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

1

Part B: Metal Ceiling and Wall System EPD Requirements

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Publisher:
UL Environment

Tracking of versions

Version	Comments	History
1.0	**Creation of PCR Part B for Metal Ceiling and Wall System Products to conform with ISO 21930: 2017 and UL Part A. This PCR has been updated to align with international standards with the intent of allowing manufacturers to create EPDs which are global in scope.**	**xxxxxx, 2019**

This PCR is valid for a period of five (5) years, set to expire in xxxxxxxx, 2024.

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 “metal ceiling and wall systems” and includes all commercially available metal ceiling and wall system products and trims, column covers, and their required suspension system and acoustical treatments, collectively referenced throughout this PCR as “metal ceiling and wall system products”. When used to self-reference this document, “PCR” refers to “sub-category PCR.”

Other PCRs considered in the development of this PCR include:

- IBU Part B: Metal Ceilings version 1.5 October 2013
- 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 75 year building service life to be consistent with ASHRAE 189.1 (2014, Section 9.5.1).

Interested Parties

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

- Ceilings and Interior Systems Construction Association (CISCA)

Manufacturers/Consultants

- Thinkstep
- TBD

Governance

There are a number representatives of ceiling manufacturers participating in the creation of this Product Category Rule ("PCR") for Metal Ceiling and Wall Systems products, including the Ceilings and Interior Systems Construction Association (CISCA). These parties represent a majority of the companies in their particular sector of the ceiling systems industry. Moreover, the manufacturing parties participating in the PCR update represent the vast majority of the ceiling systems 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 Metal Ceiling and Wall Systems industry is represented in the effort to renew the PCR for ceiling system products.

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, 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.

CISCA 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 Metal Ceiling and Wall Systems 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 January 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.

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 in xxxxxxx – xxxxxxx 2019 and a panel review, comprised of the following individuals:

TBD **TBD** **TBD**

II. Scope

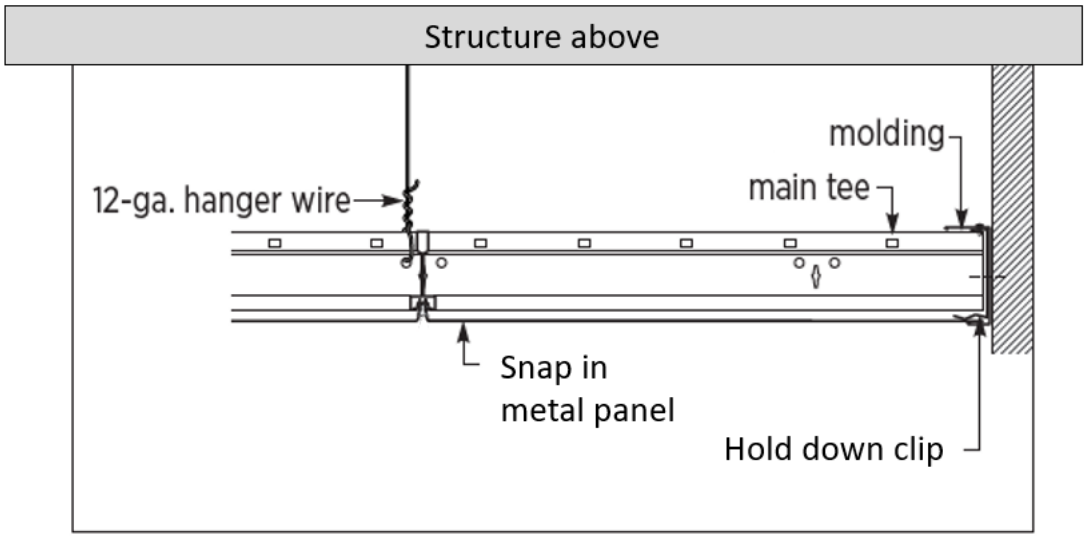
This document contains the Product Category Rule (PCR) requirements for Metal Ceiling and Wall System Product Environmental Product Declarations (EPDs) published in coordination with the ISO 21930 and EN 15804 standards. The requirements for the background Life Cycle Assessment (LCA) project report used 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, and ISO 14025 sustainability standards for EPD reporting in addition to the US Green Building Council PCR Guidance.

