

New Standard Assures Sustainability in Carpets

A Guide to Specifying Low-Impact Materials



Carpet covers nearly 70 percent of all floors in the United States.
Photo courtesy of Hedrich Blessing, Chicago, IL.

Provided by The Carpet and Rug Institute

Sound absorption, underfoot comfort, improved slip resistance, thermal comfort in an astounding array of colors, textures and patterns: the benefits of carpet are enticing. In fact, carpet covers nearly 70 percent of all floors in the United States and the country's carpet industry produces more than 19 billion feet of carpet each year to meet demand.

The carpet industry is among the most progressive in the country in addressing the potential human health, environmental and sustainability factors of its products. Strides have been made in reducing the environmental footprint of carpet, including landfill use, carbon dioxide emissions, energy consumption, waste generation, water usage and hazardous air pollutants. In the period from 1990 to 2002 the carpet industry significantly reduced its environmental footprint per square yard of production.¹

The next step in achieving sustainability is the market's use of a tough new comprehensive standard based on science and backed by diverse stakeholders. In the fall of 2007, the American National Standards Institute approved NSF 140-2007 as an American National Standard that establishes performance requirements for public health and environment, and addresses the triple bottom line—economic-environmental-social—of sustainability throughout the carpet industry's supply chain. This article will discuss sustainability factors relating to carpet, and focus on the NSF 140-2007 standard as it contributes to laying a foundation for specifying flooring materials with a lower environmental impact.

¹The Carpet Industry's Sustainability Report, 2003

CARPET BASICS

Fibers

In commercial applications, over 90 percent of the fibers used are Nylon. Yarns can be either bulked continuous filament or staple. In order to make fibers, polymer is forced, at high temperature, through a spinneret (extrusion) in uninterrupted filaments, which are then formed into a bulked continuous filament yarn. These fibers may



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in Carpets: A Guide to Specifying Low-Impact Materials. To earn one AIA/CES Learning Unit, including one hour of health safety welfare credit, answer the questions on page 8, then follow the reporting instructions or go to continuingeducation.construction.com and follow the reporting instructions.

LEARNING OBJECTIVES

After reading this article, you should be able to:

- Discuss sustainability issues relating to carpet.
- Interpret the leading national standard for carpet, NSF 140-2007, Sustainable Carpet Assessment Standard.
- Specify green carpet using this standard as a guide.



In commercial applications, over 90 percent of the fibers used are Nylon.
Photo courtesy of The Carpet and Rug Institute.

also be chopped into short fibers and then spun into staple yarn, twisted, and set with heat to hold the twist.

Backing

All carpet has some type of backing system or chemistry that helps keep the tufts in place. Backing systems are made from a variety of materials.

The methods and chemicals used depend upon the performance requirements of the backing and the carpet. These decisions will be based upon the specifier's performance considerations and the manufacturer's recommendations. Performance considerations are especially important for demanding environments. It is important that the specifier identify the highest priority needs for how the carpet will perform, whether that is resistance to wear, moisture-resistance, or heavy foot traffic. The manufacturers' end use recommendations help determine which product will meet the established performance expectations.

Carpet backing systems contain the following elements: a primary backing, a chemical adhesive, and often a secondary backing. In the most common system, the yarn is secured into the primary backing by synthetic polymer (this could be water-based latex or some type of thermoplastic), and a secondary backing (cushioned or non-cushioned) is attached with a bonding agent or adhesive to add dimensional stability and other performance characteristics to the carpet structure.

SUSTAINABLE CARPET ATTRIBUTES

Sustainability is defined as meeting the demands of today without compromising the ability of future generations to meet their needs. Applied to carpets, sustainability issues cover all phases of a product's life cycle. In order to appreciate the potential of the new NSF 140-2007 standard in improving carpet specification decisions, it is first important to understand some of the key sustainability issues faced by the carpet industry and how the industry is responding.

