

ROHNER TEXTILES: CRADLE-TO-CRADLE INNOVATION AND SUSTAINABILITY

Albin Kälin faced an all too familiar dilemma in manufacturing: that of shrinking margins coupled with rising costs and aging equipment. As managing director of the Swiss firm Rohner Textil AG (Rohner), Kälin made the decision to bolster his firm's efforts to pursue a sustainability strategy. The result was a 30% increase in total output, a drastic reduction in costs, and the production of the first 100% biodegradable commercial fabric. In the manufacturing world, where environmental improvement is viewed as a cost and not a path to strategic and financial gain, how did Rohner successfully pursue an environmental and health agenda while drastically reducing fixed costs and overhead and promoting growth?

The company could not do it alone. Only by forming a network of experts in areas ranging from fabric design, office furniture sales, chemistry R&D, and green architecture along with collaborative suppliers was Rohner able to harness the expertise to produce Climatex® Lifecycle.™ In the process, Rohner produced a fabric that revolutionized the textile industry and set a precedent for responsive environmental design.

The story of Climatex Lifecycle is not simply about one company's environmental and financial success; it is one of collaboration and networks. Each individual and organization involved in the project was subject to a variety of motivations and beliefs that brought them to work on the new fabric idea. But by uniting behind the shared vision that a fabric that met the rigid demands of office furniture suppliers and did no environmental harm was possible, the network was able to assemble and successfully bring an industry-changing product to market.

The Beginnings of an Evolutionary Network

The beginning of the Climatex story can be traced to a customer request. The inquiry came from DesignTex, a small textile design division of Steelcase, a very large commercial furniture provider. Beginning in 1991, Susan Lyons, vice president of fabric design at DesignTex, initiated a project whose goal was developing more environmentally responsible fabric. She spoke with and eventually hired design guru Bill McDonough, a prominent "green" architect, to assist in the effort. McDonough was known for designing ecologically responsible buildings and had introduced innovative concepts in constructing the first green offices for the Environmental Defense Fund, among other organizations.

McDonough's soon-to-be partner in founding McDonough Braungart Design Chemistry (MBDC), Michael Braungart, was also brought into the project to provide chemistry expertise. At the time of the project, Braungart directed the Environmental Protection Encouragement Agency (EPEA) in Germany. EPEA would evaluate the raw materials and

production processes and evaluate them according to agreed upon environmental standards.

Lyons knew that Rohner would be an effective supplier in building the new fabric. Under Käelin's leadership, Rohner had developed a rich history of commitment to the natural environment and the small community in which the Rohner production facility was located in Switzerland. In the 1980s, Käelin had led an effort to implement an innovative and silent milling technique that allowed for greater flexibility and quieter production, and improved working conditions for the surrounding neighborhood and employees. The mill had also received a European Eco-Tex certification, indicating that all of its textile products were ecologically safe for human use.

The Rohner mill was a small component of Forester-Rohner, a 700-plus employee company with five mills across Europe. Although Forester-Rohner management believed that environmental improvements were a good idea, they were skeptical that a positive bottom-line impact could be significant. Thus, any environmental improvements would have to be internally funded by the mill; there would be no significant capital investments from the larger parent firm. But the interest of Steelcase, a \$2.3 billion company and the largest manufacturer of office furniture at the time, sparked considerable enthusiasm for the project.

From "Less Bad" to Good

In formulating an environmentally friendly upholstery fabric, specifically targeted for use on office furniture, DesignTex initially proposed that the team investigate using a material constructed of cotton combined with polyethylene terephthalate (PET) from recycled soda bottles. The logic was that the use of "natural" cotton and "recycled" plastic would produce a wonder fabric with built-in marketing appeal. In addition, the fabric was market-tested, durable, and affordable.

From the perspective of McDonough and Braungart's guiding principles, however, the fabric was less than ideal. First, upholstery abrades during use, and the use of PET opened the possibility that its inherent chemicals, including suspected carcinogens, would be inhaled by users. An additional concern was with the use of cotton, which was responsible for 20% of world's pesticide use and undermined ecosystems because of the farming techniques used to produce it. Those materials did not fit the agreed-upon design principle of "cost, performance, aesthetics, environmental intelligence, and social justice."

Perhaps even worse was the problem of dealing with the proposed fabric once its useful life was completed. PET could not be composted or turned back into natural nutrients and the cotton could not be recycled into industrial use; the material was what McDonough referred to as a "Frankenstein product" — a mixture of natural and synthetic materials, neither of which could be salvaged beyond the current life cycle. Thus, the

proposed product violated the principle of “waste equals food.” As such, it constituted a cradle-to-grave design: a closed-loop product cycle resulting in useless, perhaps harmful waste instead of environmentally benign materials that can be endlessly reused. By McDonough’s standard, a product that is “less bad,” that has fewer contaminants, or can be recycled into lower-grade materials, was still not good; his goal was nothing less than a completely safe product that could be disposed of through reuse or would simply break down into nutrients — a principle known as “waste equals food.” “The team decided to design a fabric that would be safe enough to eat,” McDonough writes in *Cradle to Cradle: Remaking the Way We Make Things*, “It would not harm people who breathed it in, and it would not harm natural systems after its disposal. In fact, as a biological nutrient, it would nourish nature.”¹

