

2013 INNOVATION STORIES  
Cradle to Cradle Products Innovation Institute

“Imagine profitable business, like flourishing trees, being good for every one and every thing. At the Cradle to Cradle Products Innovation Institute, we provide guidance to today’s industries for transitioning their products and manufacturing processes to participate, profitably, in this new industrial revolution. ”

Wendy Schmidt

Founding Board Chair

The Cradle to Cradle Products Innovation Institute

## FOREWORD

### WHAT IF...

Beauty, innovation, and quality of a product were judged by a new set of criteria that considered all of the impacts that result in that product’s creation, use, and disposal?

What if every product kept people and nature safe from hazardous substances?

What if every product could be returned safely to industry or nature when we were done using it?

What if every product was made using renewable energy and in ways that protected and replenished the world’s supply of fresh water?

And what if we could be assured that all the people involved in manufacturing and assembling a product were being treated fairly?

These are not the stuff of dreams. They are the stuff of stuff. They are the five core tenets of a Cradle to Cradle Certified Product Standard, a system that recognizes and incentivizes innovations in product design and manufacture so the making of things becomes a positive force for people, the economy, and the planet. And they are at work in all sorts of products around us right now.

The companies and products presented in this collection are redefining traditional notions of quality in ways that meet new expectations of 21st century customers. Each company, product, and innovation shares kinship with the evolutions prompted by Michael Braungart’s and William McDonough’s challenges to the world: 1990, The Intelligent Product System; 1992, The Hannover Principles; 2002, Cradle to Cradle; 2013, The Upcycle.

It is not often one gets to hold history-making stories in one’s hands. We are happy to provide just such an experience.

**Bridgett Luther**

President

The Cradle to Cradle Products Innovation Institute

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## BIOMIMICRY ANSWERS HARDWOOD SCARCITY

Accoya is a result of years of visionary work that we at Accsys Technologies were fortunate enough to acquire and to bring to fruition. Our Accoya brand high-technology wood is sustainably sourced and matches or exceeds the beauty, stability and durability of tropical hardwood species.

Many wood manufacturers in the Netherlands have recognized that the durable tropical hardwoods they had long relied upon to hold up to the harsh Dutch weather are becoming endangered and increasingly scarce. This group has leveraged decades of research and forward-thinking

work to improve the quality of more common, but lower performance wood species. One technique of wood modification—called acetylation—is known to provide the performance needed but after decades of work, no one could figure out how to successfully do it on a commercial scale. This was Accsys Technologies' breakthrough. By assembling a unique team of wood and chemistry experts, the vision of these Dutch wood manufacturers and several other groups was realized.

Although acetylation is perceived as the 'gold standard'

for high technology wood modification, the Accoya process is a remarkably simple concept. Acetylation merely takes the part of wood that readily wants to bond with water, free hydroxyls, and transforms them into naturally occurring stable molecules called acetyl groups. Wood that is naturally high in acetyl groups, like the best performing tropical hardwoods, does not decay nearly as fast because rot and damaging insects do not have the food and water sources required at the molecular level for damage to begin. The acetylation process merely mimics nature and, without adding any toxic substances, ensures performance and material health. In addition, Accoya products are produced in a low-energy, low-water use process using only certified sustainable wood.

Besides durability, Accoya also has many other benefits that are indirectly linked to sustainability. For example, Accoya is far more dimensionally stable than any other wood, enabling less replacement and maintenance and improved coatings life. Accoya also has retained strength, increased hardness, increased thermal insulation properties and enhanced carbon sequestration, allowing wood to be used in exciting new ways on a scale for profound global impact.

Material reutilization, in several senses of its meaning, is one of the best features of Accoya. Firstly, the process mimics nature and the products contains only natural, compostable elements. Second, Accoya is typically made from rapidly renewable softwood species such as Radiata pine, with high yields even better than typical rapidly renewable crops (bamboo, flax, etc). Third, the wood certification schemes we utilize, such as FSC and PEFC, guarantee that the wood is sourced from sustainably managed forests, ensuring that new trees are planted after harvest and biodiversity is maintained. Reutilization also comes into play during production and end of application life. Acetylated wood that does not meet our quality requirements, or that our customers can no longer use, can be ground up and used as input for Tricoya®, our exterior grade wood composite

panel product. Ultimately Accoya can be used as wood mulch or a fuel source for utilities. But what makes Accoya a perfect fit with Cradle to Cradle is the fact that even if just discarded, it is 100% biodegradable. However, we actively promote the reuse of Accoya over its typical 50 year life, with biodegradation as a last resort.

In summary, Accoya enables abundantly available wood species to substitute tropical hardwood, and even high performance manmade materials in many demanding applications. Therefore, the potential positive impact on

**Accoya enables abundantly available wood species to substitute for tropical hardwood and even high performance manmade materials in many demanding applications.**

a global level is huge. Accoya can help further reduce greenhouse gas emissions directly through lengthening of carbon sequestration periods in products, but more importantly by replacing carbon intensive materials.



## THE FUTURE IS CLEAR

AGC Glass Europe is one of the market leaders in sustainable glass product design and processes, in part because our customers know we are focused on creating quality products while protecting our environment.

We seek to be in a leader in environmentally sound products, but we can make the biggest difference in two specific fields: energy & climate change and recycling & sustainable products.

The Cradle to Cradle philosophy fits both goals, so we began the journey towards Cradle to Cradle certification in 2010. Today, our float glass, soft coatings and main range of decorative glass are all Cradle to Cradle Certified Silver. We are proud that we are the first European glass producer to receive this label.

To reach our goals, we needed collaboration. This began with our suppliers. The Cradle to Cradle Certified Products Program gives us the necessary foundation for safe and healthy products, and is a roadmap to where further improvements are needed.

Today, at least the basic component (float glass) of all AGC products on the market is Cradle to Cradle certified Silver. Customers can be sure AGC follows sustainability principles in its standard design practices.



### GLASS FOR GREENER BUILDINGS

In the USA and in Europe, buildings are the largest CO<sub>2</sub> emitters, so reversing climate change can be helped by improving the energy performance of buildings.

Architects must not only look at the energy performances of materials, but they also need to carefully select these materials based on their sustainable design. To evaluate the sustainability of the building materials, “green indices” have been established by building certification programs, NGOs or government authorities. The Cradle to Cradle quality label covers all these aspects. Some green building certification schemes such as LEED give extra points to new projects that use Cradle to Cradle certified products, which is one of the reasons why this label is gaining ground among green building construction and design stakeholders.

### RECYCLING GLASS

Glass is endlessly recyclable like no other product, and for many years AGC’s environmental policy has been to encourage recycling in order to keep as much recycled glass as possible in our production processes. Using cullet (crushed glass that is ready to be re-melted) limits CO<sub>2</sub> emissions, since it requires less energy to melt cullet than

raw materials. Furthermore, recycled glass avoids using non-renewable natural raw materials such as sand and minerals. Today our products contain at least 30% recycled glass on average, reducing our CO<sub>2</sub> emissions by around 300,000 tons and the use of non-renewable raw materials by 1,150,000 tons per year.

Until now, AGC has only used glass waste from glass manufacturing and processing plants, because the quality of glass waste from the construction sector has not been not high enough for flat glass production. But, inspired by the Cradle to Cradle philosophy, since 2012 we have been focusing on the possibilities for recovery and recycling of windows from building renovation projects. We are confident of meeting the increasing demand for building products that incorporate recycled content materials, thereby reducing the environmental impact from extraction and processing of virgin materials.

We also actively seek alternative routes for glass waste that we cannot recycle. For example, in the Netherlands we helped to develop a national system for collecting flat glass from construction and demolition waste. This glass waste is now reused in other products (bottles, fibreglass, foam glass etc.) instead of being sent to landfill. Other potential applications include reflective road surfacing, water filtration systems and construction aggregate.

The Cradle to Cradle Certified Products Program is a roadmap to where further improvements are needed.



## ENDURING BEAUTY

Societies around the world increasingly call for companies to reduce their emissions, waste, and natural resource consumption, while increasing their energy efficiency. Alcoa is responding to the call by improving the sustainability of our processes and products.

Aluminum is an ideal material. Strong but lightweight, it is an essential component of green buildings in fast-growing urban areas. It also improves fuel efficiency and emissions reductions in all modes of transportation.

Because aluminum is infinitely recyclable, approximately

75% of all the primary aluminum produced since 1888 is still in use today. The inherent qualities of aluminum—high strength, light weight, and durability—make it one of the world's most sustainable materials.

In 2010, we received Cradle to Cradle Certified Silver for our primary aluminum, assuring customers that we are continuing to improve the sustainability of our metal, from initial production through use and then recycling. Improvements we have made in our aluminum production process—reducing energy use, deploying efficient water-

management systems, utilizing renewable energy, and recycling—helped us earn the certification.

Four product lines from our Kawneer business and the aluminum bottle have earned Cradle to Cradle certification. We also received Cradle to Cradle Certified Silver for our primary aluminum, lithographic sheet, wheel products and can sheet.

### PRODUCT DESIGN

We believe world markets increasingly should, and will, demand authentically green products as defined by the Cradle to Cradle design philosophy.

We are utilizing life cycle assessment (LCA), design for manufacturability/disassembly software, and other sustainability tools to conceive, develop, and bring to market sustainable products in each of our major market segments: transportation, packaging, building and construction, consumer electronics, and industrial and engineered products.

We will continue to evaluate existing and emerging tools and incorporate best practices into our approach to sustainable design. In addition, we conduct design pilots to evaluate product sustainability. A recent pilot that switched traditional laptop materials to aluminum for shrouds, covers, and other parts resulted in increased recyclable material, reduced waste to landfills, fewer parts and reduced assembly time, and reduced cost of structural components.

Measuring a product's impact in terms of its environmental burdens, the energy and raw materials used to manufacture it, and the benefits associated with its use requires a careful analysis from "cradle to cradle" when products are recycled or reused at the end of their useful lifetime.

We are the first aluminum company to receive Cradle to Cradle Certification from MBDC. The certification helps assure our customers that we are continuing to improve the sustainability of our metal, from initial production through use and then recycling.

The certification helps assure our customers that we are continuing to improve the sustainability of a product.



## A BED YOU WON'T LOSE SLEEP OVER

Auping is the largest independent Dutch bed manufacturer. Our company has been in business since 1888, when Johannes Albertus Auping developed a mesh bed with a spring and ventilating base under the mattress.

Auping believes that our way of working should give meaning and is based on a honest and sustainable relationship with our Environment, People and the World at large.

Auping has made a commitment to achieve Cradle to Cradle Gold Certification by 2020. Our products can be recycled at the highest level, and we utilize renewable energy. In addition, we have optimal working and social conditions for sustainable labor deployment of all stakeholders.

### ROYAL AUPING: SUSTAINABILITY POWERED BY CRADLE TO CRADLE

The products, processes and entire organization of Auping should become fully sustainable where “sustainability” is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

Auping is pursuing a positive impact on the planet. To create growth opportunities, Auping will focus more explicitly on developing innovative sustainable advantages at acceptable costs. In this Auping is taking an approach of optimization rather than minimization. Auping understands that the perspective of “people, planet and profit” will broaden the firm’s position of leadership, allowing us to realise new and advanced success factors. In the concept of ‘good design’ of products, Auping moves beyond typical measures of quality, such as cost, performance or aesthetics, to integrate and apply additional objectives addressing the environment and social responsibility.

Auping implements the Cradle to Cradle Certification framework to move beyond the traditional goal of reducing the negative impacts of commerce (‘eco-efficiency’), to a new paradigm of increasing its positive impacts (‘eco-effectiveness’).

### TIMELINE

**2010:** Auping communicates commitment to Sustainability and Environmental Responsibility with Cradle to Cradle 2020 vision.

**2012:** Auping is awarded the Cradle to Cradle Organisation Charter. Auping becomes the first bed manufacturer worldwide who receives the Cradle to Cradle Silver award for the Essential bed. The bed is also awarded with a Red Dot Design & IF award. Auping also certified several mattresses Cradle to Cradle Silver in 2012, as well as meshbases.

For the seventh year in succession, Royal Auping has been proclaimed the most reliable bed brand in the Netherlands. This emerged from the Reader’s Digest readers’ survey, ‘Trusted Brands 2013’.

With almost 39,5%, Auping came out way ahead of number two, Ikea (16,1%). The evaluation focuses on such aspects as quality, the price/quality ratio and the extent to which the brand is aware of consumer requirements. Auping scored the best of the bed brands in most of these trust factors.

**For the seventh year in succession, Royal Auping has been proclaimed the most reliable bed brand in the Netherlands.**



## MAKING SUSTAINABILITY BEAUTIFUL

Now available in more than 30 countries, Aveda, the Art and Science of Pure Flower and Plant Essences, was founded in 1978 in Minneapolis, MN, with the express purpose of creating powerfully effective, botanically-based hair, skin, body and makeup products, and spa treatments inspired by Ayurveda, the 5000 year old traditional Indian system of healing.

Aveda is world-renowned for pioneering benchmarks of environmental responsibility in beauty, including being the first privately-owned company to sign the Ceres Principles in 1989 (Coalition for Environmentally Responsible Economies) and the first beauty company in the world to manufacture with 100 percent wind power. Consistent with Aveda's long-term commitment to Cradle-to-Cradle® principles, seven Aveda products and packages are C2C certified. Aveda's annual Earth Month campaign, held each April, has raised more than \$31 million to support environmental projects around the world since 1999.

At Aveda, our goal is to ensure our products will benefit our salon guests through exceptional performance, while we



deliver our continued promise of environmental and social responsibility.

We began looking at Cradle to Cradle design principles in the early years of the 2000s as part of our research and development process.

In 2002, Aveda began its journey with Cradle to Cradle. In setting out on a path toward developing products that share the Cradle to Cradle philosophy, Aveda hired the EPEA

(Environmental Protection Encouragement Agency), an environmental research institute located in Germany and led by Dr. Michael Braungart to help advise on its future design principles for products.

In 2009 Aveda sought more formal recognition for our commitment to the Cradle to Cradle design philosophy by seeking Cradle to Cradle product certification. At that time, the EPEA and MBDC (McDonough-Braungart Design Chemistry) certified seven Aveda products, as well as packaging for those seven products.

Today, the following Aveda products have Cradle to Cradle certification: Invati™ Scalp Revitalizer (Silver), Smooth Infusion™ Shampoo (Gold), Smooth Infusion™ Conditioner (Gold), Aveda Men Pure-Formance™ Shampoo (Gold), Aveda Men Pure-Formance™ Conditioner (Gold), Invati™ Exfoliating Shampoo (Gold) and Invati™ Thickening Conditioner (Gold). In addition, the packaging for these seven products is certificated Silver.

### DESIGN AND DEVELOPMENT

Aveda's approach to responsible product design and development aims at combining sound strategy with sustainability. By being very selective in the projects we pursue, we strive to maximize the returns on development resources and minimize complexity resulting in fewer, bigger launches that are good both for the business and the planet. This "innovation sufficiency" approach requires rigorous project screening meetings at which key brand executives seek to determine:

- Is this a compelling need of guests and/or professionals?
- How can Aveda bring a solution that is holistically preferable to any substitute?
- What is the difference we can bring for the benefit of guests, professionals, key stakeholders and the planet?

Seeking this Aveda difference allows us to maximize product differentiation, which in turn, contributes to success in the marketplace and reinforces our commitment to sustainability as a source of innovation.

Our success in the marketplace reinforces our commitment to sustainability as a source of innovation.





## BARK BIGGER THAN BITE

**Bark House has created** a new, green industry for the naturally pristine but economically impoverished Appalachian Region of North Carolina. The essence of forestry was forever changed as bark was reclaimed from being a waste by-product. Today, this process is part of larger biomass utilization. The face of architecture has been impacted, as the bio-mimicry of bark transformed the exterior of structures to celebrate trees in a more holistic way.

### INSPIRATION

In 1895 Henry Bacon designed the first squared bark shingle house for an exclusive development in North Carolina. The material he used was the bark of the chestnut tree. The new shingles were used on six structures. The style spread to other exclusive resorts along the Blue Ridge Parkway and gained traction until the chestnut blight of the 1940s wiped out all chestnut trees in America. The style lay dormant for 50 years.

In 1986 Company President, Marty McCurry became inspired by historic chestnut bark shingle houses in Linville, NC.



### INNOVATION

Starting in 1990, Marty and Chris McCurry invested in starting an industry that did not exist. The material that had been used historically for squared bark shingles, American chestnut was no longer available because of the blight. Tools, supply chains and basic manufacturing methods were non-existent. Construction methods had changed since 1895, and there were questions about modern installation of the product relating to building codes. Procurement and manufacturing methods did not exist, so tools, techniques, methods, and supply chains had to be established. Logging industries were too set in their practices to interrupt their work flow and procure this waste material. Antique tools were searched out to give clues for the removal of the bark from the tree. Ultimately, old tools were used. But new tools and techniques such as stacking and sticking and methods of conveyance and proper timelines had to be identified, implemented and tested.

### MARKET EXPANSION

Locals had forgotten about the old bark shingles. A brand new client had to be created. That process started in a regional market and has expanded to 48 states and internationally.

Today's ongoing focus is comparing poplar bark house brand shingles to other cladding products. This story is more relevant today than ever related to the increased market demand for green materials in construction.

We went from restoring shingles on historic structures in the region where the style was born to creating product lines and a style that has been embraced in a multitude of architectural styles and geographic regions. Thanks to our Cradle to Cradle Certification, we are now generating buzz and sales in Europe which generally has a firewall up against products that are not of the highest standards in sustainable and ethical manufacturing.

We created an entire new industry and started the biomass utilization movement as people began to look at forest waste differently.

**Thanks to our Cradle to Cradle Certification, we are now generating buzz and sales in Europe.**



## GREEN PACKAGING MATERIALS

In 2005, partners Robert Richman and I, Ron Blitzer, made a very deliberate and conscious decision to start a “green” business. By 2006, we had identified an opportunity that had to do with sustainable packaging compostable food service plates, bowls and platters. Our innovation was to make paper plates and other food service items from renewable, tree-free plant fibers. The idea was not entirely new, but the technology was just finally developing to the point where we could begin to manufacture on a large scale with better quality and a more refined feel. This would ultimately allow

us to have an impact on the scale we wanted, which was global.

One of the biggest challenges for us was marketing. How would we differentiate ourselves from the competition? What would be the framework for building not only a sustainable product but also a sustainable business model? We launched our business by landing an account with Whole Foods Market delivering tree-free, compostable packaging for use in their prepared foods, meat and produce departments. In the process, we went out and

acquired various 3rd party certifications for compost ability, health and sanitation. This was a great first step, but we were not entirely comfortable with where we were at. Our mission statement and business model was based on lofty environmental and social ideals and we needed a more visible way to demonstrate our commitment and differentiate ourselves from the pack.

In 2007, while watching the Discovery Channel one night, Robert and I saw a documentary on Bill McDonough and the Cradle to Cradle philosophy. We knew instantly that this was the framework we had been looking for and it provided us with a roadmap for building not only our company, but our products as well. The Cradle to Cradle mantra provided us with a methodology for achieving what is known as a ‘triple bottom line’ business, balancing a commitment to people, planet, and profits that is written into our mission statement. It was clear to us from that point on that Cradle to Cradle would be the guiding force behind our vision for the company.

Be Green Packaging designs, manufactures, and distributes Cradle to Cradle Certified Silver, tree free, compostable and recyclable packaging for the food and consumer packaging industries that is safe for people and

healthy for the planet. Be Green Packaging’s business model has been created to address the international concern of teeming landfills and poor waste management. As a progressive, socially conscious and for-profit company, we are driven to create and offer not only truly sustainable alternatives to traditional packaging, but also to educate our stakeholders, employees, suppliers and communities about their impact on the environment. We are committed to the full life cycle of our products. Our packaging utilizes annually renewable plant fibers, recycles water, reuses general waste and scraps, protects the environment, and returns healthy, fertile soil back to mother earth through the process of composting. All of our protocols revolve around Cradle to Cradle philosophy and ideals.

We began our certification process in 2008 and received our certification in 2009. To date, we have received Silver certification for our products. Our short-term goal is to achieve Cradle to Cradle Gold status or higher. To date we have certified our entire food service line and have secured certifications for P&G’s Gillette Fusion ProGlide razor packaging. We currently hold seven eco-social certifications for our products, but it is our Cradle to Cradle certification that we are most proud of and feel is the best representation of who we are as a company.

**We needed a more visible way to demonstrate our commitment and differentiate ourselves from the pack.**



## FABRIC WITH A FUTURE

The story of Bella-Dura is one seventy years in the making, but the product's commitment to innovation and sustainability is continually evolving.

Without the long history of textile knowledge, perseverance, and dedication to creating a company that would endure, neither Wearbest, nor its Bella-Dura brand, would be what they are today. "We wanted to create a new technical fabric that was so revolutionary, so sustainable, it was worthy of being branded," says Wearbest/Bella-Dura President & CEO Irwin Gasner. After three years of teaming,

testing, and planning with technical and design experts, Bella-Dura was introduced by Wearbest in 2002.

Bella-Dura, as its name implies, is beautiful, durable, and sustainable. Bella-Dura fiber is 100% solution dyed, affecting unsurpassed performance from its core, and has more inherent attributes than any other indoor/outdoor textile in the marketplace today. In fact, Bella-Dura is the only textile on the marketplace whose fibers (synthetic or natural) begin as a by-product of post-industrial waste and end as a 100% recyclable material. Bella-Dura was bestowed

with the first-ever 2008 Earth Minded Award from ASID and a Cradle to Cradle Silver Certification from MBDC. Each time, Bella-Dura was the first and only environmentally friendly indoor-outdoor textile to earn these awards.

### SUSTAINABLE BUSINESS PRACTICES

In the spirit of Wearbest's interest in the wider world, Bella-Dura Fabric is uniquely proactive in the responsible utilization of limited resources. The company is dedicated to the market's need for innovative designs and fiber choices, while remaining cognizant of the ongoing demand to reduce both waste and carbon footprints.

Bella-Dura Fabric is the "environmental champion of all synthetic fibers," derived from 100% industrial waste. It is 100% recyclable at the end of its (long) useful life. Being 100% solution dyed, Bella-Dura substantially conserves on both energy and water consumption during manufacturing. As a result, its manufacturing process produces no harmful industrial waste or byproducts. In fact, it does the opposite. Bella-Dura salvages a byproduct that would otherwise be incinerated and added to environmental contamination. The resulting fiber is then woven into a high performance fabric that exceeds all contract specifications and extends its useful life cycle.

### SOCIAL RESPONSIBILITY

Under Wearbest, Bella-Dura implements a corporate "Go Green" management approach. The Go Green Team is an internal cross-departmental group that meets regularly to research and advance Bella-Dura's efforts. The team uses a five-step approach addressing the safety of materials, water quality and conservation, energy usage, waste reduction and recycling, and social accountability.

The Go Green Team monitors water usage and residual effluents and reviews alternative energy sources and green energy credits to reduce consumption where possible. The team also enforces waste reduction, implementing recycling and upcycling to significantly reduce waste and to eliminate

the production of harmful byproducts. Over 90% of ancillary production waste is recycled, including 100% of cardboard and loom selvaige waste. Wearbest also has a clear set of standards for the treatment of its employees and resources that includes supporting employee community involvement and holding employee health and happiness above all else.

### PROFITABLE GROWTH

Remaining debt-free, becoming increasingly profitable, and remaining sustainable is no easy feat in a fickle economic climate—but Wearbest/Bella-Dura remains on a solid growth trajectory in key markets including healthcare, hospitality, and indoor/outdoor, all of which rely on

Bella-Dura salvages a byproduct that would otherwise be incinerated...

'performance attributes' that the Bella-Dura brand delivers with every fiber. In fact, for the past two years, Bella-Dura's growth and profitability has continued to rise at a rate of nearly 50% a year.

This ongoing commitment to sustainable practices lead Bell-Dura to achieve its well-deserved and much valued Cradle to Cradle Silver Certification.



## CREATIVE OUTLET

Byrne Electrical Specialists grew from humble beginnings with strong focus on being a local partner. As the industry and business landscape morphed, Byrne evolved into a design, innovation, and collaboration leader. And in our efforts to remain a local partner, Byrne made substantial commitments toward sustainability and environmental responsibility.

