Part B: Product group definition | Stone flooring

Initiated by	**Natural Stone Institute** Sarah@NaturalStoneInstitute.org https://www.naturalstoneinstitute.org/
Other company(s) and organization(s) involved	**Members of NSI**

Product group

Name	**Interior and exterior stone flooring**	**CSI MasterFormat® #(s)**	04 41 00 09 63 40 32 14 40
Description Define the types of products included under this Part B	Flooring products made from natural quarried stone including residential and commercial installed products. Applications include but are not limited to interior flooring, exterior flooring, landscaping, and terracing. In the case that a company or industry manufacturers stone flooring products from multiple stone types and/or grades, these may be disclosed individually or aggregated into an average. Structural enhancement components such as fasteners and reinforcing materials should be included in the scope if they are part of a typical installation. If they are not included, a justification shall be provided which includes the mass of the omitted components and the reason why they are omitted.		
New Part B request? Yes / No	Yes	**Update to an existing Part B?** Yes / No	No
Validity date	04/06/2022 – 04/05/2027		
Existing PCRs, EPDs, TRs, or LCAs This information will be used to identify additional rules for comparability and to substantiate the rationale for creating a Part B.	A similar existing PCR exists for flooring: Product Category Rules (PCR) Guidance for Building-Related Products and Services Part B: Flooring EPD Requirements, UL Environment Standard 10010-7, Edition 1. September 28, 2018. The intent of this new Part B is to be as similar as possible to the existing UL PCR except to include stone, which the UL PCR specifically excludes.		
Relevant literature and published material	Refer to several resources available from the Natural Stone Council: https://naturalstonecouncil.org/resources		

Functional performance

Standard/certification	URL
1. ASTM C503, Standard Specification for Marble Dimension Stone (Exterior)	https://www.astm.org/Standards/C503.htm
2. ASTM C568, Standard Specification for Limestone Dimension Stone	https://www.astm.org/Standards/C568.htm
3. ASTM C615, Standard Specification for Granite Dimension Stone	https://www.astm.org/Standards/C615.htm
4. ASTM C616, Standard Specification for Quartz-Based Dimension Stone	https://www.astm.org/Standards/C616.htm
5. ASTM C629, Standard Specification for Slate Dimension Stone	https://www.astm.org/Standards/C629.htm
6. ASTM C1526, Standard Specification for Serpentine Dimension Stone	https://www.astm.org/Standards/C1526.htm
7. ASTM C1527, Standard Specification for Travertine Dimension Stone	https://www.astm.org/Standards/C1527.htm

System boundary

System boundary	The type of EPD shall be specified as cradle to grave. The modules considered in the LCA shall be described in brief as per "System boundaries" outlined in ISO 21930:2017 section 5.2 (and optionally EN 15804:2012 + A1:2013 section 6.2). For reference, the life cycle stages are shown in Figure 1 as depicted in ISO 21930:2017. It shall be apparent as to what processes are considered in what modules per the module descriptions in ISO 21930:2017 section 7.1.7. 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. Capital goods and infrastructure flows for flooring do not significantly affect the results and conclusions of the LCA or additional environmental information and shall be excluded from unit processes used to model the LCIA.

