Product Category Rules (PCR) For Preparing an Environmental Product Declaration for:

PORTLAND CEMENT, BLENDED HYDRAULIC CEMENT, AND MASONRY CEMENT
(UN CPC 3744)

Date: X, 2014

Validity Period: X, 2019

Referenced PCR: UN CPC 3744 Cement, 2010:09 V2.0, Centre for the Development of Product Sustainability in co-operation with AITEC, 2013-05-16
Scope of Validity of these PCR
These PCR apply to portland cement, blended hydraulic cement, and masonry cement.

Program Operator
ASTM International

Interested Parties
Representatives of the following organizations participated in development of the PCR:


Additional contributors: Cement Association of Canada, P.E., Emily Lorenz, P.E., National Ready Mixed Concrete Association, Northwestern University, W. Adam Slivers, Trinity Consultants, and Martha G. VanGeem, P.E.

Review Panel
Chair and panel members with contact information.

The PCR peer review report is available upon request at: cert@astm.org
1.0 General Information

These product category rules (PCR) have been developed under the general program instructions for ASTM International’s Environmental Product Declaration (EPD) Program. The PCR are intended for use by North American organizations and other interested parties for preparing EPDs for portland cement, blended hydraulic cement, and masonry cement.

The referenced PCR UN CPC 3744 Cement, 2010:09 V2.0, Centre for the Development of Product Sustainability in co-operation with AITEC, 2013-05-16 are inappropriate for adoption or direct adaptation as PCR for portland cement, blended hydraulic cement, and masonry cement in the North American context.

- PCR 2010:09 Version 2.0 lists and refers to European technical data and standards such as EN 197-1 that are not applicable to North America. North American cements are specified and classified differently.
- PCR 2010:09 Version 2.0 permits the reporting of different environmental impact categories. Characterization factors are provided for abiotic depletion potential, and those factors are listed in CML-IA. ASTM PCR specifies the use of EPA TRACI methodology as the primary reporting method.
- PCR 2010:09 Version 2.0 requires listing “as a minimum, substances contained in the product that are listed in the ‘Candidate List of Substances of Very High Concern (SVHC) for authorization’ when their content exceeds the limits for registration with the European Chemicals Agency.” Listing of substances pertaining to the European Chemicals Agency is not standard practice in the North America.
- PCR 2010:09 Version 2.0 requires emissions be reported according to European Pollutant Release and Transfer Register (E-PRTR), which is specific to Europe.

1.1 | GOAL AND SCOPE

This PCR document specifies rules, requirements, and guidelines for developing EPDs for portland cement, blended hydraulic cement, and masonry cement and underlying requirements of related LCAs. These PCR are valid for, and provide requirements for Business-to-Business (BtoB) EPDs.

An EPD prepared under these PCR will present data that has been aggregated over the following phases of the life cycle:

- raw materials acquisition;
- transportation; and

1 http://echa.europa.eu/web/guest/candidate-list-table
These PCR are consistent with and comply with the mandatory requirements contained in the following standards:

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

As indicated in Section 12, References, the CEN EN15804 standard has been consulted with regard to selected requirements and presentation details that go beyond or expand on the above-noted ISO standards.

1.2 | EPD Ownership/Responsibility

The producers or group of producers who develop an EPD following these PCR maintain sole ownership and have responsibility and liability for their EPD.

2.0 Period of Validity

This PCR document is effective for five (5) years from the latest date of publication. If after five years, relevant changes in the product category or other relevant factors have occurred (for example, LCA methodology), the document will be revised.

An EPD created under these PCR shall be valid for a five (5) year period from the date of issue after which it shall be reviewed and verified. An EPD shall be reassessed and updated after five years as necessary to reflect changes in technology or other circumstances that could alter the content and accuracy of the declaration. The process for verification and establishing the validity of an EPD shall be in accordance with ISO 14025 and ISO 21930.

3.0 Definitions

For the purposes of this document, the definitions given in ISO 6707-1, ISO 14025, ISO 14044, ISO 14050, ISO 21930 and the following apply.

