

CHELSEA CENTER FOR RECYCLING AND ECONOMIC DEVELOPMENT

UNIVERSITY OF MASSACHUSETTS



Case Study

**SelecTech
Taunton, Massachusetts**

August 2002

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SelecTech

Taunton, Massachusetts

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The Chelsea Center for Recycling and Economic Development would like to thank SelecTech, Inc. for participating in this case study and providing insight into recycled product manufacturing.

August 2002

The Chelsea Center for Recycling and Economic Development, a part of the University of Massachusetts' Center for Environmentally Appropriate Materials, was created by the Commonwealth of Massachusetts in 1995 to create jobs, support recycling efforts, and help the economy and the environment by increasing the use of recyclables by manufacturers. The mission of the Chelsea Center is to develop an infrastructure for a sustainable materials economy in Massachusetts, where businesses will thrive that rely on locally discarded goods as their feedstock and that minimize pressure on the environment by reducing waste, pollution, dependence on virgin materials, and dependence on disposal facilities. Further information can be obtained by writing the Chelsea Center for Recycling and Economic Development, 80 Everett Avenue, Suite 221, Chelsea, MA 02150.

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SelecTech Case Study

Background

SelecTech, Inc. was formed in 1994 with the objective of becoming an integrated, low cost manufacturer of injection molded plastic parts using post-consumer and post-industrial feedstock. SelecTech is achieving its objectives using a combination of proprietary preprocessing and injection molding technology that allows it to economically convert dirty feedstock into high quality products. The processes and business decisions through which SelecTech has been able to turn previously valueless feedstock into valuable consumer and industrial products illustrate effective business planning, marketing, and operational strategies. SelecTech has grown to 30 employees and three main product lines in seven years, and saves over 1,250 tons of plastic from being dumped in landfills each year.

Developing a Recycled Product Business Opportunity

Incorporating recycled content:

Using recyclable materials for manufacturing feedstock requires flexibility when identifying potential business opportunities, as the variable quality of some recyclable materials makes highly precise measurements and colors more difficult to create compared to virgin materials. The limitations of recycled materials are not necessarily a liability, as SelecTech's strategy reveals. SelecTech chose to focus on products with three basic characteristics that overcame these limitations: bigger and heavier, robust, and crude. Incorporating these types of characteristics into product designs minimized the need for exact precision that may be challenging to maintain with impure plastics source materials. This manufacturing leeway in turn lowers costs and increases manufacturing throughput.

The "less refined" nature of SelecTech's target product characteristics led to three product lines: outdoor products (planters, timbers), traffic control (speed bumps, parking blocks), and industrial floor tiles. All of these products are large, strong and unbreakable, and do not require exact properties and color specifications compared to precision mechanical parts or other consumer products.



Lesson: using recyclable materials will play a defining role in identifying product opportunities and business prospects.

Identifying competitive advantage:

Several criteria drive SelecTech's business opportunities:

1. Target markets must be large in size, have growth potential, and have an identifiable niche for SelecTech's competitive advantage (cost, performance, etc.). Emphasis on industrial applications and mass retail channels to take advantage of volume and lower selling costs.
2. Product lines should be able to maintain high profit margins.
3. Waste materials should provide a cost and technological competitive advantage.
4. Products must provide an attractive return on investment (ROI) taking into account development and market entry costs.
5. Limited market entry costs due to
 - ability to sell through existing sales channels
 - ability to partner with a sales organization to obtain sales channel
 - ability to use lower cost public relations to gain market awareness. This is dependent on having an interesting story that is "press-worthy."

SelecTech's product lines not only effectively utilize product characteristics associated with recycled plastic, but also provide value for both end-users and SelecTech. To the end user, SelecTech's planters, timbers, speed bumps and blocks, and flooring products offer strength, durability throughout the seasons, attractive appearance, and longevity, all at prices as good or better than competitive products. The planters, for example, are less expensive than clay and will not break in freezing temperatures, or when they are dropped or fall on the ground.

