



ANSI/BIFMA e3-2011e Furniture Sustainability Standard

BIFMA International
678 Front Ave. NW Suite 150
Grand Rapids, Michigan 49504-5368
Phone: 616-285-3963
Fax: 616-285-3765
Email: email@bifma.org
Website: www.bifma.org

Copyright 2011 BIFMA International

©2011

Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from BIFMA International.

Acknowledgments

The Business and Institutional Furniture Manufacturers Association (BIFMA) International and NSF International would like to thank the extraordinary group of stakeholders that came together to assist in the development of this standard:

AIS

Erin Cadieux
Greg Scher

Allsteel - Mike Veal

American Seating - Brock Hesselsweet

AQS - Scott Steady

Aquinas College - Jessica Eimer

Association of Registered Interior Designers of Ontario (ARIDO)

Gary Hewson
Susan Wiggins

Association for Contract Textiles (ACT)

Janan Rabiah

BASF Corporation

Mary Fraser
Pat Meyer

Berkeley Analytical Associates

Raja Tannous

BIFMA International

Dick Driscoll
Brad Miller
Tom Reardon

Brenner Design (AIA Rep) - Diana Brenner

Bretford Manufacturing Co. - Chris Brandel

Byrne Electrical Specialists - Pat Young

Cascade Engineering - Kelley Losey

CRI/CARE - Georgina Sikorski

EPA, Design for the Environment Program

Catherine Manzo
Sharmin Syed
Kathleen Vokes

EPA, Environmentally Preferable Purchasing Program - Alison Kinn Bennett

EPA, Green Suppliers Network - Heidi Karp

EPA, Indoor Environment Management Branch - Bob Thompson

EPA, Office of Pollution Prevention & Toxics - Sam Sasnett

EPA, Office of Solid Waste

Clare Lindsay
Verena Radulovic
Jenny Stephenson
Shala Workman

GSA, National Furniture Center

Jeffery Schatz

Gensler

Gary Gardner
Kirsten Ritchie

Global Contract Inc. - Karen Worthy

Grand Valley State University - Norman Christopher

GREENGUARD Environmental Institute

Carl Smith

Group Dekko - Fred Stevens

Haworth

Tom Lee Dykstra
Mark Bonnema
Jim Kozminski
Jim Thompson-Goodchild
Anna Wechselberger

HDR Architecture, Inc. - Jean Hansen

Herman Miller Inc.

Larry Dykhuis
Gabe Wing
Paul Murray

HMU, LLC - Dean Williams

HNI Corporation - Scott Lesnet

HOK - Robert Blaha

IDCE - Deborah Dunning

Indiana Furniture - Tracy Haase

InterfaceFABRIC

Matt Earnest
Bill Foley
Eric Harrington
Laurel Hill
Mark LaCroix

izzydesign Anne Saliers
Dan Vukceвич

Kaiser Permanente - Jan D. Stensland

Kimball International

John Kaufmann
John Shank
Steve Trinkle

Knoll Inc.

Kathy Jo DeVault
Lou Newett

MAS - Martin Bennett

MBDC - Jay Bolus

Milliken Fabric

Scott Bartolomei
Karen Smart

National Center for Manufacturing Sciences (NCMS)

Paul Chalmer
Ron Lang

Natural Logic - David Jaber

Natural Resources Defense Council (NRDC) - Rob Watson

North American Insulation Manufacturers Association - Scott Miller

Northern Virginia Community College
Linda Sorrento

NSF International

Lorna Badman
Jaclyn Bowen
Mindy Costello
Petie Davis
Kurt Kneen
Clif McClellan
Jane M. Wilson

Perkins + Will - Rod Vickroy

Sauder Woodworking - Michael Zimmerman

Scientific Certification Systems (SCS)

Linda Brown
Stowe Hartridge-Beam
Ted Howes
Rich Margosian
Ed Wyatt

Southeast Energy Efficiency Alliance

Ben Taube

State of California Air Resources Board

Peggy L. Jenkins

State of California Department of General Services

Dan Burgoyne
Craig Duehring
Pamela Fitch

State of California Department of Health Services

Toni Stein
Jed Waldman

State of California Environmental Protection Agency - Richard Lam

State of California Integrated Waste Management Board

Mary Farr
Fareed Ferhut
Kathy Frevert
JoAnn Jaschke

State of Michigan Department of Environmental Quality - Laura Rauwerda

Steelcase Inc.