Although McDonough’s strict adherence to his design principles might have frustrated many businesspeople, his explanation and expertise were exactly what Albin Kälin was hoping for. Recent regulations had defined Rohner’s plant material trimmings as toxic waste, requiring expensive exportation to Spain for disposal. In addition, Kälin was facing increased costs for wastewater treatment and electricity. Though he was able to address the issues to some extent through tax loopholes that allowed him to budget for environmental improvements to the plant’s equipment, the solid waste issue could not easily be resolved. He hoped that trimmings that “provided mulch to the local garden club” could be a solution to his problem.

Overcoming Barriers through Network Expansion

Rohner was encouraged by the promise of a safely disposable fabric, and it committed wholeheartedly to examine all the constituent chemicals in their processes. Unfortunately, their suppliers did not feel the same way. Of the 60 dye manufacturers they contacted, none initially agreed to allow Braungart’s inspection of their formulas. Finally, one company, Ciba-Geigy, agreed to join the project, hopeful that they too could garner cost reductions from eliminating dangerous chemicals from their products. Out of the more than 8,000 chemicals commonly used to achieve the aesthetic and performance characteristics for commercial fabric, the team selected 16 that they deemed safe and appropriate, and from those completed the entire fabric line.

Using the chosen materials, wool from free-range sheep and pesticide-free ramie, unfortunately led to further supply-chain challenges. The twisting of yarn usually required the addition of chemicals to the process, and to avoid that step, Rohner was forced to find a new twisting mill. Eventually the team found a small mill that valued Rohner’s business enough to change its processes. Another challenge came from Steelcase, the largest customer for the new fabric, which had updated its manufacturing codes and required additional flexibility of the fabric. The last-minute addition of chemicals, which technically met Steelcase’s design requirements, was

still an unwelcome change. Still, the team pressed forward, and saw their goal of a truly “cradle-to-cradle” textile coming closer to reality.

As Climatex Lifecycle went into production, regulators visited Rohner to test the effluent water produced in the manufacturing of the new fabric. They were astounded to realize that the water coming out of the factory was as clean or cleaner than the water coming in from the town’s drinking water supply sources.

The William McDonough Collection Debuts

Under an agreement among all parties, Rohner was granted the patent rights to Climatex Lifecycle. In exchange, DesignTex was granted exclusive use of the fabric for one year, a marketing advantage they seized by branding the fabric as “the William McDonough Collection.” Steelcase had made recent commitments to pursue an environmental agenda, and the new fabric was a perfect fit for its goals; it decided to incorporate the new fabric into one of its largest selling products, the Sensor® chair, and the success of the new textile was assured.

By 2002, Climatex Lifecycle accounted for a third of Rohner’s approximately \$8 million in revenues. The fabric had drastically reduced waste disposal costs because Rohner no longer had to pay to send trimmings to be burned at a Swiss-regulated incinerator or to Spain. Scraps of the all-natural product were made into a feltlike material and sold to local farmers and gardeners for use as mulch or groundcover. Rohner saw reduction in its overall production costs, having eliminated the need for filtering of dyes and chemicals in the production process. Other positive effects of the new production process were the elimination of regulatory paperwork and the freeing of space that had been used for the storage of hazardous chemicals.

DesignTex enjoyed so much success from the development of Climatex that it made the counterintuitive business move of giving up part of what most would see as a competitive advantage. In 2001, DesignTex, with the agreement McDonough, Braungart, and Rohner, allowed the entire textile industry to use of the Climatex Lifecycle manufacturing process to make 100% safely biodegradable fabrics. In sharing the proprietary research and development with its competitors, the network that developed Climatex Lifecycle sought to expand even further. To that end, the DesignTex decision suggests that “leadership, not ownership” is important in today’s business environment.

“We licensed the use of Climatex Lifecycle to Carnegie three years ago,” Lyons said. “And we believed that in the spirit of environmental ‘co-opetition’ that it was time to offer it to the entire industry.”

It was perhaps even more surprising that Rohner also embraced the idea of offering their patented technology to the industry. Said Bonnie Sonnenschein, corporate marketing manager for DesignTex:

When we decided to open up the Climatex Lifecycle process, Rohner actually wrote a letter of invitation to all of the ACT [Association for Contract Textiles] members, inviting them to use the process. They were really eager to share their technology. It had been seven years since we developed Climatex Lifecycle, and in that time, to our knowledge, no one else developed a 100% safely biodegradable fabric, although there was a big interest in it. It's not really green thinking if we just hold that information secret. It's a good product that everyone should use.

William McDonough and Michael Braungart, *Cradle to Cradle: Remaking the Way We Make Things* (New York: North Point Press, 2003).