*cement, blended hydraulic, n* — a hydraulic cement consisting of two or more inorganic constituents (at least one of which is not portland cement or portland cement clinker)
which separately or in combination contribute to the strength gaining properties of the cement, (made with or without other constituents, processing additions and functional additions, by intergrinding or other blending). (ASTM C219)

cement, masonry, n- a hydraulic cement manufactured for use in mortars for masonry construction or in plasters, or both, which contains a plasticizing material and, possibly, other performance-enhancing addition(s). (ASTM C219)

cement, portland, n— a hydraulic cement produced by pulverizing clinker, consisting essentially of crystalline hydraulic calcium silicates, and usually containing one or more of the following: water, calcium sulfate, up to 5 % limestone, and processing additions. (ASTM C219)

recovered material, n—material that would have otherwise been disposed of as waste or used for energy recovery but has instead been collected and recovered as a material input, in lieu of new primary material, for a recycling or a manufacturing process. (ISO 14021)

4.0 Informed Comparison

EPDs may enable comparison between products but do not themselves compare products, as stated in ISO 14025 Sections 4 and 6.7.2. It shall be stated in EPDs for building products created using these PCR that only EPDs prepared from cradle-to-grave life-cycle results and based on the same function, quantified by the same functional unit, and taking account of replacement based on the product reference service life relative to an assumed building service life, can be used to assist purchasers and users in making informed comparisons between products. The basis of a comparison shall include the product application in accordance with ISO 21930 and clearly defined and justified scenarios for modules A4, A5, B1-B7, C1-C4 (see Figure 1).

EPDs based on cradle-to-gate information modules shall not be used for comparisons unless using a functional unit and complying with all of the requirements set out in ISO 14025, section 6.7.2 EPDs based on a declared unit shall not be used for comparisons.

Since an EPD prepared using this PCR only covers BtoB, the following shall be stated in the EPD: This EPD covers only the cradle-to-gate impacts of portland, blended hydraulic, and masonry cement using a declared unit, and the results cannot be used to compare between products. The results from a portland, blended hydraulic, or masonry cement EPD must be integrated into a comprehensive cradle to grave, ISO 14044 compliant LCA in order to compare between different products.
5.0 Company/Organization, Product, and Product Category

5.1 | DESCRIPTION OF COMPANY/ORGANIZATION
The name of the company/organization as well as the place(s) of production shall be provided in the EPD. The EPD may also include general information about the company/organization such as the existence of quality systems, an environmental management system according to ISO 14001, or any other environmental management system in place.

5.2 | DEFINITION OF PRODUCT CATEGORY
These PCR address UN CPC 3744, portland, blended hydraulic, and masonry cement, which adhere to the ASTM, AASHTO, and CSA standards, shown in Table 1, that provide detailed descriptions and specifications for each product.

<table>
<thead>
<tr>
<th>TABLE 1: Portland, Blended Hydraulic, and Masonry Cement</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATERIAL</td>
</tr>
<tr>
<td>Portland cement</td>
</tr>
<tr>
<td>Blended hydraulic cement</td>
</tr>
<tr>
<td>Cementitious materials for use in concrete</td>
</tr>
<tr>
<td>Masonry cement</td>
</tr>
<tr>
<td>Masonry and mortar cement</td>
</tr>
</tbody>
</table>

5.3 | DESCRIPTION OF PRODUCT
The EPD shall provide a narrative description of the product that will enable the user to clearly and unambiguously identify the product. Cement shall be described in accordance with the appropriate ASTM, AASHTO, CSA, or other product specifications under which it is purchased.

This description shall include:

- Product identification by brand name, cement type, product designation, and simple visual representation, which may be by photograph or graphic illustration;
- Appropriate ASTM, AASHTO, CSA, or other product specifications;
- Flow diagram illustrating main unit processes by life-cycle stage according to the scope of the declaration;
- Materials and substances to be declared; and
- Any additional information that will assist in identifying the product.

