

# PACKAGING

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William  
Donough

Michael  
Braungart

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**CRADLE-TO-CRADLE DESIGN**  
**Will their ideas  
change your  
packaging?**

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# Cradle-to-cradle: the next packaging paradigm?

An architect and a chemist make a compelling business argument for ecologically "intelligent" packaging that's also good for the bottom line.

David Newcorn  
Special Projects Editor



Architect Bill McDonough and chemist Michael Braungart offer a new vision for packaging and the environment.

**H**ow's this for an environmental packaging strategy?

- Use more packaging material, not less.
- Instead of designing with the cheapest materials, design the best package possible, without worrying about per-package cost.
- "Littering" can help the environment.

Sound politically incorrect, and financially suicidal? Take a closer look. What if that ice cream wrapper lying on the side of the road were designed to "melt" into a biosafe liquid in a matter of hours at ambient temperatures? What if the foam food container was not only biodegradable, but incorporated essential nutrients to replenish the topsoil?

What if there were such a thing as fifth-class postage that existed solely for the purpose of returning packaging to the manufacturer? Instead of buying the cheapest possible packaging, you buy the best possible packaging because you are getting most of it back. And guess which package looks better on the shelf as a result?

Extreme? Yes. Possible? Only time will tell.

It's all part of a new way of product and package design, called cradle-to-cradle design.

By contrast, traditional cradle-to-grave design practically guarantees a product or package will end up as unwanted waste that must be dealt with at some cost to the end user. Plus, the manufacturer loses the economic value of reusing the material, because it's on a one-way trip out of the factory.

### Technical and biological nutrients

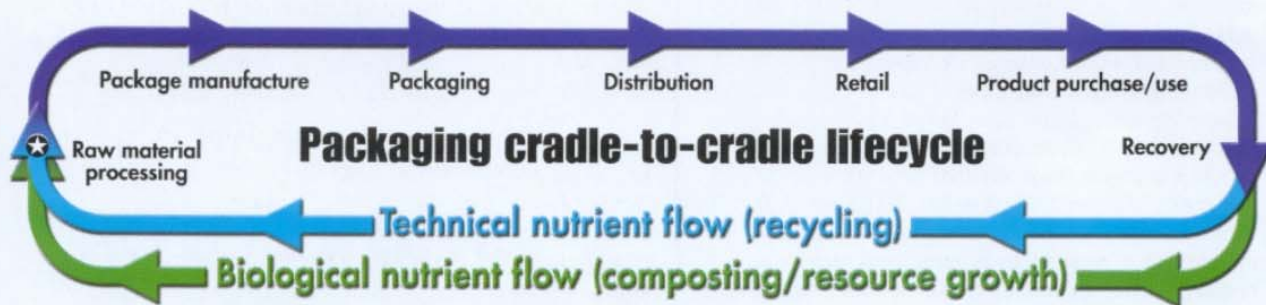
Cradle-to-cradle design means literally designing waste right out of the lifecycle of the package. Mimicking nature, a package is designed to be either

FOR RELATED ARTICLES SEARCH



### KEYWORDS:

sustainable  
biodegradable  
environmentally  
friendly



a *technical nutrient* that can be reused, or truly recycled in a tight, closed-loop process with zero loss in material performance, or a *biological nutrient* that can safely break down into the soil (see illustration, opposite page).

The originators of this concept, architect William McDonough and chemist Michael Braungart, recently published a book on the subject called *Cradle to Cradle: Remaking the Way We Make Things*. The authors' design consultancy, McDonough Braungart Design Chemistry (MBDC), has worked with companies like Ford Motor Co., Nike, Herman Miller, and BASF to help redesign their products using the cradle-to-cradle concept. Though the authors have done a few packaging projects, their design concept is essentially brand new—and untested—in the field of packaging.

However, packaging is an area that's well suited to the cradle-to-cradle design concept, the authors say. They contend that cradle-to-cradle design has

**For more on the book, see:**  
[packworld.com/go/w067](http://packworld.com/go/w067)

the potential to expand, not reduce, the choices of materials available to package designers. They say packaging can be designed to be an asset after use, rather than a liability, for customers. Finally, they argue that cradle-to-cradle packaging can cost the same or less than the packaging it replaces.

Instead of focusing on the moral argument, which traditionally pits environmentalism against business interests, the authors have made a compelling business argument for ecologically "intelligent" products and packaging that are also good for the bottom line.

