Product Category Rule
for Environmental Product Declarations

BIFMA PCR for Storage: UNCPC 3812

NSF Sustainability℠
National Center for Sustainability Standards

Program Operator

NSF International

National Center for Sustainability Standards

Valid through June 10, 2018

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BIFMA PRODUCT CATEGORY RULES

These product category rules shall be used in preparing an Environmental Product Declaration (EPD) for *storage products*.

ABOUT BUSINESS AND INSTITUTIONAL FURNITURE MANUFACTURERS ASSOCIATION (BIFMA)

BIFMA is the not-for-profit trade association for business and institutional furniture manufacturers. Since 1973, BIFMA has been the voice of the commercial furniture industry. Our industry's service to our customers – providing healthy, comfortable and productive workspaces – rests on an infrastructure of engineering and material standards. These standards, founded on centuries of craft and enhanced by ever-advancing science, embody the best of our knowledge regarding safety, ergonomics, and sustainability.

BIFMA's role is to sponsor the development and refinement of current and future standards, educate on their importance and application, and translate their necessary complexity into more easily understood and implemented formats. We also monitor the state of the industry, serve as a forum for member cooperation and collaboration, interact with international counterparts, and advocate for regulatory conditions that foster value and innovation. Visit http://bifma.org or contact email@bifma.org.

ABOUT NSF'S NATIONAL CENTER FOR SUSTAINABILITY STANDARDS (NCSS)

Through the National Center for Sustainability Standards, NSF develops life-cycle based, multi-attribute sustainability standards, protocols, and PCRs for various industries, including building products and materials, furniture, carpet and flooring, fabrics, wallcoverings, roofing membranes, green chemicals, and water and wastewater.

The National Center for Sustainability Standards will continue to add to its growing portfolio while providing education, outreach, and innovative support to private industry, trade associations, government and academia to foster a consensus-based approach toward conformity assessment in the sustainability field. Visit http://www.nsfsustainability.org or contact ncss@nsf.org.

1 GENERAL INFORMATION

Utilizing the UN Central Product Classification system for this Product Category Rule (PCR), the Class 3812 is for Other furniture, of a kind used in offices. This PCR includes the scope for subclasses of 38121 – Other metal furniture, of a kind used in offices, and 38122 – Other wooden furniture, of a kind used in offices; as each appropriately applies to the function of storage. Examples of common names or terms used to convey the function of storage within an office setting include, but are not limited to the following: bookcases, lateral files, file cabinets, bins, wardrobes, credenzas, pedestals, overheads, hutches, high-backs, lecterns, cabinets, etc. This PCR includes the manufacture of storage products constructed from singular or multiple materials, including but not limited to wood, metal, plastic, particle board, medium density fiberboard (MDF), bio-based materials, or mixtures of other materials. This PCR is valid through June 10, 2018.

This document specifies the requirements for the Life Cycle Assessment (LCA) study, and the format and content of the EPD itself. Recognizing the global aspects of the furniture industry this PCR was designed to be globally applicable, therefore the geographical coverage is global.

The PCR Committee referenced the existing PCR System Cabinet, that was published in 2011 by JIA WONG ENTERPRISE., LTD. An International PCR for Office furniture was reviewed and found not to align as closely with office furniture settings and storage devices as is defined by the functional unit requirements within this PCR. This PCR was developed by an international representation of office furniture manufactures, and thus is focused on storage for this application within office settings. Additional differences lie in the validation of service life by conforming to the requirements of ANSI testing standards. Appropriate impact methodologies were considered based on manufacturing region, and will be addressed herein.

The PCR document was prepared by NSF International (the program operator) and the Business and Institutional Furniture Manufacturers Association Product Category Rules Task Group in accordance with ISO 14025. An open enrollment period was provided to seek out stakeholders interested in being part of the PCR creation. A multi-stakeholder group composed of furniture industry personnel, material manufacturers, sustainability consultants, and other experts worked to create the PCR.

This PCR is not intended to support comparative assertions.

1.1 Goal and scope requirements for the LCA study

The goal of this PCR is to specify the guidelines for developing a Type III Environmental Product Declaration (EPD) in conformance with ISO 14025, based on an ISO 14040 and ISO 14044 compliant LCA.

The goal of an LCA that conforms to this PCR shall be, at a minimum, to identify the environmental impacts of each life cycle phase of the product, and shall be presented in such a way as to be relevant to the public.

This PCR was not written to support comparative assertions. Even for similar products, differences in functional unit, use and end-of-life stage assumptions, and data quality may produce incomparable results[12]. It is not recommended to compare LCA studies or EPDs with those of another organization as there may be differences in methodology; assumptions; allocation methods; data quality, such as variability in data sets; and results of variability in assessment software tools used. The purpose of this PCR is to provide transparent guidance for an organization to conduct an LCA, and develop an EPD, in an effort to measure progress toward environmental improvements of the organization's products being studied.