This PCR has been updated to align with international standards with the intent of allowing manufacturers to create EPDs which are global in scope.

General Guidance

The scope of this PCR applies to the product group "metal ceiling and wall systems" and includes all commercially available metal ceiling and wall system products and trims, column covers, and their required suspension system and acoustical treatments according to the standards or technical approvals shown under Section 9. Figure 1 provides a schematic for what is covered under the reporting scope of this PCR.

Figure 1. Metal Ceiling Product Scope Schematic



Applicable Products

The following Construction Specification Institute (CSI) Masterformat codes cover the scope of this Part B:

- 05 75 30 Column covers
- 07 42 00 Wall Panels
- 07 42 13 Metal Wall Panels
- 07 42 13.13 Formed Metal Wall Panels
- 07 42 13.16 Metal Plate Wall Panels
- 07 42 13.19 Insulated Metal Wall Panels
- 07 42 13.23 Metal Composite Material Wall Panels
- 07 42 63 Fabricated Wall Panel Assemblies
- 07 42 93 Metal soffit/ceiling panels
- 09 22 00 Supports for Plaster and Gypsum Board
- 09 22 26.23 Metal Suspension Systems
- 09 50 00 Ceilings
- 09 51 00 Acoustical Ceilings
- 09 51 13 Acoustical Panel Ceilings
- 09 51 23 Acoustical Tile Ceilings
- 09 51 33 Acoustical Metal Pan Ceilings
- 09 51 33.13 Acoustical Snap-in Metal Pan Ceilings
- 09 53 00 Acoustical Ceiling Suspension Assemblies
- 09 53 13 Curved Profile Ceiling Suspension Assemblies
- 09 53 23 Metal Acoustical Ceiling Suspension Assemblies
- 09 54 00 Specialty Ceilings
- 09 54 05 Specialty Ceilings
- 09 54 13 Open Metal Mesh Ceilings
- 09 54 19 Mirror Panel Ceilings
- 09 54 23 Linear Metal Ceilings
- 09 54 33 Decorative Panel Ceilings
- 09 54 36 Suspended Decorative Grids
- 09 56 00 Textured Ceilings
- 09 56 16 Metal-Panel Textured Ceilings
- 09 78 00 Interior Wall Paneling
- 09 78 13 Metal Interior Wall Paneling
- 05 75 00 Decorative Formed Metal

Corresponding applicable UNSPSC codes include:

- 30161600 Ceiling materials
- 30161601 Acoustic ceiling tiles
- 30161602 Ceiling panels
- 25172000 Suspension system components

Below are some details regarding how the scope would apply for the various types of metal ceilings.

Acoustical Ceiling Suspension System (Grid)

- Scope to include ceiling grid without hanger wires

Suspended Island Systems

- Scope to include required suspension grid without hanger wires
- Scope to include metal ceiling panels but not non-metal ceiling panels

Metal Ceiling Panels

- Scope to include metal ceiling panels and suspension grid without hanger wires

Metal Wall Panels and Column Covers

- Scope to include metal wall panels and/or column covers and supporting framework

Suspended Decorative Grids (i.e., open cell ceiling; no panels present)

- Scope to include decorative grid without hanger wires

Scope for metal ceilings to include all manufacturer supplied materials required to install the finished metal ceiling excluding hanger wires and attachment to the structure above.

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:

- Exterior cladding (covered by Product Category Rule (PCR) for Preparing an Environmental Product Declaration (EPD) for Product Group Cladding System Products, UL Environment, 2015.)
- Non-metal ceiling and wall systems
- Hangar wire, attachment clips, compression posts, vertical struts, lateral struts
- Primary structural systems in isolation such as joists, Unistrut™, and black iron are excluded from the scope of this PCR.