It is also important to understand the impact of cleaning and maintenance on the useful life of a carpet. The best constructed carpet in the world will not last very long if a good cleaning and maintenance program is not in place.

Public Health and the Environment

The manufacturing of carpet requires significant amounts of natural resources and results in sizable emissions of greenhouse gases—all of which the industry has been successfully working to reduce. The industry has less carbon dioxide emissions per square yard now than in 1990 while producing 40 percent more product. The carpet industry reductions support the goals of the Kyoto Protocol to the United Nations Framework Convention on Climate Change, which amends the international treaty on climate change, assigning required emission limits to reduce greenhouse gas emissions. Finishing and dyeing typically can involve substantial quantities of water. In the period between 1990 and 2002, water consumption at the mill level has decreased by 46 percent.²

Energy and Energy Efficiency

In terms of total energy consumption, the industry reports a 41 percent reduction in Btus per square yard of carpet manufactured in the years between 1995 and 2002.³ To further reduce energy consumption, companies will look to expand new energy technologies such as renewable fuels, fluidized beds, and using carpet waste to produce energy. Manufacturing schedules will continue to be modified to reduce energy consumption.

Biobased, Recycled Content and Environmentally Preferable (EPP) Materials

Purchasing carpet and other products with biobased, recycled content or EPP materials ensures that a demand exists for these products. This demand creates an outlet for recycled carpet and materials, which reduces the use of landfill space, as well as reducing natural resource, energy and environmental impacts associated with extracting, transporting, and manufacturing virgin, petrochemical-based raw materials. The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™ favors recycled materials. A switch to biobased, recycled content or EPP materials in a project can meet the same industry performance and carries the same manufacturer warranties as carpet without biobased, recycled content or EPP materials. Purchasing carpets certified to the NSF 140-2007 is acting favorably towards the environment.

Manufacturing

The increase in globalization and technology has ratcheted up the impacts of business on local communities. In terms of raw material acquisition and manufacturing, carpet industry companies have an opportunity to address several sustainability issues. Enhanced health and safety for workers and consumers, a shared environmental agenda with local communities, fair labor practices and working conditions, and human rights policies and procedures throughout the supply chain are all concerns that factor into a product's sustainability

quotient. This element of sustainability is also factored into the NSF 140-2007 standard.

Reclamation and End-of-Life Management

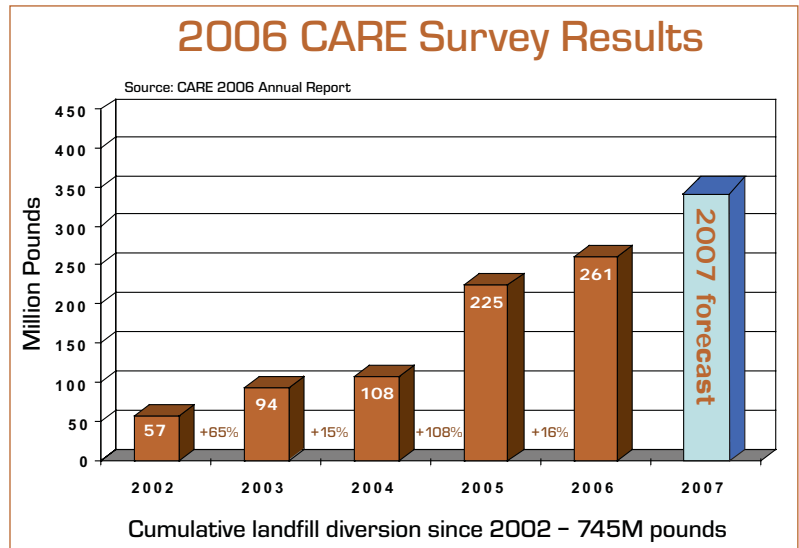
As premature replacement of carpet adds to the industry's environmental footprint, a key aspect of sustainability involves extending the product's life. Often, carpets are replaced not because they have worn out, but because they no longer retain their original appearance. To protect against removal of carpet before the end of its useful life, the industry has established a program to enable consumers to identify vacuum cleaners and cleaning systems best suited to keeping carpets clean without putting dust back into the air. Identifying safe and effective chemicals to clean carpets is another industry concern, and a more recent program identifies effective and environmentally sound carpet spot removal cleaning products, as well as pre-spray and in-tank products.