At Byrne, the goal has always been to understand where their customers are going in order to find a way to help them get there. In a time when “greenwashing” has become

a popular trend among industries trying to gain customer loyalty from those concerned with sustainability issues, Byrne has worked to develop into a genuinely green partner by pursuing Cradle to Cradle Certification of its products.

Byrne’s first experience with Cradle to Cradle Certification was Steelcase’s Answer Work Cell. It was the first Cradle to Cradle Certified workstation offered by the office furniture industry, launching in the early 2000s. Byrne’s journey into the Cradle to Cradle design philosophy began around that same time in an effort to have Byrne’s own

products certified on behalf of their customers.

Today, Byrne offers eight product lines that are fully Cradle to Cradle Certified, the highest of which achieved a Silver designation. These product lines include Assemble, Assemble Reveal, Glenbeigh Contemporary, Glenbeigh Traditional, M2X, Mho, Mho2, and Miniport. Each product line boasts dozens of configurations for a high degree of customization and control on any given project.

Beyond product adjustments, Byrne has also made strides in other areas to meet certification. Among these were changes made to the supply chain, product analysis, and manufacturing as well as issues involving material health, material reutilization, energy conservation, water stewardship and social fairness. Byrne partnered with MBDC to analyze the make-up and process of all our products and utilities, focusing on chemistry, material, delivery, quality and sustainability.

With this product and process analysis, Byrne also took steps to improve its facilities, bringing sustainability innovations home. This involved switching to LED lights in production facilities, utilizing lean manufacturing and direct shipping, optimizing waste to energy—there are even plans for recycling wasted heat from the injection molding department to melt ice near employee entrances.

While the expense of becoming Cradle to Cradle Certified has added about a 10% increase to material costs on some components, the experience and benefits have been priceless. By all accounts, Byrne’s growth as a socially

and environmentally conscious business resource has been a very good thing for the company, our customers and our community.

Passionate about the green movement (after all, green is Byrne’s color), Byrne is proud to be an early adopter of the Cradle to Cradle requirements. And while others might be content to rest at eight product line certifications or process and facility improvements, Byrne will continue to challenge itself to be a true leader in the green movement.

**While the expense of becoming Cradle to Cradle Certified has added about a 10% increase to material costs on some components, the experience and benefits have been priceless.**



**Construction Specialties™**

## BUILDING CARE

**Caring for their community.** That was the initial driver that sparked Construction Specialties' decades-long commitment to manufacturing healthy products.

The company's environmental story began in 1990, when a local newspaper reported that a hazardous waste incinerator was to be sited as its neighbor. This environmental reality initiated a larger discussion on the use of hazardous chemicals and inaugurated C/S' longstanding drive to protect the environment and manufacture healthy building products. C/S worked to keep its community clean

from an incinerator, and by 1995 the siting permit was denied. This marked the beginning of a deep exploration of the company's own manufacturing impact on people and the planet.

Vice President of Construction Specialties, Howard Williams, heard William McDonough and Michael Braungart speak and after an inspiring talk, he read Cradle to Cradle. Shortly after, the USGBC offered an innovation credit for the C2C certified products and Williams championed adoption of the Certified Product Standard. Meanwhile, Construction

Specialties customers were trumpeting Cradle to Cradle Certified, so this proved to be not only a wise investment but also a prescriptive path to environmentally responsible behavior, all under the watchful eye of the third-party certifier.

"We had a proverbial wake up call," says Williams. "We had the means to act and the support to do so. Cradle to Cradle Certified was and still is the best solution to meet our environmental and business goals. Cradle to Cradle Product Certification works well for us because it holds us accountable over time."

By having C/S products Cradle to Cradle Certified, the company was able to score big projects with leading institutions and feel good about providing safe building materials to its customers. C/S increasingly invested in the process across its portfolio, and today boasts over five certifications covering 39 product groups and hundreds of options for product variations, offering many LEED® v4 compliant selections. In 2013, Cradle to Cradle Certified products represent approximately 75% of its Interior Division's multi-million dollar revenue.

C/S launched its first PVC-free (polyvinyl chloride) Acrovyn® 3000 product in 2004. Since then, C/S has re-engineered its entire Acrovyn® line of products and modified its polyester formula to contain no persistent bioaccumulative toxins, no bisphenol A and no halogenated fire-retardants. It's been a major feat to identify and eliminate chemicals of concern from the Acrovyn® 4000 line and develop various models to reach Cradle to Cradle Certified Gold and Silver.

The Cradle to Cradle Products Innovation Institute has given C/S a platform on which to stand, enabling the company to drive its own environmental legacy.

C/S thinks big about sustainability and has taken to heart designing products for reuse or recyclability. Not only does C/S recycle up to 75% of the total solid waste from its facilities but it also allows customers to recycle C/S products. To address recycling solutions and provide consumers

the information and resources necessary to conveniently recycle, C/S launched the first commercial building products recycling locator, which can be found at [c-sgroup.com/corporate/recycling](http://c-sgroup.com/corporate/recycling).

"We define sustainable not as static, but as one of a number of dynamic structural elements supporting our worldview," says Williams. "The extent to which we value and attend to these structures is the extent to which we set our course and that of future generations. It's not so much that this raises our responsibility, but that it also raises our opportunity."

**"Cradle to Cradle Product Certified was and still is the best solution to meet our environmental and business goals."**

*Howard Williams, Vice President, Construction Specialties*

The Cradle to Cradle methodology has defined Construction Specialties quality of work, and the certification represents the company's commitment to enhancing peoples lives by making buildings better. C/S has taken a number of risks over the years to innovate safe and healthy building products, but by investing in the multi-attribute certification they saw sales climb and revenue soar.



## UPCYCLED COUNTERTOPS

The Cosentino Group is committed to the continuous improvement and development of eco-friendly processes through innovation and technology. As the market for green products grows exponentially, the growth of the company is directly linked to its green practices that respect, protect and rebuild the environment from the early stages of sourcing materials right through to product manufacturing and distribution.

ECO by Cosentino's unique make-up of recycled materials, combined with natural elements (eco-friendly

resin, natural pigments and stone scrap from quarries and fabrication) is achieved through state-of-the-art technology and delivers a hard durable surface that has high stain, scratch and scorch performance.

ECO by Cosentino is composed of 75% post-industrial and post-consumer recycled raw material, including mirrors salvaged from houses, building and factories; glass from windows and bottles; granulated glass from consumer recycling practices; porcelain from china, tiles, sinks, toilets and decorative elements; and industrial furnace residuals

from factories in the form of crystallised ashes.

By reusing these materials, Cosentino is "upcycling" products that have reached the end of their use. Approximately 3000 glass bottles equates to one ton of raw materials. The production of ECO by Cosentino® re-uses the equivalent of 65 million glass bottles, over two million square metres of bathroom mirrors and over 50,000 discarded ceramic tiles every year. In effect, our operations keep nearly 30,000 tons of new material from having to be mined.

The process begins with the salvaging of post-industrial and post-consumer raw materials. These materials are sourced from independent waste management organizations throughout Europe which then undergo an extensive cleaning process which ensures that all glues, silicones and other hazardous materials have been removed. The recycled content is mixed with other materials including stone scrap from mountains, quarries, manufacturing and fabrication, and is bonded together with an eco-resin containing 22% vegetable oil. This pioneering resin is the result of a major research and development initiative, and is unmatched in the market today.

ECO by Cosentino® is manufactured at the headquarters in Almeria, Spain. Every step of production from collating raw materials, to manufacturing, to transportation and

installation, has been created with the utmost respect and care for the environment.

The finished product is an eco-friendly, highly durable, and extremely stylish surfacing material that can be fabricated for use in any residential or commercial kitchen and bath project. For Cosentino Group, the launch of the recycled surface ECO by Cosentino has been a success story, not only because of the benefits for society for launching a sustainable and Cradle to Cradle Certified Silver product, but also from a business point of view. Since the launch of ECO by Cosentino in April 2009, total worldwide sales have reached over 24 million Euros or about 32 million US Dollars.

Cosentino Group identified a new market niche, and thanks to the Cradle to Cradle Certified recycled surface ECO by Cosentino, Cosentino Group has established itself as the leading provider of recycled surfaces in the world.

An outstanding feature of our environmental strategy is the company's active policies for air control and dust and VOC reduction; water management with the achievement of continuous reuse and "zero discharge"; and the reuse of waste as raw material for recycling into new products.

Our industrial expansion regarding the environment currently foresees a total investment of over 15 million Euros which will endow our factories with the best technology available, minimizing any future impact on the environment.

The launch of the recycled surface Eco by Cosentino has been a success story, not only because of the benefits for society... but also from a business point of view.



## INNOVATION IS COLLABORATION

Over the last decade, friends and associates have “gifted” us with at least six copies of McDonough & Braungart’s book, *Cradle to Cradle: Remaking the Way We Make Things*. The first came from our friend Jamis MacNiven. Jamis is a visionary guy, an advisor to our company, and he immediately recognized the synergy between what ConXtech was trying to achieve and McDonough & Braungart’s vision.

The philosophy of evaluating the entire lifecycle was intriguing because ConXtech’s building system was

designed with the entire lifecycle in mind.

ConXtech was fortunate to be invited to the launch of the Cradle to Cradle Products Innovation Institute in 2010. That experience convinced us that we should pursue Cradle to Cradle product certification. Rich Guinn, a business associate who had been through the process, assured us that the certification would not be as daunting as we imagined. He was right, we already had much of the documentation required and it was painless.

The story behind the ConX System is a tale of innovation,

resourcefulness, hard work and determination. Originally, buildings were created by craftsmen. But over time, the construction industry turned into a series of collaborations, involving multiple people who had different roles. These changes caused challenges and often stifled innovation.

Inventor Bob Simmons had been working for decades toward a simple formula: Build more for less. He wanted to deliver better buildings, in less time, with less risk, and less cost to the customer. He rethought the entire lifecycle—design through delivery. His idea was to develop a modular structural system which could efficiently integrate pre-fabricated or modular building elements, such as pre-fabricated stairs, walls, bathrooms or kitchens.

When Simmons began his career, he began building with wood. But wood buildings are limited in height and susceptible to decay from insects, water and time. Concrete is more durable, but is significantly more expensive than wood and requires sheer walls, which obstruct layout and limit future programmability. Simmons decided to use structural steel for its strength, durability, recyclability, recycled content, architectural flexibility, and potential for pre-fabrication utilizing CNC (computer numerical control) milling and robotic welding.

On a trip to Lake Tahoe in 2000, Simmons printed “Faster, Better, Safer” at the top of his sketchpad. He created a simple connection, which was rigid enough to allow the full utilization of column and beam members already present in nearly every structure. Used throughout a building frame, it could eliminate the supplemental shear walls or braces commonly used in conventional buildings.

The lower and locking connector, if manufactured and used over and over, had to justify the investment it would require in design time, refinement, testing, fixturing, infrastructure, approvals, codification and more. Within weeks, Simmons had turned the connector from a sketch to a full-scale wood prototype. He assembled a small team in the loft of his barn and the company ConXtech, and the ConX System, was born.

Turning conventional fabrication into a manufacturing process was a major challenge. Critics said the hurdle couldn’t be cleared. Conventional delivery is a cut-and-fit, custom crafted method and robots are much more efficient when they’re rapidly repeating precise actions. However, robots are not inherently able to make minor adjustments to the tolerances typically associated with rolled structural steel sections. The team developed a system that could take advantage of the tolerances that the robots were capable of efficiently maintaining.

**ConXtech’s building system  
was designed with the entire  
lifecycle in mind.**

They worked in the barn until January of 2004 and moved into a 122,000 square-foot manufacturing facility in Hayward, California. Since April 2004 ConXtech has constructed nearly 6MM square feet of structure for some of the largest owners and developers in the world.

The result of this effort is a system that simply fits together elegantly, economically and sustainably and can be designed for dis-assembly and re-use fulfilling the Cradle to Cradle Certified qualifications and inspiration.



## BOTTLES TO BLANKETS

DA.AI Technology is one of the world's first non-profit social enterprises. DA.AI Technology was started in 2008 by five forward-thinking entrepreneurs with ties to the Taiwan-based humanitarian foundation Tzu Chi. From the beginning, DA.AI has dedicated itself to helping resolve global environmental crises, promoting environmental education and protection and developing "breakthroughs with heart."

A global network of consumers, business partners and volunteers enthusiastically support DA.AI's inclusive combination of selfless cooperation, innovation and compassion. These help make it an industry trend-setter.

DA.AI is an active member the Taiwan Cradle to Cradle Strategic Alliance since its establishment in 2011.

DA.AI began Cradle to Cradle product certification in early 2012 with the Silver certification of the Gray Eco Blanket. Each Gray Eco Blanket is made from 63 recycled soft drink PET bottles. This equates to reducing 4 kg of CO<sub>2</sub> emission, and saving 1023 milliliters of oil and 170 liters of water.

As of 2012, Tzu Chi volunteers worldwide have delivered over 500,000 eco blankets to disaster victims in nearly 30 countries. Each blanket contains a story of love and dedication of Tzu Chi recycling volunteers. By combining

the love and dedication of recycling volunteers and the advanced textile technology, DA.AI's Gray Eco Blanket is considered a global "green" role model and Taiwan's "green" life-saving miracle.

Everyone at DA.AI is dedicated to educating and inspiring a worldwide audience to realize their full potential, helping to enhance their lives and lifestyles, and making "breakthroughs with heart" a daily reality.

DA.AI Technology has shown its commitment to material health and reutilization, energy conservation and social fairness.

### MATERIAL HEALTH AND REUTILIZATION

The fabric of the eco blanket is derived from dope-dyed, 100% post consumer recycled polyester yarn. Its color comes from color chips added during spinning, rather than traditional piece-dyed process. This approach significantly reduces water consumption and chemical pollution and it also conserves energy.

The Gray Eco Blankets also make it possible to "upcycle" bottles, so design and manufacturing procedures clearly reflect Cradle to Cradle principles. The main fabric is made from a single material: 100% post consumer PET bottles.

There are 5,413 Tzu Chi recycling stations around Taiwan in which 266 recycling education centers can recycle used and unwanted "DA.AI" products.

### ENERGY CONSERVATION

DA.AI products are all made with recycled PET bottles that have been collected, treated and sorted by over 124,000 environmental protection volunteers in 5,413 Tzu Chi recycling stations around Taiwan. 31.56 million recycled PET bottles have been converted to over 500,000 Gray Eco Blankets. This represents energy reduction equivalent to 4.4 million liters of oil, and carbon dioxide emissions up to 2 million kilograms, while saving 85 million liters of water.

### SOCIAL FAIRNESS

DA.AI Technology's most important story of product innovation begins with the many extraordinary citizens who put their hearts and souls into building a more responsible, fair and humane world. For example, Brother Ah of Tzu Chi's Neihu Recycling Education Center in Taipei has dedicated his life to protecting and improving the environment. Brother Ah and tens of thousands of Tzu Chi volunteers like him collect and sort PET raw materials to be reutilized in Eco Blankets, and various lines of fine clothing.

While collecting recyclable materials from neighbors, family members and acquaintances, volunteers also become educators. As they adopt a dedicated environmental lifestyle, all community members are transformed into active supporters of a new Cradle to Cradle-minded society.

**DA.AI has dedicated itself to helping resolve global environmental crises, promoting environmental education and protection and developing "breakthroughs with heart."**





## PALLETS OF A LIFETIME

Decade Products is a joint partnership between Dolav Plastic Products and Cascade Engineering, offering a complete line of reusable plastic containers and pallets for industrial, agricultural and food processing applications worldwide.

Cascade Engineering is a global company with 1,100 employees located in 15 facilities throughout North America and Europe. As one of the largest certified “B” corporations in the world Cascade Engineering is a nationally recognized proponent of sustainable business practices that emphasize the key role business can play in building financial, social and environmental capital.

We believe that sustainability drives innovation and growth across the three capitals that comprise the Triple Bottom Line –financial, social, and environmental, each having equal significance. We have worked diligently over the past decade to create a strategy focused on sustainability that propels our innovation and sets forth our future direction. In fact, our company’s purpose as defined by our employees is to make a positive impact on our society and the environment, and to be financially successful.

Today, as we look across the many facets of our

operations, this sustainability focus resonates strongly with our people. It has become a permanent, palpable part of our culture, and is driving our strategy in terms of new products and businesses. We are committed to building a sustainable organization, both in terms of how we operate our company and the products we bring to market.

Decade products offer a unique level of quality, performance, and cost-effective advantages unlike any other containers and pallets on the market.

Decade’s RACX® Pallet combines strength and economy in a lightweight one-piece design for superior performance at an affordable price. It is made from 100% post-industrial recycled materials. Designed to be sustainable from the start and last easily over 10 years, it is a multi-purpose pallet used for stacking, racking, and transporting, minimizing the need for wood pallets. The product is light in weight, durable and completely recyclable at the end of its life.

In addition, we have a unique “buy-back” program which allows for recycling to go toward the purchase of new pallets, thereby lowering customer costs as well as helping the environment.

The pallet uses less energy and water in the production process, has no components and involves no harmful chemicals or additives in the process. Great strides have been taken toward developing and launching products that reduce the impact on our environment. It is imperative that innovation be the building block to finding ways to reduce our waste emissions into the air, land and water, which not only gives us bottom-line results but also contributes to reducing overall demand, thereby minimizing our environmental footprint.

Our various social programs over the years positively impact society and benefit our company at the same time. Programs such as Welfare to Career, Anti-Racism Awareness, and Re-Entry Employment Resource Center have been a tremendous asset in helping the greater community and in allowing our internal culture to embrace diversity and support people with respect and dignity.

Financial capital is the final gear in the triple bottom line, and the beneficiary of the other two gears, social and environmental. The economic gear allows our company to thrive and gives us the ability to reinvest in the other two capitals so we can continue the cycle.

**Having a Cradle to Cradle Certified product gives Decade a unique advantage above all other plastic pallet makers.**

Having a Cradle to Cradle Certified product gives Decade a unique advantage above all other plastic pallet makers. Sales continue to grow year over year as plastic pallets become accepted as a viable wood replacement. In fact, this type of product has proven to be sustainable and will likely evolve into additional product certifications.



DESIGN  
Tex

## THE DEVELOPMENT OF CLIMATEX UPHOLSTERY

In 1993, Susan Lyons, then Creative Director of Designtex, a New York-based textile company, decided to develop a collection of ecological fabrics. But, at that time, no one knew exactly what a “green” fabric should be. Should it be made of recycled materials, recyclable materials, natural fibers? What was the best direction? Late that year, Lyons contacted William McDonough, an architect and leader in the field of sustainable design, to get his input.

McDonough proposed the concept of “Waste=Food” as

a guiding principle for this (and other) design problem(s). Lyons and McDonough set a goal of making a “consumable” product that, when used or discarded, would turn into soil without any harmful side effects. A partnership then emerged between Designtex, McDonough and his colleague, the chemist Michael Braungart, and the Swiss mill Rohner, to develop a biological-nutrient upholstery that would later be called Climatex®. Following the “waste=food” principle, the upholstery was designed to break down

and return safely to the earth after its useful life. In order to achieve this, every input had to be analyzed, from the raw materials (wool and ramie, a natural plant fiber) to the dyestuffs and other process chemicals used in weaving.

Braungart invited sixty different chemical companies to collaborate on the project. All but one—Ciba-Geigy—declined, reluctant to disclose their formulations to such scrutiny. With Ciba-Geigy’s help Braungart analyzed over 8,000 chemical formulations commonly used in textile production, and then selected a mere 38 that he deemed safe for human and environmental health. These were the dyes and process chemicals allowed to be used in the production of Climatex® upholstery.

This optimization of the chemistry caused a change in the mill’s effluent; the water now flowing out of the mill was actually cleaner than the inflowing water. Other portions of the manufacturing process at Rohner underwent big changes as well. Located in a small farming community in Switzerland, the mill had already been operating under high environmental standards. However, government regulations had recently become stricter, and deemed textile scraps from the weaving process to be hazardous waste. The mill was forced to export the scrap to Spain for disposal, a costly factor of doing business in the region. With the production of the new fabrics designed to safely biodegrade, the mill

was able to save the scraps and make them into felt. This felt was used by local strawberry farmers as ground cover for their crops, and the mill was saved costly disposal fees related to previous textile constructions.

The result of this unprecedented collaboration produced the first Climatex® upholstery collection, launched by Designtex in 1995. Lyons, McDonough, Braungart and Rohner had developed a true “consumable,” an industrially-produced textile that was entirely compostable. At the end of their useful life, Climatex upholsteries can simply be thrown in the garden to become food for other living organisms. In the spring of 2011, embracing McDonough’s concept “Leadership not Ownership”, Designtex, McDonough and Braungart, and Rohner announced they were opening up the Climatex® system of manufacturing to the entire textile industry

Over subsequent years, Designtex expanded its Climatex® offering to some twenty styles, and when the Cradle to Cradle certification protocol was developed, Climatex® upholsteries were awarded Gold level certification. Designtex continues to add styles to the Climatex® collection, now woven by Gessner AG in Switzerland, still utilizing a design and manufacturing process that has proven its sustainability over close to two decades.

Following the “waste=food” principle, the upholstery was designed to break down and return safely to the earth after its useful life.



The Floor is Yours

## HEALTHIER FLOORING

Desso has been learning how to move towards the less wasteful economy via its Cradle to Cradle® commitment. This embraces a whole new way of looking at doing business in which goods are made out of the most positive materials so they can be recycled in a healthy way at the end of the product's life.

This philosophy fits perfectly into Desso's wider corporate mission to lead in the world in producing environmentally responsible flooring products that deliver outstanding value in design and functionality and

contribute to people's health and wellbeing.

Based on the insight that people spend 90% of their time indoors, Desso's innovation platform enables the company to design carpets that make the indoor environment healthier such as the DESSO AirMaster® carpet. Carpet which is eight times more effective than hard floors at retaining the fine dust particles that can cause damage to human health.

In terms of material reutilization, in early 2008, Desso took revolutionary steps to ensure that its carpets would be collected and safely recycled by launching its Take Back™

programme. Products are taken back by Desso after their useful life, and recycled into new carpet products, or used in other recycling initiatives. In support of this process Desso developed an innovative separation technique called Refinity®, which enables it to separate the yarn and other fibers from the backing, thereby producing two main material streams which can be recycled. After an additional purification stage, the yarn is returned to the yarn manufacturer for the production of new yarn.

For Polyamide 6 yarn, this process takes place at Aquafil, one of Desso's yarn suppliers. Aquafil has developed proprietary technology to turn recovered post-consumer polyamide 6 carpet fibres into new polyamide 6 again and again.

By sourcing positively defined raw materials, introducing new manufacturing methods and collecting used carpets from clients; Desso is achieving a closed loop process.

Since 2008, Desso has put its products where they are assessed chemical by chemical according to Cradle to Cradle certification criteria in terms of human health and the environment, recycling potential, energy and water use and social responsibility.

A major milestone was reached in 2010 when Desso developed and launched its DESSO EcoBase® backing. Due to its innovative composition, the polyolefin based layer of the DESSO EcoBase® backing is fully and safely recyclable in Desso's own production process. Carpet tiles with DESSO EcoBase® are positively defined up to 97% of the total materials

Desso began certifying its products according to Cradle to Cradle criteria in 2008. By 2012, 90% of its carpet tiles in the commercial business division had been Cradle to Cradle certified and carpet tile products with EcoBase™ backing were awarded a Silver certification in 2010.

Desso was also the first company in the world to have its products certified against the new Cradle to Cradle 3.0 level established in January 2013.

Since 2007, Desso's market share for carpet tiles

increased in Europe from 15% to 25% . Against the backdrop of recession and market contraction, Desso also managed to significantly increase sales of its new DESSO AirMaster® carpet, designed to reduce the damaging effect of airborne particulates indoors. This became the second best performing product in the company's portfolio and was created when the company was focused on its new C2C goals.

