



FROM THE FORD “SCI LAB”

April 11, 2011: TINY BUBBLES IN PLASTIC COMPONENTS CAN SAVE WEIGHT

FROM THE LABS OF FORD MOTOR COMPANY researchers and interior/exterior component engineers have been investigating using microcellular or MuCell technology for injection-molded parts to reduce component weight, a key Ford strategy to help increase fuel efficiency.

HOW IT WORKS: MuCell, developed and patented by MIT and now owned by Trexel Inc., involves the highly controlled use of a gas such as CO₂ or nitrogen in the injection-molding process, which creates millions of micron-sized voids or bubbles in uniform configurations.

- In Ford research trials, the microscopic bubbles reduced component weight up to 10 percent for a non-visible part, without sacrificing dimensional integrity
- Using MuCell technology also eliminates pack and hold times in the molding/cooling process, reducing cycle times. With MuCell, the typical time to mold a part during trials improved up to 30 percent
- The MuCell process also requires less clamping force, allowing a reduction in injection press size by up to 50 percent; reduced cycle times and clamping forces translate to energy savings and reduced CO₂ emissions associated with production

POTENTIAL CONSUMER BENEFIT: Overall vehicle weight affects fuel efficiency, a top purchase consideration for buyers. Yet consumers don't want to give up comfort, convenience, performance, appearance or technology. So automakers must look at every aspect of a vehicle, from the smallest bracket to the engine that powers it for potential weight savings.

- Ford is committed to reducing vehicle weight between 250 and 750 pounds depending on vehicle line by 2020; increased use of high-strength steels, aluminum, magnesium and other platform efficiencies has already begun to meet these goals
- Ford has four nameplates with EPA-certified 40 mpg-plus (Focus SE with SFE package, Fiesta SE with SFE package, Fusion Hybrid, Lincoln MKZ Hybrid), more than any other full-line manufacturer

WHAT'S NEXT: Ford will continue to research potential uses of MuCell technology for production of interior components. Ford also has patents filed on improvements to the MuCell process.

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