Randy Carter
Phil Hester
Ben Massie
Mary Ellen Mika
Jeff Musculus
Steve Price
Dave Rinard
Nancy Sicilian
Denise Van Valkenburg

Sustainable Research Group

Clinton Boyd
Bill Stough

Syracuse University - Jianshun Zhang

Teknion

Scott Deugo
Doug Hietkamp
Jim Klotz
Richard Wolfe
Charles Choo

The Right Place, Inc. - Karen Wolf

Thomas J. Newhouse Design
Tom Newhouse

Tuohy Furniture - Craig Bren

Victor Innovatex

Dave Freund
Beth McInnis

Table of Contents

1	General	1
1.1	Purpose	1
1.2	Scope.....	1
2	Normative References	2
3	Definitions	4
4	Assessing Conformance, Evaluation, and Assessment Criteria.....	9
4.1	Elements.....	9
4.2	Prerequisites.....	10
4.3	Credits	10
4.4	Points.....	10
4.5	Baseline and Normalization Values.....	10
4.6	Frequency of Evaluation.....	10
5	Materials.....	11
5.1	Prerequisite.....	11
5.2	Climate Neutral Materials	11
5.3	Life Cycle Assessment	12
5.4	Efficient Use of Materials.....	12
5.5	Rapidly Renewable Materials	12
5.6	Bio-based Renewable Materials - Sustainable Wood	13
5.7	Recycled Content	13
5.8	Recyclable and Biodegradable Materials	15
5.9	Extended Product Responsibility.....	15
5.10	Solid Waste Management.....	17
5.11	Water Management.....	17
6	Energy and Atmosphere	18
6.1	Prerequisite.....	18
6.2	Building Energy Performance Baseline	18
6.3	Building Energy Performance Rating	18
6.4	Building Rating System Certification	19
6.5	Embodied Energy	19
6.6	Finished Product Energy Consumption.....	19
6.7	Transportation	19
6.8	On-site and Off-site Renewable Energy.....	20
6.9	Greenhouse Gases	21
7	Human and Ecosystem Health	22
7.1	Prerequisites.....	22
7.2	ISO 14001 or Equivalent	22
7.3	Chemical Management Plan (CMP) – Facility.....	23
7.4	Effects of Product, Process and Maintenance Chemicals	23
7.5	Reduction/Elimination of Chemicals of Concern	24
7.6	Low Emitting Furniture.....	28
8	Social Responsibility	31
8.1	Prerequisites.....	31
8.2	Policy on Social Responsibility.....	31
8.3	External Health and Safety Management Standard.....	31
8.4	Inclusiveness	32
8.5	Engage in Community Outreach and Involvement.....	32
8.6	Social Responsibility Reporting.....	32
8.7	Supply chain	33

Annex A - Map of EPA Regions	34
Annex B - Chemicals of Concern List	35
Annex C - Individual Volatile Organic Chemical (VOC) Concentration Limits	51
Annex D - Scorecard (Normative).....	52
Interpretations	57

Foreword¹

This Standard was developed by the Joint Committee on BIFMA e3 Furniture Sustainability using the consensus process described by the American National Standards Institute.

The Joint Committee was created by the Business and Institutional Furniture Manufacturers Association (BIFMA) and NSF International.

NSF and BIFMA developed this Standard in order to provide the marketplace with a meaningful standard that would harmonize sustainability standards for the office furniture industry and help to distinguish environmentally preferable business and institutional furniture. The Standard was designed to allow for multiple levels of achievement, to provide an open alternative to proprietary protocols.

In ANSI/BIFMA e3-2011e following the annexes, issued interpretations on this ANSI standard are listed. These interpretations are in effect at the time of publication and are subject to change through the balloting process to this standard. This version also contains editorial corrections and the following balloted revisions:

Issue 5 – Section 7.6 and Annex C

This revision modified section 7.6 Low Emitting Furniture, Annex C and the related normative references in section 2.

Issue 6 – Interpretation for section 6.3.1

Based on an interpretation request to modify section 6.3.1 regarding normalization.

Normative References have been updated in this version of e3.

Suggestions for improvement of this Standard are welcome. Comments should be sent to Chair, Joint Committee on BIFMA e3 Furniture Sustainability, c/o NSF International, Standards Department, P.O. Box 130140, Ann Arbor, Michigan 48113-0140, USA.

Business and Institutional Furniture Manufacturers Association (BIFMA)

Established in 1973, the Business and Institutional Furniture Manufacturers Association (BIFMA) International's mission is to lead, advocate, inform and develop standards for the North American office and institutional furniture industry. BIFMA serves businesses that are primarily engaged in design, development, marketing and fulfillment of office and institutional furniture products.

BIFMA is a not-for-profit organization that provides an effective forum for Members to cooperate and collaborate on appropriate industry issues. We develop voluntary product and industry standards that support safe, healthy and sustainable environments; publish key industry statistics; advocate for legislation and government regulation that have a direct impact on the health of the industry; and facilitate meaningful dialog and education to support our core services and the industry we serve.

NSF International

NSF International has been testing and certifying products for safety, health, and the environment for more than 65 years (www.nsf.org). As an independent, not-for-profit organization, NSF's mission is to protect public health and the environment through standards development, inspection, testing, and certification for the food, water, build/construction, retail, chemical, and health science industries. NSF Sustainability draws upon this expertise in standards development, product assurance and certification, advisory services and quality systems management to help companies green their products, operations, systems and supply chains.

¹ The information contained in this Foreword is not part of this American National Standard (ANS) and has not been processed in accordance with ANSI's requirements for an ANS. Therefore, this Foreword may contain material that has not been subjected to public review or a consensus process. In addition, it does not contain requirements necessary for conformance to the Standard.