**In addition to commercial impact, going C2C company-wide has strengthened Desso's reputation as an innovator and sustainable business.**

In addition to commercial impact, going C2C company-wide has strengthened Desso's reputation as an innovator and sustainable business. Desso has been profiled in the Financial Times, Harvard Business Review and the Ethical Corporation. In 2012, Desso became one of the first members of the Circular Economy 100, created by the Ellen MacArthur Foundation and Desso CEO Alexander Collot d'Escury will participate in discussions on the circular economy at the World Economic Forum.



## INNOVATION CORNERSTONE

Dow is committed to using resources more efficiently and enhancing the quality of life of current and future generations. Our chemistry brings solutions for big challenges like energy, climate change, water, food, housing and health.

As a leading solutions provider in the building industry we are committed to providing sustainable products and technologies that help improve the energy-efficiency and sustainability of residential and commercial buildings worldwide.

Innovation is a cornerstone for Dow, both for products manufactured, such as STYROFOAM™ Brand Insulation and THERMAX™ Insulation, and for how the company operates. In 2012, Dow was named to the Thomson Reuters Top 100 Global Innovators list in recognition of the Company's R&D and patent leadership. The list recognizes the most innovative companies in the world, selected using a proprietary series of patent-focused metrics.

Dow has committed to limiting global Green House Gas (GHG) emissions to the level that Dow experienced in

2006, growing the company but not the amount of emitted carbon.

To ensure that the message on climate change initiatives are well understood and communicated, an assessment is conducted with an Impact Tool that quantifies the impact of Dow products—including STYROFOAM™ Brand Insulation and THERMAX™ Insulation—in the supply chain, before Dow operations, and during the use phase by our customers and ultimate end users. This assessment is accomplished with an Impact Tool that quantifies the energy and GHG profile of products and helps convey the benefits by communicating a ratio of burden compared to benefit. For example, the ratio of benefit throughout the life of the STYROFOAM™ Brand Insulation product line is seven times the GHG emissions involved in the manufacturing and construction phases of making homes and other applications more energy efficient.

At the product level, innovation continues to drive beneficial environmental changes. Starting in 2009, STYROFOAM™ Brand Insulation production converted to zero ozone-depleting, no-VOC (volatile organic compound) foaming agent technology, completing the conversion of its plants in advance of the Montreal Protocol deadline to phase-out hydrochlorofluorocarbon (HCFC) 142b, an ozone-depleting compound. Dow developed its next-generation foaming agent technology delivering the same properties and offering an even “greener” choice to builders designing energy efficient homes and buildings with rigid foam insulation. The new proprietary foaming agent technology

was developed by a team led by Dow's Simon P. Lee, who was recognized by the Intergovernmental Panel on Climate Change (IPCC) for his contribution to the 2007 Nobel Peace Prize. The two-year, multi-million dollar project cut in half the greenhouse gas emissions resulting from production of STYROFOAM Brand Insulation at all of its converted production facilities in North America.

In March 2011, Dow Global Technologies LLC (DGTL) a subsidiary of The Dow Chemical Company, announced the invention and development of the Polymeric Flame Retardant, a stable, high molecular weight, non-PBT (Persistent, Bioaccumulative, Toxic) substance. The additive is intended to provide a fire safety solution for extruded and expanded polystyrene foams, enabling these thermal insulation materials to continue to meet the increasing demands of global energy efficiency regulations and sustainable building design. Polymeric Flame Retardant innovation and scale-up are important steps forward in order for the industry to develop a more sustainable, reliable and available flame retardant for polystyrene foam insulation.

Having Cradle to Cradle Certification aligns with Dow's 2015 Sustainability Goals especially in the areas of renewable energy, water stewardship and social responsibility. Further, Cradle to Cradle Certification builds on Dow's legacy of building solutions that save energy and reduce greenhouse gas emissions by measuring the company's progressions across additional sustainability criteria.

**Our chemistry brings solutions for big challenges like energy, climate change, water, food, housing and health.**



## GREEN & CLEAN

Ecover, a pioneer in the development of powerful, ecological cleaning products, has re-launched its Ecover Professional range with three new concentrated products, new and improved formulae and a fresh new design. So impressive is the new range that it has been awarded a 'Cradle to Cradle Certified' title - a first in the world of professional cleaning. No other professional cleaning product can say the same.

After 17 years of providing professional cleaning products that pack a punch, this breakthrough in sustainability takes powerful, professional cleaning products to a new level. "The result is a complete range of powerful cleaning products that are safe for people and the planet. With these products, we are ready for the future." Johan Tops, International B2B Manager.

The new Ecover Professional products will be sold across Europe through the existing business to business dealer network to the public sector, the healthcare sector, the leisure sector and contract cleaners.

### SILVER-CERTIFIED PRODUCTS

A team of scientists at EPEA have rigorously assessed all ingredients, packaging materials, processes and social practices used, testing for maximum material reutilization and biodegradability. As a result, Ecover Professional now has seven products Cradle to Cradle Certified at Silver level.



### MATERIAL REUTILIZATION

The formulas of our products have been designed with a maximum of renewable ingredients. Most products are composed of 95% or 99% percent renewable ingredients. This is an excellent example of combining sustainable credentials with cleaning power. The design of our products is based on our diamond model.

The Professional range's packaging bottles are now made entirely from Plantastic PolyEthylene (PE), a revolutionary green plastic made from sugarcane that is 100% renewable, reusable and recyclable. Our Plantastic bottles meets the Gold criteria in the category of material reutilization of Cradle to Cradle certification.

### MATERIAL HEALTH

The most dangerous particles were found in the packaging of our cleaning products. That is why we changed the caps of the bottles into transparent- coloured caps. The ingredients of the cleaning agents are selected in that way to have an optimal biodegradability and a minimum impact on aquatic life.

### RENEWABLE ENERGY

Ecover already uses 100% green energy for our electricity. We are also looking into the possibilities of biogas.

### WATER STEWARDSHIP

Ecover works together with a local water purification company to clean our production water before going to nature.

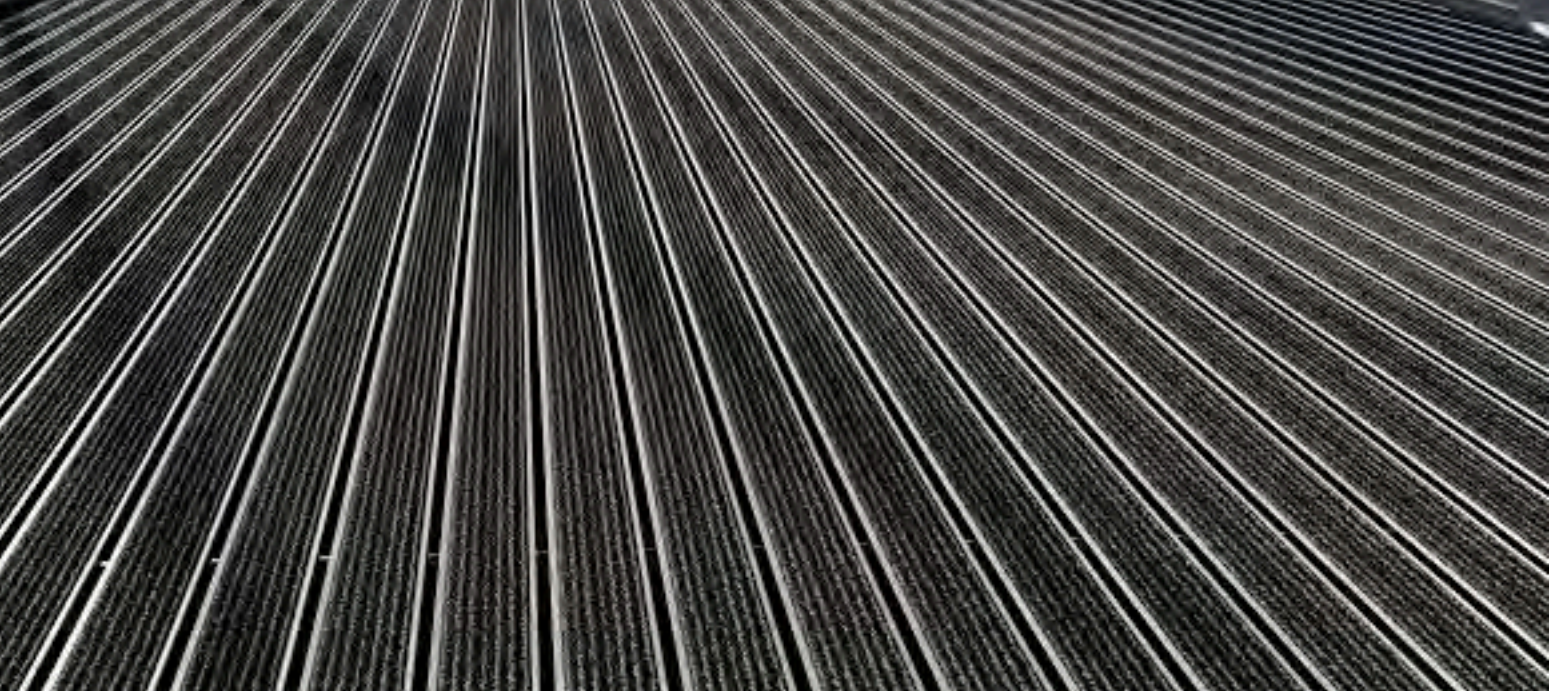
### SOCIAL FAIRNESS

For Ecover social fairness is very important. All suppliers are screened by our purchase department. We also engage with local communities; for example, our team building day is a charity for a local community. This year we have been supporting OKAN, a school for children of immigrants to learn Dutch.

### ABOUT ECOVER

Ecover (ecover.com) was founded in Belgium in 1979 by a team of highly motivated eco-pioneers, long before labels such as 'sustainable' and 'environmentally friendly' became desirable. These pioneers had sufficient evidence that phosphates, a common ingredient in washing and washing up detergent, was degrading our waters. They were so concerned that they developed the first phosphate-free detergent. It was a great success and quickly found its way into health food stores and supermarkets throughout Europe. Now, in 2013, Ecover has more than 35 different products sold in 40 countries throughout the world.

**After 17 years of providing professional cleaning products that pack a punch, this breakthrough in sustainability takes powerful, professional cleaning products to a new level.**



## SOLUTIONS FOR SUSTAINABLE CONSTRUCTION

emco Bau has been developing and manufacturing individually designed clean-off systems for commercial buildings for fifty years, all made to the highest quality and safety standards.

Our company focuses on innovation and quality. We are always looking for practical solutions with which we can affirm our commitment to products that are environmentally friendly and conserve resources whilst at the same time, meeting the needs of the market. We needed a concrete way to show our responsibility and commitment to sustainability,

and so we decided to pursue Cradle to Cradle certification. We aim to follow the Cradle to Cradle design philosophy as we expand and offer our customers high-quality products that are also environmentally sustainable.

There is a growing demand from architects, operators and investors for certified solutions to sustainable construction and renovation. In response, we have developed our latest product adhering to the strict Cradle to Cradle Certification criteria, where the requirements exceed even the standard systems on the market, such as

LEED, BREEAM and DGNB. The certification provides our customers the proof of the eco-efficiency of the product and its associated high level of environmental quality.

Sustainability in general has always been of great importance at emco Bau. Following our initial contact with Professor Michael Braungart in early 2012, it was clear that the Cradle to Cradle concept met our expectations and future requirements perfectly. We had our products thoroughly analyzed. By the end of this process we had developed our new product, the “emco Ecoline® Pioneer;” the first fully recyclable entrance mat in Europe. The development phase involved all our suppliers and included an analysis of their products too, something quite new for both our partners and ourselves, and we are very proud of the result.

emco Bau presented the Ecoline® Pioneer at the BAU 2013 fair in Munich, making us the first company in Europe—and one of the first in the world—to offer a high quality entrance mat that has a closed material cycle. All components, from the yarn to the aluminum profile, can be recycled. To achieve this, the entrance mat system was developed according to the strict environmental criteria of Cradle to Cradle, and certified by the non-profit Cradle to Cradle Products Innovation Institute. This new product shows how emco Bau is taking responsibility for its products in regards to the environment and future generations even more seriously, from development to disposal. At the same time, we have responded to the growing demand from architects, customers and investors for solutions that are specifically designed and certified for sustainable construction and renovation.

The emco Ecoline® Pioneer is manufactured using a very heavy aluminum profile with a proven heavy carpet insert from Desso®. The inserts were developed according to the criteria of the Cradle to Cradle concept and features patented Desso AirMaster® technology that has an exceptionally high capacity to bind particulate matter. In order to meet the demanding criteria of the Cradle to Cradle

certification, the manufacturer of this new product has also developed new sound insulation made from recyclable plastic.

We are always looking for practical solutions with which we can affirm our commitment to products that are environmentally friendly and conserve resources whilst at the same time, meeting the needs of the market.

The new entrance mat is suitable for indoor use and outdoor use in a covered area. It meets the high requirements for non-slip and fire safety. The new product can withstand extreme loads, such as those found in shopping malls, railway stations and airports. A wide range is available so that the matting system can integrate harmoniously into the architecture of any entrance area.

The emco Ecoline® Pioneer entrance mat is our first product to be certified by the Cradle to Cradle Innovation Institute, and we're excited about how the market will accept the new product. The initial feedback has been positive, giving us the confidence to continue working with the Cradle to Cradle concept and developing new products.

## TEXTILES WITH A TWIST

Gabriel A/S is a Danish company, established in 1851. Gabriel develops and manufactures upholstery fabrics and other components for furniture. We have one product certified, Gaja C2C, a wool product.

Innovation and value-adding partnerships are fundamental values of Gabriel's mission statement. Gabriel develops its services to be used in fields of application where product features, design and logistics have to meet invariable requirements and where quality and environmental management must be documented.

Our CSR work makes a positive contribution to all areas of our business and among our partners. We believe that it does not pay to compromise in the areas such as the environment or animal welfare, as these areas have a positive influence on the company's value creation while also adding value to the products for our customers and users.

And we have acted on our beliefs.

As a leader in our industry, it made sense to have our products certified as Cradle to Cradle. Our top customers were focusing on Cradle to Cradle design, and we wanted to make it easy for them by supplying our own certified textile. Certification was the logical next step in our tradition of building top-quality products while protecting our environment.

In the 1980s, Gabriel was the first Danish textile manufacturer to offer dyes without heavy metals. In 1991,



we were the world's first manufacturer of upholstery fabrics to gain quality certification under ISO 9001, and five years later, we were the first Danish textile company to achieve ISO 14001 certification. Most of our products are labelled with either Oeko-Tex or the EU Ecolabel, and we have more of those labels in our portfolio than any of the other firms in our sector.

Aside from certification, we have spent approximately 800 hours to optimize dyestuff with the Cradle to Cradle criteria and work on colour scales with the improved dyestuff.

Our Cradle to Cradle certification process has been one of continuous improvement whilst working together with the EPEA team. It began with investigating our dyestuffs and raw materials (wool), to improve the material health of our product. Unlike other environmental labels, Cradle to Cradle certification requires suppliers of chemicals and dyes to provide their patented recipes for evaluation. This information has traditionally been closely held. The first step was to identify our suppliers and to share this information and establish links between them and EPEA. Through our existing environmental certifications, we already had a good idea of what was inside our products, but certification has helped us understand our product even more.

Early on, we discovered that a good environmental case alone wouldn't sell the product, so our design team worked on the colour scale. Some of the desired colours were difficult to produce with the current dyestuffs. But we worked with suppliers and designers to solve this challenge. Along with the ability of the designers to have an open mind, changes and adjustments made it work in the end, and a beautiful colour scale is now available. The textile Gaja C2C, was launched in 2010.

In October 2012, Gaja C2C was accepted in the standard collection of one of the world's leading suppliers of office furniture. This was a significant achievement, and the fact

that Cradle to Cradle certification was a door-opener to this customer showed us the benefit of all our hard work.

Recently, we have decided to expand our portfolio of Cradle to Cradle certified products, because we think this will be good for our business. We are now focusing on material reutilization, which we hope will provide significant environmental benefits and create unique products. We have created a team that includes designers, technicians, environmental engineers, logistics and suppliers. Our designers planned the colour scales as they would have for any other product, knowing they might need to change. But they were able to meet certification standards and produce all the colours we needed, which show that the Cradle to Cradle certification process does not necessarily limit design options.

For Gabriel, the Cradle to Cradle certification has opened a door to a new community where we share visions about a positive footprint and ideas to improve our products. It has also given us access to some of the thought leaders in innovation and environment, and we are inspired by their ideas. Gabriel has participated in numerous seminars in Denmark, where we have shared our story and inspired others to work with Cradle to Cradle. We are proud to be able to share our work and our success as part of the Cradle to Cradle certified product family.

**Certification has opened a door to a new community where we share visions about a positive footprint and ideas to improve our products.**



## SUSTAINABLE DIAPERING SYSTEM

The current Cradle to Cradle Certified gDiapers disposable inserts, used with our reusable diaper covers (gPants) are a more sustainable diapering system with more environmental benefits than any other single-use disposable diaper in the market.

Unlike most single-use diapers, including “bio” diapers, diapers with compostable parts or diapers that are dyed brown, gDiapers contain no polypropylene or polyethylene. These plastics persist in the environment long after disposal with no ability to break down (about 50 million diapers are thrown in US landfills each day). Home composting disposable inserts (wet ones only) create a usable humus. There is no other disposable diaper, on the market that can make all of these claims. Further, gDiapers offers a cloth insert which, with a gPant, offers a fully reusable system.

It took significant innovation for gDiapers to create our disposable inserts, gPants and cloth inserts. But in our innovation story, our current products are only a starting point. Our ultimate goal is to eliminate conventional disposable diapers from the planet.

It has taken us nearly 8 years in business and some honest reckoning for us to affirm this goal. For our first years in business, we thought we were in it to do well by doing good. But we saw that, like most companies, we were actually focusing the vast majority of our energies on quick success. In the past 18 months, we have refocused our goals. Now, we are pushing product innovation to create a diaper whose upstream production and downstream disposal will be regenerative—truly cradle to cradle rather than cradle to grave.

We see in consumers an anomaly between the genuine concern most people have for the planet and the dominant practice of mindlessly purchasing and throwing away conventional disposable diapers. We are now in the process of creating a product that will serve the real needs and desires of parents globally: an affordable, accessible diaper that is gentle and breathable for their babies and a diaper whose production and disposal regenerates the environment rather than depletes it. The Cradle to Cradle certification is a vital tool to help us reach this goal.

### MATERIAL HEALTH

gDiapers disposable inserts are more than 75% cellulose-based. gDiapers disposable inserts have four main ingredients: cellulose tissue, cellulose coverstock, woodfluff pulp and SAP. A comparison of our materials to the materials of other leading diaper brands is below.

Note that gDiapers disposable inserts contain neither of the plastics polypropylene or polyethylene. It’s unknown how many years it will take for these diapers to breakdown in landfill, current estimates are 250-500 years. In diapers, these plastics impact babies health, limiting breathability and causing diaper rash.

### MATERIAL REUTILIZATION

Since our company’s inception, gDiapers has offered diapering with meaningful material reutilization. gDiapers’ disposable inserts (wet ones only) break down in home composts in 3 months, creating rich, usable soil. gDiapers compostable diaper insert is diametrically opposite to the 50 million landfill-bound diapers that hit US landfills every day. It makes a resource out of waste—the pinnacle of Cradle to Cradle principles.

### ENERGY CONSERVATION

We have seen our Cradle to Cradle commitment spread to our disposable insert manufacturer in the Midwest. Our manufacturer, a much larger business than gDiapers made the switch to 100% renewable energy thanks to our commitment to the Cradle-to-Cradle process. And that was just the beginning. Today, their recently renovated facility has major energy efficiency features including buildings that capture natural light, a near 100% rate of recycling that generates revenue for them, an onsite community garden and Cradle to Cradle certified carpeting. All thanks to our much smaller Portland, Oregon-based company.

Thanks to the Cradle to Cradle process, our much bigger partner made the switch to 100% renewable energy.



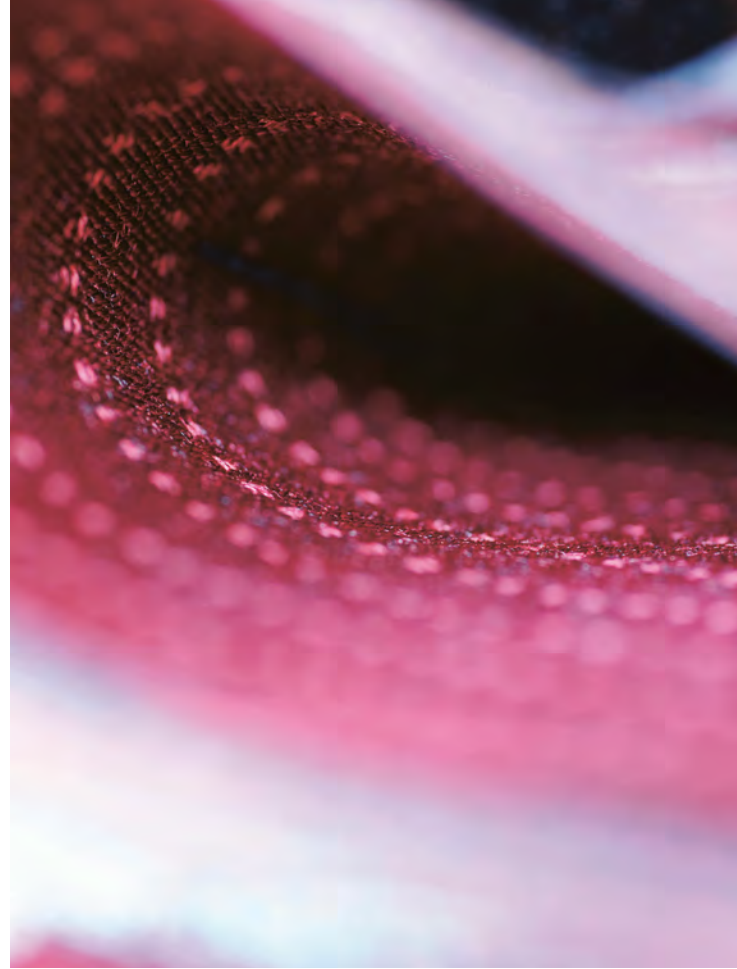
## RECOVERABLE TEXTILES

Gessner AG, Wädenswil, manufactures recyclable upholstery fabrics for climate-controlled seating under the well-known Climatex® brand name, which includes the product lines Lifecycle™ and Lifeguard™. Their first-class design and outstanding comfort are the result of intelligent technologies and the art of weaving sophisticated fibres into outstanding fabrics.

Gessner has now launched a new Cradle to Cradle-inspired invention that will fundamentally change the worlds of furniture, office furniture and transportation in terms of design, comfort, durability and environmental friendliness: the Climatex Dualcycle™ fabric. This new fabric utilizes astonishing natural principles that motivated its design.

Nature has a tendency to be wasteful. It loves magnificence, beauty and abundance. This gives it a crucial advantage over humanity's creations. Whatever nature produces, it produces without restraint. However, what nature produces does not become waste but becomes food; there is consumption without loss. The products of humanity are still far from achieving that, and the truth is we can hardly afford it. Our raw materials are precious and are becoming scarce. What can we do?

We can tread new paths. We can stop and think. For example, we can think about eco-effectiveness, recyclability, and about donkeys and horses.



### DONKEYS AND HORSES

What do donkeys and horses have to do with textiles? To answer this question, the following exchange between Michael Braungart, EPEA Hamburg and the Managing Director of Gessner AG, Fredy Baumeler, is presented.

Fredy: "Dear Michael, what are your thoughts on the recycling of textile hybrids?"

Michael: "My dear friend, consider this observation. Crossbreeding Donkeys and Horses produces mules, that is to say, hybrids. They have great stamina and strength, are

good-natured, and also have a very long life expectancy. But, they are not able to procreate. Now textiles can also exhibit all of these qualities when natural and polymer fibres are mixed, because this produces highly durable hybrids. But until now, textile hybrids have not been recyclable."

The intimate mixture of different materials prevented continuous renewal in the cycle, which is precisely the impetus that gave Gessner the crucial incentive to innovate.

