

A photograph of a smiling man and a young child with curly hair brushing their teeth together. The man is on the right, looking towards the camera, and the child is on the left, looking forward with their mouth open. Both are holding white toothbrushes with pink accents. The background is a soft, out-of-focus indoor setting.

kuraray

Create an
impact with
Kuraray
elastomers

Septon™ Hybrar™ Kuraray Liquid Rubber



Leading innovation with Kuraray's Elastomers

At Kuraray, we create value for people and the planet around the world. Founded in 1926 in Japan, our innovative specialty chemicals, fibers, resins, and films serve as the backbone for a wide range of products used in everyday applications – from healthcare, automotive, and agriculture to architecture, cosmetics, electronics, and textiles.

We operate office, production, and research and development facilities in 31 countries and employ more than 11,000 team members worldwide. While we act globally, we support our customers and clients locally. At Kuraray, we co-create our future through a value based collaboration approach with our customers.

As a global leader in specialty chemicals, our expertise has withstood the test of time due to our commitment to innovation, sustainability, community, and collaboration. We continually streamline our processes and practices to advance our commitment to protecting the environment, improving global health, and creating cleaner chemicals.

Developing unique Elastomers for Half a Century

We launched our Elastomer division in 1972 with the production of polyisoprene rubber. Today, we operate four elastomer production facilities – located in Houston, Kashima, Niigata, and Thailand – that can produce 84,000 tons of materials each year. In addition, our three research centers from Texas to Japan give Kuraray's customers the best global research and development expertise available.

Over the past five decades, our commitment to continuous innovation grew, allowing us to invent new products that have played a vital role in the medical, communications, and automotive fields.



SEPTON™

High-performance TPE

SEPTON™ is a series of styrenic thermoplastic elastomers used in a great number of TPE compounds.



SEPTON™ BIO-series

Bio-based TPE

SEPTON™ BIO-series is a unique bio-based, styrenic thermoplastic elastomer made from a beta-farnesene monomer derived from sugar cane, with a bio-content up to 80%.



SEPTON™ Specialty Grades

Using its proprietary polymer synthesis and modification technologies, Kuraray has developed several unique specialty grades, which are called SEPTON™ V-series, SEPTON™ J-series, and SEPTON™ Q-series.



HYBRAR™

Vinyl-rich, high-performance TPE

HYBRAR™ is a unique block copolymer consisting of polystyrene end blocks and a vinyl-bond rich poly-diene midblock that presents peak tan delta.



Kuraray Liquid Rubber

High-performance synthetic rubber

KURARAY LIQUID RUBBER is a reactive plasticizer with low volatiles that enhance the rubber compound properties.



Liquid Farnesene Rubber

Bio-based liquid rubber

Liquid farnesene rubber is a unique bio-based, liquid rubber made from a beta-farnesene monomer derived from sugar cane, with a high bio-content and significant greenhouse gas reductions.



ISOBAM™

Water-soluble polymer

ISOBAM™ is an isobutylene and maleic anhydride copolymer, soluble in water and alkali water.

SEPTON™

High-performance TPE

SEPTON™ is a series of styrenic thermoplastic elastomers used in a great number of TPE compounds and can be processed in various forms. The Hydrogenated Styrenic Block Copolymers (HSBCs) consist of styrene-based hard blocks and a hydrogenated diene soft block. These styrenic TPEs cover a broad range of applications including compounds, polymer modification, adhesives, flexible PVC substitutes and vibration damping products.



Features and benefits

- Excellent mechanical properties
- UV-/Weather resistant
- Good resistance to chemicals
- Good low temperature performance
- Non-toxic
- High heat resistance
- Excellent electrical insulation
- Rubber-like elasticity
- Recyclable

Applications

- Compounding
- Consumer goods
- Medical
- Mobility
- Oil modification
- Sporting goods & footwear

SEPTON™

Specialty Grades

Using its proprietary polymer synthesis and modification technologies, Kuraray has developed several unique SEPTON™ grades. Each series covers a broad range of product properties, including being super soft and having superior heat resistance.