System Boundary

The system boundary for EPDs created using this PCR is either cradle to gate, cradle to gate with options (end of life), or cradle to grave.

The EPD requirements include:

- ISO 21930:2017 standard
- EN 15804 standard (optional)
- ULE General Program Instructions v 2.4, July 2018 (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 of the Product Category Rules, available at http://industries.ul.com/environment/transparency/product-category-rules-pcrs

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 the requirements listed in Section 2.2.4.1.

Industry-Average EPD Participation

A manufacturer qualifies for participation in an industry-average EPD created using this PCR if the manufacturer provides LCA data used to calculate the EPD average.

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 unless the Program Operator has information to the contrary, in which case the Program Operator, LCA practitioner, primary sponsor of the industry average EPD, and manufacturer shall confer in an effort to reach consensus.

Pending all criteria set forth by the primary sponsor of the industry average EPD are met, 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-wide LCA.

Governance

An industry organization, in this case the Ceilings and Interior Systems Construction Association ("*CISCA*") , shall inform possible industry participants through association meetings, newsletters, e-mail messages, and similar types of outreach, including public notices in the trade press publications. Confidential business information shall be collected by a third party. Data from the third party shall be provided to the facilitator as aggregated data 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

Trade associations 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 modeling software version and impact assessment version available.

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 years if: 1) significant changes have occurred in the manufacturing process; 2) new industry participants; 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 would also justify creation of an updated EPD.

Additional companies may be added to an existing industry-average EPD at the scheduled review by submitting data required for retroactive participation. However, this shall not automatically trigger a recalculation of the industry average impacts.

1. Content of the EPD

EPD Program and Program Operator Name, Address, Logo, and Website	Program Operator Provided
General Program Instructions and Version Number	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)	
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]
Range of Dataset Variability	[Industry-average only; mean, median, standard deviation]
EPD Scope	[Cradle to gate, cradle to gate with options (specify options), or cradle to grave]
Year(s) of reported manufacturer 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 Program Operator Provided 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 (September 2018), in conformance with ISO 21930:2017, serves as the core PCR, with additional considerations from the USGBC/UL Environment Part A Enhancement (2017) ☐ 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

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

Comparison of the environmental performance of Metal Ceiling and Wall System Products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under this PCR.

Full conformance with this PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

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. Industry Average EPD

The name of the sponsoring organization as well as participating manufacturers shall be provided.

2.1.2. 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.

2.2. 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: Industrially-manufactured metal ceiling systems to EN13964 made of edged or rolled metal sheets as comprehensive construction kits or individual components.

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 2.5.2 shall constitute an individual declared product. For each declared product, list the physical characteristics required in Section 2.6 – in the form that the product would be installed or sprayed and cured – along with the reference to the test standard for each. When pertinent, provide a description of the metal ceiling or wall product. Mass shall be based on the total amount of material needed to produce 1 m^2 of the given product, i.e. prior to yield losses, including any and ancillary materials. Other relevant product specification values may be provided here.

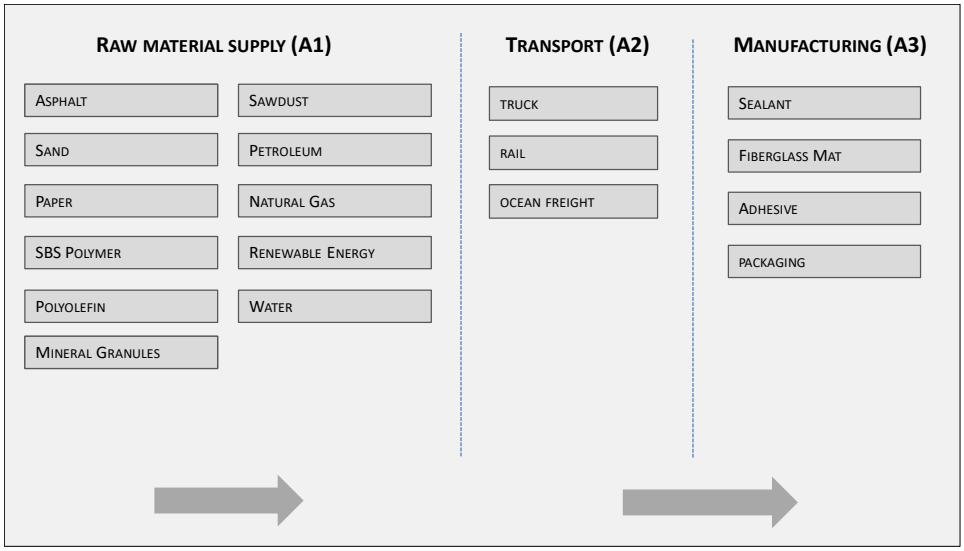
The appropriate ASTM or CSA product specification shall be provided, including additional pertinent physical properties and technical information.

