

DuPont Automotive

Innovation Spotlight: DuPont™ Zytel® HTN



PART OF THE 2016 SPE
AUTOMOTIVE INNOVATION
AWARDS PROGRAM
PROCESS / ASSEMBLY /
ENABLING TECHNOLOGIES
CATEGORY

Ford 3.5L Thermostat Housing Assembly

Application

First hot-gas welded PPA thermostat housing. Developed by system supplier Bocar Group Plastics Division for the 2017 Ford Motor Company 3.5L V6 Cyclone TiVCT TDI engines.

Unmet Need

Engine downsizing and increased fuel efficiency requirements are ongoing trends that are driving the demand for components and assemblies that are lighter weight; able to fit into the ever-decreasing space on the engine; and capable of delivering required performance in under-the-hood environments that are experiencing higher operating temperatures and pressures.

Challenges

- Component must withstand temperatures ranging from -40°C to 120°C and 3.3 bars peak system pressure.
- Component must withstand aggressive glycol environment.
- Component must be lighter weight than incumbent metal assembly.

- Packaging space is at a premium, driving complex design with tight tolerances.
- High-quality weld joints with no dust in coolant circuit are required.

Solution

Bocar Group Plastics Division developed the first hot-gas welded PPA thermostat housing with multiple joints. The hot-gas welding process enables a high-quality weld joint without dust generation and the tightly packaged innovative design made with DuPont™ Zytel® HTN:

- Reduces weight by 30% compared to the previous aluminum solution, helping to improve fuel efficiency.
- Maintains tight tolerance sealing to the engine.
- Fits into a very limited space on the engine.
- Costs 40% less than the previous aluminum solution.
- Meets Ford Motor Company critical performance requirements.



DuPont Material Chosen and Why

DuPont™ Zytel® HTN51G35HSLR was chosen for this application because it offers:

- Outstanding resistance to glycol
- Excellent creep resistance at engine operating temperatures
- High strength and stiffness over a wide range of temperatures
- Retention of properties when exposed to moisture
- Fast molding cycles and excellent flow that allows molding of complex parts

For more information on the Hot Gas Welded Thermostat Housing and other SPE award winners and finalists, visit the [SPE Automotive Innovation Awards website](#).

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