

Sustainable carpet assessment draft standard

Draft NSF International/ American National Standard

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for Sustainability —

**Sustainable carpet
assessment**

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Foreword (This foreword is not part of NSF Draft Standard 140 – 2005.)

This Draft American National Standard for Trial Use, NSF 140 Sustainable Carpet Assessment Standard, has been developed as part of the ongoing efforts of a number of interested parties to document and improve the sustainability profile of carpet and rug products using established and/or advanced scientific principles, practices, materials and standards. Stakeholders involved in developing the Draft Standard included carpet and rug manufacturers, end users such as interior design professionals, state agencies responsible for environmentally preferable product procurement practices, academics and non-governmental organizations.

The purpose of the Draft Sustainable Carpet Assessment Standard is to establish consistent requirements for sustainable carpet products. These requirements are intended to form the basis of conformity assessment programs, such as third-party certification or registration.

The Draft Sustainable Carpet Assessment Standard has been designed, in part, to satisfy the following criteria:

- Demonstrate how carpet and rug products can conform to the environmental, economic, and social principles of sustainability throughout the supply chain.
- Demonstrate conformance with ISO Type 1 (14024) and Type 2 (14021) environmental labelling and declaration requirements.
- Demonstrate conformance with the Federal Trade Commission (FTC) Guides for the Use of Environmental Marketing Claims.
- Engender confidence in the various stakeholders (manufacturers, suppliers, regulators and consumers) that products labelled with a third party certification mark consistently meet the requirements of this program.
- Encourage participation by all manufacturers of carpets and rugs to maximize impact reductions and enhance environmental accomplishments.

Comments on this Draft Standard for Trial Use should be sent to NSF International, Standards Department, PO Box 130140, Ann Arbor, Michigan 48113-0140, USA or to standards@nsf.org.

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NSF Draft Standard For Sustainability

Sustainable carpet assessment

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1 Purpose and Goals

The purpose of the sustainable carpet standard is to provide a market-based definition for a path to sustainable carpet, establish performance requirements for public health and environment, and address the triple bottom line, economic-environmental-social, throughout the supply chain.

The goals of this Standard are to:

- a) Increase the economic value of sustainable carpet throughout the supply chain by enhancing market demand for sustainable carpet products.
- b) Provide information that enables specifiers to sort out the complex information on sustainable attributes.
- c) Identify other consensus based standards and sustainable carpet.
- d) Educate and instruct all stakeholders in the carpet supply chain.
- e) Encourage competition between manufacturers and their suppliers to seek out or develop environmentally preferable processes, practices, power sources, and materials.

This Standard is intended to help raw material suppliers, converters, manufacturers and end-users. Adherence to this Standard and achievement of high levels of sustainable attribute performance can or should result in:

- Cost savings
- Design innovation
- Product differentiation
- Long term customer relationships
- Liability reduction
- Ecological restoration

2 Scope

The scope of the Standard enables organizations throughout the carpet supply chain to apply performance requirements to achieve sustainable attributes and demonstrate compliance with levels of achievement through quantifiable metrics. The Standard is inclusive, is based on life cycle assessment (LCA) principles, and provides benchmarks for continuous improvement and innovation.

Compliance to this Standard is intended to allow inclusive participation and encourage the progressive movement of the carpet industry toward sustainability. This Standard identifies six levels of sustainable attribute performance and four levels of achievement by which carpet materials and products can be measured with respect to specific attributes that indicate progress toward sustainability.

This Standard is voluntary yet emphasizes disclosure of information on both impacts and benefits of a carpet or carpet product from an environmental and sustainability perspective.

All products or processes can be referenced under this Standard if they are able to achieve all prerequisites and score the minimum required for compliance as specified in section 6.

This Standard does not apply to packaging of sustainable carpets.

3 References and Tools

This Standard incorporates procedures and protocols established in the following sustainability references, thereby eliminating both redundancies and potential inconsistencies. The links provided were accurate as of the time of publication of this document.

Global Reporting Initiative (GRI) Social Indicators <http://www.globalreporting.org/GRIGuidelines/index.htm>

Stockholm Toxic Chemicals List <http://www.chem.unep.ch/publications.htm>

Life Cycle Assessment (LCA) ISO General Principles Standard
<http://www.iso.ch/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=23151>

General Product Life Cycle Diagram (see Annex A, Figure A.1)

Federal Trade Commission *Environmental Marketing Guides*
<http://www.ftc.gov/bcp/conline/pubs/buspubs/greenguides.htm>

US Green Building Council *LEED Rating System* http://www.usgbc.org/LEED/existing/leed_existing.asp

FSC Certified Wood Practices <http://www.certifiedwood.org/>

Green-e Power <http://www.resource-solutions.org/Green-epage.htm>

Scientific Certification Systems *Carpet Floor Coverings Assessment Criteria and Reference Guide*
<http://www.scscertified.com/>

Additional information on use of this Sustainable Carpet Assessment Standard is provided in Annex A. A Reference Guide for implementation is available to provide details on the intent for each element in the matrix, examples and how to go about documenting for compliance.

4 Definitions

4.1 Best Management Practices (BMPs) for Soil Erosion and Runoff Control: These practices improve soil productivity and prevent water pollution that adversely affects biota including spawning grounds. They provide a basis for measuring the environmental impact of corn production for extraction of polylactic acid (PLA). Use of PLA fiber is recognized in this Standard. Many carpet materials may be biobased in the future and thus developed from agricultural products.

BMPs provide benefits at the raw materials extraction stage. These practices developed by EPA, Purdue University, and Conservation Technology Information Center, can be viewed at <http://www.epa.gov/watertrain/agmodule/> with detailed descriptions, manuals, and photos of practices. They allow for local variables, e.g. weather, pests, soil, and type of farm, and are summarized and slightly modified as follows:

Conservation Tillage - leaving crop residue (plant materials from past harvests) on the soil surface reduces runoff and soil erosion, conserves soil moisture, helps keep nutrients and pesticides on the field, and improves soil, water, and air quality;

Crop Nutrient Management for Organic fields - fully managing and accounting for all nutrient inputs helps ensure nutrients are available to meet crop needs while reducing nutrient movements off fields. It also helps prevent excessive buildup in soils and helps protect air quality;

Pest Management - varied organic methods for keeping insects, weeds, disease, and other pests below economically harmful levels while protecting soil, water, and air quality;

Conservation Buffers - an additional barrier of protection by capturing potential pollutants that might otherwise move into surface waters. Examples are grassed waterways and riparian conservation areas.

Irrigation Water Management - reducing nonpoint source pollution of ground and surface waters caused by irrigation systems;

Grazing Management where manure is used for fertilizer - minimizing the water quality impacts of grazing and browsing activities on pasture and range lands;

Animal Feeding Operations (AFOs) Management where manure is used as fertilizer - minimizing impacts of animal feeding operations and waste discharges through runoff controls, waste storage, waste utilization, and nutrient management;

Erosion and Sediment Control - conserving soil and reducing the mass of sediment reaching a water body, protecting both agricultural land, water quality, and habitat.

4.2 Biobased: In contrast to the petroleum-based model that relies on materials photosynthesized millions of years ago, biobased manufacturing processes use photosynthesis that occurred in the past decade. Biobased processes use naturally occurring enzymes or organisms. Biobased manufacturing processes generate by-products that are not hazardous, can be reused and are disposed of through biodegradable methods. In the context of this Standard, biobased materials shall be sustainably produced resulting in multiple attributes listed in Annex A, A.2.

4.3 Biodegradable: "Reliable scientific evidence that the entire product or package will completely break down and return to nature, *i.e.*, decompose into elements found in nature within a reasonably short period of time after customary disposal (16 C.F.R. § 260.7 (b))."

4.4 Carpet: Heavy functional and ornamental floor coverings consisting of pile yarns or fibers and a backing system. They may be tufted or woven.

4.5 Closed Loop Process: Materials reclaimed and returned in a process that are neither classified

as, defined as, nor operate as, a waste, i.e., any discarded material. Materials in a closed loop process are treated as commodities in a manner designed to avoid loss or release to the environment (See generally, 40 C.F.R. § 261.4(a)(8)).

4.6 Compostable: “Competent and reliable scientific evidence that all materials in the product or package will break down into, or otherwise become part of, usable compost (e.g., soil conditioning material, mulch) in a safe and timely manner in an appropriate composting program or facility, or in a home compost pile or device (16 C.F.R § 260.7 (c)).”

4.7 Continual Improvement: Continual improvement is a process used in total quality management, in which a company through its routine course of business, continually improves its products and processes.

4.8 Design for the Environment (DfE): Through life-cycle assessment, DfE considers all environmental implications or stages of a product: energy and materials used, its manufacture and packaging, transportation, consumer use, reuse or recycling, and disposal. 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).

4.9 Life Cycle: Consecutive and interlinked stages of a product system, from raw material acquisition or to final disposition or reuse.

4.10 Life Cycle Assessment (LCA): Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle (see Annex A, Figure A.1).

4.11 Life Cycle Design: An approach for designing more ecologically and economically sustainable product systems, integrating environmental requirements into the earliest stages of design. In life cycle design, environmental, performance, cost, cultural and legal requirements are balanced. (*EPA Introduction to Environmental Accounting June 1995*).