The scope of the LCA shall include a description of the following according to this PCR:

1. Functional Unit
2. System Boundary
3. Description of data
4. Criteria for inclusion of inputs and outputs (cut off rules)
5. Data quality requirements and
6. Units

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2 PRODUCT DESCRIPTION

This PCR applies to products that provide the function of storage of office based materials and supplies: e.g., books, files, media, digital media, office supplies, or other items potentially associated with storage within an office environment. Other functions that the product may provide are not considered herein. The product description shall include the name of the product, product manufacturer and/or model number, a general description and a picture of the product. The product, or range of products, shall be identified by the classification of the product and number of functional units that the product represents. The minimum product or range of products shall be sufficient to meet the service life identified in *Functional Unit*, Section 3.

Based on multiple proprietary LCAs and one publicly available LCA[1] from furniture industry manufacturers, similar products [i.e., products with different textiles, core construction material (metal, wood, composite), surface treatments, number of drawers/shelves, etc.] may be included in the same declaration, provided that the range of variation within each impact category does not exceed ± 10% of impact categories listed in *Parameters to be Declared in the EPD*, Section 8. To reduce the number of unique product LCAs and EPDs for similar storage units, a base configuration can be used internally to support and compare product options against the declared base configuration.

[1] Dietz, Bernhard *Life cycle assessment of office furniture products* 2005 <http://css.snred.umich.edu>

3 FUNCTIONAL UNIT

The functional unit shall be one unit of storage, maintained for a 10 year period. The functional unit shall be presented as how it applies to one of the sub-categories described in Section 3.1.

The ANSI/BIFMA X5.9 method is an industry-recognized and approved test methodology demonstrating that a storage unit remains usable for a period of 10 years. Products that have been documented to meet ANSI/BIFMA X5.9 can be also considered to meet the 10-year service life. The 10-year service life was based upon an extensive study conducted on behalf of BIFMA in which various product types were evaluated for typical service life in their original application prior to replacement due to various reasons, including updates to facility and the need for general replacement. However, subsequent uses including refurbishment, resale, and donation along with disposal, are not part of the specified life cycle considerations within this PCR.

For storage units with a service life of more than 10 years, the entire impact shall be allocated to the 10-year period (i.e., the reference flow shall be one storage unit and not a portion of a storage unit, and results shall not be normalized from a fraction of a storage unit to meet the functional unit).

For storage units with a service life of less than 10 years, a fractional approach shall be used (i.e., it may take more than one storage unit to meet the functional unit requirements). Aggregated results shall be reported for products that require more than one storage unit to meet the service life.

If the product does not meet ANSI/BIFMA X5.9 or equivalent, and the warranty period is five years or more, the maximum service life shall be five years. For products with warranties less than five years, the service life shall equal the warranty period.

3.1 Sub category functional unit descriptions

The EPD shall provide information for the entire physical product. The number of storage units required shall be clearly stated on the front page of the EPD declaration and unit values shall not be less than one. The product or range of products shall denote which subcategory of storage function that the unit represents.

3.1.1 Static Storage (e.g., bookcases, hutches, towers, etc.): a storage device that is stationary and consists of no moving parts. The storage device may contain parts that may be repositioned, (e.g., shelf or divider panel). Construction may consist of metal, wood, laminate, resin and glass components, including stationary and adjustable components. The storage device shall allow for convenient storage of articles, including but not limited to the following: books, binders, personal and non-personal items found and/or used in the workspace. Storage space is maximized by utilizing vertical space. A functional unit for this category shall contain 0.15 m^3 of storage capacity.

3.1.2 Storage Device with Retractable Storage Areas (e.g., file cabinets, pedestals, lateral files, cabinets, etc.): a storage device that has one or more drawers that extend, and whose intended purpose is to facilitate the storage of legal and letter size files. Construction may consist of metal, wood, laminate, resin and glass components or any combination of materials. Additional functions shall be clearly denoted in the Product Description section of the EPD. Such additional functions of the storage device could include: seating with cushion top, mobility using casters, and/or locking features. A functional unit for this category shall contain 0.15 m^3 of storage capacity.

3.1.3 General Storage: a storage device that does not conform to the specific requirements of Sections 3.1.1 and 3.1.2. The storage device within this grouping shall be a clearly defined functional unit that conforms to the requirements of this PCR, and complies with the capacity defined in this sub-section. Construction may consist of metal, wood, laminate, resin and glass components or any combination of materials. The function(s) of General Storage includes some combination of storage characteristics described in Sections 3.1.1 and 3.1.2 that provide storage for a variety of office and personal items within the workstation, such stored items as paper, binders, books, office supplies, coats, and personal items. Examples of General Storage include: bookcases with hinged or sliding doors, towers with retractable drawers in addition to fixed open storage area, and hutches with doors and other moving components. A functional unit for this category shall contain 0.25 m^3 of storage capacity.

