

SMaRT

Environmental Product Declaration (EPD) Policy & Product Criteria Rule (PCR)

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“The first companies disclosing sustainable product information independently certified to leadership consensus standards, should be encouraged and commended because the rest of industry will be encouraged to disclose in the same manner.

Leadership standards meet today’s market demand for greater global progress by substantially improving public health, environment and social equity.

Leadership disclosure can encourage pollution reductions in the same manner as EPA’s Toxic Release Inventory (TRI) which resulted in a 95% voluntary reduction of TRI human health and eco-toxic pollutants.”

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Background. Pursuant to SMaRT prerequisites, SMaRT requires all of the elements of ISO compliant EPDs. SMaRT requires for all certifications a Certification Summary that must be publicly disclosed that documents the SMaRT credits achieved and certification level. The SMaRT Certification is an ISO Type III Label and requires all applications submitted for SMaRT Certification to contain a legally binding certification by the manufacturer that all information submitted is accurate, not misleading, and qualified professionals were used consistent with FTC's Environmental Marketing Guides. Global third party auditing is required by SMaRT. SMaRT requires as a prerequisite an ISO compliant LCA for every product certified. SMaRT is the leadership consensus and transparent sustainable product standard and label recognized by the Leadership Standards Campaign.

The European Union defines an EPD as a Type III Third Party Certified Label with "*quantified environmental data for a product with pre-set categories of parameters based on the ISO 14040 series of standards, but not excluding additional environmental information.*"

"The use of EPDs shall encourage the demand and supply of those products that cause less stress on the environment through clear communication of verifiable and accurate product information. This shall stimulate the potential for market-driven continuous environmental improvement. EPDs -

- *provide **life cycle assessment-based** information and additional information on the environmental aspects of products,*
- *assist purchasers and users to make informed **comparisons** between products (but not being so-called comparative assertions),*
- *encourage **improvement** of environmental performance, and*
- *provide information for **assessing** the environmental aspects of products over their life cycle."*

At the December 14, 2010 MTS Executive Board Meeting at Knoll's DC Showroom, the Board identified a need to continue SMaRT's international recognition beyond Canada and the decision was made to file for recognition with the Green Star green building certification of the Australia and New Zealand Green Building Councils and this application was approved. It was decided that the best approach for recognition in the European market and for further progress in SMaRT's international acceptance, that an EPD Summary be part of the SMaRT Summary. The European Union has been considering EPD requirements for manufacturers for many years.

The Executive Board has the authority to make an EPD Summary part of the SMaRT Summary because all of the needed EPD data are required as part of SMaRT Certification, and the Board has jurisdiction over SMaRT Marketing. An EPD component to the SMaRT Summary will increase the value of SMaRT to product purchasers, specifiers, and manufacturers, disclose additional relevant LCA information that the market desires, and help differentiate SMaRT from greenwash standards.

Existing EPD Requirements. Most of the work on identifying EPD requirements has been based on ISO 14025 and ISO 14040 LCA Standards defining LCA principles, framework, requirements, guidelines, inventory, impact, data documentation and format.

LEED 2012 Third Public Comment Draft ISO states (p.110) that "*All Environmental Product Declarations must to consistent with International Standards Organization (ISO) 14025, 14040, 14044 and 21930.*" The ISO requirements for LCAs and EPDs are as follows:

- ISO 14025 sets forth requirements for Type III Labels and Declarations including EPDs which provide quantitative environmental information about a product. SMaRT is an ISO

- 14025 Type III Label.
- ISO 14040 sets forth LCA principles.
- ISO 14044 sets forth LCA requirements and guidelines.
- ISO 21930 sets forth EPD requirements for building products.

The SMaRT EPD Complies With all of the Preceding ISO Standards as documented as follows in the SMaRT PCR and SMaRT EPD Reporting Requirements.

ISO 21930 §5.6 covers comparability of EPDs and states that the product criteria rule (PCR) sets forth the rules and requirements for comparison. The SMaRT PCR identified below is taken from ISO and other LCA requirements of the SMaRT Standard and its administration.

SMaRT prerequisite MFG 2-2 requires an ISO compliant LCA for all product stages and 13 environmental impacts, and SMaRT PHE and many others provisions of SMaRT as detailed in the next section of this Policy set forth uniform requirements for this ISO compliant LCA and PCR. SMaRT meets all of the prerequisites of ISO 14025 as a Type III Declaration and Label since it is a consensus standard identifying quantitative environmental parameters about a product over all product stages and is independently certified and audited by qualified environmental professionals. SMaRT third party certification and review is also by qualified LCA professionals. See the SMaRT / MTS LCA qualifications at the end of this Policy.

SMaRT LCA & Product Criteria Rule (PCR) Documentation & Requirements.

SMaRT PCR requirements are part of SMaRT's prerequisite for an ISO compliant LCA for each SMaRT Certified product, and many other SMaRT LCA requirements built into the 2.0, 3.0 and 4.0 SMaRT consensus Standard through an extensive independent third party LCA expert research and development process and SMaRT's extensive peer-review and national consensus votes of approval.

1. **Three Year SMaRT LCA & PCR Independent Third Party Consensus Approval Process With Many Independent Third Party LCA Experts Consistent With ISO.** The LCA and PCR requirements for SMaRT were first developed in SMaRT 2.0 in 2003 in an extensive year and one half consensus process with many third party LCA experts including from state and federal government, universities, and professional firms as well as engaged outside third party LCA experts some of whom have been also engaged to help SMaRT manufacturers on their SMaRT EPDs. These professionals included the leading global LCA experts from universities and government who helped develop the ISO LCA Standards, the first consensus LCA impact category performance metrics by the federal government, and were engaged by MTS as the programme operator on an independent third party basis to develop SMaRT's LCA and PCR requirements including an extensive industry LCA baseline evaluation.