### BACK TO SQUARE ONE

Gessner decided long ago to develop and manufacture upholstery fabrics that satisfy the increasing demand for ecological and functional products in every respect. So the question was, how could the indisputably desirable qualities of hybrid textiles (e.g., strength and durability) be reconciled with recyclability? The answer was simple, but tough: back to square one.

### REINVENT ALL OVER AGAIN

This motto was suggested more than two years ago by the Managing Director of Gessner AG, Fredy Baumeler. Firstly, the benefits of polymer fibres in terms of durability and resistance needed to be exploited. At the same time, the climatising and haptic properties of the natural raw materials for "Climatex" would need to be preserved at all costs.

It was crucial to ask the right questions. As there was no progress on the question of how to make the hybrid fabric recyclable as a whole, the question needed to be how its

components could be recovered individually. Thus began an intensive search for a system for a "decomposable textile hybrid." Gessner AG discovered that it could join different recyclable fibre systems in the fabric using a "textile lock," resulting in two new products - the Cradle to Cradle Certified Silver CLIMATEX DUALCYCLE™ and CRADURA™.

The answer was simple but tough:  
back to square one.



## HEALTHY PRINTING PRODUCTS

In 2011, after intensive research, the Austrian communication company gugler\* succeeded in producing printing products in such a way that they could be returned to the biological cycle at the end of their product life cycle - and has been awarded the Cradle to Cradle Silver certificate for its pureprint product groups.

All the substances in the Cradle to Cradle certified printing products have been analyzed together with the environmental research institute, EPEA Hamburg. The optimization focused on material health and material

reutilization criteria. Gugler\* had already established very high standards for energy conservation, water stewardship and social fairness. While working on the project, our team members became much more aware of the environmental problems that conventional printing products can cause, and confirmed that the Cradle to Cradle approach offers a better way.

### DEVELOPING HEALTHY PRINTING PRODUCTS

Paper is a valuable and versatile raw material, and these traits must be maintained in the recycling process. As a printing company, it is ultimately up to us to determine the quality of the printed matter we produce. In our Cradle to Cradle research project, we have selected printing components and developed inks which are ideal for recycling and which leave out toxic yellow pigments. Our Cradle to Cradle certified printing products are completely safe to humans and the environment. With respect to the health impact, such as allergies and so on, the highest standards are met. Cradle to Cradle printing products could even be directly composted. When burnt, the ash is even good for the vegetable garden.

Cradle to Cradle printing products show how everything can be useful. If the components used in printing products are safe for the biological cycle, then the sludge from de-inking is no longer waste, but a nutrient. It contains organic pulp particles which can help the ground store moisture, and the mineral content of calcium carbonate from the fillers in the paper is a wonderful lime fertilizer. In this way, printing products can contribute to formation of humus and to making the ground fertile, while the same time storing carbon underground. To close this cycle on a larger scale, widespread rethinking is required. However, we can start by showing that a circular economy is possible. With the first Cradle to Cradle Certified printing products, we have laid a good foundation. The more people who increase the proportion of Cradle to Cradle paper recycling,

the better.

### KICKING OFF THE NEXT PRINTING REVOLUTION

gugler\* has always been among the pioneers in the field of ecological printing in Europe. We were the first printing company to receive the Austrian eco label. Many other printers followed our lead.

Cradle to Cradle was a welcome opportunity for innovation which allowed gugler\* to forge ahead of the field with a unique USP while bringing positive change into the world. With Cradle to Cradle we have again set a new quality standard for the printing industry. Within only one year, the amount of offset printing products meeting the Cradle to Cradle standard reached 10% of our offset production. Currently gugler\* is developing a licensing model for other printing companies wanting to produce Cradle to Cradle printing products in order to multiply the positive effect of this innovation.

With this step, we hope to kick off a 'snowball effect' for the next printing revolution!

**Cradle to Cradle was a welcome opportunity for innovation which allowed gugler\*, once again, to forge ahead of the field with a unique USP while bringing positive change into the world.**



## DOING SUSTAINABILITY RIGHT

We've always believed life is the most beautiful and powerful in a natural and pure state. With the brand's vision of "It's O'right," O'right devotes itself to develop 'green' products, and to charity activities for environmental protection to ensure our future generations a good and sustainable life.

O'right's logo starts with a big "O", which symbolizes the ideal and beauty of the earth. We are bound and determined to protect the earth and hope to encourage other people to do the right things with us together to make the earth a greener and better place to live.

In 2012, we applied for Cradle to Cradle product certification for our Goji Berry Volumizing Shampoo, which at the moment is the only product to achieve Cradle to Cradle certification.

The outstanding design concept of the "Tree in A Bottle"—the first bottle to grow a tree, has been awarded the Red Dot Design Award Best of the Best 2013. The 100% biodegradable material of the bottle allows decomposition into CO2 and water, enabling the embedded acacia seeds—an efficient CO2 absorbing plant—to grow naturally.

In order to be able to follow the vision of our company and brand, we moved into our new factory in Longtan township in the beginning of 2012, which conforms to green building concepts and has been awarded "Asia's First GMP Certified Green Plant," as well as the Taiwan EEWH Green Building Gold Certificate. To optimize the use of natural resources effectively, the O'right Green Headquarters



generates wind and solar power for the manufacturing process and has established a water recycling system. O'right Green Headquarters symbolizes our love and concern for the earth and our desire for industry and nature to sustainably coexist.

O'right puts green concepts into products: from materials, ingredients, designs, charity activities to experiences. We use natural & certified organic ingredients, free of artificial hormones, and which don't pollute the aquatic environment. Our packaging material is also sustainable—our eco-cartons are made of 80% recycled

paper, and we use FSC certified paper and soy ink for all printed matters. Soy ink is non-toxic, contains no heavy metals, and does not cause irritation or pollution. The use of refill packages helps to save 38,000 plastic bottles annually.

In our facility we systematically reutilize rainwater for irrigation. We reclaim water from the purification process that is high in natural minerals and is reutilized for daily cleaning uses, restroom water and a landscaping waterfall. After the subterranean four-pool purification process, where adjustment, containment, hydrolytic oxidation and hydrogel precipitation takes place, the reclaimed water stream synergistically integrates with the circulating eco ponds. The water can be used for aquaculture, raising fish or creating a natural eco-chain, as well as for water quality monitoring and observation.

With the brand's vision, "It's O'right", we focus on caring for future generations and environmental protection. We hope to inspire everyone to love the Earth. In 2008, O'right supported "ORBIS International" for saving sight of children with vision problems with NTD 18.2 million (products and funds). In 2010, O'right supported the "Association of Pingtung Indigenous Culture and Education" to rebuild a joyful learning environment for children in typhoon-stricken regions after Typhoon Morakot with NTD 7 million (products and funds). In 2011, O'right supported the "Eden Social Welfare Foundation" to help developmental delayed children catch up to their age groups with the annual lecture income from the CEO of O'right, Mr. Steven Ko and O'right's VP Mr. Michael Chang. And in 2012, O'right supported the

"ELIV International Service Association" to create a green, sustainable orphanage to help Cambodian children grow up healthy.

O'right shares its own experience and successful, sustainable, innovative business model with colleges and social organizations. It not only arouses more enterprises' green thoughts, but students also are impressed with our natural and organic hair care products. O'right brings the awareness of "100% Made in Taiwan" (MIT) green hair care products to people and broadens a worldwide opportunity for the MIT green cosmetics industry.

O'right devotes itself to develop 'green' products, and to charity activities for environmental protection to ensure future generations a good and sustainable life.

HermanMiller



## HELPING PEOPLE PERFORM AT THEIR BEST

The products and services of Herman Miller are purposefully designed to enhance the human experience wherever people work, live, heal and learn. We emphasize a problem-solving approach, continually seeking to create inspiring designs that help people do great things and organizations to perform at their best. In pursuit of that mission, we are motivated by our more than 100 year history and a deeply rooted culture that calls us to do our part in creating a better world. Environmental stewardship has long been a core value of our company in service to these ideals, as we passionately work to better the health and well-being of customers, our employees, communities, and the planet we share.

### ENVIRONMENTAL ADVOCACY

Herman Miller's interest in the environment began with the convictions of our founder, D.J. De Pree, who believed that corporations, like people, should see themselves as stewards. He understood that respecting the environment was more than good business practice—it was the right thing to do. We formalized this commitment to sustainability in 1953, in a formal set of policies, when D.J. stated, "Herman Miller will be a good corporate neighbor by being a good steward of the environment." That progressive stance has grown in scope and sophistication ever since. Through myriad programs, initiatives, and the contributions of thousands of employees and our business partners, today



Herman Miller has embedded sustainability in virtually every aspect of our business, from architecture to product design to operations.

### OUR 'DESIGN FOR THE ENVIRONMENT' JOURNEY

In 1991, we drafted our first Design for the Environment (DfE) guidelines, to help product designers and our engineers make environmentally intelligent decisions when choosing materials and manufacturing processes during design and development. That protocol measured the environmental impacts of materials and could be

integrated into a more holistic approach that evaluated and balanced environmental criteria along with performance, cost, and aesthetics. But we soon realized that while we were well informed about a material's performance, we had little knowledge about chemical composition and related environmental impacts.

After evaluating several existing environmental protocols, the team decided to partner with McDonough Braungart Design Chemistry (MBDC) in the development of their Cradle to Cradle protocol for material assessment and selection. We could see that by fully integrating a sophisticated tool into Herman Miller's DfE process, and establishing this as foundational to all existing and future product development (not simply one-off projects), Herman Miller could reach a new milestone in our journey to true sustainability. Together we built a customized assessment tool that analyzed materials for their human health and ecological effects, recyclability, use of recycled content and renewable resources, and design for disassembly. As a result, in 2001, Herman Miller became the first company in the world to fully implement the Cradle to Cradle protocol as an integral part of all our product development.

### TODAY AND TOMORROW

In 2013, as our business approaches \$1.8 billion in revenue, more than 66% of Herman Miller's product sales are in DfE-approved designs. Our overall progress towards sustainability is equally remarkable, with a 92% reduction in the total operational footprint (solid and hazardous waste, energy, water and air) from our baseline year of 1994, even

as the company grew significantly over that period. As our journey continues in pursuit of 100% DfE product sales and a fully sustainable enterprise we take pride in our association with partners like the MBDC and the Cradle to Cradle Products Innovation Institute, and the growing number of like-minded companies and organizations who share this compelling vision for the future.



**"Herman Miller has been a pioneer moving beyond eco-efficient to true sustainability."**

William McDonough, Co-Founder and Principal, McDonough Braungart Design Chemistry, 2001



## NON-TOXIC PIGMENTS & WATER RECYCLING

Founded in 2003, IceStone is the world's leading manufacturer of sustainable durable surfaces. We strive to create healthy, high-performance products, to empower and engage every employee, and to minimize our environmental footprint. To that end, production is powered by a water recycling system, day-lighting, and steam heat generated in the Brooklyn Navy Yard. Employees collectively own 10% of the company, and every non-exempt worker receives a living wage with benefits and on-site skills training. We chose to

participate in the Cradle to Cradle Certification program because it measures and informs IceStone's social and environmental practices, and drives product innovations as well.

IceStone has invested \$32,000 in Cradle to Cradle<sup>CM</sup> certification program since 2006. This investment represents both certification and renewal fees, and the implementation of several material and facility innovations that have enabled us to achieve the Gold level of certification (the highest level

any durable surface has achieved to date) for all IceStone products. Currently, there are 21 products; from 2009-2011, IceStone had 28 products, each of certified at the Gold level

### GOING FOR GOLD

While dozens of innovations have been made since IceStone's initial certification in 2006, there are two prominent changes that were critical in our journey from Silver level to Gold level certification; the elimination of problematic pigments from the product recipe, and the addition of a water recycling system to our facility.

### MATERIAL HEALTH INNOVATIONS

IceStone is made of three core ingredients: 100% recycled glass, portland cement, and non-toxic pigments. Our durable surfaces are an alternative to engineered stones, which consist of quartz and petrochemical binders, and natural stones quarried from the Earth. Though we engineered IceStone to perform without harmful resins and petrochemicals, pigments containing trace amounts of chromium and cadmium, known human carcinogens, were used in some product recipes. Less than one year after receiving Silver level certification, IceStone's R&D team set out to eliminate these problematic chemicals from the product. We worked closely with our pigment suppliers to find inorganic options that would create a similar hue and color in our palette.

Once we identified these new pigments, we worked with

MBDC to ensure they would meet Gold level Material Health criteria. The R&D process took approximately three months. We modified an existing product and discontinued another. The result- a toxin free line of countertop materials- was achieved without compromising the vibrancy and beauty of our design. This month, we received a letter from our supplier announcing that their iron oxide pigments contain 94% recycled content and had received SCS Certification. We're proud to partner with like-minded suppliers, and to witness their own sustainability evolution.

### WATER STEWARDSHIP INNOVATIONS

IceStone requires a significant amount of water during the cutting and polishing process. In the fall of 2008, we installed a large capacity water recycling system in our facility. The water recycling system separates the hardened, solid clay from the water of our manufacturing by-product (known as "slurry"). After filtering and separation, the water is re-used in production. The water recycling system has saved several million gallons of fresh water per year since its installation, and is a unique feature of our sustainable manufacturing process.

The Cradle to Cradle Certification program...measures and informs IceStone's social and environmental practices, and drives product innovations as well.



## MODULAR WALL SYSTEMS

In 2009, inspired by the Dutch documentary 'Tegenlicht,' the director of Interwand set the company on its current course toward making all of its products in accordance with Cradle to Cradle principles by 2020. Interwand wants raw materials to remain available for future generations and therefore wants to develop Cradle to Cradle Certified products. We feel a responsibility for the preservation and reuse of resources.

With the introduction of the GreenFlexibility™ programme, Interwand wishes to systematically make

its products and processes more sustainable. This policy programme will cover various developments that form part of sustainable and corporate social responsibility.

### SUSTAINABILITY AND CRADLE TO CRADLE

In March 2009, Interwand proposed to take the first steps towards Cradle to Cradle Certification. During a kick-off meeting in May 2009, the possible Cradle to Cradle Certification perspectives were discussed with EPEA. It was agreed to do a first scan by screening the materials used by

Interwand along the principles of Cradle to Cradle design. We have certified the Intersmart and are now working on certifying our next partition; the Interline.

### MATERIAL HEALTH

The goal for Interwand is to produce modular wall systems with high quality materials which contribute to a better indoor air quality of office spaces. To reach that goal, each material of the wall system will be defined for a biological or technical cycle, and all ingredients will be identified. Where applicable, ingredients are defined through an ABCX categorization, and the path of each of these nutrients is defined.

Interwand wants to have all 9 products certified in 2020, so there will be no more 'code red' chemical ingredients.

### MATERIAL RE-UTILIZATION

Another interesting point is that we are working on the optimization of the wall system towards a service product. A take back system would be part of this concept. In 2020, it should be possible to bring all of our products back to Interwand. Our slogan is: the office of the future, is our warehouse. In addition to disassembly, we are working on creating a new company to sell these partitions again.

The wall systems of Interwand are assembled on site, which means that a modular construction is already part of the design concept. This design concept of easy disassembly will be further optimized and the potential for take back system will be considered always.

### RENEWABLE ENERGY

Interwand has started to implement solar power in our subsidiary in Germany. Further steps will soon be taken in

the Netherlands, and plans for the implementation of wind energy are being developed.

A CO<sub>2</sub> footprint will be drawn up each year end for control purposes and will result in improvement objectives for the following year. The total of the yearly discharge of CO<sub>2</sub> on the basis of the energy used by Interwand for production, offices and transport will be reduced by saving energy and/or using sustainable energy.

### WATER STEWARDSHIP

Interwand must demonstrate we are using our water resources responsibly and efficiently and that the water discharge from factories into local rivers is as clean as possible. Interwand is not a major consumer of water in the plant.

The water we do use in the plant is used in processes such as the application of the glaze. This water is purified in an in-house water treatment plant.

We feel a responsibility  
for the preservation and  
reuse of resources.



KE FIBERTEC

## THE FIRST C2C CERTIFIED VENTILATION DUCT

KE Fibertex designs and sells textile ventilation systems (more commonly known as Fabric ducts/duct socks/sox) for draft free air distribution in all types of rooms and applications. Ours is the world's first Cradle to Cradle Certified ventilation duct. Fiber ducts provide inherent benefits including draft-free, evenly distributed air, reduced installation costs, and lightweight for structures with little or no load bearing capacity.

The ductwork is used in a wide range of applications including office space, industrial facilities, laboratories, food

industry installations, showrooms, museum galleries and sports complexes.

And because fabric vents absorb so little humidity, even in environments with relative humidity as high as 90%, they are an ideal solution for pools, natatoriums and indoor water parks. Ducts sections are zippered, making them easy to install and disassemble and are machine washable.

KE Fibertec has been working with energy savings, environmental issues and CSR for several years. Consequently, it was natural for us to take the next step on

the sustainability ladder. We preferred the Cradle to Cradle certification as this program is well-documented as a benefit of our customers. The certification mark documents the sustainability of our product. It also takes into account that we take responsibility of its lifecycle from production to reuse. No other program shows that commitment to our customers.

The certification process began in February 2012 when we partnered with the C2C consulting division of Gabriel, who helped us through the process. Gabriel has a close relationship with EPEA in Hamburg and guided us in making the right decisions. In October 2012 we were awarded the Silver certification. The process was a time consuming one but as a company we wanted to make the commitment to a healthy, safe future with an abundance of resources.

At present our only Cradle to Cradle certified product is the CradleVent® textile duct which was awarded the C2C Silver certificate. CradleVent® is our company's contribution to a future-proof and sustainable product for air distribution in office buildings, schools, laboratories, sports arenas, as well as public buildings.

Since getting our product certified, it has been recognized by the architecture community as a superior product. The many architects that support Cradle to Cradle recognize our commitment and trust our product.

As part of our certification process we had to make choices about the materials we could use. We had to learn how to specify in terms of type of material, suspension and colour. But in the end, we were very happy with the result

and our choices. As we move forward, we aim to include other suspension types and colours in our Cradle to Cradle certification.

Our Cradle to Cradle ventilation duct has recently been chosen for a new school in the Netherlands, Lyceum Schravenlant. The pilot project for both school and the municipality has very high ambitions with regard to sustainability, within which the Cradle to Cradle principle serves as a guiding principle.

All kinds of ways are being considered for making the school as sustainable as possible in its entirety. The concept of a long life span is the starting point for this, with the focus on the total building and period of use, in order to make sustainable solutions feasible..

Since getting our product certified is has been recognized by the architecture community as a superior product.



## REUSE AND ROCK ON

We would like to introduce our unique meta-quartzite stone products and the plethora of applications that may be obtained. The meta-quartzite stone is very durable. There is actually a geologic patent for it because it is a bit of a geological anomaly. It is pure silica bonded by quartz making it a glass-grade silica sand that has confounded geologists, but in a good way. The material has a high threshold for resistance to wear and has an extraordinarily high slip resistance in the polished finish. The Stone is much more durable than any other in its class, and an investment

in Las Vegas Rock is an investment in a product that will last indefinitely.

These properties create a decided advantage in long term value for the geological anomaly that is the Las Vegas Rock quarry. The highly technical processing capabilities of the factory also provide a significant advantage. The factory is experienced and adept at supplying large scale architectural cladding projects on schedule and within budget.

Las Vegas Rock is one of a kind. We have been labeled the “pioneers of sustainability” for stone quarries throughout

the industry. We are the only Cradle to Cradle Certified Silver natural stone in the world. Cradle to Cradle Certification provides us with a means to tangibly and credibly measure achievement in environmentally-intelligent design and helps customers purchase and specify products that are pursuing a broader definition of quality. This means using environmentally safe and healthy materials; design for material reutilization, such as recycling; the use of renewable energy and energy efficiency; efficient use of water, and maximum water quality associated with production; as well as instituting strategies for social responsibility.

LVR practices ecologically-conscious manufacturing. There is zero waste in production—100% of the Las Vegas Rock byproduct is repurposed. We utilize solar power up at the quarry and we reuse and recycle all onsite water. Even our finite material is reused. Since we are glass-grade silica, the fines are used to make windshields, added to concrete to make concrete stronger, and is even PGA approved topsoil. When we cut to size material for projects and there is leftover material, we stock pile it and bring it back up to the quarry and crush it as landscape rock. Absolutely everything is reused in some shape or form! Due to the geologic make-up of the stone, it requires no chemicals or fillers either. These characteristics will help facilitate possible LEED points in Innovation in Design, and there are several more credits that may be obtained due to the technical aspects of the stone (Thermal Mass, Solar Reflectivity, etc.)

We have a wide range of products that can be utilized in Landscape Design, Architecture, and Interior Design. We

like to say that we not only produce stone products, we manufacture ideas. Working closely with designers, we are able to expand our product range with conceptual ideas from project to project.

If there is an area in the quarry that we plan on utilizing and there is any native vegetation located there, we have a company called Native Resources that comes out and transplants the material to an undisturbed location. We also contribute several thousands of dollars into a fund that is setup so that when the quarry is no longer running it will be transformed into some type of usable space IE. A Park, Trail System/Hiking area, Golf Course, etc.

The sustainable initiatives in place at LVR set it apart and make it one of the most unique stone quarries out there.

**The sustainable initiatives in place at LVR set it apart and make it one of the most unique stone quarries out there.**





## MAKING THE WORLD A BRIGHTER PLACE

The Lighting Quotient is a manufacturer of high performance architectural luminaires. We are deeply committed to performance, quality and product longevity. As a leader in sustainability, we design and build products that save energy, defy the landfill and support Cradle to Cradle initiatives.

Our fraqtir LED lighting products use an innovative refractive optic that efficiently captures and redirects light from an array of LEDs to create highly effective, application specific light distributions while achieving up to 82% energy

savings over traditional light sources. Our elliptipar and fraqtir products are Cradle to Cradle Certified Silver.

One of the first challenges as we began our Cradle to Cradle Certification process was to address the wires used in our luminaires. All of our UL-recognized wire used PVC insulation, so we had to find a source for non-PVC insulated wire. Working with our wire and cable supplier, we found a source of non-PVC insulated wire, but they did not offer type of wire we needed. Since most of our luminaires feature adjustable aiming, we need to use stranded wire,

but stranded wire cannot be inserted into socket and ballast terminals. So we developed a stranded wire with a bonded topcoat, which gave us the flexibility we needed for adjustable aiming and permitted clean insertion into the socket and ballast terminals.

Our luminaires are constructed mainly from aluminum and stainless steel which had been assessed as “green,” but which we identified several machined parts made of softer aluminum alloys which had high lead content for increased ease of manufacturability. In our certification process, these parts were phased out, in lieu of alloys with no lead content.

In order to encourage reuse and recycling we created documentation for all of our Cradle to Cradle Certified luminaires providing directions on how to return the luminaire to us for reuse and repurposing at end of useful life. Knowing that this may not always happen, we also created detailed instructions illustrating how to disassemble the luminaire, identified all of the materials, and provided links to local recycling centers.

The Cradle to Cradle Certification process is a continuous improvement effort, and as such we are always looking for healthier materials to use in our products as well as ways to reduce electricity and water in the manufacturing process at our facility. Facility improvements have led to a reduction of annual water usage of 416,000 gallons in 2009 to 370,000 in 2010. In 2011 we decommissioned our vintage 1958 central steam boiler and upgraded to smaller localized high efficiency boilers which have reduced our natural gas consumption by up to 40% (20% in the winter months).

Reductions in energy use were a result of facility upgrades including a 4.6kW reduction from replacing older luminaires with new LED (Cradle to Cradle Certified SILVER) luminaires.

The Lighting Quotient is dedicated Cradle to Cradle Certified Partner and we look forward to our journey as we travel the continuum towards achieving platinum level someday.

**As a leader in sustainability, we design and build products that save energy, defy the landfill and support Cradle to Cradle initiatives.**



Visit [C2C Certified Product Registry](#)

## PVC-FREE SHADECLOTHS

"As explained by McDonough, the question we need to start our design process is: 'How do we love all the children, of all species, for all time?' My perception of Cradle to Cradle Certified protocol now, in light of that question, can be likened to this analogy. Throughout the 1960s, buildings burned their electric lights all night, to keep them warm. Today, this seems ludicrous. I believe that in the future, providing products of use or consumption

that are not healthful—and instead negatively impact the environment—will be just as ludicrous."