ANSI/BIFMA e3 Furniture Sustainability Standard

1 General

1.1 Purpose

The purpose of this voluntary Standard is to provide measurable market-based definitions of progressively more sustainable furniture by establishing performance criteria that address environmental and social aspects throughout the supply chain.

1.2 Scope

This Standard provides a pathway towards sustainability by establishing measurable criteria for multiple levels of achievement and/or performance.

This Standard is applicable to all business and institutional furniture; this includes but is not limited to moveable walls, systems furniture, desking systems, casegoods, tables, seating, and accessories. The Standard is also applicable to materials and components manufactured by suppliers to furniture manufacturers.

This Standard is applicable to business and institutional furniture manufactured in one facility or multiple facilities, one country or multiple countries. It addresses product-based characteristics in the general areas of materials, use of energy, human and ecosystem health, and social responsibility impacts.

2 Normative References

The following documents contain provisions that, through reference in this text, constitute provisions of this standard. At the time of publication, the indicated editions were valid. All standards are subject to revision, and parties are encouraged to investigate the possibility of applying the recent editions of the standards indicated below.

- ANSI/BIFMA M7.1-2011, *Standard Test Method for Determining VOC Emissions From Office Furniture Systems, Components and Seating*, <http://www.bifma.org/standards/standards.html>
- ANSI/BIFMA X7.1-2011 *Standard for Formaldehyde and TVOC Emissions of Low Emitting Office Furniture and Seating* <http://www.bifma.org/standards/standards.html>
- ASTM D996, *Standard Terminology of Packaging and Distribution Environments*, <http://www.astm.org/Standards/D996.htm>
- California Code of Regulations, Title 24, Part 6 *California's Energy Efficiency Standards for Residential and Nonresidential Buildings*, <http://www.energy.ca.gov/title24/>
- CA DGS Purchase Spec 1-09-71-52, California Department of General Services Technical Environmental Purchase Specification for Contract 1-09-71-52 on Open Office Panel Systems, Section 4.7 Indoor Air Quality, Table C, <http://www.documents.dgs.ca.gov/pd/epp/furniture/DGS1-09-71-52.pdf>
- California Integrated and Waste Management Board, *Sustainable (Green) Building, Special Environmental Requirements Specification, Section 01350* <http://www.ciwmb.ca.gov/greenbuilding/Specs/Section01350/>
- CDPH/EHLB/Standard Method v1.1-2010, California Department of Public Health, Division of Environmental and Occupational Disease Control, Environmental Health Laboratory Branch, Indoor Air Quality Section, Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.1, 2010, <http://www.cal-iaq.org/vocs/standard-method>
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) *Appendices I or II*, www.cites.org
- ISO 11469, *Plastics -- Generic identification and marking of plastics products* www.iso.org
- ISO 14001, *Environmental management systems -- Requirements with guidance for use*, www.iso.org
- ISO 14025, *Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures*, www.iso.org
- ISO 14040, *Environmental management -- Life cycle assessment -- Principles and framework*, www.iso.org
- ISO 14044, *Environmental management -- Life cycle assessment -- Requirements and guidelines*, www.iso.org

2 Normative References (Continued)

- United States Green Build Council LEED – *Existing Buildings: Operations & Maintenance Rating System*, www.usgbc.org

3 Definitions

3.1 air pollutant: Any substance in air that could, in high enough concentration, harm humans, animals, vegetation, or material.

3.2 air pollution: The presence of contaminants or pollutant substances in the air that interfere with human health or welfare, or produce other harmful environmental effects.

3.3 biodegradable: Capable of decomposing under natural conditions.

3.4 biodiversity: The number, variety, and variability of living organisms.

3.5 byproduct: Material, other than the principal product, generated as a consequence of an industrial process or as a breakdown product in a living system.

3.6 carcinogen: Any substance that can cause or aggravate cancer.

3.7 chemicals of concern: A chemical that makes a significant contribution to one or more of the following life cycle impact categories (Refer to Annex B):

- persistent, bioaccumulative, and toxic (PBT); and/or
- reproductive toxicant; and/or
- carcinogen; and/or
- endocrine disruptor.

3.8 child labor: Exploitation of workers under the minimum legal age for employment in the country where the facility operates.

3.9 conformity assessments: Demonstration that specified requirements relating to a product, process, system, person, or body is fulfilled.

3.9.1 first party conformity assessment: Conformity assessment activity that is performed by the person or organization that provides the object.

3.9.2 second party conformity assessment: Conformity assessment activity that is performed by a person or organization that has a user or purchaser interest in the object.

3.9.3 third party conformity assessment: Conformity assessment activity that is performed by a person or body that is independent of the person or organization that provides the object, and of the user or purchaser interests in that object.

3.10 cradle-to-gate: A term used to describe the LCA boundary encompassing the life cycle stages of raw material extraction and conversion to a bulk form or a generic shape.

3.11 criteria (air) pollutants: The 1970 amendments to the Clean Air Act required EPA to set National Ambient Air Quality Standards for certain pollutants known to be hazardous to human health. EPA has identified and set standards to protect human health and welfare for six pollutants: ozone, carbon monoxide, total suspended particulates, sulfur dioxide, lead, and nitrogen oxide. The term, "criteria pollutants" derives from the requirement that EPA must describe the characteristics and potential health and welfare effects of these pollutants. It is on the basis of these criteria that standards are set or revised.