To further reduce the overall environmental impact of carpet, the carpet industry is voluntarily recycling old carpet materials back into production of new carpets, as well as recycling it into alternative uses—everything from building materials to auto parts. The tasks of collecting, sorting and transporting used carpet are being addressed by carpet and fiber companies and individual entrepreneurs. A number of carpet companies have collection sites in place and are developing the means to separate carpet components and recover polymers. The industry is working toward recycling Nylon 6 and Nylon 6,6 fiber back into fiber. Both forms of nylon find widespread use in commercial carpets today. Some companies are refurbishing used carpet modules. Currently, billions of polyethylene terephthalate (PET) plastic beverage bottles are used each year to make polyester carpet fibers.

CARE reports...a 16 percent increase in diversion [from landfill] and a 23 percent increase in recycling from the previous year.

"In this area the key question facing the carpet industry is how to make a product that has the fewest environmental impacts and a useful path at the end of its life. You have to begin with the end in mind," says Frank Endrenyi, Vice President of Sustainable Development for Mohawk Industries, Calhoun, Georgia, a producer and distributor of flooring worldwide, noting that there is substantial research being done among carpet industry companies on this issue. "If you make it, you eventually have to replace it. Some raw materials are easier to recycle back into carpet or other products than others."

One of the leading programs in carpet recycling is the Carpet America Recovery Effort (CARE), a joint industry-government non-profit effort to increase the amount of recycling and reuse of post-consumer carpet and to reduce the amount of waste carpet going to landfills. CARE was established as a result of a Memorandum of Understanding



for Carpet Stewardship, a national agreement signed by members of the carpet industry, representatives of government agencies at the federal, state and local levels, and non-governmental organizations. CARE reports that of the approximately 5 billion pounds of carpet that was discarded in 2006, 261 million pounds of post-consumer carpet were diverted from landfills with 240 million pounds recycled—that is a 16 percent increase in diversion and a 23 percent increase in recycling from the previous year. As of September 1, 2007, there are 54 centers around the United States for the collection of post-consumer carpet. The CARE website includes a comprehensive listing of carpet recycling programs, as well as information on market and product development for recycled carpet and information on other end-of-life options. It is worth noting that for maximum assurance, recovery-recycling requirements should be spelled out in the purchase contract. Waiting to address end-of-life issues until the need arises can result in more limited options and higher costs.

Transportation

With raw materials and finished product shipping long distances, transportation impacts should be considered. Many carpet industry companies have voluntarily adopted a range of efficiency measures from rolling, wrapping and compressing rugs for efficient shipping to adopting reusable or recyclable packaging and consolidating inbound shipments to maximize the use of trailers. It is a common practice for companies to use the largest possible container to reduce handling and maximize floor space, and products are frequently transported in dedicated tanks and trucks to eliminate entirely the need for packaging. The latest carpet tile technology has reduced the amount of raw material required and therefore transportation of less weight has impacted the transportation of those products. New tiles have around 30 percent less weight than older technologies.

Indoor Air Quality

According to Dr. Robert Peoples, Director for Sustainability for the Carpet and Rug Institute, a misconception exists about indoor air quality concerns related to carpet. "Indoor air quality concerns are really minimal when it comes to carpets, carpet backings, cushions and

adhesives that meet industry standards,” says Peoples. “In fact, tested and certified carpet is one of the lowest emitting products that is put inside a building envelope. Most new interior furnishings and building materials emit VOCs for a period of time. Emissions from new carpet are among the lowest of any indoor furnishings, and most VOCs dissipate within 72 hours—even faster with good ventilation.”

