

The Preserve toothbrush designed by Recycline, Inc. is a *green* product. It is *green* because it takes post-consumer and pre-consumer polypropylene, number 5 plastics, and used it to make a very functional, simple and popular item. Post-consumer indicates materials that have been *used* by the consumer and pre-consumer is that material that has been collected from the manufacturing process such as the extra trimmings, pieces that fell to the floor, imperfect products etc. that never made it to consumer. The toothbrush was Recycline's first endeavor. It took two years of planning and researching. Now they have a tongue cleaner, Jr. toothbrush, and tableware. Recycline is continuing to expand in new areas using the same mission – customers, environmental responsibility and simplicity.

Recycline is located in Massachusetts. It was started in 1996 by Eric Hudson to “help consumers conserve” (LeBel 2004). It began to develop the idea first by finding a niche to combat excessive waste and reinforce the company's 3 R's – recycle, recover, and reuse. The toothbrush seemed like a good place to start they wanted to make “high quality, innovative and environment friendly personal care products that can be used with comfort, conscience, performance and style” (www.recycline.com). The National Zoo website reports that 50 million pounds (of toothbrushes) are disposed of annually in landfills (Hafferty, 2005). This is potentially a large portion of landfill space that could be diverted. Recycline invested there time asking the dental profession what they would do if they had to design a toothbrush. According to Recycline the response was a toothbrush that guided your brushing technique, a handle that naturally helped your hand move the head over your teeth and gums in a motion they call Bass Technique. The website dedicates a whole page to describing this motion and gives detailed directions to both layman and dental professionals. The toothbrush handle and head were designed to be ergonomically correct and effective. Once the design was established they moved to the making of the Preserve.

Polypropylene plastic was chosen because it was easy to work with and did not lose integrity in the next life or the recycling process. The dental professionals also chimed in, in the bristle department strongly disagreeing with the use of natural fibers for the bristles because they are harsh on tooth enamel and can more readily promote the environment for bacterial growth. They suggested nylon, with a “rounded end” as the

best bristle. Nylon is also a plastic. Since it was oral hygiene this bristles would of course be virgin nylon. Interestingly enough nylon and polypropylene combine to make a stronger plastic – great for its next use as plastic lumber. It should be stated here that none of the toothbrushes are recycled into new toothbrushes but instead become plastic lumber. Plastic lumber is an excellent replacement for traditional wood timber. It has been used in decking, trail boards, benches, picnic tables, chairs, trashcans, toys, and signs. Recycline wanted to use the best environmentally appropriate plastic and therefore teamed up with University of Massachusetts at Lowell’s Plastic Engineering Department, a nationally renowned department.

Recycline had the design/blueprints of the toothbrush, the materials, it just needed to find the pre-consumer, post-consumer plastics, sources and suppliers, the manufacturer and by what means it would re-collect the toothbrushes. Similarly to how William McDonough and Michael Braungart, authors of Cradle to Cradle, suggested to designers coming up with a ‘positive list’ first, Recycline in essence did the same. They knew what the ultimate product wanted to do and how they wanted to remake it. Their next test was finding the right source. They could originally only use natural colored or light colored polypropylene because they wanted to *add* color to the handle, since it is all one piece it could only be one color. Later they were able to move on to darker colored sources which could only be made into darkly colored handles, they have got positive feed back from their black toothbrush. This means that they can widen their color range for post and pre-consumer plastics. In 2000, they joined forces with Stonyfield Farm, using their yogurt cups – they are both light in color and the right plastic for the handle. Customers can send back their empty and cleaned yogurt cups to Stonyfield Farm and they will become the source of the handle. Before this collaboration or if there is a greater demand than the supply of yogurt containers they turn to their other suppliers. It is important to note that all preserver products now use 65% Stonyfield Farm yogurt cups in the entire 100% recycled handle. The other 35% of the natural colored polypropylene comes from Conigliaro Industries (Mass., USA). “They are a collection facility” the website explains they “acquire plastics from the first-use disposal...they sort, do a preliminary cleaning of foreign particles and grind the materials” (www.recycline.com). Another company, EnviroPlastics (Mass., USA), is a “cleaning and reprocessing” supplier, which also does

some “sourcing activities”. Plastic sources must of course be from appropriate source and Recycline must know first use.

The actual process for most “re-manufacturing” involves the following (taken from www.recycline.com):

- Debaling: Break apart bales of crushed bottles purchased from raw material vendors. These bales contain mixed color HDPE packaging materials.
- Sort and Granulate: The individual bottles are sorted into two distinct manufacturing lines; one for opaque milk and water bottles and one for all other colors. The bottles are then granulated into a raw flake material.
- Clean and Wash: Each manufacturing line has its own wash system that removes pieces of label, foil and glue from the flakes.
- Pelletization: The cleaned flake materials are then passed through an extrusion and pelletization process that produces finished goods.