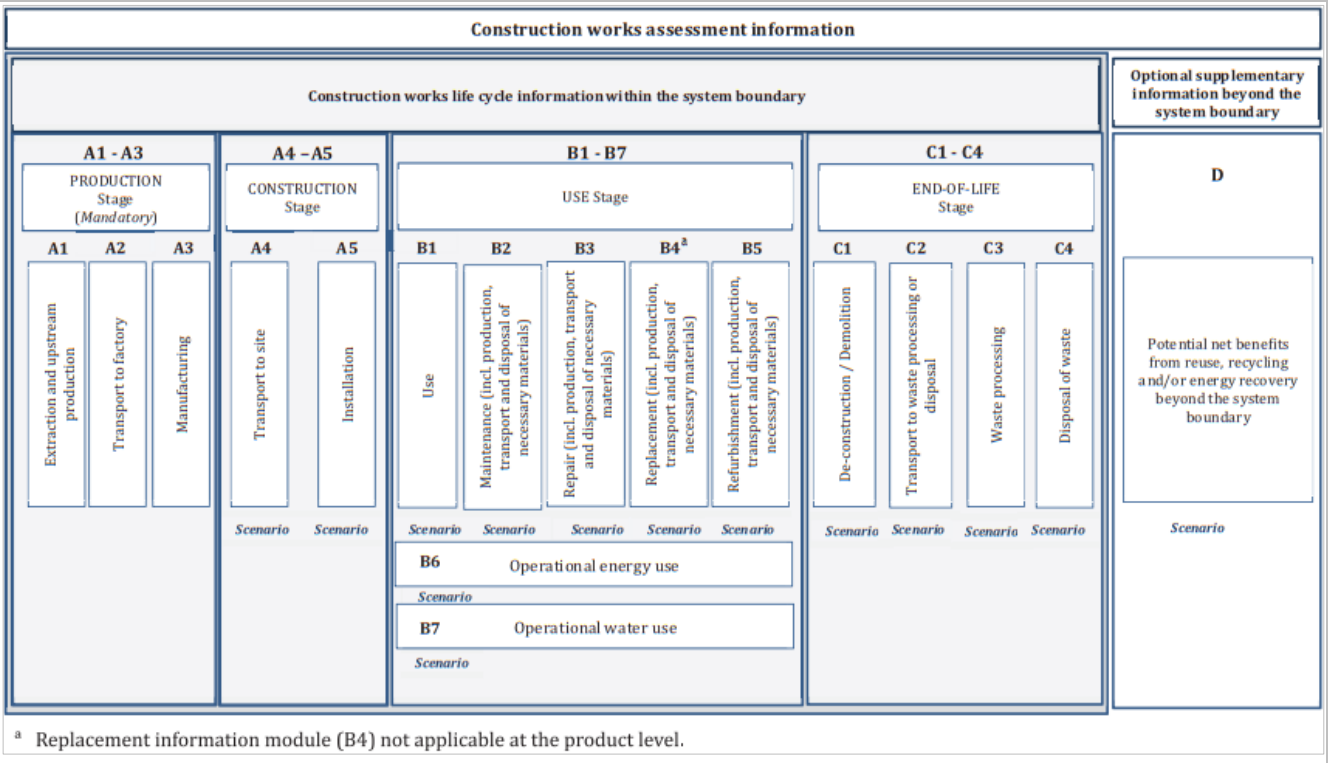

Figure 1. Life cycle stages as depicted in ISO 21930:2017

Technical data

Product properties	The following properties of the product declared in the EPD shall be reported. If any are not applicable to the reported product, then state "Not applicable". Industry average EPDs that contain multiple stone types must list each stone type represented.

Table 1. Product properties

Name	Value	Unit
Stone type(s)		
Stone grade(s)		
Thickness*		mm
Product weight		kg/m^2

*Minimum disclosed thicknesses shall be 10 mm for interior products and 30 mm for exterior products

Functional unit

Unit	**Required: One square meter of floor covering.** In addition, the mass needed to achieve the functional unit shall be reported as follows: **Table 2. Functional unit and mass** **Name** / **Value** / **Unit** Functional Unit: 1 m^2 Mass: kg
Rationale	This functional unit meets the applicable function of the products and is consistent with the existing UL PCR cited above.

Additional rules for comparability

1. Clarification More product group specificity as needed	None
2. Additional rules to Part A	The following results derived from the product life cycle inventory shall be reported. Refer to the ACLCA ISO 21930 Guidance Document for further calculation instructions. **Table 3. Resource Use Indicators**

Parameter	Description	Unit
RPR_E: Renewable primary resources used as energy carrier (fuel)	(First use) bio-based materials used as an energy source. Hydropower, solar and wind power used in the technosphere are also included in this indicator	MJ
RPR_M: Renewable primary resources with energy content used as material	(First use) biobased materials used as materials (e.g., wood, hemp, etc.).	MJ
$NRPR_E$: Non-renewable primary resources used as an energy carrier (fuel)	(First use) materials such as peat, oil, gas, coal, uranium used as an energy source.	MJ
$NRPR_M$: Non-renewable primary resources with energy content used as material	(First use) primary resources such as oil, gas, and coal, used for products (e.g., plastic-based products).	MJ
SM: Secondary materials	Materials recycled from previous use or waste (e.g., scrap metal, broken concrete, broken glass, plastic, and wood) that are used as a material input from another product system. These include both renewable and non-renewable resources, with or without energy content, depending on the status of the material when it was originally extracted from the environment.	kg
RSF: Renewable secondary fuels	Renewable materials with energy content that have crossed the system boundary between product systems and are used as fuel input (energy source) in another product system (e.g., biomass residue pellets, chipped waste wood).	MJ
NRSF: Non-renewable secondary fuels	Non-renewable materials with energy content that have crossed the system boundary between product systems and are used as fuel input (energy source) in another product system (e.g., processed solvents, shredded tires).	MJ
RE: Recovered energy	Energy recovered from disposal of waste in previous systems, such as energy recovery from	MJ