The SMaRT LCA and PCR development was Chaired by the State of Minnesota (ISO 14025 §8.1.2). The LCA requirements and PCR development and review by a group of LCA experts was led through over five outside contracts initiated by MTS at a cost of over \$60,000 with independent third party LCA experts from leading universities, the federal government, and professional firms, and the results of this effort were reviewed by hundreds of interested parties and other outside LCA experts (ISO 14025 §8.1.2).

After one year of research and development by these independent outside third party LCA experts, the LCA and PCR requirements were incorporated into the draft SMaRT 2.0 Standard.

Further outside peer review of these SMaRT LCA and PCR requirements and the Draft SMaRT 2.0 included a 20 State Task Force led by the States of California and Minnesota working in conjunction with EPA in a four month process resulting in further improvements.

The SMaRT 2.0 Standard then went through a 30-day national consensus vote of approval and was unanimously approved. These LCA and PCR requirements in SMaRT were subsequently further peer reviewed and approved in the SMaRT 3.0 and SMaRT 4.0 national consensus votes of approval.

This third party expert LCA and PCR review was competent complying with ISO 14025 §§8.1.2 & 8.2.3, and addressed:

- General background knowledge of the relevant sectors, product and product-related environmental aspects
- Expertise in LCA and methodology for LCA work
- Awareness of relevant standards in the fields of environmental labeling and declarations and LCA,
- Knowledge of the regulatory framework within the scope of the SMaRT PCR
- Knowledge of the requirements for Type III environmental declarations including by the FTC Environmental Marketing Guides & ISO
- Independent LCA expert third party review
- A comprehensive mix of interested party perspectives and competencies
- The SMaRT PCR document included the results of repeated PCR reviews, comments and recommendations made by the group of independent third party LCA experts.
- The SMaRT PCR review demonstrated that it was developed in accordance with the ISO 14040 series of standards and, specifically, in accordance with §6.7.1 of ISO 14025.
- The SMaRT PCR fulfils the ISO general programme instructions, and the LCA-based data, together with the additional environmental information prescribed by the PCR, give a description of the significant environmental aspects of the product.

2. The SMaRT Consensus Standard & Its Administration Uniquely Contain the ISO LCA and PCR Requirements as documented in this subsection and numbers 3-9 below:

- The Scope of the SMaRT Standard is based on life cycle assessment and SMaRT and SMaRT certifications are required to cover 12 LCA impacts over all product stages making the system boundaries all product stages from raw materials extraction to end of life or reuse without cutoffs (SMaRT §2).
- References and tools for the SMaRT Standard include the ISO LCA Standards (SMaRT §3).
- Closed Loop Process containing many LCA benefits as defined by EPA (SMaRT §§4.3, 4.24, & 6.4.3).
- Design for Environment is a specific component LCA of SMaRT requiring “*All effects a product may have on the environment are examined during its design phase. All life cycle stages are analyzed including a full assessment of all inputs to the product, the company’s operations related to the product, how the product is used, and final product disposition whether reused, taken back, or disposed of (State of Minnesota DfE Toolkit www.moea.state.mn.us/p2/dfe.cfm)*” (SMaRT §§ 4.6 & MFG 4.1).
- Consensus definitions of Life Cycle, Life Cycle Assessment, Life Cycle Design, Life Cycle Impact Assessment (SMaRT §§4.8 - 4.11).
- Pollution Prevention and Precautionary Principle definitions as important improvement attributes of LCA (SMaRT §§4.13 & 4.14).

- **Reclamation & Reuse LCA Requirements:** *“Manufacturers and distributors take financial and/or physical and/or contractual responsibility for their products or for another’s product, throughout the entire product lifecycle, including collection disassembly and reuse and/or recycling of the products to the highest degree practicable. This includes reusing the products and components for extended product life. See Computer TakeBack Campaign Platform (Elec.Take it Back Campaign Mar. 2001).” (SMaRT §§4.16, 4.20, 4.24 and EOL).*
- **LCA Supply Chain Consensus Requirements:** *“Supply Chain is the all inclusive set of links from raw materials to customer, including extraction, transportation, fuels, manufacturing, and use, i.e., the network of retailers, distributors, transporters, storage facilities and suppliers that participate in the sale, delivery and production of a particular product (Investorwords.com 2003). (SMaRT §§ 4.22 - 4.25, 5, 6, 6.2 - 6.5, 6.7, PHE 5-2, RE&ER 7-1, MFG 1-2, & Appendix).*
- **Consensus Sustainable Product definition based on LCA (SMaRT §§4.25 & 4.26).**
- **LCA requirements for Sustainable Product Communications:** *“LCA must be used for communications using the word “sustainable,” or “environmentally preferable” as part of the competent scientific evidence requirement pursuant to Federal Trade Commission (FTC), EPA, & Attorneys Generals’ product marketing requirements (See 16 C.F.R. § 260.7(a). LCA is used to identify environmental benefits and areas for improvement in the supply chain for all environmental media (air, water & land), including local environmental issues in the production of agricultural biobased products. See Figure 1. EPA Final Environmentally Preferable Product Guidance sets forth as a ‘Guiding Principle: Life Cycle Perspective/Multiple Attributes- A product or service’s environmental preferability is a function of multiple attributes from a life cycle perspective (2002).’” (SMaRT §5.1).*
- **LCA Requirements for Product Labeling or Marking. (SMaRT §§ 5.2 & 7).**
- **Prerequisite requirement for an ISO Compliant LCA for the SMaRT Certified Product including functional unit (MFG 2-2).**
- **Prerequisite requirement for LCA inventory and prohibition of input and output toxic Stockholm Treaty Chemicals and requirement that no input or output of over 30 Stockholm Treaty Chemicals are generated by SMaRT Certified Products (PHE 1-2 & 1-3).**
- **Prerequisite requirement for Life Cycle Inventory of some 1300 pollutants covering 12 environmental impacts using the federal government’s consensus LCA inventory list of pollutants including** *”human ecological health outflows (air & water), products and coproducts, Pollutant Flows (Flue Gas and Wastewater); Total Solid Waste; Recovered Matter; Greenhouse Gases; Acidification Gases; Other Air Emissions; Ozone Depletion; Smog/MIR Index; Eutrophication; Other Water Effluents. Baselines for Pollutant Reductions & Metrics: The inventories in PHE 2-1 & 2-2 comprise the baselines for pollutant reductions in PHE 3-1, 4-1, 5-1 & 6-1. The Baseline for PHE 2-4 below is 1986 data derived from a company Environmental Management System or ISO14040 compliant LCA. The metrics used to measure all pollutant reductions documented in PHE 2-4, 3-1, 4-1, 5-1, & 6-1 are detailed in column five of Table 1 below (characterization factor). “ (PHE 1-1, 2.1 & 2.2).*
- **LCA Impact Required Characterization Factors (SMaRT PHE 2-2, 2-4, 3-1, 4-1, 5-1, & 6-1).**

