Hylon® N1213STL PA6/6 Resin

Product Attributes

- Glass Filled for High Rigidity
- Super-tough Impact Modified
- Chemical

PROPERTY	METHOD	UNIT	DAM
PHYSICAL			
Specific Gravity	ASTM D792	-	1.19
Water Absorption (24-Hr Immersion)	ASTM D570	%	-
Mold Shrinkage (Flow, 1/8 in.)	ASTM D955	in/in x 10^{-3}	-
MECHANICAL@ 73°F			
Tensile Strength at Yield	ASTM D638	psi MPa	12,600 *87*
Elongation at Break	ASTM D638	%	2.5
Flexural Modulus	ASTM D790	psi MPa	550,000 *3,793*
Flexural Strength	ASTM D790	psi MPa	18,000 *124*
Izod Impact Strength (Notched)	ASTM D256	ft-lb/in J/m	2.6 *139*
THERMAL			
Heat Deflection Temperature: 66 psi *0.46 MPa* 264 psi *1.82 MPa*	ASTM D648	 °F *°C* °F *°C*	 - - 430 *221*

†The data listed here fall within the normal range of product properties, but they should not be used to establish specification limits or used alone as a basis for design. This information is not intended as a warranty of any kind. Buyers must make their own representative test and assume all risks of use, whether used alone or in combination with other products. Entec Polymers, LLC assumes no obligation or liability of any advice furnished by it or results obtained with respect to these products. All warranties expressed or implied including warranties of merchantability for a particular purpose or use are excluded and disclaimed. Entec Polymers, LLC assumes no liability for use of products in infringement of any patent. The foregoing limitation of remedy and exclusion of liability is reflected in and is part of the consideration for the price at which the products are sold by Entec Polymers, LLC. All data displayed herein has been obtained via testing of injection-molded specimens of natural color. Pigmentation may affect certain properties to various degrees.

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When Royal Appliance Mfg. decided that its Dirt Devil line of vacuum cleaners should include a steam cleaner, they created a challenge for themselves and for all those involved with the product design process. The design team wanted to create a shallower, more streamlined product, but also wanted a water tank that had a capacity comparable to competing models. To solve the load support problem, the back panel would have normally been built up, which was contradictory to the concept of creating a slimmer unit.

How did Royals' design team accomplish the task of supporting the weight of a full sized water tank while simultaneously reducing the profile of the entire unit and meeting stringent time and marketing requirements?

When conferring with technology consultants at Entec Polymers, LLC, the various teams assembled at Royal were introduced to a glass filled, super-toughened nylon product that would satisfy the need for strength in a relatively small piece. Initially, an Entec HYLON® grade, N1213STL, was suggested but the purchasing and marketing teams indicated a need for reduced material cost. Taking this need into account, Entec representatives suggested Entec HYLON® grade N1213STL, which would satisfy the physical properties required as well as the need for a reduction in cost.

Since the back panel would be subjected to stresses from supporting the machine as well as forces used to move and maneuver the unit, a finite element analysis and MoldFlow analysis were needed. Entec enlisted Advanced Plastics Technology (APTEC) to complete these analyses and recommend design changes in order to minimize molded in stress and maximize resistance to warpage due to external forces. Upon analysis, APTEC recommended very minor changes, such as including extra support ribs and changing gate locations to promote better glass fiber orientation. Upon implementing the changes that APTEC proposed for use with the Entec HYLON® grade N1213STL, the molder reported that the first run of the part was a complete success.

As a result of conferring with Entec on material selection, the advanced analysis abilities of APTEC and the custom compounding abilities of Entec were made available to the design team at Royal, resulting in a finished product that was two months ahead of schedule with significantly reduced costs.