Material contents of the finished building product, including packaging, shall be declared in terms of the main components. Intentionally added substances officially classified as hazardous according to relevant national or international regulations shall be stated. Product specific data that is confidential because of the competitive business environment, intellectual property rights, or similar legal restrictions need not be declared except where such data involves regulated hazardous substances, which must always be disclosed.

6.0 Requirements for the Underlying LCA

The underlying Life Cycle Assessment (LCA) shall be conducted in accordance with the ISO 14040 and ISO 14044.

6.1 FUNCTIONAL AND DECLARED UNIT

The functional unit of a product provides the quantitative normalization for comparing products of equivalent function (functional unit) or equivalent specification. A functional unit is defined for EPDs covering the complete cradle-to-grave life cycle or the cradle-to-gate life cycle with a use stage scenario.

A declared unit is defined for EPDs covering only the cradle-to-gate or cradle-to-gate plus end-of-life stages (see Section 6.2). If the intended use of the EPD is for comparison purposes between different building products, the entire life cycle shall be included, including the use and end-of-life stages. In such situations the functional unit shall be used as the reference unit, not the declared unit.

For portland cement, blended hydraulic cement, and masonry cement EPDs, which deal with only the cradle-to-gate phase of the life cycle, the declared unit shall be one metric tonne. Data may additionally be presented per ton.

6.2 SYSTEM BOUNDARIES

Figure 1 shows the life-cycle stages and individual modules that shall be included within an LCA system boundary, depending on whether the EPD is BtoB or Business-to-Consumer.

**Figure 1 Life-Cycle Stages and Modules**

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION</th>
<th>USE STAGE</th>
<th>END OF LIFE STAGE</th>
</tr>
</thead>
</table>
Product Category Rules for Portland Cement, Blended Hydraulic Cement, and Masonry Cement - v7.5a

Cradle-to-Gate or “Information Module” (BtoB EPDs) | The life-cycle activities and related processes shall include modules A1, A2, and A3—the production stage—as defined below, with scenarios for other life-cycle stages as appropriate.

Cradle-to-Grave (mandatory for BtoC EPDs) | A complete cradle-to-grave LCA shall be developed for the product, including all life-cycle stages and modules, for a specified defined function and service life, inclusive of maintenance and replacement and end-of-life effects.

The system boundaries will include the average transportation of major inputs to (and within) each life-cycle stage, where relevant.

Any site-generated energy and purchased electricity shall be included in the system boundary. The extraction, processing, and delivery of purchased primary fuels, for example natural gas and primary fuels used to generate purchased electricity, shall also be included within the boundaries of the system. The sources for purchased electricity will be based on published U.S. and Canadian government sources for regional grids that are either self-sufficient or net exporters, if available. If the relevant grid is not in either category the grid fuel mix shall include the next largest NERC (North American Electric Reliability Corporation) region. If such site-specific or regional data are not available, regional averaged grid mix values for major grids that are not connected (for example, East, West, and Texas) shall be used. The sources for electricity (calculation procedure) will be documented.

In the case of portland, blended hydraulic, and masonry cements, modules A1 to A3 (highlighted in Figure 1) apply.

The following are factors to be taken into account for the relevant modules.

Modules A1-A3, the Production Stage:

- Extraction and processing of raw materials, including fuels used in product production;
- Average or specific transportation of raw materials from extraction site or source to manufacturing site (including any recovered materials from source to be recycled in the process), including empty backhauls and transportation to interim distribution centers or terminals;
- Manufacturing including all energy and materials required, and all emissions and wastes produced;
- Packaging, including transportation and waste disposal, to make product ready for shipment;
- If packaging is purchased from multiple suppliers, then a weighted average of the transportation distances by mode from all suppliers shall be included in the LCA modeling;
- Average or specific transportation from manufacturing site to recycling/reuse/landfill for pre-consumer wastes and unutilized by-products from manufacturing, including empty backhauls; and
- Recycling/recovery/reuse/energy recovery of pre-consumer wastes and by-products from production.

Excluded from System Boundary | A summary of items that may be excluded in the primary product stages include:

- Production, manufacture, and construction of manufacturing capital goods and infrastructure;
- Production and manufacture of production equipment, delivery vehicles, and laboratory equipment;
- Personnel-related activities (travel, furniture, and office supplies); and
- Energy and water use related to company management and sales activities that may be located either within the factory site or at another location.