Table 1 – Baseline Assessment Life-Cycle Impact Categories

| Impact Category | Scale | Sample LCI Data (i.e., classification) | Common Characterization Factor | Description of Characterization Factor |
|----------------------------------|-------------------|---|--|---|
| Climate Change | Global | Carbon Dioxide (CO ₂) Nitrogen Dioxide (NO ₂) Nitrous Oxide (N ₂ O) Methane (CH ₄) Chlorofluorocarbons (CFCs) Hydrochlorofluorocarbons (HCFCs) Methyl Bromide (CH ₃ Br) | Global Warming Potential | Converts LCI data to carbon dioxide (CO ₂) equivalents Note: global warming potentials can be 50, 100, or 500 year potentials. |
| Stratospheric Ozone Depletion | Global | Chlorofluorocarbons (CFCs) Hydrochlorofluorocarbons (HCFCs) Halons Methyl Bromide (CH ₃ Br) | Ozone Depleting Potential | Converts LCI data to trichlorofluoromethane (CFC-11) equivalents. (aka R11) |
| Acidification | Regional Local | Sulfur Oxides (SO _x) Nitrogen Oxides (NO _x) Hydrochloric Acid (HCl) Hydrofluoric Acid (HF) Ammonia (NH ₃) | Acidification Potential | Converts LCI data to hydrogen (H ⁺) ion equivalents. OR kg SO ₂ eq. |
| Eutrophication | Local | Phosphate (PO ₄) Nitrogen Oxide (NO) Nitrogen Dioxide (NO ₂) Nitrates Ammonia (NH ₃ , NH ₄) | Eutrophication Potential | Converts LCI data to nitrogen (N) equivalents OR kg P eq. |
| Photochemical Smog | Local | Nitrogen Oxides (NO _x) Formaldehyde Acetaldehyde Ethylene Glycol Hexanal Toluene | Photochemical Oxidant Creation Potential | Converts LCI data to equivalents. kg O ₃ -Equiv. OR Kg NMVOC (non-methane volatile organic compounds) OR kg ethene eq. |
| Ecotoxicity Air, water & soil | Local | | Ecological Toxicity Potential | Partially Affected Fraction of Species (PAF) [PAF m ³ day/kg OR kg 1,4-DB eq. OR kg DCB-Equivalent) (DCB - Dichlorobenzene) |
| Human Health Toxicity | Local | | Toxicity Equivalency Potential | kg 1,4 dichlorobenzene (1,4-DB) eq OR kg DCB-Equivalent) (DCB - Dichlorobenzene) |

| | | | | |
|---|-----------------------|---|------------------------------------|---|
| Fossil Fuel Depletion | Global | Coal Natural Gas Oil | Fossil Fuel Depletion Potential | Converts LCI data to Kg Oil equivalents |
| Habitat Alteration Defer until Forestry Criteria are available | Global | Land Use (Installation Waste) Land Use (Replacement Waste) Land Use (End-of-Period Waste) | Habitat Alteration Potential | Converts LCI data to Threatened and Endangered Species count per square meter |
| Criteria Air Pollutants (human health) | Global | Nitrogen Oxides (Nox as N02) Particulates (>PM10) Particulates (<+10) Particulates (unspecified) Sulfur Oxides (Sox as SO2) | Criteria Air Pollution Potential | Converts LCI data to [kg PM10-Equiv] |
| Solid and Hazardous Waste | Local Gate to Gate | Ash Solid Waste Packaging Waste Hazardous Wastes | Waste Characterization Potential | Converts LCI data to equivalent tons |
| Water Intake | Local | Water | Water Consumption Characterization | Converts LCI data to m3 |