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[1]

[1] This example flow diagram is specific to a fiberglass asphalt shingle product and other product types covered in this PCR will differ.



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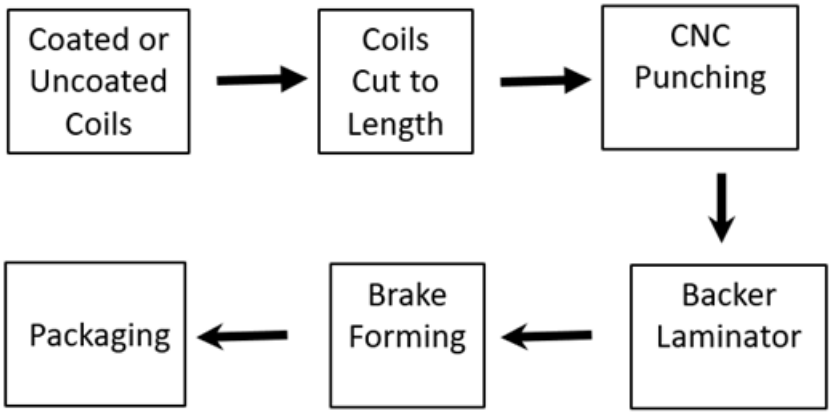

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307 **2.3. PRODUCT AVERAGE**

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309 **2.3.1 Industry Average EPD (if relevant)**

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

312

313 **2.3.2 Product Specific EPD**

314

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

318 **2.4. APPLICATION**

319 The designated applications for the referenced product(s) shall be specified. The applications of the declared
320 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.

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. If additives such as flame retardants, softeners or biocides are used, their functional chemical group shall be indicated.

Regulated Hazardous substances and dangerous substances shall be reported per Part A, Section 4.11.

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.

2.6. Technical Requirements

The appropriate ASTM or CSA product specification shall be provided, including additional pertinent physical properties and technical information. The following technical data for the product as delivered shall be provided with reference to the applicable test standard.

Table 1. Technical Data

Name	Value	Unit
Sound absorption coefficient (ASTM C423)	-	%
Light reflectance (ASTM E1477)		%
Standard specs for metal suspension systems (ASTM C635)		Pass/Fail
Standard test methods for surface burning characteristics of building materials (ASTM E84)		Flame spread/smoke developed
Standard test methods for fire tests of building construction and materials (ASTM E119)		Must meet building code requirements

2.7. Properties of Declared Product as Delivered

The product(s) declared in this document shall comply with at least one of the standards listed in Table 1.

The final evaluation report/certification/registration is available at: [Insert link]

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 (i.e. cradle-to-gate with end of life, including modules A1-A3 and C1-C4).

3.1. Functional Unit

For EPDs covering the complete life cycle, a functional unit shall be defined based on the functional use or performance characteristics of the product integrated into a building or other type of construction in the use phase. The functional unit shall be 1 m² of constructed area using the product, including all layers required to achieve the expected performance. Explanation of the selected functional unit shall be stated clearly, including the reference service life, installation methods and all ancillary materials such as, but not limited to, fasteners and adhesives.