4.12 Life Cycle Impact Assessment: Phase of life cycle assessment aimed at understanding and evaluating the magnitude and significance of the potential environmental impacts of a product system at all product stages.

4.13 Metric: A standard of measurement.

4.14 Pollution Prevention: Changing existing or planned operations so that waste generation is prevented or the volume and/or toxicity of wastes are minimized. Pollution Prevention (P2) is the reduction or elimination of pollution at the source (source reduction) instead of at the end-of-the-pipe or stack. P2 occurs when raw materials, water, energy and other resources are utilized more efficiently, when less harmful substances are substituted for hazardous ones, and when toxic substances are eliminated from the production process.

4.15 Precautionary Principle: Where threats of serious or irreversible harm to people or nature exist, anticipatory action will be taken to prevent damages to human and environmental health, even when full scientific certainty about cause and effect is not available, with the intent of safeguarding the quality of life for current and future generations.

4.16 Primary Conversion Process: A process that refines or converts a raw fossil fuel or biomass into a material used by traditional manufacturing processes.

4.17 Reclamation: 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 carpet to the highest degree practicable. This

includes reusing the products and components for extended product life. See Computer Take Back Campaign Platform (Elec. Take it Back Campaign March 2001).

4.18 Recycled Content: The amount of material by weight "collected, separated or otherwise recovered from the solid waste stream for use in the form of raw materials, in the manufacture or assembly of a new package or product (16 C.F.R. § 260.7 (d))". See background in Appendix A.3. Coal fly ash used as filler or binding agent qualifies as post industrial content only, as do all other post industrial content fillers and binders.

Post Consumer - A material or finished product that has served its intended use and has been diverted or recovered from waste destined for disposal. Manufacturer's scrap that would have, in any case, been incorporated into the product does not qualify as recycled under the Federal Trade Commission Guides. See 16 C.F.R. 260.7(e).

Post Industrial/Preconsumer – Materials generated by manufacturers or product converters, such as trimming, overruns, and obsolete products that are incorporated back into the manufacturing process of the same or a different product. See Appendix A3.

4.19 Recycling: A series of activities that includes collecting materials that would otherwise be considered waste, sorting and processing recyclables into raw materials such as fibers, and manufacturing raw materials into new products. (<http://www.epa.gov/epaoswer/non-hw/muncpl/recycle.htm>).

4.20 Renewable Energy: Includes solar electric (photovoltaic), solar thermal, wind, geothermal, biogas, biomass, hydro and renewable cogeneration on site or off site, on or off grid. Off-site renewable energy can either be displaced which is renewable energy meeting Green-e requirements generated by the same owner on a different site, or Green-e power that is purchased on the open market from sources that are certified through the Green-e Renewable Electricity Certification Program. Contracts for purchase of Green-e electricity should be for a minimum of two years.

The non-profit organization Center for Resource Solutions established the *Green-e* Renewable Electricity Certification Program to encourage consumer confidence in buying "green" electricity. *Green-e* is the nation's first voluntary certification and verification program for "green" electricity products. The criteria require that at least 50% of the supply is generated from the sun, water, wind, burning of wastes (biomass) or geothermal heat from the earth. In addition, in the use of any traditional fuel, emissions of sulfur dioxide (which causes acid rain), nitrogen oxide (which causes smog) and carbon dioxide (which causes climate change) shall be lower than average. The companies that receive the Green-e designation shall agree to an annual audit to ensure they have purchased a satisfactory amount of "renewable" power: <http://www.green-e.org>. The *Green-e Standard* is at http://www.green-e.org/ipp/standard_for_marketers.html.

4.21 Reuse: "Use a product more than once, either for the same purpose or for a different purpose. Reusing, where possible, is preferable to recycling because the item does not need to be reprocessed before it can be used again" (<http://www.epa.gov/epaoswer/non-hw/muncpl/reduce.htm#reuse>).

4.22 Reusable: The potential of a product for reuse as defined in 4.21, and that facilities exist to make such reuse economically feasible.

4.23 Supply Chain: 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).

4.24 Sustainable Agriculture: An integrated system of plant and animal production practices having site-specific application that will, over the long term:

- satisfy human food and fiber needs
- enhance environmental quality and the natural resource base upon which the agricultural economy depends
- make efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls
- sustain the economic vitality of farm operations
- enhance the quality of life for farmers and society as a whole

(*Food, Agriculture, Conservation, and Trade Act of 1990*). Sustainable agriculture protects native vegetation, habitat and forests, and where forest harvesting arises in the carpet supply chain, uses *FSC Certified Wood* practices.

4.25 Sustainable Carpet: A sustainable carpet meets or exceeds the environmental, social, and economic performance requirements set forth in this Standard’s “Sustainable Carpet Assessment Matrix” in section 6. These products and their related systems have the following attributes:

- All materials and process inputs and outputs are safe for human and ecological health in all phases of the product life cycle;
- All energy, material and process inputs come from renewable or recycled sources;
- All materials are capable of returning safely to either natural systems or industrial systems;
- All stages in the product life cycle actively support the reuse or recycling of these materials at the highest possible level of quality; and
- All product life cycle stages enhance social well being.

NOTE: This definition of Sustainable Carpet is derived from the definition of Sustainable Textile developed by McDonough Braungart Design Chemistry (MBDC).

4.26 Sustainable Reuse: Reuse is sustainable when it includes social supply chain considerations specified in the table 2 in MFG 1-2, and the product is EITHER:

- reused indefinitely, maintaining performance and quality characteristics and environmental integrity without harmful releases to health or environment, as part of a closed loop program in which only chemically contaminated used product is disposed of, OR
- reused, and then returned safely to natural systems without any adverse effects to public health and environment.

5 General Requirements

In order to achieve a sustainable achievement rating, a carpet product shall provide environmental, economic, and social benefits while protecting and enhancing the needs of future generations, public health, welfare and environment over its full commercial cycle, from raw materials extraction to final disposition. A sustainable carpet shall also provide the equivalent in performance and quality to other carpets.

A sustainable carpet may be petrochemical-based or biobased but shall demonstrate throughout its

supply chain, multiple attributes that protect public health and environment and foster healthy and prosperous conditions for human and ecological systems.

5.1 Life Cycle Assessment (LCA)

Consistent with the Sustainable Carpet Assessment Matrix in Section 6, sustainable carpet shall be evaluated over the supply chain for multiple environmental benefits/impacts. LCA is one recognized tool to do this. LCA shall be used for communications using the word “sustainable,” as part of the competent scientific evidence requirement pursuant to Federal Trade Commission (FTC), EPA, and 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 and 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).*” Also relevant is the ISO General Principles LCA Standard.

5.2 Product Labeling and Marking

Manufacturers demonstrating compliance with this Standard may mark or label their sustainable carpet achievement on their product and literature consistent with the appropriate level in the Achievement Matrix (see 7.1.1).

5.3 Use of Sustainably Produced Biobased Materials in Carpet

Sustainably grown agricultural materials used in carpet shall demonstrate sustainable performance attributes throughout their supply chain and production system. Producers should be able to account for and report on these attributes. Sustainable carpet product manufacturers using agricultural raw materials should be able to demonstrate sustainable performance attributes resulting from the use of sustainable agriculturally grown raw materials.

See Annex A for guidance - A.2 Sustainably Produced Biobased Material Performance Attributes.

5.4 Sustainable Natural Animal Carpets

Sustainable carpet may be from natural animal fiber provided that sustainable agricultural best management practices defined in 4.1 are followed for grazing management, conservation buffers, and animal feeding operation management, organic feed is used, and the animal is not harmed to obtain the fiber (see Annex A).

5.5 Compliance of Product Platforms

Compliance of products determined by platforms, i.e., groupings of individual products or product lines with a high degree of uniformity of environmental attributes, shall be allowed.

6 Sustainable Carpet Evaluation Criteria and Assessment Matrix

The Sustainable Carpet Evaluation Criteria are divided into five subject categories as follows:

- Safe for Public Health and Environment (PHE);
- Renewable Energy and Energy Efficiency (RE);
- Material, Biobased or Recycled (MATLS);
- Facility or Company Based (MFG); and
- Reclamation, Sustainable Reuse and End of Life Management (EOL)

The following sections describe each category and the associated evaluation criteria. A summary of all the criteria can be found in the Sustainable Carpet Assessment Matrix (Table 3) located at the end of this section. For each criterion within each category, a total number of possible points are specified. All requirements below are required throughout the supply chain over all product stages as indicated also in the Matrix.

6.1 Safe for Public Health and Environment (PHE)

This Category contains initial achievement levels that simply inventory pollutants and energy use adversely affecting public health and environment. It specifies intermediate achievement levels reducing a minimum number of known harmful pollutants, and higher achievement levels reducing more pollutants.

This category provides a reasonable and achievable pathway for a carpet to be documented as safe for public health and environment over the supply chain.