3 Definitions (Continued)

3.12 design for the environment (DFE): The systematic integration of environmental attributes into the design of products and processes. There are three unique characteristics of DFE:

- The entire life-cycle is considered;
- Point of application is clearly in the product realization; and
- Decisions are made using a set of values consistent with industrial ecology, integrative systems thinking or another framework.

3.13 ecosystem: The interacting system of a biological community and its non-living environmental surroundings.

3.14 environment: The sum of all external conditions affecting the life, development, and survival of an organism.

3.15 environmental aspect: An element of an organization's activities, products or services that can interact with the environment.

3.16 environmental policy: A statement by the organization of its intentions and principles in relation to its overall environmental performance, which provides a framework for action and for the setting of its environmental objectives and targets.

3.17 environmental management system: The part of a company's overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy.

3.18 forced labor: Compulsory prison or debt bondage labor. Lodging of deposits or identity papers by employers or outside recruiters for the purpose of restricting or preventing the individual from leaving employment.

3.19 fossil fuel: Fuel derived from ancient organic remains. Some examples are peat, coal, crude oil, and natural gas.

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

3.21 greenhouse gas (GHG): Gases related to human activities that accelerate the greenhouse effect (as defined in Credit 6.9.1).

3 Definitions (Continued)

3.22 hazardous substances (materials):

- Any substance that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive.
- Any substance designated by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or is otherwise released into the environment.

3.23 incidental presence: The presence of a regulated metal (e.g., cadmium, lead, mercury, hexavalent chromium) as an unintended or undesired ingredient of a package or packaging component.

3.24 legacy products: Business and institutional furniture products manufactured for sale prior to the publication date of this standard.

3.25 life cycle: The total impact of a system, function, product, or service from the extraction of raw materials through its end-of-life management.

3.26 life cycle assessment (LCA): A tool for the systematic evaluation of the environmental aspects of a product or service system through all stages of its life cycle consistent with ISO 14040. An analytical tool to implement life cycle thinking, inclusive of both product and process. An LCA is generally quantitative and requires that the results be normalized to a functional unit.

3.27 life cycle inventory (LCI): A process of quantifying energy and raw material requirements, atmospheric emissions, waterborne emissions, solid wastes, and other releases for the entire life cycle of a product, process, or activity.

3.28 life cycle thinking: A conceptual approach that addresses environmental problems from a whole-systems or holistic perspective. The essential difference from an LCA is that the results are not normalized to a functional unit, and the results may be expressed qualitatively or quantitatively.

3.29 maintenance chemical: A chemical not directly used in the manufacturing of the product (e.g., forklift engine oil).

3.30 package: A container providing a means of marketing, protection, or handling of a product and shall include a unit package, an intermediate package, and a shipping/transport container as defined in American Society for Testing and Materials (ASTM) D 996. "Package" shall also mean and include such unsealed receptacles as carrying cases, crates, cups, pails, rigid foil, and other trays, wrappers and wrapping films, bags, and tubs.

3.31 packaging component: Any individual assembled part of a package such as, but not limited to, any interior or exterior blocking, bracing, cushioning, weatherproofing, exterior strapping, coatings, closures, inks, and labels.

3.32 post-consumer: Generated by households, or by commercial, industrial, and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose. This includes return of materials from the distribution chain.

3 Definitions (Continued)

3.33 post-industrial (pre-consumer): Diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

3.34 pollution: This is generally, the presence of a substance in the environment that because of its chemical composition or quantity prevents the functioning of natural processes and produces undesirable environmental and health effects.

3.35 process chemical: Used in the direct manufacturing of the product and is not intended to be incorporated into the product as shipped (e.g. prep solvent prior to powdercoat).

3.36 product chemical: Incorporated in or on the product as shipped (e.g. wood finish).

3.37 recovered material: Waste materials and byproducts that have been recovered or diverted from solid waste, but does not include materials and byproducts generated from, and commonly reused within, an original manufacturing process.

3.38 recyclable: Capable of minimizing waste generation by recovering and reprocessing usable products that might otherwise become waste.

3.39 recycle: To minimize waste generation by recovering and reprocessing usable products that might otherwise become waste (e.g., aluminum cans, paper and bottles, etc.).

3.40 recycled-content materials: Materials that have been recovered or otherwise diverted from the solid waste stream, either during the manufacturing process (post-industrial) or after consumer use (post-consumer).

3.41 remanufacturing: Restoring products to usable condition by replacing or repairing parts as needed.

3.42 renewable energy: Energy from a source that is replenishable and replenished on some reasonable time scale. Potential renewable energy sources include, but are not limited to wind, solar, heat from the earth's interior, oceans, rivers, and biomass.

3.43 renewable material: A material that is replenishable and replenished on some reasonable time scale. Renewable material sources include, but are not limited to wood, grass fibers, plant-based plastics, and bio-based fuels.

