

# THE GREEN BUSINESS

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APRIL 2002

# Letter

THE HANDS-ON JOURNAL FOR ENVIRONMENTALLY  
CONSCIOUS COMPANIES

## A SEAT AT THE TABLE

*How Herman Miller  
Integrates Environment  
Into Product Design*

**F**or all the talk about “greening” design, genuine success stories remain few and far between. Most companies’ efforts involve incremental changes to a small number of products — discrete design changes or materials substitution that make a few products a little “less bad” but fall short of any lofty goals.

Lofty goals, in this case, require looking at the full spectrum of life-cycle impacts of a product, if not an entire product line or company, identifying opportunities for improvement at each stage — and doing so rigorously and systematically. Few companies can make that claim.

One that can is Herman Miller, the \$2.2 billion Michigan-based furniture company that

appears to have taken on design for environment (DfE) as a core business strategy.

Over the past year, Herman Miller’s lofty goals have led to a three-part “protocol for sustainability” focused on infusing environmental attributes into all of its new products and, eventually, into all of its existing ones.

The company’s efforts come at a time when DfE seems, slowly but surely, to be garnering corporate adherents. European takeback laws set to take effect in 2006 are changing the way automobiles are designed and assembled (and, eventually, disassembled) and will likely be extended to computers and other electronics. All told, some 28 countries now have takeback laws on the books. Green-design gurus Bill McDonough and Michael Braungart are involved with innovative design projects at BASF, BP, DuPont, Ford, Nike, and other multinationals. This month, the two are making the media rounds promoting green design — along with their newly published book on the subject, *Cradle to Cradle* (see p. 8).

Herman Miller has long been at the leading edge of design, and of environmental concern. Since the early 1990s, when it established a zero-landfill goal, it has

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# DESIGN

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pushed environmental innovation up the supply chain, beginning with its own designers. Its green-design roots go back to the mid 1980s, when the company won acclaim for its decision not to use rosewood, a threatened tropical hardwood, in its famed Eames chair. Herman Miller's latest project leverages its existing relationship with McDonough and Braungart, who previously designed the company's "greenhouse" office and manufacturing building in Michigan.

Last year, the company began developing three components of its new DfE strategy:

- an environmental rating tool for new products;
- a materials database that prioritizes existing environmentally friendly materials and spurs the development of new ones; and
- disassembly guidelines and related training procedures.

The idea, says Scott Charon, commodity manager in New Product Development at Herman Miller, began with customers' growing questions about the environmental attributes of products. "We wanted to develop a tool to bring products to market that customers are asking for," he says. "This is an area where we wanted to be a leader." Charon noted that some large customers are now putting environmental considerations ahead of cost.

## GREEN, YELLOW, RED

The protocol was developed in partnership with McDonough-Braungart Design Chemistry (MBDC), which already had been working directly with several Herman Miller suppliers. MBDC recognized that Herman Miller had in place a solid product development system to measure against cost, performance, and customer needs. They designed

## Better Design, by Nature

One design approach gaining increased attention is biomimetics, also referred to as "biomimicry," a new science that studies nature's best ideas and then imitates these designs and processes to solve human problems. Says Janine Benyus, author of *Biomimicry*: "The core idea is that nature, imaginative by necessity, has already solved many of the problems we are grappling with. Animals, plants, and microbes are the consummate engineers. They have found what works, what is appropriate, and most important, what lasts here on Earth. This is the real news of biomimicry: After 3.8 billion years of research and development, failures are fossils, and what surrounds us is the secret to survival." More information: visit [www.biomimicry.org](http://www.biomimicry.org).

Natural System . . .	. . . and What It Inspired (or Might)
Abalone mussel nacre (mother-of-pearl coating)	Hard coatings for windshields and anything that needs to be lightweight but fracture-resistant. A crystalline coating self-assembles in perfect precision atop protein templates. In the abalone, it's a 3-D masterpiece, tougher than anything we can manufacture.
Blue mussel adhesive	Underwater adhesive — unlike our glues, it sets underwater and doesn't need a primer, an initiator, or a catalyst to work. Could revolutionize paints and coatings, and enable surgeons to operate without sutures.
Elastin, the elastic protein in heart muscle	Intelligent materials, fabrics, and fibers that stretch and contract in response to heat, light, and chemical changes.
Orb-weaver spider silk	A way to manufacture fiber without using high heat, high pressure, or toxic chemicals. The fiber is stronger and more resilient than anything we now have; could be used in parachute wires, suspension bridge cables, sutures, protective clothing, etc.
Rhinoceros horn	Self-healing material that is both compressively and laterally strong — a new fender?
Sharks, anemones, and other marine creatures	New antibiotics, fungicides, etc. Marine creatures, which live surrounded by pathogens in the sea, are full of novel defenses.
Slug mucous	Amazing lubricants instantly absorb up to 1500 times their weight in water. Can also "clean and jerk" and so might be helpful in molecular machines.