We asked the authors, in a series of exclusive interviews, to flesh out their vision for how cradle-to-cradle design might play out in packaging.

### No more 'ugly' packaging

McDonough and Braungart frown on what they term *eco-efficient* packaging, with its traditional focus on making packaging merely less damaging to the environment. For example, a bottle with recycled content is still headed on a one-way trip to a landfill, unless a consumer happens to recycle it.

Instead, the authors favor *eco-effective* packaging, which is designed at the outset to travel in either a biological or technical closed loop.

"For me, packaging is far too important to make it merely efficient," says Braungart. In other words, the trade-off associated with traditional *eco-efficient* packaging—duller colors and reduced performance characteristics—is not only not worth it, it's unnecessary, Braungart maintains.

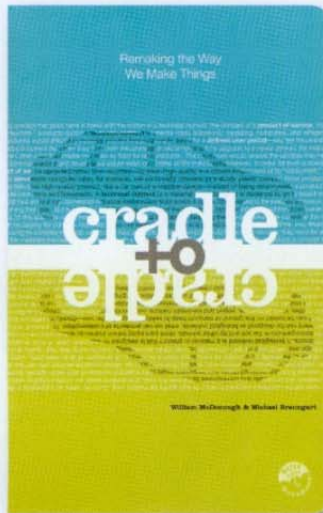
The traditional way: eco-efficient packaging	The cradle-to-cradle way: eco-effective packaging
Minimize the amount of packaging materials to reduce impact on environment.	Use as much packaging as is desired to protect and differentiate the product because that package will become a biological or technical nutrient after its first use.
Discourage littering because materials don't break down for decades; and, if they do, toxic additives can enter the environment.	Discarded biodegradable packaging that incorporates soil nutrients would actually benefit the environment, not harm it.
Consumer is left with the liability of package disposal after product is consumed.	Consumer no longer has disposal liability because package will become a technical or biological nutrient after its first use. Customer is left with a positive impression of the product and the manufacturer.
Recycled-content packaging can result in reduced performance and attractiveness.	By positively selecting the right additives and inks, packaging can be cheaper to recycle in a true, 100% closed-loop process with no loss in performance.
Recycling often requires consumers to distinguish among unfamiliar types of materials, such as various types of plastics.	Consumers pitch all recyclables in a single bin and biodegradables in another, letting modern sortation technology do the work.
Deposits may be mandated by law.	Packagers can create their own deposit systems to recover expensive, desirable packages.
Packaging materials must be as cheap as possible, often leading to multilayer composites or laminates that are difficult or impossible to reuse or recycle.	Returnable packaging reduces or eliminates the need to create hybrids that don't readily disassemble into technical or biological nutrients.

What stands in the way of true closed-loop recycling, according to Braungart, is not the materials themselves—it's often the additives and inks, which were never designed or selected with closed-loop recyclability in mind. The result is that "you are highly limited in the next use of that material," says Braungart. "If you mix all these different types of additives, you always end up with downcycling." In other words, a park bench instead of a pop bottle.

Instead, package designers can still use the same materials they're using now, but positively select the ingredients of that material for recyclability. That could mean a 100% post-consumer-recycled (PCR) package that looks and prints as good as new. "We have been testing polymers that can be reused up to 90 times with the same performance characteristics," says Braungart.

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## Cradle-to-cradle



**Book as information package: To illustrate the authors' point, the book itself is made entirely out of polypropylene, which can be melted down to make another PP book. Today's information packaging (books) are what the authors call "monstrous hybrids" of paper, board, adhesives, cloth and other materials, which can only end up in a landfill.**

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It's not just about plastic—paper-based packaging can be designed this way too. "If you design inks in a way that you can wash them out, then you get white paper again," says Braungart.

Or instead of becoming a technical nutrient, a package can be designed to be a biological one. "As soon as you add more than 35% linear polyesters to PET, the whole material becomes biodegradable," says Braungart.

"I'm saying we should design for reincarnation," says Braungart. "You plan the next use of the material into the package already."

### Reusability saves

The notion of reusable packaging is a big potential part of the cradle-to-cradle vision. "Today, packaging needs to be cheap, which limits the designer's possibilities," says Braungart. Viewing packaging as a technical nutrient that can be reused "means you can use far more valuable and expensive materials," he says. This hinges, of course, on the cost-effective recovery of those materials.

William McDonough says some packaging, such as for consumer electronics, is ripe for return, via, say, fifth-class postage.