Recent studies indicate an improvement in indoor air quality when carpet is present. Carpet acts to “trap” dust and dirt until it can be removed by routine vacuuming. As opposed to a smooth floor covering, carpet benefits residents by holding or trapping dust and allergen particles so they won’t be blown around in a room—and it is only airborne particles that affect allergic individuals.

SPECIFICATION CONSIDERATIONS

In specifying carpets with sustainable attributes, the choices can be overwhelming. Incorporating sustainability into carpet manufacturing is a complex undertaking that goes well beyond just utilizing recycled content. In addition to established recovery programs that keep carpets out of landfills, companies may claim a variety of product attributes from durability to long-lasting carpet tiles, recycled elements, low- or no-VOC adhesives or methods that even obviate the need for adhesives altogether. Manufacturers may even claim to reduce their products’ life-cycle impacts through emissions reductions, maximizing the use of renewable energy sources or reducing waste and toxins. While all of these impacts should be considered in specifying carpets, valid product comparisons can be difficult and time consuming.

In specifying carpets, third party assurances that attest to a product’s environmental quality performance can help narrow the search. But caveat emptor, some third-party assurances carry more weight than others.

Ecolabels

An ecolabel is a labeling system for consumer products that are made in a fashion so as to avoid detrimental effects on the environment. Ecolabels help guide consumers in purchasing products that have a reduced environmental impact. Ecolabels can be based on a standard or other recognized protocol, e.g. Energy Star, Green Seal, National Organic Program, Green Label, etc. Problems may arise when an ecolabel is directly connected to the firms that manufacture or sell the ecolabeled products. For quality assurance, it is imperative that the labeling entity be clearly divided from and independent of the product’s manufacturers or other stakeholders.

Standards

Standards involve a recognized protocol. Standards are published specifications that establish a common language, and contain a technical specification or other precise criteria and are designed to be used consistently, as a rule, a guideline, or a definition. Standards assure that a product meets the most rigorous industry tests and provide architects and building owners with third-party assurances about the quality, sustainability and longevity of the products they specify. Standards use a consensus process; a wide range of stakeholders

develop the standard and are governed by nationally and internationally recognized organizations.

INTRODUCTION TO NSF

NSF International, a not-for-profit, non-governmental organization, provides standards development, product certification, education and risk-management for public health and safety. While focusing on food, water, indoor air, and the environment, NSF develops national standards, provides learning opportunities through its Center for Public Health Education, and provides third-party conformity assessment services while representing the interests of all stakeholders. The primary stakeholder groups include industry, the regulatory community, and the public at large.

NSF is widely recognized for its scientific and technical expertise in the health and environmental sciences. Its professional staff includes engineers, chemists, toxicologists, and environmental health professionals with broad experience both in public and private organizations.

Since it was founded in 1944, NSF has developed over 50 voluntary American National Standards under the scope of public health and safety. NSF/ANSI Standards are developed through involvement of those who are directly and materially affected by the scope of the standard. The process ensures balanced input from industry representatives, public health/regulatory officials, and users/consumer representatives. ANSI’s accreditation verifies that NSF develops standards in a manner to ensure openness and due process allowing for equity and fair play.

The purpose of NSF 140-2007...is to provide a market-based definition for a path to sustainable carpet.

NSF 140-2007, Sustainable Carpet Assessment Standard

The purpose of NSF 140-2007, Sustainable Carpet Assessment Standard is to provide a market-based definition for a path to sustainable carpet. It also establishes performance requirements for public health and environment and addresses critical economic, environmental and social issues as they pertain to the industry.