- Reduction of 1300 Toxic Chemicals & Media Pollutants as Measured by ISO compliant LCA for the following LCA Impact Categories and EPA TRACI LCA Characterization Factors as baseline assessment: “Global Warming, Acidification, Ozone Depletion, Eutrophication, Photochemical Smog, Human Health, Ecological Toxicity, Fossil Fuel Depletion, Habitat Alteration, Criteria Air Pollutants, Water Intake, Solid and Hazardous Waste. Quantification of toxic chemicals and media pollutants shall use the units of measurement for the Characterization Factors in the fifth column of Table 1 below. These characterization factors are defined in the US EPA Tool for the Reduction and Assessment of Chemical and other environmental impacts (TRACI). The baseline for these reductions is the inventories generated in PHE 2-2 & 2-3 in the year 2000 using Table 1 units of measurement below,” (PHE 2-2, 2-3 3-1 – 6-1).
- Reporting as Part of SMaRT Certification, results of ISO Compliant LCA for product SMaRT Certified (SMaRT §7.1.3)
- Legally Binding Certification of Manufacturer that the information submitted including the ISO compliant product LCA are accurate, not misleading, and qualified professionals were used consistent with the FTC Environmental Marketing Guides: “This certification must also state that “both the express and implied meaning of the certification about the data, responses to information, and provisions of the standard, is reasonable and based on competent and reliable scientific evidence prepared by qualified professionals in the relevant area, using procedures to produce accurate and reliable results.’ See 16 C.F.R. § 260.5. Further, such certification and its documentation will be publicly available.” An equivalent express warranty option is allowed if it is incorporated into the product contract of sale by the manufacturer with its purchasers consistent with the Uniform Commercial Code. (SMaRT §7).
- Prerequisite requirement for Performance Durability standards compliance ensuring product performance and extended product life which are important LCA use and end of life stage performance metrics (EOL 1-2 & 2-1).

- MTS third Party Data audit of the ISO Compliant LCA and all of the preceding LCA and PCR requirements (SMaRT §7.3.1).
- Independent Third Party Global Auditing including ensuring compliance with the product ISO Compliant LCA and all of the preceding LCA and PCR requirements (SMaRT §7.3.2).
- Decertification of the manufacturer if there are any bona fide noncompliance with SMaRT requirements including the preceding LCA and PCR requirements (SMaRT §7.4).

This LCA and PCR development for SMaRT 2.0, 3.0 and 4.0 was conducted and meets the requirements of ISO 14025, 14040, 14044, and 21930 including ISO 21930 and 14044 PCR requirements.

3. SMaRT is an ISO Type I Ecolabel & ISO 14025 Type III Environmental Declaration Label comporting with ISO Ecolabeling requirements for life cycle based sustainable product certification to a consensus standard, and the following ISO 14025 Environmental Declaration definitions and requirements:

- §3.1 *Environmental label / environmental declaration*
- §3.2 *Type III environmental declaration*
- §3.3 *Type III environmental declaration program*
- §3.4 *Programme operator*
- §3.2 *Life cycle*
- §5.3 *Life cycle basis including coverage of all product stages*
- §5.5 *Involvement of interested parties*
- §5.6 *Comparability*
- §5.7 *Verification*
- §5.8 *Flexibility*
- §5.9 *Transparency*
- §6 *Programme requirements including involvement of interested parties and development of the PCR.*
- §7 *Declaration Requirements*
- §8 *Verification*
- §9 *Requirements for Business to Consumer Communications*

4. Life Cycle Stages for Inclusion in SMaRT & The SMaRT PCR Are All Stages which is also required for all SMaRT Certifications and define the system boundaries: extraction, transportation, manufacturing, use, reuse, and end of life (SMaRT §§ 4.3, 4.6, 4.8 - 4.11, 4.16, 4.20, 4.22 – 4.26, 5, 5.1, 5.2, 6, 6.2 – 6.5, 6.4.3, 6.7, 7, 7.1.3, PHE 1-2, 1-3, 2-2, 2-3, 3-1 – 6-1, RE&ER 7-1, MFG 1-2, 2-2, & 4.1, all EOL credits, all of section 7, & Appendix) (ISO 21930 §6.21).
5. Rules for Producing Additional Sustainable Product Information are the environmental and social performance metrics identified by all SMaRT credits achieved by a SMaRT Certification: Safe for Public Health & Environment (17), Renewable Energy & Energy Reduction (18), Biobased or Recycled (25), Facility Based / Social Equity (10), Reuse, Reclamation & End of Life Management (8), Innovation in Manufacturing (2), and Certification & Reporting (SMaRT §7) (ISO 21930 §6.21).
6. EPD Parameters Covered, Collated and Reported are identified below in the SMaRT EPD format and by the transparent sustainable performance credits identified in the SMaRT

Scorecard for the Credits achieved by the SMaRT Certified Manufacturer (ISO 21930 §6.21).

7. This EPD Policy and PCR Requirements Were Developed in An Open Consultation Process. SMaRT is a transparent consensus sustainable product standard meeting the open consultation requirements including for development and approval of LCA and PCR requirements, with independent third party LCA experts. This EPD Policy was approved by a balanced board of product purchasers, specifiers, professional firms, non-governmental organizations, and manufacturers in consultation with consumer and environmental groups. (ISO 21930 §§5.2 & 6.21).
8. Product Category and Definition is all products other than airplanes and vehicles. The product category includes all building products. SMaRT's scope is identical with this category and definition. (SMaRT §2) (ISO 21930 §§6.21(a) & 6.22).
9. Goal and Scope of SMaRT LCAs & PCR are to provide common criteria and assumptions for accurate product environmental quantitative information for all product stages and 12 environmental impacts. LCAs are necessary to obtain supplier environmental product information, to help manufacturers improve the technical and eco efficiency of their products, and to identify environmental impacts that most need to be improved. The audience for LCA and EPD communications is purchasers, specifiers, manufacturers, and interested environmental professionals, and consumers. SMaRT LCA results using its common requirements listed above, allow accurate comparison of one SMaRT Scorecard to another SMaRT Scorecard. MTS believes that comparative assertion of one EPD to another cannot be effectively made on the basis of LCA alone because there are thousands of PCRs that need to be completed for product categories and it is highly unlikely to be done due to substantial dollar and time commitments. (ISO 14040 §5.2, ISO 14044 §4.2, & ISO 21930 §6.21(b)).