7.0 Life-Cycle Inventory Analysis

7.1 | DATA COLLECTION AND DESCRIPTION OF DATA

The data shall be representative according to temporal, geographical, and technological requirements.

Temporal | The obtained information from the manufacturing process should be annual values, preferably from the previous twelve-month period or calendar year. Average background data shall not be older than ten years unless accompanied by a statement attesting to the validity of older data.
Geographical | The geographic region of the relevant life-cycle stages included in the calculation of representative data shall be documented.

Technological | Data shall represent technology in use.

The use of specific or generic background data shall be documented. As a rule, the following distribution will be applied:

- Extraction and/or production or both of raw materials (specific or average background or both);
- Manufacturing of the product (specific);
- Data sources and any calculation procedures for the fuel mix for electricity generation shall be documented;
- Hazardous waste shall be reported according to applicable U.S. and/or Canadian federal or state/provincial regulations.
- If EPDs for upstream products are not made available, data from the best available published literature shall be permitted to be used; and
- If multiple suppliers are used for one material, then a weighted average, based on volume or mass, shall be used to assign transport distance and mode.

For generic data, national databases shall be used to the extent that they are applicable (for example, U.S. Life Cycle Inventory Database, www.nrel.gov/lci). If appropriate national data is not available, sources for similar technology adjusted for national boundary conditions (for example, energy mix) may be used.

All data sources shall be specified, including database and year of publication (reference). Sources of data for transport models (including transport mode, distances, and quantities to be transported) and thermal energy production shall be documented. Where proxy data is used in the absence of specific data for chemicals or other inputs, the source and justification for selection of the proxies shall be documented in the LCA report.

When preparing a company-average EPD for an identical product manufactured at multiple facilities, the LCI data for each site shall be weighted to determine a company average. Weighting shall be by portland, blended hydraulic, and masonry cement production for each of the four cement-plant process types. A plant specific EPD shall identify the plant process type: dry with preheater and precalciner, dry with preheater, long dry, or wet. Data reported in the declarations shall be as production-weighted averages of multiple facilities.

The product content will be described in the declaration. Product specific data that is confidential because of the competitive business environment, intellectual property rights, or similar legal restrictions need not be declared. In such cases, a notation that the
information is confidential will be made along with a description of the function of the component.

7.2 CUTOFF RULES

Criteria for the exclusion of inputs and outputs (cut-off rules) in the LCA and information modules and any additional information are intended to support an efficient calculation procedure. They shall not be applied in order to hide data. Any application of the criteria for the exclusion of inputs and outputs shall be documented. All inputs and outputs to a (unit) process, for which data are available, shall be included in the calculation. Data gaps may be filled by conservative assumptions with average or generic data. Any assumptions for such choices shall be documented.

The cutoff criteria for flows to be considered within each system boundary are as follows:

- **Mass** | If a flow is less than 1% of the cumulative mass of the model flows, it may be excluded, provided its environmental relevance is minor.

- **Energy** | If a flow is less than 1% of the cumulative energy of the system model, it may be excluded, provided its environmental relevance is minor.

- **Environmental relevance** | Material and energy flows known to have the potential to cause significant emissions into air, water or soil related to the environmental indicators of these PCR shall be included even if such flows meet the above two criteria.

At least 95% of the energy usage and mass shall be included and the life-cycle impact data shall contain at least 95% of all elementary flows that contribute to each of the declared category indicators.

A list of hazardous and toxic materials and substances shall be included in the inventory and the cutoff rules do not apply to such substances.

7.3 DATA QUALITY REQUIREMENTS

Any secondary data source used in the underlying life-cycle inventory shall be complete and representative of the applicable North American region in terms of its geographic and technological coverage and of a recent vintage, which is typically less than ten years old. Any deviations from these requirements for secondary data shall be documented and the following apply:

- All data shall be accurate and representative of the production process, current technology, and current measurement capability.