Prior to NSF 140-2007, architects relied on the LEED building standard to steer them toward green carpet solutions. “LEED evaluates all aspects of the building from doors to steel posts. Because there are so many elements to evaluate, a typical ‘green’ carpet according to LEED had recycled content and minimal off-gassing,” says Mohawk’s Endrenyi. “In contrast, NSF 140 is focused on multiple attributes over the entire life cycle of the carpet product. Recycled content is only one element of what NSF 140-2007 recognizes.”

“Besides,” adds Bill Gregory, Director of Sustainable Strategies for Milliken & Company, Spartanburg, South Carolina, a privately held textile and chemical manufacturer, “the total environmental impact including all phases of the life cycle are important in determining product sustainability. Now an architect or specifier can call a manufacturer

and say, 'I want a product certified against the standard to a specific level.' They don't have to do any more research or make value judgments about which ecolabels to trust. NSF 140-2007 has done the work, so choosing green is easier and transparent."

NSF 140-2007 is the culmination of five years of work by a host of diverse stakeholders including carpet and rug manufacturers, end users, interior designers, state and federal agencies responsible for procurement practices, particularly the California Environmentally Preferable Purchasing Task Force's Carpet Subcommittee, the Federal EPA, and academics and non-governmental officials.

Work began in 2003 with the goal of developing a standard that would help purchasers identify carpets with sustainable attributes. The effort resulted in a draft public domain standard administered by NSF International. In December 2005, the jointly developed standard was issued as the Draft American National Standard for Trial Use, NSF 140-2005 Sustainable Carpet Assessment Standard (Draft NSF 140-2005). At that time, California initiated its California Gold standard for carpet procurement that was essentially the same as the original draft of NSF 140-2005, with several additional prerequisites. Following a comment period, the draft, revised as necessary, was submitted to the American National Standards Institute (ANSI) for approval as an American National Standard. The final NSF 140-2007 was published in the fall of 2007.

"The stakeholders decided it was important to put a stake in the ground and start the process of certification against a benchmark. The draft standard allowed us to begin the journey and at the same time get real world feedback on what was working and what needed to be adjusted or improved. We didn't want to let perfect get in the way of 'good enough,'" says Peoples, noting that the work on NSF 140-2007 has become a model for several other industries.

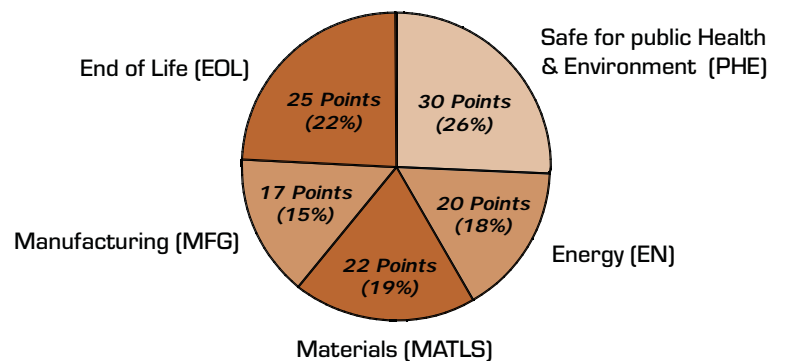
With the release of NSF 140-2007, California is planning to transition 100 percent of its state carpet purchases to the NSF 140-2007 Platinum level over the next 12-18 months, eventually completely transitioning from its currently mandated California Gold Standard.

The first carpet products certified against the approved standard are expected to be available in the marketplace by the second quarter of 2008. Currently, 18 carpet products are certified to the California Gold Sustainable Carpet Standard, and an additional 11 products are certified to the NSF140 Draft Standard.

HOW THE STANDARD WORKS

A point-based evaluation system comparable to the LEED rating system for green buildings, NSF 140-2007 is based on life cycle assessment principles, and provides benchmarks for continuous improvement and innovation. In order to achieve a sustainable rating, a carpet product must 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 must also provide the equivalent in performance and quality to other carpets.