6.1.1 Level 1 Criteria – Supply Chain Feedstock Inventory

PHE 1-1: Feedstock Inventory Documentation - Identify material composition for components present at 1% (10 parts per thousand), including Stockholm Convention Persistent Organic Pollutants¹. [1 pt]

PHE 1-2: Input Stockholm Chemicals – Document that Stockholm Convention Persistent Organic Pollutants are not present at 0.1% or greater in the product. [1 pt]

6.1.2 Level 2 Criteria – Manufacturing Emissions Inventory and Credit for Voluntary Reductions Beyond Compliance

PHE 2-1: Inventory Human and Ecological Health Chemicals Emissions – Report year 2000 human and ecological health process outflow data (emissions) for certified product or product line for chemicals listed in the BEES Please User Questionnaire for Human and Ecological Health outflows (air and water). The questionnaire can be downloaded from <http://www.bfrl.nist.gov/oe/software/bees.html>. [2 pts]

PHE 2-2: Inventory Air, Water and Waste (Media) Pollutants – Report year 2000 process outflow data (emissions) for certified product or product line for the following environmental impact categories listed in the BEES Please User Questionnaire: Building products and other co-products; 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. [2 pts]

Baselines for Pollutant Reductions and Metrics: The inventories in PHE 2-1 and 2-2 comprise the baselines for pollutant reductions in PHE 3-1, 4-1, 5-1 and 6-1. The Baseline for PHE 2-4 below is 1986 data derived from a company Environmental Management System or ISO 14040 compliant LCA. The metrics used to measure all pollutant reductions documented in PHE 2-4, 3-1, 4-1, 5-1, and 6-1 are detailed in column five of Table 1 below (characterization factor).

PHE 2-3: Output Stockholm Chemicals – Document that manufacturer does not have Stockholm Convention Persistent Organic Pollutant emissions at or above TRI reporting thresholds. [1 pt]

PHE 2-4: Credit for Voluntary Pollutant Reductions Beyond Compliance - Document voluntary pollution reductions beyond Federal, State, or local regulatory compliance from 1986-1999 for Solid and Hazardous Waste, SARA Title III Toxic Release Inventory (TRI) Emissions

¹ The Stockholm Convention on Persistent Organic Pollutants, (signed in Stockholm, May 23, 2001) is intended to eliminate or restrict the production, use and/or release of twelve chemicals that, due to their persistence in the environment, can affect human health throughout the globe, regardless of the location of their use. The twelve chemicals include; pesticides (Aldrin, Chlordane, DDT, Heptachlor, Hexachlorobenzene, Dieldrin, Mirex, Toxaphene), industrial products (PCBs, polychlorinated biphenyls) and byproducts, i.e., unintentionally formed chemicals (polychlorinated dioxins and furans).

<http://www.epa.gov/tri/chemical/>, Climate Change Emissions, Water Use Reduction, and Energy Efficiency:

For 30-50% reductions: 1 point/impact for each of the 5 impacts above inventoried in PHE 2-1 including SARA Title III TRI chemicals

For 51-85% reductions: 2 points/impact for each of the 5 impacts above inventoried in PHE 2-1 including SARA Title III TRI chemicals

Over 85% reductions: 3 points/impact for each of the 5 impacts above inventoried in PHE 2-1 including SARA Title III TRI chemicals

8 Points Maximum Credit

6.1.3 Level 3 Criteria – 10-25% Reduction in Chemical and Pollutant Emissions

PHE 3-1: 10-25% Reduction of Toxic Chemicals and Media Pollutants Achieve an average 10-25% reduction of toxic chemicals and media pollutants in at least seven of the following twelve environmental life cycle impact categories: 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. In these 7 out of 12 categories, reductions *shall be achieved* for Global Warming, Human Health and Ecological Toxicity.

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) <http://www.epa.gov/ORD/NRMRL/std/sab/traci/index.html>.

The baseline for these reductions is the inventories generated in PHE 2-2 and 2-3 in the year 2000 using Table 1 units of measurement below, or a recognized and approved industry baseline for carpet.

2 points maximum credit as follows:

1 point for an average 10-25% reduction across 7 impact categories

2 points for an average 10-25% reduction across 12 impact categories

Table 1 – Baseline Assessment Life-Cycle Impact Categories

Impact Category	Scale	Sample LCI Data (i.e., classification)	Common Characterization Factor	Description of Characterization Factor
Global Warming	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.
Acidification	Regional Local	Sulfur Oxides (SO _x) Nitrogen Oxides (NO _x) Hydrochloric Acid (HCl) Hydrofluoric Acid (HF) Ammonia (NH ₄)	Acidification Potential	Converts LCI data to hydrogen (H ⁺) ion equivalents.
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
Photochemical Smog	Local	Nitrogen Oxides (NO _x) Formaldehyde Acetaldehyde Ethylene Glycol Hexanal Toulene	Photochemical Oxidant Creation Potential	Converts LCI data to nitrogen oxide (NO _x) equivalents.
Human Health	Local	Dioxins (Unspecified) Arsenic (As) Mercury (Hg) Carbon Tetrachloride (CCl ₄) Cadmium (Cd) Lead (Pb)	Toxicity Equivalency Potential	Converts LCI data to toluene equivalents.
Fossil Fuel Depletion	Global	Coal Natural Gas Oil	Fossil Fuel Depletion Potential	Converts LCI data to surplus MJ equivalents
Habitat Alteration	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

Table 1 – Baseline Assessment Life-Cycle Impact Categories

Impact Category	Scale	Sample LCI Data (i.e., classification)	Common Characterization Factor	Description of Characterization Factor
Criteria Air Pollutants	Global	Nitrogen Oxides (NO _x as NO ₂) Particulates (> PM10) Particulates (<+10) Particulates (Unspecified) Sulfur Oxides (SO _x as SO ₂)	Criteria Air Pollution Potential	Converts LCI Data To To Microdalys/G
Ecological Toxicity	Local	Dioxins Mercury (Hg) Cadium (Cd) Napthalene (C ₁₀ H ₈) Formaldehyde (CH ₂ O)	Ecological Toxicity Potential	Converts LCI data to 2,4-D equivalents
Solid And Hazardous Waste	Local	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 equivalent liters

– concluded –

PHE 3-2: Minimize Indoor VOC Emissions - The maximum concentration for any chemical emitted at 96 hours in emissions tests (following a ten-day conditioning period), shall not result in a modeled indoor air concentration greater than ½ the chronic reference exposure level (CREL) established by California Office of Environmental Health Hazard Assessment (OEHHA), except formaldehyde which shall not exceed ½ the OEHHA indoor chronic reference exposure level (REL). Testing shall be in accordance with CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers (http://www.dhs.ca.gov/ps/deodc/ehlb/iaq/VOCS/Section01350_7_15_2004_FINAL%20WITH%20ADDENDUM-2004-01.doc). [1 pt].

NOTE: Conformance with this criterion can be met through participation and compliance with the CRI Green Label Plus Program.

PHE 3-3: Minimize Indoor Carcinogenic VOC Emissions – Carcinogenic or reproductive toxicant VOCs shall not emit from products at levels above the Safe Exposure Levels (SELs) as described in section 8.2 of CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small Scale Environmental Chambers (http://www.dhs.ca.gov/ps/deodc/ehlb/iaq/VOCS/Section01350_7_15_2004_FINAL%20WITH%20ADDENDUM-2004-01.doc). Green Label Plus VOC testing data can be used to perform the calculations for meeting this credit pursuant to Standard Practice 174 including in section 8.2 cited above. [1pt]

6.1.4 Level 4 Criteria – 26-50% Reduction in Chemical and Pollutant Emissions

PHE 4-1: 26-50% Reduction of Toxic Chemicals and Media Pollutants – Achieve an average 26-50% reduction of toxic chemicals and media pollutants in at least seven of the following twelve environmental life cycle impact categories: 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. In these 7 out of 12 categories, reductions shall be achieved for Global Warming, Human Health and Ecological Toxicity.

Quantification of toxic chemicals and media pollutants shall use the units of measurement for the Characterization Factors in the fifth column of Table 1. 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 and 2-3 in the year 2000 using Table 1 above, or a recognized and approved industry baseline for carpet.

2 point maximum credit as follows:

1 point for an average 26-50% reduction across 7 impact categories

2 points for an average 26-50% reduction across 12 impact categories, 26% average

PHE 4-2: Minimize Indoor Formaldehyde Emissions – The maximum concentration for formaldehyde emitted at 96 hours in emissions tests (following a ten-day conditioning period), shall not result in a modeled indoor air concentration greater than ½ the chronic reference exposure level (CREL) established by California Office of Environmental Health Hazard Assessment (OEHHA). Testing shall be in accordance with CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers [1 pt].

PHE 4-3: No PBDE Flame Retardants in Carpet Product - Polybrominated diphenyl ethers in carpet are required to be phased out from carpet products in California and other States are considering similar action. The reason is PBDEs are accumulating in fat tissue of living organisms and are implicated in brain and thyroid problems (*PBDE Flame Retardants – A Growing Concern*, Washington State Department of Ecology 2004). As required in California's Health and Safety Code, Section 108920-108922 manufacturers shall document, via formulary declaration, that the product does not contain more than one-tenth of 1 percent of pentaBDE or octaBDE by mass. [1 pt]

6.1.5 Level 5 Criteria – 51-75% Reduction in Chemical and Pollutant Emissions

PHE 5-1: 51-75% Reduction of Toxic Chemicals and Media Pollutants – Achieve an average 51-75% reduction of toxic chemicals and media pollutants in at least seven of the following twelve environmental life cycle impact categories: 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. In these 7 out of 12 categories, reductions shall be achieved for Global Warming, Human Health and Ecological Toxicity.

