INTERIOR ARCHITECTURAL WOOD DOOR LEAVES

The product group includes interior flush door leaves compliant with the ANSI/WDMA I.S. 1A Interior Architectural Wood Flush Doors and interior wood stile and rail door leaves compliant with ANSI/WDMA I.S. 6A Interior Architectural Stile and Rails Doors, for use in commercial buildings.

REFERENCED PCR:
Interior Architectural Wood Door Leaves

**Scope of Validity of these PCR**

Wood door leaves are removable panels that are applied in purpose to allow ingress, egress, or decorative closure of, or, through an opening in a wall. The door leaf can swing on hinges, slide or spin on hardware, or be stationary inside an opening. This product group includes door leaves that are built to Architectural Wood Door Standards as identified by ANSI/WDMA I.S. 1A and 6A and AWI/AWMAC/WI Architectural Woodwork Standards. The components used to manufacture the door leaves are specified within aforementioned standards. Due to applicable building codes for fire rating, sound transmission, architectural design, or other specified duty requirements, materials used in finished assembled door leaves include, but are not limited to door leaves made with either wood-based or non-wood-based materials. These PCR exclude door leaves primarily intended for single-family residential application, exterior door systems, and doors made primarily from metal.

This product group consists of the door leaves only, but may include factory-applied astragals, glazing, louvers, moldings, beads, finishes, and blocking, made from wood, wood composite or other material. It does not include the doorframe, hinges or operating hardware.

**Program Operator**

ASTM International

**Interested Parties**

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


Additional contributors: Architectural Woodwork Institute (AWI) and the Door and Hardware Institute (DHI).

**Review Panel**

Jamie Meil, Athena Sustainable Materials Institute (Chairperson)

Jerry Heppes Sr., Door and Hardware Institute

James Salazar, Coldstream Consulting

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

**PCR VERSION HISTORY**

<table>
<thead>
<tr>
<th>Version Number</th>
<th>Amendments</th>
<th>Date Issued</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>03 / 27 / 15</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>11 / 02 / 16</td>
</tr>
</tbody>
</table>
Table of Contents

Page 5
1.0 | General Information
1.1 | Goal and Scope

Page 6
1.2 | EPD Ownership/Responsibility
2.0 | Period of Validity
3.0 | Definitions

Page 7
4.0 | Informed Comparison
5.0 | Company/Organization, Product, and Product Category
5.1 | Description of Company/Organization
5.2 | Definition of Product Category

Page 8
5.2.1 | Material Standards
5.3 | Description of Product

Page 9
6.0 | Requirements for the Underlying LCA
6.1 | Functional and Declared Unit

Page 10
6.2 | System Boundaries

Page 12
7.0 | Life-Cycle Inventory Analysis
7.1 | Data Collection and Description of Data

Page 13
7.2 | Cutoff Rules
7.3 | Data Quality Requirements
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 for preparing EPDs for interior architectural wood door leaves.

The referenced PCR—UN CPC 31, NAICS 321 North American Structural and Architectural Wood Products, 2013:05, Version 1.1, FPInnovations, could not be adopted as PCR for architectural wood doors. The primary reason is that the referenced PCR are focused on solid wood products, whereas architectural wood door leaves are comprised of a wide variety of components, which are noted in Section 5.2. However, the referenced PCR has served as a basis for relevant sections of these PCR to the extent possible, and these PCR can therefore be considered an adaptation using the ASTM International PCR template.

In addition, The Norwegian EPD Foundation (EPD-Norge) PCR on Windows and Doors, NPCR 014, Rev. 1 March 2013 and the Institut Bauen und Umwelt e.V. (IBU) PCR Part B: Requirements on the EPD for Windows and Doors were reviewed and determined to be inappropriate for direct adoption or adaptation for North American interior wood door leaves. Both PCR documents refer to European technical data and standards that are not applicable to North America, especially EN 15804, which serves as core rules for PCR. The IBU PCR also refers to and relies on a separate document, the IBU Part A core rules. In both core PCR the impact measures listed reflect European characterization models and units of measure rather than those specified in the Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) system used in North America.

