

New possibilities through innovation and sustainability define Kuraray's appearance at K2022

Sustainable Bio-Circular EVAL™ and GENESTAR™-composites for hydrogen tanks

Hattersheim/Frankfurt am Main, 16th August 2022 +++ Kuraray, the global specialty chemicals company headquartered in Japan, is aligning its appearance at K2022 (19-26 October 2022, Düsseldorf, Hall 7a/D06) entirely with the theme of co-creating a sustainable future together with a stronger focus on innovation to create true opportunities. To promote innovation globally and across the entire product portfolio, Kuraray has created the "Innovation Networking Center" (INC). The INC, which Kuraray is presenting to an international audience for the first time at European K2022, has the purpose to promote networking and exchange - across Kuraray's diverse products and business units as well as improving connectivity with its numerous customers and partners around the world. Another highlight at the Kuraray booth will be the introduction of "Bio-Circular EVOH" adding one more value proposition to the recyclable EVAL™ EVOH barrier resins in packaging applications. In Europe, EVAL Europe N.V. plant has received ISCC-PLUS certification, which enables the market introduction of EVOH from renewable resources. Other trade show highlights are GENESTAR™ for new, recyclable composite materials in hydrogen tanks and SEPTON™ BIO-series, a bio-based thermoplastic elastomer which is based on beta-farnesene and derived from sugar cane, while both liquid farnesene rubber and silane-modified GS-L-BR improve tire performance and durability.

1. Innovation Networking Center: Innovation through co-creation

With the newly established INC, Kuraray is opening up new paths to greater innovation and sustainability for its customers - through more intensive exchange and strong networking. The INC is both a virtual and global facility. Its goal is to bundle forces and create horizontal links between R&D, production, sales, marketing, and HR at Kuraray. Under the INC umbrella, Kuraray strengthens its core competencies within ten segments (e.g. Paper & Packaging, Automotive, and 3D printing). Over the past year, Kuraray has worked hard to strengthen its capabilities in segments such as Paper & Packaging (P&P). At K2022, visitors can discover various applications with high barrier

packaging solutions that meet and fulfill current sustainability requirements and regulations. In the P&P industry in particular, consumers have a great influence on brand owners and converters. Kuraray's product portfolio and expertise can be the answer to provide solutions for society's needs. In line with Kuraray's new slogan "Possible starts here," the INC creates added value and innovative solutions for and with Kuraray customers through global networking. It also promotes external networking and involves Kuraray's customers and partners. The bundling of all these new perspectives in the INC allows co-creation that provides answers to customers' problems - and to challenges society is facing as a whole.

2. Paper & Packaging: First ISCC+ Certification for Bio-Circular EVAL™

International Sustainability & Carbon Certification, ISCC, is a leading global certification system that covers all sustainable raw materials, including agricultural and forestry biomass, biogenic waste, recycled materials, and renewable energy. ISCC-PLUS Renewable Resource certification supports the use of bio and circular feedstocks, also accepting the mass balance approach. Its purpose is to document the proportion of bio-based and circular feedstocks in the production process. Kuraray is now the first ethylene-vinyl alcohol (EVOH) copolymer producer to receive a corresponding ISCC-PLUS certificate for the bio-circular ethylene monomer in its supply chain. The certificate covers, in principle, all EVOH variants that Kuraray produces in Antwerp. Kuraray is a global leader in the production and development of EVOH barrier resins and films. Greater sustainability and recyclability are explicit requirements of Kuraray's customers in the food, cosmetic or health care industry. EVAL™ acts as an excellent gas barrier for film packaging of perishable foodstuffs, as aroma preservation or as an efficient functional barrier for organic solvents or potential contaminants, such as those that might be present in food cartons made of recycled corrugated board or post-consumer recycled plastics.

3. Hydrogen tanks made from GENESTAR™ carbon fiber reinforced composites

Kuraray will also showcase solutions highly interesting for the automotive and fuel cell electric vehicle industries at K2022. GENESTAR™ is a robust, heat-resistant PA9T polyphthalamide from Kuraray that has long proven its value in under-the-hood and electrical and electronic applications, such as thermostat housings or high-voltage connectors. But GENESTAR™ also shows its advantages both in glass and carbon fiber reinforced composites. Kuraray's PA9T exhibits superior mechanical properties at high temperatures, while its very low water absorption - the lowest of all high-temperature polyamides - ensures high dimensional stability. This makes lightweight GENESTAR™ glass fiber reinforced composites suitable for automotive structural components, such as bumper beams or battery housings. Carbon fibers composites enable very interesting applications for GENESTAR™: Kuraray and development partners currently develop prototypes of high-pressure hydrogen tanks for fuel cell vehicles. Until now, the outer shell of a hydrogen tank mostly consisted of thermosetting resins. Their main disadvantage is that they are not recyclable in any way; they do not

melt or dissolve in acid. In contrast, the recycling of thermoplastic PA9T is possible. Excellent mechanical properties, as well as the very good gas barrier properties, are advantages of GENESTAR™ when it comes to manufacturing lightweight, reliable, and recyclable hydrogen tanks.