From SelecTech's perspective, the products tap into high growth markets, and can be produced with significant cost savings compared to traditional manufacturers because of the ability to use "dirty" and commingled plastic. The home and garden industry is rapidly growing; customers across the country will likely be purchasing multiple planters. The cost savings available through using imperfect recycled plastics help provide a competitive advantage for SelecTech, above and beyond other product characteristics. While the planters provide advantages to the buyer, as noted above, internally, the ability to overlook exact color sensitivity and other specifications leads to cost advantages compared to other manufacturers. A significant part of the cost advantage also lies with SelecTech's injection molding technology, which is unique in the United States and currently proprietary. The technology is especially designed to handle unclean plastic sources, eliminating the need to wash, grind, or pelletize the plastic scrap.

Lesson: competitive advantage based on recycled content is different for the buyer and producer. The buyer's primary interest is quality (not recycled), while the producer wants to provide this quality at a lower cost. Recycled content can be a key competitive advantage for producers because the cost of material input is lower, enabling a competitive price advantage in the marketplace.

Analyzing market potential:

SelecTech's niche provides a competitive advantage based on quality and cost (driven by recycled content). Did the market also fulfill demand requirements to move forward with production? SelecTech used a variety of sources to analyze and refine this competitive advantage through understanding market potential and financial opportunity. The goal was to determine and understand three key areas:

1. Cost structure.
2. Product scope.
3. Current holes in the marketplace.

Marketplace and product scope analysis included learning pricing structures in SelecTech's target areas. This meant looking at existing products by store walkthroughs and product/pricing surveying. What were SelecTech's product relationships to existing options, such as type, quality, and utility, and what were the resulting price ramifications for SelecTech? The company looked at competitor company characteristics to understand potential weaknesses. SelecTech also utilized market data, extensive spreadsheet and sensitivity analysis, and sales partner data. SelecTech took advantage of all possible sources and contacts, whether point of purchase data, suppliers, and buyers, to help understand the complexities of the market opportunities that were potentially available to SelecTech.

A key aspect on the cost side was analyzing recycled plastic supply sources. In order to maintain a stable competitive advantage through cost structure, SelecTech needed to find a non-competitive materials source to avoid exposure to price fluctuations of raw materials. The company found that 50 million tons of waste wire casings are deposited in landfills yearly, as the plastics are difficult to work with and impure by normal manufacturing standards. To SelecTech, this material source was important in establishing their main competitive advantage over companies offering similar products: a lower cost structure enables SelecTech to compete on price terms as well as quality.

Lesson: determining market potential for recycled product introduction involves analyzing many different areas, from revenue opportunities to supplier costs and industry structure. Financial opportunity is driven by sales potential as well as beneficial cost structure on the supply side.

Financing and fund raising:

SelecTech's business model based on non-traditional production strategies (incorporating recycled content), and position as a start-up within a perceived "low-tech" industry with modest growth potential, were liabilities for the company when approaching various investor sources. SelecTech needed to pursue a number of funding sources to start the business and roll out new products. SelecTech found more success contacting investors and groups interested in socially responsible business, such as the Sustainable Jobs Fund and Boston Community Capital. SelecTech also took advantage of grants available through various government agencies, such as the Massachusetts Department of Environmental Protection, which administers the Recycling Industries Reimbursement Credit grant program, and the Chelsea Center for Recycling and

Economic Development, which sponsored a demonstration project of SelecTech's timbers to assess construction techniques. Government programs have accounted for about 3% of SelecTech's total funding. As always, cash flow is key when approaching funding sources, even socially driven investors.

SelecTech has also found other creative means to finance growth. For example, it pays sales representatives on commission, minimizing costs until cash has already been received from customers. Imaginative business practices like this can help free cash resources that would otherwise be tied up in operational costs. Still, SelecTech has not been able to grow the company as quickly as desired because of difficulties obtaining sufficient investment funds.