- The information obtained from the manufacturing process shall be annual average values.
• Average background data shall not be older than ten years for industry average data or five years for producer specific data, unless justification is provided.

• When the owner of the EPD is not the owner of all upstream processes, the owner shall contact his suppliers within the system boundary. If the suppliers do not supply data, the owner shall use the best-available data in the literature based on data quality requirements of this PCR.

• Data shall be identified as direct (for example, measurements or purchasing records), indirect (based on calculations), estimated, or other.

7.4 | UNITS

SI units shall be used with conversions as shown in the table below as necessary. Preferred power and energy units are as follows:

• kWh or MJ for electric energy
• kW or MW for power

TABLE 2: Conversion Factors to be Used if Reporting in IP Units (Imperial)

<table>
<thead>
<tr>
<th>CONVERT FROM</th>
<th>TO</th>
<th>MULTIPLY BY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square meter (m$^2$)</td>
<td>Square foot (ft$^2$)</td>
<td>1.076391E+01</td>
</tr>
<tr>
<td>Kilogram (kg)</td>
<td>Pound (lb)</td>
<td>2.204622</td>
</tr>
<tr>
<td>Mega joule (MJ)</td>
<td>British Thermal Unit (BTU)</td>
<td>9.478170E+02</td>
</tr>
<tr>
<td>Degree Celsius (°C)</td>
<td>Degree Fahrenheit (°F)</td>
<td>(°C * 9/5) +32</td>
</tr>
<tr>
<td>Cubic meter (m$^3$)</td>
<td>Cubic foot (ft$^3$)</td>
<td>3.531466E+01</td>
</tr>
<tr>
<td>Meter (m)</td>
<td>Foot (ft)</td>
<td>3.281</td>
</tr>
<tr>
<td>m$^2$K/W</td>
<td>ft$^2$Fhr/Btu</td>
<td>5.6783</td>
</tr>
<tr>
<td>Metric tonne</td>
<td>Ton</td>
<td>1.102</td>
</tr>
</tbody>
</table>


7.5 | ALLOCATION RULES

In a production process in which more than one type of product is generated, it is necessary to allocate the environmental flows (inputs and outputs) from the process to the different products to get product-based inventory data. Allocation, if required, shall follow the requirements and guidance of ISO 14044:2006, Clause 4.3.4.
Energy used as feedstock to produce materials (for example, plastic) should be allocated to material resources (kg), while process energy shall be allocated to energy resources (MJ).

Allocation related to transport should be based on the mass of transported product.

When the product’s original function is no longer needed or possible, the product can be processed further in a waste management system. For example, it can be recycled, reused, or energy recovered. Emissions from downstream recycling or combustion after the end of waste state will be allocated to the new downstream products, such as heat and electricity. In the case of incineration of wastes for energy production at the primary production site, the combustion emissions shall be allocated to the building product unless the energy is exported.

Recycling processes should be treated as closed loop recycling, as long as no change occurs in the inherent properties of the recycled material. In such cases, the need for allocation is avoided since the use of secondary material displaces the use of virgin (primary) materials.

If different allocation options are relevant and a deviation of greater than 20% is a foreseen outcome, a sensitivity analysis should be initiated. These different allocation approaches and data sets shall be documented and declared.

Only the materials, water, energy, emissions and other elemental flows associated with reprocessing, handling, sorting, and transportation from the point of the generating industrial process to their use in the cement plant need to be considered for recycled or recovered materials. Any allocations before reprocessing shall be allocated to the original product. Fly ash, processed and unprocessed slag and silica fume are considered recovered materials and not co-products.

Recycled and recovered materials with fuel content and used as fuels, such as scrap tires shall be considered alternative energy. Only the materials, water, energy, emissions and other elemental flows associated with reprocessing, handling, sorting, and transportation from the point of the generating industrial process to their use in the production process need to be considered. Any allocations before reprocessing shall be allocated to the original product.

8.0 Impact Categories and Characterization Factors

Environmental impact category indicators shall be taken from Table 3 below for declaring environmental aspects in accordance with ISO 21930:2007, Section 8.2 and ISO 14044:2006.

