

DuPont™ Zytel® HTN and Zytel® LCPA Address Challenges in eMobility



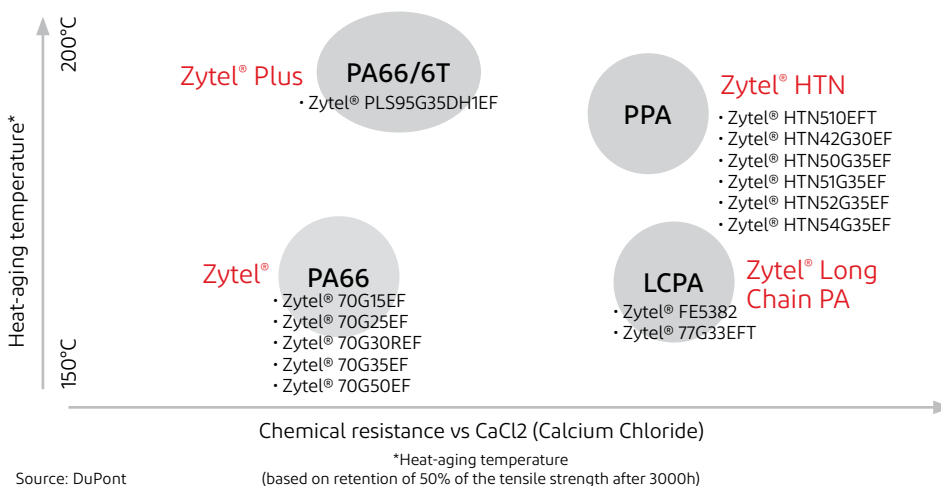
Advances in EV technology, autonomous, and automated vehicles increasingly require materials that can handle contact with various fluids, and low- to high-voltage loads in different conditions like temperature and humidity. DuPont's AHEAD™ (Accelerating Hybrid-Electric Autonomous Driving) initiative offers the widest portfolio of electrically-friendly (EF), heat-stabilized nylon materials based on different chemistry. These materials are specifically designed to increase the durability of components for better safety, efficiency, and connectivity performance at different temperature levels.

The portfolio comprises Zytel® PA66, Zytel® Plus, Zytel® HTN, and Zytel® Long Chain PA (LCPA) – addressing different temperature and chemical resistance requirements.

Key Advantages of Zytel® HTN and Zytel® LCPA EF Materials

- insulating, electrical resistance
- heat resistance
- chemical resistance
- strength & stiffness
- dimensional stability
- hydrolysis resistance
- fatigue resistance
- easy to process

Robust Portfolio of Electrically-friendly Products



Source: DuPont

The portfolio of solutions

DuPont designed its Zytel® EF portfolio to address key challenges faced by the automotive industry as manufacturers continue to advance the electrification of vehicles and autonomous drive.

EV drivetrain safety calls for increased durability of components and improved electrical properties. Components—like connectors, switches, relays, busbars, and sensors—can malfunction or short circuit when voltage is applied. Malfunctions often occur because of three factors: surface moisture, elevated temperature, and traces of halide ions such as chlorine, bromine, or iodine that can lead to electrolytic corrosion. The Zytel® EF portfolio overcomes these performance challenges.

Automotive manufacturers rely on the Zytel® EF portfolio to drive innovation of plastic solutions that perform under the intensity of low- and high-voltage applications with:

- Organic heat-stabilized materials that extend component lifetime by preventing electrolytic corrosion
- Materials based on different chemistry to address specific temperature and chemical resistance
- Materials with different glass fiber levels
- Laser-markable formulations that allow for part identification through QR and DMC codes
- Materials designed for high flow and laser transparency for laser welding to boost productivity and improve ease of assembly

Zytel® HTN and Zytel® LCPA SPE EF Portfolio – Main Features

Grade	Details	Reflow Performance (°C) w/o blistering (85°C 85% RH 168hrs)	Heat-aging Temperature (based on retention of 50% of the tensile strength after 3000h)	Laser Transparent	CTI (V)
Zytel® HTN510EFT NC010	Unfilled	N/A	140°C		600
Zytel® HTN510EFT BK010	Unfilled	N/A	140°C		600
Zytel® HTN42G30EF NC010	High flow, superior reflow soldering capability	>280	170°C		600
Zytel® HTN42G30EF BK038LM	High flow, superior reflow soldering capability	>280	170°C		600
Zytel® HTN50G35EF BK083	Retains stiffness & strength in various environments	N/A	180°C		600
Zytel® HTN51G35EF NC010	Retains stiffness & strength in various environments	N/A	185°C	✓	525
Zytel® HTN51G35EF BK083	Retains stiffness & strength in various environments	N/A	185°C		525
Zytel® HTN51G35EF BK236LT	Retains stiffness & strength in various environments	N/A	185°C	✓	525
Zytel® HTN52G35EF BK420	High flow	260	170°C		600
Zytel® HTN54G35EF NC010	Toughness, thermal shock, overmolding	N/A	170°C		600
Zytel® HTN54G35EF BK420	Toughness, thermal shock, overmolding	N/A	170°C		600
Zytel® HTN54G35EF BKB336	Toughness, thermal shock, overmolding	N/A	170°C		600
Zytel® 77G33EFT BK276	High flow, overmolding, toughness	N/A	180°C		600
Zytel® FE5382 BK276	High flow, overmolding	N/A	175°C		600

Zytel® HTN EF and Zytel® LCPA electrically-friendly, heat-stabilized materials

The DuPont™ Zytel® HTN heat-stabilized and electrically-friendly product family delivers material grades with more stable electrical properties compared to inorganic heat-stabilized materials. This product family is designed for applications requiring continuous temperature up to 185°C, low water absorption, high chemical resistance, and dimensional stability. Formulations with different glass fiber levels and reflow soldering capability are available depending on customer requirements.

Zytel® HTN EF products offer:

- laser-marking grades that allow for part identification through QR and DMC codes
- grades designed for high flow, allowing for the filling of thinner and smaller parts for miniaturization; in particular when using Zytel® HTN 42 and 52 product lines

- laser-welding capability to boost productivity and improve ease of assembly
- superior reflow soldering capability for Zytel® HTN 42
- robust design and assembling thanks to high elongation and toughness at break for snap fit; in particular when using Zytel® HTN 42 and 54 product lines
- high hydrolysis resistance and resistance to ATF oils; in particular when using Zytel® HTN 50 and 51 product lines

The DuPont™ Zytel® LCPA heat-stabilized and electrically-friendly product family is based on long chain polyamide chemistry and delivers the right level of viscosity suitable for conductor overmolding and excellent CaCl₂-resistance as well as dimensional stability.

Additionally, Zytel® LCPA delivers:

- High toughness and heat-shock resistance for Zytel® 77G33EFT
- Robust design and assembling thanks to high elongation at break for snap fit
- Lower moisture absorption compared to Zytel® PA66 grades
- Better hydrolysis resistance and salt resistance compared to Zytel® PA66 grades
- Lower melt viscosity allowing miniaturization

For more information, contact your DuPont representative.



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