Current Credit Distribution *



*Standard version 8-31-07

Mandatory minimum requirements of sustainable performance are identified, as are three levels of achievement—silver, gold and platinum—by which carpet materials and products can be measured with respect to specific attributes that indicate progress toward sustainability.

The standard allows carpet to be either petrochemical-based or biobased provided that it meets performance requirements, has multiple attributes that protect public health and environment, and fosters healthy and prosperous conditions for human and ecological systems throughout its supply chain.

Point System

While all carpets must meet certain prerequisites in each of the five categories, no minimum number of credits from any category is required for compliance. Instead, similar to LEED, once all prerequisites have been met, users may earn additional credit points toward multiple levels of achievement [See table below].

All credits have the same weighting or value toward compliance. To earn silver achievement level, products must earn at least 37 points; for gold achievement level, 52 points; and for platinum, 60 points. The NSF140-2007 Gold/EPP and Platinum/EPP levels recognize superior performance.

LEVEL	POINTS REQUIRED
Silver	≥ 37 points
Gold	≥ 52 Points
Platinum	≥ 60 Points

Because consistency is key to NSF140-2007, specifiers can be assured that products were evaluated on a level playing field using the same criteria. An external auditor developed an accompanying workbook that spells out the methodology for all required calculations. "There was enough complexity that various manufacturers might interpret what was asked for in different ways," says Endrenyi. "The workbook stipulates 'divide x into y' or whatever is called for. So we're all making—and being evaluated—on the same calculations."

Points are available in 5 different categories:

Public health and environment (possible 30 points)

This category contains various options to demonstrate that an organization is taking steps to minimize pollutants and energy use adversely affecting public health and environment.

- **Prerequisites** (four points total; three prerequisite points; one platinum prerequisite point). Manufacturers are required to reduce or eliminate chemicals with potential adverse human health effects. One point is given for identifying the composition of raw materials including those identified in the standard as persistent, bioaccumulative and toxic. One point is awarded for documenting that persistent bioaccumulative toxins (PBTs) are not present at 0.1 percent or greater in the product. Also, while there are no polybrominated diphenyl ethers (PBDEs) in carpet, concerns by several stakeholders and the California phase out of PBDEs in all products dictated its inclusion. Thus, one point is earned for containing no polybrominated diphenyl ethers (PBDEs). Minimizing indoor VOC emissions is a prerequisite for gold and platinum performance, and is accorded one point.

Additional points are available for reducing or eliminating other chemicals and for reducing specified life cycle impact areas, including global warming and fossil fuel depletion.

Energy and energy efficiency (possible 20 points)

This category documents energy used in carpet production, greenhouse gas emissions, and recognizes the use of renewable energy.

- **Prerequisite** (one point). As a prerequisite, the manufacturer must document 100 percent of its electrical and thermal energy requirements. For onsite-generated energy, the manufacturer shall identify fuel type used; for off-site generated energy, percent renewable vs. non-renewable energy must be documented.

Up to 12 additional points can be earned for the percentage of the manufacturing facility's total production energy requirements that is derived from renewable energy and/or the percentage of energy reduction per square yard or per pound of product.

The manufacturer can earn up to 6 points based on the suppliers' usage of renewable energy. An additional point is awarded if the manufacturer documents reductions in greenhouse gas emissions resulting from energy use.

Bio-based, recycled content or environmentally preferable (EPP) materials (possible 22 points)

This category requires progressively higher levels of bio-based, recycled content or EPP materials contained in a carpet product.

- **Prerequisites** (three points total; two prerequisite points; one platinum prerequisite point). Two points are awarded for documenting the bio-based, recycled content or EPP materials of the product. Recycled content must be classified by post industrial/

pre consumer or post-consumer materials as defined by sources stipulated in the standard. Post-industrial/pre-consumer content receives one half the credit of post-consumer content.

A 10 percent post-consumer recycled content is a prerequisite for platinum achievement level and is awarded one point.