"There's no reason we can't create it," says McDonough. "That can be our recycling system. We say to FedEx, UPS, the postal service, look, you guys have trucks moving around—they come full, they leave empty. How about they come full, they leave full? What you do is you just make it lowest priority. Nobody thinks about the positive aspects of low priority. Any postage truck that's driving around empty at end of day is suboptimal. You're driving air around."

How to handle returnability for a package that's been contaminated by the product? "Procter & Gamble may not be able to reuse that package," acknowledges McDonough, "but BASF could use that polymer. So it might list BASF's return address instead of Procter & Gamble's."

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## Cradle-to-cradle

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Adds Braungart: "You can give your customers a choice. Here's the eco-efficient ugly, cheap package; and here's the nice package that you'd like to see in your bathroom, but it's so valuable that we'd like to have it back."

Of course, returnable packaging has shown steady growth over the last few years for industrial applications. Manufacturers streamlining their supply chains find it's easier to coordinate closed-loop package use-and-return systems when there's only a handful of vendors or customers involved.

But returnable consumer packaging is quite another story. Back in 1960, of course, 95% of soft drink containers were refillable glass bottles. However, today, that number is less than half a percent, according to the Container Recycling Institute.

Why did the beverage industry move away from returnable packaging? Several reasons. One was the development of the recyclable aluminum can in 1962. Another was labor costs, particularly the teamsters who operated the trucks that delivered product to the stores. Further, retailers didn't like committing valuable space to returned containers awaiting pickup, nor did they like the labor involved in making refunds. And bottling plants didn't like the space, labor, and energy required for bottle sanitizing systems. In the end, it was cheaper for the industry to switch to one-way packaging, which it did.

So though the notion of returnable consumer packaging is intriguing, there's quite a history that would have to be overcome to make it a reality for most packagers.

### Recycling varies

McDonough and Braungart's notion of closed-loop biological and technical nutrient streams depends upon the existence of robust recycling and composting infrastructures. But recycling is inherently a local issue—recycling infrastructures can vary widely from one municipality to the next. Municipal composting is far from widespread, and returnable packaging infrastructures in this country are all but nonexistent, except in states with bottle deposit bills. Finally, getting consumers to figure out which type of material goes into which recycle bin is no easy task.

One municipality that seems to have hit on a viable recycling/composting collection infrastructure is San Francisco, according to MBDC's Joe Rinkevich. In that city's Fantastic Three program, all recyclables go into one recycling bin, sparing

### Call for entries: better e-commerce packs

EPA's Office of Solid Waste, in partnership with McDonough Braungart Design Chemistry (MBDC), recently announced the Cradle-to-Cradle Design Challenge for E-Commerce Shipping Packaging and Logistics. The premise of the competition is to rethink and redesign e-commerce shipping packaging for a cradle-to-cradle lifecycle, including systems for packaging recovery. Entry deadline is August 15, 2003. Winners to be announced at Pack Expo Las Vegas in October. Details are available at [www.mbdc.com/challenge](http://www.mbdc.com/challenge).

## Recent enviro-packaging developments

Below is a partial list of recent commercial developments in environmental packaging, most of which happen to be plastic. Of course, environmental advantages have also been associated with paper, glass, and metal packaging.

Company	Technology
Arcor PET Packaging	SuperCycle™ recycling technology now handles multilayer PET
Cargill Dow	NatureWorks™ biodegradable resin from renewable resources
CCL Plastic Packaging	Plastic tubes with up to 35% post-consumer recycled (PCR) content
DuPont	Biomax® biodegradable polyester coatings and films
Earthshell	Biodegradable foodservice packaging
Eastman Chemical Co.	Eastar Bio® biodegradable resins
Shell Chemical	Biodegradable solvents for coatings and printing inks
UCB Films	NatureFlex™ biodegradable films
Zed Industries	Biodegradable skin packaging

Visit [packworld.com/go/w068](http://packworld.com/go/w068) for a more complete list, including Web links to the above items.

residents the burden of sortation. All organic waste such as food scraps goes into a second bin. Everything else goes into a third bin, whose contents are landfilled. Residents only pay for the waste they put in the third bin, thus creating a financial incentive to use the first two bins.

Both authors contend great strides have been made in sortation technology. "In Europe, the green dot system has generated a lot of separation techniques," says Braungart, who is German.