3.44 reusable packaging: Packaging that has been conceived and designed to accomplish within its lifecycle a minimum number of trips or rotations, is refilled or used for the same purpose for which it was conceived, with or without the support of auxiliary products present on the market enabling the packaging to be refilled: such reused packaging will become packaging waste when no longer subject to reuse.

3.45 significant environmental aspect: An environmental characteristic that has or can have significant environmental impact.

3.46 social responsibility (or equity): The identification of issues, the development of standards, and the implementation of programs that address corporate responsibility for the ethical treatment of employees, communities, and other stakeholders.

3 Definitions (Continued)

3.47 solid waste: Non-liquid, non-soluble materials ranging from municipal garbage to industrial wastes that may contain complex and sometimes hazardous substances.

NOTE: For purposes of this standard, this definition is not intended to match the EPA Resource Conservation and Recovery Act (RCRA) definition.

3.48 source reduction: A pollution prevention technique that eliminates the potential for pollution at the source, or where the polluting material enters the product or service cycle.

3.49 stakeholders: People who are (or might be) affected by any action taken by an organization. Examples are: Customers, owners, employees, associates, partners, contractors, suppliers, related people or located nearby.

3.50 sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their needs.

3.51 toxic: Presenting an unreasonable risk of injury to human health or the environment.

3.52 waste: Unwanted materials left over from a manufacturing process, or refuse from places of human or animal habitation.

4 Assessing Conformance, Evaluation, and Assessment Criteria

Organizations that choose to assess their business and/or institutional furniture products to this standard can achieve first-party, second party, or third-party verification of conformance. Organizations can show continuous improvement by moving products to higher levels of conformance.

The manufacturer of the applicant product can determine the scope of conformance to the extent that the scope can be clearly communicated to potential purchasers of the product. The scope of conformance can be defined based on geographic location. A product that is manufactured in one location can be included, while the same product manufactured in another location could be excluded. In this case, the credits that are based on “facility” or “corporate” characteristics (such as energy use, water use, and health and safety management) shall be evaluated based on the activities only at the location included in the scope of conformance (see 3.20 definition of gate-to-gate).

The scope of assessment is gate-to-gate unless otherwise specified within individual credit language. The applicant shall clearly specify cut-off criteria for inclusion of inputs and outputs and the assumption on which the cut-off criteria are established in the scope of assessment. The intent of the Standard is to encourage reduction in environmental impact and credits are not awarded for operations that are within the gate-to-gate boundaries or within the individual credit language boundaries, but are excluded from the applicants’ scope of assessment. Nor are credits awarded for the lack of an environmental impact where one had not previously existed. The scope of conformance can also be defined based on product options or characteristics. For example, wood/veneer options could be included while laminate/non-wood options are excluded, or vice versa.

Representative (worst-case) Sample Selection

For manufacturers wishing to demonstrate compliance for a specific product(s), only that product shall be evaluated.

A manufacturer may demonstrate compliance of a broad set of products by using the results from a limited number of representative models. A range, series or category of products with varying characteristics may be grouped together for evaluation purposes if the products can be expected to perform similarly during evaluation (e.g., having the same general construction, materials, and manufacturing processes). Evaluation models shall be selected from the group based on those that can be expected to have the highest propensity for environmental impact. A case-by-case product line analysis by the manufacturer in consultation with the laboratory and/or certification agency is required, taking into consideration any special attributes, materials, methods of manufacture/construction, etc.

4.1 Elements

This Standard is divided into four basic elements consisting of various prerequisites and credits that are potentially available to organizations seeking product conformance to the standard. The four basic elements are:

- materials;
- energy and atmosphere;
- human and ecosystem health; and
- social responsibility.

4 Assessing Conformance, Evaluation, and Assessment Criteria (Continued)

4.2 Prerequisites

Each element has one or more prerequisites that are required as the minimum performance against the standard and applicants/products shall meet all prerequisites in each element in order to proceed. Once the prerequisite(s) are met, products may achieve additional credits toward multiple levels of achievement in each element by meeting the specified performance requirements.

4.3 Credits

Beyond the prerequisites, there is no minimum number of credits from any of the four major elements required to demonstrate conformance to this Standard. The required credits can come from any of the four elements.

4.4 Points

Each credit has one or more points that accumulate toward a level of conformance. In addition to a minimum number of total points required for each conformance level, there is also a minimum number of product related points for each level. See Annex D for a listing of product related credits and points.

4.4.1 Levels of Conformance

Silver	32 to 44 total points; at least 5 of which are product related points
Gold	45 to 62 total points; at least 11 of which are product related points
Platinum	63 to 90 total points; at least 18 of which are product related points

4.5 Baseline and Normalization Values

Some points require improvements against a baseline. Applicants have flexibility in defining the unit of measure they use to demonstrate improvement. Once an applicant defines the unit of measure, they must consistently use that throughout the standard whenever the normalization method is applied. For purposes of this standard, the baseline is the average of any 36 consecutive months within the previous 72-month period.

4.6 Frequency of Conformity Assessment

Products must be reevaluated if significant changes to materials, processes or the facility occur that affect the eligibility for any credit within the scope of conformance at the time of the change. Regardless, the frequency of conformity assessment shall not exceed three years.