3.2 Cut-off rules

Mass and energy flows that consist of less than 1% may be omitted from the inventory analysis. Cumulative omitted mass or energy flows shall not exceed 5%. Mass or energy flows that contribute more than 10% to an impact category shall be included. Energy and tools associated with point of use assembly by end-user shall be omitted so long as the energy and tools required are normal and common to everyday practice. (Electricity used

for power screw driver or vacuum for cleaning are examples of energy and tools that are to be omitted from the inventory analysis of the use phase.)

4 SYSTEM BOUNDARIES

System boundaries are a set of criteria specifying which unit processes are part of a product system. The entire life cycle is to be covered including all industrial processes from raw material.

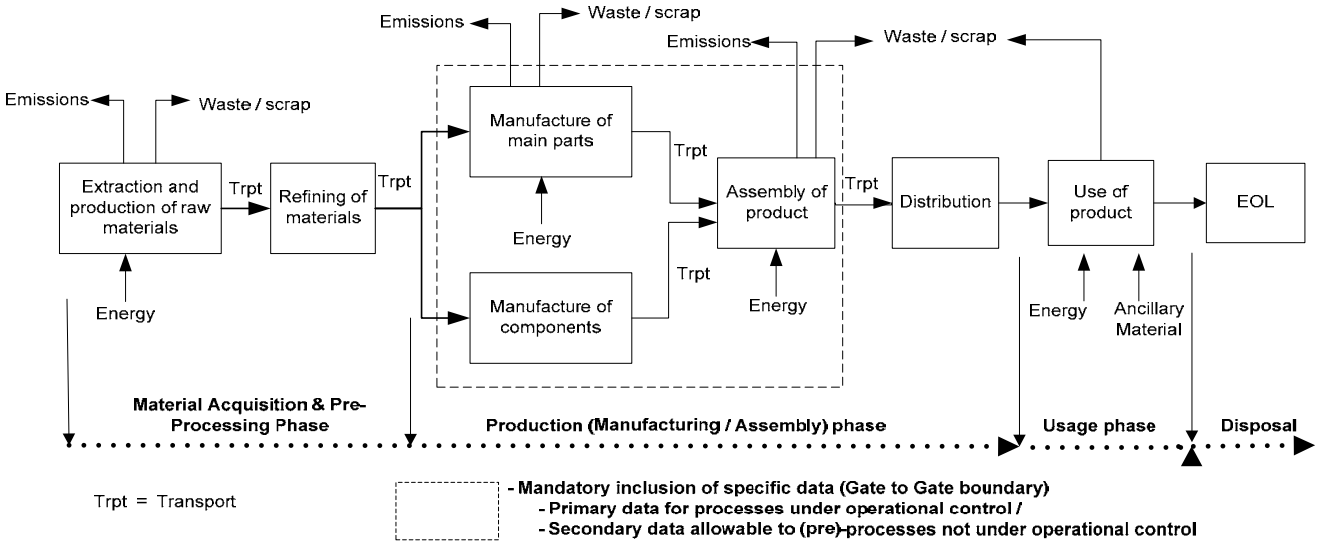

Figure 1: System Boundaries, example flow

4.1 Material acquisition and pre-processing stage

The material acquisition, pre-processing, and intermediate processing stage starts when the material is extracted from nature, and ends when the material in component form reaches the gate of the production facility or service delivery operation. Materials can be considered either “primary” or “secondary”.

- Primary materials are extracted from nature, examples include iron ore, bauxite, wood, etc. that are used to create basic materials used in the production of office furniture (e.g., steel).

- Secondary materials are recovered, reclaimed, or recycled content that are used to create basic materials to be used in the production of office furniture. Transportation of materials shall be included in the life cycle impact assessment.

- Primary processing is the conversion of materials to a bulk form or a generic shape (materials or components that are not necessarily manufactured exclusively for the office furniture industry).

- Intermediate processing is the conversion of materials to components (e.g., particleboard, plastic pellets, steel coil, etc.).

For the material extraction and primary/intermediate processing stage the boundary ends when the component reaches the gate of the production stage. Transportation at all processing stages shall be included in the life cycle impact assessment.

Waste and scrap created during raw material acquisition and pre-processing, and emissions associated with transporting the material to recycling or landfill centers shall be accounted for. Primary data for this stage shall be used, if available,otherwise secondary data shall be used. Secondary data shall be used for industry processes, and may come from the USLCI for US based processes, the ELCD database for European based processes, the Japanese LCI Database, other relevant national or regional databases, or similarly regionally developed life cycle inventory data. If waste materials are recycled, landfilled, combusted, or composted, the transport distance shall be reported. In the US, the EPA WARM model gives an average transport end of life distance as 32 kilometers (20 miles), this value shall be used for US based processes when primary data or other representative data are not available, and when transport distance is not integrated into the dataset.

