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Mack Tweaks Tool, Process To Mold Recycled PVC Flooring

Posted on March 1, 2013 by [Doug Smock](#)

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An interesting project at [Mack Molding](#) shows the challenges of using waste materials in sophisticated manufacturing processes.

Mack, based in the environmentally conscious state of Vermont, is working with [SelecTech](#) (Avon, Mass.) to produce an interlocking (adhesives free) flooring system from post-industrial flexible vinyl, including flexible films, roofing membranes and swimming pool liners.

The two companies have been working together since 2011 to refine the manufacturing system for the flooring, which is custom injection molded on two 500-ton presses.

Processing recycled resins requires a new mindset.

"Typically, manufacturers want highly specified materials so that everything can be totally measurable and quantifiable," says SelecTech Founder and President Thomas Ricciardelli. "Anything short of that makes the job harder. So when molding recycled material, which has a fairly large process window, there's a level of subjectivity and art to it. And most manufacturers don't want that."

Inconsistent material requires rapid process changes, including melt temperature and injection pressure adjustments, altering the conductive blend for the static control product, and right-sizing the cosmetic laminate layer that is over-molded onto the interlocking substrate or backing.

Mack recently redesigned the molds to reduce tile thickness, which not only helps meet the cosmetic specs, but eliminates weight by roughly 30% without impacting performance.

Mack engineers have also modified the geometry on the core side of the tool to improve the filling pattern, resulting in a flatter, thinner part. Engineers used mold-filling analyses and SolidWorks to help with this improvement over the original design. The flatter edges of the tile and improved interlock fit result in easier installation for the customer.

The tool is plated for improved chemical resistance and long-term durability for molding recycled PVC compounds. A second tool of the new design is currently being built by Colonial Machine Co., Kent, Ohio, and is expected to be in production this month.

In addition to refining existing tools, research and development is ongoing to add recycled vinyl-back carpet tile or carpet crumb to the materials list. This could have a huge impact on the environment because some eight billion pounds of carpet are disposed of each year, with vinyl-back carpet comprising about 155 of that total.

The motives for buyers are not entirely altruistic.

New laws in California tax carpet sales. Money is refunded to companies that find ways to recycle and reuse waste carpet to manufacture other products.



Sustainable flooring made by Mack, SelectTech.



About Doug Smock

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