**TABLE 3: Declaration of Environmental Category Indicator Results, Use of Resources, and**

Page 13 of 20
# Generation of Waste

<table>
<thead>
<tr>
<th>CATEGORY INDICATOR</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming potential (GWP)</td>
<td>kg CO₂ equiv</td>
</tr>
<tr>
<td>Acidification potential</td>
<td>kg SO₂ equiv</td>
</tr>
<tr>
<td>Eutrophication potential</td>
<td>kg N equiv</td>
</tr>
<tr>
<td>Smog creation potential</td>
<td>kg O₃ equiv</td>
</tr>
<tr>
<td>Ozone depletion potential</td>
<td>kg CFC-11 equiv</td>
</tr>
</tbody>
</table>

### Total primary energy consumption

<table>
<thead>
<tr>
<th></th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonrenewable fossil</td>
<td>MJ</td>
</tr>
<tr>
<td>Nonrenewable nuclear</td>
<td>MJ</td>
</tr>
<tr>
<td>Renewable (solar, wind, hydroelectric, and geothermal)</td>
<td>MJ</td>
</tr>
<tr>
<td>Renewable (biomass)</td>
<td>MJ</td>
</tr>
</tbody>
</table>

### Material resources consumption

<table>
<thead>
<tr>
<th></th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonrenewable materials</td>
<td>kg</td>
</tr>
<tr>
<td>Renewable materials</td>
<td>kg</td>
</tr>
<tr>
<td>Fresh water</td>
<td>l</td>
</tr>
<tr>
<td>Non-hazardous waste generated</td>
<td>kg</td>
</tr>
<tr>
<td>Hazardous waste generated</td>
<td>kg</td>
</tr>
</tbody>
</table>

Notes for Table 3:


2. Fresh water is naturally occurring water on the earth’s surface and underground as groundwater in aquifers and underground streams. The term specifically excludes seawater and brackish water.

3. Recovered or recycled materials are neither nonrenewable nor renewable resources under ISO definitions. The use of such materials can be reported as additional environmental information as per clause 9.

4. Primary energy is an energy form found in nature that has not been subjected to any conversion or transformation process. Examples of primary fuels are coal, natural gas, biomass, etc. Examples of secondary fuels recovered from previous use or as waste are: solvents, wood, tires, oil, and animal fat.
9.0 Additional Environmental Information

A Type III environmental declaration shall include, where relevant, additional information related to environmental issues, other than the environmental information derived from LCA, LCI, or information modules. This information shall be separated from the information described in ISO 14025, 7.2.2. Identification of the significant environmental aspects should take into consideration information on environmental issues such as the following:

- Impact(s) and potential impact(s) on biodiversity,
- Toxicity related to human health or the environment or both, and
- Geographical aspects relating to any stages of the life cycle (for example, a discussion on the relation between the potential environmental impact(s) and the location of the product system);

- Data on product performance, if environmentally significant;
- The organization’s adherence to any environmental management system, with a statement on where an interested party may find details of the system;
- Any other environmental certification program applied to the product and a statement on where an interested party may find details of the certification program;
- Other environmental activities of the organization, such as participation in recycling or recovery programs, provided details of these programs are readily available to the purchaser or user and contact information is provided;
- Information that is derived from LCA but not communicated in the typical LCI- or LCIA-based formats;
- Instructions and limits for efficient use;
- Hazard and risk assessment on human health and the environment;
- Information on absence or level of presence of a material in the product that is considered of environmental significance in certain areas (see ISO 14021:1999, 5.4 and 5.7);
- Preferred waste management option for used products; and
- Potential for incidents that can have impact(s) on the environment, such as recycled content or recycling rates.