Quantification of toxic chemicals and media pollutants shall use the units of measurement for the Characterization Factors in the fifth column of Table 1. These characterization factors are defined in the US EPA Tool for the Reduction and Assessment of Chemical and other environmental Impacts (TRACI). Quantification shall be as shown in Table 1, with characterization factors as 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 and 2-3 in the year 2000 using Table 1, or a recognized and approved industry baseline for carpet.

2 points maximum credit as follows:

1 point for an average 51-75% reduction across 7 impact categories

2 points for an average 51-75% reduction across 12 impact categories

PHE 5-2: Supply Chain Stockholm Chemicals - Identify all supply chain material and process inputs present at 1% (10 parts per thousand), including Stockholm Convention Persistent Organic Pollutants. [1 pt]

Document that no Stockholm Convention Persistent Organic Pollutants are released as process outputs

(emissions) throughout the supply chain and at the point of manufacture at or above TRI reporting thresholds. [1 pt]

Document that no Stockholm Convention Persistent Organic Pollutants are used in supply chain materials and that no process inputs are at or above TRI reporting thresholds. [1 pt]

6.1.6 Level 6 Criteria – No or De Minimis Chemical and Pollutant Emissions

PHE 6-1: No or De Minimis Toxic Chemicals and Media Pollutants – Release no or de minimis amounts of toxic chemicals and media pollutants in at least seven of the following twelve environmental life cycle impact categories: 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. In these 7 out of 12 categories, reductions shall be achieved for Global Warming, Human Health and Ecological Toxicity.

Quantification of toxic chemicals and media pollutants shall use the units of measurement for the Characterization Factors in the fifth column of Table 1. 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 and 2-3 in the year 2000 using Table 1 above, or a recognized and approved industry baseline for carpet.

3 points maximum credit as follows:

2 points for 76% or greater average reduction across 7 impact categories

3 points for 76% or greater average reduction across 12 impact categories

6.2 Renewable Energy and Energy Efficiency (RE)

This category contains an initial achievement level that inventories renewable content of energy used. Higher achievement levels require higher use of renewable energy. CO₂ reductions are covered in 6.1. The highest achievement levels require substantial use of renewable energy. For purposes of this standard, renewable energy is defined in 4.20.

This category provides a reasonable and achievable pathway for the energy used in carpet production to be documented as renewable over the supply chain and not contribute to climate change.

6.2.1 Level 1 Criteria – Energy Inventory

RE 1-1: Electrical and Thermal Energy Inventory – For the manufacturing facility only, document 100% of production electrical and thermal energy requirements. Thermal energy is energy such as heat or steam for industrial, commercial, heating or cooling purposes, including through the sequential use of energy. For onsite generated energy, identify fuel type (e.g., natural gas, diesel oil, fuel oil, bauxite coal). For offsite generated energy (e.g., supplied electricity), document percent from renewable versus non-renewable sources. [1 pt]

6.2.2 Level 2 Criteria – Use of Renewable Energy (1%)

RE 2-1: 1% Renewable Energy – For the manufacturing facility only, document that 1% of the total production energy requirements (electrical and thermal) are derived from renewable energy sources meeting green-e requirements. This criterion can be demonstrated by the use of on-site owner generated renewable energy meeting Green-e requirements, renewable energy supplied from off site sources meeting green-e requirements, certified Green-e Power² or certified Green-e Tradable Renewable

² Information on the Green-e Renewable Electricity Certification Program can be found at <http://www.green-e.org/>

Certificates³. [2 pts]

RE 2-2: Cleaner and Greener Certification – Achieve at least Level Two Cleaner and Greener Certification⁴. [1 pt]

6.2.3 Level 3 Criteria – Use of Renewable Energy (2-10%)

RE 3-1, 3-2, 3-3: 2-10% Renewable Energy – For the manufacturing facility only document that 2-10% of the total production energy requirements (electrical and thermal) are derived from renewable energy sources meeting Green-e requirements. This criterion can be demonstrated by the use of on-site owner generated renewable energy meeting Green-e requirements, renewable energy supplied from off site sources meeting Green-e requirements, certified Green-e Power or certified Green-e Tradable Renewable Certificates. [RE 3-1: 1 pt – 2-4%; RE 3-2: 1 pt – 5-7 %; RE 3-3: 1 pt – 8-10%. 3 pts max]

RE 3-4: Certification of Climate Change Emission Reductions – Obtain Cleaner and Greener Certification of all climate change emission reductions. [1 pt]

6.2.4 Level 4 Criteria - Use of Renewable Energy (11-25%)

RE 4-1, 4-2, 4-3: 11-25% Renewable Energy – For manufacturing facility only, document that 11-25% of the total production energy requirements (electrical and thermal) are derived from renewable energy sources meeting Green-e requirements. This criterion can be demonstrated by the use of on-site owner generated renewable energy meeting Green-e requirements, renewable energy supplied from off site sources meeting Green-e requirements, certified Green-e Power or certified Green-e Tradable Renewable Certificates. [RE 4-1: 1 pt – 11-14%; RE 4-2: 1 pt – 15-19%; RE 4-3: 1 pt – 20-25%. 3 pts max]

RE 4-4: 1-25% Renewable Energy – For upstream product stages, document requirements as calculated in this section (6.2.4) [2 pts]

6.2.5 Level 5 Criteria - Use of Renewable Energy (26-50%)

RE 5-1, 5-2: 26-50% Renewable Energy – For manufacturing facility only, document that 26-50% of the total production energy requirements (electrical and thermal) are derived from renewable energy sources meeting Green-e requirements. This criterion can be demonstrated by the use of on-site owner generated renewable energy meeting Green-e requirements, renewable energy supplied from off site sources meeting Green-e requirements, certified Green-e Power or certified Green-e Tradable Renewable Certificates. [RE 5-1: 1 pt – 26-34%; RE 5-2: 1 pt – 35-50%. 2 pts max]

RE 5-3: 26-50% Renewable Energy – For upstream product stages, document requirements as calculated in this section (6.2.5) [2 pts]

6.2.6 Level 6 Criteria - Use of Renewable Energy (51-100%)

RE 6-1, 6-2: 51-100% Renewable Energy – For upstream product stages, document that 51-100% of the total production energy requirements (electrical and thermal) are derived from renewable energy sources meeting Green-e requirements. This criterion can be demonstrated by the use of on-site owner generated renewable energy meeting Green-e requirements, renewable energy supplied from off site sources meeting Green-e requirements, certified Green-e Power or certified Green-e Tradable Renewable Certificates. [RE 6-1: 1 pt – 51-74%; RE 6-2: 1 pt – 75-100%. 2 pts max.]

³ Information on the Green-e Tradeable Renewable Certificates can be found at http://www.green-e.org/what_is/dictionary/trc.html

⁴ Cleaner and Greener Certification is explained at <http://www.cleanerandgreener.org/certification/>

6.3 Biobased or Recycled Materials (MATLS)

Biobased materials as well as natural fiber like cotton and wool, are produced by sustainable agriculture as defined in 4.24, and *FSC Certified Wood* forest practices. Recycled materials are measured by percent recycled content by total product weight. Higher achievement levels require progressively higher levels of biobased materials and recycled content. This Category contains achievement levels ranging from simple inventorying of biobased and recycled materials at Level 1, to requiring substantial percent of biobased and recycled materials at high Levels.

This category provides a reasonable and achievable pathway for biobased and recycled carpet to be documented over the supply chain.

6.3.1 Progressively higher levels of biobased and recycled materials are required by this section. The recycled content and biobased content shall be determined for all products in a product platform. Materials such as face fiber, and backing are preferred recycled content materials. Coal fly ash used as filler or binding agent qualifies as preconsumer/post industrial content only, as do other post industrial content fillers and binders.

Recycled materials are measured by the percent of pre consumer/post industrial or post consumer materials by weight. Biobased content is also measured in the same manner. This percentage is calculated by dividing the weight of the recycled or biobased content by the total weight of the finished product functional unit (e.g., one square yard for carpet) and multiplying by 100. $[(\text{Biobased and/or Recycle Content Weight}) / (\text{Total Product Weight}) \times 100]$.

6.3.2 Level 1 Criteria – Materials Content Inventory

MATLS 1-1: Inventory Biobased and Recycled Content Materials – Document the recycled and biobased content. Recycled content shall be classified by pre-consumer/post industrial or post-consumer materials in accordance with ISO 14021 and the FTC Environmental Marketing Guides. Biobased materials are those produced under sustainable agricultural practices as described in 4.24 and incorporate the Best Management Practices for Soil Erosion and Runoff Control as described in 4.1. This includes FSC Certified Wood practices as well as USDA Organic practices. [2 pts]

6.3.3 Level 2 Criteria – 5-24% Biobased or Recycled Content

MATLS 2-1, 2-2, 2-3, 2-4: 5-24 % Biobased or Recycled Content or Environmentally Preferred Material – Document that 5-20% of the material feedstock is composed of biobased or recycled materials. Calculation of material contributions shall conform to the following:

- Post-consumer recycled content – Applied at a ratio of 1:1 (e.g., every 1% of the product sourced from 100% post-consumer material results in 1% recycled content credit);
- Pre-consumer recycled content – Applied at a ratio of 1:0.5 (e.g., every 1% of the product sourced from 100% pre-consumer material results in 0.5% recycled content credit); and/or
- Biobased content - Applied at a ratio of 1:1 (e.g. every 1% of the product sourced from 100% biobased material results in 1% biobased content credit).
- Environmentally preferred materials – Materials used in the product that are designated as preferred utilizing an ISO 14040 Compliant LCA. The material will apply at the ratio of 1:1 (e.g., every 1% of the product sourced that is 100% LCA certified results, in 1% material content credit).