5 Materials

5.1 Prerequisite

The organization shall implement a design for environment (DFE) program. The prerequisite is met if a DFE program is implemented at the time of the assessment. The DFE program shall, at a minimum, consist of the following elements: renewable materials; recycled materials; recyclable and biodegradable materials; end of life management; water management and energy efficiency.

5.2 Climate Neutral Materials

The organization shall increase the use of climate neutral materials. The applicant shall receive one point if it demonstrates that at least 30% of the final product weight is comprised of climate neutral materials. Materials are climate neutral when there is zero net greenhouse gases (GHG) measured in terms of CO₂ equivalent, emitted over the life cycle of the material. GHG impact is calculated utilizing life cycle assessment (LCA) and then is neutralized utilizing certified emission reductions (CERs), verified emissions reductions (VERs), or reductions registered with the California Climate Action Registry (CCAR). The offsets must equal or exceed the GHG produced during extraction, processing, manufacture, and transport of the product.

For the purposes of this credit, the LCA scope must include the following boundary elements (reference: ISO 14040):

- acquisition of raw material
- inputs and outputs in the main manufacturing/process sequence
- distribution/transportation

For the purposes of this credit, the LCA scope need *not* include:

- use and maintenance of finished product
- disposal of process wastes and products
- recovery of used products
- additional operations, such as lighting and heating

For the purposes of this credit, the offset quality must meet at least one of the following:

Offset Quality Mechanism	Web Address/Notes
Gold Standard CER	http://www.cdmgoldstandard.org/
CER	http://cdm.unfccc.int/index.html
Gold Standard VER	VCS (below), with added sustainable development criteria
VER	http://www.v-c-s.org/
CCAR	http://www.theclimateregistry.org/

NOTE: The Climate Registry is a nonprofit partnership developing an accurate, complete, consistent and transparent greenhouse gas emissions measurement protocol that is capable of supporting voluntary and mandatory greenhouse gas emission reporting policies for its Members and Reporters. It will provide a verified set of greenhouse gas emissions data from its Reporters supported by a robust accounting and verification infrastructure.

5 Materials (Continued)

5.3 Life Cycle Assessment

The organization shall encourage use of Life Cycle Assessments (LCA) to inform product design and development, and to optimize materials choices. The organization may complete an LCA for the furniture product being assessed. By fulfilling the criteria below, the applicant can earn a maximum of three points in this credit, as detailed below.

5.3.1 The applicant shall receive one point if it provides evidence that the company has incorporated the life cycle assessment frame work into product design by applying the first two of the four LCA components in ISO 14040 and ISO 14044 (Goal & Scope Definition and Life Cycle Inventory). The LCA boundary must encompass extraction of raw materials through end of product life.

5.3.2 The applicant shall receive a second point if it provides evidence that the company has completed an LCA utilizing all four components in ISO 14040 and ISO 14044. At a minimum the impact categories must include Global Warming Potential.

5.3.3 The applicant shall receive a third point if it demonstrates compliance to 5.3.2 and provides evidence that the company has completed an independent third-party review of its LCA.

5.4 Efficient Use of Materials

The organization shall reduce the quantity (mass) of raw materials used in the manufacture of products. Material efficiency is calculated for the materials comprising 80 percent of the weight of the products to be assessed. This credit is focused on the substantial conversion of raw material (e.g. sawing, routing, machining, forming, stamping, molding, cutting, sewing) and does not cover the extraction and initial processing of raw materials.

By fulfilling one of the two criteria below, the applicant can earn a maximum of two points in this credit, as detailed below.

5.4.1 The applicant shall receive one point if it demonstrates a Material Efficiency of 60%.

5.4.2 The applicant shall receive two points if it demonstrates a Material Efficiency of 70%.

$$\text{Material Efficiency} = [(\text{Input Mass} - \text{Waste Mass}) / (\text{Input Mass})] \times 100\%$$

Process aids and incidental consumables (e.g. gloves, sand paper) are not included in the calculation. Waste Mass includes materials sent to recycling.

5.5 Rapidly Renewable Materials

The organization shall increase the use of rapidly renewable materials that are obtained from bio-based sources and decrease dependency on petroleum-based materials. Rapidly renewable materials reach commercial maturity in 10 years or less. In order to qualify for these points the product to be assessed must contain at least 1 percent rapidly renewable material by weight or volume. By fulfilling one or both of the two criteria below, the applicant can earn a maximum of two points in this element, as detailed below:

5.5.1 The applicant shall receive one point if it selects rapidly renewable materials for use as an element of a new or existing product.

5 Materials (Continued)

5.5.2 The applicant shall receive two points if it demonstrates compliance to 5.5.1 and ensures that rapidly renewable material production waste is not destined for disposal.

5.6 Bio-based Renewable Materials - Sustainable Wood

Wood specified in the product, other than recovered or reused wood, shall not contain endangered wood species, unless the trade of such wood conforms with the requirements of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I or II, and is harvested according to the applicable laws and regulations of the country of origin.

In order to qualify for these points the product to be assessed shall contain at least 5 percent wood by weight. By fulfilling one of the two criteria below, the applicant can earn a maximum of two points in this credit, as detailed in 5.6.1 and 5.6.2.