3.1. Declared Unit

For EPDs not covering the complete life cycle, e.g. leaving out the use stage, a declared unit is defined. A declared unit shall be applied if the precise function of the product is not stated or not known. Conversion factors (e.g. density, thickness, moisture content, surface area etc.) shall be provided in order to allow the users to conduct further calculations (e.g. transport impacts, energy simulations). The declared unit shall be 1 kg. A weighted average thickness or other applicable aspects of the product shall be stated when the EPD deals with a generic or representative product group with different thicknesses. The weights shall reflect the relative production volumes for the relevant materials.

The mass and/or thickness to achieve the functional or declared unit shall be indicated in Table 2 as declared.

Table 2. Functional or Declared Unit Properties

Name	Value	Unit
Functional unit		Required: m^2 Optional: 1 ft^2 (0.093 m^2)
Declared unit		Required: kg Optional: lbs
Declared unit		Required: linear meter Optional: linear foot
Thickness to achieve Functional or Declared Unit		Required: mm Optional: in
Surface weight per Declared Unit		Required: kg/m^2 Optional: lbm/ft^2

A functional unit includes installed product and shall take into considerations 7% installation waste by default unless supporting documentation is provided.

3.1. System boundary

The type of EPD shall be specified as cradle to gate, cradle to gate with options (end of life), or cradle to grave. The modules considered in the LCA shall be described in brief 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 shall be reported separately if included in the EPD.

Capital goods and infrastructure flows shall be excluded from unit processes used to model the LCIA unless they significantly (>10%) affect the conclusions of the LCA or additional environmental information. The LCA report should specify lifetimes of capital goods and infrastructure included. The impact burden from capital goods and infrastructure shall be allocated to the product(s) in the LCA by either a) proportional to the specified lifetime of the asset, or b) proportional to the production output of the asset. Any deviation shall be explicitly specified and justified.

3.2. Product specific Calculations for use phase (Modules B1-B7)

Use-stage environmental impacts of asphalt roofing products during building operations depend on product maintenance.

3.3. Reference Service Life and Estimated Building service life

The reference service life and building estimated service life shall be indicated according to Part A, Section 2.8.2.

The assumptions upon which the designated RSL is based and for which the RSL exclusively applies shall be provided in Section 4, Table 5. Influences on ageing, when applied, shall be in accordance with the state of the art.

3.4. 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 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.

3.5. CUT-OFF RULES

Cut-off rules as specified per the Part A, Section 2.9 shall be used and documented. All known mass and energy flows shall be reported. No known flows should be deliberately excluded.

3.6. DATA SOURCES

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

3.7. 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.

All steel datasets should utilize the most recent Worldsteel datasets representing the source of the steel unless there is data specific to the steel supplier. All aluminum datasets should utilize the most recent industry (IAI or EAA) aluminum datasets representing the source of the aluminum**.**

3.8. PERIOD UNDER REVIEW

The period under review and ensuing averages shall be documented.

3.9. COMPARABILITY AND BENCHMARKING

Comparison of EPD results between non-competitive products may be included in this section per the requirements in Part A, Section 9.

3.10. ESTIMATES AND ASSUMPTIONS

Key assumptions and estimates in this section should be included in the Life Cycle Assessment, provided that they are not dealt with in Section 3 or Section 4.

Transport, installation, and deconstruction procedures are common to all products within the category. In the absence of primary data, the following assumptions should be used for products sold in North America. Any deviations from these assumptions (e.g. different geographies) shall be justified and explained.

TABLE 3. TRANSPORT, INSTALLATION, AND DECONSTRUCTION PROCEDURES

Product transport from point of manufacture to building site	Mode: Diesel-powered truck/trailer Distance: 800 km
Product transport from building site to waste processing	Mode: Diesel-powered truck/trailer Distance: 161 km
Installation & deconstruction procedures	Manual (no operational energy use)

3.11. 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.

4. 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).