Regulation has long been a way to force packagers and their suppliers to take the environment into account when designing their packaging. Producer-responsibility laws on the books in Europe and elsewhere are a prime example. When asked if he supports the creation of an eco-tax that subsidizes eco-effective packaging at the expense of noneco-effective packaging, McDonough replied, "It would certainly help. But I don't think it's essential. That's a cultural question that will play itself out in the political arena."

Indeed, in their book, McDonough and Braungart view regulation as a failure of design: "In a world where designs are unintelligent and destructive, regulations can reduce immediate deleterious effects. But ultimately a regulation is a signal of design failure...good design can require no regulation at all."

### Waste to energy

If a package can be safely burned as fuel, that's another way it can end up as a biological nutrient. Trouble is, most packaging was never designed for burning. Again, additives in the package,

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such as heavy metals in printing inks, that are released during incineration require expensive filtration technology that eats into the economic value of packaging as a fuel.

In countries where packaging waste is burned for fuel, Braungart says such packaging could be *designed* for clean burning. This can also be a finan-

cial benefit to, say, blow molders, who already find themselves manufacturing bottles on razor-thin margins. Trimmings and scrap take on new value because "you can generate your own energy from the waste that you have without needing several filters" required for conventional packaging.

## Comes down to cost

For most packaging users and suppliers—and consumers, for that matter—cost outweighs the environment as a purchasing factor. But the authors insist eco-effective packaging can be the same or cheaper compared to traditional packaging. That's one of the most important arguments in the cradle-to-cradle zeitgeist, yet it's the hardest one to prove, because the idea is still so new. And it runs contrary to the industry's experience with most new forms of, say, biodegradable packaging, which typically cost more, not less, than traditional materials.

Some of the basic arguments run like this: Returnable packaging is much more expensive to initially buy, but a much lower quantity needs to be purchased compared to one-way packaging. Or the raw ingredients, such as the resin, of eco-effective packaging may cost more; but by carefully selecting the additives in the material, the material could be cheaper to manufacture or recycle into a package again, lowering or containing overall costs.

Braungart even suggests that eco-effective packaging can increase brand loyalty, possibly reducing marketing costs. That is, a consumer who can return, recycle or compost a package now becomes a crucial part of the cradle-to-cradle lifecycle, and is presumably won over by the brand's lack of a disposal burden. "If your customer becomes your partner, you don't need to repeatedly convince him to use your product," says Braungart.

The authors contend that companies who have redesigned their *products* based on the cradle-to-cradle concept have done so at the same or less cost. They argue packaging should be no different.

Too utopian? McDonough and Braungart are unapologetic. They freely admit the cradle-to-cradle design philosophy is not a magic bullet or even a solution. They see it as a roadmap for manufacturers to take their packaging in a completely different direction.

"It's going to take a while," McDonough admits. "But it doesn't mean you can't start down that path and put that forth as your vision. At least you have a vision instead of no vision. At least you have a strategy instead of no strategy."

**McDonough Braungart Design Chemistry**

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[www.mbdc.com/packaging](http://www.mbdc.com/packaging)



# Packagers react to cradle-to-cradle design

Packagers express interest in cradle-to-cradle design. In July, an initial meeting will be held to see if a cross-industry cradle-to-cradle packaging workgroup should be organized.

David Newcorn  
Special Projects Editor

A new book, *Cradle to Cradle: Remaking the Way We Make Things*, by architect William McDonough and chemist Michael Braungart, sets forth an entirely different vision for environmentally effective products and packaging (see separate story, p. 62). To gauge the packaging field's reaction to this new philosophy, we floated the cradle-to-cradle idea to several companies in a survey on Packworld.com. The vast majority personally supported the idea of a cradle-to-cradle packaging initiative at their companies (see chart). And half said their company would be receptive to such an initiative.

This research comes with two important caveats. First, survey respondents read only a brief paragraph summarizing the cradle-to-cradle concept, versus the authors' entire book. Second, when it comes to packaging and the environment, there has always been a big difference between what people say in a survey and what they actually do in real life.

Nevertheless, the findings are significant on two

counts. First, it's often assumed by people outside the packaging field that people *in* the field do not care about the environment because they are associated with the manufacture and use of packaging. That couldn't be further from the truth, a fact that is documented by the findings of the survey.

Second, the research documents an awkward disconnect between what packaging people want as individuals versus what their employers require for their businesses to run smoothly.

