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hatch
PRODUCT DEVELOPMENT

Hatch may be a new name but the company has been helping local entrepreneurs and businesses for the past 5 years. Mathew S. Smith purchased Smith Herrick Engineering in 2010, becoming the sole owner of the company. After the purchase Smith rebranded the company Hatch Product Development, LLC. You can find the new brand and some advanced examples of capabilities at www.hatchpd.com.

Hatch moves concepts to production. With full design/analysis, prototyping, sourcing, production design, and equipment manufacturing services we can take any project and ready it for your team to market and sell.

Previous newsletters touched on our capabilities, including unique automation, controls, and production techniques. This time we'll focus on one of our specialties, plastics.

What type of plastics to use:

Picking the wrong plastic can hinder the design process, resulting in over-engineering and wasted time and money. There are thousands of grades of engineering plastics on the market. Furthermore, we must be aware of plastic additives, which can improve processing, increase performance, and reduce the need for a few key questions about the intended use and operating environment of the product. The number of options will immediately be reduced down to just a few options. The basic chart below provides examples of plastics we would utilize the major compounds.

Generic Name	Trade Name	Description	Use	Cost
Polypropylene		Scratch resistant lightweight	1) Used where high flexural strength is required	Med
		Extremely High Chemical Resistance	2) Milk Bottles	
			3) Living Hinges	
Acrylonitrile, Butadiene, Styrene	Cyclac	Strong, flexible uses rubber as a filler	1) Toys	Low
			2) Automotive gauges	
			3) Electronics Housings	
Polyvinyl Chloride		Reasonably Strong	1) Pipes	Very Low
		Chemical Resistant	2) Consumer Electronics	
Nylon 6/6	Zytel	Chemical Resistant	1) Throttle Pedals	Med
		High Strength	2) Chain Saw Connectors	
		Dimensionally Stable	3) Zip Ties	
Delrin Celcon		Extremely Wear Resistant	1) Sliding Bearings	Med
		Moderate Impact Resistance	2) Rotary Bearings	
		Moderate Strength	3) Buckles	
Polycarbonate	Lexan	Bullet Proof	1) Safety Shields	Med
		Transparent	2) High Impact Bottles	
		High BPA Content	3) Many Impact demanding applications	

JELD-WEN

WINDOWS & DOORS

VOLUME 1, ISSUE 7 AUGUST 2011

FEATURING RECLAIMED DOUGLAS FIR

Compelling Character

Reclaimed wood is recovered from old barns, houses, fences and factories across America. It features nail and bolt holes, natural weathering and other signs that provide clues of its unique history of its first use. It also possesses an appearance not available in most new lumber due to its old-growth roots offering dense grain and a high degree of heart wood.

Old School Advantages

Having been harvested and milled years ago, reclaimed wood is most often old-growth with dense grain, making it harder and more durable than new lumber. Combine that with the fact that by making beautiful new products out of it we offset the demand for new lumber and prevent old wood from ending up in landfills or burn piles.



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A specific example of the nuances of plastic selection can be seen in this camera lens case. The demands of this product included many factors...

- Impact resistant
- Water tight
- High strength
- Low temperature environment
- Bendable but not breakable

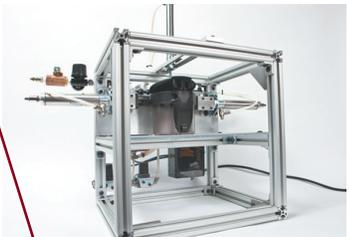
The hinged lid was the most demanding of all the parts so let's focus there. The lid had to be flexible yet rigid, tough, wear resistant, dimensionally stable, and able to accept an over-mold.

From our chart above you will find that Polypropylene, Nylon, and Acetal all have some of the characteristics that we need. Polypropylene was rejected because it is typically pliable so it wouldn't meet our rigidity needs and it is susceptible to UV light. Acetal is great in wear but we weren't sure if we could find a recipe that would meet the flexural needs and maintain stiffness, furthermore over-molding Acetal is practically impossible. Ultimately nylon was our leading candidate.

To test the materials we, at Hatch, designed and built an accelerated life testing apparatus. This device effectively subjects parts based on a consistent metric.

A number of Nylon blends to choose from and all will accept an over-mold. A look at data sheets led us to a nylon that excels in flexural loading. When it came to parts up we choose the cam-molding glass fiber reinforced. The glass fiber pushes a flexural strength, but due to its brittleness, we did extensive testing to find a balance between the two results was a Nylon 6 with 7% glass fiber.

Considering if plastic is a possibility for your current products, or if you are developing a new product and want to explore your options, contact us for a free consultation.



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