1.1 | GOAL AND SCOPE

This PCR document specifies rules, requirements, and guidelines for developing EPDs for interior architectural wood door leaves and underlying requirements of related life-cycle assessments (LCAs). These PCR are valid for, and provide requirements for, Business-to-Business (BtoB) EPDs.

An EPD prepared under these PCR shall present results for the following phases of the life cycle:

- raw materials acquisition,
- transportation to manufacturer, and
- manufacturing.

A reference service life (RSL) must be stated for a BtoB EPD if a use phase scenario is included in the EPD. A RSL shall be based on a verifiable performance history as per the System Boundaries section.

These PCR are consistent with and comply with the mandatory requirements contained in the following standards:

- International Organization for Standardization (ISO) 21930:2007 Building construction — Sustainability in building construction — Environmental declaration of building products
- 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
While not necessarily complying with the CEN EN 15804 standard, it is referenced in Section 12 and has been consulted with regard to selected requirements and presentation details that go beyond or expand on the above-noted ISO standards.

The following language shall be incorporated in any EPD created in accordance with this PCR:

This declaration is an environmental product declaration in accordance with ISO 14025 that describes environmental characteristics of the described product and provides transparency and disclosure of environmental impacts. This EPD does not guarantee that any performance benchmarks, including environmental performance benchmarks, are met.

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. Revisions may also be made to these PCR during the period of validity, however such changes do not have to be reflected in existing EPDs during their validity period unless the EPD owners choose to do so.

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 14021, ISO 14025, ISO 14044, ISO 14050, ISO 15686-1, ISO 21930, and the following apply.

Door leaf | 1) A separately movable division of a swinging, folding or sliding door. 2) One of a pair of doors.

Detailed component definitions can be found in ANSI/WDMA I.S. 1A and ANSI/WDMA I.S. 6A.
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 created using these PCR that only EPDs prepared from cradle-to-grave life-cycle results and based on the same function, reference service life (RSL), and quantified by the same functional unit can be used to assist purchasers and users in making informed comparisons between products.

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.

It shall be stated in an EPD based on these PCR that the EPD covers only the cradle-to-gate impacts of interior architectural wood door leaves using a declared unit and the results cannot be used to compare between 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 systems in place.

5.2 | DEFINITION OF PRODUCT CATEGORY

These PCR address the specific interior architectural wood door leaves produced from, but not limited to, the materials shown in Table 1. Section 5.2.1 shows the standards that provide detailed descriptions and specifications for each material.
**TABLE 1: Interior Architectural Wood Door Leaf Materials**

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Construction</td>
<td>Wood Based Particleboard Core (PC), Agrifiber bio based Core, Medium Density Fiberboard Core, Structural Composite Lumber Core (SCLC), Staved Lumber Core (SLC), Laminated Veneer Lumber Core (LVLC), Fire Resistant Composite Core (FD), Hollow Core (HC), and Special Core Types applicable for Sound Retardant (STC), Foam Core, Rapidly Renewable Materials Core, Lead Lined (X-ray) and Bullet Resistant cores.</td>
</tr>
<tr>
<td>Vertical and Horizontal Edges</td>
<td>Wood or wood composite material; solid, laminated or veneered</td>
</tr>
<tr>
<td>Surface Materials - Face Materials</td>
<td>Wood veneer including reconstituted, Medium Density Overlay (MDO), Medium Density Fiberboard (MDF), high density fiberboard (HDF), hardboard or other high-density surface, High Pressure Decorative Laminates (HPDL), Low Pressure Decorative Laminates (LPDL), polyvinyl chloride (PVC), fiberglass reinforced plastic (FRP), cork or leather, non-PVC acrylic surfaces, paper surfaces, bio-based Polyethylene Terephthalate Glycol (PETG)</td>
</tr>
<tr>
<td>Crossbands</td>
<td>Wood or engineered wood veneer or engineered wood product (composite)</td>
</tr>
<tr>
<td>Attachments/Accessories</td>
<td>Wood or metal accessories including but not limited to: edge protectors and astragals, glass, louvers, light beads and frames, applied panels, applied molding, including wood or metal insets, and blocking made from wood, wood composite or other material</td>
</tr>
<tr>
<td>Surface Coatings - Finishes</td>
<td>Transparent and opaque factory-applied coatings. All coating types for clear, stained, primed, or opaque finishes</td>
</tr>
<tr>
<td>Adhesives</td>
<td>Type I or Type II of various formulations, depending upon materials and components being bonded and processed</td>
</tr>
</tbody>
</table>

### 5.2.1 MATERIAL STANDARDS

The following is a list of some, but not all of the material standards used in the construction of interior architectural wood door leaves. The standards address performance, construction or ingredient requirements for materials, other than solid wood or wood veneer.