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**KEYWORDS:**

sustainable  
biodegradable  
environmentally  
friendly

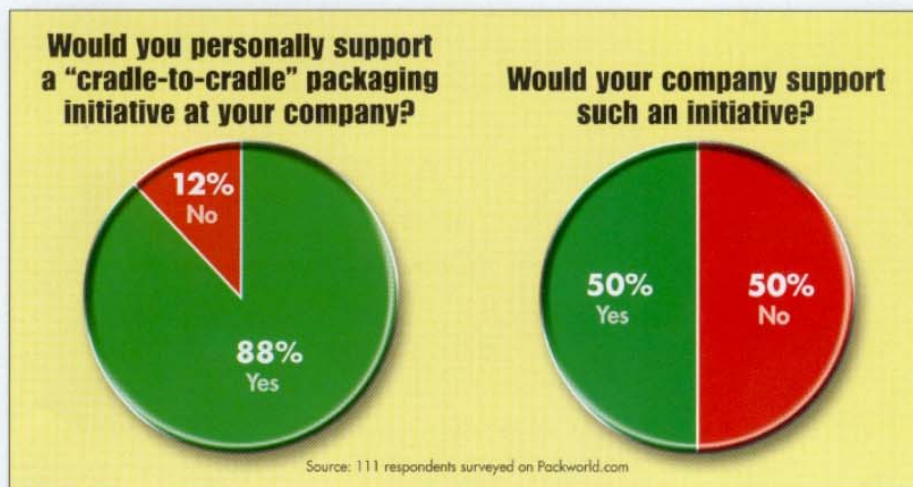
Respondents describe how their companies think about packaging and the environment at [packworld.com/go/w091](http://packworld.com/go/w091)

**Sound thinking**

We also interviewed some key packaging people to get their reaction to the cradle-to-cradle concept. A few who knew of the concept reacted favorably when contacted for this report, but they could not obtain permission to speak to us on behalf of their companies.

One person who is familiar with the cradle-to-cradle concept is Graham Houlder, global packaging coordinator for Unilever Bestfoods, based in the Netherlands. That company is embarking on a global sustainable packaging strategy that echoes the cradle-to-cradle philosophy.

"The thinking is very sound," Houlder said, regarding cradle-to-cradle. However, for food packaging, Houlder has doubts about biodegradability. "The current biopolymers that are out there don't offer us the barrier properties we need for our food products. If you're going to biodegrade something, you need it to be sensitive to heat, moisture, oxygen, and proba-



bly light, and those are the things we try to barrier our products against.”

A representative from one leading supplier of biopolymers takes such constructive criticism in stride. “No one polymer is perfect for every application,” acknowledges Michael O’Brien, communications manager for Cargill Dow Polymers. Cargill Dow manufactures NatureWorks™ PLA, a polymer derived from renewable resources such as corn. “We focus on where it does work—in our case, fresh prepared foods for grocery retailers,” says O’Brien. “The barrier properties are suitable for it. Grease- and aroma-resistance are our strong performance benefits.”

Unilever’s Houlder also points out that reusability and returnability are obviously a problem for single-use food packaging. “Legislation prevents us from using recycled materials in direct contact with food because of the risk of contamination. The only real technical cycle that would allow us to do that is, for example, the repolymerization of PET.”

For the moment, Unilever’s sustainable packaging effort is focusing on paper. “For our cartons and shippers, we’re looking at how much fiber comes from forests that are being replanted, versus indigenous forests that are not being replaced,” says

Houlder. “We’d like to move to a completely certifiable source for 100% of the packaging.”

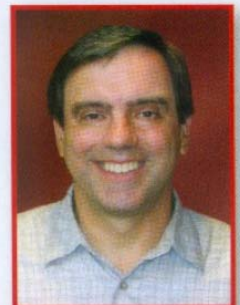
Is Unilever willing to pay an upcharge for sustainable packaging? “That decision hasn’t been made yet,” says Houlder. “But we’d be hard-pressed to see a reason why, particularly in the paper area, we should take on cost. In the future, there should be plenty of sources of sustainable fiber.”

### Moving to the next level

Another convert to the cradle-to-cradle concept is John Delfausse, vp of packaging at Minneapolis-based Aveda, a maker of upscale cosmetics and health and beauty products.