Beyond the prerequisite of inventorying of bio-based, recycled content and EPP materials, manufacturers are awarded points for increasing percentages of bio-based, recycled content and EPP materials. Manufacturers can earn the full 20 for a points feedstock composed of 100 percent bio-based or recycled content.

Manufacturing (possible 17 points)

This category encourages corporate wide environmental responsibility and achievements.

- **Prerequisites** (six points total; three prerequisite points; three platinum prerequisite points). One point is earned for documenting a formal policy and Environmental Management System (EMS) and publicly declaring environmental targets, objectives and metrics pursuant to ISO 14001. An additional mandatory point is earned by reporting social indicator metrics, including labor practices and decent work conditions, human rights policies and procedures, and societal and community impacts. An additional mandatory point is earned for demonstrating the product meets applicable performance durability testing requirements. Qualifying for platinum status requires completing an actual Life-Cycle Assessment (LCA) for the product platform undergoing assessment; three points are awarded. Additional points are derived for a range of sustainable business practices from certifying its environmental management system to incorporating environmental components into product design and achievements in minimizing waste generation and reduction.

Reclamation and end-of-life management (possible 25 points)

Any holistic approach to sustainability must incorporate end of life considerations. This category encourages product reuse, recycling and reclamation, thereby reducing waste to landfills and incineration. It requires extended life of the system including proper installation and maintenance. A manufacturer or supplier shall have its own materials management system or demonstrate financial or contractual instruments whereby it takes materials that start as carpet and are reclaimed and/or recycled. This category accounts for recycling 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 land filling and incineration.

- **Prerequisites** (three points total; one prerequisite points; two platinum prerequisite point). As a prerequisite, the manufacturer must describe where operational reclamation opportunities exist



New fiber pad is made from 100 percent post-consumer carpet.

(one point earned). As a Platinum level prerequisite, carpet must be installed using CRI Carpet Installation Standard 104 and/or manufacturers' recommended procedures and is awarded one point. For 2007, 10 percent reclamation and recycling is a prerequisite for Platinum/EPP, consistent with CARE goals and is awarded one point. Check CARE website for subsequent years' goals.

Beyond the prerequisites, up to 17 additional points are awarded for various levels of product reclamation. Manufacturers who show an 80 percent reclamation rate calculated according to a proscribed formula receive the full 17 points.

A manufacturer shall earn two points by documenting that the materials management system takes materials that start as carpet and reclaims them into secondary non-carpet materials. A manufacturer shall earn up to two points by reclaiming secondary materials into the same product system from which they originated. And the manufacturer shall earn two points by taking back materials that start as carpet and are reclaimed and repurposed/refurbished/ reused as equivalent carpet products.

Post-consumer recycled content is defined as a material or finished product that has served its intended use and has been diverted or recovered from waste destined for disposal. Post-industrial/pre consumer recycled content are materials generated by manufacturers or product converters, such as trimming, over-runs, and obsolete products that are incorporated back into the manufacturing process of the same or a different product

Innovation Credits (Possible 10 points)

NSF140-2007 provides manufacturers the opportunity to be awarded points for exceptional performance above the requirements set by the Sustainable Carpet Assessment Standard and/or innovative performance not specifically addressed by the Sustainable Carpet Assessment Standard.

Innovation credits shall be applied for and submitted by applicants to address topics that will further the promotion of sustainable carpet. A maximum of 10 points shall be awarded for any innovation credits.

For instance, innovation points can be earned for design innovations

that achieve dematerialization, or using less material by percent, or weight per square foot—an accomplishment that means reduced impacts over the life cycle of the product. Says Peoples, "A company may find a way to reduce the energy used to make a square yard of carpet by 50 percent. That would represent a breakthrough and some new technology. So you give a point for innovation. Or a company finds a way to eliminate the filler—30 percent by weight of a broadloom carpet. Today this filler is strip mined from the earth and has little or no recycle value, so you reward them for dematerialization with a point."