- ANSI A135.4 Basic Hardboard
- ANSI A208.1 Particleboard
- ANSI A208.2 Medium Density Fiberboard (MDF) for Interior Applications
- ANSI/NEMA LD-3 High-Pressure Decorative Laminates (HPDL)
- ANSI/WDMA I.S. 1A Industry Standard for Interior Architectural Wood Flush Doors
- ANSI/WDMA I.S. 6A Industry Standard for Interior Architectural Wood Stile and Rail Doors

### 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. This description shall include, where relevant:

- Product identification by brand name, material type, and simple visual representation, which may be by photograph or graphic illustration;
• List of the standards and other product specifications to which the products comply;
• Details such as size and finish;
• Flow diagram illustrating main unit processes by life-cycle stage according to the scope of the declaration; and
• Materials and substances to be declared.

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 LCA shall be conducted in accordance with 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 building products.

Since these PCR for interior architectural wood door leaves only cover the cradle-to-gate stages, a declared unit shall be used. For a standard door, the declared unit shall be a single door leaf unit measuring 1.95m² (21ft²) at a nominal 44.45mm (1-3/4in.) thicknesses. Door leafs of other sizes and thicknesses may be reported. The declared unit and the mass reference in kg must be indicated. The following Declared Unit table shall be provided in the declaration. An example of the declared unit definition is provided below.

<table>
<thead>
<tr>
<th>Declared Unit (Example)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>Declared Unit</td>
</tr>
<tr>
<td>Mass of door</td>
</tr>
<tr>
<td>Conversion factor to 1kg</td>
</tr>
<tr>
<td>Nominal size and thickness</td>
</tr>
<tr>
<td>Door area</td>
</tr>
<tr>
<td>Ratio to standard door</td>
</tr>
</tbody>
</table>

Note: As per section 5.3, the material contents of the finished door, including packaging materials, shall be declared on a mass basis for all major inputs.
The LCA can be conducted for either an average product or a specific product. In the case where an LCA is calculated as average environmental performance for Interior Architectural Wood Door Leaves a statement to that effect shall be included in the EPD.

The product description must clearly state if the product is:
- A specific product from a specific factory/plant of a manufacturer
- A specific product as an average from several of the manufacturer’s plants
- An average product from a manufacturer’s plant
- An average product from several of the manufacture’s plants
- A specific product as an average from several manufacturers’ plants
- An average product as an average from several manufacturers’ plants

When the intent of the EPD is to be representative of an average product, a weighted average shall be calculated on the basis of annual production of each product type represented by the product category EPD.

6.2 | SYSTEM BOUNDARIES

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

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

<table>
<thead>
<tr>
<th>PRODUCT STAGE</th>
<th>CONSTRUCTION PROCESS STAGE</th>
<th>USE STAGE</th>
<th>END OF LIFE STAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw material supply</td>
<td>Transport</td>
<td>Manufacturing</td>
<td>Transportation</td>
</tr>
<tr>
<td>A1</td>
<td>A2</td>
<td>A3</td>
<td>A4</td>
</tr>
</tbody>
</table>

**Cradle-to-Gate or “Information Module” (BtoB EPDs)** | The life-cycle activities and related processes shall include modules A1, A2, and A3—the product 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.

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
fueled used to generate purchased electricity, shall also be included within the boundaries of the system. Regionally specific inventory data on electricity shall be based on subnational U.S. and Canadian consumption mixes that account for power trade between the regions. If such regional data are not available, production mixes of the three continental interconnections (East, West, Texas) as well as those of Hawaii and Alaska may be used. A comparable approach shall be taken for electricity consumption in the case of materials or input products imported from outside the U.S. and Canada. The sources for electricity (calculation procedure) shall be documented.