– Jan Berman, CEO, MechoSystems

When our MechoShade® and ElectroShade® roller-shade systems originated in the early 1970s, we were facing energy embargoes and an energy crisis. The building and design industry was in need of products that could reduce

a building's day-to-day operational energy consumption. We were heavily influenced by this need as we developed our products. We aimed to promote this and other healthful benefits, such as a view to the outdoors and the use of natural lighting. What we weren't doing at that time was considering the components going into our products. Nor did we think ahead, to the ends of their useful lives, to consider what would happen to them. That is, not until people began to ask, "What goes into your product?"

I first heard William McDonough at EnvironDesign in 1996 and learned about Climatex® by Designtex®. Its development as a biological nutrient became part of the initial Cradle to Cradle Certified protocol. At the same conference, designer Penny Bonda caught my attention in her lecture by saying something along the lines of, "We love MechoShades, but could you offer us a PVC-free shade cloth?"

I soon realized my obligation, and that of MechoSystems as a manufacturing company, to know what materials are going into our products, and how to manage these products at the ends of their lifecycles.

At the appropriate time, I coordinated Twitchell's new management to have them hear Bill deliver a keynote speech. As intended, it encouraged them to invest in this new direction. In 2004, EcoVeil—our very first Cradle to Cradle Certified product—was released.

The first system, our manual Mecho®/5 with EcoVeil, features heavy-duty hardware, a patented clutch design, and a 25-year non-depreciating warranty. The second system is our competitively priced Manual UrbanShade® with EcoVeil. There are hundreds—if not thousands—of product configurations possible between the potential combinations of our two C2C Certified hardware systems and EcoVeil shade cloths.

The Cradle to Cradle Certification story at MechoSystems is one of great innovation, perseverance, and—ultimately—success. Twitchell, in support of our shared vision, became a fabulous partner. Together we pioneered the replacement of

a PVC-coated, polyester yarn, with a technical yarn. EcoVeil uses a TPO (thermoplastic olefin) extrusion over a polyolefin core yarn (replacing the polyester core yarn). There were many challenges along the way. With our combined efforts, we eventually reached the ideal hand (softness) of the shade cloth, tested its flame retardancy, and manipulated its color fastness and its ability to weld into a shade cloth, and to then hang flat. Each one of these issues required revolutionary work. In the end, we succeeded and were

**These products have  
changed our industry.**

awarded a Cradle to Cradle Certification, now certified Silver. The flame-retardant chemistry remains a challenge to further improve EcoVeil. But the concept made it possible to have a PVC-free coated yarn that minimizes yellow and red chemicals, and can be recycled.

EcoVeil, Mecho/5, and UrbanShade are the first Cradle to Cradle Certified window-covering products on the market. MechoSystems is the first and only window-covering manufacturer to have an entire window-shading system—including both the hardware and the shade cloth—Cradle to Cradle Certified. We have optimized our chemistry to provide the ability for these products to be disassembled and brought back into industrial waste streams. It is MechoSystems' policy to take these products back, when sent to our factory, for proper reuse of all components or for turning them back into industrial raw materials.



## SAFER FABRICS

At Mermet, we are dedicated to creating green fabrics made from environmentally responsible manufacturing processes. In 2010, our organization became aware of MBDC and the Cradle to Cradle design framework and certification program. Immediately, we knew we had to get on board and set an example for our industry. We also realized that the safe and healthy materials movement was gaining momentum and that architects, designers and other building professionals were putting more emphasis on sustainable building and design—and specifying

more green products for their projects. Understanding the importance of this paramount shift and our social responsibilities as a company, we began rethinking the way we manufactured our fabrics and the materials we used. We knew we wanted to produce Cradle to Cradle Certified shade fabrics.

Currently, we have three fabric lines all Cradle to Cradle Certified Silver level. These are Greenscreen Revive, Cortina and Siena. Each fabric line has its own unique pattern and colors.

Greenscreen Revive is made of 100% PVC-free polyester and contains 89% Repreve® fibers. Each yard of GreenScreen® Revive™ fabric uses 11 post-consumer bottles. Repreve® fibers are made from 100% recycled materials, a combination of post-industrial and post-consumer plastic waste. In comparison to virgin polyester, Repreve reduces energy consumption by over 6%, water consumption by nearly 50%, and greenhouse gas emissions by over 34%.

Unifi blends 60% virgin polyester pellets with 40% reprocessed material to produce Repreve yarn which is used in our Revive fabrics. 89% of Revive fabric content is Repreve® yarn. Unifi's goal is to process Repreve® yarn from 100% reprocessed and recycled materials by 2015.

Cortina and Siena are completely recyclable 100% polyester, PVC-free fabrics. Both fabrics emulate beauty of design and functionality.

### OUR STORY

Since 2010, we have outfitted the entire plant with environmentally friendly equipment, established waste collection points, and provided employees with waste management policies and procedures. As a result of our continuous efforts, approximately 90 percent of our post-production materials are now recycled. Some of these items include packaging materials, yarn and scrap fabric which is down-cycled for use in items such as traffic cones, carpet backing, and walk-off mats.

To prepare for Cradle to Cradle Certification, we developed GreenScreen Revive—the first of our Cradle to Cradle Certified products.

Upon launch, we communicated a recycling program to our Greenscreen Revive dealers. The Recycling Program requires dealers to collect any scrap from the manufacturing of the shades as well as any shades returned from consumers and send it back to the yarn producer, Unifi, to ultimately be recycled into new fabric.

Our launch, January 2011, resulted in a fantastic market response and demand for the fabric has grown steadily. Total

2012 sales were 77% greater than 2011 and for 2013, our six month sales are up 18%!

We continued to hear from more consumers looking for green, PVC-free fabric alternatives. So we decided to create more sustainable fabrics, and in May 2011, we launched Cortina and Siena. Our fabrics have been very popular among interior designers and architects for their decorative looks and are featured on many websites such as The Ethical Fashion Source Network, Ecouterre, Specialty Fabrics Review, and Architectural Record.

### MATERIAL REUTILIZATION

All of our fabrics can be recycled. In addition, our company

...90 percent of our post-production materials are now recycled.

has a commitment to be completely land-fill free in 2014.

### ENERGY AND WATER

Gilford Performance Textiles, our manufacturing partner of Greenscreen Revive, uses 75% of their thermal energy from methane gas from a nearby landfill. This is equivalent to 1 million gallons of oil. Gilford's waste water is treated on site before being discharged and their sludge is being used for land reclamation projects.

# method

## FOR A CLEANER FUTURE

Method's mission is to take dirty out of cleaning by making products that are safe for the environment and people. Our company was founded on principles which align with Cradle to Cradle principles, including green chemistry, closed loop design, recyclability, and biodegradable ingredients.

Cradle to Cradle Certification helps us validate our environmental and health performance and demonstrate how we make improvements over time.

Method's approach to innovation spans the entire company—from our plastic surgeons (aka packaging engineers) to our green chefs (aka formulators). We do not believe that a truly sustainable company exists yet. But because we aspire to pioneer a cleaner clean, we continuously make real steps towards that goal.

We strive to continually improve in all of the Cradle to Cradle Certification's five criteria.

### MATERIAL HEALTH

100% of Method's ingredients are screened before our chefs begin formulating new products. Our ingredients are assessed by McDonough Braungart Design Chemistry (MBDC) on more than 15 endpoints for environmental and human safety. We use these assessments to select the healthiest ingredients available and to work with our suppliers to improve the chemistry of existing ingredients. This process has led to development of new, biobased ingredients to replace petro based ingredients. One



example would be levulinic ketal ester, a natural, degradable solvent that method helped pioneer that is a replacement for traditional glycol ether solvents in cleaning products.

### MATERIAL REUTILIZATION

Method's biological and technical nutrients are designed for closed loop cycles. We were the first cleaning company to source 100% post-consumer recycled content for our PET bottles. We also design our packaging for recyclability by selecting plastic resins that are most commonly recycled in curbside collection programs. There is enough plastic already on the planet—we try to keep it cycling as much as possible. In 2012, Method launched the world's first bottles made with a blend of recovered ocean plastic and post-consumer recycled plastic. Tons of plastic enter the oceans

every year. Using plastic recovered from the ocean in place of virgin plastic is a reminder that we have enough plastic on the planet, and we should use what we already have.

### SOCIAL FAIRNESS

Method is a founding B Corp and a long-time supporter of integrating social accountability into our company structure. Our mission includes an explicit commitment to social impact. Method also gives our employees three days each year to volunteer in the community.

### ENERGY CONSERVATION

Method has internalized our carbon reduction strategy to facilitate energy conservation and carbon emission reductions that are associated with mixing and packaging our products. In addition to purchasing renewable energy credits, we make real carbon reductions within our supply chain by providing financial incentives to our suppliers that implement energy and water conservation strategies. In the past, method's incentives have led to new projects like water recycling and installing solar powered fork lifts.

### WATER STEWARDSHIP

Because our products touch water throughout their lifecycle, method pays close attention to our water footprint. We have identified several ways to minimize water use and contamination. Several of our facilities use practical processes to eliminate effluent. One facility uses reverse

osmosis water production using high pressure filters to remove any chemicals in the water intake. Our products themselves are optimized to biodegrade, minimizing impacts to water treatment systems and water bodies. To push the limits of water use in our products, our chefs formulated several concentrated cleaners including the only 8x concentrated detergent, which has no added water in its formula. That way, we aren't selling and transporting water—that's what your washing machine is for.

Cradle to Cradle Certified helps us validate and demonstrate how we make improvements over time.

## STICKING TO SUSTAINABILITY

Micro-Pak's sustainability story is embedded in our company's mission. Our products and services are designed to prevent consumer products from "going green." While we all want to be kind to the earth, allowing mold to develop when goods are packaged in humid Asian climates and shipped between continents is one type of green we can do without. Our mission is to eliminate mold from the supply chain, which means that fewer of our customers' goods are destroyed by mold and mildew. It also means that a lot less of our scarce natural resources are used, burned up and thrown away in the process.

Micro-Pak's most significant innovation is arguably the one that brought the company into being. The creation of Micro-Pak Stickers and Sheets provided a replacement for the silica gel packets that are ubiquitous in consumer product packaging.

Micro-Pak products are designed to activate when the moisture content within a packaged consumer product reaches a certain level. At that point, an active ingredient is released which actually prevents mold growth. Extensive third-party testing confirms that Micro-Pak products are significantly more effective at preventing mold than silica gel and other alternatives. Additionally, Micro-Pak products have substantial environmental advantages over silica gel, beginning with manufacturing efficiency. Far fewer inputs are required, including raw materials, energy and water; and far fewer outputs result, such as waste and greenhouse gas



emissions.

Our products are also much more efficient during transportation. A typical silica gel packet is 5-10 times heavier than a corresponding Micro-Pak product. Although the absolute difference may appear small, when you apply it to billions (yes, billions) of individual intercontinental shipments every year, using Micro-Pak products can lead to significant savings in transport fuel and lower greenhouse gas emissions from transportation. Lastly, Micro-Pak products are recyclable at end of life, while silica gel ends up in a landfill.

In the past three years we have built on the inherent environmental advantages of our products by creating a greatly expanded sustainability platform. Over that time we have developed a comprehensive sustainability strategy, brought in dedicated staff to execute it, and created an Emissions Calculator that generates a high-level impact assessment of manufacturing and shipping our products

versus those of our competitors.

Because of its credibility and comprehensive approach, Cradle to Cradle certification has added an important element to our stakeholder engagement. The certification provides a critical platform for transparency around the material health of our products.

The Cradle to Cradle process has also helped identify opportunities that are now our top sustainability priorities. We see energy use and greenhouse gas emissions as having the biggest potential for improvement. We have conducted a carbon footprint and are setting goals for reduced emissions through improved manufacturing efficiency and the installation of renewable energy capacity at our manufacturing facilities. The comprehensive Cradle to Cradle material testing also revealed the opportunity to improve the environmental footprint of our products by replacing certain pigments. We have identified and implemented better-performing alternatives.

A third priority is conducting a life-cycle assessment to benchmark our environmental footprint. An LCA provides customers with increased transparency about our environmental performance, and gives us a baseline from which to innovate the next generation of Micro-Pak products, with the goal of improving to no less than Cradle to Cradle Gold certification.

Our core customer base, which includes major retailers and global footwear and apparel brands, is aligned with our sustainability commitments. We have found that our sustainability platform has helped unlock new opportunities with industry leaders increasingly concerned with their companies' environmental performance. Cradle to Cradle has added credibility to our efforts to date and is helping define our focus going forward.

**Cradle to Cradle Certification provides a critical platform for transparency around the material health of our products.**



## SPINNING A NEW YARN

Minlan has been in business since 1984. Based in Taiwan this company is totally invested in new materials that are durable and provide excellent quality to their customers with a positive environmental impact. The Cradle to Cradle Certified yarn is a polypropylene base that is durable, cost effective and non-toxic. And it looks good.

Minlan has devoted themselves to the study and production of eco-friendly products through their Cradle to Cradle certification. Their research led them to devote most of their production using Polypropylene. Polypropylene has

particularly low melting point which makes it a better choice from an energy use standpoint. It is also very easy to recycle. The innovation of their production process enabled them to declare Polypropylene as:

- lowest energy, due to decrease in temperatures during in the whole process;
- lowest waste product;
- no water pollution due to the solution dyeing process which allows them to add colorant during the extrusion

process;

- excellent carbon reduction as part of recovery of heat and water during the production process;
- reutilization of all remnants to produce socks, gloves and reutilize into recycled apparel and accessories.

The reuse process is a critical part of the Cradle to Cradle inspiration that required their team to come up with useful ways to reuse remnants as opposed to turning those materials from waste to energy as they move to a more sustainable production process.

The leadership team at Minlan is completely invested in sustainability and are proud to be part of the Cradle to Cradle certified products family of companies.

They have committed to getting at least four more products certified in the coming year. They have been working with McDonough Braungart Design Chemistry and the team in Charlottesville to help optimize their product. They have invested in dyes and are phasing out all red assessed dyes working hard to eliminate any chlorine based dyes.

When you think of Minlan you begin to see how one company within the textile industry really makes progress towards making the world better through the certification process. The company's commitment to sustainability had been part of their operations but by deciding to take on certification their innovation started.

Minlan has an active collaboration with the Taiwan

Textile Research Institute in helping to bring new materials and dyes to the very robust textile industry in Taiwan. The TTRI, formerly the China Textile Institute, is focused on bringing more value-added products to the industry as well devoting resources to corporate social responsibility and the development of friendly "green" textiles.

Their factory produces 3,000,000 yards of yarn a month. Their focus on durability means that their yarn is the basis for many adventure fabrics including Cordura® which is being worn by explorers around the world, including Helen Thayer. Ms. Thayer, author and National Geographic photographer is a spokesperson for the Cordura® brand. Minlan yarn is also being used by Timberland's canvas shorts as well as Wrangler's RIGGS® Work Wear.

Through the example of Minlan we can start to imagine how an initiative with the textile industry could begin to have a profound effect on the future.

Imagining a profound effect on the future.



## DRIVERS OF SUSTAINABLE DEVELOPMENT

Royal Mosa is an innovative Dutch ceramic tile producer, located in Maastricht, The Netherlands, since 1883. Mosa's vision is that in the future, buildings will consist of nothing but 'sustainable' building materials, which have been designed and produced in a responsible manner and can be used without health risks. This requires a new approach from manufacturers, together with architects and builders. Mosa wants to be "in the driving seat" of these developments. We chose C2C because it is a positive, integral approach focused on innovation.

We believe that if you are serious about implementing the C2C concept in your company you might as well certify your products. It shows that your company is taking C2C very serious, it creates trust and credibility in the market.

Mosa tiles are qualified as "designed for the technocycle, but safe for the biocycle", a qualification which confirms that Mosa tiles do not release any harmful compounds during their useful life and do not damage nature in case of accidental dumping. The main constituents of Mosa tiles are clay and sand, natural raw materials that are present in

abundance in nature. Mosa C2C tiles are free of hazardous compounds, the result of years of R&D in which all the tile ingredients—including our suppliers' raw material chain—were analysed and classified to ppm (parts per million) level.

Very strict leaching tests carried out by independent laboratories were part of this program, as the C2C criteria governing the absence of hazardous compounds are much more stringent than the prevailing environmental legislation.

Mosa tiles consist solely of natural raw materials that can be recycled. The tiles currently contain a percentage of "pre-consumer" recycled material originating from production waste as well as residual materials from the stone and glass industry. Mosa wall tiles contain 22 or 25 percent of recycled materials, depending on the type of tile, and floor tiles contain 21 or 45 percent.

Mosa uses water during various production phases. Reusing water is an essential element of appropriate use of this scarce and expensive resource. Process water is purified in an in-house water treatment plant and the residual sludge is recycled in the tile production process. Since 2010 the cooling water cycle in the wall tile factory is closed, resulting in a 60% reduction of the total ground water volume to be pumped up. Our aim is to either vaporize or reuse all process water by 2020. An step-by-step action plan is currently being implemented to achieve this.

Cradle to Cradle also extends to energy consumption and in particular its origin, since the amount of energy consumed is irrelevant when it is generated by renewable sources.

In 2007 Mosa switched over entirely to electricity generated by hydropower stations. This, in combination with continuous improvement of the production processes, has resulted in a 48% reduction of CO2 emissions per tonne finished product over the past ten years. The next step is to find further renewable energy sources for the longer term, in particular for the kilns in which the tiles are fired at ca. 1100 °C. Mosa is actively seeking renewable sources that

are available in sufficient quantity and quality. Meanwhile, Mosa works according to the "trias energetica" principle: the residual heat from the furnaces is recovered for reuse in the production process.

Mosa implements the local-for-local principle whenever possible, namely responsible production close to key markets and regional sourcing. Nearly 90% of all raw materials are sourced from controlled quarries in Holland, Germany and France, within a 500 kilometer radius from

**We chose C2C because  
it is a positive, integral approach  
focused on innovation.**

Maastricht.

Mosa's ongoing efforts to improve the labour conditions have resulted in our working environment being rated as one of the best in the European ceramic tile industry. More than 200 people per year are offered an opportunity to combine schooling and training-on the job. Also Mosa puts great effort on being a good neighbour to the urban district where it is located.

In this way Mosa, the largest industrial employer in Maastricht, sells to international markets while at the same time it fulfills the natural obligation to keep the welfare, know-how, and pride for its people and the region.



## PLAY WITHOUT PVC

Our mission at Playworld Systems is to create safe and healthy environments for children. To that end we committed to eliminate PVC and the associated phthalates from all of our products. No equipment existed to meet our needs, so we developed machines in-house that could automate high-volume, large parts.

After months of work and a \$2.5 million investment, Playworld Systems succeeded in becoming 99.99 percent PVC-free. After we achieved our goal, we wanted to communicate our sustainability philosophy and find a

credible certification program that would help us establish continuous sustainability improvement efforts. We sought out a program with criteria that would benefit the environment and our customers and help guide us in our overall sustainability efforts.

In 2010, Playworld Systems partnered with MBDC to integrate Cradle to Cradle® design principles throughout its product lines and worked to source safe and healthy materials that can be kept in infinite use. By the next year, 18 product lines were Cradle to Cradle Certified at the

Basic level. Playworld Systems continued to make strides to improve its environmental footprint, and now the vast majority of the company's 2011 catalog products (including 23 product lines) are Cradle to Cradle Certified at the Silver level. According to Jay Bolus, VP of Technical Operations at MBDC, "Playworld Systems has made an impressive company-wide commitment to obtain certification for all of its products, and no other company with such a broad product offering has done that."

Playworld Systems worked with MBDC to contact more than 125 suppliers and sub-suppliers to validate the safety of each material for human and environmental health. The company changed its purchase specifications to meet the stringent certification requirements and ended relationships with certain suppliers that were unable to meet the guidelines. Through this exhaustive exercise with MBDC, Playworld Systems was able to eliminate neoprene (a material related to PVC) from its belt bridges and identify a safer polyethylene coating for high-traffic parts.

Aligning with the Cradle to Cradle® philosophy also required Playworld Systems to analyze its waste streams. The modular playground equipment was already designed for easy disassembly and recycling, and over 95 percent of the materials used in the products are recyclable when appropriate recycling facilities are available. Playworld Systems went even further to develop solutions that support its customers in recycling the products and keeping the valuable materials out of landfills. Instructions are provided to all customers on how to recycle the play equipment when

it has reached the end of its long, useable life. The company boosted the recycling rate of its manufacturing waste to 95 percent, and it implemented a "Recycle from Home" program that allows employees to bring in recyclables from home that are not accepted in municipal recycling streams. This successful recycling service has diverted more than 16,700 pounds (more than 8 tons) of materials from landfills since the program began in July 2012. Our desire to become a more sustainably-focused company led to our alignment with the Cradle to Cradle® philosophy.

Playworld Systems continues its commitment to protecting the planet for generations of happy, playful people, each and every day.

Playworld Systems continued to make strides to improve its environmental footprint... the vast majority of the company's 2011 catalog products are Cradle to Cradle Certified at the Silver level.





## CHALLENGING OURSELVES & THE INDUSTRY

In 2013, PUMA launched two new collections of lifestyle apparel, footwear and accessories, both Cradle to Cradle Certified Basic. The collections include re-issues of iconic PUMA styles such as the PUMA Suede and T7 Track Jacket, along with newly designed windbreakers and sweatshirts and a fully recyclable backpack and shoulder bag.

With InCycle, we wanted a challenge for ourselves and the way the footwear and apparel industry could innovate for sustainability. To achieve a third party certified line of

products we pushed both our suppliers and ourselves. In order to get a full line that was Cradle to Cradle Certified, we had to innovate at both micro and macro levels. At the micro level, we looked at what types of pigments and dyestuffs we used in our products. At the macro level, we developed a system within our stores that could take back products and put them into a system where they could be recycled or reused. That required us to partner with organizations like EPEA in Germany, who have the chemistry knowledge and

could work with our supply base and innovate within our supply chain. We also partnered with I:CO to install Bring Back Bins in the majority of our stores that can take products back.

The PUMA Bring Me Back program is a product recycling initiative that creates a closed-loop system aimed at diverting products from the landfill. The majority of PUMA locations now have Bring Back Bins that can accept clothes, shoes and bags. After an InCycle product owner has worn the item to his or her heart's content, they can return it to a PUMA Bring Back Bin to help close the loop. With our recycling partner, I:CO, we handle the rest.

Through developing the InCycle collection we have challenged ourselves and learned quite a bit from the process. Our cross-functional team worked together to deliver the collection: from our sourcing organization, designers, innovation experts, as well as strategy and marketing so we had a 360-degree approach to the collection. We learned what it takes to deliver a Cradle to Cradle Certified Basic collection and use that experience to start impacting the way we build our standard products. In this journey, we address how we design our products from the beginning. For example, an InCycle tee shirt has been slightly tweaked to make it work within the Cradle to Cradle Biological Cycle, swapping a polyester sewing thread for cotton. It is a very small change, but something we have had to do to adhere to the criteria — a journey that we have taken together with our thread supplier.

The InCycle collection also challenged our marketing team to convey the value of the Cradle to Cradle principles and certification in clear, engaging terms. We developed attention-grabbing point of sale materials such as an in-store terrarium to show the Biological Process of our InCycle Basket. In addition to other marketing tools such as an explanatory video, these pieces helped convey the innovative aspect of the InCycle collection to not only our

customers but also our internal team members and store employees.

One of the very tangible outcomes of the work on the InCycle collection is our pigment and dyestuff positive lists. These are lists of formulations that adhere to the Cradle to Cradle principles. We have developed those formulations in conjunction with our suppliers and EPEA, and are now sharing these with the textile industry through the Zero Discharge of Hazardous Chemicals project. Through this initiative, multiple brands will have access to this list. With this shared knowledge, other brands may be able to start building on these efforts to move the entire industry towards a more sustainable future.

