Additional statistical information may also be reported.

Product specific EPDs which include averaging shall report the range of results for all TRACI indicators for products included in the average.

Per Part A, life cycle impact assessment (LCIA) results shall be declared using scientific notation with three significant digits (e.g. 1.23E-5 = 0.0000123) for each module. Uniform formatting shall be used for all indicator values.

- Required: North America (Part A, Section 4.7, Table 9, TRACI indicators with IPCC 2013 factors for GWP)
- Optional: EU (Part A, Section 4.8, Table 10, CML indicators)
- Optional: Rest of World (Part A, Section 4.9, Table 11, indicators as provided)

The following statements on comparability shall immediately follow the LCIA results table in an EPD:

> ***Comparability**: Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted*.
>
> *Any comparison of EPDs shall be subject to the requirements of ISO 21930. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories*.

**TABLE 3. DESCRIPTION OF THE SYSTEM BOUNDARY MODULES**

| | PRODUCTION | | | CONSTRUCTION | | USE | | | | | | | END OF LIFE | | | | BENEFITS & LOADS BEYOND SYSTEM BOUNDARY | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D | |
| EPD Type | Raw material supply | Transport | Manufacturing | Transport to site | Assembly/Install | Use | Maintenance | Repair | Replacement | Refurbishment | Operational Energy Use | Operational Water Use | Deconstruction | Transport | Waste processing | Disposal | Reuse, Recovery, Recycling Potential | Reference Service Life |
| **Cradle to gate w/ EOL** | *Required* | | | *Excluded* | | | | | | | | | *Optional, Depending on Part A, Section 2.8.4.5* | | | | *Excluded* | Optional |
| **Cradle to gate with options** | *Required* | | | | | | | | | | | | *Required* | | | | *Optional* | Optional |
| **Declared Modules (Indicate with "X")** | | | | | | | | | | | | | | | | | | |

## 5.2. LCA RESULTS FROM LCI

Results derived from the product LCI shall be reported as follows:

- Resource use indicators (Part A, Section 4.1, Table 6)
- Output flows and waste category indicators (Part A, Section 4.1.2, Table 7)
- Carbon emissions and removals (Part A, Section 4.6, Table 8)

# 6. LCA: Interpretation

Interpretation requirements for the Project Report are provided in Part A, Section 5.

An interpretation shall be provided in the EPD which discusses the assumptions and limitations associated with the interpretation of results as declared in the EPD, both methodology and data related.

This interpretation shall also include a description of the time frame and/or variance of the LCIA results if the EPD is valid for several products. An illustration of the results with figures is recommended in the EPD, e.g. for the dominance analysis, the distribution of impacts across the modules, the $CO_2$-balance, etc. as appropriate for a reader's understanding of the environmental profile of the declared product.

# 7. Additional Environmental Information

## 7.1. Results for Unfinished Steel

In addition to reporting results for Modules A1, A2, and A3 for fabricated products within the scope of this PCR (see Scope section), disaggregated results for Module A1 may additionally be reported for the production of mill product. These results shall be reported on the basis of one (1) metric ton and optionally one (1) short ton may additionally be reported.

## 7.2. Environment and Health During Manufacturing

Measures relating to environmental and health protection during the product manufacturing process extending beyond national guidelines (of the production country) may be described, e.g. reference to a product safety data sheet (SDS), description of Environmental Management Systems or similar, programs addressing air emissions, waste water, noise, etc.

## 7.3. Environment and Health During Installation

Information should be provided in this section on the relationship between the product, the environment and health, including any possible harmful substances or emissions e.g. reference to a product safety data sheet (SDS). Any recommendations concerning cleaning, maintenance, etc. of the declared product should be listed in Section 4 “Technical information on scenarios”. In establishing safe thresholds of exposure for humans, measures such as Reference Concentrations (RfC) or Reference Dose (RfD) can be used, which are established by US EPA and available in the Integrated Risk Information System database. In establishing safe thresholds of exposure for flora/fauna, measures such as Criteria Maximum Concentration (CMC) or Criterion Continuous Concentration (CCC) can be used, also established by US EPA and available as part of the National Recommended Water Quality Criteria. Other data sources can be used to establish safe thresholds of exposure for humans and flora/fauna, with justification.

## 7.4. Environmental Activities and Certifications

Other environmental activities, such as participation in recycling or recovery programs along with the details of these programs and contact information, may be provided.

For certifications applied to the product and listed in the EPD, a statement shall be included on where an interested party can find details of the certification program.

## 7.5. Further Information

A reference source for additional information may be provided here, e.g. homepage, reference source for safety data sheet.