4. SEPTON™ BIO-series: Improving the carbon footprint with Kuraray's unique, bio-based TPE derived from sugarcane

Sustainability and alternatives to crude oil-based products are becoming increasingly important across industries. Plastics play an important role here. At K2022, Kuraray offers an answer to more sustainable mobility with several solutions that simultaneously improve sustainability and product performance. To achieve that, Kuraray has developed a bio-based thermoplastic elastomer: SEPTON™ BIO-series. This family of hydrogenated styrene farnesene block copolymers (HSFC) is synthesized from beta-farnesene, a monomer derived from sugarcane. Compared to conventional styrenic block copolymers, SEPTON™ BIO-series not only reduces greenhouse gas emissions by replacing butadiene and isoprene, but also improves product properties such as oil retention, weatherability and compression set. A significant advantage and decisive added value of SEPTON™ BIO-series compared to conventional materials available on the market are the significantly lower greenhouse gas emissions. These are up to 33% lower than standard SEBS and SEEPS. The grades of SEPTON™ BIO-series vary by molecular weight and bio-content. SEPTON™ BIO-series is available with a bio-content of up to 80%. Furthermore, they are recyclable. In order to meet manufacturers' medium- and long-term sustainability goals, SEPTON™ BIO-series is used in various applications not only to increase the bio-content but also to reduce weight.



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5. Liquid farnesene rubber: Significant carbon footprint improvement in rubber compounds

Liquid farnesene rubber is a bio-based liquid rubber, which is based on beta-farnesene, a monomer derived from sugarcane. With liquid farnesene rubber, Kuraray is expanding its portfolio of liquid rubbers with a product based on natural and renewable raw materials. Applied as an additive in rubber compounds, liquid farnesene rubber gives them high plasticity, excellent flexibility at low temperatures and improves ice grip. Liquid farnesene rubber is mainly used in winter tires, where it increases ice grip while preventing the rubber compounds from hardening over time and significantly improves the carbon footprint. With liquid farnesene rubber, Kuraray expands its KURARAY LIQUID RUBBER series by a unique, bio-based solution.

6. Silane-modified GS-L-BR: Functionalized liquid rubber grades

Cars and tires have always evolved side-by-side. Electric vehicles (EVs) place special demands on the performance and properties of tires. Kuraray's silane-modified GS-L-BR is one of Kuraray's latest developments in functionalized liquid rubbers to meet emerging tire performance needs. Silane-modified groups enhance the rubber interaction with silica (which is a popular filler for tires) and improves its dispersion. Applied in tires, GS-L-BR improves the grip performance, rolling, and abrasion resistance, which has an overall positive impact on the lifetime of tires. Improved silica dispersion is a crucial success factor for overall tire performance.

Images:



Kuraray's sustainable packaging solutions include Bio-Circular EVAL™, Plantic™ made from renewable raw materials, biodegradable Exceval™ and water-soluble MonoSol films, made with disappearing polymer technology. Kuraray innovative barrier packaging materials deliver performance and sustainability benefits.

About Kuraray

Established in 1991, Kuraray Europe GmbH is based in Hattersheim, near Frankfurt am Main, Germany. In 2021 the company generated annual sales of EUR 1.1 billion.

It has more than 820 employees in Germany at its sites in Hattersheim, Frankfurt and Troisdorf. Kuraray is a global speciality chemicals company and one of the largest suppliers of industrial polymers and synthetic microfibres for many sectors of industry. Examples are Kuraray Poval™, Mowital®, Trosifol® and Clearfil™. Kuraray Europe also has around 215 employees at six other European sites. They are also working on the development and application of innovative high-performance materials for a wide range of sectors, including the automotive, paper, glass and packaging industries, as well as for architects and dentists.

Kuraray Europe is a wholly owned subsidiary of the publicly listed Kuraray Co., Ltd., which is based in Tokyo, Japan, and has more than 11,330 employees worldwide and sales of EUR 4.8 billion.

This press information including images is available at: <https://www.kuraray.eu/>

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