MTS believes that substantial LCA uncertainty, variability, and incompleteness does not accurately allow comparative assertions of one EPD to another even using the same PCR and allowed by ISO with outside review.

- a. Functional unit. The functional unit of a building product is expressed on the basis of the relevant technical performance characteristics of the building product when integrated into a building. It provides the reference for adding up material flows and the connected environmental impacts for each of the life-cycle stages of the building product. All SMaRT LCAs are ISO compliant and required to identify the functional unit (SMaRT MFG 2-2) (ISO 21930 §6.24).
- b. System boundaries. The system boundaries for SMaRT, all SMaRT LCAs and PCRs are for a full LCA, i.e., all product stages from extraction to final use / reuse including transportation, byproducts, secondary materials, ancillary products, complimentary products, and waste. See comprehensive SMaRT LCA requirements for all product stages in #4 above. All significant environmental / energy impacts are captured and identified (ISO 14025).
- c. Data quality & completeness. By using the legally binding certification requirements for manufacturers for accuracy and use of qualified professionals, the uniform LCA and PCR requirements for SMaRT certified products uniquely result in less variability and greater rigor, consistency, precision, accuracy and completeness of the SMaRT ISO compliant LCA, PCR and EPD. Due to ISO requirements, SMaRT manufacturers are required to describe in the ISO compliant SMaRT LCAs both quantitative and qualitative aspects as well as data quality, collection methods, precision, all sources,

representativeness, completeness, reproducibility, consistency, and uncertainty (SMaRT MFG 2-2 & §7 LCA reporting). Age of data is identified and minimum amount of time over which data must be collected. The geographic coverage of the data must be extensive enough to meet the requirements above to cover all significant environmental / energy impacts. Treatment of missing data must be described pursuant to ISO 14044 §4.2.3.6.3. (SMaRT MFG 2-2 & §7 LCA reporting). SMaRT requires the identification of the technology or technology mix of manufacture of the product. (ISO 14025 §6.71(b) & ISO 21930 §6.2.6).

- d. **Data calculation.** Allocation of material flows is required by the SMaRT LCA pursuant to ISO 14044 §4.3.4.2, & for reuse and recycling §4.3.4.3. Allocation is portioning the input or output flows of a process or a product system between the product system under study and one or more other product systems. The allocation for the processes included in the upstream module is most often done by the LCA software system and the underlying datasets in its database. General principles to follow for the allocation of environmental burdens between product systems are: The environmental impact associated with the treatment of wastes not being used as a resource in another product system lies with the generator. The environmental impact associated with the processing of the waste into resource for subsequent use lies with the user of that resource. These principles are consistent with liability for hazardous waste by manufacturers.

Beyond the use of these principles, the SMaRT requirements to identify 12 impacts over all product stages, means that co-product allocation is always avoided by system expansion so all significant environmental impacts are captured. All hazardous and toxic materials are included in SMaRT LCA requirements including both inventory and impact. Consistent with the above allocation requirements, SMaRT does not allow the use of economic allocation criteria because of its sensitivity to market specific conditions. These SMaRT requirements provide for the most robust, transparent, and leadership environmental results encouraging protection and enhancement of public health and environment. A description of these methodologies used is required to be presented in the ISO compliant SMaRT LCA pursuant to ISO 14044 requirements and adhered to in the SMaRT EPD. (ISO 221930 §6.2.7 & ISO 14044).

EU EPD Requirements. The EU identifies general requirements from its 2002 “*Final Report on Evaluation of Product Declaration Schemes* (at 11)” documenting the minimum EPD requirements for EU Member Nations:

“Programme-related:

- Independent verification
- Quality control of data
- Interested party participation
- Inclusion of additional non-LCA data
- Procedures for PSR development

Method- and data-related:

- Use of LCA according to ISO 14040ff
- set of indicators (inventory and impacts)
- rules for calculating the set of indicators
- data requirements (e.g. specific/generic, time frame)
- Allow for cradle-to-gate assessments”

EDP statutory requirements are in effect for consumer products sold in France after January 1, 2011. The Program is administered by Agency for Environmental and Energy Management (ADEME) and the primary requirements are as follows (Environmental Labeling for Consumer Products, Mar. 24, 2009 ADEME):

1. A CO2 Footprint Indicator is mandatory. All products should have objective information on emissions of greenhouse gases they are responsible for on a functional unit basis pursuant to ISO 14040 LCA standards.
2. Other environmental indicators are required. These indicators are underdevelopment by product category.
3. Methods of Calculation. The methods of calculation should take into account the entire life cycle of a product: extraction of raw materials (or exploitation), processing, transmission, distribution, use, end of life. It is important to know the environmental impact. Environmental indicators are the same within a product category (defined by the same functional unit).

Information regarding the calculation of indicators should remain transparent to ensure credibility and comparability of the figures between products.

4. Principles Set Forth for the French EPD (Guide to best practices BP X30-323: General Principles for an Environmental Communication on Mass-market Products, ADEME):

- The communication displayed shall refer to the whole product-plus-packaging item.
- The communication shall be reliable, transparent, and simple yet cover multiple criteria and in the same format across all products,
- Methods used to gauge their impact shall remain the same despite the quality differences inherent to each individual product,
- The communication must allow the consumer to be aware of life cycle impacts of the product to allow an informed decision for product purchasing
- Information disclosed must be based on common, validated methodology, with basis of calculations and analysis.