Lesson: pursue a variety of funding sources that may be overlooked by traditional companies. Socially responsible funds and angel groups will often be excited about green products companies, and at the least provide contacts or further ideas. Government grants, although usually on the small side, can provide much needed cash to buy capital equipment or train employees, without relinquishing company equity.

Managing the Value Chain

Supply:

SelecTech looked for recycled plastic supply sources with two main criteria: high volume availability and plastic waste with problems. In other words, find a plastics source that no one else can use that is also easily available. SelecTech found that tens of millions of tons of wire casing waste is destined for landfills every year. This plastic waste comes in all sorts of colors, sizes, and shapes (not pelletized), making the materials undesirable for most plastics manufacturers. Other plastics sources that were identified contained cork waste.

SelecTech has consistently found sources that are good for SelecTech and bad for everyone else. This situation protects SelecTech from supply price competition as suppliers have few other buyers if any, and helps to support SelecTech's competitive advantage based on cost. Using crude plastic sources immediately results in 50% cost savings over using virgin materials.

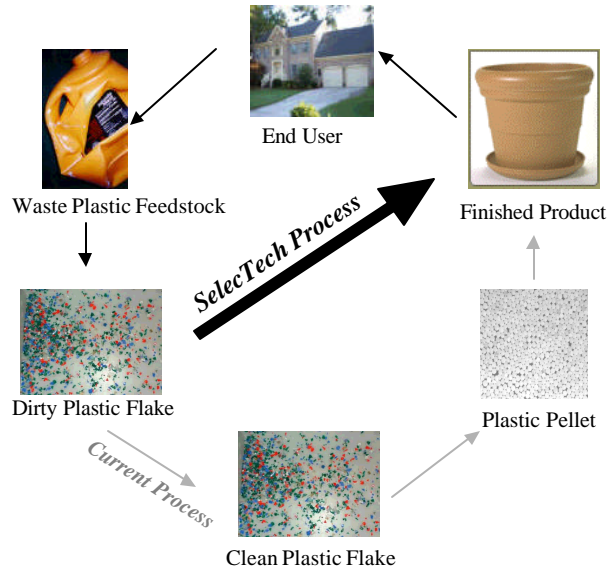
Lesson: recycled plastics afford unique supply opportunities that can differentiate a recycled product manufacturer from competitors.

Manufacturing:

SelecTech constructed manufacturing operations to take advantage of plastic waste most companies deem to be unusable. SelecTech found a European injection molding technology that enables manufacturing with impure plastics and dirt. As the technology was not currently in use in the United States, SelecTech was able to negotiate a contract giving the company exclusive rights for the injection molding capability, contingent on continued business growth and future equipment purchases. SelecTech created manufacturing operations fundamental to maintaining a competitive advantage. In addition, while other companies pay higher costs associated with cleaning and

pelletizing waste plastic, SelecTech is able to bypass these operations, thereby lowering its costs of goods produced, as portrayed in Figure 1.

Figure 1: SelecTech Process



SelecTech incorporates other manufacturing operations as well to become more vertically integrated to strengthen its competitive advantage. For example, SelecTech is searching for new ways to handle dirty plastics, creating new “recipes” of plastic blends, incorporating non-clean or even non-plastics debris. As mentioned above, SelecTech looks to cleaning and other pre-manufacturing processes normally associated with plastics manufacturing. The net effect of this effort is essentially expanding the company vertically, enabling the company to handle all aspects of manufacturing and processing. SelecTech purchases the raw materials, prepares them for manufacturing internally, and does not have to rely on other vendors who may specialize in cleaning or creating pellets for injection molding.

Other efforts to become more vertically integrated involve taking non-recyclable products (or currently expensive to process) and transforming them into material inputs, such as carpet backing and plastic wrapping material. SelecTech’s efforts to become more vertically integrated, based on unique handling and processing abilities of recycled plastics, helps protect the supply chain from external influence and price pressures, provides new potential sources of raw materials, and maintains internal cost advantages.

