

LANXESS expands masterbatch range for efficient rubber reinforcement

- **State of the art aramid pulp now also available for silicone rubber and fluoro rubber**
- **Carbon nanotubes for excellent property profiles**

Cologne – At K 2019, the international trade show for plastics and rubber taking place in Düsseldorf from October 16 to 23, LANXESS will be showcasing new masterbatches for manufacturing reinforced rubber parts. The pre-dispersed additives from the Rhenogran product series are easy to handle, dust free, simple to dose, and also exhibit outstanding processing properties.

“The short-fiber aramid pulp in the Rhenogran P91-40 types provide exceptional reinforcement. They improve dimensional stability and extend the service life of the end products that use them,” explained Dr. Benjamin Bechem, head of Global Marketing for Technical Rubber Goods at LANXESS’ Rhein Chemie (RCH) business unit. Aramide fiber masterbatches have previously been available in natural rubber, EPDM, NBR and CR matrices. These can also be used in IR, BR, SBR and HNBR, making them virtual all-rounders. New additives pre-dispersed in silicone rubber (Q) and fluorinated rubber (FKM) are filling in the remaining gaps. “For our next step, we are planning to develop masterbatches of this kind for use beyond rubber as well, such as for thermoplastic polymers,” added Bechem.

Short-fiber reinforcement for numerous applications

Rhenogran P91-40/Q is particularly suited to the manufacture of high temperature resistant, durable, wear-resistant silicone items such as washers and seals. The silicone matrix and the aromatic polyamides in the fibers form a perfectly matched pair, especially when exposed to high thermal stress.

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The type dispersed in fluorinated rubber, Rhenogran P91-40/FKM, can be used to manufacture such products as high-performance rubber items for aviation, which withstand high operating temperatures, require good chemical resistance and outstanding dynamic properties. Each of the new additives has above 40 percent highly fibrillated pulp content, consisting of Twaron 1091 aramid fibers from Teijin Aramid B.V., based in Arnhem in the Netherlands.

The range of products offered by the LANXESS's Rhein Chemie business unit also includes reinforcing additives based on cellulose fibers (Rhenogran WP – wood pulp) in polymers such as SBR, EPDM and PVC. The native cellulose used comes from various types of hardwood. The renewable fiber material is biodegradable and is a contributing factor in the additive's cost-effectiveness.

Pre-dispersed CNTs make all the difference

Rhenogran CNT types are currently being developed as further reinforcing additives for special applications that involve withstanding even higher mechanical stresses. Owing to concentrations of one or two percent for single-wall carbon nanotubes (CNTs) and more than ten percent for multi-wall CNTs, these masterbatches can be diluted up to 20 times again in compounds. Exceptional thermal and electrical conductivity of the CNTs are additional attractive characteristics. The latter can be used, for example, to make a significant contribution to the anti-static properties of natural rubber compounds and synthetic rubber items.

Rhenogran CNT masterbatches are intended to expand the range of water dispersed CNT latex additives and initially available only in relatively highly diluted states. The water-free systems are produced from the aqueous Rhenofit CNT dispersions by coagulation. "The special challenge in manufacturing CNT dispersions lies in finding a suitable dispersion method. For that, we use a particularly gentle process that does not destroy the nanostructures. Despite that, the process reliably unfolds and disentangles agglomerates formed

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during the production of the CNTs and would otherwise impair their homogeneous distribution in the rubber compound later on,” explained Bechem.

Homogeneous mixing in particular is a key prerequisite for achieving an optimized property profile in the end product. This is not usually possible with CNTs added as powders and thus in an agglomerated state. The development of CNT-based additives began at the Rhein Chemie business unit years ago as part of the Inno.cnt innovation alliance sponsored by the Federal Ministry of Education and Research.

Rubber additives from a single source

LANXESS supplies the rubber industry with a broad portfolio of pre-dispersed chemicals, processing promoters, vulcanization and filler activators, light protection waxes, release agents, tire marking paints and high-performance curing bladders for tire manufacturing. The company offers a comprehensive range of additives, from A for anti-reversion agents to Z for zinc dithiophosphates.

Detailed information about products from the Rhein Chemie business unit can be found on the website at <http://rch.lanxess.com>.

LANXESS is a leading specialty chemicals company with sales of EUR 7.2 billion in 2018. The company currently has about 15,500 employees in 33 countries and is represented at 60 production sites worldwide. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives, specialty chemicals and plastics. LANXESS is listed in the leading sustainability indices Dow Jones Sustainability Index (DJSI World and Europe) and FTSE4Good.

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Images



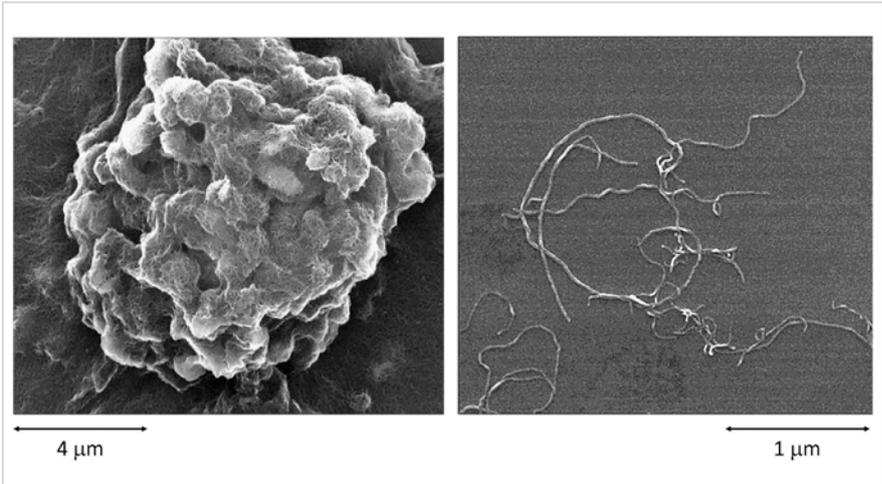
Aramid fiber pulp under the microscope (background) and highly durable belts made from fiber-reinforced rubber.

Photo: LANXESS AG

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Electron microscope images of carbon nanotubes (CNTs) in agglomerated (left) and dispersed (right) states.

Photo: LANXESS AG