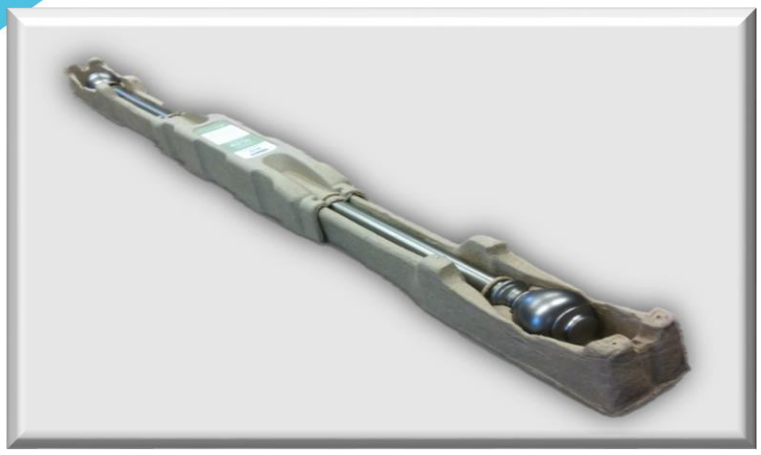
Developing Composite Recycled Packaging

Case Study: Intercrown Enterprise



SUMMARY

Industry
- Retail home products

Customer Location
- Taipei, Taiwan, Hong Kong and Guangzhou, China; Madison, WI

Business Situation
- Packaging is both a differentiator and a throwaway, so we needed to make sure it was environmentally conscious.

Technical Situation
- Intercrown needed to improve the industrial design of its product in a way that it could be manufactured inexpensively and reliably.

Solution
- NLS worked directly with the factory and local suppliers to refine the supply chain, while design engineering and simulation improved the design and designed the tooling.

Benefits
- Environmentally conscience packaging solution
- Intercrown's customer (Walmart) was impressed by the talent and ingenuity, and wanted to see how it could continue to grow its business with Intercrown.

Solutions / Services
- Design engineering and simulation services
- Materials engineering services
- Manufacturing engineering services

Company Overview

Intercrown Enterprise LTD, a manufacturer of window treatment products, was founded in Taiwan in 1969. From the start, Intercrown's main mission has been affordable innovation. The company's ability to sell products at affordable prices stems from cutting out the middleman and selling directly to customers. With offices in the U.S., China, and Taiwan, Intercrown prides itself on its ability to deliver innovative products, ideas, and solutions. This is where Northern Lights Solutions came into play.

Situation

Northern Lights Solutions has a history of developing better products with advanced and sustainable materials. We were contacted by Intercrown to create a new type of packaging for its shower rods that were being imported into Walmart stores all over the world.

One of the major problems associated with packaging in China is directly related to the lack of wood resources, of which packaging material is largely composed of. Wood in China is a scarce commodity, making it costly to produce packaging material. This added cost negatively affects both the retailer's bottom line, as well as the end-user's. Since wood is not a rapidly renewable resource, it is not considered a sustainable choice.

Intercrown was looking to decrease costs associated with packaging, and the company needed help coming up with an innovative solution.

Design Engineering Services

NLS discussed options, designs, and costs with Intercrown before suggesting molded pulp for the packaging. Molded pulp is ground up recycled newspaper that is mixed with glue and thermoformed with heat into a rigid package.

NLS researched the material attributes of molded pulp while an interior designer came up with creative packaging concepts. These sketches were turned into prototypes with 3D modeling and the material was thoroughly tested.

Simulation and Analysis Services

Molded pulp is a non-linear material which has different mechanical properties in different directions. Because of that fact, NLS was forced to do extensive mechanical testing to define its properties. Finite element analysis was used to test the product to Wal-Mart packaging specifications. The part failed the initial computer simulations and had to be redesigned and tested until it passed. In the past, tooling had to be made for each trial test. However, NLS was able to save this tooling cost and extra time spent for rework.

Results

NLS contacted a vendor of molded pulp in China to manufacture the prototype for Intercrown. The vendor worked with Intercrown to set up a process that incorporated the factory's recycled scrap paper into the molded pulp packaging. The egg carton technology packaging is made out of 100% recycled materials. This dramatically reduces the carbon footprint by not having to extract virgin materials. The packaging has an innovative design. It is much lighter than the average packaging material, so more products are able to ship in the same container, and less waste is created. Since the product is manufactured out of recycled materials, it can easily be recycled by the end-user. However, if it is disposed of in the landfill, it will still decompose faster than other packaging materials. Another added bonus is that the scrap packaging material from the plant is recycled back into the packaging, which further reduces the amount of product going to the landfill.

Both Intercrown and Walmart were pleased with the results of the packaging, and both companies love the design and sustainability of the project outcome. This is the first retail packaging made from molded pulp at a big box retailer. Intercrown is now rushing to develop other packaging from molded pulp for some of its other products sold to big box retailers.

NorTech INNOVATION AWARDS

This project was nominated, and a finalist, for a Nortech Innovation Award, which honors the latest technological breakthroughs that positively impact the industry and local economy through job creation, attraction of capital investment, and overall business growth.

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