For material waste not imbedded in software packages, or where a primary data does not exist, a 10% scrap rate shall be used for the model and material recycling percentages, and rates for the US shall be based on USEPA Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures (current version)[11] outside the US, a regional, or nationally appropriate waste model shall be used.

All transportation, including interfacility transport, prior to the material being shipped to the production stage shall be included.

Transport from the raw material stage to the production stage shall be included. If using an LCA tool where this transport data are not included, or primary data do not exist, transport distances listed in Table 1 shall be used for North American based processes ransport of the extracted raw materials within the acquisition and pre-processing stage is not covered in Figure 1. For processes outside of North America, an appropriate regional or national transportation distance and mode(s) shall be used where primary data do not exist. A weighted average transportation distance may also be calculated from primary data. Table 1 below is intended to be used for material transportation associated with the appropriate process flow(s). If more than one transporation was required, then the usage of multiple transportation data sets shall be reflected in the LCA.

Table 1 materials transport distances, material acquisition, and pre-processing stage to production stage:

Raw Material/ Classification grouping		Distance (miles)		
		Rail	Truck*	Water
Veneer	26 Wood Products	162 miles	332 miles	5982 Miles Picking 5 Ports for an average of **all** water transport (Asia, Australia, Africa, Europe & South America)
Particle Board	26 Wood Products	162 miles	332 miles	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)
MDF	26 Wood Products	162 miles	332 miles	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)
Paper Backer	27 Pulp, newsprint, paper, and paperboard	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge) [837 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code "Table 7"][1]	742 miles	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)
Solid Wood	26 Wood Products	162 miles	332 miles	5982 Miles Picking 5 Ports for an average of **all** water transport (Asia, Australia, Africa, Europe & South America)
Plywood	26 Wood Products	162 miles	332 miles	5982 Miles Picking 5 Ports for an average of **all** water transport (Asia, Australia, Africa, Europe & South America)
Plastic (inc. polymer-based materials; exc. textiles)	24 Plastics & Rubber	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)	757 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 13[2]	960 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]

Raw Material/ Classification grouping		Distance (miles)		
		Rail	Truck*	Water
Steel	32 Base metal in prim. or semifin. forms & in finished basic shapes	562 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]	932 miles	833 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]
Extruded Aluminum	32 Base metal in prim. or semifin. forms & in finished basic shapes	562 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]	932 miles	833 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]
Cast Aluminum	32 Base metal in prim. or semifin. forms & in finished basic shapes	562 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]	932 miles	833 miles in 2007 U.S. DOT Shipment Characteristics by SCTG Code Table 7[1]
Glass	31 Nonmetallic mineral products	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)	126 miles	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)
Fabric Leather	30 Textiles, leather, and articles of textiles or leather	0 miles (NA due to this mode of transport not being significant for this commodity, to our knowledge)	294 miles	5982 Miles Picking 5 Ports for an average of **all** water transport (Asia, Australia, Africa, Europe & South America)

NOTE: The average transport distances could also be used for complete components or units.
NOTE: Oceanic distances were approximated. For materials where a particular mode of transport was not typical or common, it was assumed to be zero.
Table 7[1] and Table 13[2] as referenced from:
<http://www.bts.gov/publications/commodity_flow_survey/final_tables_december_2009/pdf/entire.pdf>
Distances taken from the U.S. Department of Transportation's Research and Innovative Technology Administration (RITA) website's "TranStats".
*Truck distance listed in round trip, as the assumption is made that the delivery truck returns empty after making the delivery.

4.2 Production

The production stage starts with the product components entering the production site and ends with the final product leaving the production gate. This stage is intended to be "gate-to-gate".

Gate-to-gate describes the product boundary encompassing the fabrication and assembly of business and institutional furniture. For the purposes of this PCR, the entry gate is the receiving dock of the first facility where basic materials used in the manufacture of the furniture (e.g., steel, particleboard, fabric, laminate, etc.) begin the conversion to furniture components. The end gate is the shipping dock where the ready-to-install furniture will be transported for distribution to the end user. The gate-to-gate will include transportation of intermediate materials and components between facilities where more than one physical location is included in the manufacturing process.[4]

Site and gate are used here figuratively, as a product may go though many processes and corresponding intermediate facilities before exiting the production stage as a final product. During production, the product undergoes the transformation from intermediate materials, to product component, to semi-finished product, to the final product; additionally, any co-products or wastes formed during production shall be considered in this stage. Production includes processes such as:

- Transport of components or semi-finished products between processes and/or facilities;
- The following shall include the materials and energy use along with the transportation to the point of use:
  - Production of the final product by assembling of the components or semi-finished products;

- Product of the components or semi-finished product(s);
- Use of catalysts or other ancillary materials during production;
- Any additional preparation of the final product, including forming, surface treatment, machining and/or other processes, as appropriate; and
- Materials used in packaging of the final product shall be included.

