

## New lubricant additives save fuel

- New lubricant additives yield an excellent viscosity-temperature profile and additional protection against wear and tear
- Market launch in the fall of 2015
- Lubricant additives from Evonik are already reducing fuel consumption in automobiles by three to four percent

In the fall of 2015, Evonik Industries will be introducing a new generation of lubricant additives to the market. These additives maintain the viscosity (thickness) of the lubricant at an optimized level across a broad range of temperatures, while offering additional protection against wear and tear. In addition to reducing vehicle fuel consumption by three to four percent, this latest generation of Evonik lubricant additives also extends the life of engines and transmissions. With the launch of these products, Evonik, one of the world's leading specialty chemicals companies, has expanded the range of lubricant solutions that they offer to the automotive industry.

Claus Rettig, who heads up Evonik's Resource Efficiency Segment, notes: "We offer our customers solutions that enable them to use resources efficiently. Our latest high-performance additive expands our leadership in lubricant additive technology. At the same time, it also strengthens our position as a provider of environmentally sound, energy-efficient system solutions for the automotive industry."

The growth of the global market for high-performance lubricant additives is outpacing that of other markets. The reasons for this, according to Rettig, are increasing mobility as well as increasing demand in Asia for high-performance lubricants containing a higher proportion of additives. In response, Evonik has recently and significantly expanded its production capacities at its Singapore manufacturing facilities.

The new high-performance lubricant additives offer superior performance in optimally adjusting lubricant viscosity, and they are also notable for other surface-active properties. For example, the additives help to form a lubricating film on a metal surface,

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protecting it from wear due to friction. At the same time, it also keeps the oxidation products of the oil in suspension. This property prevents additional wear caused by deposits on the metal surface. Together, these effects extend the life of the metal, as Evonik has demonstrated many times in tests performed in the company's Oil Additives Performance Test Laboratory.

Stephan Fengler, head of Innovation Management for Evonik's Oil Additives Business Line, explains: "Thanks to this development, we can offer lubricant manufacturers a highly innovative, high-performance product that significantly improves the viscosity index of lubricants. In addition, the product's value is enhanced still further by its built-in protection against wear."

This new generation of additives represents an extension of a class of polymers known as comb polymers. On the market since 2010, these materials are gaining increasing acceptance for use in high-performance lubricants. Because they reduce fuel consumption, and thereby help reduce carbon dioxide emissions, their use in factory, or first-fill oils for new cars is becoming increasingly common.

Comb polymers are long-chain molecules based on alkyl methacrylates with unusually long, non-polar side chains. These specialty polymers exhibit outstanding properties as temperature-sensitive thickening agents in lubricants. By forming coil like structures in the lubricant, comb polymers are able to influence lubricant viscosity: the polymeric coils expand considerably at elevated temperatures, thus thickening the lubricant more than traditional additives do. At very low temperatures, the coils shrink and no longer have much impact on viscosity.

This temperature-dependent coiling behavior is much more pronounced in comb polymers than it is in traditional polymers. As such, comb polymers have a more pronounced balancing effect on the temperature-viscosity profile of the lubricant, bringing us a giant step closer to an ideal lubricant in which the viscosity never changes.

Lubricants reduce friction between moving metal components, such as those found in a vehicle's engine, transmission, and axles.

The viscosity of the lubricant needs to be at a certain level if it is to do its job properly. If it is too thin, it will not adequately protect the metal from friction. If it is too thick, it will increase the energy required to keep the components moving, which, in turn, increases fuel consumption. The thickness of a lubricant depends on temperature. Lubricant behavior in automobiles is similar to that of honey, which can be very hard when cool, and then liquid at warmer temperatures.

Evonik is one of the world's leading producers of lubricant additives for the automotive industry and for hydraulic and industrial applications. In order to help lubricant manufacturers looking for suitable additives to use in long-lasting, fuel-saving drivetrain components, Evonik is marketing its entire line of automotive lubricant additives—including formulation assistance and services for the automotive industry—in a single package under the brand name DRIVONTM technology. The first product in the new generation of comb polymers is scheduled for market launch in the fall of 2015 under the name VISCOPLEX® 12-209.

#### **Company information**

Evonik, the creative industrial group from Germany, is one of the world leaders in specialty chemicals. Profitable growth and a sustained increase in the value of the company form the heart of Evonik's corporate strategy. Its activities focus on the key megatrends health, nutrition, resource efficiency and globalization. Evonik benefits specifically from its innovative prowess and integrated technology platforms.

Evonik is active in over 100 countries around the world. In fiscal 2014 more than 33,000 employees generated sales of around €12.9 billion and an operating profit (adjusted EBITDA) of about €1.9 billion.

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