**We were able to learn exactly what it takes to deliver a Cradle to Cradle Certified collection and use that to start impacting the way we build our standard products**



## THE HEALTHY ALTERNATIVE TO FOAM

Radium Foam is the first bedding foam supplier in the world to receive the Cradle to Cradle Silver certificate for its 100% Natural Vita Talalay.

Vita Talalay is renowned for its cushioning support and natural ventilation and therefore is a vital component in premium comfort beds. In 2008 Radium introduced its 100% Natural Vita Talalay latex to the bedding industry. The objective was to meet the increasing demand from consumers for natural products. Natural products are considered healthier options and are more trusted than

artificial products.

In 2010, a logical next step was to achieve an objective certification for Natural Vita Talalay; one which not only looked at the product but also the process to create it. Radium Foam found this with Cradle to Cradle certification, which requires a long term commitment in which continual improvement is key; not only in terms of our materials but also in our processes and organization. Sustainability for Radium is our long term commitment. We consider it our fundamental "point of entry;" a must, no matter what the

circumstances are. Natural Vita Talalay is the healthiest option for current generations and will always be the most responsible option for future generations.

Radium is also happy that, by having improved Natural Vita Talalay to the level of achieving certified Cradle to Cradle™ Silver accreditation, we offer consumers the most responsible choice and we as an industry. Together with partners like bedding retailer Auping, we have put effort into closing the Cradle to Cradle circle. We believe a Cradle to Cradle bedding industry is within close reach. The illustration above shows how the industry could appear in the Netherlands if everybody works together towards the end goal, a full Cradle to Cradle industry.

The Hevea Brasiliensis tree grows in tropical countries like Malaysia, Vietnam and India. From this tree natural latex can be obtained. This natural latex is sourced by Radium Foam and used in the Vita Talalay process to make comfortable and naturally ventilating foam for the bedding industry. Natural Vita Talalay, certified Cradle to Cradle™ Silver is supplied to bedding manufacturer and retailer Auping, which creates its Cradle to Cradle™ Silver certified bed named "Essential." This bed is sold to consumers, who can benefit from a healthy and refreshing sleep.

After the mattress has reached the end of its use the materials can be separated and the Natural Vita Talalay can be either recycled into a new product (e.g. for floor mats), or reused to make a virgin rubber again which can have a second life in a new product cycle (e.g. car tires).

This is how Radium Foam sees the future of the bedding industry. Cradle to Cradle thinking helps everyone by making more healthy and environmentally friendly products. For Radium Foam this means being the most naturally responsible, yet breathable and comfortable option for a better night's sleep.

### BIOLOGICAL CYCLE



This natural latex ... is used in the Vita Talalay process to make comfortable and naturally ventilating foam



## DESIGN WITH REUSE IN MIND

Rendemint was founded with the desire to develop solutions for office, outdoor and home that were completely designed with the Cradle to Cradle design philosophy. Our company was founded after watching a documentary on Cradle to Cradle presented by Netherlands Public Television (NPO) called "Waste+Food". If it weren't for Cradle to Cradle, our company would not have started.

Without compromise, we walked through all stages of the manufacturing process, and we discussed the materials

the production energy, glues, manufacturing and logistics involved. When it came time to seek certification, there was no need to change a thing. And the Rendem series is Cradle to Cradle Certified Gold.

The materials used and the finishing layers are free from any harmful substances. No toxins are used, no formaldehyde, and the collection is more than carbon neutral (carbon positive). The Rendem series is produced without any fossil fuels. The production facility runs on

100% geothermal energy. A minimal amount of renewable resources are used, and a maximum of innovation guarantee we are making most sustainable furniture in the world.

We started with the wood. No forest is felled for the Rendem series, not even Forest Stewardship Council (FSC) managed forests. All materials are agro-waste from rubber and coconut plantations. We use only plantation wood from trees that are commercially unprofitable. In their original use, they are produced as trees for latex.

Wood from rubber trees has a gentle, light green-toned grain and color, suitable for indoor use. Wood from coconut palms has a fine grain and a dark color that is suitable for indoor and outdoor use. Pigments added to the natural oil finish give the wood a transparent protective layer customized to the customer's liking.

When it comes to design for reuse and participation in the Circular Economy, we have developed procurement system for all our products called PRP, which stands for Pre-Returnable Procurement. In short, PPR is a contract between manufacturers and end users in which they mutually agree to give back, and suppliers are legally obliged to take back and reuse products. PRP is independent of ownership, lease or lease-performance and can be used for every product, every project, every service. It allows someone to significantly contribute to an actual circular economy, regardless of the form of financing. The contract has unlimited transferability and includes identification of raw materials, specifications,

and engineering drawings as well as a "Future Innovation Module" that integrates future innovations into the contract.

Optimal sustainability is the driving force behind the Rendem series of furniture. Not just because of our concerns about humans, environment and climate, but mainly because of the future. With the Rendem series, we are working to meet the needs of the present without compromising the ability of future generations to meet their own needs.

Some see sustainability as a limitation to design, but design and sustainability can go together very well. To achieve this, one must design entirely from a sustainable point of view, and that is exactly where the Rendem series distinguishes itself from the market. For us, design is combining healthy, natural materials with contemporary technology within a timeless design with respect for people, environment and future generations.

**If it weren't for Cradle to Cradle, our company would not have started.**

# replenish.

## CONCENTRATED ON SUSTAINABILITY

While ironing his shirts one afternoon, Jason Foster was struck by a bolt of creativity to design a new kind of bottle: a reusable upper bottle that attaches to a replaceable concentrate refill pod. The intent of this radical design? Usher in a new era of “easy-to-mix-with-water” cleaning concentrates that are more affordable, more convenient and dramatically less wasteful than the pre-mixed disposable products we buy today. Foster’s innovation would lead to the founding of Replenish, a company aimed at improving the user experience for concentrates.

Concentrates are a win-win-win-win for consumers, manufacturers, retailers and our environment. They save money and space, are lighter to carry and last longer than pre-mixed products. However, people have historically avoided concentrates for a simple reason—they’re not easy to use. Mixing and measuring requires a second container, or even worse, a funnel to keep things from getting messy. Furthermore, the consumer product goods industry hasn’t made innovating the concentrate user experience a top priority.

Thus, the consumer marketplace stays stuck in a single-use, disposable world for products like mouthwash, hand soap, shampoos, beverages, and room deodorizers, as well as other everyday cleaning products like multi-surface cleaners. This single-use mindset costs consumers hundreds of millions of dollars in wasted energy and plastic spent on transporting and packaging water that could



easily be added at home instead of the factory. This simple change could cut energy, plastic and CO2 by 90% for many consumer products.

The clarity of Foster’s vision to fundamentally change packaging did not translate into a simple engineering and production endeavor. Foster was unaware that his design for the Replenish bottle defied 75 years of bottle manufacturing. Fortunately for Foster, he found inspiration in Cradle To Cradle principles and approached the Institute with a rendering of his concept—a reusable upper bottle that attaches to a replaceable concentrate refill pod. The big idea: a small three-ounce concentrated refill pod can make three bottles worth of a product (over 50 total ounces) when users add water. In fact, water makes up 70%- 90% of all consumer liquid products. To make mixing easy and eliminate the inaccuracy and mess, Foster designed

a measuring cup directly inside the reusable bottle. To measure concentrate, you simply turn the reusable bottle upside down and gently squeeze the refill pod until the measuring cup is full. Next, flip the bottle right side up and add water. Now everything you need to mix concentrates is integrated into one design.

Since nothing like Replenish’s Refillable Bottle System had been seen before, the Institute connected Foster with experts to help develop a new manufacturing approach and find materials durable enough for many cycles of reuse. The key was starting from scratch at the front-end with the right design for concentrates, rather than retrofitting existing bottle designs and compromising the user experience. If it were easy and saved money, people would be motivated to truly change their behavior.

To prove it, Foster needed to get the Replenish platform in the hands of consumers at mass retail, not simply as a niche sustainability product. In order to compete at this level, Replenish had to be a better overall user experience, it needed to look nicer on the counter and feel more like a quality appliance in your hand—all while being less expensive on a per ounce basis than the existing disposable, pre-mixed products. So with the Institute’s help, Foster created and branded a 99% plant-derived, nontoxic, readily biodegradable, and pH neutral Multi-Surface Cleaner and sold it using Replenish’s Refillable Bottle System. This

allowed the technology to get to market quickly rather than wait for the first brand to adopt it.

Fortunately, the strategy was successful and Replenish announced their Cradle To Cradle Gold Certification on May 25 of 2011 for a Multi-Surface Cleaner that would eventually become a top pick of Good Housekeeping and Martha Stewart Living. Replenish Multi-Surface Cleaner is sold in stores across the US, Canada, Japan and the UK. .

**Cradle To Cradle thinking offered a framework to bring these ideas to fruition and provided a language that everyone could understand—from manufacturers, to retailers to consumers.**



## REUSABLE WORKWEAR

REWORK Cradle to Cradle workwear is the first cotton industrial clothing that will not eventually end up in a trashcan. The workwear is designed in such a way that all its constituent parts can be reused. Old and worn REWORK workwear can be used to spin new yarn or to make compost. The concept is innovative as well as sustainable and has a recognizable quality for a price that is comparable with that of normal industrial clothing. REWORK Cradle to Cradle workwear is the result of a unique partnership — two years of studies, trials and tests between workwear producer Van Puijenbroek Textiel, textile service companies Berendsen and Lavans and waste management services provider Van Gansewinkel.

Van Puijenbroek Textiel was founded in 1865 as a family business. Since then, Van Puijenbroek Textiel has grown and is now a leading player on the international market for professional industrial and safety clothing. Berendsen and its family of companies have more than 100 years of experience in the textile and service industry, providing solutions to lease, source, clean and maintain the textiles. Laban is a service company, mainly focused on the rental and maintenance of clothing, floor mats and hygiene services with the aim of being “the greenest laundry of Europe”. Van Gansewinkel Group is both a waste service provider and a supplier of raw materials and energy with a workforce of approximately 5,800 and an annual revenue of more than €1.0 billion.



The story began in 2010 when Van Gansewinkel asked Van Puijenbroek whether the company would be interested in designing completely recyclable workwear. In order to live up to its “Waste no more” slogan, the waste management services provider and raw materials and energy supplier was looking into ways of reducing its own waste, including the workwear its own personal were using. Van Puijenbroek Textiel accepted the challenge and began examining the possibilities together with Michael Braungart and his team at EPEA.

It soon became apparent that the textile company could not simply convert existing product lines into completely recyclable clothing. Van Puijenbroek had to start fresh, with a completely new design. And to be successful, the project also had to have the support of industrial laundries, the companies that manage clothing throughout its life cycle. The textile service companies Berendsen and Lavans were especially enthusiastic, as both these companies have very strong commitments to sustainable business practices and found the Cradle to Cradle® concept to be completely in line with their objectives.

In order for true recycling to be successful, the fabric had to be made from one type of fiber. Van Puijenbroek eventually decided on 100% cotton woven with a panama weave to give a quality of 270 grams per square meter, which is comparable with the qualities used for other industrial workwear. Next, the project group started looking into everything needed to process the fabric. The chemicals and dyes also had to be environmentally friendly. The suppliers gave the specifications for all the materials to EPEA so that it could test whether they were suitable for the Cradle to Cradle® concept. This was a lengthy process. For example, in order to change the color of rough fabric from ecru (greyish-pale yellow) to black, 26 different chemicals and raw materials were needed. It took more than a year for the fabric to pass all the EPEA tests. What’s more, the clothing needed to withstand repeated washings at 95 degrees Celsius, the temperature used by industrial laundries.

Cradle to Cradle is more than recycling. Smart solutions were used from the outset in its design and production. The way in which REWORK workwear is dyed is, for example, much more environmentally friendly than traditional methods. As a result, the cotton thread does not contain any harmful substances, which means it can be used as a raw material for making, for example, new workwear. And that is precisely the idea behind the Cradle to Cradle: waste is food. This approach is a good way of tackling the increasing global

scarcity of raw materials. Why throw away valuable raw materials like cotton, when you can easily reuse them?

The REWORK Cradle to Cradle® fabric is made from 100% cotton woven with a panama weave to give a quality of 270 grams per square metre, which is comparable with the qualities used for other workwear, for example, the Van Puijenbroek Textiel K1. REWORK Cradle to Cradle® fabric can also be washed at 95 degrees Celsius, which means it can be cleaned by industrial laundries.

**A unique partnership — two years of study, trials and tests.**



## UNZIPPING POLYETHYLENE TEREPHTHALATE

When we first read Cradle to Cradle, we immediately saw complementary connections with what we were trying to accomplish at SABIC with VALOX iQ™ technology. VALOX iQ™ resin is a product of up-cycling, consistent with the Cradle to Cradle principles. Used in a wide range of products from automotive to consumer products, and from electronics to fibers, VALOX iQ™ resin has provided designers with a new alternative at the hard to find intersection of recycled content and high performance.

A limitation of recycled plastics is that many recycling

processes down-cycle the material, breaking down the polymers and reducing their performance with each life cycle. SABIC's VALOX iQ technology overcomes these limitations by using chemical processes to unzip polyethylene terephthalate (PET) bottles into their precursor chemicals, purify them, and then use them to create new polybutylene terephthalate (PBT). The resulting VALOX iQ resin contains up to 60% recycled content with performance that is nearly equivalent to virgin, non-recycled PBT.

The process up-cycles lower performing packaging

grade PET from soda and water bottles, with lives measured in weeks, into high quality engineering plastics that can be used for electronics, cars, fabrics, and buildings, with useful lives measured in years. By displacing the virgin raw materials used to manufacture PBT, VALOX iQ resin has been shown through peer reviewed life cycle assessment to reduce the energy and carbon footprint of the material by up to 61% and 49% respectively. Additionally, the process yields other recycled by-products, consuming 0.87 kg of PET waste for each kg of VALOX iQ resin produced.

VALOX iQ resin may be combined with modifiers, reinforcement, colors, and other plastics to create a wide variety of engineering thermoplastic materials. One of these materials, VALOX iQ8280SF resin, was first certified by MBDC as a Cradle to Cradle product in 2009 for its relevance in the commercial interiors and furniture market and because the Cradle to Cradle mark so accurately represented the aspirations for the product line. VALOX iQ8280SF resin, currently available from SABIC, is a 30% glass reinforced plastic and a potential candidate for furniture, automotive and telecomm applications.

Since then, variations of these up-cycled plastics have been used in electrical vehicle chargers, desktop computer cooling fans, automotive exteriors, and consumer products. VALOX iQ resin has been one of SABIC's most decorated products, winning awards from the Society of Automotive Engineers (2006) and the Society of Plastics Engineers (2007). In addition, it received the Dutch Responsible Care Award (2009), the China Plastics Technology Green Material Innovation Award (2012), and was named PLASTPOL's Best Material Ingenuity (2012).

The Cradle to Cradle experience was a catalyst for SABIC to develop its own internal sustainable product standard to help guide innovation within the company. The internal standard considers both life cycle assessment, as well as green chemistry considerations, consistent with the concept of material health in Cradle to Cradle. This product standard,

and our VALOX iQ successes, have inspired new recycled plastics, light weighting solutions for automotive fuel economy, and waste reduction solutions for manufacturing complex products.

SABIC also continues to invest in VALOX iQ resin. The VALOX iQ family now includes more than seven variations to help solve different design challenges, including XENYO iQ™ resin which is best suited for outdoor products, rugged consumer goods, and power tool housings. SABIC is looking to continue its success with new customers interested in its VALOX iQ and XENYO iQ resins.

The Cradle to Cradle experience led SABIC to develop its own internal sustainable product standard to help guide innovation within the company.



# sapa:

## LIGHTPOLE TO LIGHTPOLE

Sapa Pole Products, business unit of the Sapa Group and producer of aluminum light poles, flagpoles and traffic regulation systems, works in a safe and responsible manner, which expresses respect for the environment and the health of our employees, our customers and the communities in which we operate.

Sapa first came across the Cradle to Cradle concept through the Aluminium Center in the Netherlands. Without realizing it, Sapa had already taken a step in the direction of Cradle to Cradle by recycling the aluminium of old light

poles for the use of producing new light poles. The Cradle to Cradle snowball has continued to roll at Sapa ever since. The realization of a Cradle to Cradle light pole became top priority.

In the past years we analyzed our production process with help of an independent consultancy group. At different stages in our production process we have implemented energy savings and with our patented reinforcement profile we managed to reduce the weight of our light poles by up to 20%. Sapa also made a transition to green energy for all

energy used in the final manufacturing stage and is using 100% renewable energy via certificates.

Historically, the light poles produced by Sapa Pole Products consisted of between 80 to 95% recycled aluminium. After critical research on scrap purchasing and optimizing the calculation process of the input of metal, the casthouse department is now using a guaranteed minimum of 95% recycled aluminium in the production of all Sapa Pole Products' light poles.

Apart from the recycled aluminium, other materials used in the light pole have been subjected to critical examination. To fulfill the Cradle to Cradle requirements for all other material components, we closely cooperated with our suppliers to investigate all the ingredients and if necessary to search for substitutes which met the Cradle to Cradle requirements. In some cases this meant a change to a new supplier.

The certification process took two years - in close cooperation with EPEA. In September 2011 we obtained the silver Cradle to Cradle certification for our aluminum light poles, as the first supplier of Cradle to Cradle certified light poles worldwide. A logical next step in the continuous development of Cradle to Cradle is the focus on closing the cycles. Sapa set up a take-back system in collaboration with partners. With this take-back system, Sapa closes the aluminium loop.

When delivering new poles, Sapa retrieves old aluminum light poles in its entirety (e.g. including fitting, cabling etc.), after which all parts are stripped and fully brought back into the technical cycle. The residues that Sapa cannot handle are brought back into the loop by the Cradle to Cradle certified waste specialist Van Gansewinkel. For dismantling the complete light poles, Sapa gets help from a public company whose aim is to promote people who cannot return to the labor market without assistance. So the take-back system also contributes to the social engagement of Sapa.

Cradle to Cradle has become an integral part of our business. The implementation of the Cradle to Cradle

philosophy required commitment by the entire business. It is an on-going process because of continuous new developments and findings. The awareness of the employees of the Cradle to Cradle philosophy changed the internal culture. Everyone working within the company contributes.

The realization of a Cradle to Cradle light pole became our top priority.



# SCHOTT

## GLASS THAT GIVES BACK

We started with a corporate goal to protect the environment and conserve natural resources. Now, we produce our architectural product PYRAN® Platinum fire-rated glass-ceramic exclusively by the microfloat process and are able to achieve high-quality, low-bubble-count glass without the traditional refining additives antimony and arsenic.

Our next challenge was to educate our architectural customers on how they can add value to building projects using our environmentally friendly fire-rated glazing product. We also wanted to benchmark our manufacturing

process against other environmentally conscious companies in the industry. We chose to work with McDonough Braungart Design Chemistry's (MBDC) Cradle to Cradle Certification Program because of its close ties with the LEED building rating system.

The first step we took as an applicant was to disclose, under the protection of a non-disclosure agreement, to MBDC the chemical composition of our product down to 100 parts per million, along with the specifications from all of our raw material suppliers.

The second step in the application process was to collect detailed energy and water usage at our manufacturing site. We have the advantage of manufacturing PYRAN® Platinum glass-ceramic at SCHOTT Technical Glass Solutions GmbH (SCHOTT TGS) in Jena, Germany, where local regulations and culture have focused on conservation of natural resources for many years. This part of the process was the most positive and satisfying, as it gave us a forum to tout the positive steps we had already taken in terms of eco-friendly practices, specifically in energy and water conservation. While we had been focused on improving the ecological impact of our production processes, working with the Cradle to Cradle certification program steered us towards considering the totality of the environmental impact of our product, from the beginning to the end of the product life cycle.

We pursue environmentally friendly energy usage through renewable resources and conservation efforts. We take pride in the fact that we purchase 20 percent of our electricity from renewable sources, including wind, biomass, hydroelectric, solar, and biogas, and that we generate electricity via on-site solar panels, that feed some power back into the grid.

Water conservation has also been a major focus at our manufacturing site. All of the buildings on site use low-flow toilets and fixtures. Self-audits of manufacturing areas at SCHOTT TGS are done every three months to identify areas for improvement, including opportunities to improve energy and water conservation. We already use greywater for 90 percent of the total water needs at our manufacturing site and freshwater is used only for drinking water and sensitive

manufacturing process steps. All process water is used in continuous loops, and only evaporative losses are replaced. Our wastewater is routed to the local wastewater treatment plant, which produces biogas.

The final area of concentration of the Cradle to Cradle certification program is corporate social responsibility, including labor practices and ethics, and service to the local community. Assuming responsibility for our employees and our company has always been part of the SCHOTT corporate culture. That is why safety and environmental protection are high-priority goals for SCHOTT.

SCHOTT's overall experience with the Cradle to Cradle certification process was very positive and informative. Our PYRAN® Platinum fire-rated glass-ceramic achieved Cradle to Cradle certification at the Silver level. The certification is reviewed on a yearly basis, giving us the opportunity to strive for higher levels of certification to acknowledge continuous improvement toward the goals of sustainability and conservation of resources. One example of our continuing involvement with Cradle to Cradle certification is the recycling program we implemented for our glass-ceramic that we previously thought was technically infeasible in the U.S. We also began an ambitious R&D project to improve the material content of our fire-protective interlayer. We are now considering applying for Cradle to Cradle certification for our environmentally-friendly products in other markets.

The feedback from our customers has also been very positive. Most are familiar with Cradle to Cradle certification and appreciate the added value the certification provides.

Working with the Cradle to Cradle Certification program steered us towards considering the totality of the environmental impact of our product...





## SUSTAINABILITY THROUGH INNOVATION™

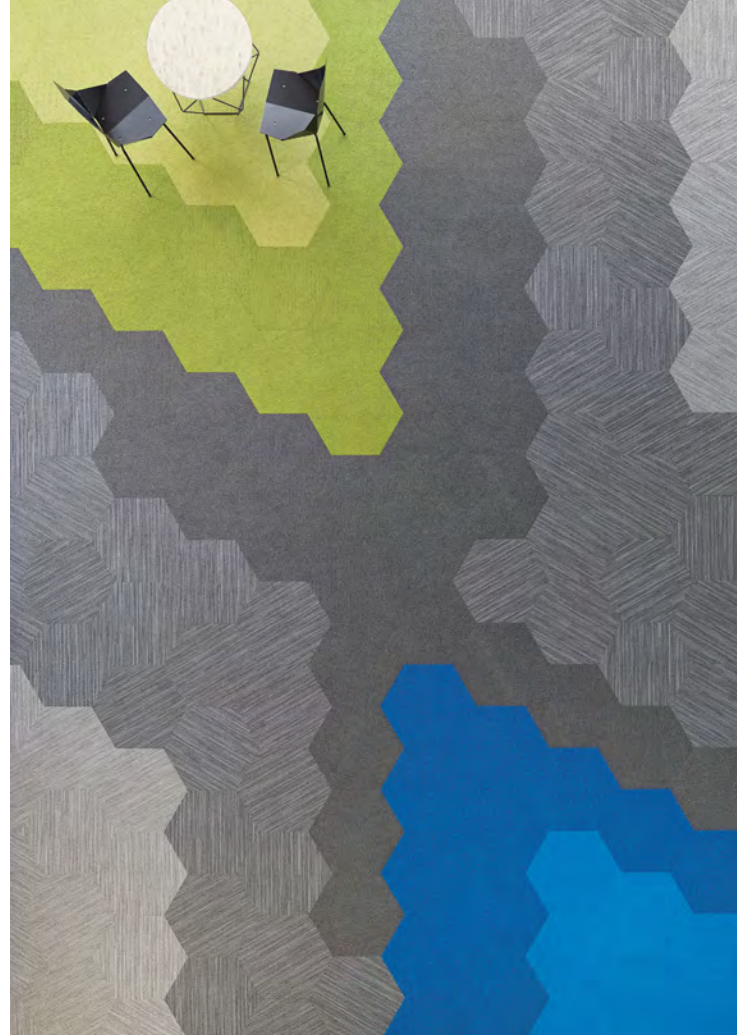
Shaw Industries was built on a long history of innovation—and a commitment to using resources to responsibly design and manufacture products that enhance quality of life for people all over the world—helping create a better future for our customers, our associates, our company and our communities in the process.