	combustion of landfill gas or energy recovered from other systems using energy sources.	
FW: Use of net freshwater resources	Net freshwater consumption shall be calculated according to ISO 14046. Net freshwater is equal to consumptive freshwater use (freshwater consumption) and should not consider water which is not consumed. The parameter contains: evaporation (e.g., cooling towers), evapotranspiration (evaporation of irrigated water), embedded freshwater (e.g., concrete), drainage of freshwater into the ocean. Further guidance is provided in ISO 21930:2017, Section 7.2.13.	m^3

Output Flows and Waste Category Indicators

The indicators describing waste categories and other material flows are output flows derived from LCI and shall be reported according to ISO 21930:2017 Section 7.2.14 and EN15804:2012+A1:2013 Section 7.2.5. They shall be included in the EPD as follows:

Table 4. Output flows and waste category indicators

Parameter	Parameter	Unit
HWD	Hazardous waste disposed	kg
NHWD	Non-hazardous waste disposed	kg
HLRW	High-level radioactive waste, conditioned, to final repository	kg or m^3
ILLRW	Intermediate- and low-level radioactive waste, conditioned, to final repository	kg or m^3
CRU	Components for reuse	kg
MR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EE	Recovered energy exported from the product system	MJ, lower heating value (LHV) per energy carrier

"Hazardous waste disposed" is the amount of hazardous waste that is disposed according to Table 16 in the Life Cycle Stage scenarios. Radioactive waste is not included.

"Non-hazardous waste disposed" is the amount of non-hazardous waste that is disposed.

"Radioactive waste disposed" is the amount of radioactive waste that is disposed. High-level radioactive waste, e.g., when generated by electricity production, consists mostly of spent fuel from reactors. Low- and intermediate-level radioactive wastes, e.g., when generated by electricity production, arise mainly from routine facility maintenance and operations. See ISO 21930:2017 Section 7.2.14, Table 4 for how to assign output flows to information modules C1-C4.

The output material flows are declared in the module from which they cross the system boundary, as a rule when they reach the system boundary between product systems

NOTE: For the calculation and communication of indicators on environmental aspects:

As long as the LCA software used does not allow distinguishing the primary energy used as raw material or as energy carrier, it is permissible to calculate the primary energy as a fuel source across modules A1-A3 as the difference between total primary energy and primary energy used as a raw material, where primary energy used as a raw material is calculated based on the product material composition and corresponding lower heating values (LHVs) of the materials. LHV values are often contained in inventory database descriptions or available by government agencies. In this case, the method and LHV values used shall be indicated by an accompanying footnote in the table.

Example: If natural gas is used as both heating energy and as a raw material for polymer resin, and a breakdown of $NRPR_E$ / $NRPR_M$ is not available directly from the LCA software, it can be calculated by calculating the total heating of combustion (LHV) of all of the natural gas and subtracting the heat of combustion (LHV) of the natural gas feedstock for the polymer resin ($NRPR_M$).

As long as the used LCA software does not allow calculating the use of secondary materials or secondary fuels directly, it is permissible to declare these indicators based on available information from the main system (i.e., manufacturer´s data) as a minimum value. In this case, the method shall be indicated by an accompanying footnote in the table.

Carbon Emissions and Removals

Stone does not contain biogenic carbon. However, some packaging material or other ancillary material might contain biogenic carbon. If biogenic carbon is included in the reported GWP calculations, relevant carbon emissions and removal metrics shall be reported per Table 5. If carbon emissions and removal metrics in Table 5 cannot be disclosed, biogenic carbon shall be excluded from GWP calculations.

Table 5. Carbon emissions and removals

Parameter	Parameter	Unit
BCRK	Biogenic Carbon Removal from Packaging	kg CO_2
BCEK	Biogenic Carbon Emission from Packaging	kg CO_2
BCEW	Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO_2
CWNR	Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	kg CO_2

3. Default life cycle stage scenario(s)

Calcination and carbonation are not relevant to the life cycle of stone flooring products. A statement that these are not relevant shall be included in the LCA background report.