- Specific weighted portions of a material cannot be counted twice. Therefore a material cannot be counted as 100% biobased and 10% post-consumer recycled content. It could however be 4% biobased and 20% environmentally preferred materials content.

[4 pts max; MATLS 2-1: 1 pt – 5-9%; MATLS 2-2: 2 pts – 10-14%; MATLS 2-3: 3 pts – 15-19%; MATLS 2-4 4 pts – 20-24%]

6.3.4 Level 3 Criteria – 25 – 44% Biobased or Recycled Content

MATLS 3-1, 3-2, 3-3, 3-4: 25 - 44% Biobased or Recycled Content – Document that 25-44% of the material feedstock is comprised of biobased or recycled materials. Calculation of material contributions shall be as described in Section 6.3.3.

[4 pts max; MATLS 3-1: 1 pt – 25-29%; MATLS 3-2: 2 pts – 30-34%; MATLS 3-3: 3 pts – 35-40%; MATLS 3-4: 4 pts – 40-44%]

6.3.5 Level 4 Criteria – 45-64% Biobased or Recycled Content for Carpet

MATLS 4-1, 4-2, 4-3, 4-4: 45-64% Biobased or Recycled Content for Carpet – Document that 45-64% of the material feedstock is comprised of biobased or recycled materials. Calculation of material contributions shall conform to the following:

- Post-consumer recycled content – Applied at a ratio of 1:1 (e.g. every 1% of the product sourced from 100% post-consumer material results in 1% recycled content credit);
- Pre-consumer recycled content – Applied at a ratio of 1:0.5 (e.g. every 1% of the product sourced from 100% pre-consumer material results in 0.5% recycled content credit); and/or
- Biobased Content for Carpet - Applied at a ratio of 1:2 (e.g., every 1% of the product sourced from 100% biobased material results in 2% biobased content credit). Note: to qualify for biobased credits at this level, biobased materials shall be sourced from agricultural operations that comply with BMPs as defined in section 4.1 and are certified as organic or conform with transitional organic requirements (e.g. any pesticides or fertilizers used cannot be derived from synthetic (i.e., petroleum) sources). For transitional organic, the transitional fields for crop production shall stay transitional for 3 years minimum. Transitional means that pesticide and fertilizer use has ceased, but the fields are not certified organic.

[4 pts max: MATLS 4-1: 1 pt – 45-49%; MATLS 4-2: 2 pts – 50-54%; MATLS 4-3: 3 pts – 55-59%; MATLS 4-4: 4 pts – 60-64%]

6.3.6 Level 5 Criteria – 65-84% Biobased or Recycled Content for Carpet

MATLS 5-1, 5-2, 5-3, 5-4: 65-84% Biobased or Recycled Content for Carpet – Document that 65-84% of the material feedstock is comprised of biobased or recycled materials. Calculation of material contributions shall be as described in Section 6.3.5.

[4 pts max; MATLS 5-1: 1 pt – 65-69%; MATLS 5-2: 2 pts – 70-74%; MATLS 5-3: 3 pts – 75-79%; MATLS 5-4: 4 pts – 80-84%]

6.3.7 Level 6 Criteria – 85 -100% Biobased or Recycled Content for Carpet

MATLS 6-1, 6-2, 6-3, 6-4: 85-100% Biobased or Recycled Content for Carpet – Document that 85 - 100% of the material feedstock is comprised of biobased or recycled materials. Calculation of material contributions shall conform to the following:

- Post-consumer recycled content – Applied at a ratio of 1:1 (e.g., every 1% of the product sourced from 100% post-consumer material results in 1% recycled content credit);
- Pre-consumer recycled content – Applied at a ratio of 1:0.5 (e.g., every 1% of the product sourced from 100% pre-consumer material results in 0.5% recycled content credit); and/or
- Biobased content - Applied at a ratio of 1:3 (e.g., every 1% of the product sourced from 100% biobased material results in 3% biobased content credit). Note: to qualify for biobased credits at this level, biobased materials shall be sourced from agricultural operations that comply with BMPs as defined in section 4.1 and are certified as organic or conform with transitional organic requirements (e.g., any pesticides or fertilizers used cannot be derived from synthetic (i.e., petroleum) sources). For transitional organic, the transitional fields for crop production shall stay transitional for 3 years minimum. Transitional means that pesticide and fertilizer use has ceased, but the fields are not certified organic.

[5 pts max; MATLS 6-1: 1 pt – 85-87%; MATLS 6-2: 2 pts – 88-90%; MATLS 6-3: 3 pts – 91-93%; MATLS 6-4: 4 pts – 94-96%; MATLS 6-5: 5 pts – 97-100%]

6.4 Facility or Company Based (MFG)

This Category encourages corporate wide environmental responsibility and achievements. Achievement levels range from simple adoption of an environmental policy and having an environmental management system, to supply chain activities like LCA and disclosing the percentage of sustainable carpet purchased, made, and sold.

This Category documents corporate wide achievements in addition to those for sustainable carpet.

6.4.1 Level 1 Criteria – EMS Policy and Social Indicator Reporting

MFG 1-1: Environmental Management System Environmental Policy and Publicly Available Targets – The Manufacturer shall document a formal Environmental Management System and Policy and publicly declare its environmental targets, objectives and metrics pursuant to ISO 14001. Public declaration shall be via the Company's web site or the Company's publicly available annual report. [1 pt]

MFG 1-2: Social Indicator Reporting – Report social indicator metrics as shown below in Table 2 for each company whose product constitutes at least 3% of the product being evaluated. It is not the intent of this requirement that companies supplying chemicals that end up at de minimis levels in the product being evaluated, be contacted and asked for this information. The reporting of employment information required in Table 2 can be made by either a detailed breakdown or general summary of compliance.

[1 pt manufacturer submitting for certification]

Table 2 – Social Indicators for Sustainable Carpet Assessment Standard
(source: Global Reporting Initiative)

Indicator		Description
Labor practices and decent work	Employment	Breakdown of workforce, employment type, employment contract workforce retained vs. temporary workforce.
		Net employment creation, turnover
		Employee benefits, beyond those legally mandated
	Health and Safety	Recording and notification of occupational accidents, injuries, illnesses and disease.
Human Rights	Strategy and Mgt	Description of policies and procedures dealing with all aspects of HR relevant to operations including monitoring mechanisms and results.
		Description of policies and procedures to evaluate and address human rights performance within the supply chain and contractors, including monitoring systems and results.
	Child Labor	Description of policy and procedures excluding child labor including monitoring systems and results.
Society	Community	Policies to manage impacts on communities in areas affected by activities as well as description of procedures to address this issue, including monitoring systems and results.

6.4.2 Level 2 Criteria – Supplier Social Reporting, Targets and LCA

MFG 2-1: Social Indicator Reporting – Report social indicator metrics as shown in Table 2 for each company whose product constitutes at least 3% of the product being evaluated. It is not the intent of this requirement that companies supplying chemicals that end up at de minimis levels in the product being evaluated, be contacted and asked for this information. The reporting of employment information required in Table 2 can be made by either a detailed breakdown or general summary of compliance.

[1 pt. for supplier reporting]

MFG 2-2: LCA Process – Manufacturer shall have completed a Life-Cycle Assessment (LCA) process for the product undergoing assessment. The LCA shall be completed in accordance with the ISO 1404x (14040 – 14048) standards for life cycle assessment. [4 pts]

6.4.3 Level 3 Criteria – Closed Loop Process

MFG 3-1: Transparent Secondary Materials Reclamation System - A manufacturer or supplier shall have or insure/facilitate a materials management system whereby it takes materials that start as carpet and are reclaimed into secondary non carpet products with a reclamation program in place, and with no increased environmental impact than the original manufacturing process. [1 pt]

MFG 3-2: Transparent Materials Reclamation System - A manufacturer or supplier shall have or insure/facilitate an operational materials management system whereby secondary materials (e.g. post-consumer and post-industrial/pre-consumer recycled materials) are reclaimed in the same product system from which they originated with a reclamation system in place, and with no increased environmental impact than the original manufacturing process. [1 pt postindustrial or 2 pts postconsumer]

MFG 3-3: Transparent Repurpose Materials Reclamation System - A manufacturer or supplier shall have or insure/facilitate a materials management system whereby it brings back materials that start as carpet and are repurposed/refurbished/reused as equivalent carpet products through the reclamation program, and with no increased environmental impact than the original manufacturing process. [2 pts]

MFG 3-1 to 3-3: Reclamation processes shall be made available to greater than 50% of customer base. Credits may be obtained individually or in any combination as the manufacturer's reclamation program applies.