Source: [www.biomimicry.org](http://www.biomimicry.org). © Janine Benyus.

the sustainability protocol to integrate with that existing product development process.

Each product evaluated by the system is rated in three different areas — disassembly, material chemistry, and recyclability. In each of those areas, designers use the tool to assign a series of credits related to various design factors. So, if a product can be completely disassembled down to its individual components, it gets a "credit" of 100%. A component that cannot be disassembled easily, such as a glued assembly, receives a 0% rating.

Similar ratings are given for "material chemistry," the human health and environmental factors

associated with each product component. Every material contained in product is rated on a green/yellow/red color scheme and assigned a corresponding credit, which is weighted based upon the amount of that material in the product.

The third rating is given each material based upon its recyclability, along with the material's recycled or renewable content.

Finally, the three scores are compiled and the product is given an overall score (see box, p. 7).

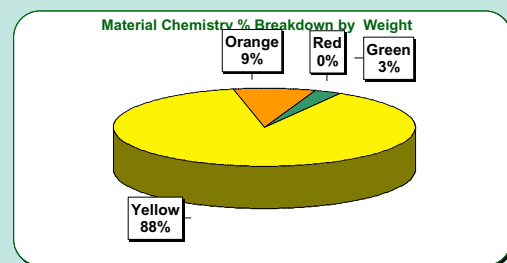
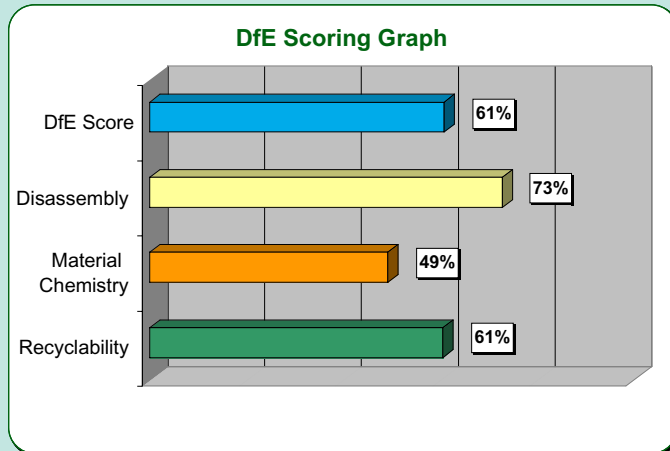
Charon says Herman Miller is using the sustainability tool to assess all new launch products — roughly 10 a year — as well as existing products as they are

Assessment Date  
4/1/02

## Herman Miller DfE Product Assessment Tool

<b>Product Number</b>  CHA-1234	<b>Description</b>  ECO Chair	<b>DfE Score</b>  61%	<b>73%</b>	<b>49%</b>	<b>61%</b>	
			<b>Disassembly Score</b>	<b>Material Chemistry Score</b>	<b>Recyclability Score</b>	<b>Rec./Ren. Content Score</b>
					76%	14%