The following technical information and scenario requirements match UL's PCR cited above.

The following information shall be reported. If a life cycle module does not have associated activity or impacts, then those module rows may be excluded in the EPD but there must be an accompanying statement that there is no activity or impacts associated with the applicable module(s); additional information may also be listed if necessary.

The following technical information is a basis for each module.

Results reported in the following tables shall be reported over the entire building estimated service life (ESL).

Manufacturing

The manufacturing process and locations shall be described. 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. A graphical depiction of a flow diagram illustrating main production processes according to the scope of the declaration shall be included.

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 re-use, recycling, or landfill disposal based on packaging type.

The following disposal pathways shall be used for the product packaging unless justified otherwise.

Table 6. Packaging Disposal Assumptions by Region [1]

Country/Region	Material	Recycling Rate	Landfill Rate	Incineration Rate
Brazil	Plastic	13.5%	86.5%	0%
	Metals	70%	30%	0%
	Glass	2.4%	97.6%	0%
	Pulp (cardboard, paper)	13.1%	86.9%	0%
	Wood	51.4%	48.6%	0%
Canada	Plastics	78%	22%	0%
	Other materials	20%	80%	0%
China	Plastics	25%	56%	19%
	Metals	20%	80%	0%
European Union	Plastic	40.3%	28.7%	31.0%
	Metals	76.2%	23.3%	0.5%
	Glass	73.2%	26.7%	0.1%
	Pulp (cardboard, paper)	82.8%	9.4%	7.8%
	Wood	39.8%	34.5%	25.7%
India	All	10%	90%	0%
Japan	Metals	98%	2%	0%
	Other materials	21%	1%	78%
Korea	All	83.9%	9.4%	6.1%
United States	Plastics	15%	68%	17%
	Metals	57%	34%	9%
	Pulp (cardboard, paper)	75%	20%	5%

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.

Transportation to the building site

The following information shall be provided to specify transport after the manufacturing gate to the building site:

Table 7. Transport scenario parameters

Name	Value	Unit
Fuel type		
Liters of fuel		l/100 km
Vehicle type		
Transport distance		km
Capacity utilization (including empty runs, specify whether mass or volume based)		%

[1] Underwriters Laboratories. Product Category Rules for Building-Related Products and Services in: Brazil, China, Europe, India, Japan, South Korea, North America, Southeast Asia; Part A: Life Cycle Assessment Calculation Rules and Report Requirements. UL 10010 version 3.2. December 2018.

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)		-

In the absence of primary data or other justification, the EPD shall assume product is transported via diesel-powered truck/trailer from the manufacturing site to the building site for a distance of 800 km. This includes intermediate stops through a distribution network, if applicable.

Product Installation

A description of the type of processing, machinery, tools, dust extraction equipment, ancillary materials, etc. to be used during installation 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.

The following information regarding product installation shall be disclosed in the EPD.

Table 8. Installation scenario parameters

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/m^3

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

In the absence of primary data, the EPD shall assume waste is transported via diesel-powered truck/trailer from the building site to the waste processing site for a distance of 161 km.

Reference Service Life

A product’s reference service life (RSL) depends on the product properties and reference in-use conditions. These conditions shall be declared with an 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:

Table 9. Reference Service Life Information

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, vehicle loads		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

Note: Due to the nature of natural stone, it is anticipated that most stone flooring products will last for the lifetime of the building.

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.

The following information on maintenance and repair shall be provided based on the manufacturer's recommendations. In the absence of primary data, assumptions (e.g., cleaning) shall be documented and reported in the EPD.

Table 10. Maintenance scenario parameters

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 11. Repair scenario parameters

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)

The number of replacements of product expected during the building ESL of 75 years shall be declared. Required or expected maintenance are to be modeled according to manufacturer's guidelines. Assumptions and key parameters shall be clearly stated, and the manufacturer is to submit supporting documentation to justify the assumptions made.

If the RSL is less than the building's ESL of 75 years, the number of replacements that will be necessary to fulfil the required performance and functionality over the building ESL shall be identified.

Replacements should be rounded-up to the nearest tenths of the ESL of the building, e.g., 1.42 rounded to 1.5.