5.6.1 Basic Level

The applicant shall receive one point if:

- A minimum of 20 percent of the total wood weight of the product conforms to a third-party certification program for environmentally and socially responsible forest management including but not limited to, chain of custody practices throughout the supply chain; and
- The applicant publicly declares the third-party certification program.

5.6.2 Advanced Level

The applicant shall receive two points if:

- A minimum of 30 percent of the total wood weight of the product conforms to a third-party certification program for environmentally and socially responsible forest management including but not limited to, chain of custody practices throughout the supply chain; and
- The applicant publicly declares the third-party certification program.

5.7 Recycled Content

The organization shall increase the amount of recycled content material incorporated into products and packaging. By fulfilling the criteria below, the applicant can earn a maximum of three points in this credit, as detailed below.

5.7.1 Basic Level

The applicant shall receive one point if either:

- It incorporates recycled content materials into the product so that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 30 percent of the total weight of the materials in the product; or
- It incorporates recovered materials into the product at or above the levels specified in the recovered materials content requirements listed below in Table One.

5 Materials (Continued)

NOTE: An applicant product may not meet the Table One Recycled Materials Content Requirements solely on the basis of its steel content, or if it is made from more than 50% (by weight) extruded aluminum.

TABLE ONE - Recovered Materials Content Requirements

Product	Material	Post-consumer Content (%)	Total Recycled Content
Furniture structure	Steel	16	25
Furniture structure	Aluminum ¹	--	75
Cellulose Loose-Fill and Spray-On	Post-consumer Paper	75	75
Particleboard/ Fiberboard component ²	Wood or wood composite	--	80
	Agricultural fiber		90
Fabric	PET	See Note ³ Below	100
Plastic furniture component	Various (non-fabric)		20
Remanufactured or Refurbished Furniture	Various	25	25
Acoustical Material	Various		20
¹ This limit does not apply to extruded aluminum. ² Particleboard and fiberboard used in the wood components of office furniture may also contain other recovered cellulosic materials, including, but not limited to, paper, wheat straw, and bagasse. The percentages of these materials contained in the product would also count toward the recovered materials content level of the item. ³ The 100% post-consumer content requirement of the CPG for PET fabric is not replicated here. <i>Note: Post consumer and total recycled percentages are expressed as weight percent of total material specified.</i>			

5.7.2 Advanced Level

The applicant shall receive two points if it demonstrates compliance to either requirement in 5.7.1 and either:

- It incorporates recycled content materials into the product so that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 50 percent of the total weight of the materials in the product; or
- It demonstrates that the recovered content of its product exceeds the levels specified in the recovered materials content requirements listed in Table One by at least 20 percent in each material category, relevant to the product being assessed; if 100 percent recovered content has not already been achieved.

5 Materials (Continued)

NOTE: this second option shall not be available for products made entirely of steel or made from more than 50% (by weight) extruded aluminum.

5.7.3 Packaging

The applicant shall receive one point if it incorporates recovered materials into packaging at or above the levels specified in the recovered materials content requirements as listed in Table Two:

TABLE TWO - Recovered Materials Content Requirements

Product	Material	Post-consumer Content (%)	Total Recycled Content (%)
Packaging	LDPE, LLDPE	25	35
	HDPE	25	35
	PET	10	25
	Corrugated Cardboard	25	40

5.8 Recyclable and Biodegradable Materials

The organization shall increase the use of recyclable and biodegradable materials in the product.

The applicant shall receive one point if it:

- Identifies and quantifies the amount by weight of recyclable and biodegradable materials in the product. All qualifying recyclable and biodegradable materials shall be clearly labeled or otherwise identified in a manner that facilitates easy identification of materials during disassembly; and
- Verifies availability of recycling/biodegradation facilities (excluding waste to energy) for recyclable and biodegradable materials in product in at least six of the ten U. S. EPA regions (see annex A for map of regions).

NOTE: labeling/marketing of plastic components, to support identification and recycling, shall be completed in accordance with ISO 11469.

5.9 Extended Product Responsibility

5.9.1 Design for Durability/Upgradeability

The applicant shall earn one point if it maximizes the useful life of the product to make it easy to refurbish and upgrade for multiple uses by the original or subsequent users. In order to accomplish this, the organization shall adopt and publicize a policy stating that it will design and manufacture products that have a long useful life; can withstand repeated service, repair, and handling; and has standardized product parts and components available to facilitate maintenance, servicing, and reassembly. The organization's policy may allow for the replacement of design components and reuse of functional components. The product to be assessed must be covered by the policy.

5 Materials (Continued)

5.9.2 Design for Remanufacturing

The applicant shall earn one point if it designs products to ensure that they can be remanufactured. The products shall be designed in a modular fashion to facilitate the replacement of components that are subject to wear or breakage, likely to go out of style, or likely to be upgraded. In order to earn a point in this credit, the organization shall conform to all three of the requirements below in its design for remanufacturing:

- Product disassembly instructions are publicly available;
- Disassembly is possible with standard tools and does not require special training; and
- Disassembly can occur in a reasonable amount of time.