Waste and scrap created during production shall be included in the LCA model. Commercially available LCA software programs typically embed these flows in the modeling datasets. The primary data shall be used if it is available. If waste materials are recycled, landfilled, combusted, or composted, the transport distances shall follow the current version of the USEPA WARM Model, currently 20 miles (32 Kilometers) [USEPA Waste Reduction Model (WARM)[11]] within North America, or another appropriate regionally or nationally applicable model outside North America unless primary data has been obtained, in which case the primary data shall be used.

For waste and scrap in production not imbedded in software package's modeling datasets, or when no primary data exist, a 30% scrap rate shall be used for the model. The transport distances shall again follow the USEPA WARM Model[11], currently 20 miles, or other appropriate regionally or nationally applicable model. The amount of waste material sent to landfill versus recycling shall be based on EPA Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for Durable Goods (current version)[9] within North America, or other appropriate regionally or nationally applicable model for production outside of North America.

Transportation of parts, semi-finished and finished products to the place of final assembly and/or distribution shall be included. Intercompany movement of parts, semi-finished and finished products shall be accounted for where facilities fall under operational control of the reporting company. For facilities not under operational control of the reporting company, intercompany movement of goods should be included.

4.3 Distribution, storage, and use

The product distribution and storage stage starts with the product leaving the gate of the production facility and ends when the consumer takes possession of the product. Several legs of distribution and storage may occur for one product, including storage at a distribution center and a retail location, if applicable. Product distribution and storage includes processes such as facility operations and transportation between facilities.

The use stage begins when the consumer takes possession of the product and ends with the used product entering the end-of-life stage. For some products the use stage does not require energy or generate emissions (e.g., greenhouse gases); for these products transportation from the storage facility to the use-location to the end-of-life location may be the only major processes. Transportation mode and distances shall be based on primary data. Typical processes for distribution and use include:

- Transportation to the use location and during use;
- Storage at the use location;
- Normal use;
- Repair and maintenance occurring during the usage time; and
- Preparation of a product.

For a service [furniture as a service (leased furniture) should be treated as a product], the production and use stage may be combined into the service delivery stage. This stage encompasses all operations required to complete a service. For repair of leased or purchased furniture, the following shall be considered: driving to the site, assessing the product, ordering or picking up parts, and returning to complete the final repair. All material flows (i.e., parts needed for the repair), energy flows (fuel to deliver the service person and/or parts), and end-of-life considerations of materials and wastes make up the processes along the service life cycle.

4.4 End-of-life stage

The end-of-life stage boundary begins when the used product is ready for disposal, recycling, reuse, etc. and ends when the product is landfilled, returned to nature (combustion, deterioration), or transformed to be recycled or reused. Processes that occur as a result of the disposal are also included within the end of life stage. End-of-life processes may include:

- Collection of end-of-life products and packages;
- Dismantling of components from end-of-life products;
- Shredding and sorting;
- Incineration and sorting of bottom ash; and

- Landfilling, landfill maintenance, decomposition emissions.

In the absence of primary data on actual end of life treatment for the product, the most current version of the USEPA Municipal Solid Waste (MSW[9]) data, USEPA WARM model,**Error! Bookmark not defined.** or surrogate (shall be identified in the EPD) within North America, or another appropriate regionally or nationally applicable model shall be used outside North American to determine the percent of each material in the product(s) that can be recycled versus landfilled. The amount of each material in the product that can be assumed to be recycled is determined by multiplying the EPA MSW**Error! Bookmark not defined.** within North America, or other appropriate regionally or nationally applicable model, recycling rate (in %) by the amount of each homogenous material type that is able to be disassembled. The remaining materials that are not recycled should be modeled for end of life using 80% landfill and 20% incineration[2].

[2] The usage of 80%/20% is a general disposition determined by the US EPA in the "Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks" document, page 111, and is deemed to be an acceptable disposition rate of final materials.

5 ALLOCATION RULES

Allocation procedures shall be uniformly applied to similar inputs and outputs of the system under consideration. If allocation cannot be avoided, users shall follow procedures outlined in ISO 14044-2006 for allocation procedures.

Where possible, allocation should be avoided by dividing unit processes into two or more sub-processes (as specified in ISO 14044, Section 4.3.4, Allocation), or through expansion of system boundaries to include the additional functions of co-products. If allocation cannot be avoided, the following hierarchy of allocation methods is preferred:

- Mass, or other biophysical relationship; and
- Economic value.

Deviation from these allocation rules shall be documented and justified.

For allocation due to recycling, companies shall use the Recycled Content Method. Allocation procedures for reuse and recycling discussed in ISO 14044-2006 (see Section 4.3.4.3) shall be applied for recycling situations.

Figure 2 illustrates a simplified process map for a product that uses the recycled content method[3]. The recycled content method is also referred to as the cut–off method, and the 100-0 method.

[3] The collection process is listed as an attributable end-of-life process; however, the location of this process depends on how the recycled material is collected, as discussed above and in *System Boundaries*, Section 4.