Results reported in Table 6 through Table 9 shall be reported over the entire estimated building service life (ESL).

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, the production processes for all locations shall be described and reference to quality management systems may be included.

4.2. PACKAGING

Information on product-specific packaging: type, composition and possible reuse of packaging materials (paper, strapping, pallets, foils, drums, etc.) shall be included in this Section. The EPD shall describe specific packaging scenario assumptions, including disposition pathways for each packaging material by reuse, recycling, or landfill disposal based on packaging type.

If removable backing is used on the product, it should be considered as part of the packaging.

In the absence of specific primary data, the data assumptions from Part A, Section 2.8.5, Table 2 shall be used.

In the case of reusable packaging designed to last for multiple reuse cycles, one reuse shall be assumed in the absence of primary manufacturer data. At the end of its reuse cycle, reusable packaging shall be assumed to go to landfill.

4.3. TRANSPORTATION

The following information should be provided to specify any transport after the manufacturing gate: type of transport, type of vehicle, distance, type and amount of energy carrier.

TABLE 4. TRANSPORT TO THE BUILDING SITE (A4)

Name	Value	Unit
Fuel type		
Liters of fuel		l/100km
Vehicle type		
Transport distance		km
Capacity utilization (including empty runs, specify whether mass or volume based)		%
Gross density of products transported		kg/m^3
Weight of products transported (if gross density not reported)		kg
Volume of products transported (if gross density not reported)		m^3
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)		-

4.4. PRODUCT INSTALLATION

A description of the type of processing, machinery, tools, dust extraction equipment, ancillary materials, etc. to be used during installation and measures for reducing noise shall be included. Information on industrial and environmental protection may be included in this section.

Any waste treatment included within the system boundary of installation waste should be specified. Installation scrap shall be included in Module A5. A functional unit includes installed product and shall take into consideration 7% installation waste by default unless supporting documentation is provided.

TABLE 5. INSTALLATION INTO THE BUILDING (A5)

Name	Value	Unit
Ancillary materials		kg
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m^3
Other resources		kg
Electricity consumption		kWh
Other energy carriers		MJ
Product loss per functional unit		kg
Waste materials at the construction site before waste processing, generated by product installation		kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)		kg
Mass of packaging waste specified by type		kg
Biogenic carbon contained in packaging		kg CO_2
Direct emissions to ambient air, soil and water		kg
VOC emissions		µg/m3

Industry average scrap rates are currently not available, and industry has committed to develop values representative of practice in the field.

The VOC emissions shall be determined in accordance to “Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers- version 1.2” CA Specification 01350.

TABLE 6. REFERENCE SERVICE LIFE

A product’s RSL depends on the product properties and reference in-use conditions. These conditions shall be declared with a RSL and it shall be stated that the RSL only applies to these reference in-use conditions. The reference in-use conditions for achieving the declared technical and functional performance of the product and the declared RSL shall include the following, where relevant:

Name	Value	Unit
RSL		Years
Declared product properties (at the gate) and finishes, etc.		Units as appropriate
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)		Units as appropriate
An assumed quality of work, when installed in accordance with the manufacturer’s instructions		Units as appropriate
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature		Units as appropriate

Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)		Units as appropriate
Use conditions, e.g. frequency of use, mechanical exposure.		Units as appropriate
Maintenance, e.g. required frequency, type and quality of replacement components		Units as appropriate

4.5. USE

Any relevant information may be provided in this section regarding specific product use conditions and/or limitations relevant to product use, including a description of any maintenance, repair, replacement or refurbishment processes and/or a reference to where a description can be found.

Any relevant information may be provided in this section regarding specific product use conditions and/or limitations relevant to each product application and/or use, including a description of any maintenance, repair, replacement or refurbishment processes and/or a reference to where such descriptions may be found.

There is assumed to be no energy, material or water inputs required during the use phase of the metal ceiling or wall system.