Additional information shall only be related to environmental issues. Information and instructions on product safety unrelated to the environmental performance of the building product shall not be part of a Type III environmental declaration.
10.0 EPD Supporting Data

A project report shall be prepared in accordance with the requirements and guidance of ISO 14044:2006, Clause 6, for third-party reports. This information shall document the LCA study and additional environmental information in a systematic, comprehensive way, and shall be made available to the verifier in order to demonstrate that the requirements of this PCR document and ISO 21930 “Environmental declaration of building products” have been met. The project report shall include, where relevant:

- The commissioner of the report, the contact information of the report author, and the date of the report;
- The input and output environmental data of the unit processes that are used for the LCA calculations;
- The documentation (measurements, calculations, estimates, sources, correspondence, traceable references to origin, and so forth) that provides the basis from which the process data for the LCA is formulated;
- The specification used to create the manufacturer’s products;
- Energy consumption figures;
- Emission data to air, water, and soil;
- Waste production;
- Data that demonstrates that the information is complete – in specific cases, reference can be made to, for instance, standards or quality regulations;
- Referenced literature and databases from which data have been extracted;
- Data used to carry out sensitivity analyses;
- Documentation that demonstrates that the building product can fulfill the desired function(s) and performance;
- Documentation that demonstrates that the chosen processes and scenarios in the flow chart satisfy the requirements in ISO 21930;
- Documentation that substantiates the chosen life cycle of the building products;
- Documentation and substantiation of the percentages or figures used for the calculations in the end-of-life stage;
- Documentation and substantiation of the percentages and figures (number of cycles, prices, and so forth) used for the calculations in the allocation procedure;
- Information showing how averages of different reporting locations have been calculated to obtain generic data;
- Documentation used to substantiate any qualitative information in the additional environmental information;
- Procedures used to carry out the data collection (questionnaires, instructions, informative material, confidentiality agreements, and so forth);
The characterization factors used;
- The criteria and substantiation used to determine the system limits and the selection of input and output flows;
- Documentation that demonstrates consistency when using information modules; and
- Documentation used to substantiate the other choices and assumptions.

11.0 Content of the EPD

The following demonstration of verification shall be completed and included with the EPD. Note that third-party verification is optional for BtoB EPDs, but mandatory for BtoC EPDs.

Demonstration of Verification

<table>
<thead>
<tr>
<th>PCR REVIEW, WAS CONDUCTED BY:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; Name and organization of the chair, and information on how to contact the chair through the program operator &gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INDEPENDENT VERIFICATION OF THE DECLARATION AND DATA, ACCORDING TO ISO 14025:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(WHERE APPROPRIATE A) THIRD PARTY VERIFIER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;Name of third party verifier&gt;</td>
</tr>
</tbody>
</table>

Optional for business to business communication, mandatory for business to consumer communication.

All Type III environmental declarations in a product category shall follow the format and include the parameters as identified in this PCR. The following general information shall be declared in the EPD:

- Name and address of the manufacturer(s);
- Product identification by name (including, for example, production code) and a simple visual representation of the product;
- Description of the building product’s use and the functional or declared unit of the product to which the data relates;
- Description of the application (installation) of the building product where relevant;
12.0 References

ISO Standards:

ISO 14021: 1999 Environmental labels and declarations -- Self-declared environmental claims (Type II environmental labeling)

ISO 14025: 2006 Environmental Labeling and Declarations—Type III Environmental Declarations Principles and Procedures


ISO 21930: 2007 Sustainability in Building Construction—Environmental Declaration of Building Products

Other References:

AASHTO M 85 Standard Specification for Portland Cement

AASHSTO M 240 Standard Specification for Blended Hydraulic Cement

ASTM C91 Standard Specification for Masonry Cement


ASTM C219 Standard Terminology Relating to Hydraulic Cement


BS EN 15804 Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products

Carbon Leadership Forum (CLF), North American Product Category Rules (PCR) for ISO 14025 Type III Environmental Product Declarations (EPDs) and/or GHG Protocol Conformant Product “Carbon Footprint” of Concrete, Revised Version 1.1, December 2013

CSA A3001 Cementitious Materials for Use in Concrete

CSA A3002 Masonry and Mortar Cement


UN CPC 375 Concrete Product Category Rules, version 1.0, dated February 2013, developed for the World Business Council for Sustainable Development (WBCSD) Cement Sustainability Initiative—global scope