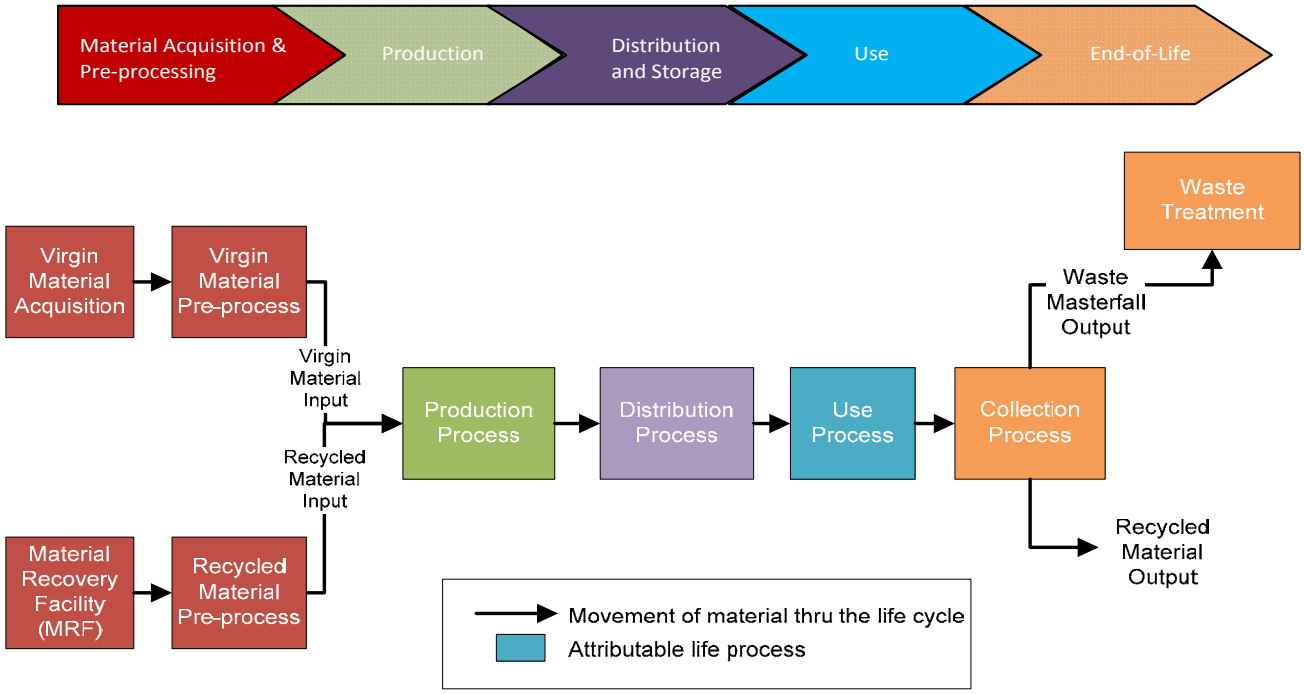

Figure 2: Example Process Map Illustrating the Recycled Material Input Method

6 UNITS AND QUANTITIES

International System of Units (SI units) shall be used for both the LCA and the EPD. Quantities shall be represented with a maximum of three significant figures.

7 CALCULATION RULES AND DATA QUALITY REQUIREMENTS

7.1 Types and sources of data

Primary data shall be used for facilities and processes under operational control of the reporting company. Representative data may be used for facility operations that contribute less than 10% of the total product output, with at least 50% of facility operations data are from a primary source. For facilities and processes outside of the operational control of the reporting company, secondary data may be used. For products that are manufactured wholly or largely outside of the reporting company control (e.g., contracted products or significant assemblies), primary data are highly encouraged; however, secondary data may be used in lieu of primary data. The reporting company shall use energy production data aligned with the region (region shall be used from most local and relavent source being from local power grid, state power grid, country sub-regional power grid, to least of a national power grid) of manufacture, and shall document the unit processes; and describe how the secondary data are appropriately selected. Justification for the inability to obtain primary data shall be provided in this case.

Primary data (site specific or representative averages) should be used for unit processes that contribute to the majority of the mass and energy flows, or which have the most relevant environmental emissions (ISO 14044).

7.2 A data quality assessment shall be made for the system under study.

All data shall be accurate, complete, and representative of the manufacturing process, current technology and current measurement capability. The data shall be consistent with the following requirements:

1. The information obtained from the manufacturing process(es) shall be average annual values with the yearly values documented and averaged, and it shall not be more than five years old. The usage of secondary data shall be less than 10 years old. If data older than 10 years is used from a secondary source, justification shall be included to address why newer data is not available.
2. Data should represent the technology(ies) and process(es) in current use.
3. Data quality assessment shall conform to ISO 14044, Section 4.2.3.6.
4. Data quality assessment shall, at a minimum, address the following:

a) time-related coverage: age of data and the minimum length of time over which data should be collected;
b) geographical coverage: geographical area from which data for unit processes should be collected to satisfy the goal of the study;
c) technology coverage: specific technology or technology mix; and
d) uncertainty of the information (e.g., data, models and assumptions).

