

# Stronger, Faster, Lighter

Four successes for the Lotus Exige S of Evonik Industries in the 2008 racing season

The 2008 racing season brought the team from Evonik Industries and RED-Motorsport four impressive class victories for their Lotus Exige S. Two class wins in the Dutch Super Car Challenge and one each in the AvD 1000 km race and the legendary 24-hour Brit Car Race in Silverstone add up to a considerable achievement.

This stellar result is due in no small part to the use of novel materials developed in the Chemicals Business Area of Evonik, which reduced the weight of the car and improved performance and durability. They gave the ultra lightweight Lotus even more speed and strength, and saved time at the pit stops. The car now weighs in at just 820 kilos.

The well proven team of Evonik and RED started work on the new Lotus Exige last winter. The engineers succeeded in taking another 20 kilograms off the bodywork of the already light racing car through a combination of carbon fibers and ROHACELL® structural foam. This material was used for the aerodynamically optimized rear wing as well as the front and rear body clamshells. The new components reduce the weight so significantly that greater acceleration is possible and curves can be negotiated at higher speeds. A further advantage is that the new clamshells consist in each case of a single piece, as opposed to several individual components. This means that they are quickly and safely removed and remounted at pit stops. They are nevertheless extremely strong and highly durable.

Further kilos have been pared by replacing glass windshields by PLEXIGLAS<sup>®</sup>. Because the new windshields have a scratch resistant finish, they show no trace of their use in this season's racing.

Yet more power was provided by an engine oil that significantly reduces friction and a special grease for the particularly heavily stressed drive shafts, the results of a collaboration between Evonik and the lubricants producer Fuchs Europe. These measures improve performance, reduce fuel consumption, and enhance the durability of the powertrain. As a

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result, the drive shafts and engine have stayed the course through the entire 2008 racing season.

The aluminum sandcasting previously used for the charge air duct has been replaced by VESTAMID® HT *plus* high-temperature plastic. Thanks to this high-tech product the tube is only half as heavy as its metal counterpart, and its smooth interior surface optimizes airflow and engine performance. "With this, we're demonstrating for the first time that our new plastics can be used directly next to the engine, and meet the stringent temperature requirements placed on them," says Olivier Farges of Evonik Industries.

Another crucial component of the Lotus Exige S is—as in 2007—the superlight lithium-ion starter battery with LITARION® electrodes and SEPARION® separators from Evonik. Their use highlights the fact that severe racing conditions provide an excellent testing ground for materials from the viewpoint of general applicability and possible subsequent use in serial production. Li–Tec Battery GmbH & Co KG in Kamenz, Germany, is using Evonik materials in lithium-ion batteries which will soon be mass produced for entirely conventional cars—a collaborative venture in which Evonik Industries is a strategic partner. "On the whole," says Klaus Hedrich, head of Evonik's Automotive Industry Team, "the 2008 season has been very successful." And he is confident that next year will bring fresh triumphs.

In fiscal 2007 Evonik Industries generated sales in the automotive industry of  $\in$ 1.943 billion, corresponding to 14 percent of overall sales totalling  $\in$ 14.430 billion. The Group supplies the auomotive industry with a variety of polymers, additives, and material components for developing and mass-producing plastic parts for drive trains and car bodies and for exterior and interior applications. Further applications include components for lithium-ion batteries, tires, coatings, adhesives, and lubricants.

The Performance Polymers Business Unit of Evonik Industries is a worldwide manufacturer of PMMA products sold under the **PLEXIGLAS**<sup>®</sup> trademark on the European, Asian, African and Australian continents and under the trademark **ACRYLITE**<sup>®</sup> in the Americas.



#### **Company information**

Evonik Industries is the creative industrial group from Germany which operates in three 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 is active in over 100 countries around the world. In its fiscal year 2007 about 43,000 employees generated sales of about  $\in$ 14.4 billion and an operating profit (EBITDA) of more than  $\in$ 2.2 billion.

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