State of EPD Market. ADEME found a wide variety of EPDs in the market with conflicting assumptions, which is consistent with MTS' review of EPDs in the market. EPDs purport to follow ISO 14025. About 10 different formats of EPDs were reviewed by MTS, and none meet the above French EPD requirements in terms of disclosing life cycle information in a format and with information that is meaningful to consumers or purchasers. It is probably only meaningful to LCA experts because it is too complicated. A solution would be to have this understandable summary information first in the SMaRT EPD, with the technical information following to ensure transparency and credibility.

SMaRT EPD Format & SMaRT EPD Certification / Recertification. The SMaRT EPD is independently certified by MTS. The SMaRT EPD also reuses the SMaRT Section 7 legally binding certification that the SMaRT EPD Certification Application meets the requirements of SMaRT and the requirements of this SMaRT EPD Policy.

Just as with SMaRT Certification, recertification to the SMaRT EPD is required every three years including payment of fees pursuant to the SMaRT Fee Policy to be in good standing.

The following required format and data are based on ISO LCA Standards, and the EU and French requirements above.

1. Title & Purpose: SMaRT Environmental Product Declaration (EPD)

- EPD Purpose & Value. EPD's disclose environmental product information over the product's life cycle, from raw materials extraction, transportation, manufacture, use, and reuse or end of life.
 - Consistent with current EPD mandates, the EPD purpose is to allow consumers, product purchasers, and other interested parties to make a more informed decision about a product based on accurate and relevant life cycle environmental information.
- EPD Limitation On Product Comparison. EPD Product Criteria Rules (PCRs) are a prerequisite to allow EPDs to be competently prepared through the PCR common set of requirements. PCRs identify for a product category, common definitions and measurements so that products within a product category may be compared accurately.
 - There are literally thousands of consensus PCRs for product industries, e.g., furniture, lamps, electrical products, etc., that need to be prepared before EPDs can be begin to compare one product to another. Accordingly, MTS believes that EPDs *can not* accurately be used to compare one product to another even with additional third party review.
 - Most EPDs do not conduct *in situ* verification of data such as manufacturing facility auditing.
 - There are limitations and variability in ISO compliant LCA tools used.
 - There is substantial variability in even if using the same PCR.
 - There are incomplete LCAs not using all 13 recognized impact categories
- SMaRT Product Comparisons. In contrast, SMaRT Certification allows any certified product to be accurately compared to another based on consensus environmental and social criteria of the product's life cycle with the comparison being the level of certification and total points achieved which are both disclosed in the transparent SMaRT Certification Summary for each product.
- EPD Mandates. EPDs are required as of January 2011 for consumer products sold in France and the European Union has minimal EPD Requirements for Member Nations.

2. Product Description

- Marketing photo of product
- General description of the product including its uses in the market
- Table of materials in the product by source of the material (where it comes from) and percent, e.g., aluminum, steel, jute, glass; Polypropylene is a thermoplastic material produced from the polymerization of propene which is sourced from petroleum.

3. Short Summary Company Description & Logo

- Company environmental targets, objectives and metrics pursuant to ISO 14001 (MFG 1-1)

4. Tables of Quantity of CO2 Emissions, Global Warming Potential, and Water Use by Product Stage

- Extraction
- Transportation
- Manufacturing
- Use
- Reuse
- End of life

Carbon and water use footprint diagrams are required like Figure 2 and Table 4 of the attached Texbond EPD (SMaRT EPD Format 4), but with the pie chart indicating the contribution of carbon / greenhouse gas emissions and water use by all product stages. The reporting of climate pollution and water usage are on a 'per functional unit' basis. The functional unit for the SMaRT EPD is also the CO2 per kilogram or square meter of product based on global warming potential of the product, and cubic meters of water used per kilogram or square meter of product.

Greenhouse gas footprints shall be generated in accordance with ISO 14064:2006 (Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals).

Water use footprints are to be generated in accordance with LCA methodologies ISO 14040:2006 (Environmental management - Life cycle assessment - Principles and framework) and ISO 14044:2006 (Environmental management - Life cycle assessment - Requirements and guidelines).

5. SMaRT Rating, Score, & Relation to SMaRT EPD

- SMaRT Logo
- Statement of Significance of SMaRT Certification. SMaRT is the national consensus sustainable product standard and certification that qualifies for the SMaRT LEED Credit of the US and Canada Green Building Councils, and Green Star credit of the Australia and New Zealand Green Building Councils. SMaRT is recognized as the leadership sustainable product standard and label by the Leadership Standards Campaign. SMaRT is to products as LEED is to buildings and is a multi-attribute certification incorporating 49 single attribute standards with requirements for public health and environment, renewable energy and energy efficiency, recycled or biobased content, facility data, reuse, and innovation. SMaRT has 15 prerequisites and 28 minimum points for certification. SMaRT Certified products are those best for the environment, economy, and social equity. SMaRT has been adopted by 31 entities including the Capital Markets Partnership Sustainable Manufacturing Underwriting Standard identifying increased profits and share value for manufacturers and retailers.
- Statement of Significance of SMaRT Certification for Generating a SMaRT EPD. Some important SMaRT credits used as the basis of this SMaRT EPD are:
 - LCA consensus definitions in SMaRT §§4.8 - 4.13
 - Prerequisite requirement for an ISO Compliant LCA for the SMaRT Certified Product (MFG 2-2)
 - Prerequisite requirement for Life Cycle Inventory of some 1300 pollutants covering

