Stumbling Into An Environmental Windfall, MICROFOAM Total Quality Management Team Tackles Packaging

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Steve Foster

In these days of companies striving to come up with "green" packaging concepts or designs to offer their customers the most environmentally correct total package, it is a change to hear about a company with a new packaging idea that was not initially designed to "save the world." However, the final product, The Reusables™ program, developed by a Total Quality Management team from MICROFOAM,® headquartered in Chadds Ford, PA, has been recognized as one of the most environmentally-sound packaging materials available today.

The Original Idea ...

In September of 1992, Gary Smith, MICROFOAM senior market manager for the furniture group, went to JCPenney's Director of Packaging Pat Rooney, with a prototype shipping bag called the "CouchPouch,"™ designed to help eliminate the need for costly corrugated shipping containers for the upholstered furniture industry. Working with an ad hoc group of design and manufacturing people from the MICROFOAM plant, the team developed a bag that consisted of an inner-layer of Microfoam, with an outer layer of a polyolefin film; the outside seams were then heat-sealed.

This two-dimensional flat bag design was constructed to endure the perils of tough handling in freight shipments on common carrier trucks. The bag was intended for one-way use, and the test was to ship upholstered units from one distribution center to another. The jury is still out as to whether or not those test shipments ever had any bags put on them, because when the upholstered units arrived at their destination, they were unrecognizable. "We were frustrated because this was an idea that everyone thought would surely work, a bag instead of a costly, bulky, corrugated carton," Smith comments. His resulting new charge to his design group was to make the bag tougher, especially the seams, which looked like the area that took the most abuse during the test shipment.

MICROFOAM has been the only manufacturer of a low-density, polypropylene foam used in surface protection and light-duty cushioning for over 20 years. This foam, also called Microfoam, uses a proprietary, high-speed, flash-extrusion manufacturing process, in conjunction with recapturing up to 99 percent of its CFC-free blowing agent components and reusing them in the process as well. Herman C. Koch, general manager of MICROFOAM explains, "Since the beginning, we have always concentrated on reusing our foam scrap from our process, and eventually devised a way for our customers to return their waste foam for recycling. The concept of 'reuse' has obviously been one that the company has been familiar with since it began manufacturing in 1971."

One of the key performance characteristics of Microfoam is its ability to cling to highly-polished or lacquered surfaces without marring the finish. Its "coefficient of friction" also prevents slipping against fabric; this is why Microfoam is heavily used in the fine furniture and upholstered furniture industries. It was in an attempt to solve a problem within this industry that The Reusables product line was accidentally created.

Steve Burkhardt and Larry Cotton, key players in the design team for MICROFOAM and specifically the CouchPouch, created a way to sew the seams instead of heat-sealing them. Their method seemed to add tremendous strength to the product. We sewed a few test bags and sent them to the field. Smith and his boss, Bernie Tuvlin, director of sales, were explaining to a prospective customer the benefits of using a strong pouch to ship their upholstered goods. In the middle of his sentence about the pouch's superior puncture resistance Smith heard a popping noise and turned to see Tuvlin's index finger poking through the bag. So at that time maybe "puncture resistance" was a relative term!

Try, Try Again ...

In August of 1993 a revised version of the CouchPouch was introduced to the marketplace. It was constructed of an inner layer of Microfoam and an outer layer of a woven polypropylene fabric, with sewn seams. This material composition was called "MicroTuff."™ "We went back to the same set of customers with our second-generation product, who had fortunately not given up on us," says Smith. They too were of the same conviction that we really had a product that could change the way furniture was being shipped throughout the United States. We tried more test shipments with JCPenney, and now also included Levitz and River Oaks Furniture, still with no satisfactory results. The particular pattern of the polypropylene fabric used to strengthen the CouchPouch actually generated too much friction against the other test units and rubbed right through the bag. Although this was a disappointment, the design team felt they were very close to solving the problem.

For the third-generation the team switched to a specially coated, polypropylene fabric on the outside to prevent abrasion against other surfaces. Another test shipment was scheduled; when the truck arrived Smith and his pioneering customer were afraid to open the door to see what else could possibly happen. But surprise! Not only did the CouchPouch make it without any problems, but it was immediately sent back out to a distribution center farther across the country to really test the pouch's durability. The pouch arrived a little dirty and with a few snags here and there, but overall in excellent condition!

It was after several more test shipments using the same pouch over and over again, that the light bulb finally went off. The Microfoam team saw that it had made these things so strong customers could actually reuse their CouchPouches over and over again, and realize tremendous cost savings over existing materials employed to protect their items. A new product had just been developed without anyone fully realizing it!

The TQM Assignment ...

