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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 e of plastic additives, which can improve processing, increase performance, and reduce ng a few key questions about the intended use and operating environment of the product, ll immediately be reduced down to just a few options. The basic chart below provides ex- 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	
onitrile, Butadiene, Styrene	Cycolac	Strong, flexible uses rubber as a filler	1) Toys	Low
			2) Automotive gauges	
			3) Electronics Housings	
yvinyl 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	
Acetal	Delrin Celcon	Extremely Wear Resistant	1) Sliding Bearings	Med
		Moderate Impact Resistance	2) Rotary Bearings	
		Moderate Strength	3) Buckles	
olycarbonate	Lexan	Bullet Proof	1) Safety Shields	Med
		Transparent	2) High Impact Bottles	
		High BPA Content	3) Many Impact demanding applications	

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...

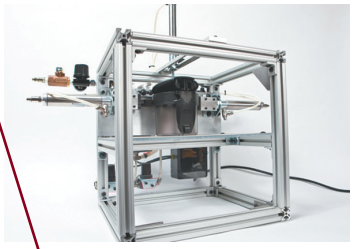
- Impact resistant
- Water tight
- High strength
- Low temperature environment
- Bendable but not breakable

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 e worth of usage into just 24 hours. This key piece of equipment meant that we could eject parts based on a consistent metric.

a number of Nylon blends to choose from and all will accept an over-mold. A look data sheets led us to a nylon se it excels in flexural loading. arts up we choose the com- adding glass fiber reinforce- the glass fiber pushes a flex- brittleness, we did extensive a balance between the two result was a Nylon 6 with 7% ve.



dering if plastic is a possibility current products, or if you are y product and want to explore l us for a free consultation.

www.hatchpd.com ❖ contact@hatchpd.com ❖ 541.788.8465

JELD-WEN
WINDOWS & DOORS
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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.

CONTACT DON FOR MORE INFORMATION
CALL 541-382-1149

Cascade Publications Inc.
404 NE Norton • Bend, OR 97701• 541.388.5665 • Fax: 541.388.6927
www.cascadebusnews.com • cbn@cascadebusnews.com