5.9.3 Design for Recycling

The organization shall maximize the degree to which materials from the product that cannot be reused or remanufactured can be recycled into value-added products. In order to earn a point in this credit, the organization shall conform to all four of the requirements below in its design for recycling:

- Product disassembly instructions are publicly available;
- Disassembly is possible with standard tools and does not require special training;
- Disassembly of the product can occur in a reasonable amount of time; and
- Product parts are labeled, or otherwise identified, to facilitate separation by material content, and identification of any materials that may require special handling.

5.9.4 Other Facilitation Efforts

By fulfilling one or both of the two criteria below, the applicant can earn a maximum of three points in this credit, as detailed below:

5.9.4.1 Research on Recovery Options

The applicant shall receive one point if it researches and publishes information on the highest value recovery opportunities for its legacy product lines and the materials that comprise them.

5.9.4.2 Buy-back/Take-back/Leasing

The applicant shall receive one point if it makes a buy-back or take-back program part of its strategic sales strategy for products it is selling or leasing. The applicant shall receive a second point upon providing proof of implementation. The applicant may involve a third party in the buy-back/take-back program. The applicant shall ensure that the program is managed consistently with its own environmental programs.

5 Materials (Continued)

5.10 Solid Waste Management

The applicant shall receive a maximum of two points based on its published and implemented solid waste diversion program for landfill disposal (this credit does not apply to hazardous waste). The applicant shall receive:

- One point for a 100 percent diversion goal.
- One point for achieving 100% diversion for product to be assessed for solid waste generated from fabrication and assembly of product components. Not included are solid waste generated from raw material extraction and conversion; process aids (for example: sandpaper, gloves, spray booth filters) and packaging.

5.11 Water Management

The intent of this section is to focus on process water only. Process water includes water used for pre-treatment (e.g., phosphating wash line), water-based adhesive processes, cooling water, water-jet cutting operations, and spraybooth over-spray capture systems. In order to qualify for water management credits, the applicant must prove that process water was used in the manufacturing of the product to be assessed, at any point in time during the past six years. The applicant must state whether the assessment is being completed for the applicants' own facilities, and/or facilities operated by a supplier (using process water for the product to be assessed).

5.11.1 Water Inventory of Factory

The applicant shall receive one point if it establishes a baseline process water inventory to document water sources/withdrawals, uses, and discharges for the facility where the finished product is assembled or manufactured.

5.11.2 Water Efficiency

The applicant shall receive one point if it implements program(s) to maximize process water efficiency to reduce the burden on the water supply and local wastewater treatment systems for the facility where the finished product is assembled or manufactured. The organization shall provide objective evidence that water efficiency improvement goals have been established for the facility within the past 6 years. Performance against the goals must be tracked. Absolute reductions in total water usage must be documented.

5.11.3 Wastewater Discharge

The applicant shall receive two points if it achieves zero net process water usage or wastewater discharge rates for the facility where the finished product is assembled or manufactured.

6 Energy and Atmosphere

6.1 Prerequisite

Top management of the organization shall develop and implement an energy policy that shall establish the organization's overall direction in terms of its commitment to energy conservation and performance. The policy shall:

- Be appropriate to the nature and scale of the organization's activities, products, and services;
- Include a commitment to continual improvement;
- Include a commitment to comply with relevant local, state, and federal regulations, and with other requirements to which the organization subscribes;
- Provide the framework for setting and reviewing objectives and targets; and
- Be documented, implemented, and communicated.

The policy should focus on the organization's mission, vision, and core values. Specific local or regional conditions should be considered, as should the organization's image and the views of other interested parties. Other interested parties may include employees, shareholders, customers, consumers, local communities, environmental groups, lenders, and regulators.

6.2 Building Energy Performance Baseline

6.2.1 The applicant shall receive one point if it conducts a building energy baseline from historical energy use data, for buildings directly associated with manufacturing and/or final assembly of the product being assessed. This would include all energy sources used such as electricity, natural gas, propane, etc.

6.2.2 The applicant shall receive up to two additional points if it conforms to 6.2.1 and conducts a building energy baseline from historical energy use data for facilities such as warehouses, office building, showrooms, supply partner facilities (other than final assembly), that are associated with the product being assessed.

NOTE: one point for each facility, maximum of two points.

6.3 Building Energy Performance Rating

6.3.1 The applicant shall receive two points if it demonstrates an EnergyStar equivalent rating of at least 60, for buildings directly associated with manufacturing and/or final assembly of the product being assessed; calculated using the method described in the LEED-EB Reference Guide, Credit EA 1 on an absolute or normalized basis.

6.3.2 The applicant shall receive up to two additional points if it conforms to 6.3.1 and demonstrates an EnergyStar rating of at least 60 (calculated using the method described in the LEED-EB Reference Guide, Credit EA 1) for facilities such as warehouses, office buildings, showrooms, supply partner facilities (other than final assembly) etc., that are associated with the product being assessed, or improve the energy efficiency by 35% over the baseline calculated in credit 6.3.1.

NOTE: one point for each facility, maximum of two points.