“The whole concept makes an awful lot of sense,” says Delfausse. Aveda is already pushing post-consumer-recycled (PCR) content of its packaging to unprecedented levels (see p. 74). But Delfausse says the company is looking to move to the next level of sustainable packaging. Closures could be a test case. Currently all Aveda’s closures use virgin polypropylene resin. In an attempt to create a PCR PP closure, the company’s suppliers have been hampered by supply issues.

“Based on the whole cradle-to-cradle concept, we



**John Delfausse**  
vp of packaging,  
Aveda

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## Cradle-to-cradle reaction

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realized we’ve got a tremendous source—all of our consumers. If we could actually ask our customers to return our caps, we’d have an unlimited source of PP that could go back into the same sort of caps.”

Delfausse acknowledges there’s not currently an effective infrastructure for returning closures, most of which are PP. Many closures aren’t marked with the Society of the Plastics Industry’s chasing-arrows recycling coding; and, even if they were, PP is simply not recycled in any significant volume in this country.

A solution might involve placing a collection bin in stores where its products are sold, or possibly examining some sort of deposit system similar to soft drinks, according to Delfausse. Still, Aveda would have to overcome history. The company tried to collect its packaging years ago, and “we got everybody’s garbage,” says Delfausse.

Yet he remains undeterred. “What cradle-to-cradle really does is get the industry to start thinking about what we need to do

to collect these things,” he says. For now, Aveda will investigate conducting a closure collection program in a limited market test.

### Reusability can be tough

Alison Kent, manager of the global corporate packaging team at Hewlett-Packard, was reading the book at the time we went to press. “The case that [the authors] lay out seems very provocative,” she says. However, returnable packaging would nevertheless be challenging for HP. “We change our products so frequently that there’s only a limited period when the packaging material would be relevant to reuse,” she says.

Regarding the argument that cradle-to-cradle can be done at the same or lower cost, she responds, “In our own investigations to use more environmentally responsible materials and designs, it’s often at a cost. That’s always the trade-off.” But,



**Alison Kent**  
corporate packaging  
manager,  
Hewlett-Packard

[www.packworld.com](http://www.packworld.com)

Kent allows, “what we’ve been looking at is one slice of the whole system cost. So maybe if you look at it end to end, it can be less.”

Although there are many obstacles to be overcome before the cradle-to-cradle concept can be said to have caught on in the packaging arena, a growing number of packagers and suppliers are showing interest. That’s why *Cradle to Cradle* authors McDonough and Braungart are hosting a one-day industry meeting in July, at which attendees will receive an overview of the cradle-to-cradle philosophy and will discuss whether to form a working group focusing on cradle-to-cradle package design. For details, visit the link below.

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# Aveda pushes PCR

**As part of its environmental commitment, Aveda achieves 80% to 100% post-consumer-recycled (PCR) content in much of its packaging.**

**David Newcorn**  
Special Projects Editor

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.com

**KEYWORDS:**

PCR  
recycled-content

**A**t Minneapolis-based Aveda, the environmental impact of a new package comes first, cost is second, and design is third. That stems from the company's mission statement, in which Aveda "strive[s] to set an example for environmental leadership and responsibility."

So it's no surprise that this manufacturer of upscale cosmetics and health and beauty products has been on the leading—and some might say bleeding—edge of post-consumer-recycled (PCR) content in its packaging. The company now reaches 80% to 100% PCR in much of its packaging portfolio, with very little below 50% PCR.

**Balancing act**

Decisions are not always easy. "Our biggest challenge has been trying to make sure we still meet the environmental requirements [of the corporate mission] and maintain the quality of the package we would expect to provide to our customers," says John Delfausse, Aveda's vp of packaging.

As an example, the company boosted the PCR content in its high-density polyethylene bottles last

year from 45% to 80%. "By doing that, it was a tremendous move," says Delfausse, "but everybody from the president on down had to accept that the bottles' color turned grayer. But we saved about 150 tons of virgin polyethylene on an annualized basis. I don't think any other company is putting that level of recycled material into a cosmetics package."

In some cases, Aveda's quest for high-PCR packaging has led to unusual choices. When a search for high-PCR-content folding cartons didn't turn up anything satisfactory, Aveda looked at catalogs and annual reports. "We found a cover stock with 100% post-consumer content," says Delfausse. "Our printer was able to run the cover stock and actually make sleeves and cartons out of it."