6.4.4 Level 4 Criteria – Design for Environment

MFG 4-1: Identify Adopted Design for Environment Process – As a minimum, manufacturer shall have completed the Design for Environment Product Matrix included in the State of Minnesota's Design for Environment Toolkit⁵ or equivalent. [2 pts]

6.4.5 Level 5 Criteria – EMS Certification

MFG 5-1: Environmental Management System Certification – Manufacturer shall document certification of environmental management system to ISO 14001, EPA Performance Track, or equivalent. [2 pts]

6.4.6 Level 6 Criteria – Transaction Disclosures

MFG 6-1: Sustainable Carpet Transaction Disclosures – Manufacturer shall disclose the percent (%) on US dollar basis, of sustainable carpet purchased, made and sold. [2 pts]

6.5 Reclamation, Sustainable Reuse and End of Life Management (EOL)

This Category encourages product reuse and reclamation, thereby reducing waste to landfill and incineration. It requires that product performance standards be met, and also requires extended life of the system including proper installation and maintenance. This category accounts for downcycling of goods, and materials from their highest to lowest use after production and prior to final disposition, encouraging reuse and avoiding disposal.

This Category helps further CARE goals and documents carpet reclamation over the supply chain, avoiding landfilling and incineration. Carpet America Recovery Effort (CARE) is a joint industry-government effort established as a result of a Memorandum of Understanding (MOU) for Carpet Stewardship to increase the amount of recycling and reuse of post consumer carpet and reduce the amount of carpet waste going to landfills. www.carpetrecovery.org

6.5.1 Level 1 Criteria – Reclamation Program and Product Durability

EOL 1-1: Operational Reclamation Program – Manufacturer shall describe where operational reclamation opportunities exist for the manufacturer's product to be certified. This means that the product is recyclable pursuant to the FTC Guides 16 CFR § 260.7(d). [1 pt]

EOL 1-2: Performance Durability – Manufacturer shall demonstrate the product meets the applicable performance durability testing requirements as listed in Appendix A.3. [1 pt]

6.5.2 Level 2 Criteria – Extended Product Life and 1-6% Product Reclamation

EOL 2-1: Extended Product Life of System – The manufacturer shall document that the product meets the performance durability requirements in Annex A.3. Carpet is installed using CRI Carpet Installation Standard 104 and/or manufacturers' recommended procedures. In addition, carpet manufacturers and dealers shall recommend to the customer in writing that CRI *Care and Maintenance* and/or recommended manufacturer maintenance procedures are followed. [2 pts]

⁵ The Design for Environment Toolkit can be found at <http://www.mosa.state.mn.us/p2/dfe.cfm>

EOL 2-2 to 2-4: 1-6% Product Reclamation – Manufacturer shall document product reclamation rate of 1-6%. Reclamation rate shall be calculated as follows:

$$\text{Reclamation Rate} = \frac{\text{kgs of all product reclaimed (annually)}}{\text{kgs of annual production of product being certified}}$$

EOL 2-2: 1 pt – 1-2%

EOL 2-3: 1 pt – 3-4%

EOL 2-4: 1 pt – 5-6%

Total of 3 points maximum

[1 point awarded for every 2% reclamation rate from 1% to 6%] Higher points in the 1 to 6% range will reward new recycling programs and encourage manufacturers to recycle.

6.5.3 Level 3 Criteria – 7-12% Product Reclamation

EOL 3-1 to 3-3: 7-12% Product Reclamation – Manufacturer shall document product reclamation rate of 7-12%. Reclamation rate shall be calculated as described in Section 6.5.2 [1 point awarded for every 2% reclamation rate.]

EOL 3-1: 1 pt – 7-8%;

EOL 3-2: 1 pt – 9-10%

EOL 3-3: 1 pt – 11-12%.

Total of 3 pts maximum

6.5.4 Level 4 Criteria – 13-20% Product Reclamation

EOL 4-1 to 4-4: 13-20% Product Reclamation - Manufacturer shall document product reclamation rate of 13-20%. Reclamation rate shall be calculated as described in Section 6.5.2 [1 point awarded for every 2% reclamation rate.]

EOL 4-1: 1 pt – 13-14%

EOL 4-2: 1 pt – 15-16%

EOL 4-3: 1 pt – 17-18%

EOL 4-4: 1 pt – 19-20%

Total of 4 pts maximum

6.5.5 Level 5 Criteria – 21-30% Product Reclamation

EOL 5-1 to 5-5: 21- 30% Product Reclamation – Manufacturer shall document product reclamation rate of 21-30%. Reclamation rate shall be calculated as described in Section 6.5.2 [1 point awarded for every 2% reclamation rate.]

EOL 5-1: 1 pt – 21-22%

EOL 5-2: 1 pt – 23-24%

EOL 5-3: 1 pt – 25-26%

EOL 5-4: 1 pt – 27-28%

EOL 5-5: 1 pt – 29-30%

Total of 5 points maximum

Level 6 Criteria - Greater than 30% Product Reclamation

EOL 6-1 to 6-11: Greater than 30% Product Reclamation – Manufacturer shall document product reclamation rate of greater than 30%. Reclamation rate shall be calculated as described in Section 6.5.2 [1 point awarded for every 2% reclamation rate up to 40%.] All points awarded above 39% reclamation are innovation points.

EOL 6-1: 31-32% reclamation – 1 pt
 EOL 6-2: 33-34% reclamation – 1 pt
 EOL 6-3: 35-36% reclamation – 1 pt
 EOL 6-4: 37-38% reclamation – 1 pt

EOL 6-5: 39-40% reclamation – 1 pt
 EOL 6-6: 41-49% reclamation – 1 pt
 EOL 6-7: 50-59% reclamation – 1 pt
 EOL 6-8: 60-69% reclamation – 1 pt
 EOL 6-9: 70-79% reclamation – 1 pt
 EOL 6-10: 80-89% reclamation – 1 pt
 EOL 6-11: 90-100% reclamation – 1 pt

Total of 7 innovation points maximum: EOL 6-5 to EOL 6-11.

6.6 Innovation

Innovation credits shall be applied for and approved and are submitted by applicants to address topics that will further the promotion of sustainable carpet. A maximum of 15 points shall be awarded for any innovation credits, whether or not it includes 6.6.1 and 6.6.2.

6.6.1 Specific Innovation Credit for Dematerialization

Credit is provided for process, and product or product lines that provide equal function using less material by percent weight per square foot, which reduces impacts as measured over all product stages. The intent for this credit is to use design innovation to achieve dematerialization. [2-5 pts].

6.6.2 Specific Innovation Credit for Energy Efficiency

Credit is provided for innovative ways to achieve future energy reductions as measured by total energy reduced per square yard of product or over an entire facility involved in making the certified product. [up to 3 pts]

6.7 Sustainable Carpet Assessment Matrix

Table 3 is the Sustainable Carpet Assessment Standard Matrix, summarizing each of the criteria presented above.

Table 3 – Sustainable Carpet Assessment Matrix
 (Covers All Carpet Product Stages: Raw Materials, Transportation, Manufacturing, Use, And Final Disposition)

Sustainable Attribute Performance Levels Approaching Sustainable Carpet	Safe For Public Health And Environment (PHE) 31 Pts Max.	Renewable Energy And Energy Efficiency (RE) 19 Pts Max	Biobased Or Recycled (MATLS) 23 Pts	Facility Or Company Based (MFG) 18 Pts	Reclamation, Sustainable Reuse, And End Of Life Management (EOL) 22 Pts + 7 Pts Innovation
Level 1 [all pre-requisites] [point level]	PHE 1-1: Feedstock Inventory Documentation [2 pts] PHE 1-2: Input Stockholm Chemicals [1 pt]	RE 1-1: Energy Inventory [1 pt] Manufacturing Facility Only	MATLS 1-1: Inventory Biobased and Recycled Content Materials [2 pts]	MFG 1-1: EMS Environmental Policy and Targets [1 pt] MFG 1-2: Social Equity Reports [1 pt. Manufacturer]	EOL 1-1: Operational Reclamation Program [1 pt] EOL 1-2: Performance Durability [1 pt]
Level 2 [point level]	PHE 2-1: Inventory Human Health and Ecological Chemical Emissions [2 pts] PHE 2-2: Inventory Air, Water and Waste Pollutants [2 pts] PHE 2-3: Output Stockholm Chemicals [1 pt] PHE 2-4: Reductions Beyond Compliance [8 pts]	Manufacturing Facility Only: RE 2-1: 1% Renewable Energy [2 pts] RE 2-2: Cleaner and Greener Certification Level 2 [1 pt]	MATLS 2-1: 5% biobased or recycled content [1 pt] Individual points can be achieved for postconsumer, biobased and/or post industrial/preconsumer. MATLS 2-2: 10% [2 pts] MATLS 2-3: 15% [3 pts] MATLS 2-4: 20% [4 pts]	MFG 2-1: Social Equity Reports [1 pt. Supplier] MFG 2-2: LCA Process [4 pts]	EOL 2-1: Extended Product Life of System [2 pts] EOL 2-2: — 2-4, 1-6% Product Reclamation [1 pt every 2%]

Table 3 – Sustainable Carpet Assessment Matrix
 (Covers All Carpet Product Stages: Raw Materials, Transportation, Manufacturing, Use, And Final Disposition)

