

## Press release

2013/03/08

Lightweighting technology: 65 percent weight savings with composite leaf springs manufactured at Benteler-SGL by using Henkel's Loctite matrix resin

### Series production of composite leaf springs

**Henkel is combining its specialist expertise in the field of polyurethane chemistry with the know-how of Benteler-SGL, one of the leading manufacturers of composite components for automotive applications. The collaboration has made it possible to mass-produce lightweight, fiber-reinforced leaf springs based on polyurethane matrix resin.**

Lightweight construction technologies are steadily gaining ground in the automotive industry as the weight savings they achieve in modern cars help to significantly reduce fuel consumption and carbon emissions. Working with Benteler-SGL, Henkel has developed a process for resin transfer molding (RTM) of glass-fiber-reinforced leaf springs that uses a polyurethane matrix resin. Compared to conventional leaf springs made of steel, these composite leaf springs are up to 65 percent lighter.

With Loctite MAX 2, Henkel is offering a polyurethane-based composite matrix resin that cures significantly faster than the epoxy products usually employed for the RTM process. Due to its low viscosity, the polyurethane resin penetrates and impregnates the fiber material more easily and less harshly, thus enabling very short injection times to be applied. One special feature of Loctite MAX 2 is its exceptionally high stress intensity factor, which is a measure of toughness. This excellent toughness also has a positive effect on the fatigue behavior under load. Leaf springs in cars are constantly subjected to dynamic loading under driving conditions, so the use of flexible materials with a high fatigue tolerance considerably prolongs the life of such components.

Resin injection processes such as RTM predominate in the manufacture of automotive composites for mass-produced automobiles because they make it possible to control the curing reaction more reliably, either by adjusting the temperature or adding an accelerator. Furthermore, the risk of local overheating and resulting shrinkage is reduced, as the polyurethane resin Loctite MAX 2 generates less heat overall during curing than epoxy resins do. As a result, even thick components with many fiber layers cure fast. The RTM process is especially attractive for volume production of cars as fast curing of the matrix resin permits short cycle times to be achieved.

The product range of Benteler-SGL, a joint venture of Benteler Automobiltechnik and the SGL Group, includes body shell components such as side blades, doors and visible carbon components. The composite components, which are designed specifically for mass-production consist mainly of carbon and glass fibers in various textile forms such as stitched or woven fabrics. Customers include almost all the big names in the automotive industry, primarily in the premium class.

### **Combined process technology expertise**

“While developing these composite leaf springs, the competencies of Benteler-SGL and Henkel complemented each other perfectly,” says Frank Deutschländer, Global Market Manager Automotive at Henkel AG & Co. KGaA. “With our matrix resin technology Loctite MAX 2, we were able to establish a new process at Benteler-SGL that is tailored to the automotive industry and gives this fiber composite component an attractive properties profile.”

Given the more stringent CO<sub>2</sub> exhaust standards, lightweight construction is becoming ever more important for the automotive industry. The composite components from Benteler-SGL help to reduce fuel consumption while offering a high level of safety. “Thanks to our intensive collaboration with Henkel, we have succeeded in producing a resin transfer molded glass fiber reinforced leaf spring for the automotive industry that not only combines low weight with high strength but is also mass production capable. It thus also satisfies the highest expectations in terms of cost-efficiency and process reliability,” says Frank Fetscher, Head of Sales and Marketing at Benteler-SGL Automotive Composites.

**Photo material is available at <http://www.henkel.com/press>**

### **About Henkel**

Henkel operates worldwide with leading brands and technologies in three business areas: Laundry & Home Care, Beauty Care and Adhesive Technologies. Founded in 1876, Henkel holds globally leading market positions both in the consumer and industrial businesses with well-known brands such as Persil, Schwarzkopf and Loctite. Henkel employs about 47,000 people and reported sales of 16,510 million euros and adjusted operating profit of 2,335 million euros in fiscal 2012. Henkel's preferred shares are listed in the German stock index DAX.

## About Benteler-SGL

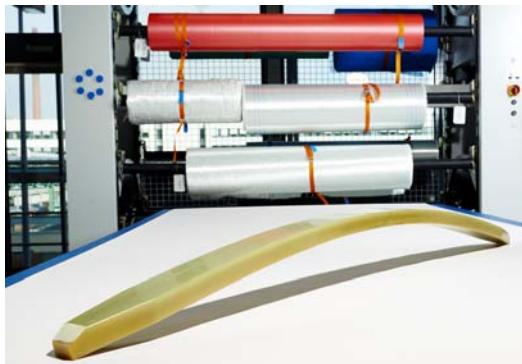
Benteler-SGL GmbH & Co. KG was founded in 2008. It is a joint venture of Benteler Automobiltechnik GmbH with headquarters in Paderborn, Germany, and SGL Group with headquarters in Wiesbaden, Germany. The core competencies of SGL Group in material sciences and carbon fiber-based preliminary products are complemented by the market and engineering technical competence of Benteler, a tier 1 supplier to the automotive sector for many years. At the beginning of 2009, the joint venture company additionally took over the automobile business unit of Composite Technology GmbH in Ried im Innkreis, Austria, from the Fischer Group. The production operation has been systematically built up since that time. Today, Benteler-SGL employs 150 people in Austria, twice as many as in 2009. More information can be found at [www.benteler-sgl.com](http://www.benteler-sgl.com).

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## The following material is available:



The collaboration of Henkel and Benteler-SGL has made it possible to mass-produce lightweight, fiber-reinforced leaf springs based on polyurethane matrix resin.



Compared to conventional leaf springs made of steel, composite leaf springs are up to 65 percent lighter thanks to Loctite matrix resin.



Twin shuttle press at Benteler-SGL.

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