Bill of Material						Disassembly	Material Chemistry		Recyclability	Rec./Ren. Content
Part Number	QTY	Description	Material - Print	Supplier	Wt (g.)	% Weight Credit	Rating	% Weight Credit	% Weight Credit	% Weight Credit
123456-BK	1.00	FRAME, SEAT	16 Ga. 1008-1010 Steel	Frame Inc.	2,500 g.	100%	Yellow	50%	100%	28%
123457	1.00	PAN - SEAT	20% GF Polypropylene	Molders Plus	600 g.	0%	Yellow	50%	50%	0%
123458	4.00	FASTENER - PU	Sintered Metal	Fastener Land	42 g.	100%	Green	100%	100%	20%
123459	4.00	FASTENER - ST	Spring Steel	Fastener Land	1 g.	100%	Yellow	50%	100%	20%
123460	4.00	BUMPER	Super Rubber	Importers R'Us	26 g.	100%	Orange	25%	0%	0%
123461	4.00	CONNECTOR CLIP	Nylon 6/6	Importers R'Us	26 g.	0%	Yellow	50%	100%	0%
123462	1.00	BACK	20% GF Polypropylene	Molders Plus	1,000 g.	100%	Yellow	50%	50%	0%
123464	2.00	ARM ASSY, RH & LH	380 Aluminum	Importers R'Us	404 g.	0%	Orange	25%	50%	0%
123467	2.00	ARM LH / RL	Polyraze 1234	Molders Plus	188 g.	0%	Yellow	50%	50%	0%
123468	2.00	O-RING	Silicone Rubber Fill	Importers R'Us	1 g.	0%	Red	0%	0%	0%
123469	2.00	SPRING	Steel	Importers R'Us	10 g.	0%	Yellow	50%	50%	0%
123470	4.00	CHAIR FEET	Sintered Metal	Importers R'Us	100 g.	0%	Green	100%	50%	0%
						4,898 g.				



Product Disassembly Suggestions

An illustrative assessment for a hypothetical Herman Miller product, showing how materials are weighted and scored.

updated and relaunched.

The database that drives much of the tool is being fleshed out this spring, says Charon, based on product information provided by suppliers. Most have been cooperative; only one supplier wasn't willing to provide information. "In the future, we're

probably going to have to look at an alternative supplier," he says.

The overall goal, says Charon, is to continually improve each product's score by finding better alternatives to problematic components — less-toxic dyes, for example, or reduced-VOC particleboard.

What's the value? Charon believes the start-up cost — which is "less than what we would spend to introduce a chair," will yield substantial benefits. "At minimum, we'll have a great environmental story to tell" when customers come, asking questions. ♦

### Select DfE Resources

- **Cleaner Technologies Substitutes Assessment**  
[www.epa.gov/dfepubs/tools/ctsa](http://www.epa.gov/dfepubs/tools/ctsa)
- **Design for Environment Guide** — [www.nrc.ca/dfeguide](http://www.nrc.ca/dfeguide)
- **Economic Input-Output Life-Cycle Assessment**  
[www.eiolca.net](http://www.eiolca.net)

- **Ecosite: The Worldwide Resource for LCA**  
[www.ecosite.co.uk](http://www.ecosite.co.uk)
- **Environmental Life-Cycle Management: A Guide to Better Business Decisions**  
[www.greenbiz.com/resources/design/tools.cfm?linkadvid=4772](http://www.greenbiz.com/resources/design/tools.cfm?linkadvid=4772)

- **Environmental Product Development**  
[www.io.tudelft.nl/research/dfs](http://www.io.tudelft.nl/research/dfs)
- **IdeMAT** — [www.io.tudelft.nl/research/dfs/ideimat/index.htm](http://www.io.tudelft.nl/research/dfs/ideimat/index.htm)
- **Pollution Prevention by Design** — [www.pnl.gov/doesustainabledesign](http://www.pnl.gov/doesustainabledesign)

# THE GREEN BUSINESS Letter

THE HANDS-ON JOURNAL FOR ENVIRONMENTALLY CONSCIOUS COMPANIES

**The earth is a bottom-line issue.** Today, companies of all sizes and sectors are striving to integrate environmental thinking into strategic business decisions and create more environmentally sustainable systems of commerce — while improving financial performance, enhancing reputation, and achieving competitive advantage in the global marketplace.

**The definition of environmental responsibility is changing.** Among leadership companies, it means having a comprehensive view of one's operations, products, and strategies with an eye to eliminating waste and emissions . . . maximizing the efficiency of all assets and

resources . . . improving the quality of products and services . . . creating new market opportunities . . . and enhancing relationships with customers, employees, suppliers, communities, regulators, and others. It's no easy task — even for the most committed companies..

**That's where we fit in.** Each monthly issue brings the latest tools, strategies, research, and hands-on advice to help your company make the environment a source of profit — and pride. From corporate strategy to facilities management, personnel policies to product development, we help you make good, green choices — every single day.

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