- 12 environmental impacts (PHE 1-1)
 - Prerequisite requirement for inventory of input and output toxic Stockholm Treaty Chemicals and requirement that no input or output Stockholm Treaty Chemicals are generated by SMaRT Certified Products (PHE 1-2 & 1-3)
 - Inventory Air, Water, & Waste Media 1300 Pollutants for pollutant flows (flue gas and wastewater), total solid waste, recovered matter, greenhouse gases, acidification gases, other air emissions, ozone depletion, smog, eutrophication, and other water effluents (PHE 2-2)
 - 10% - 100% Reduction in 1300 Toxic Chemicals and Media Pollutants based on EPA's TRACI Characterization Factors as Baseline Assessment Life Cycle Impact Categories for global warming, stratospheric ozone depletion, acidification, eutrophication, photochemical smog, human health toxicity, fossil fuel depletion, habitat alteration, criteria air pollutants, ecological toxicity, solid and hazardous waste, water intake. (PHE 3-1 to 6-1)
 - Prerequisite requirement for EMS Environmental Management Policy & Targets (MFG 1-1)
 - Adopted Design for Environment Process (MFG 4-1)
 - Prerequisite requirement for Operational Reuse Recovery System (EOL 1-1)
 - Prerequisite requirement for Performance Durability standards compliance (EOL 1-2)
- Required Statement of Significance of SMaRT Certification & SMaRT EPD on the First Page of Every SMaRT EPD, Preferably in a Text Box using Knoll's ReGeneration Chair as an example.

[THIS SECTION TO BE "BOILERPLATE STYLE" TEXT BOX]

SMaRT & SMaRT EPD Significance

All SMaRT Product EPDs are Certified as Sustainable Products, Stockholm Treaty Toxic Chemicals / PVC and SF6 free, meet SMaRT's Carcinogen and Legal Operations Policies, use FSC Certified Wood for wood products, and are uniquely comparable accurately based on life cycle assessment (LCA).

The ReGeneration by Knoll chair is a **SMaRT Sustainable Platinum** certified product achieving:

- 30 points for Safe for Public Health & Environment
- 30 points for Renewable Energy & Energy Reduction
- 9 points for Biobased or Recycled Materials
- 15 points for Facility or Company Requirements
- 4 points for Reclamation, Sustainable Reuse & End of Life Management
- 5 points for Innovation in Manufacturing

The ReGeneration SMaRT Sustainable Product Certification Summary and Scorecard are at: <http://mts.sustainableproducts.com/SMaRT/ReGeneration>

Background on SMaRT & ISO Environmental Labels

SMaRT is a type 1 consensus, performance based and quantified Ecolabel, an independently third-party verified, multi-criteria license to use the SMaRT Label indicating the overall environmental and sustainable preferability of a product on a life cycle basis. Type 2 labels are manufacturer self-claims on the environment without third party verification. A type 3 label is an independent, qualified third-party verified environmental product declaration based on a quantified LCA with set parameters. To increase accuracy, SMaRT EPDs combine the requirements of a type 1 Ecolabel and also a transparent type 3 label. LCAs are best used to obtain supplier environmental impact data and improve product design.

6. **Packaging Summary Description**
7. **Product Quality Standards Compliance and Warranty**
8. **Summary of Operational Reuse System**
9. **Life Cycle Assessment (LCA) Summary**

- LCA definition: **Life Cycle** is the consecutive and interlinked stages of a product system, from raw material acquisition to final disposition or reuse. **Life Cycle Assessment** is the compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle.
- Functional unit, e.g., for carpet is one square meter of installed carpet for heavy use
- Cut off Criteria are not allowed to exclude significant environmental impacts or product stages by SMaRT because the system boundary is the entire life cycle since SMaRT requires 12 environmental impacts over all product stages. Cut-off criteria can include or exclude materials, energy and emissions data are as follows:
 - Mass – If a flow is less than 1% of the mass of the modeled product it may be excluded, providing its environmental relevance is not a concern.
 - Energy – If a flow is less than 1% of the cumulative energy of the model it may be excluded, providing its environmental relevance is not a concern.
 - Environmental relevance – If a flow meets the above criteria for exclusion, yet is thought to potentially have a significant environmental impact, it will be included.
 - The total excluded flows do not exceed 5% of overall life cycle.
- Allocations are not used in SMaRT because its system boundaries cover all stages. System expansion is conducted when the issue of allocation arises in order to capture the full LCA impacts.
- Statement of Status of Product Criteria Rules for this EPD if PCRs in addition to the SMaRT PCR is used.
- Identify the ISO Compliant LCA Data System Used, e.g., GaBI, SimaPro, BEES
- Data Quality. Statement on the quality of data including any limitations that could affect environmental impact conclusions and representations
- System Boundaries cover the entire product LCA including extraction, transportation, manufacturing, use, reuse, end of life for the product and packaging.
- Diagram of Energy Usage by type over the life cycle broken down by renewable and nonrenewable energy. See figures 7& 8 of attached European Aluminum Association (EAA) EPD (SMaRT EPD Format 9).
- Diagram of Energy Use by Life Cycle Stage. See Figure 7 of attached Bentley Prince Street EPD.
- Diagram of Life Cycle Stages as a Percent of LCA Impacts. See Figure 14 of attached Bentley Prince Street EPD.
- Table of Life Cycle Impact Assessment for the Declared Product. See Tables 6 & 7 of the attached EAA EPD.
- Product Installation Impacts. Impacts resulting from the installation of the building product in the building (e.g. energy and materials used) must be identified and included in the EPD report unless data are unavailable and this fact shall be stated in the SMaRT EPD (ISO 21930 §6.2.6 & ISO 14025).