Smith saw that this packaging design could be utilized in many different market segments beyond furniture. Since the company was also well into the practice of TQM in many of its business operations, management then decided that a TQM team should be assigned to assess the market prospects for an exciting product that was now called, "The Reuse-A-Bag."™

The Reuse-A-Bag team members included those obviously already involved with the project, as well as a cross-section of representatives from sales, marketing, accounting, and advertising. This assignment was not , however, to be a full-time commitment; normal daily obligations still had to be met by the team members, and on occasion they were able to all meet together to discuss the progress of the project. The cross-sectional mix was an attempt to have ideas thrown into the fray from individuals not at all familiar with the existing or prospective markets, to insure that ideas outside the paradigm would get a chance. It worked. Greg Zenuk, senior market manager for MICROFOAM, is largely responsible for taking the Reuse-A-Bag to the next level, and expanding its applications into a variety of markets. Greg specifically came up with the idea of marketing the Reuse-A-Bag to the appliance and electronics industry for the delivery of refrigerators, washers and dryers, and projection screen TVs. This industry experiences an

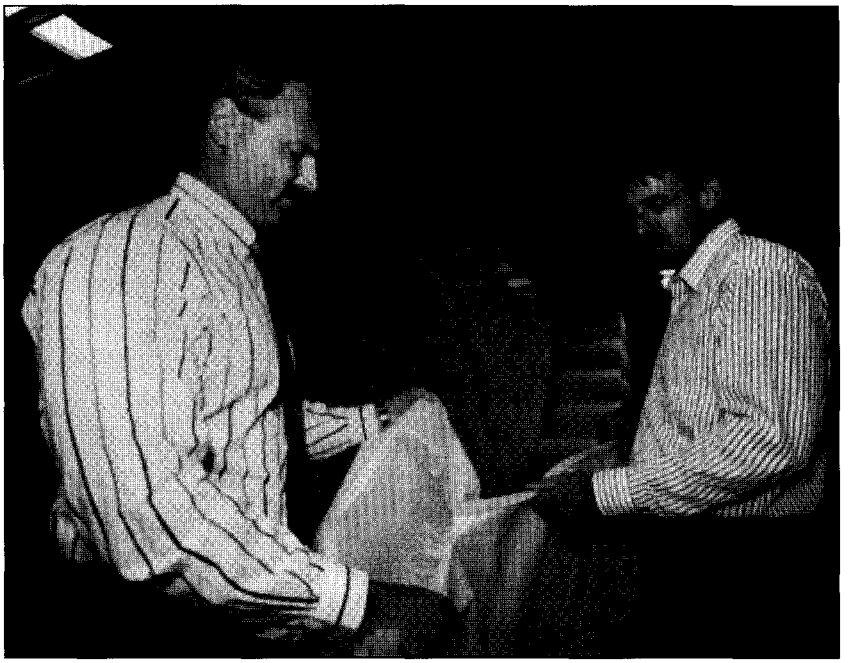

Figure 1. *Greg Zenuk and Steve Burkhardt evaluate where seam strength needs to be improved.*

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incredible amount of damage in the delivery of units from the curbside into the home, as well as damage from floor models that no longer have their original shipping cartons to protect them.

The breakthrough into this second industry did not come without difficulties, however. The original bag design (the CouchPouch) was two-dimensional ... refrigerators are not. When a Reuse-A-Bag was placed over the refrigerator, it had excess material on top that the customers liked to call "ears." Greg worked closely with the design team at the MICROFOAM plant to develop a three-dimensional rectangular bag that would properly fit over the item, and ultimately offer better protection.

As with any developmental project, it is imperative to win the confidence of a customer who is able to see through all of the initial misfires and realize the benefit of such a product. That customer helps "champion" the product; without that involvement the project runs into a dead-end. George Norat, operations manager for TOPS Appliance City in Edison, NJ, realized that Greg had come to them with a different type of product, and was willing to work with him to help refine the product to fit their specific needs.

After Greg had finished telling a room full of customers about the durability of the bag, he challenged Norat to try and tear the bag apart. First Norat declined, but then after some coaxing he grabbed two panels of the bag ... and proceeded to rip the seam into shreds. Somewhat red-faced, Greg remarked that he "must have gotten hold of an 'easy-opening' bag." As the development continued, Greg communicated back to the design team what changes (like beefing up the thread used in the seams) the bag needed. Changes were also made from customer suggestions, not just from areas that failed. Then more changes were made, and more changes.

For example, the customer wanted to have Velcro closures all around the bag. Then they wanted brass grommets on the bottom of the washer/dryer units to tie around the unit to protect against damage from a hand truck. "Finally, we had it!," says Zenuk. "We had the Reuse-A-Bag in which the appliance industry could deliver any refrigerator, TV, or washer/dryer based on our customer's input."

The only problem was that our super-modified bag had too many bells and whistles; the response of our sticker-shocked customer was, "I can afford one... maybe two." We had let our enthusiasm to satisfy our customer's perceived needs cloud our vision of controlling costs. That is when TQM team member Lori Kelly, cost control supervisor for MICROFOAM, was finally given more time to speak at our meetings. Working even more closely with those in the field and manufacturing, Lori and the team were able to refine the product to acceptable performance and cost levels, and were able to identify the actual needs of the customer.

For example, the team came up with standard size bags that did not require expensive Velcro closures. They educated the drivers and warehouse personnel on how to properly apply the bag and reduced damage to the bottom where grommets were thought to be needed. "That did not mean we didn't still listen to our customer for valuable input," says Zenuk.