# 8. Project Report and Supporting Documentation

The Project Report Content, Structure, and Accessibility requirements to support an EPD created using this document are provided in Part A: Section 2. Project Report elements include general information (Part A: Section 2.1), study goal (Part A: Section 2.2), study scope (Part A: Section 2.8), and the life cycle inventory analysis, impact assessment, and interpretation (Part A: Section 3, 4, and 5). Additionally, the Project Report shall include additional

required supporting documentation specified in this sub-category Part B and according to Part A, Section 6. The Project Report requirements for the life cycle inventory analysis provided in Part A: Section 3 are sufficient to conform with this sub-category Part B.

As a general rule, all statements shall be documented with measured data (presented by the corresponding test certificates). In the case of non-verifiable substances, the limit of detection shall be included in the declaration. Interpreting statements such as "… free of …" or "… are entirely harmless …" are not permissible.

## 9. References

The literature referred to in the Environmental Product Declaration shall be cited. Standards and standards relating to evidence and/or technical features already cited in the EPD do not need to be listed here. This Part B PCR document shall be referenced.

**UL ENVIRONMENT**

UL Environment General Program Instructions March 2020, version 2.5

Part A: Life Cycle Assessment Calculation Rules and Report Requirements UL Environment (December 2018, version 3.2)

**SUSTAINABILITY REPORTING STANDARDS**

EN 15804:2019-04 - Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction product.

ISO 14025: 2006 - Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 14040: 2006 - Environmental management – Life cycle assessment – Principles and framework

ISO 14044:2006 - Environmental management – Life cycle assessment – Requirements and guidelines

ISO 21930:2017 - Sustainability in building construction -- Environmental declaration of building products

Product Category Rule Guidance Development Initiative. Guidance for Product Category Rule Development. (August 28, 2014, version 1.0).

**RELEVANT FEDERAL STANDARDS AND SOPS**

Environment Canada, National Pollutant Release Inventory (NPRI) (http://www.ec.gc.ca/inrp-npri/)

EPCRA 313 Toxic Release Inventory Reporting (U.S.) (https://www.epa.gov/toxics-release-inventory-tri-program) Accessed 08 December 2017.

US EPA, ORD/NRMRL/Sustainable Technology Division, Systems Analysis Branch, SOP No. S-10637-OP-1-0- Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI), Software Name and Version Number: TRACI version 2.1, USER'S MANUAL, 24 July, 2012

**RELEVANT PCRS**

PCR Guidance-Text for Building Related Products and Services. Part B: Requirements on the EPD for Structural Steel. IBU. version 1.6, November 2017.

**AISC, ASTM AND AISI STANDARDS**

AISC 303-10, Code of Standard Practice for Steel Buildings and Bridges. American Institute of Steel Construction, Chicago, IL. 2010.

ANSI/AISC 360-16, Specification for Structural Steel Buildings. ANSI. (2016).

AISI S100-16, North American Specification for the Design of Cold-Formed Steel Structural Members. American Iron and Steel Institute, Washington DC. (2016).

AISI S201-12, North American Standard for Cold-Formed Steel Framing – Product Data 2012 Edition. AISI. (2012).

AISI S220-15, North American Standard for Cold-Formed Steel Framing - Nonstructural Members. American Iron and Steel Institute, Washington DC, Standard. 2015.

AISI S240-15, North American Standard for Cold-Formed Steel Structural Framing. American Iron and Steel Institute, Washington DC, Standard 2015

ASTM A615/A615M, Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement, ASTM International, West Conshohocken, PA, (2014).

ASTM A653, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process, ASTM International, West Conshohocken, PA, (2015).

ASTM A706/A706M, Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement, ASTM International, West Conshohocken, PA, (2014).

ASTM A1003 / A1003M, Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members, ASTM International, West Conshohocken, PA, (2013).

ASTM C1047, Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base, ASTM International, West Conshohocken, PA, (2014a).

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## 10. Appendix

The scope of this PCR applies to the product group “steel construction products” and includes mill level products, fabricated structural steel, cold-formed steel sections, concrete reinforcing steel products, and other fabricated/manufactured products made primarily of steel used and/or sold in North America including, but not limited to, the following standards and specifications.

### Structural Steel

The elements included in the scope of this PCR for structural steel are defined in the AISC 303-16 Code of Standard Practice for Steel Buildings and Bridges, Section 2, Classification of Material.