We believe this isn't simply the right thing to do. We believe it's the only thing to do. That's why we adopted a Cradle to Cradle design philosophy more than a decade ago, reinforcing our commitment to using only the safest, healthiest materials available—and to designing products that are as sustainable as they are beautiful.

### PIONEERING CRADLE TO CRADLE FLOORING

What if used carpet never had to be sent to the landfill? Instead, what if it could remain within a continuous cycle of use and reuse? What if it was made with safe, healthy ingredient materials—and assembled so that, at the end of its useful life, it could be reclaimed and reused in the manufacture of new carpet? What if this cycle took place over and over again? How much energy and water would we save? How much waste would we eliminate? How much valuable raw material would we conserve?

These were the questions our innovation and design teams sought to answer when we set out to create a commercial carpet tile backing that offered our commercial architecture and design community a more environmentally



responsible alternative to traditional PVC-backed carpet tile.

The result was EcoWorx®, the world's first Cradle to Cradle Certified, fully recyclable carpet tile—a product that elevated standards of sustainable product design both for our company and for our customers.

Now the fastest growing product in the commercial market, EcoWorx has been installed in several hundred thousand projects across 80 countries—and we are expanding production with new manufacturing facilities in the US and China.

### WE WANT IT BACK

Knowing viable channels for reclamation and reuse are key to a product's ultimate sustainability, we also pledge to collect and recycle EcoWorx at no cost to our customer under our Global Environmental Guarantee. The guarantee gives customers around the world the peace of mind that comes with knowing the EcoWorx tile they no longer need can easily become new EcoWorx tile.

And to fully complete the circle of responsible design, manufacturing, use and reuse, our post-consumer carpet recycling efforts also encompass all types of carpet. Through the world's largest post-consumer carpet reclamation and recycling infrastructure, we're reclaiming 100 million pounds of carpet each year. In the process, we're helping to keep more valuable material in a continuous cycle of use and reuse.

### DESIGNING FOR THE FUTURE

Spurred by the resounding success of EcoWorx, we now manufacture Cradle to Cradle Certified products across most flooring categories—and more than 60% of our \$4.5 billion annual sales are the result of our Cradle to Cradle Certified products.

Today, the Cradle to Cradle philosophy is an integral part of our approach to product innovation—and a fundamental part of our journey towards creating a better future for all.



What if used carpet never had to be sent to the landfill? Instead, what if it could remain within a continuous cycle of use and reuse?



## “RESIN”ATING WITH THE FUTURE

SK Chemicals utilizes state of the art technology to achieve harmony between human beings and their environment. SK Chemicals' focus on the development of an eco-friendly chemical portfolio is the hallmark of our balanced approach to profit and social responsibility. SK Chemicals business structure is divided into 'Green Chemicals Business,' and the 'Life Science Business,' encompassing its corporate mission 'Health Improvement of Humankind and Protection of Global Environment.'

Based on our technologies and capabilities we've

accumulated over the past 40 years, SK Chemicals Green Chemicals business has grown to a global enterprise that develops various products such as bio-based eco-friendly transparent heat-resistant plastic resin ECOZEN, high performance engineered plastic SKYGREEN PETG resins, and SKYPET PET plastic resins. SK Chemicals Green Chemicals Division is leveraging its world-class engineering expertise, and state-of-the-art production facilities in order to advance as a leading global manufacturer of environmentally responsible materials.

With applications ranging from consumer products, appliances and medical to construction materials, SKC advanced materials are an integral part of people's daily lives. SK Chemicals is committed to protecting those lives and the environment by manufacturing plastic resins which are carcinogen free, 100% recyclable, with the inclusion of renewable resources.

SK Chemicals shares the same vision as the Cradle to Cradle Products Innovation Institute: to make products that are a positive force for, society, economy, and the planet. Proceeding with the Cradle to Cradle certification allowed SK Chemicals to have an honest 3rd party analysis of the environmental impact of our business has on the planet.

SK Chemicals was honored to have received GOLD certification for our ECOZEN Bio-based PETG plastics resin, GOLD certification on our SKYGREEN PETG high performance engineered plastic and SILVER certification on SKYPET PET plastic resin. The certifications have re enforced what we have been striving for, and what we will continue to improve upon.

SK Chemicals is concentrating on benefitting mankind by creating chemicals products that enrich our lives in a sustainable manner. We will produce products such as bio-degradable packaging materials and bio-sourced materials for automobiles, which are lightweight and reduce environmental impact in both the production and end-use sectors of the product life-cycle.

We are practicing enterprise-wide sustainability management in all areas including production, product design and engineering, and corporate culture, based on the introduction of eco-friendly facilities, increasing the portion of eco-friendly materials, and "Green Culture" - encouraging voluntary participation of all employees.

To this end, SK Chemicals has selected bio-materials, composite materials, high performance materials and energy storage materials as the four new core businesses, and is conducting aggressive R&D activities to become a global leader among the chemical industries.

SK Chemicals was bestowed with the first-ever Gold level certification from Cradle to Cradle products innovation among the world's PET industries. We are very honored to be certified at the Cradle to Cradle Gold level and proud of such accomplishment as this certification is necessary for the SK Chemicals' overall vision statement.

SK Chemicals, which pursues endless change and innovation, is a company that thinks of gracious harmony between nature and humankind. The company is making an effort to rise as a globally leading company that provides green materials and total healthcare solutions. Chemistry for the future, and life science for happiness, SK Chemicals' innovation for tomorrow never stops.

We care for the future. Healthcare. Earthcare.

SK Chemicals utilizes state of the art technology to achieve harmony between human beings and their environment.



# Steelcase

## DESIGNED TO INSPIRE

The relationship forged with McDonough Braungart Design Chemistry has been a potent catalyst for inspiration and innovation. Though Steelcase already had a strong legacy of environmental sustainability, President and CEO Jim Hackett immediately understood the importance of this new way of thinking - to society, our customers and our company.

He had a vision for the role Steelcase should play. As this vision percolated throughout the company, the Cradle to Cradle philosophy and methodologies became a powerful, clarifying lens for innovation, changing how we would design and manufacture products for more positive impact

from that time forward.

The impact is evident and the stories are many. Some are headliner product stories, innovations that raised the bar for sustainable products throughout our industry, like our Think® chair, launched in 2004 as the first product to earn Cradle to Cradle certification. Think was carefully designed with every stage of its lifecycle in mind, including easy disassembly with common hand tools for refurbishing or recycling. It became a global best-seller, one of our most popular seating products.

Our second-generation Think chair, introduced in 2013,

was designed to be even more sustainable, engineering an upholstery process that eliminates the use staples, using considerably fewer parts, and eliminating an adhesive. By vetting what we learned since the original launch, and reimagining Think, we improved it on multiple fronts. The new solution is proof that constant refinement in sustainable design can ultimately lead to higher performing, cost neutral—or even less expensive—products.

Another recent innovation is Loop 2 Loop™, the first upholstery material to be produced from a closed loop system that recycles textile waste back into original-quality fiber and yarn. An example of supply chain collaboration at its best, the development involved several companies working together for two years. Loop 2 Loop, designed by Designtex, is woven by the textile manufacturer Victor from yarn from Unifi for use on Steelcase products. Now in production, the cutting waste is being collected from our facilities and recycled into yarn made by Unifi, again and again.

Of course, we are grateful to have achieved high-visibility breakthrough innovations such as Think and Loop 2 Loop, and others like them. Equally important to us, however, are the many equally important, but smaller innovations that we realize day in and day out. Many of these are testimonies to the pervasive influence of Cradle to Cradle thinking within Steelcase. Our collaboration with a small start-up to protect our products with grown, compostable packaging material. Our partnership with Fortune 500 suppliers to develop a

new material to meet our clean materials objectives. The use of state of the art laser technology in Germany to deliver superior aesthetics and eliminate the need for edge band solvents and adhesives. We take on the challenge of this work because it matters - and we know it delivers much greater value to the company, our customers and society. Innovation is a primary reward of sustainable design.

The embedded innovation and the insights we've gained in pursuing a deep understanding the materials chemistry and the Cradle to Cradle impacts of our products have rewarded our company with a broad portfolio of C2C certifications. Our certifications are tangible evidence of the commitment to the work our developers do every day. They are a reflection of the added value we provide to our customers and the importance we place on preserving the potential of people and society. Most importantly, we have come to know that creating sustainable value in the 21st century isn't just about using less. It's also about creating more—more opportunities, more innovation, more capacity for positive change.

Simply stated, the things we've learned as a result of our early relationship with Bill McDonough and Michael Braungart, extending today to the Cradle to Cradle Products Innovation Institute, has driven us to become a more sustainable, innovative, fit and relevant company. It has changed us, and continues to change us, profoundly and for the better.

Creating sustainable value in the 21st century isn't just about using less. It's also about creating more—more opportunities, more innovation, more capacity for positive change.



## FULLY RECOVERED PAPER

Steinbeis products are produced by the most advanced technology, to maximize savings on energy, water and carbon emission. We produce 100% recovered paper, and so fewer raw resource (forests) need to be cut. Our entire product line has already been certified by Blue Angel and the EU Ecolabel. We are strong supporters of all initiatives that advance the circular economy. Our prime interest is to keep the paper fibers within the cycle, but we can't prevent paper from exiting the cycle. Using our paper enables businesses or consumers to really close their loop, and extend the number of lifecycles for office-paper.

Working with 100% recycled fibers lowers environmental impacts as well as usage of virgin materials significantly.

Using this concept, 100% of used paper can be used to make new generations of Cradle to Cradle Certified Office paper. Since sustainability and Cradle to Cradle thinking are becoming more and more important for businesses, Steinbeis decided to certify this products with the Cradle to Cradle certification.

Steinbeis employs a closed-loop recycling model. New paper is produced from 100% recovered paper by using an integrated cycle-based process, with up to 83% savings on water, up to 72% savings in energy, and 100% savings in raw material compared to conventional paper production, since



no trees are used. We generate energy from production residues, alternatives fuels, and biomass. Our energy profile with 100% thermal energy and 50% electrical energy also gives us a significant reduction on carbon emissions - up to 62%. All production residues are almost entirely recycled. We have created a technology-led recycling model in which we generate most of the energy we use, convert up to 100% of our raw materials, and are able to manage every aspect

of our impact on the environment. With our integrated approach to recycling, there is virtually no need for separate waste disposal via landfill sites. Any fiber residue is used as fuel in our on-site power plant or as a raw material for brick and cement production.

We left the old, energy-intensive method of manufacturing paper from virgin fiber behind us. Instead, we began to make high-quality recycled paper from 100% recovered fiber. Thus began a new era and the ongoing development of an innovative production model based on efficient use of energy and resources. The ecological restructuring of technologies and the economy is a revolution in which we are proud to be a part of. From the sourcing of recovered paper through to manufacturing and distribution, our entire recycling and production process is designed for optimum environmental performance: maximum resource protection, efficient energy management, innovative technologies and our own unique approach to procurement.

We increase resource productivity by extending its lifecycle through upcycling, and are offering products that are completely free from harmful additives and are fully biodegradable. A near-natural material cycle without waste.

**Working with 100% recycled fibers lowers environmental impacts as well as usage of virgin materials significantly.**



## RENEWABLE BIOFOAM

The Synbra Group has a leading position in Europe regarding Expandable Polystyrene (EPS) for Sustainable Insulation Systems and Industrial Products & Solutions for a wide diversity of markets. Synbra Technology bv in Etten-Leur, The Netherlands, is the in-house polymerization and R&D facility 'Technology & Innovation' and the centre of excellence in materials and product development. A recent example of the Synbra group's innovations is BioFoam® Expanded-PLA & Synterra® 2nd generation PLA.

In 2010 Synbra decided to enter the Cradle to Cradle

certification program for BioFoam®. This is the world's first poly-lactic acid (PLA)-based product and the world's first bio-based foamed product to receive this certification. The Cradle to Cradle standard match perfectly with the developments which has started long before Synbra came in contact with Cradle to Cradle.

Tebodin Consultants and Engineers, an Accredited Cradle to Cradle Certified Assessor, compiled information on material safety, water and energy utilization as well as social responsibility. Based on the information collected,

EPEA was able to execute the health assessment. The cost for the certification were lower than expected as a result of the good co-operation between Synbra, Tebodin and EPEA.

During the evaluation process it became clear that Synbra needed to look out for alternatives for some pigments as they contained halogens and heavy metals. The improvement program to reduce the amount of certain substances of EPEA seemed not feasible, but Synbra is very proud that they managed to achieve the standards of Cradle to Cradle Certified Product Program.

Bio-Foam® is produced from renewable source PLA. Compared to the average emission of standard oil-based polymers, this bio-based products emits 70 percent less CO2 during production. After use, the foam can either be remolded to a new product or be completely biodegraded. Being 'designed for the environment', it leaves no chemical waste, which complies waste, which complies with the Cradle to Cradle principles.

In 2011 the first plant to use a new polymerization technology for PLA that was developed by Sulzer Chemtech and Purac Biochem and built by Synbra Technology in the Netherlands has started industrial production of Synterra® PLA grades. In this way Synbra Technology has secured an integrated raw material stream for the further development of BioFoam® E-PLA; a foamed product made from this PLA.

The new plant has a capacity of 5.000 ton/year: it is using L & D Lactides from Purac, produced from GMO-free plant feedstock, 100% biobased.

Cradle to Cradle in marketing is very powerful. Synbra came in contact with new clients. An example is Cryostore in Sneek who use the BioFoam® for the Kelvinbox through Synprodo. Another example is Termokomfort Netherland BV in Almere, who uses BioFoam for isolation of buildings. Tecniq, based in California, who makes surfboards out of it.

**Synbra has the world's first PLA-based product and the world's first bio-based foam product to receive Cradle to Cradle certification.**



## NATURE'S CLEAN DESIGN

Tagawa Sangyo Co., Ltd is Japan's manufacturer and developer of lime-based building materials. Founded in 1924 and now successfully run by its third generation owner, Nobuyoshi Yukihiro. Our philosophy and manufacturing principles are directed toward genuinely sustainable and regenerative design. Its wall and ceiling plaster, tiles, and unique "Lumie Cubes" are truly "eco-effective" materials. That means not only are they non-toxic, but they make a positive contribution to the rooms and buildings in which they are as they clean the air,

regulate humidity, and absorb carbon dioxide. If and when buildings are deconstructed, these materials can safely nourish soil.

We first heard about Cradle to Cradle in 2008 from our business partners in the United States, who were closely working with architects. At that time, we were looking for a credible third-party product certification that would prove our products' environmental and safe nature. After exploring about C2C in more details, the whole concept and the certification just made perfect sense, and we felt

it matched very well with our products performance and our company's story.

Shikkui is a traditional and innovative Japanese lime plaster made of slaked lime of high calcium purity, seaweed extracts, natural plant fiber, and other natural aggregates. It has been widely used throughout Japan for both internal and external walls of houses, temples, and castles, as well as for ceilings and decorative purposes for over 1000 years. Shikkui combines the reliability of a time-tested material with cutting edge engineering to deliver a surface coating system unmatched in beauty, versatility, durability, and health.

In the past 15 years, our company invested about 8 million dollars in R&D and associated human labor, materials, equipment and machines, cooperating with universities and laboratories, and pursuing product certifications. Through the process of innovation and continuous development, our company created a range of Shikkui plasters for various types of applications purposes. In addition to the traditional application by a trowel, the Shikkui lime plasters can now be applied by airless and texture sprayers, rollers and spatulas, to create a wide variety of finished ranging from restoration projects to highly decorative applications, commercial, and residential projects.

Some Shikkui finishes may contain up to 50% in weight of fine aggregate of made from reprocessed eggshells that come from a Japanese mayonnaise manufacturer — a classic example of "upcycling". Chicken eggshells are 95-97%

calcium carbonate crystals, which are stabilized by a protein matrix to produce characteristics close to marble.

Another important innovation is the successful development of Limix, is a non-baked tile made of the same components as Shikkui lime plaster, compressed under extremely high pressure. Thermal processes and any chemical binder are not used, yet the hardness and physical properties are again very similar to marble. This unique, one-of-a-kind technology allows for various customizable designs, textures, patterns, and inclusions of various recycled and upcycled aggregates.

At the same time, Limix tiles exhibit all health and environmental properties of Shikkui lime plaster, properties that are increasingly in demand from consumers, construction specifiers, and architects interested in optimal indoor health, beauty, and durability. The material is naturally antibacterial, antiviral, and antifungal. The addition of diatomaceous earth enhances the plaster's ability to regulate humidity. It also purifies the air, as it absorbs and breaks down toxins commonly emitted from carpets, furniture, and construction materials such as ammonia, formaldehyde, and hydrogen sulfide. Over the life of an installation, these surface coatings continually harden as they absorb CO2.

In keeping with the Cradle to Cradle design concept, all products can be returned safely to nature to nourish, balance, and stabilize soil.

**As we looked for a credible third-party product certification that would prove our products' environmental and safe nature, Cradle to Cradle made perfect sense.**



## RENEWED FLOORING

Tarkett is committed to Sustainability through a holistic approach that brings together the three dimensions of people, planet and profit. Since 2009, Tarkett has implemented an ambitious eco-innovation strategy integrating sustainable and socially responsible objectives from the very start of product design as well as at each step of the product life cycle. This strategy meets today's and tomorrow's customer needs and lifestyles.

Eco-innovation takes into account the relationship between people and flooring as well as the relationship

between the environment and flooring. It is a concept that encourages thinking in terms of solutions, and in terms of "positive contribution" to society and the planet. With this framework in mind we decided to work with the German scientific institute EPEA (Environmental Protection and Encouragement Agency) not only to certify some of our products, but to widely deploy the Cradle to Cradle® principles in all activities with the objective to become a "circular company".

Tarkett first started to work with EPEA in 2010, helping us

to assess the quality of the materials we use and identify the best alternatives and reuse options. We made a tremendous joint work involving multi-disciplinary teams (Research, Development, Design, Marketing & Sales, Operations, Purchases...) to "eco-design" our products and adapt our manufacturing process. Tarkett obtained its first Cradle to Cradle certification in 2011 for our linoleum and wood flooring.

The environmental and social approach is at the heart of Tarkett's eco-innovation strategy, which is based on four dimensions that underpin our "Cradle to Cradle" philosophy:

### GOOD MATERIALS

We select good materials in the design of products, creating new formulations based on materials that are safe for people and the environment and that can enter into a technical or biological nutrient cycle. Good materials include rapidly renewable materials such as linseed oil, pine resin, and cork flour, to make 100% recyclable vinyl flooring containing recycled materials.

### RESOURCE STEWARDSHIP

We use resources responsibly in Tarkett operations (38 sites WW), optimizing and reducing consumption of water, energy, raw materials and avoiding waste.

Between 2010 and 2012, KPIs were established requiring 5% yearly water use reduction; but our actual water consumption reduction was 24% due to closed-loop water circuits set up in half of the production sites. We achieved 5% energy consumption reduction in some plants we due to

biomass-based energy production systems. We decreased the volume of waste sent to landfill to 20%.

### PEOPLE FRIENDLY SPACES

Tarkett is the first flooring company committed to offer products with VOC emission levels 2 to 20 times lower than the most stringent IAQ certification requirements. New formulations developed for some vinyl ranges based on alternative plasticizers without phthalate, helping to improve indoor air quality and health (in NA). A dry buffing system for cleaning and floor maintenance reducing quantity of water (-18%), energy (-20%) and detergents (-2.3 times).

### REUSE

We recycle to eliminate waste and re-use at the end of product usage, thus ensuring a "closed-loop" approach. We also collect and recycle circuits of post-installation and post-consumer products set up in France and Sweden (ReUse programme), and in the United States (ReStart and Infinity Initiatives). In addition, we've incorporated a recycling/ collection/reuse system for artificial turf fields. (FieldTurf)

To complete this eco-innovation approach, Tarkett also deploys its Corporate Sustainability commitment on the Social Responsibility dimension and Corporate Governance. The Group is also member of the UN Global Compact program since 2009 and promotes it to its suppliers (30% of purchases are made with suppliers committed to the UN Global Compact).

**Tarkett is committed to sustainability through a holistic approach that brings together the three dimensions of people, planet and profit.**



**Troldtekt®**   
Natural acoustic solutions

## SOUND OF SUSTAINABILITY

Troldtekt has produced acoustic panels, made from wood and cement since 1935, and the panels have been used widely as ceiling and wall panels in Danish buildings. The acoustic panels are installed in schools, institutions, sports and swimming pools, as well as commercial buildings and private homes.

Troldtekt's work of integrating environmental standards and sustainability into the company led to a decision in 2012 to apply for a Cradle to Cradle® certification for the 'Troldtekt Nature' range. The decision was made after completing a

survey among architects which found that they preferred a Cradle to Cradle certification. Today, Troldtekt's entire range of acoustic panels have been certified.

Working with the Cradle to Cradle concept has convinced the company of the value of continuing down this path and Troldtekt is now working on formulating objectives and measurable steps on the road to become a complete Cradle to Cradle® company.

### MATERIALS

The wood used for the production of Troldtekt is PEFC-certified Norway spruce from local forestry operations. The PEFC-certification guarantees that the wood can be traced back to sustainable forestry. By using wood from a healthy and well-developed forest area, Troldtekt is helping to ensure continued biodiversity and the positive effect of the trees on the climate.

Troldtekt's acoustic panels have undergone an ABC-X examination. Over 95% of the product (by weight) has been analysed, and all the ingredients in the materials down to a level of 100 ppm have been evaluated and found to be safe for the biological cycle and for humans and the environment.

Combined with the panels' high acoustic properties, this means that they also help ensure a healthy and comfortable indoor climate. In addition, the panels are CE-labelled and meet the declared Danish and European fire classifications.

### PRODUCTION

Troldtekt's Danish factory operates as a closed production system, with no release of wastewater and a focus on recycling energy. Approx. 95% of the energy used to heat the factory's production area comes from the combustion of wood waste from the production. Troldtekt also has an agreement with DONG Energy to buy certificates for renewable energy covering 100% of the company's electricity consumption in 2013. This electricity will be supplied by DONG Energy's new wind farm at Anholt, which means that Troldtekt is also helping support the local production and expansion of renewable energy.

Surplus waste material from production is sent to KomTek A/S, which processes and refines organic residues to produce bio-compost, whereby carbon and nutrients can return to the soil. The company also recommends composting the Troldtekt panels after use.

Inspired by the Global Compact standard, Troldtekt has its own Code of Conduct which all suppliers are asked

to sign, whereby they undertake to observe a number of internationally recognised standards in the areas of environmental protection, working environment and anti-corruption. Troldtekt's Code of Conduct should be seen as a collaboration code for suppliers and sub-suppliers, which helps raise the quality throughout the entire value chain. The company also participates in a number of social activities, such as sponsoring the Danish Association for the Hard of Hearing.

As greater focus is given to sustainable building schemes such as DGNB, LEED and BREEM, Troldtekt is able to brand itself on quality, intelligence and responsibility, since the company can document its contribution to the three sustainable building schemes, which gives the company a strong position when a construction project is evaluated as a whole.

**Troldtekt is able to brand itself on quality, intelligence and responsibility.. which gives the company a strong position when a construction project is evaluated as a whole.**





## WOVEN INTO YOUR LIFE

Earthtex®, the collective name for Twitchell's certified product line, first began in late 1999. At the millennium many publications began to surface regarding the dangers and toxins associated with Twitchell's core product PVC. After three years of consistent research and trials Twitchell found being green actually had many shades depending on who was asked. We found what we believe to be the true color of "green" through a lecture given by William McDonough. From this burgeoned a vision for the future of PVC- free products for our company as well as our

customers.

Together with Mechoshade Systems, Twitchell set on a path to incorporate the vision. It started with joint meetings with both companies and MBDC. After those initial meetings, our whole management became engaged in making sure that our product could earn Cradle to Cradle certification.

In 2006 Twitchell finally launched their first commercial product line of Earthtex® exclusively with Mechoshade Systems. Concurrently, Earthtex® also began the process

of being Cradle to Cradle certified and earned the Silver certification mark. With this one product line, there are up to 109 different components that encompass our Earthtex® line of fabrics. Each of these components can be mixed to produce over 500 different designs.