SelecTech has also taken advantage of recycled plastics by choosing to make product lines that are consistent with the 80/20 rule, meaning that fulfilling most of the important design requirements rather than 100% results in satisfactory quality products for the marketplace. Small imperfections, such as minor color variations, in the final product are not a quality liability. This quality latitude is much easier to handle than exact color matching each production run. Finally, SelecTech is always striving to

improve its internal operations, finding new efficiencies. For example, a new operations specialist was brought on to organize material workflow and processing schedules. With limited funding, Tom Ricciardelli, SelecTech's president said "We focus on what we have, making it run better."

Lesson: manufacturing efficiency involves many different functional areas, from material processing to product creation. While recycled materials pose challenges for some manufacturers, ingenuity and thinking outside standard industry practices can result in new sources of value and competitive advantage.

Brand Management and Distribution:

Recycled product manufacturers face additional challenges in convincing potential buyers that the product contains as much value as traditional alternatives. Green products can often be perceived as a negative to the end-user. To overcome this issue, SelecTech's marketing message stresses premium quality, lower cost, and superior function. SelecTech sells features and function, and does not emphasize recycled content. For example, product literature does not contain the recycled "chasing arrows" symbol.

Still, all things being equal, green product attributes are a plus according to SelecTech. Taking advantage of the green label often depends on the end user and the marketing message must be selective. Most customers searching through Home Depot are not likely to be looking specifically for products with recycled content. In this case, point of purchase advertising such as labels and displays should emphasize product quality and function. There are specific green retailers, however, who attract customers based on the environmental theme. Depending on the target buyer and location, the marketing message must be customized to effectively utilize the various product attributes, both green and non-green, that may affect the purchasing decision.

"It is easy to underestimate the selling process," according to Tom Ricciardelli. Beyond the intricacies of brand management with respect to recycled products, SelecTech also found that the selling process was much more difficult than initially estimated. At first, SelecTech felt that, "better quality will result in people buying the product." However, the selling process did not turn out that way. Convincing buyers of quality required effective marketing. This was challenging for a company that was technology driven; marketing was a tangential issue to the product development process that SelecTech was founded on.

As a result, management had to devote much more time and energy to marketing functions, developing a variety of distribution channels. Hiring marketing consultants was too expensive, so SelecTech used guerilla marketing techniques such as partnership development and attending trade shows in specific industry sectors, to minimize marketing costs. Partnerships included private branding and selling through sales representatives within industry sectors. For example, SelecTech began selling products through independent sales representatives or "selling companies," who specialize in supplying garden centers or playground equipment providers. The sales function is

currently about 80% outsourced, which limits exposure from complete reliance on selling companies who may change focus or limit resources. Establishing these selling relationships and distribution outlets has been a significant challenge for SelecTech.

Print advertising has been limited because of the high expense. When placing print ads, SelecTech has focused on trade magazines in their target sectors to reach higher volume buyers, as opposed to retail advertising. Attending trade shows for particular industries has also been effective, such as park and recreation expos. Green trade shows are useful for networking within the environmental community but have not been an effective selling mechanism for SelecTech, as serious buyers are usually looking for value rather than green products, and would probably not be attending an environmental expo.

Lesson: brand management must be focused on product quality and attributes, buyers are looking for product value over green content. Selling and distribution channel development will probably take more time than expected, even with a superior product.

Customer Relationship Management:

SelecTech maintains contact with customers during and after the sales process for two main reasons: product development ideas and industry knowledge. SelecTech builds customer relationships to gain their feedback and learn what they are saying. For larger customers, SelecTech sometimes modifies certain features if deemed valuable for other existing or potential customers, and incorporates changes into standard manufacturing molds. SelecTech even helped with installations of its plastic timbers to learn more about the strengths and weaknesses of the product, and further refine the product design to eliminate problems.