In the case of EPDs based on these PCR, modules A1 to A3 (highlighted in Figure 1) apply. The following are factors to be taken into account for each life-cycle stage.

Modules A1-A3, the Product Stage:

• Extraction and processing of raw materials, including fuels used in extraction and transport within the process;
• Average or specific transportation of raw materials (including recycled materials) from extraction site or source to manufacturing site (including any recovered materials from source to be recycled in the process) and including empty backhauls and transportation to interim distribution centers or terminals;
• Manufacturing of the product, including all energy and materials required and all emissions and wastes produced;
• Packaging, including transportation and waste disposal, with 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/reuse/energy recovery of pre-consumer wastes and by-products from production.

Module A1, A2 and A3 may be declared as one aggregated module A1-3. If the modules are shown separately, the totals shall also be shown.

All assumptions from LCA shall be described in detail.

Any transportation data other than identified above shall be indicated. If transportation information is included in other stages than indicated, or if no transportation information exists and assumptions are made, this should be noted.

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 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 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 and a conservative approach shall be taken.

When preparing an average EPD for an identical product manufactured at multiple facilities, the results for each site shall be weighted to determine the average. Weighting shall be by annual product production. 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 (cutoff 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. Data gaps may be filled by conservative assumptions with average or generic data. Any assumptions for such choices shall be documented.

The cut-off criteria for flows to be considered within the 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 criteria for mass and energy as defined in ISO 21930, Section 6.2.7.2.

At least 95% of the energy usage and mass flow 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

The quality of data used to generate the EPD shall be addressed in the project report in compliance with ISO 14044, Section 4.2.3.6. 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, consistent, reproducible and representative of the production process, current technology, and current measurement capability with any known uncertainty levels stated.
- 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 its 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>
<thead>
<tr>
<th>TABLE 2: Conversion Factors to be Used if Reporting in IP Units (Imperial)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONVERT FROM</strong></td>
</tr>
<tr>
<td>Square meter (m²)</td>
</tr>
<tr>
<td>Kilogram (kg)</td>
</tr>
<tr>
<td>Mega joule (MJ)</td>
</tr>
<tr>
<td>Degree Celsius (°C)</td>
</tr>
<tr>
<td>Cubic meter (m³)</td>
</tr>
<tr>
<td>Meter (m)</td>
</tr>
<tr>
<td>m²K/W</td>
</tr>
<tr>
<td>Metric tonne</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, Section 4.3.4.

Recycled and recovered materials shall be considered raw materials. Only the materials, water, energy, emissions, and other elemental flows associated with reprocessing, handling, sorting, and transportation from 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. Recycled and recovered materials with fuel content and used as fuels, such as used tires, shall be considered alternative energy.

Allocation related to transport shall be based on the mass or volume of transported product, whichever is relevant.

When a 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 shall 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 shall be initiated. These different allocation approaches and data sets shall be documented and declared.

### 7.6 BIOTIC CARBON SEQUESTRATION

Carbon sequestration in wood components may be taken into account. However, sequestration shall be reported as additional environmental information as per Section 9, and shall not be included in the global warming potential (GWP) impact measure for a cradle-to-gate EPD.

### 8.0 Impact Categories and Characterization Factors

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

<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>
<tr>
<td>Total primary energy consumption</td>
<td></td>
</tr>
<tr>
<td>Nonrenewable fossil</td>
<td>MJ (HHV)</td>
</tr>
<tr>
<td>Nonrenewable nuclear</td>
<td>MJ (HHV)</td>
</tr>
<tr>
<td>Renewable (solar, wind, hydroelectric, and geothermal)</td>
<td>MJ (HHV)</td>
</tr>
<tr>
<td>Renewable (biomass)</td>
<td>MJ (HHV)</td>
</tr>
<tr>
<td>Material resources consumption</td>
<td></td>
</tr>
<tr>
<td>Nonrenewable material resources</td>
<td>kg</td>
</tr>
<tr>
<td>Renewable material resources</td>
<td>kg</td>
</tr>
<tr>
<td>Net fresh water (inputs minus outputs)</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:

1. 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, but does include fresh water that has been treated to make it potable. Energy use and other impacts associated with fresh water treatment are not included. The net fresh water outputs shall include water returns to the same watershed with evaporative water losses treated as consumption.