Sustainable Attribute Performance Levels Approaching Sustainable Carpet	Safe For Public Health And Environment (PHE) 31 Pts Max.	Renewable Energy And Energy Efficiency (RE) 19 Pts Max	Biobased Or Recycled (MATLS) 23 Pts	Facility Or Company Based (MFG) 18 Pts	Reclamation, Sustainable Reuse, And End Of Life Management (EOL) 22 Pts + 7 Pts Innovation
<p>Level 3 [point level]</p>	<p>PHE 3-1: 10-25% Reduction in Toxic and Media Pollutants [2 pts]</p> <p>PHE 3-2: Minimize Indoor Air VOCs [1 pt]</p> <p>PHE 3-3: Minimize Indoor Air Carcinogenic VOCs [1 pt]</p>	<p>Manufacturing Facility Only:</p> <p>RE 3-1: 2% Renewable Energy [1 pts]</p> <p>RE 3-2: 5% Renewable [1 pt]</p> <p>RE 3-3: 8% Renewable [1 pt]</p> <p>RE 3-4: Climate Change Emission Reductions [1 pt]</p>	<p>MATLS 3-1: 25% biobased or recycled content [4 pts] individual points can be achieved for postconsumer, biobased and/or post industrial/preconsumer</p> <p>MATLS 3-2: 25% [1 pt]</p> <p>MATLS 3-3: 35% [3 pts]</p> <p>MATLS 3-4: 40% [4 pts]</p>	<p>MFG 3-1: Transparent Materials Reclamation Systems [5 pts max]</p>	<p>EOL 3-1-3-3: 7-12% Product Reclamation [1 pt every 2%]</p>
<p>Level 4 [point level]</p>	<p>PHE 4-1: 26-50% Reduction in Toxic and Media Pollutants [2 pts]</p> <p>PHE 4-2: Minimize Indoor Formaldehyde Emissions [1 pt]</p> <p>PHE 4-3: No PBDE [1 pt]</p>	<p>Manufacturing Facility Only:</p> <p>RE 4-1: 11% Renewable Energy [1 pts]</p> <p>RE 4-2: 15% [1 pt]</p> <p>RE 4-3: 20% [1 pt]</p> <p>Upstream Stages:</p> <p>RE 4-4: 1-25% [2 pts]</p>	<p>MATLS 4-1: 45% biobased or recycled content [1 pt] Individual points can be achieved for postconsumer, biobased and/or post industrial/preconsumer. Biobased shall be organic w/BMPs</p> <p>MATLS 4-2: 45% [1 pt]</p> <p>MATLS 4-3: 50% [2 pts]</p> <p>MATLS 4-4: 60% [4 pts]</p>	<p>MFG 4-1: Identify Adopted Design for Environment Process [2 pts]</p>	<p>EOL 4-1 – 4-4: 13- 20% Product Reclamation [1 pt every 2%]</p>

Table 3 – Sustainable Carpet Assessment Matrix
 (Covers All Carpet Product Stages: Raw Materials, Transportation, Manufacturing, Use, And Final Disposition)

Sustainable Attribute Performance Levels Approaching Sustainable Carpet	Safe For Public Health And Environment (PHE) 31 Pts Max.	Renewable Energy And Energy Efficiency (RE) 19 Pts Max	Biobased Or Recycled (MATLS) 23 Pts	Facility Or Company Based (MFG) 18 Pts	Reclamation, Sustainable Reuse, And End Of Life Management (EOL) 22 Pts + 7 Pts Innovation
<p>Level 5 [point level]</p>	<p>PHE 5-1: 51-75% Reduction in Toxic and Media Pollutants [2 pts]</p> <p>PHE 5-2: Supply Chain inventory and limit on Stockholm Chemicals [3 pts total]</p>	<p>Manufacturing Facility Only: E 5-1: 26% Renewable Energy [1 pt]</p> <p>RE 5-2: 35% Renewable [1pt]</p> <p>Upstream Stages: RE 5-3: 26-50% [2 pts]</p>	<p>MATLS 5-1: 65% biobased or recycled content [1 pt]</p> <p>Individual points can be achieved for postconsumer, biobased and/or post industrial/preconsumer. Biobased shall be organic w/BMPs</p> <p>MATLS 5-2: 70% [2 pts] MATLS 5-3: 75% [3 pts] MATLS 5-4: 80% [4 pts]</p>	<p>MFG 5-1 : Environmental Management System Certification [2 pts]</p>	<p>EOL 5-1-5-5: 21- 30% Product Reclamation [1 pt every 2%]</p>
<p>Level 6 [point level]</p>	<p>PHE 6-1: No or De Minimis Toxic and Media Pollutants [3pts]</p>	<p>For all Upstream Stages:</p> <p>RE 6-1: 51% Renewable Energy 1 pt]</p> <p>RE 6-2: 75% Renewable [1 pt]</p>	<p>MATLS 6-1: 85% biobased or recycled content [1 pt]Individual points can be achieved for postconsumer, biobased and/or post industrial/preconsumer. Biobased shall be organic w/BMPs</p> <p>MATLS 6-2: 88% [2 pts] MATLS 6-3: 91% [3 pts] MATLS 6-4: 94% [4 pts] MATLS 6-5: 97% [5 pts]</p>	<p>MFG 6-1: Sustainable/EPP Carpet Transaction Disclosures [2 pts]</p>	<p>EOL 6-1: 30% or More Product Reclamation [1 pt every 2% until 40%. 1 pt every 10% from 41-100%]</p>

7 Compliance with Standard

In order to claim conformance with this standard, manufacturers shall comply with the following requirements.

7.1 Declaration of Level of Conformance and Metrics

7.1.1 Carpet manufacturer shall provide the Statement of the Achievement Level it has attained based on specific Sustainable Attribute Performance for all product stages. The Gold/EPP and Platinum/EPP levels will be highly differentiated recognizing superior performance. Achievement levels are designated as follows:

Sustainable Carpet Achievement Levels:

Bronze	28 to 36 points
Silver	37 to 51 points
Gold/EPP	52 to 70 points
Platinum/EPP	71 to 113 points

7.1.2 The carpet manufacturer shall provide metrics that demonstrate the specific achievement level and shall make these metrics publicly available. The manufacturer shall disclose by weight, achieved percent total preconsumer and post consumer recycled content, and percent biobased content.

7.1.3 Carpet manufacturers shall provide results of any publicly available life cycle assessments, if used, that comply with ISO LCA General Principles Standard pursuant to 5.1.

7.2 Communications regarding compliance with this Standard

All communications by carpet suppliers and manufacturers regarding this standard and applicable sections, shall comply with the Federal Trade Commission *Environmental Marketing Guides* at 16 C.F.R. Part 260 (1998) for accurate, reliable, and documented communications: <http://www.ftc.gov/bcp/gnrule/guides980427.htm>.

All communications shall state that "both the express and implied meaning of the compliance claim 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.

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Annex A

(Informative)

Guidance on the Use of the Sustainable Carpet Assessment Standard

A.1 General Guidance

The leading stakeholders in the carpet industry are striving to become more sustainable. The global carpet industry uses many chemicals and processes affecting human health and environment. It is faced with major competitive challenges. Encouragingly, a number of corporate carpet leaders have successfully addressed this challenge by substantially reducing their environmental burdens, while improving social and economic equity throughout the supply chain.

This Sustainable Carpet Assessment Standard responds to this challenge and is a way for leaders in the industry to foster innovation and capture environmental, economic and social benefits associated with a transition to sustainability. Participants in this Standard recognize that a major transition is necessary given the “weight of evidence” regarding the condition of the global environment and need for improved economic and social prosperity. There is a great opportunity to create life-affirming sustainable products with substantial global value.

By applying this Standard, stakeholders throughout the carpet supply chain will significantly and continuously improve their sustainable product performance realizing:

- Design innovation by thoughtful consideration of materials and resources.
- Value added materials and products designed for safe reclamation and reuse.
- Ecological restoration.
- Long term strengthened customer relationships by offering cutting edge solutions to environmental problems.
- A shared environmental agenda serving local communities.
- Reduced liability and need for regulation.
- Compatibility with other market trends such as clean vehicles, sustainable government procurement, and growing consumer demand for sustainable products.

A.2 Sustainably Produced Biobased Material Performance Attributes

- Enhance environmental quality and natural resources including local watersheds, native vegetation, habitat and forest ecosystems
- Reduce and eliminate toxic substances
- Reduce release of green house gases; nitrous oxide, methane, carbon dioxide
- Reduce reliance on non-renewable resources and increased use of renewable resources and energy
- Diversify crops (including livestock) and cultural practices to enhance the biological and economic stability of the farm

- Minimize reliance on purchased inputs; fertilizers, pesticides, irrigation water, energy, chemicals
- Develop biological systems which do not need high levels of material inputs
- Increase (vs. decline) soil productivity through; reduced topsoil erosion and compaction, replenishing soil organic matter, improving water holding capacity, biological activity; reducing soil salinization of soils
- Reduce or eliminate non-point source of water pollutants including sediments, salts, fertilizers (nitrates and phosphorus), pesticides, and manure
- Reduce eutrophication and "dead zones" due to nutrient runoff affecting many rivers, lakes, and oceans
- Minimize water quality impacts on surface water, ground water, drinking water supplies, loss of wetlands, wildlife habitat and fishery production
- Improve local market systems
- Minimize mono-culture commodities systems
- Improve rural prosperity
- Increase farm profitability and competitiveness (e.g. reduced or optimized costs of inputs vs. yield losses)
- Improve local economic development
- Reduce depopulation of farm communities
- Provide Healthy and Humane Care of Livestock. See these references:

<http://www.sustainableagriculture.net/vision.php> - National Campaign for Sustainable Agriculture

<http://www.thefoodalliance.org/guidingprinciples.htm> - Food Alliance

<http://www.mtn.org/iasa/susagdef.htm> - Alliance for Sustainability

<http://www.hsus.org/ace/11527> - Humane Society of the United States

<http://www.sd-commission.gov.uk/pubs/curry/01.htm> - Sustainable Development Commission (UK)

A.3 Specific Guidance

Recycled Content Background. "[T]he materials that have been recovered or otherwise diverted from the solid waste stream, [can] be either during the manufacturing process (pre-consumer), or after consumer use (post consumer). To the extent the source of recycled content includes pre-consumer material, the manufacturer or advertiser must have substantiation for concluding that the pre-consumer material would otherwise have entered the solid waste stream. In asserting a recycled content claim, distinctions may be made between pre-consumer and post-consumer materials. Where such distinctions are asserted, any express or implied claim about the specific pre-consumer or post consumer content of a product or package must be substantiated (16 C.F.R. § 260.7 (e)."