SelecTech also solicits feedback from its selling partners and distributors to learn more about the competitive landscape. Actively communicating with customers can lead to valuable knowledge of competitors' product offerings and industry trends. While this type of intelligence gathering can be difficult in a retail setting when interacting with thousands of disparate customers, SelecTech's selling strategies enable the company to gain end-user data via a limited number of intermediaries through which SelecTech does most of its direct selling. These partners interact directly with the end-users whether selling to earn commissions or privately branding SelecTech products.

Lesson: business development takes place beyond the sales cycle, and involves creating communications channels to refine current product offerings and generate future business.

Internal Organization:

SelecTech has evolved over its seven-year existence, from a start-up environment to a more stabilized business striving to expand its revenue base. In the early stages, operations would change on the fly but as production volumes increased, it became necessary to put standards in place and tighten operational control for production consistency and efficiency. Specific steps to improve operations included talking with

manufacturing operations employees to figure out ways to lower cost and increase efficiency, and hiring staff specialized in designing workflows to maximize throughput capabilities. Persistent efforts to analyze and re-work operations led to overall cost reductions of 30% and a reduction in monthly break-even time by 25%.

While increasing standardization to reduce waste and make operations more systematic, SelecTech also wished to maintain the creativity that drove the company's initial phases. There is still time set aside to "play" with new plastic mixes, testing new sources of recycled plastics and developing materials, even experimenting with new products or product attributes. For example, SelecTech could expand its customer base for floor tiles by providing new appearances beyond the current industrial look and feel. Within the systematic structure of SelecTech's operations, there is also a deliberate effort to innovate and try new techniques and recycled materials.

Finally, SelecTech has faced a steep learning curve from a senior management perspective. One aspect has been changing general management priorities and activities as the company has grown and developed from being a startup. For example, Tom Ricciardelli has a business and engineering background, and in the beginning stages of the company was directly involved with product development and manufacturing operations. As the company grew, other management activities such as marketing and day to day oversight required that he delegate more responsibility to the manufacturing operations he first designed. Learning to delegate tasks and responsibilities was a significant growth related issue, and one that still poses difficulties. In addition, senior management at first underestimated the level of interaction needed with employees to make sure everyone was working towards the same goals. Constant communication, "management by walking around," and face to face time has been critical in creating a SelecTech team environment. No problem is too small an issue, even an employee's car breaking down.

Lesson: a recycled product manufacturer faces the same internal management challenges as any company. With the use of recycled content still a growing manufacturing technique, make sure to allot time for creative problem solving and "play-time" with trash!

External Relationships:

Participation in networks such as the Re-Made in Massachusetts Alliance is an important component of SelecTech's business development. Constant discussion and interaction at various networking opportunities and within formal organizations has provided a number of tangible benefits to SelecTech, even when there is not necessarily an obvious direct relationship. As Tom Ricciardelli put it, just talking with other people has led to "new ways of thinking about problems." For example, SelecTech learned about a new manufacturing method to grind old carpets, as well as new product ideas.

Working with various agencies can also be helpful as a way to receive assistance and guidance at little or no cost. As already mentioned, SelecTech has pursued DEP grants to aid with capital procurement. SelecTech has worked with the Chelsea Center in

a number of areas, receiving material guidance, testing support, networking, interns, and research collaboration with the University of Massachusetts. SelecTech has been an active member in helping build the Re-Made in Massachusetts Alliance, a network of recycled product manufacturers in Massachusetts that is supported by the Chelsea Center.

Lesson: as Tom said, “things happen through constantly talking with others.” Although easily viewed as a luxury, outside networking and relationship building could be vital for business development and future prospects.

Value Chain Summary:

The figure below summarizes SelecTech’s value chain as it relates to creating a sustainable competitive advantage. Recycled plastics are a fundamental part of the value creation process, whether driving a competitive cost advantage, strengthening brand recognition, or guiding research and product development.

Figure 2: SelecTech Value Chain Summary