Other industry advances have ranged from eliminating the need for adhesives and floor underlayments to renewing old carpet tiles to reclaiming Nylon 6. "This standard allows credit for breakthroughs and challenges the industry to continue to innovate," says Gregory.

THE IMPACT OF NSF140-2007

As a cutting-edge standard that is serving as a model for other industries, NSF140-2007 will simplify the procurement process for green carpet. As potential specifiers of virtually everything that goes into a building, architects, and designers have the opportunity to use the Standard not only to help educate clients, but to reduce the environmental footprint of their projects. Because it is built on credible science and a consensus process, the Standard will make it easier for users to identify certified carpets with a lower environmental impact, and go a far distance in benefiting users—as well as all organizations involved in the supply chain—in terms of contributing to LEED Credits (EQ c4.3, MR c4, ID c1), design innovation, product differentiation, long-term customer relationships, product innovation, improved indoor air quality and lower emissions, reduced liability, ecological restoration, enhanced health and safety for workers and consumers, and measurable reductions in total environmental impact.

"NSF140-2007 is a holistic standard," says Steve Bradfield, Corporate Director of Environmental Affairs for Shaw Industries, Dalton, Georgia, a manufacturer of a wide variety of flooring. "But is it perfect? Is the balance correct? It may take a couple of iterations to get it right. Conditions will change. As climate change increases, specifiers will be asking more questions about emissions factors and we may give that consideration more weight. The beauty of standards is that they can be revised periodically. They're not meant to be static." ■

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LEARNING OBJECTIVES

After reading this article, you should be able to:

- Discuss sustainability issues relating to carpet.
- Interpret the leading national standard for carpet, NSF 140-2007, Sustainable Carpet Assessment Standard.
- Specify green carpet using this standard as a guide.

1. Over 90 percent of all commercial carpet uses:

- a. nylon.
- b. polymers.
- c. synthetic fibers.
- d. olefin.

2. In the period 1990-2002, water used at carpet mills has:

- a. increased by 52 percent.
- b. remained constant.
- c. been subject to legal restrictions.
- d. decreased by 46 percent.

3. One of the leading programs in the carpet recovery effort is:

- a. U.S. EPA.
- b. CARE.
- c. U.S. Green Building Council.
- d. NSF International.

4. Developed Standards:

- a. involve a recognized protocol.
- b. claim a variety of product attributes.
- c. are issued by manufacturers.
- d. are legally binding.

5. The purpose of NSF140-2007 is to:

- a. recommend recycled carpets.
- b. identify a market-based path to sustainable carpets.
- c. distinguish which carpets have the best environmental performance.
- d. none of the above

6. NSF140-2007 has:

- a. three levels of achievement.
- b. a weighting system for credits.
- c. points available in 10 categories.
- d. no prerequisites.

7. NSF140-2007 requires all carpets to be bio-based.

- a. True
- b. False

8. Platinum level designation necessitates a minimum of:

- a. energy usage.
- b. adverse social impacts.
- c. 60 points.
- d. petro-based materials.

9. In the energy category points can be earned for:

- a. a supplier's use of renewable energy.
- b. increasing bio-based materials.
- c. recycled content.
- d. sustainable business practices.

10. Manufacturers can earn full reclamation category points for:

- a. avoiding landfilling or incineration of products.
- b. post- and pre-consumer recycling programs.
- c. an 80 percent reclamation rate.
- d. adoption of a materials management system.

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The NSF 140-2007 Standard is another major step forward for the carpet industry, a recognized leader in environmental stewardship. This standard has become a model for several other industries. A full listing of certified carpet products may be found at <http://www.scscertified.com/sustainablechoice/index.html> Information on the CARE organization may be found at www.carpetrecovery.org and the Carpet and Rug Institute at www.carpet-rug.org To obtain a copy of the actual NSF 140-2007 standard go to www.nsf.org/info/carpet

www.carpet-rug.org

www.carpetrecovery.org