It should be noted that this is not their exact process because they only use #5 plastics. After the plastics are cleaned, sorted, ground - they are ready for the manufactures where they will be injection molded to form the handle. An unnamed manufacturer produces the Preserve toothbrushes using injection molding. It is a technique where pellets are “fed from a hopper into a heating chamber. A plunger pushes the plastic through the heating chamber, where the material is softened into a fluid state. At the end of this chamber, the resin is forced into a cooled, closed mold” (<http://lifecycle.plasticsresource.com>). It may be surprising to know that there are only six major manufacturers in the industry according to ‘Production’ section of Recycline’s website. They chose one of the top two after an interview process. They point out that to their knowledge only one company “does not out-source to these specialized manufacturers”. A separate article on the website www.tiplepundit.com, in 2005, mentioned Radius another manufacture of toothbrushes, upon going to their site they did say that they make all of their products on site in Pennsylvania. Radius takes a different path on function and materials.

The plastics are all tested to check for quality, they do this by heating the material in a leaching solution for 24hrs the solution is then tested. They test for ‘foreign

elements' and heavy metals. Heavy metals could have contaminated the plastics in the manufacturing process. The 'foreign element reading' of the plastics is required by the U.S. Environmental Protection Agency (EPA) and the plastic must fall below a certain quantitative requirement and be considered "safe for drinking water" (www.recycline.com). Recycline has always been below these levels. They of course check "to make sure they are clean" and that they are held to the same standards as virgin plastics. The final step is stapling in the "virgin nylon bristles... in a tri-level configuration" (www.recycline.com).

Packaging has not been forgotten and is a slender light weight transparent case with ventilation holes and cap that doubles both as a package and a travel case. The air holes and cap are sealed by a small-perforated piece of plastic of unknown origin. The case is classified as a number 7 signifying 'other'. It is made of cellulose "derived out of wood harvested from forests managed under a program of sustainable yield" (www.recycline.com). The cap is number 2 (HDPE) high-density polyethylene that can be recycled at most curbside recycling programs. The Paper insert is 100% recycled with a 50% post-consumer waste. The inks are soy based. At most retailers (Trader Joe's, Whole Foods, Target) there are postage paid mailers provided by Recycline to help "provide for the end-life products" (Lively, 2006). The mailer envelope is made by eNVIRO-TUFF and is 35% recycled post-consumer product.

The toothbrush is designed to be effective in this life, as toothbrush, and the next as whatever you mind can imagine and your hands can build as plastic lumber. The toothbrush is one solid piece of polypropylene plastic unlike many new toothbrushes that are comprised of plastic and rubber for grip and comfort. The Preserve instead of using rubber makes use of three rings just before the handle arches. To date, it seems to be the only product of its kind on the market. Radius has recently (2005) been trying to catch up with a using more environmentally responsible packaging. They did in 1983 try and use cardboard but that did not work and in 1992 they used the travel case concept but it was too durable and not recyclable. They now have a toothbrush that has some recycled components and or comes from sustainable yield forests. Radius did make a claim on its website that it was not worth the cost to recycle a toothbrush and they suggested just reusing them around the house but Recycline did confront them on the point of their

calculations about amount of fossil fuels and such used in the collection of the toothbrushes and recycling etc. and Radius did take the page offline. There are pros and cons to the Radius company and it may come down to personal preference. There is a comparison of the two – Preserve (Recycline) and Intelligent (Radius) in an article by Evelyn Hafferty that might be helpful for those in the market.

Recycline has paid careful attention to its many steps along the chain of events, from source to selling. They have also demanded the same from their suppliers and manufactures. They have chosen companies that have excellent “attention to quality” and or that have been leaders in their fields. They have helped consumers support an eco-minded business by providing a strong, simple, functional, aesthetic pleasing toothbrush that is affordable (roughly \$3.00, \$2.79 + tax at Trader Joe’s). Dentists suggest changing your toothbrush every few months. This adds up! Recycline saw this as a confirmation to change both the outcome of #5 plastics, and the way we think about everyday products.

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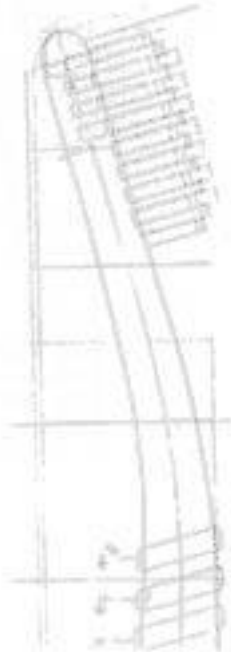
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