



SHADES OF GREEN
CARPET AND ENVIRONMENT

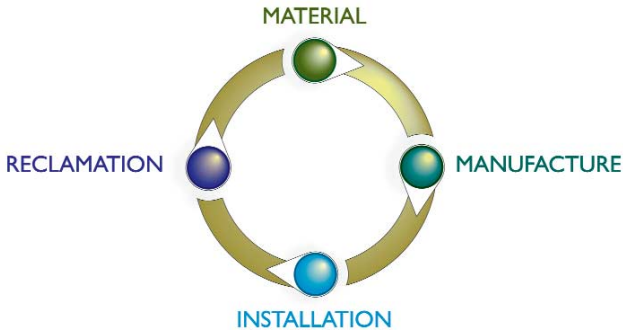
WHITE PAPER

As momentum builds in the design community for sustainable design practices, it becomes important to make as many decisions as possible to support the intent of sustainability. Since floorcovering is one of the largest items in the finish budget, evaluating the specification and impact on both the interior and exterior environment can contribute to the green effect. Issues such as LEED certification, face fiber, backing materials, recycled content and industry efforts at supporting sustainable design need clarification.

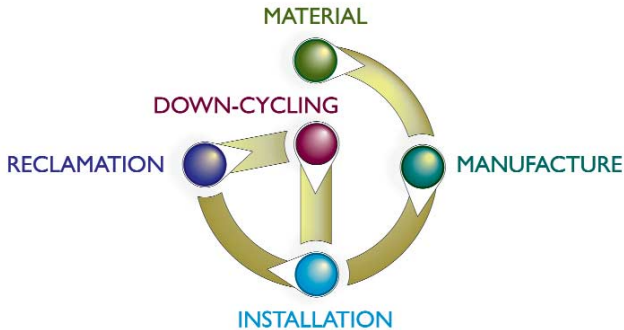
The U.S. Green Building Council (USGBC) has established a set of project rating criteria called Leadership in Energy and Environmental Design (LEED). This program has brought nationwide attention to the promotion of environmentally responsible buildings. Of the sixty-nine possible points to achieve the highest rating, carpet and its installation can contribute to five points. Specifying low-emitting carpet and adhesives, recycled content, and rapidly renewable components will contribute to LEED credits. Also, carpet reclamation during construction and/or demolition will contribute to Construction Waste Management credit. It is important to know that LEED does not certify products. Instead, LEED certifies the responsible application of products in the scheme of an entire project. The idea of "green building" is a whole building concept that aims to unite the best of both architectural and environmental engineering practices to produce a high-performance building.

RECYCLING AND DOWN-CYCLING

The ideal model for sustainability is nature. In nature there is no waste. When this model is used to evaluate carpet specification, the considerations are whether the carpet will ultimately become waste, or become part of a cycle. As part of a technical cycle, carpet products can either "close the loop" to become carpet again, or down-cycle into other consumer products. Down-cycling is a linear process that does not truly fit the model, but offers an extended lifecycle for products that delays the eventual waste. As part of a biological process, carpet can be biodegradable and/or contain rapidly renewable components.



CLOSED LOOP RECYCLING PROCESS



DOWN-CYCLING PROCESS



FIBER AND THE ENVIRONMENT

The various face fiber types, due to their chemical compositions, have differing abilities to become part of these technical or biological processes. Recent technology has allowed Nylon 6 to be broken down to caprolactam – its main component – and turned into face fiber over and over again as part of a closed loop. This technology involves a major effort at reclamation and the sorting of various carpet fiber types. Nylon 6,6 can be down-cycled, but recycling has proven to be, thus far, neither economically nor environmentally feasible. In the meantime, consumer products such as carpet cushion, plastic lumber, automotive components and railroad ties extend the lifecycle of this type of nylon before it ultimately hits the landfill. This is a responsible alternative that buys some time for technology to catch up. Also, waste-to-energy is commonly considered a viable option for type 6,6, but long-term unknowns about the true safety of incineration remain.

Wool and polylactic acid (PLA) are agricultural products that have potential to be part of the biological cycle. Wool can have a long commercial life, and can be incorporated into compost at the end of its useful first life. PLA is a relatively new fiber extracted from corn sugars, a rapidly renewable component. There is not much history on the performance of PLA in carpet fabrics, certainly not in commercial installations. In itself, PLA is biodegradable. Performance characteristics can be enhanced when it is combined with other fiber types, as is currently common practice within apparel fabric applications. However, the addition of other fiber types may compromise the biodegradable potential.

Backing choices can also impact sustainability issues, as backing can be 60% or more of the total weight of a carpet product. There are available backings with high recycled content and some that incorporate rapidly renewable resources such as soy-based poly oils. For carpet tiles, less toxic alternatives to polyvinyl chloride (PVC) are widely available. There are many mill sponsored programs in place to add recycled content, as the technology pipeline can be filled with reclaimed carpet to repeat the cycle again and again.

RECYCLING CARPET MATERIALS

Recycled content in both face fiber and backing materials is widely available for sustainable options. Understanding the difference between, and impact of, post-industrial content vs. post-consumer content is imperative. Post-industrial is reclaimed as part of the manufacturing process and put back into the system. Although a number of claims have been made recently as the sustainability issues receive more focus, it is sound business practice and has been for years. Only the claims are new. Post-consumer content is reclaimed after a product has ended its useful “first” life, and becomes part of the manufacture of a new product, keeping the content from the landfill. The ideal here is to close the loop, and mimic nature’s model of no waste. Post-consumer content is far more preferable, and is weighted much heavier when achieving LEED points. Products with **ANY** recycled content can **CONTRIBUTE** to LEED points. As the practices are more widely applied, the recycling business will be stimulated, and the premium associated with added content should gradually disappear.



GREEN CERTIFICATION

The Carpet and Rug Institute (CRI) has established a Green Label program to certify low-level volatile organic compound (VOC) emissions on carpet types from participating manufacturers. The manufacturers periodically submit samples for testing by an independent lab. The CRI Green Label is worth one full Indoor Environmental Quality LEED point. LEED points can also be achieved by specifying low VOC adhesives and sealants for carpet and other interior finishes.

CRI also has conducted full research projects to study the benefits of carpet to the interior environment. These studies showed carpet to be beneficial in noise abatement, dust control and slip/fall reduction. They also proved that carpet is ergonomically beneficial as well. The carpet industry as a whole has made great strides in wastewater and energy reductions. The industry is also funding an initiative – the Carpet America Recovery Effort – to help remove the financial and logistical barriers of reclamation efforts, and to research positive recycle and down-cycle alternatives for what would become waste.

The manufacturing of intelligently designed products is important to the green shift in the economy. A well crafted carpet product and installation that perform properly for the life of the warranty fits well into the sustainable design process. Responsiveness to technologies that can give the product value to the next generation of products is ideal in support of the “no waste” paradigm.

Preparing for the future of green buildings requires an understanding of current strategies and staying abreast of new technologies that enter the marketplace. Our goal should be incremental progress. The seemingly cumbersome approach can be taken in pieces to begin to adjust the total effect on our planet and our lifestyles. The highest standards for sustainable design do not need to be reached at the outset. Shared knowledge of resources and experiences – both positive and negative – can make the method more effortless until sustainable design becomes normal procedure. A contribution and commitment to the process, large or small, will begin to make a difference to both the interior and exterior environments.

REFERENCES

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USGBC website: <http://www.usgbc.org>

CRI website: <http://www.carpet-rug.com>

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