

DuPont™ Zytel® Electrically-friendly, Heat-stabilized Portfolio Addresses Challenges in eMobility



Electrically-friendly materials from DuPont can be used for different components in e-motors, power electronics, connectors, and sensors.

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 – addressing different temperature and chemical-resistance requirements.

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.

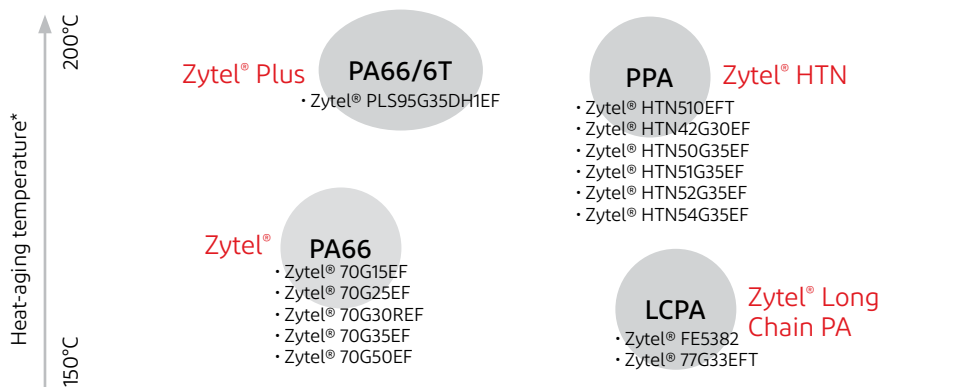
EV drivetrain safety calls for increased durability of components and improved electrical properties. Components—like

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

Robust Portfolio of Electrically-friendly Products



Source: DuPont

Chemical resistance vs CaCl2 (Calcium Chloride)

*Heat-aging temperature (based on retention of 50% of the tensile strength after 3000h)

Key Advantages of Zytel® EF Materials

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

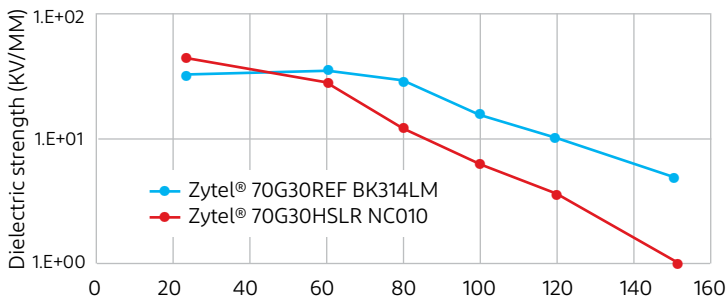
Zytel® PA66 and Zytel® Plus – Main Features

Grade	Heat-aging temperature (based on retention of 50% of the tensile strength after 3000h)	Enhanced hydrolysis resistance vs other EF grades	Laser marking	Laser transparent
ZYT70G15EF BK314LM	150		✓	
ZYT70G25EF NC010	170			✓
ZYT70G25EF BK538LM	170		✓	
ZYT70G30REF BK314LM	160	✓	✓	
ZYT70G30REF NC010	160	✓		✓
ZYT70G30REF BK601LT	160	✓		✓
ZYT70G35EF BK538	170		✓	
ZYT70G35EF NC010	170			✓
ZYT70G50EF BK314LM	160		✓	
ZYTPLS95G35DH1EF BK314LM	200		✓	

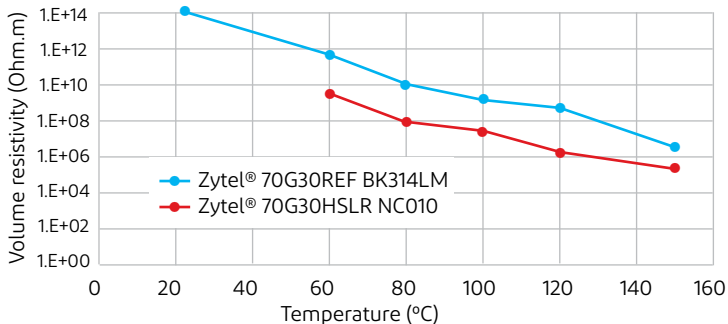
Source: DuPont

Electrical properties

Dielectric strength



Volume resistivity



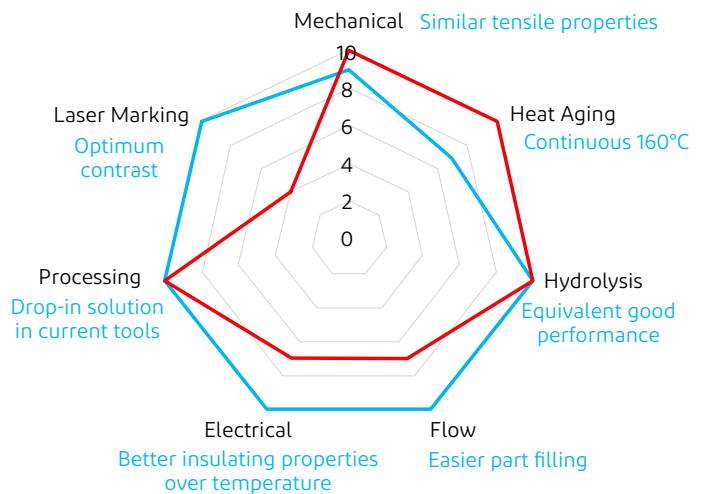
Source: DuPont

Zytel® PA66 and Zytel® Plus electrically-friendly, heat-stabilized materials

The DuPont™ Zytel® PA66 and Zytel® Plus heat-stabilized and electrically-friendly product family delivers material grades with more stable electrical properties over temperature compared to inorganic heat-stabilized materials, and continuous operating temperature in the range of 150°-170°C and up to 200°C for Zytel® Plus. This means increased CTI and dielectric properties (as seen in the graph) over temperature that allow for compliance with OEM specifications and:

- Greater design flexibility
- Miniaturization
- More durable high-voltage applications
- Extended component lifetime due to prevention of electrolytic corrosion

— Zytel® 70G30REF BK314LM — Zytel® 70G30HSLR BK099



Source: DuPont

For more information, contact your DuPont representative.



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