Press release

VESTAMID® Fuel Lines—Ready for the Future

October 24, 2007

- The increasing use of ethanol in Otto fuels necessitates new line systems

- The new generation of VESTAMID® multilayer tubing systems perform impressively in tests

Marl—VESTAMID® molding compounds from the High Performance Polymers Business Unit of Essen, Germany-based Evonik Industries are the world's most widely used polyamide 12 compounds for fuel lines. In response to the changes expected in fuel composition in the future as a result of the energy debate, the company is further developing its multilayer tubing systems.

VESTAMID® leads in multilayer tubing systems

To meet complex demands on mechanical and chemical properties, permeation behavior, and rational and cost-effective production, automotive manufacturers fit their vehicles with coextruded multilayer fuel lines made with polyamide 12 layers. Many years ago, Evonik developed for this purpose systems from VESTAMID® compounds and barrier layers against fuel permeation from polybutylene terephthalate (PBT), polyvinylidene fluoride (PVDF), and ethylene tetrafluoroethylene copolymer (ETFE), and is the world market leader in such systems.

Multilayer tubing systems with EVOH barrier layer

Biofuels, such as those produced by blending ethanol with conventional fuel in proportions between 5 and 85 percent, will become increasingly important in the future. High Performance Polymers has therefore developed a new generation of polyamide 12-based multilayer tubing systems for fuel lines. The 4300, 4500, and 4540 multilayer tubing systems possess a barrier layer of ethylene vinyl alcohol copolymer (EVOH), which minimizes fuel permeation of ethanol-containing fuels in particular. The outer and inner layers of the 4500 and 4540 systems consist in each

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case of polyamide 12 bonded to the EVOH barrier layer by an adhesion promoter. The adhesion promoter system has been designed specifically for good mechanical properties and reliable adhesion. It is also polyamide-based, and is superior to a polyolefin adhesion promoter because of the elevated fusion range demanded by the increasingly high temperatures in the engine compartment of future vehicles. A particularly cost-effective four-layer version with a polyamide 6 inner layer (the 4300 multilayer tube system) rounds off the product palette. However, this type shows reduced resistance to chemicals, particularly in contact with metallic components and de-icing salt.

The new VESTAMID® line systems had to prove their worth under rigorous conditions: CE85A—85 percent ethanol in fuel—at 80°C was circulated through them for 5,000 hours, at an external air temperature of 60°C. When examined subsequently, none of the systems showed properties significantly different from those of untested tubes. Vehicles with fuel lines made from 4300, 4500, and 4540 multilayer tubing systems can therefore be safely operated with ethanol-containing fuels.

Company information

Evonik Industries AG is the creative industrial group which operates in three highly profitable, promising business areas: Chemicals, Energy and Real Estate. Evonik is a global leader in specialty chemicals, an expert in power generation from hard coal and renewable energies, and one of the largest private residential real estate companies in Germany. Our strengths are creativity, specialization, continuous self-renewal, and reliability.

Evonik Industries is active in over 100 countries around the world. In fiscal 2006 around 43,000 employees generated sales of €14.8 billion and operating Profit (EBIT) of over €1.2 billion. Evonik plans to enter the capital market in the first half of 2008.

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