There was a problem when the bags were returned to the warehouse and folded up for reuse — it was not clear when bags were folded flat for storage, which bag went on what size appliance. To get a first-hand perspective of what the delivery drivers were talking about, Zenuk spent an entire day in a delivery truck observing how the drivers put the bag on, delivered the unit, and removed the bag for its return to the warehouse. This problem was communicated to Burkhardt, design team member, who then developed the idea of using color-coded fabric to sew the seams together. The system was designed so that certain color seams on the bags would

fit certain sized items. The team developed a color-keyed chart to hang in the truck or the warehouse, greatly expediting the process of the workers picking out a correct size bag.

At some points, it seemed as though we had micro-teams forming, although not officially. Zenuk and Burkhardt began working together on a Tyvek® label system which provided us the flexibility of printing the customer's name on the bag. (See Figure 2.) The label also included the numbers 1 through 20, to indicate how many cycles the bag had been through. Then Zenuk, Burkhardt, and Kelly worked on ways to reduce materials and labor costs, such as recharting web widths to minimize waste when manufacturing the bags. They also quickly realized that a standardization system needed to be implemented. "We didn't want to end up with 50 different customers having 50 different custom bag sizes," explains Zenuk. After surveying many of our test customers, we came up with 15 standard bag sizes, with custom sizes still available at longer leadtimes.

Figure 2. *Gary Smith (right), discussing the Tyvek® label with customer Pat Rooney, director of packaging with JCPenney.*

The Reuse System ...

TQM team member Larry Cotton said, "The concept is simple, a reusable shipping bag. But if you don't have a system to get the bag back, you can't reuse it!" This proved to be one of the most difficult challenges the team had to face. How does the customer get the Reuse-A-Bag back if it is shipped outside of their area? What happens when the bags need to be cleaned and returned? Once Smith realized the bag could be reusable, he set out to investigate a closed-loop system of recovery for his furniture customers, many of whom ship on their own trucks.

Close to one of JCPenney's distribution centers was a handicapped workshop shelter. We approached the workshop's management with the idea of going to the JCPenney center, picking up the Reuse-A-Bags, cleaning them, removing any shipping labels or tape, refolding them, and then returning the bags to JCPenney for reuse. The first regional program was so popular that a nationwide network of handicapped sheltered workshops was organized to handle MICROFOAM Reuse-A-Bags from any part of the country.

The program was taken one step further for those companies located too far from any one of the workshops. United Parcel Service was contacted by MICROFOAM, and an agreement was made utilizing the UPS Authorized Return Service,® which will take the Reuse-A-Bags with a prepaid delivery ticket to the closest handicapped workshop for refurbishing. The bag is then returned to the original customer for reuse in the system. Customers that make only local deliveries with the Reuse-A-Bag also have access to the network of handicapped workshops for refurbishing their Reuse-A-Bags. Once the bags have finally reached the end of their lifecycle, they can then be sent to a plastics recycler to be used in the manufacture of light switch covers, flower pots, marine-environment lumber, and a variety of other durable plastic products.

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Packaging Utopia?

One of the key reasons for the success of this project was the laissez-faire philosophy we were intentionally afforded by upper-level management, Smith and Zenuk agree. If we needed the funding for something, we got it. If we needed upper-level contacts with other companies to assist in pushing the concept, we got that too. But we never had management come to us suggesting we reevaluate the validity of the project, even with all the false starts. A common goal was set by a team of individuals that were in many cases plunging into unfamiliar territory. In almost every case we learned

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tough lessons, made adjustments and kept on going. A genuine sense of pride in developing a product and concept so unique to the marketplace sustained the professional stamina needed to turn the product into a success story.

Now the Reuse-A-Bag is part of an entire set of products called "The Reusables,"™ a variety of reusable shipping products ranging from wraps to fit odd size appliances, to bags for upholstered furniture, to VCR bags complete with attached plastic envelopes to house remote controls during transit. The automotive industry is testing The Reusables to protect door panels during intra-plant operations, as well as manufacturers of multi-million dollar machine presses being readied for shipments overseas. Application opportunities continue.

What began as one individual's idea to help protect his customers' upholstered goods for one-way shipments, evolved into an obsession by six team members to develop a turn-key reusable packaging program. The Reusables program has developed into an environmentally powerful package, which in one case has reduced a customer's disposable packaging materials by over 70 tons annually. The team continues to listen to customer suggestions and make modifications accordingly — what works well in one industry doesn't always cross market lines without problems. Remember the "ears?"

The team responsible for this project, although formally dissolved, continues to communicate with each other on an almost daily basis, and has created resident "experts" who go out in the field to assist other marketing representatives for possible reusable applications in their territories.

Steve Foster serves as advertising manager for MICROFOAM, and recently received the Gold Medal from the Business Marketing Associates of Philadelphia. He also handles government sales and the ROCKGUARD (pipeline protection) product line. He has been a member of several TQM teams, including this one, in his eight years with the company.

The efforts of the MICROFOAM TQM team that developed The Reusables was recognized by Management Roundtable in Boston, MA as an outstanding concept and design, and was one of six national recipients of the 1994 American Product Excellence Awards.