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Beyond Recycling: Manufacturers Embrace 'C2C' Design

By REBECCA SMITH

WITH ITS SLIGHTLY curved back and adjustable armrests, Steelcase Inc.'s "Think" chair doesn't look particularly radical, but it embodies a lot of forward thinking by the nation's biggest office furniture maker. The \$900 chair can be disassembled with basic hand tools in about five minutes and most of its parts are recyclable.

The "Think" chair is Steelcase's first product to meet a design ideal being embraced by a growing number of furniture, carpeting and other manufacturing companies: using parts that can be recycled several times, and manufactured in ways least harmful to the environment. The goal is to abandon the cradle-to-grave path of man-made products that end up in garbage dumps and instead make them C2C, or "cradle to cradle."

At the forefront of such thinking are architect William McDonough and his chemist partner, Michael Braungart. The pair's 2002 book, "Cradle to Cradle: Remaking the Way We Make Things" has become a manifesto for a growing group of "green" industrial designers. Mr. McDonough says many designers feel challenged to make better products. "We want clean production that's based on a regenerative technology," he says. "Pollution is a symbol of design failure."

For example, the "Think" chair is made at factories that buy "green" or renewable power from sources like wind turbines and solar panels, says Allan Smith, director of environmental strategy for



Steelcase's 'Think' chair is 99% recyclable. It's made without benzene, lead, mercury or solvents.

Steelcase. All known carcinogens were eliminated in the manufacturing process and each part is stamped with icons showing how they should be sorted for recycling. The chair is 99% recyclable.

Companies making more ecologically-friendly products aren't just trying to be fashionable. Con-

sumers are increasingly seeking environmentally safe products and are sometimes willing to pay a premium for them. Because the makers avoid harmful substances, they are less likely to injure workers during the manufacturing process. And the economics of green design are changing, too. The recent run-up in the price of oil, for instance, has pushed up the price of petrochemicals and made it more cost-effective to recycle old synthetic material.

The U.S. Green Building Council, a Washington nonprofit coalition of builders, manufacturers and public agencies that promotes construction of energy-efficient buildings, estimates that \$5.8 billion was spent on green-building initiatives last year, a 34% increase over 2003.

Yet going green isn't an easy business decision. Much discussion has taken place within these companies about whether environmentally safe products can be commercially viable. Some manufacturers have decided to start with products that already are particularly profitable, giving them latitude to experiment.

Shaw Industries Inc., the nation's biggest carpet maker, was initially skeptical about the economics behind the cradle-to-cradle concept, says Steven Bradfield, head of environmental products for the Dalton, Ga. unit of Berkshire Hathaway Inc. In the past five years, however, his firm has found ways to recycle old carpet retrieved from its own customers. The recycled material is now cheaper than an equivalent amount of new raw material.

Shaw has redesigned its \$150-million-a-year business. Please Turn to Page B2, Column 3

Manufacturers Create Products With 'C2C' Designs

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ness of carpet tiles, typically used to cover large commercial spaces. Its entire carpet tile business is now made of recycled materials. In addition, the company now guarantees buyers that it will recycle all carpet squares, and an 800-number is stamped on the back of each tile for customers to call to have the tiles picked up. In the past, the cost of discarding old squares in garbage dumps was hidden in the cost of new carpet. Companies like Shaw that have become converts "will quietly adopt this as a basic business practice," says Mr. Bradford, adding that his firm is looking for ways to extend the concept to other product lines like broadloom carpets.

Steelcase, too, is looking to expand the concept to its other products. It's begun to change its buying practices, for example, selecting wood for desks that comes from tree farms that practice sustainable-harvesting techniques, Mr. Smith says.

Advocates of the green approach say it forces manufacturers to find out what's in the materials they use. Office design company **Herman Miller Inc.**, for instance, now asks all its vendors to submit exact specifications and chemical ingredients of the materials they supply.

"If a company won't give us their secret formulas, then we won't do any new business with them," says Scott Charon, head of new products at the Zeeland, Mich., company. He says a couple of suppliers balked initially, but have since

changed their minds. Products that meet the strict "cradle to cradle" protocol currently account for only about 5% of sales, a figure the company plans to increase to 50% by 2010 as it designs new products and redesigns old ones.

Herman Miller prefers to use environmentally sensitive materials whenever possible. Polyvinyl chloride, commonly called PVC, that's used in office chair armrests has been one of the most difficult materials to replace because alternative materials can cost four times as much. The company uses unconventional materials at times, such as the fabric made from extracts of corn that's in its "Mirra" office chair. The fabric can be stripped off and composted while about 96% of the chair can be recycled.

The cradle-to-cradle recycling concept has even spawned a home design competition in Virginia at the Roanoke Regional Housing Network, a group that promotes urban revitalization and fair housing. None of the 625 "C2C" designs achieved the complete life-cycle goal, but each contained elements to conserve energy and employ materials that are durable and benign. Gregg Lewis, an architect whose firm administrated the competition, is trying to raise money to build some homes using the designs in Roanoke.

One home designed by a Seattle team has a photovoltaic "skin" on the exterior walls that produces electricity from the sun in a way that's similar to rooftop solar

panels. Rainwater is captured and used to flush toilets. The roof has a sod layer due to its natural insulating properties.

Other entrants' designs used earth-friendly materials like linoleum made from linseed oil, pine resin and wood flour, a finer form of sawdust. Other materials used were concrete containing fly ash—a byproduct of coal burned for electric-power generation; wall board made from wheat chaff; and insulation derived from recycled cotton.

"The good news is industry is coming out with new materials each month," says Matthew Coates, a member of the Mithun Architects team in Seattle that won first place in the professional design category.

One such supplier is the German chemical maker **BASF AG**, which advertises itself as the company that "doesn't make the products" people use, but instead makes the products people use "better." BASF is developing products that break into the two main cradle-to-cradle categories—"biological nutrients," such as those made from plants that can be returned to the earth and "technical nutrients" like those made from metals and plastics that can be recycled.

A foam made by BASF that's commonly used as a packaging material, for example, has been reformulated so it can be ground up and recycled. "The challenge is getting it back [from customers] to recycle it," says Gene Zimmerman, the U.S. unit's business director.