We were only able to reach the Silver level due to the stringent flame testing requirements. This has not discouraged Twitchell's desire to maintain the highest level of sustainability. Currently Twitchell has run over 300 trials to eliminate the hazardous flame retardant agents from Earthtex®. Thus far nothing has met the stringent flame standards for our industries' requirements.

Since Earthtex®'s initial inception Twitchell has invested over 1 million dollars in designing, testing and developing Earthtex® as we know it today. To date this is less than 1% of the total sales of this product. Twitchell remains dedicated to making Earthtex® a success; due to its positive attributes and the value it adds in the industry of window shades as well as other high-end interior product lines.

Innovation has driven Twitchell Technical Products, LLC for almost a century and continues to do so today. Since its beginning in 1922, the Twitchell name has represented quality and social responsibility in yarns and fabrics across a multitude of industries. Now Twitchell continues that trend with Earthtex® Brand fabrics. We understand a changing global environment demands a new world of

environmentally friendly textiles and textile applications; fabrics that embrace the wellness of our planet, our future as well as the future of all mankind. Supporting sustainable environmental practices with Earthtex® is not only a product design goal, but a company competency.

Earthtex® represents a continued company commitment to materials perpetually circulated in closed loops, maximizing material value without damaging ecosystems. Our water policy and procedures utilize a closed loop cooling system that is constantly recycling water supply to our machinery instead of utilizing an open loop system requiring use of additional water.

Twitchell Technical Products, LLC is committed to Cradle to Cradle design and has incorporated Cradle to Cradle thinking into our manufacturing processes. Each of the components used in Earthtex® is evaluated by an independent source (MBDC) and broken down to determine the effect on human health and its effect on the environment. Only after each component is assessed and passes through analysis is the specific component added to the Earthtex® formulation.

The Cradle to Cradle design strategy encourages all to generate ecological, social and economic value by embracing and applying true eco-effective manufacturing. It's our commitment to lead the world in the development of eco-effective textiles.

**We understand a changing global environment  
demands a new world of environmentally friendly textiles  
and textile applications.**

## GLASS-GROWN TREES

In the market of structural soils, enabling trees to grow well in paved conditions in cities, many different products are available in the Netherlands. Manufacturing a structural soil that actually functions as such (structurally stable and providing suitable rooting space for trees) is an exact science. Getting it wrong means that it either won't be structurally stable, or able to function as soil for the tree.

Despite all this, there is no certification program in place in the Netherlands for structural soils. Customers are therefore currently unable to determine if a structural soil will either function, or fail, since the manufacturer's story is all they have to base their (investment) decision on. The Cradle to Cradle Certification demonstrates to our customers, that we 'say what we do, and that we do what we say'.

Since our company has always been focused on material re-use, energy conservation, water stewardship, and social fairness, the Cradle to Cradle Certification program enabled us to demonstrate and prove to our customers that our product is actually developed and manufactured with all those criteria in mind. The Cradle to Cradle certification helps us convince our customers that our product is really safe for them, for the future, and for the environment. This is important because the ingredients we feed into the manufacturing process are still considered 'waste' by Cradle to Cradle-unaware people and for them 'waste' is still something potentially dangerous.



Our company works on changing linear processes in today's landscaping business in to circular processes, even though it might only be step by step. Material reutilization is the main theme for Tree-Terra. As a company we strongly feel that mining large quantities of rocky materials in Germany and peat in natural areas in the Baltic States and Sweden, to be transported to the Netherlands to make structural soils, makes no sense.

### FUNCTIONAL APPROACH

We began with determining what each component in our product has to do, not what it had to be or look like. With this functional approach we contacted Van Gansewinkel in the Netherlands, a company which recycles all kinds of waste.

Van Gansewinkel came up with the idea to transform a waste-stream of recycled glass in to glass-sand, something that would never have crossed our own minds.

In order to find a replacement for the peat, we met a large greenhouse strawberry grower, who discarded the strawberry plants and cocopeat substrate as waste at the end of the growing season. Together, we developed a relatively simple industrial method with which the plants and the Cocopeat substrate are separated. The plants can now be composted and the substrate is re-used in Tree-Terra. We transformed 100% waste in to 100% usable materials. In the end, the cost of the process to regain the Cocopeat was even a little bit lower than buying new. In addition, Cocopeat has found its way to other interested customers, beyond just the production of Tree-Terra.

### ENTHUSIASM

The knowledge and enthusiasm gained from developing Tree-Terra has encouraged the development of a new

substrate for green roofs and roof gardens. This new substrate is based on the same recycled materials as Tree-Terra, and combined with other Cradle to Cradle certified products such as BioFoam. We initially fueled enthusiasm for the project by facilitating low cost, small-scale experiments. Now, field tests of this new product show very promising growth results and the necessary laboratory research is being negotiated. The potential product (Roof-Terra) could be launched soon, because research institutes have shown keen interest in a Cradle to Cradle certified green roof substrate.

### 'CAN-DO' ATTITUDE

Ask anybody out front if you can grow trees on glass, and they'll most likely tell you that you can't. In all of our innovation efforts, we find it essential to adopt a 'can-do'-attitude. We are honest enough to say that we usually don't have a direct answer as to 'how,' but you might end up finding 'how' in your network of surrounding companies. A 'Can-do' attitude is essential in innovation: it is the 'do' that takes an idea and turns it into a product.

The Cradle to Cradle Certification does help us differentiate ourselves from our competitors. Slowly, by explaining the ideas behind the Cradle to Cradle philosophy, our customers start to see that what we do actually makes sense.

**The Cradle to Cradle Certification demonstrates to our customers,  
that we 'say what we do, and that we do what we say'.**

This washroom is equipped with **Satino BLACK** tissue paper

**Satino BLACK**  
IT'S SO EASY TO GO GREEN

[www.satino.com](http://www.satino.com) Satino by Van Houtum

-  Harmless to people and the environment
-  Sustainable production process
-  100% green energy
-  100% recycled paper




## TOTAL WASHROOM SOLUTIONS

For more than 75 years, Van Houtum has supplied hygienic paper and innovative solutions for better toilet hygiene in combination with exceptional environmental performance. We produce the most environmentally friendly toilet paper in the world, new generation of Cradle to Cradle Certified products, under the brand name Satino Black.

The production of most hygienic paper and soap involves the addition of numerous chemicals. All of these

chemicals have been analyzed in detail in collaboration with the EPEA, a well-known international scientific institute in Germany, not only to identify the presence of pollutants but also to determine their bio-degradability. All the substances that did not comply with strict requirements have been replaced by natural and bio-degradable ingredients. As a result, Satino Black hygienic paper and soap are suitable for the biological cycle.

While many companies strive to reduce their negative impact on the environment, we have decided to adopt a more effective approach of striving to achieve a positive impact on society and the environment. Our company has historically adopted the “people, planet, profit” thinking. Cradle to Cradle was an inspiring and logical next step: a shift in thinking from merely reducing negative impacts to making positive contributions for all the stakeholders associated with our products. Our goal was to improve our whole business operation, not just “get certified.” So the certified hallmark is the highly-valued crown on our work that helps us distinguish our value proposition in the marketplace.

Innovation is one of our main priorities, so we continually work on developing our products. We do this in collaboration with customers and end-users to the greatest possible extent. After all, it is from them that we can learn the most about their needs and perceptions. We approach this by analysing the complete chain and product life-cycle and consulting people who are involved in both areas. This applies from the time the products leave our factory to their

actual installation in a toilet area, to refilling dispensers and to the use of our products until they reach the end of their serviceable life.

Next, we set our sights on total washroom solutions. For instance, we fancied a soap composed of ingredients selected for their hypoallergenic and moisturizing effects, which would eliminate skin irritation from hand-washing, and instead nourish the skin with natural oils. Once again, some of our suppliers declared our wishes to be unrealistic. Yet today our certified products include two different types of tissues, two detergents, alcohol gel, toilet-seat cleaner and seven different types of dispensers, stylishly designed and made from recycled plastic. Today our suppliers fully support our commitment and come to us when they have relevant innovations.

The business result has absolutely been positive. The whole approach has given our company a unique market position. Growth of our Satino Black business is healthy and stable. And last but not least, our efforts have created a natural sense of pride within the company. To us, Cradle to Cradle is an inspiring concept that give us direction for our future. And our work has just begun.

**The certified hallmark is the highly valued crown on our work that helps us distinguish our value proposition in the marketplace.**



## RESPECTING THE ENVIRONMENT

Van Swaay Duurzaam Hout (translation: Van Swaay Sustainable Wood) is a manufacturer and supplier of sustainable timber and works with respect for people, the environment and their surroundings.

Van Swaay Duurzaam Hout aims to be a leader in delivering sustainable wood products with extended life, and to become one of the most modern timber companies in the Netherlands. Cradle to Cradle Certification certainly fits into this philosophy.

Until about 1990, preserved softwood was being used as bank protection in the form of a sheet pile wall in the Netherlands. However, because of the leaching of creosote oil and copper, the use of preserved wood in water was banned in the Netherlands. As a result, more and more tropical hardwood was used for bank protection, which was completely unsustainable.

Van Swaay's H2H® brand means Wood to Wood, and refers to the construction of two wood-types using

finger joints. It combines the features of two types of wood: European spruce (not treated) and durable tropical hardwood (Angelim Vermelho).

H2H® retaining walls are only used in fresh water. The portion of the shelves where the pinewood has been used, including the finger joint which connects the boards with the tropical hardwood (Angelim Vermelho), are located under water. The tropical hardwood section is located partly below and partly above the waterline. Since wood degradation takes place only at the water-air line, it is not necessary to make use of tropical hardwood for the entire pile wall, but the durability of our walls is similar to a complete hardwood pile wall.

The two species of wood in our walls are put together through a 'finger-welding technique' that is based on the cutting of conical teeth or fingers in wood. By attaching the fingers of two pieces of wood to slide under high pressure into each other, a self-locking capability is created. Addition of glue increases the strength of the structure. For H2H® the finger joints are connected together under extreme pressure, using a minimal amount of glue.

The 20% section of the wall that can be affected by fungus consists of tropical hardwood and the rest of the

pile (about 80%) consists of untreated softwood. In this way, H2H® walls utilize 80% less tropical hardwood, at a decreased cost with similar functionality.

At the end of the period of use, any area of the wall can be cut, and the remaining parts can be re-processed, to create a new H2H® product. The cut portion can serve as biological fuel for generating green electricity. When wood grows, CO<sub>2</sub> is stored, so throughout the life of the H2H® product the CO<sub>2</sub> is sequestered in the timber. By using a minimal amount of tropical hardwood, Van Swaay prevents unnecessary cutting of tropical forests.

Van Swaay carefully accounts for water use throughout their entire manufacturing processes, including stocking of their products. They protect water sources from contamination and give careful consideration to efficiency techniques at every step.

Corporate Social Responsibility is involved at all core processes of the company, from purchasing and production to marketing and human resources. Van Swaay recognizes the importance of international initiatives in the field of sustainable development and support the Global Compact principles of the United Nations.

**Van Swaay Duurzaam aims to become one of the most innovative timber companies in the Netherlands.**



## FIRST TRUE TECHNICAL

### THE INNOVATION STORY

Victor Group has had a longstanding history of over 70 years of recycling textiles and utilizing waste as a resource. In 1994, Victor Innovatex was started with a new mill dedicated to meeting the needs of the growing contract market, and from the beginning President Alain Duval placed sustainability at the heart of the company's corporate strategy. Improved product quality, decreased energy costs, and decreased raw material use are just a few of the bottom-line benefits stemming from Victor's long-standing commitment to

sustainability, recycling, and recyclable fabric. The rapid growth of Victor Innovatex has proven the validity of Mr. Duval's claim that "what's good for the environment can also be good for business."

Duval led the company with a vision to design the industry's first antimony-free polyester. With this innovation Victor Innovatex could transform the toxic process of making polyester, a polymer that accounts for approximately one-half of the worldwide production of all synthetic fibers. Approximately 80-90% of polyester is manufactured using

a catalyst based on antimony, a suspected carcinogen and reproductive toxin that leaches from the fibers during the high temperature dyeing process and pollutes the mill wastewater before entering the environment.

In 2000, Victor was encouraged by Susan Lyons from Designtex (a company that worked with William McDonough & Michael Braungart to design the first biological nutrient textile) to engage McDonough Braungart Design Chemistry (MBDC) as a partner to innovate a new polyester that can be manufactured with a nontoxic catalyst. By applying green chemistry tools used in a different industry, MBDC helped Victor identify an alternate catalyst based on titanium and silica. In 2003 Victor launched Eco Intelligent® Polyester as the industry's first antimony-free polyester.

Eco-Intelligent® Polyester features all the performance benefits of conventional polyester and designed to be safely manufactured and later recycled again and again into new fabric following use without any of the typical hazardous by-products. In addition to being antimony-free, the polyester was designed to be free of organohalogenes and PBTs (chemicals that are persistent, bioaccumulative, and/or toxic). MBDC evaluated all of the product ingredients, dyestuffs and auxiliary chemicals for toxicity to human and environmental health and eliminated any problematic chemicals. A list of 57 chemicals was trimmed down to a palette of 15 nontoxic chemicals, which eliminated the concern of harmful ingredients entering the environment during manufacturing, disposal, or recycling.

### THE FIRST TRUE TECHNICAL NUTRIENT TEXTILE

While polyester can be perpetually recycled again and again, conventional polyester releases antimony and other harmful chemicals into the environment with each cycle and pollutes and degrades the recycled polyester stream for the next use of that material. The intentional design of a continuously recyclable textile that only uses safe ingredients makes it an ideal technical nutrient for industry. Victor's Eco-Intelligent Polyester is setting the standard for a high-quality, safe

material that can be perpetually recycled and provide a source of clean recycled polymer for a range of industries and product applications. Victor is helping lead industrial transformation through Cradle to Cradle Design

Setting the standard for a  
high-quality, safe material that can be  
perpetually recycled.

In 2006, Eco-Intelligent® Polyester became one of the first products to be Cradle to Cradle Certified™ at the Gold level due to Victor's innovations in design and operations. In order to achieve this stringent level of certification, a product can have no ingredients of high risk to human or environmental health. The product must be manufactured using at least 50% renewable energy; Victor far exceeds that threshold by using 91% hydroelectric power at its mill. Certification at the Gold level also requires an audit of the facility's water use and social fairness. Towards that end Victor Group has achieved ISO 14001 Certification for environmental management, and the company continues to decrease its energy and water consumption per yard of fabric produced. Furthermore, Victor ensures that all of the textile paper waste, plastic waste, and packaging are both recycled and recyclable and it is striving to achieve eliminate the concept of waste throughout all of its operations.



## ZINC AND STEEL

**Our core business** is to produce corrosion protection layers for all kind of steel structures by using the hot dip galvanizing (HDG) process. The HDG process involves the use of the natural element zinc. From a product contribution perspective, zinc is ideal for recycling just like all other non-ferrous metals. Hot dip galvanizing with zinc is the best choice in protecting steel against rust, extending the life cycle of fabricated steel up to more than 100 years.

Whilst our product and process have achieved very high levels of resource and energy efficiency, we started to take

measures to improve the effectiveness of our product and process. We found that the potential of our operations was not being continuously improved and that a professional approach was required to convert our processes to fully comply with Cradle to Cradle criteria.

In pursuing the objective of optimizing product performance and the sustainability of our duroZINQ® product, we decided to certify our HDG process as well, in order to ensure a complete product/process combination that conforms to the Cradle to Cradle philosophy.

Cradle to Cradle certification is the approach we've utilized to achieve a unique level of effectiveness in our resource utilization supporting our branded product duroZINQ®, as well as our leading market position in corrosion protection services.

This programme is called Planet ZINQ and involves all measures designed to complement the contribution of HDG in terms of product sustainability, such as resource effectiveness (continuous recycling and material reutilization), resource and energy efficiency, and corporate social responsibility in terms of fair employment and training. Details of our programme and best practice examples are available on our website [zinq.com](http://zinq.com) under the Planet ZINQ tab.

The duroZINQ story is characterized by many, often small development steps over 5 years that result now in the first Cradle to Cradle certification of a corrosion protection system worldwide.

The basis of the duroZINQ technology is the traditional HDG process, in which metal components are immersed in a molten zinc alloy and therefore coated with zinc. Due to the metallurgical reaction between iron and zinc, an inseparable and therefore very durable and reliable protecting layer against corrosion is built up. The underlying objective was to match the Cradle to Cradle capabilities of our production process with those of our product.

In a nutshell, the Cradle to Cradle certification confirms that duroZINQ® presents the most effective coatings for the purpose of corrosion protection and design of steel structures on the market today. The measures taken in the field of resource efficiency and effectiveness alongside the level of efficiency achieved makes duroZINQ® the preferred choice for protecting fabricated steel products from sectors like the automotive and commercial vehicle industry, solar and wind mill structures, lighting poles or crash barriers.

We see the duroZINQ® certification as a good example that even a traditional process with a technically mature and well performing product can still be continuously improved

and made more effective constantly. The Cradle to Cradle approach supports our ambition to innovate processes and products in HDG and confirms the direction we have taken already years ago. Additionally, it helps us to further transform our strategy into applying measures at operating level, e.g. regarding the use of products and the handling of residues in our production process. Customers as well as suppliers are part of a complete process chain approach and are invited to link in with the Cradle to Cradle achievements in our HDG process and product.

**Cradle to Cradle certification is the approach we've utilized to achieve a unique level of effectiveness of resource utilization, as well as our leading market position...**

In terms of industry impact, this first Cradle to Cradle certification in HDG is a milestone and will set the pace for the industry forcing others to match process and product in terms of effectiveness and Cradle to Cradle capability.



## SUSTAINABLE SURF WAX

As owner and founder of WET WOMEN LLC., I created and formulated WET WOMEN® SURF WAX. I wanted to create a Cradle to Cradle product, rather than a cradle to grave product. My love for the ocean (windsurfing, surfing, swimming, snorkeling) and respect for the environment inspired me to create a new product (Wet Women® Surf Wax) with a new concept in mind. The wax was to be designed so as to be completely harmless to the ocean and its inhabitants, the beaches, and the humans using it. The surf wax would be nontoxic, biodegradable, and compostable.

After having read the Cradle to Cradle book, I wanted to meet the stringent criteria of the Cradle to Cradle certification to guarantee that the surf wax had truly been evaluated and scientifically backed up for its characteristics (human health, environmental health, water stewardship...), meeting their stringent certification criteria. I wanted to make sure my product would be determined to be an honest ecologically intelligent product, after having been



evaluated for and meeting their rigorous certification criteria requirements and conditions.

It started as an investment to begin our collaboration with MBDC and between the creation of the formula, R & D, ingredients and molds, graphics, the marketing and branding, the annual recertification, two websites, legal fees, packaging... it's been an adventure.

I was living in Maui, Hawaii, wave sailing (windsurfing) both recreationally and competitively, and surfing recreationally. I'd been looking to create a business that would inspire and celebrate and promote women on the water and looked to create revolutionary/evolutionary eco-intelligent products for the company. I needed to begin with such a product, one that directly related to the water and waves in which I was living.

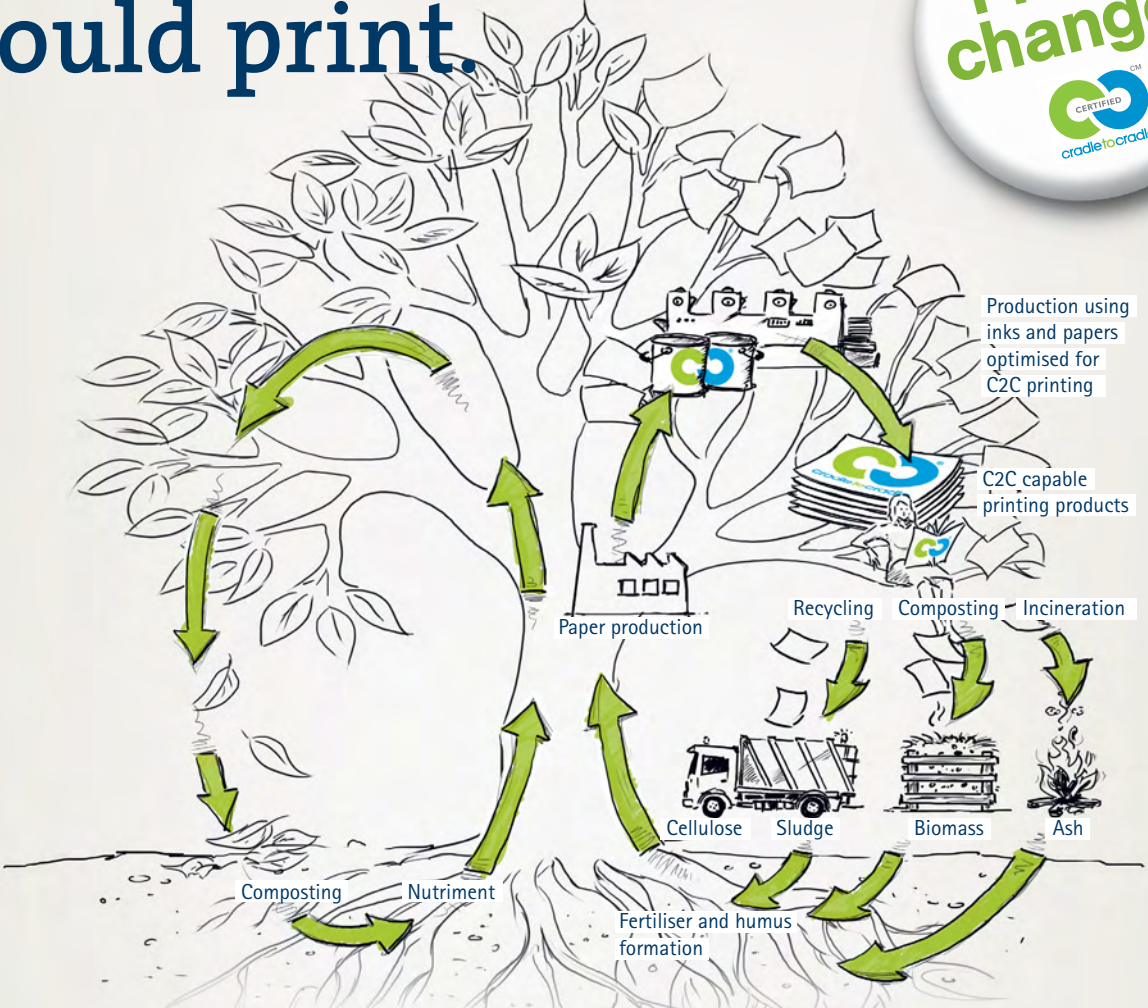
I came upon the Cradle to Cradle book by William McDonough and Michael Braungart in 2003 and decided (before even having established Wet Women® in 2004) that I needed my first major product to be certified, in order to separate my wax from the rest but also to participate in the innovation of 'green products' without just 'green washing' and be a truly eco- intelligent product. In the creation of the surf wax, we began a collaboration with MBDC in March 2005 and had the wax officially certified as a Biological Nutrient in January 2006. Wet Women, LLC has continued to recertify the wax annually, upgrading to Silver Certified in 2007.

Wet Women® Surf Wax meets the criteria especially well in the material health and reutilization arena. The ingredients alone were at one point considered a 'biological nutrient' in that they can be completely broken down in the environment. The ingredients are 100% nontoxic and biodegradable.

Currently, as a one woman show, I buy energy blocks from alternative sources of energy generation such as wind power from the local electricity supplier. The creation of the wax requires little to no use of water, and does not contaminate any water source in creation nor clean up. It is just me (owner and founder) making the wax, with no outsourcing to any other company, and therefore can verify that all employees are treated fairly. Therefore most important piece to meeting criteria is in the ingredients (true 'biological nutrients' in the aquatic systems, 100% biodegradable and nontoxic) not harming the environment, nor sea creatures, nor the people using it.

**“I decided to participate in a revolutionary way of creating a surf wax that would be nontoxic, biodegradable, and compostable.”**

# That's how nature would print.



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