Table 12. Replacement (B4) scenario parameters

Name	Value	Unit
RSL		Years
Replacement cycle		(ESL/RSL) – 1
Energy input, specified by activity, type and amount		kWh
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 and amount (e.g., cleaning agent)		kg
Replacement of worn parts, specify parts/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)		As appropriate

Table 13. Refurbishment (B5) scenario parameters

Name	Value	Unit
Refurbishment process description (cite source in report)		
Replacement cycle		Cycles/RSL
Replacement cycle		Cycles/ESL

Energy input, specified by activity, type and amount		kWh
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
Material input for refurbishment, including ancillary materials specified by type (e.g., cleaning agent)		kg
Waste material(s), specified by material		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)		

Operational Energy Use (B6) / Operational Water Use (B7)

The following operational energy and water use parameters shall be declared in the EPD.

Table 14. Operational energy and water use scenario parameters

Name	Value	Unit
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		kg
Energy input, specified by activity, type and amount		kWh
Equipment power output		kW
Characteristic performance (e.g., energy efficiency, variation of performance with capacity utilization)		Units as appropriate
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)		As appropriate

Disposal

The possible disposal channels shall be indicated in accordance with disposal routes and waste classification referenced in Table 15 and Table 16.

The following disposal pathways for the product shall be used by region or country unless justified otherwise. Results for each of the individual options shall also be separately reported (i.e., if results are presented of a scenario that includes landfill, recycling, and incineration, then results must also be presented separately for 100% landfill, 100% recycling, and 100% incineration).

Table 15. Product Disposal Assumptions by Region

Country/Region	Material	Recycling Rate	Landfill Rate	Incineration Rate
Brazil	All	0%	100%	0%
Canada	All metals	85%	15%	0%
	Other materials	7%	93%	0%
China	All	5%	95%	0%
European Union	All	50%	50%	0%
India	All	0%	100%	0%
Japan	All	53%	47%	0%
Korea	All	83.9%	16.1%	0%
United States	All metals	85%	15%	0%
	Other materials	0%	100%	0%

South East Asia - Malaysia	Concrete and aggregate	68%	32%	0%
	Wood	4%	96%	0%
	Others	0%	100%	0%
South East Asia - Singapore	All	94%	6%	0%
South East Asia - Other	All	5%	95%	0%

The following relevant legislation references shall be used by region or country:

Table 16. Waste classification by region

Country/Region	Legislation
Brazil	Annex 1-A to 1-C of the CONAMA Resolution no 23, from December 12, 1996, unless they do not present any characteristics listed in Annex II of the same legislation. Annex 10-A and 10-B of the CONAMA Resolution no 235, from January 7, 1998.
China	List of Toxic Chemicals Severely Restricted on the Import and Export in China (Circular No. 65 [2005]) Measures for the Administration of Restricted Use of Hazardous Substances in Electrical and Electronic Products (Circular No. 32 [2016])
Europe	REACH Substances of Very High Concern
India	REACH Substances of Very High Concern
Japan	Hazardous wastes defined by the Basel Law are as follows: A. The following materials which are exported or imported for the disposal operations listed in Annex IV of the Basel Convention. 1. Materials listed in Annex I of the Convention and having one or more hazardous characteristics listed in Annex III of the Convention; 2. Materials listed in Annex II of the Convention; 3. Materials to be notified to the Secretariat of the Convention by the Government of Japan through the designation by the Cabinet Order in accordance with Section 1 or 2 of Article 3 of the Convention; and 4. Materials informed by the Secretariat of the Convention in accordance with Section 3 of Article 3 of the Convention. B. Materials, exportation, importation, transportation (including storage) and disposal of which must be regulated based on bilateral, multilateral, or regional agreements or arrangements defined in Article 11 of the Convention.
Korea	Waste Control Act with some regulation under the Act on the Promotion of Saving and Recycling of Resources.
North America	Resource Conservation and Recovery Act (RCRA), Subtitle 3
Southeast Asia	REACH Substances of Very High Concern

The following end of life scenario parameters shall be declared in the EPD. In the absence of primary data, the EPD shall assume product is transported via diesel-powered truck/trailer from the building site to the waste processing site for a distance of 161 km.

Table 17. End of Life (C1-C4) scenario parameters

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

Re-use Stage

The possibilities of re-use, recycling, and energy recovery may be described. If module D is optionally included, the following scenario parameters shall be declared in the EPD.