TABLE 7. MAINTENANCE (B2)

Name	Value	Unit
Maintenance process information (cite source in report)		-
Maintenance cycle		Cycles/ RSL
Maintenance cycle		Cycles/ ESL
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m^3
Ancillary materials specified by type (e.g. cleaning agent)		kg
Other resources		kg
Energy input, specified by activity, type and amount		kWh
Other energy carriers specified by type		kWh
Power output of equipment		kW
Waste materials from maintenance (specify materials)		kg
Direct emissions to ambient air, soil and water		kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants)		

TABLE 8. REPAIR (B3)

Name	Value	Unit
Repair process information (cite source in report)		-
Inspection process information (cite source in report)		-
Repair cycle		Cycles/ RSL
Repair cycle		Cycles/ ESL
Net freshwater consumption specified by water source and fate (e.g., X m3 river water evaporated, X m3 city water disposed to sewer)		m^3
Ancillary materials specified by type (e.g. cleaning agent)		kg
Energy input, specified by activity, type and amount		kWh
Waste materials from repair (specify materials)		kg
Direct emissions to ambient air, soil and water		kg
Further assumptions for scenario development (e.g. frequency and time period of use, number of occupants);		

REPLACEMENT (B4) / REFURBISHMENT (B5)

Metal ceilings shall be assumed to last the entire duration of the building ESL with no replacements.

4.6. 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

TABLE 9. 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

4.7. RE-USE PHASE

The possibilities of re-use, recycling and energy recovery shall be described.

TABLE 10. REUSE, RECOVERY AND/OR RECYCLING POTENTIALS (D), RELEVANT SCENARIO INFORMATION

Name	Value	Unit
Net energy benefit from energy recovery from waste treatment declared as exported energy in C3 (R>0.6)		MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (R<0.6)		MJ
Net energy benefit from material flow declared in C3 for energy recovery		MJ
Process and conversion efficiencies		
Further assumptions for scenario development (e.g. further processing technologies, assumptions on correction factors);		

5. Environmental Indicators Derived from LCA

5.1. LCA Results from LCIA

In Table 13, "Description of the system boundary," all declared modules shall be indicated with an "X".

Modules A1, A2, and A3 may be declared as one aggregated module A1-A3.

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.

- North America (Part A, Section 4.7, Table 9, TRACI indicators)
- EU (Part A, Section 4.8, Table 10, CML indicators)
- Rest of World (Part A, Section 4.9, Table 11, indicators as provided)

Table 11. Description of the System Boundary Modules

	PRODUCT STAGE			CONSTRUCT-ION PROCESS STAGE		USE STAGE					END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY	
	A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**C1**	**C2**	**C3**	**C4**	**D**	
	Raw material supply	Transport	Manufacturing	Transport from gate to site	Assembly/Install	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling Potential	Reference Service Life
						B6 Operational Energy Use of Building Integrated System During Product Use										
						B7 Operational Water Use of Building Integrated System During Product Use										
Cradle to installation with end of life	*Required*			*Optional (Based on scenarios)*							*Optional*				*Optional*	Required

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. 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.

7.2. 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”.

7.3. Extraordinary Effects

Fire

Information should be included on the product’s fire performance and possible impacts on the environment e.g. reaction-to-fire, other relevant fire tests as applicable, and emissions to air.

Water

Information should be included on the product’s performance and possible impacts on the environment following unforeseeable influence of water, e.g. flooding.

Mechanical destruction

Information should be included on the product’s performance and possible impacts on the environment following unforeseeable mechanical destruction.

7.4. Delayed Emissions

If a manufacturer wishes to declare quantitative or qualitative information on delayed emissions used to calculate Global Warming Potential within the EPD, information may be provided here. See Part A, Section 4.4 for more information.

7.5. 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, should 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.

7.8. 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.

If relevant to the scope of the declared product, or due to the product material composition, it is recommended to provide sufficient supporting documentation in the EPD and Project Report. When providing documentation, testing protocols and other relevant information shall be indicated. If supporting documentation is not provided, the reasons shall be indicated in the EPD and Project Report.