### Cold-Formed Steel Sections

The shapes included in the scope of this PCR for Cold-Formed Steel Framing structural and nonstructural members/sections are defined in the following standards:

- AISI S100 - American Iron and Steel Institute - North American Specification for the Design of Cold-Formed Steel Structural Members
- AISI S201 - North American Standard for Cold-Formed Steel Framing – Product Data
- AISI S220 - North American Standard for Cold-Formed Steel Framing – Nonstructural Members
- AISI S240 - North American Standard for Cold-Formed Steel Framing – Structural Framing
- AISI D100 - Cold-Formed Steel Design Manual
- ASTM C1047 – Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base

### Metal Lath

- ASTM C847 Standard Specification for Metal Lath

### Concrete Reinforcing Steel

The steel reinforcing bars included in the scope of this PCR are those defined in one of the following specifications:

- ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
- ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
- ASTM A767/767M - Standard Specification for Deformed and Plain Zinc-Coated Steel Bars for Concrete Reinforcement
- ASTM A775/A775M - Standard Specification for Deformed and Plain Epoxy Coated Reinforcing Steel Bars
- ASTM A934/A934M - Standard Specification for Deformed and Plain Epoxy Coated Prefabricated Reinforcing Steel Bars

**CORRUGATED STEEL PIPE**

The corrugated steel pipe included in the scope of this PCR are those defined in one of the following specifications:

- CSA G401 (2014) - Corrugated Steel Pipe
- ASTM A742/A742M-13 - Standard Specification for Steel Sheet, Metallic Coated and Polymer Precoated for Corrugated Steel Pipe
- ASTM A929/A929M-17- Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe

**ROLL FORMED STEEL PANELS**

Steel cladding, roofing and deck products defined in the scope of this PCR are those defined in of the following specifications:

- ANSI/SDI C-2017 - Standard for Composite Steel Floor Deck – Slabs
- ANSI/SDI RD-2017 - Standard for Steel Roof Deck
- ANSI/SDI NC-2017 – Standard for Non-Composite Steel Floor Deck
- CSSBI 20M-17 - Standard for Sheet Steel Cladding for Industrial, Commercial and Institutional Building Applications
- CSSBI 21M-17 - Standard for Steel Farm Roofing and Siding
- CSSBI 23M-15 - Standard for Residential Steel Cladding
- CSSBI S8-18 - Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products
- CSSBI 22M-17 - Standard for Residential Steel Roofing

**Applicable Products**

The following Construction Specification Institute (CSI) Masterformat codes and UNSPSC codes cover the scope of this Part B. These lists are non-exhaustive and may include other relevant steel construction products:

- 03 20 00 Concrete Reinforcing
- Corrugated Steel Pipe
- Steel Cladding
- Steel Roofing
- 03 21 00 Reinforcement Bars
- 03 21 11 Plain Steel Reinforcement Bars
- 03 21 13 Galvanized Reinforcement Steel Bars
- 03 21 16 Epoxy-Coated Reinforcement Steel Bars
- 03 21 19 Stainless Steel Reinforcement Bars
- 05 10 00 Structural Metal Framing
- 05 12 00 Structural Steel Framing
- 05 12 13 Architecturally-Exposed Structural Steel Framing
- 05 12 16 Fabricated Fireproofed Steel Columns
- 05 12 19 Buckling Restrained Braces
- 05 12 23 Structural Steel for Buildings
- 05 13 00 Structural Stainless-Steel Framing
- 05 21 00 Steel Joist Framing
- 05 31 00 Steel Decking
- 05 40 00 Cold-Formed Metal Framing

- 05 41 00 Structural Metal Stud Framing
- 05 42 00 Cold-Formed Metal Joist Framing
- 05 42 13 Cold-Formed Metal Floor Joist Framing
- 05 42 23 Cold-Formed Metal Roof Joist Framing
- 05 43 00 Slotted Channel Framing
- 05 44 00 Cold-Formed Metal Trusses
- 09 21 16 Gypsum Board Assemblies
- 09 21 16.23 Gypsum Board Shaft Wall Assemblies
- 09 22 16 Non-Structural Metal Framing
- 09 22 36.23 Metal Lath

Corresponding applicable UNSPSC codes include:

- 30103614 - Steel plate joist
- 30103618 - Steel framework
- 30103623 - Reinforcing bar or rebar or mesh
- 302636 - Carbon steel bars
- 302637 - Steel alloy bars
- 302638 - Tool steel bars
- 302639 - Specialty steel bars
- 302640 - Carbon steel sheets
- 302641 - Steel alloy sheets
- 302642 - Specialty steel sheets
- 302643 - Specialty steel coils
- 302644 - Carbon steel ingots strips billets and coil
- 302645 - Stainless steel bars
- 302646 - Stainless steel sheets
- 302647 - Stainless steel coil
- 302648 - Stainless steel strips

**Non-Applicable Products**

Products that may provide the same function in a different application are not within the scope of this PCR. These excluded products are:

- Non-steel products