Table 18. 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 (Recovery percentage > 60%)		MJ
Net energy benefit from thermal energy due to treatment of waste declared as exported energy in C4 (Recovery percentage < 60%)		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);		

4. Additional data quality requirements
Pertaining to the product group

Data Selection and Data Quality Requirements

The requirements ISO 21930:2017 Section 7.1.9 shall be used in developing the EPD.

The data selection and collection procedures shall be documented in the project report.

Primary data shall be collected for every process in the product system under the control of the organization developing the LCA. Primary data shall be collected using either direct measurement or facility personnel's best engineering estimates based on actual production if measurements are not available. The method of collection shall be specified for each process in the LCA report.

The specified secondary sources should have temporal, geographic, and technological coverage appropriate to the scope of the product category. The system boundaries of the secondary sources should be equivalent and reference flows should be adaptable to the product system specified in the PCR. Allocation procedures used in the specified secondary sources should be appropriate for the product category.

For industry-average EPDs, data shall be collected from participants in a consistent manner.

All data sources shall be specified, including database and year of publication (reference).

Secondary data sources from regions other than the primary market may be used only if primary market data are unavailable in any commercial database. The substitute source shall be cited and key data properties provided, including geographical origin, temporal, and technology.

As a general rule, specific data derived from specific production processes shall be the first choice as a basis for calculating an EPD.

	Manufacturer-specific data sets shall be based on 12 consecutive months of averaged data; deviations shall be justified in the project report. If future production conditions are to be incorporated at the time of generating the EPD, the following shall apply: • Processes which do not have an influence on the manufacturing process (e.g., procurement of green electricity) may be integrated in the Declaration. For green electricity, this means that the Declaration may not be issued until such a time as procurement takes place and is verified by contract. • For processes which have an influence on manufacturing processes (e.g., new furnace), data must be available over a certain period of time which provides a representative set of data for the new process. In this case a minimum of 3 months is required along with a statement that the data is expected to be representative of future operations. An evaluation of data quality, including temporal, geographical, technological representativeness, and completeness, shall be included in the project report. If the data quality assessment gives sufficient reason to believe that any of the employed generic material or process LCI data is not representative of the product(s) under study and may introduce error to the reported impact category results, then a reasonable effort shall be made by the declaring organization to improve the data quality either by 1) collecting primary data on the material or process in question from suppliers or process operators, 2) developing LCI data based on other data sources like scientific literature, equipment specs, or trade publications, or 3) assessing whether more representative LCI data is available. If none of these options is viable within given constraints, then a sensitivity analysis shall be conducted on the subject data to show its potential effect on the study results, and the source and nature of the expected error shall be documented in the project report and a disclaimer should be added to the EPD that the reported values are likely an over- or underestimate of potential environmental burdens.

Additional LCA calculation rules

N/A	Optional	Required	*Indicate whether conformance is the manufacturer's choice or required for EPD/TR. Refer to Part A: Compatibility appendices for content requirements.*
		X	ISO 21930:2017
	X		EN 15804:2012 + A1:2013
	X		EN 15804:2012 + A2:2019

Industry average EPD requirements

Requirements	<u>Participation and representativeness</u> 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, unless otherwise justified. The method for determining representativeness shall be described. To ensure an industry-average EPD is representative, the information provided in the average EPD and in the LCA report shall be presented according to ISO 21930:2017 Section 5.3. Include how a sufficient statistical representation is achieved, how geographic location is assessed, and how the average is weighted to ensure sufficient representation so as to avoid bias. A quantitative assessment of primary dataset variability, including mean, median, standard deviation, and best fitting probability distribution function shall be included. The method of dataset averaging shall be described and justified. The justification shall consider if data is more appropriately represented by standalone gate-to-gate processes (horizontal averaging) versus capturing the flow of goods within a facility(ies) (vertical averaging). A qualitative assessment shall be provided within the EPD that estimates percent representation of industry and percent geographical region representation, the median reference flow units (e.g., weight, area, volume), and other contributing sources of variation (e.g., operational capacity, grid mix). Per ISO

21930:2017 Section 5.3, a sensitivity analysis should be conducted on the differences between the products included the average.

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

A manufacturer desiring retroactive inclusion in the industry average EPD shall provide the manufacturing and product data information submitted in the original industry average EPD to the LCA practitioner. The 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.

When determining a manufacturer's participation eligibility, the EPD Program Operator shall follow the 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.

Governance

An industry organization, such as a trade association, 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 operational information 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.

Industry-Average EPD Updates

Industry-average 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 the EPD's primary sponsor determines that:

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.