

DuPont Automotive

Innovation Spotlight: DuPont™ Zytel® and Zytel® HTN



Latching Refueling Valve

Application

First bi-stable latching refueling valve (L-RV) that eliminates power draw in both the open and closed state. Developed by system supplier Continental Automotive for the 2017 Ford Fusion and Lincoln MKZ hybrid electric vehicles (HEVs).

Unmet Need

HEVs use both internal combustion engines and battery power. The efficient use of electric power to optimize fuel economy and minimize greenhouse gas emissions is critical. Therefore, maximizing range and performance of HEVs by minimizing power draw from ancillary functions and processes is an ongoing priority.

Challenges

- The operating environment of the valve system includes fuel exposure at temperatures exceeding 100°C.
- Stable and consistent frictional forces are required to ensure free movement of valve components over a wide range of temperatures and fuel exposure conditions.

Solution

The patented Continental design uses an internal latch mechanism with a single activation pulse. This L-RV, which stays open with no energy during refueling:

- Increases battery life through a 150,000% reduction in energy usage compared to existing valve designs.
- Meets emission standards during fuel fill events by directing fuel vapor through the carbon canister to trap hydrocarbons so they do not enter the atmosphere.
- Features a simple design that is easily extendable to replace conventional solenoid valves in a variety of applications.

DuPont Materials Chosen and Why

DuPont™ Zytel® HTN was chosen for the latch component of this application because it offers:

- Consistent coefficient of friction over a wide range of temperatures and fuel conditions
- Enhanced wear protection for increased durability
- Dimensional stability, even after prolonged exposure to fuel
- Excellent processing capabilities to enable tight tolerance micro features in latch components

DuPont™ Zytel® was chosen for the housing structure of this application because it provides:

- Flexibility for advanced manufacturing technologies
- Laser welding capability for the hermetic system seal



For more information on the Latching Refueling Valve and other SPE award winners and finalists, visit the **SPE Automotive Innovation Awards website**.

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