5. Data quality assessments, examples include (but not limited to):
    a) USLCI
    b) ILCD
6. Table 8.2: Criteria to Evaluate the Data Quality Indicators, WRI product standard
7. Representative data should always be used in the upstream phases (extraction, processing and production). Information from databases may be regarded as representative data, if they fulfill the following requirements:
    a) Representative of the geographical area, i.e., data from the same country, or from areas with the same energy supply mix;
    b) Technological equivalence;
    c) Boundaries towards nature; and
    d) Boundaries towards technical systems shall be of best equivalence.

If representative data are not available, use of a specific proxy is allowed. The user shall document and justify the decision to use the specified proxy.

7.3 Data source

The source of the input data shall be transparent.

7.4 Electricity modeling

Where primary data are available for the electrical power grid for a given unit process, it shall be used to model the electricity source. If data are not available at that level, the next highest aggregation of electrical grid data shall be used, with a preference of local, regional, national, and then multi-national. The French LCA database will soon have estimates of the national grid for most countries globally. The ILCD database has estimates for the EU

countries. In the US, the source of national grid data is the U.S. LCI Database.

Carbon offsets or Renewable Energy Credits or Certificates shall not be used in the inventory. These refer to credits purchased for processes not under the control of the purchaser. For example, a coal fired power plant might buy carbon credits that support the planting of forests, or might buy Renewable Energy Credits that support the installation of renewable energy at distributed locations. On-site renewable energy from solar cells or other renewable energy source may only be included in the inventory if they are not grid-linked. This process avoids the issue of double-counting renewable energy inputs.

7.5 LCIA methodology

The following environmental impact categories shall be disclosed in the EPD per functional unit. The impact categories shall be divided per functional unit into quantity of each impact category for materials acquisition and refining, production (manufacturing and assembly), distribution and use, and end of life.

1. Global warming potential (GWP 100 years) [kg CO_2-eq.]
   IPCC (most recent version); Biomass CO_2 emissions shall be reported separately.

2. Acidification potential (AP) [mol H+ eq. / kg of emission]
   TRACI 2.010; outside North America, regionally applicable methodologies.

3. Photochemical ozone creation potential (POCP, or “Smog”) [kg O_3 eq. / kg of emission]
   TRACI 2.0; or outside North America, regionally applicable methodologies.

4. Eutrophication potential (EP) [kg N eq. / kg of emission]
   TRACI 2.0; or outside North America, regionally applicable methodologies.

7.6 Sensitivity analysis

A sensitivity analysis shall be performed for all major assumptions in the LCA model and a clear description of the influence associated with the environmental impact for each of the assumptions chosen.

8 PARAMETERS TO BE DECLARED IN THE EPD

References shall be the most recent version required at the time of the LCA. LCI data and Impact Assessment shall be declared in the EPD as detailed below.

8.1 Materials composition

Product specifications, consisting of material composition of the reference product, in kg per functional unit, and in percentage of total weight.

8.2 Life cycle inventory data

Inventory assessment categories (e.g., energy and water) shall be reported by life cycle stage, and in total for the following:

1. Emissions to air {kg}
    a. SOx, NOx, CO_2, methane, N_2O, CO
2. Water usage and emission to water {kg}
    a. Phosphates, nitrates, dioxin, heavy metals (arsenic, lead, mercury, cadmium, and chromium)
    b. Withdrawl (total water input)
3. Energy type and usages {MJ}
    a. Primary energy demand, fossil fuel based energy, nuclear
    b. Renewable (solar, wind, hydro, biomass)
4. Waste management {kg}
    a. Incineration with energy recovery
    b. Incineration without energy recovery
    c. Landfill (non-hazardous solid waste)
    d. Hazardous waste
    e. Landfill avoidance (recycling)

8.3 Impact assessment categories

Impact assessment categories shall be reported by life cycle stage, and in total. Impact categories shall use the characterization models specified in *LCIA methodology*, Section 7.5 of this PCR.

1. Global warming potential
2. Acidification potential
3. Photochemical ozone creation potential
4. Eutrophication potential

9 OTHER ENVIRONMENTAL INFORMATION

EPDs developed using this PCR should 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 conform to ISO 14025, 7.2.3 and 7.2.4.

Additional environmental impact categories that should be considered as necessary for the report include, but are not limited to the following:

- Ozone Depletion Potential
- Human Toxicity
- Land Usage
- Ecotoxicity

Chemicals listed on the MSDS/SDS should be disclosed for all materials that make up 1% or more of the product by weight. MSDS/SDS reportable chemicals are defined in this PCR as a chemical listed on a Material Safety Data Sheet or Safety Data Sheet. Ninety-five percent (95%) of product weight should be accounted for. For base metals, materials can be based on generic composition defined by appropriate organizations' standards. No further review of wood and other natural fibers is required; however, products using these materials should report added MSDS/SDS reportable chemicals. Companies choosing to report these chemicals should add information regarding potential exposure to these chemicals (i.e., some MSDS listed chemicals may have no route of exposure during normal use).