10. **Statement of Compliance With ISO 21930 EPD Reporting Requirements & Legally Binding Certification of Compliance With This Policy**

Pursuant to ISO 21930 §§7.2, 6 and 8.1, the manufacturer must submit and execute the same legally binding certification as it executed for SMaRT 7 Certification, that this SMaRT EPD Policy is adhered to with accurate information that is not misleading, and qualified professionals are used consistent with the FTC Environmental Marketing Guides or as an express warranty part of the product contract of sale to customers.

The legally binding certification must specifically state that ISO 21930 EPD Methodology and PCR framework is adhered to including as replicated in this EPD Policy including the following information required by ISO 21930 §8.1 & ISO 14025 §9:

- a. name and address of the manufacturer(s)
- b. description of the building product's use and the functional or declared unit of the building product to which the data relates
- c. building product identification by name (e.g., including production code) and a simple visual representation of the building product to which the data relates
- d. name of the programme and the programme operator's address and logo and website
- e. PCR identification
- f. date the declaration was issued and period of validity
- g. data from LCA or LCI or information modules; see ISO 21930 §§8.2.2 and 8.2.3
- h. additional environmental information; see ISO 21930 §8.2.4
- i. content of the product as identified in c) above, covering materials and substances to be declared (e.g., information about product content, including specification of materials and substances that can adversely affect human health and the environment, in all stages of the life cycle).
- j. statement that the LCA and declaration cover all product stages.
- k. statement that environmental declarations from different programmes might not be comparable
- l. statement that this declaration represents an average performance, 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 shall be stated
- m. site(s), manufacturer or group of manufacturers, or those representing them, for whom the results of the LCA are representative
- n. information on where explanatory material can be obtained
- o. No part of the required content of the declaration required by the PCR shall be omitted or simplified as required for business-to consumer communication.
- p. Consistent with SMaRT, the SMaRT PCR and SMaRT EPD, all life cycle stages are covered in the EPD (ISO 14025 §9.2.1).
- q. The SMaRT EPD is made available to the consumer at the point of purchase (ISO 14025 §9.2.2).

11. Demonstration of EPD Verification and Independent Third Party Certification

SMaRT PCR review consistent with ISO 21930 §§6.2 & 9.1 & ISO 14025 §8.1.2 was conducted by Market Transformation to Sustainability (MTS). The Chairman of the SMaRT Committee overseeing this EPD Policy and requirements is Doug Pierce, Perkins+Will who can be contacted through MTS@sustainableproducts.com.

Independent verification of the declaration and data, according to ISO 14025:2006 which can be internal (ISO 14025 §8.1.1).

internal

SMaRT EPD third party verification was conducted by MTS independent of first parties (suppliers / manufacturers) and second parties (purchasers) and is appropriate for business to business and business to consumer communications, and consumer and environmental representatives reviewed the SMaRT EPD Policy consistent with ISO 14025 §9.3. MTS is not involved in the development of the ISO compliant LCA or the EPD, has no conflicts of interests, and is a nonprofit IR §501(c)(3) (ISO 14025 §§8.1.1 & 9.4).

MTS is competent to conduct the third party SMaRT EPD verification pursuant to ISO 14025 §8.2 as documented in section 12 of the SMaRT EPD Policy.

12. EPD Certification / Verification Qualifications for SMaRT EPD Certification by MTS

- Authored LCA Technical Paper for US Green Building Council (USGBC) (1991)
- Launched ISO ASTM LCA Consensus Standards (1993)
- Initiated and reviewed Chapter on LCA Application to Materials & Specifications / Green Building Principles in *Sustainable Building Technical Manual* (DOE, EPA, USGBC, PTI 1996)
- Successfully managed approval of version one of ASTM / ISO LCA Standards (1997)
- Initiated and facilitated first US LCA for a chair with NIST (1998)
- Authored and published peer-reviewed *Sustainable Products Training Manual* with LCA chapter and comparative LCA results of bio-based vs. petroleum fuels (1998)
- Supported NIST development of BEES Please Technical Manual which was first US consensus of LCA impact categories and their performance metrics (2000)
- Developed and approved SMaRT 1.0 consensus sustainable product standard with ISO compliant LCA prerequisite (2000)
- Developed and approved SMaRT 2.0 consensus sustainable product standard with comprehensive LCA ISO compliant requirements detailed above in *Statement of Significance of SMaRT Certification for Generating a SMaRT EPD* (2002)
- Developed online LCA and Sustainable Products Education (2003)
- Developed and approved SMaRT 3.0 consensus sustainable product standard with comprehensive ISO compliant LCA requirements detailed above in *Statement of Significance of SMaRT Certification for Generating a SMaRT EPD* (2004)
- Developed and approved SMaRT 4.0 consensus sustainable product standard with comprehensive ISO compliant LCA requirements detailed above in *Statement of Significance of SMaRT Certification for Generating a SMaRT EPD* (2006)
- Performed life cycle assessment of cement products (2007)
- Developed, peer-reviewed and approved LCA Education Program accredited by AIA, IDEC & USGBC (2008)
- Authored and published *LCA & Certified Sustainable Products Teaching Guides* (2008)
- Qualified SMaRT to *Green Star* including Green Star LCA requirements. Green Star is the Green Building Standard of the Australia and New Zealand Green Building Councils (2011).
- Developed and approved SMaRT EPD Policy (2011-2012)
- And accordingly has achieved the following LCA / EPD professional competencies pursuant to ISO 14025 §8.2.2 –
 - knowledge of relevant sectors, product and product-related environmental aspects
 - process and product knowledge of the product category

- expertise in LCA and methodology for LCA work
- knowledge of relevant standards in the fields of environmental labeling and declarations and LCA
- knowledge of the regulatory framework within which requirements for Type III environmental declarations have been prepared, and
- knowledge of the Type III environmental declarations programme