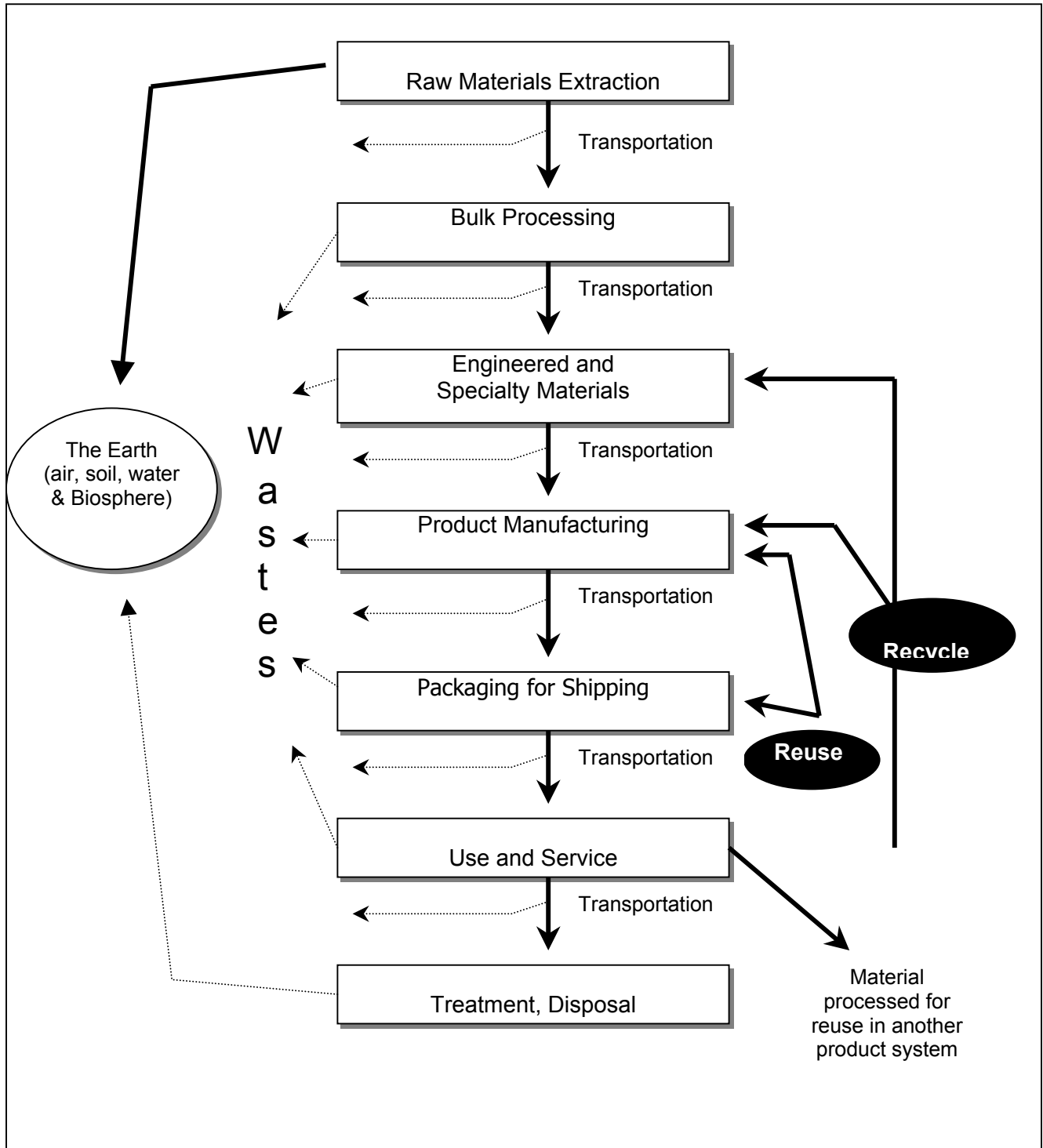
For products or packages that are only partially made of recycled material, a recycled claim should be adequately qualified to avoid consumer deception about the amount, by weight, of recycled content in the finished product or package. (§ 260.7 (e)."

Performance Durability Testing. For performance durability testing under the Reclamation Sustainable Reuse and End of Life Management section of the Matrix, Carpet Performance Testing is used for carpet.

Table A.1 – Carpet Performance Testing

Characteristic	Commercial Performance Standard		Residential Performance Standard	
	Value	Method	Value	Method
Appearance Retention Rating (ARR)	Moderate Traffic – Min 2.5 ARR Heavy Traffic – Min 3.0 ARR Severe Traffic – Min 3.5 ARR	ASTM D5252-Hexapod Drum at 12000 cycles CRI TM 101-ARR Grading Assessment		
Tuft Bind	8.0 lbs for loop pile yarns 3.0 lbs for cut pile yarns	ASTM D1335	6.2 lbs for loop pile yarns 3.0 lbs for cut pile yarns	ASTM D1335
Delamination Strength	Minimum average value of 2.5 pounds per inch	ASTM D3936	Minimum average value of 2.5 pounds per inch	ASTM D3936
Topical Treatments	Minimum 350 ppm fluorine	AATCC 189	Minimum 350 ppm fluorine	AATCC 189
Flammability (Pill Test)	Must meet Federal requirements	DOC FF 1-70	Must meet Federal requirements	DOC FF 1-70
Flammability (Radiant Panel)	Must meet local building/fire code regulations. Class 1-minimum 0.45 watts/cm ² Class 2-minimum 0.22 watts/cm ²	ASTM E648	N/A	
Smoke Density	Must meet local building/fire code regulations. Maximum specific optical density not exceeding 450 (flaming exposure)	ASTM E662	N/A	
Electrostatic Propensity	Equal to or less than 3.5KV	AATCC –134, Step Test		
Colorfastness to Light	Minimum grade 4 at 40 AFU	AATCC 16E	Minimum grade 4 at 40 AFU	AATCC 16E

Figure A.1 – The General Product Life Cycle



Standards and Criteria

The following standards and criteria established and adopted by NSF as minimum voluntary consensus standards are used internationally:

- 2 Food equipment
- 3 Commercial warewashing equipment
- 4 Commercial cooking, rethermalization, and powered hot food holding and transport equipment
- 5 Water heaters, hot water supply boilers, and heat recovery equipment
- 6 Dispensing freezers
- 7 Commercial refrigerators and freezers
- 8 Commercial powered food preparation equipment
- 12 Automatic ice making equipment
- 13 Refuse processors and processing systems
- 14 Plastics piping system components and related materials
- 18 Manual food and beverage dispensing equipment
- 20 Commercial bulk milk dispensing equipment
- 21 Thermoplastic refuse containers
- 24 Plumbing system components for manufactured homes and recreational vehicles
- 25 Vending machines for food and beverages
- 29 Detergent and chemical feeders for commercial spray-type dishwashing machines
- 35 High pressure decorative laminates (HPDL) for surfacing food service equipment
- 36 Dinnerware
- 37 Air curtains for entranceways in food and food service establishments
- 40 Residential wastewater treatment systems
- 41 Non-liquid saturated treatment systems
- 42 Drinking water treatment units – Aesthetic effects
- 44 Residential cation exchange water softeners
- 46 Evaluation of components and devices used in wastewater treatment systems
- 49 Class II (laminar flow) biosafety cabinetry
- 50 Circulation system components and related materials for swimming pools, spas/hot tubs
- 51 Food equipment materials
- 52 Supplemental flooring
- 53 Drinking water treatment units – Health effects
- 55 Ultraviolet microbiological water treatment systems
- 58 Reverse osmosis drinking water treatment systems
- 59 Mobile food carts
- 60 Drinking water treatment chemicals – Health effects
- 61 Drinking water system components – Health effects
- 62 Drinking water distillation systems
- 75 Non-potentially hazardous foods
- 140 Draft standard for trial use – Sustainable carpet assessment
- 169 Special purpose food equipment and devices
- 170 Glossary of food equipment terminology
- 173 Dietary supplements
- 177 Shower filtration systems – Aesthetic effects
- 184 Residential dishwashers
- 14159-1 Hygiene requirements for the design of meat and poultry processing equipment
- 14159-2 Hygiene requirements for the design of hand held tools used in meat and poultry processing
- 14159-3 Hygiene requirements for the design of mechanical belt conveyors used in meat and poultry processing



THE HOPE OF MANKIND rests in the ability of man to define and seek out the environment which will permit him to live with fellow creatures of the earth, in health, in peace, and in mutual respect.