10 INDEPENDENT VERIFICATION

All verification of EPD, LCA, LCI and additional environmental information shall conform to ISO 14025, Section 8.1.3. The Type III EPD verification shall conform to ISO 14025, Section 8.1.4.

Verifiers shall conform to ISO 14025, Section 8.2. LCA expertise and conform to program operator instructions.

11 REFERENCES

American Forest and Paper Association. *Life Cycle Inventory Analysis: Enhanced Methods and Applications for the Products of the Forest Industry*. The International Working Group, 2006.

ANSI/BIFMA e3 Furniture Sustainability Standard.[4]

Atherton, John. *Declaration by the Metals Industry on Recycling Principles*, International Journal of Life Cycle Assessment, 12 (1), 59-60, 2007.

FTC Part 260, Green Guides.[5]

(ILCD, 2010) Joint Research Commission, 2010, *ILCD Handbook: General Guide for Life Cycle Assessment*.[6]

Intergovernmental Panel on Climate Change (IPCC).[7]

ISO 14025:2006 *Environmental labels and declarations – Type III environmental declarations – Principles and procedures.*[8]

ISO 14040:2006 *Environmental management - Life cycle assessment – Principles and framework.*[8]

ISO 14044:2006 *Environmental management - Life cycle assessment – Requirements and guidelines.*[8]

Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2008.[9]

[4] e3-2012 BIFMA Furniture Sustainability Standard, definitions <www.BIFMA.org>
[5] Federal Trade Commission <http://www.ftc.gov>
[6] <http://lct.jrc.ec.europa.eu>
[7] World Meteorological Organization (secretariat to IPCC), 7bis Avenue de la Paix ,C.P. 2300, CH- 1211 Geneva 2, Switzerland <http://www.ipcc.ch>
[8] International Organization for Standardization (ISO), Case postale 56, CH-1211 Geneve 20, Switzerland <www.iso.org>
[9] <http://www.epa.gov/epawaste/nonhaz/municipal/msw99.htm>

USEPA, *Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI).*[10]

USEPA, *Waste Reduction Model (WARM).*[11]

World Business Council for Sustainable Development's Global Water Tool.[12]

World Resources Institute (WRI), *Draft Product Life Cycle Accounting and Reporting Standard.*[12]

[10] USEPA, Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) <http://www.epa.gov/nrmrl/std/sab/traci/>
[11] USEPA Waste Reduction Model <http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html>
[12] WRI Product Life Cycle Accounting and Reporting Standard (second draft - English) October 2011 *Copyright © World*

12 EPD FORMAT

The format of the environmental product declaration (EPD) should be structured as follows:

A. Front page:
    1. To avoid misinterpretation of results, a company shall include a disclaimer to the audience (reader) identifying the difficulties in comparing results, and referring the reader to additional information if needed.

        This EPD was not written to support comparative assertions. Even for similar products, differences in functional unit, use and end-of-life stage assumptions, and data quality may produce incomparable results. It is not recommended to compare EPDs with another organization as there may be differences in methodology, assumptions, allocation methods, data quality such as variability in data sets, and results of variability in assessment software tools used.
    2. Picture of product or family
    3. Manufacturer's name and contact information
    4. Information on the EPD program operator
    5. Date of certification and period of validity
    6. Functional unit
        i. 10 year service life

B. Key environmental parameters:
    1. Global warming potential
    2. Primary energy demand
    3. Percentage of recycled content

C. Product specifications, as described in *Product Description*, Section 2

D. Material resources, sorted by:
    1. Virgin renewable resources
    2. Recycled resources
    3. Virgin non-renewable resources

E. Energy consumption:
    1. Fossil fuels
    2. Nuclear fuels
    3. Renewable fuels
    4. Miscellaneous fuels (surplus heat, incineration of waste)

F. Impact assessment categories, as specified in *Impact Assessment Categories*, Section 8.3

G. Emissions and wastes, as specified in *Parameters to be Declared in the EPD*, Section 8

H. Additional environmental information per *Other Environmental Information,* Section 9

I. References, as specified in *References*, Section 11

12.1 Period of Validity for the EPD

The validity of the EPD shall be reported in the EPD, and shall not exceed a five (5) year period from the date of issuance. If changes in any of the environmental impacts are larger than ± 5%, the EPD shall be adjusted. The EPD shall be reviewed and reissued every five years from the date of issuance or earlier, as appropriate.

12.2 References

The EPD shall, if relevant, refer to:

- The underlying LCA report;
- The relevant PCR document;
- Other documents that complement, verify and support the EPD;
- Instruction for recycling; and
- Program Operator instructions.