2. 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 Section 9.

3. 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.

4. Recycled and recovered materials with fuel content and used as fuels shall be considered alternative energy. Examples of such secondary fuels are solvents, wood, tires, and animal fat. Emissions from secondary fuels shall be included in the calculation of the relevant environmental impacts. The use of such fuels should be stated.

5. Energy consumption shall be reported in Higher Heating Values (HHV) mega joules.

6. Where applicable, feedstock energy shall be declared and shown separately.

7. Radioactive wastes shall be reported under Hazardous Waste Generated category.

The impact categories of life-cycle impact assessment (LCIA) shall be calculated using characterization factors specified in version 2.1 of TRACI (Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts). [http://www.epa.gov/nrmrl/std/traci/traci.html](http://www.epa.gov/nrmrl/std/traci/traci.html)

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, Section 7.2.2. Identification of the significant environmental aspects should, as a minimum, take into consideration the following:

- Information on environmental issues, such as:
  - 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 or renewable energy credits (REC), 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, Sections 5.4 and 5.7);
• Sequestered biogenic carbon;
• Preferred waste management option for used products; and
• Potential for incidents that can have impact(s) on the environment, such as recycled content, recycling rates, or carbon sequestration.

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, Section 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 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 products can fulfill the desired function(s) and performance;
• Documentation that demonstrates that the chosen processes and scenarios in the flow chart satisfy the requirements set 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>

Independent verification of the declaration and data, according to ISO 14025:

- Internal
- External

(Where appropriate 1) Third party verifier:

<name of third party verifier>

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;
• Detailed list of the substances, by weight, that make up the building product, taking into account cutoff rules and confidentiality;

---

1 Optional for business to business communication, mandatory for business to consumer communication.
• Data from LCA or LCI or information modules, as per ISO 14025, Section 7.2.2;
• Additional environmental information (see Section 9);
• Statement of whether the EPD is cradle-to-gate or cradle-to-grave;
• Statement that EPDs from different programs (using different PCR) may not be comparable;
• Statement that the EPD represents an average performance in cases where an EPD declares an average performance for a number of products, in addition, information on the deviation of the products’ performance with respect to the average, if significant, shall be stated;
• Information on where explanatory material may be obtained;
• Diagram of the life-cycle stages included in the LCA subdivided into production, construction, use and end-of-life stages, and system boundaries;
• When the EPD includes the use stage, a description of the nature of the processes and ancillary materials that are required for installing the building product in the building or other type of construction works and their replacement and maintenance according to the cutoff criteria;
• Name of the program and the program operator's address and, if relevant, the logo and website URL;
• Identification of the PCR document on which the EPD is based;
• Date the EPD was issued and period of validity;
• Site(s), manufacturer, or group of manufacturers or those representing them for whom the results of the LCA are representative;
• Name of PCR review panel chair;
• Whether the independent review of the EPD and data was conducted by an internal or external verifier (third-party verification is mandatory for BtoC EPDs); and
• Name, address, phone number, fax number, and e-mail of the third-party verifier and logo of the verification body, if applicable.
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 14050:2009 Environmental management—Vocabulary
ISO 15686-1:2011 Buildings and constructed assets—Service life planning -- Part 1: General principles and framework
ISO 21930:2007 Sustainability in Building Construction—Environmental Declaration of Building Products

Other References:

ANSI A135.4 – Basic Hardboard
ANSI A208.1 – Particleboard
ANSI A208.2 – Medium Density Fiberboard (MDF) for Interior Applications
ANSI/NEMA LD-3 – High-Pressure Decorative Laminates (HPDL)
ANSI/WDMA I.S. 1A – Interior Architectural Wood Flush Doors
AWI/AWMAC/WI Architectural Woodwork Standards
Institut Bauen und Umwelt e.V. (IBU) PCR Guidance-Texts for Building-Related Products and Service, Part B: Requirements on the EPD for Windows and doors
The Norwegian EPD Foundation (EPD-Norge) PCR on Windows and Doors, NPCR 014, Rev. 1 March 2013