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 quoted in full from the following sources. Standards and standards relating to evidence and/or technical features already fully quoted 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 April 2017, version 2.1

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

CHARACTERIZATION METHODS

IPCC. 2014. CLIMATE CHANGE 2013. THE PHYSICAL SCIENCE BASIS. CAMBRIDGE UNIVERSITY PRESS. http://www.ipcc.ch/report/ar5/wg1/ Accessed 09December 2018

Hauschild M.Z., & Wenzel H. Environmental Assessment of Products. Springer, US, Vol. 2, 1998

Heijungs R., Guinée J.B., Huppes G., Lankreijer R.M., Udo de Haes H.A., Wegener Sleeswijk A. Environmental Life Cycle Assessment of Products: Guide and Backgrounds. CML. Leiden University, Leiden, 1992

Jenkin M.E., & Hayman G.D. Photochemical ozone creation potentials for oxygenated volatile organic compounds: sensitivity to variations in kinetic and mechanistic parameters. Atmospheric Environment. 1999, 33 (8) pp. 1275–1293

WMO. 1999. Scientific Assessment of Ozone Depletion: 1998, World Meteorological Organization Global Ozone Research and Monitoring Project – Report No. 44, WMO, Geneva

USE PHASE ASSUMPTIONS

United States Environmental Protection Agency, WaterSense, Office of Wastewater Management (4204M), 2014 https://www.epa.gov/aboutepa/about-office-water#wastewater Accessed 09 December 2018

SUSTAINABILITY REPORTING STANDARDS

EN 15804: 2012-04 - 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 14046:2013 - Environmental management- Water footprint- Principles, requirements and guidelines

ISO 15392:2008 - Sustainability in building construction- General principles

ISO 15686-1:2011 - Buildings and constructed assets- Service life planning Part 1: General principles

ISO 15686-2:2008 - Buildings and constructed assets- Service life planning Part 2: Service life prediction procedures

ISO 15686-7:2008 - Buildings and constructed assets- Service life planning Part 7: Performance evaluation for feedback of service life data from practice

ISO 15686-8:2008 - Buildings and constructed assets- Service life planning Part 8: Reference service life and service life estimation

ISO 21930: 2007 - 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).

TESTING AND CLASSIFICATION REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH®) Threshold Limit Values and Biological Exposure Indices

Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers- version 1.2, January 2017.

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

US: Resource Conservation and Recovery Act (RCRA), Clause C (https://www.epa.gov/rcra) Accessed 08 December 2017.

40 CFR 50 Protection of Environment - Part 50: National Primary and Secondary Ambient Air Quality Standards (U.S.) (https://www.epa.gov/criteria-air-pollutants/naaqs-table) Accessed 08 December 2017.

Clean Air Act (CAA) Section 112(r): Accidential Release Prevention/Public Management Rule (https://www.epa.gov/sites/production/files/2013-10/documents/caa112_rmp_factsheet.pdf) Accessed 08 December 2017

CERCLA Hazardous Substances (U.S.) (https://www.epa.gov/epcra/epcracerclacaa-ss112r-consolidated-list-lists-march-2015-version) Accessed 08 December 2017.
U.S. Department of Labor, Occupational Safety & Health Administration (OSHA 1910.1200 Hazard Communication Standard—Toxic and Hazardous Substances (U.S)
(http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099)

RELEVANT PCRS

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

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

Part B: Requirements on the EPD for Metal Ceilings. Institute of Construction and Environment e.V., Königswinter (October 2013, version 1.5)

ASTM STANDARDS

ASCE 7-10: Minimum Design Loads for Buildings and Other Structures

ASTM A568: Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

ASTM A641: Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire

ASTM A653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM C423: Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

ASTM C635: Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

ASTM C636: Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels

ASTM D1002: Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded

ASTM E1477: Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers

ASTM E488: Standard Test Methods for Strength of Anchors in Concrete Elements

ASTM E580: Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions

ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials