

Painted foam TPO part earns Henry Ford Technology Award

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Ford is introducing the industry's first structural-foam painted thermoplastic elastomer (TPO) component using a patented injection molding process called SPT.

"It's a total game changer," says Harry Lobo, a product development engineer at Ford. A unique endothermic foaming agent coupled with a proprietary primer yields a 30% weight reduction and a 65% cost reduction.



2013 Ford Edge Sport uses new TPO process.

In the process developed by [ABC Group](#) (Toronto), the foaming agent does not release until the mold is completely filled. Use of counter pressure replaces traditional injection molding. Polymer pellets are pre-coated with primer to assure consistent

dispersion of foam concentrate. Parts are reduced from three to one.

The ABC process will be used first in a six-foot-long sport rocker molding on the Ford Edge Sport, but will soon also be used in other applications, including another rocker and a box for a truck. An application with JEEP is also being explored.

The process begins by blending a foaming agent with TPO or another resin. A small amount of back pressure then contains the foam within TPO skin layers. Pressure is generated into the tool with nitrogen gas at 120 psi.

In the current approach, there is an outer TPO layer with two inner glass fiber polypropylene inserts, three pieces of tape, and 17 fasteners. The weight is 8 lb, or 16 lb per vehicle. The one-piece TPO structure only requires six fasteners.

The design includes strengthening ribs. In a significant design innovation, wall stock can be varied across the length of the part while maintaining a Class "A" Surface. "The beauty is that you can put structural strength where you want it," says Lobo. That was important because the challenge for the part was to withstand simultaneous loads of 200 pounds with a seven millimeter deflection.

There's no glass reinforcement in the talc-filled TPO. The material supplier is LyondellBasell. The tooling supplier is Delta Tool.

Unlike some other foaming processes, there is no requirement to buy additional equipment.

The engineering team recently was presented the prestigious Henry Ford Technology Award. The TPO rocker molding is a finalist in the 2012 Society of Plastics Engineers Automotive Innovation Awards program. Winners will be announced at a [banquet](#) in Livonia, MI on Nov. 7.

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