

DuPont Automotive

Shaping the Future of Mobility

How science-powered innovation, high-performance materials and expert global development teams help the automotive industry shape the future of “mobility”



Sustainable Mobility

Three billion vehicles could crowd the roadways by 2035, making mobility, emissions, fuel economy and safety even more critical



Invention and Innovation

DuPont scientists have invented some of the industry's most innovative materials, including:

- DuPont™ Kevlar® aramid fibers
- DuPont™ Nomex® fibers
- DuPont™ Tyvek® nonwoven materials
- DuPont™ Delrin® acetal resin
- DuPont™ Sorona® renewably sourced polymers
- Nylon – the world's first synthetic fiber

The Challenge

Visit a major city anywhere in the world and one of the most common experiences is gridlock. A snapshot into the future shows more of the same, with some forecasters predicting as many as 3 billion vehicles will crowd the roadways as soon as 2035*.

Driving this scenario is a steadily growing population and rising incomes. Complicating the scenario is an ever-increasing appetite for energy, concerns about environmental impact and the need to protect passengers and pedestrians.

Industry, governments, academics and scientists around the world understand the challenge and are aggressively addressing the needs with multiple strategies and technologies. These range from new approaches to mass transit, shared vehicles, alternative-powered and alternative-fueled vehicles, small personal mobility vehicles and, in some cases, connected autonomously controlled vehicles.

DuPont's Role

DuPont has a long and rich history of invention and innovation working with the global automotive industry. We remain committed and connected with renewed investment in materials science needed to reduce dependence on fossil fuels and in the installation of global “Innovation Centers.” These centers are designed to connect customers, strategic partners and academics with more than 9,500 DuPont scientists and engineers located in more than 150 technical centers around the world.

Experience has shown that in this complex industry, there is no one solution. The same is true today and DuPont has responded by adding new materials technologies to our portfolio that includes more than 100 high-performance product families. Our global, experienced technical development teams are trained to help the industry with new ways to:

... Reduce Weight

Plastics are inherently lighter than metals, but lightweighting requires more than direct material substitution. DuPont high-performance materials, predictive engineering and design teams work with customers to redesign the weight out, often integrating functions to eliminate non-value adding cost at the same time. The team has earned numerous innovation awards and driven breakthrough industry “firsts” that led to mass production especially under the hood, where temperatures, pressures and chemical exposure can defeat traditional plastics.

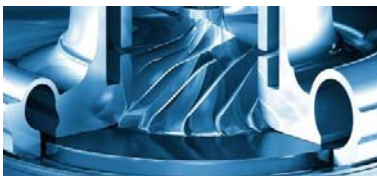
* IHS Global Insights - Is Mobility As We Know It Sustainable?

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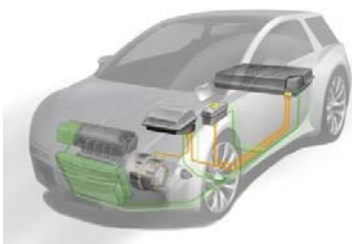
Plastics for Lightweighting

Using lightweight plastics, such as DuPont™ Zytel® PLUS nylon, could eliminate 11 kg on the 70 million light-vehicle 2011 engines, saving 240 million gallons of fuel or 9 million barrels of crude oil used for transportation



Efficiency

Six of every 7 liters of fuel put into a vehicle are lost to inefficiencies



Extending Range

DuPont™ Energain® battery separators can boost power 15 to 30 percent and increase battery life by up to 20 percent

... Improve Efficiency and Performance

DuPont materials and design ideas help reduce energy loss due to rolling resistance in tires and friction in driveline systems.

- In engine systems, long-term heat, pressure and chemical-resistant plastics, elastomers and composites help the industry add lighter weight power-boost technologies to smaller, more efficient engines that reduce CO2 emissions and improve fuel economy without compromising performance.
- In air-management systems, DuPont brings more than 20 years experience reducing part count, designing for tight underhood packaging constraints, reducing weight up to 50 percent and cost up to 30 percent using more than 25 high-performance thermoplastics, composites and elastomers, such as such as Vamac® AEM, Hytrel® TPC-ET and Nomex® fibers, to replace traditional metal/rubber components.
- DuPont also brings the *Science of Wear, Friction and Sealing* to engine and driveline systems to help reduce frictional loss caused by moving parts.
- DuPont™ Teflon® fluoropolymers can play a critical role in enabling oxygen sensors in automotive fuel systems, enhancing engine control in a way that saves up to 15 percent of fuel and allows for up to 95 percent reduction in NOx emissions.

... Boost Performance in Alternative Drive Vehicles

Hybrid and electric vehicle manufacturers can access new battery chemistries and discover a wide range of materials to improve performance, range, safety and reduce weight. In motors, DuPont offers the industry's broadest range of electrical insulation materials, including: films, varnishes, aramid papers, pressboard products, thermoplastic resins and wire enamels. In battery pack cells and structures, DuPont™ Energain® battery separators can boost power 15 to 30 percent and increase battery life by up to 20 percent while plastics can be used to reduce weight. DuPont 'electrically friendly' materials for connectors and cable jacketing are rated to withstand 600-plus volts on the comparative tracking index (CTI).

... Adopt More Sustainable Materials

DuPont offers the broadest portfolio of high-performance materials made of renewably sourced ingredients for use in plastics, fibers and fluids. These award-winning materials have found their way into a growing number of vehicle applications, including carpets, underhood components, fuel lines and interior vehicle touchpoints delivering better performance, reducing environmental footprint and capturing industry innovation awards. Additionally, DuPont recently introduced its new DuPont™ Opteon™ yf refrigerant which offers very low global warming potential (GWP) as well as optimal balance of performance, safety, cost and environmental sustainability.

... Improve Safety, Comfort and Design

As emissions and fuel economy are critical to sustainable mobility so safety comfort and design are critical to consumers. Automakers understand the need to balance sometimes seemingly conflicting demands, and can work with DuPont materials to add color and style inside and out; to stifle unwanted noise with high-performance DuPont™ Krytox® lubricants; and to help ensure safety as DuPont materials remain the benchmark in terms of performance in many active and passive safety systems.

* IHS Global Insights - Is Mobility As We Know It Sustainable?

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