Because there are many complex factors that contribute to how a package impacts the environment, Aveda uses a special computer software program called Merge™ to help evaluate the impact of various packaging alternatives. In use at Aveda for about two years, the program was developed by the not-for-profit Alliance for Environmental Innovation, a project of Environmental Defense

**HDPE shampoo bottles:**  
**Minimum 80% PCR**  
Wheaton Plastics div.,  
Alcan Packaging, [www.alcan.com](http://www.alcan.com)

Aveda's John Delfausse: "We lightweighted our haircare and bodycare bottles and moved to a minimum of 80% post-consumer-recycled [PCR] content from 45% previously. This has reduced our use of virgin high-density polyethylene by 300,000 pounds or 150 tons per year. We're trying to get it up to 90% or 100%."

**Extruded squeeze tubes: up to 35% PCR**  
CCL Plastics,  
[www.cclplastic.com](http://www.cclplastic.com)

Delfausse: "We are the first to add PCR to our extruded tubes. We are now achieving 35% PCR in many of our newly launched products in tubes. We're trapping a high-density post-consumer layer in the middle and a low-density polyethylene inside of that. CCL Plastics has really partnered with us on this."

**Folding cartons:  
Between 55% and 100% PCR**

Johnson Printing, 763/571-2000

*Delfausse: "In our folding cartons, we were at about 35% PCR, and we went to 55% PCR, which is now our standard for a clean white surface. Our new hair coloring carton [far right] is plain grey chipboard with 77% PCR."*



(Boston, MA), and the Pew Charitable Trusts. It scores or rates a product or package based on seven different metrics: packaging resource consumption, packaging energy consumption, virgin materials content, nonrecyclable materials content, presence of known toxins, greenhouse gases, and pallet inefficiency.

**At what cost**

Aveda has relentlessly lightweighted its packages and pushed its suppliers to increase the level of PCR content, even if it pushes up the cost of its packaging. There's no average upcharge percentage because each package varies in PCR content; but, as a typical example, its PCR-contented extruded tube package (see tube photo, p. 74) carries a 16% upcharge over standard virgin materials.

However, Delfausse points out that not all Aveda packaging carries an upcharge. Like other suppliers, Aveda from time to time puts its packaging out for competitive bidding. Recently, Aveda found a new supplier that offered packaging with almost twice the PCR content for less than what Aveda had been paying.

Delfausse claims Aveda hasn't encountered any serious machinability issues typically associated with high-PCR-content packaging. "The key to the PCR tubes was to get a true round opening for filling," he says. "There were some ovality issues that needed to be overcome before we could get into production. We are also experiencing some paneling issues with our HDPE bottles at 80% PCR. But we believe that this may be due to lightweighting of the bottles and not because of the PCR."

**Alliance for Environmental Innovation**  
Phone: 617/723-2996  
[www.environmentaldefense.org/alliance/merge/merge.htm](http://www.environmentaldefense.org/alliance/merge/merge.htm)

**Lipstick refill**

**Molded pulp clamshell: 100% PCR newsprint**  
UFP Technologies, [www.mouldedfibre.com](http://www.mouldedfibre.com)

**Sleeve: 100% PCR paper**  
Fraser Papers, [www.fraserpapers.com](http://www.fraserpapers.com)

**Accessory case overcap**

**Inside: ABS (90% PCR) and PP (90% PCR)**  
**Outside: 70% PP (90% PCR)/30% natural flax fibers**  
**Aluminum ring: up to 60% PCR**  
Risdon-AMS, [www.risdon-ams.com](http://www.risdon-ams.com)

*Delfausse: "We're the first company to make a lipstick case out of recycled materials. For the accessory case, the supplier actually developed a way of blending natural materials into plastic resins. They were trying to find a substitute for fiberglass in extruded piping. We asked them to get involved with us to develop our lipstick cover."*



**PET jar and bottle: 100% PCR**  
INOAC Packaging Group, [www.inoacusa.com](http://www.inoacusa.com)

**HDPE jar (not shown): 100% PCR**  
Tricor Braun, [www.tricorbrown.com](http://www.tricorbrown.com)

*Delfausse: "We had blue glass with gold stamping on it, which couldn't be recycled. We switched to blue PET, which looks almost like the glass, and eliminated the gold stamping. We're now doing 100% PCR content in our PET bottles and jars."*



**Bottle with expanded content label**  
Ampersand Label,  
[www.ampersandlabel.com](http://www.ampersandlabel.com)

*Delfausse: "Because this package is global, we needed copy in five languages. We're eliminating folding cartons and leaflets by using multi-page labels."*