SEPTON™ Q-series is a range of thermoplastic elastomers that combines softness and elasticity. **SEPTON™ V-series** is a block copolymer with reactive and crosslinkable, hard and soft blocks. **SEPTON™ J-series** is Kuraray's specialty product for high-performance gels.

SEPTON™ BIO-series

Bio-based TPE

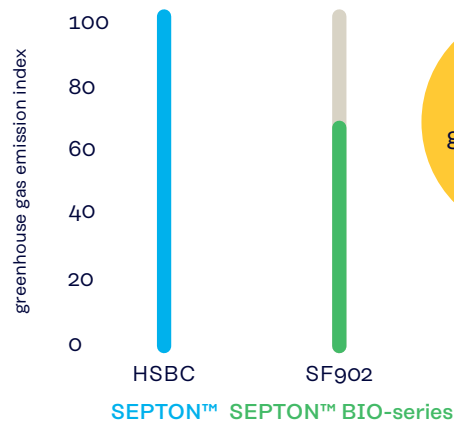
SEPTON™ BIO-series is a unique hydrogenated styrene farnesene block copolymer (HSFC). Kuraray is the first and only manufacturer of bio-based HSBC materials on the market. As one of the leading suppliers of TPEs, Kuraray is responding to increasing industry demand for more sustainable materials that can significantly improve an end product's environmental footprint.

Features and benefits

- Bio-based polymer with up to 80% bio content
- Lower greenhouse gas emissions than conventional SEBS/SEEPS
- Excellent wet and dry grip performance
- Strong and stable adhesion force across a wide temperature range
- Good processability
- Good damping properties over a wide temperature range
- Low compression set, low permanent set
- Soft without plasticizer
- Enables adhesive applications with excellent removability and no residue

Applications*

- Adhesives, coatings, sealants
- Compounding
- Consumer goods
- Electronics
- Industrial & construction
- Mobility
- Sporting goods & footwear
- 3D printing



*For certain applications, SEPTON™ BIO-series cannot be introduced due to raw material supply relations. Please contact our sales representatives.

**Assumptions & Limitations
For detailed information on measurements, assumptions and limitations, please contact our sales representatives.

Principles & Frameworks
• Calculation principles & frameworks: ISO14040:2006 and ISO14044:2006
• Lifecycle Inventory database: IDEA (Inventory Database for Environmental Analyses) version 2.3
• LCIA model: IPCC AR5 100a

System Boundaries
• Cradle to gate
• Biogenic carbon absorption is included
• Incineration and transportation to customer sites are not included

HYBRAR™

Vinyl-rich, high-performance TPE

HYBRAR™ is a truly unique block copolymer consisting of polystyrene end blocks and a vinyl bond rich poly-diene midblock. Due to its peak tan delta over a broad temperature range, HYBRAR™ exhibits high vibration damping and shock absorption properties. Unlike PVC and other SBCs, products manufactured using HYBRAR™ do not need a plasticizer. The highly elastic styrenic block copolymer HYBRAR™ can be processed in a wide variety of forms, including films, tubes, foams, and injection molding. HYBRAR™ products are available as hydrogenated and non-hydrogenated grades. Hydrogenated grades of HYBRAR™ have excellent compatibility with polypropylene resulting in excellent transparency and clarity when blended.



Features and benefits

- Excellent vibration damping over a broad temperature range
- High affinity for polyolefins and polystyrene
- Good moldability
- Can be cross-linked like vulcanizable rubber
- Rubber-like elasticity
- Very good heat and weather resistance
- Alternative to PVC
- No additional plasticizers required

Applications

- Compounding
- Food and packaging
- Industrial and construction
- Medical
- Mobility
- Sporting goods and footwear

Kuraray Liquid Rubber

High-performance synthetic rubber

Kuraray Liquid Rubber functions as “reactive plasticizers”, they help reduce Mooney viscosity and facilitate the mixing process. Kuraray Liquid Rubber is co-vulcanizable with the base rubber, significantly reducing migration, massively improving shelf-life and durability of the products.

Features and benefits

- Transparent
- Colorless
- Odorless
- Low VOCs



Applications

- Tires
- Rubber goods
- Adhesives
- Automotive sealants



Types

- Liquid Polybutadiene (L-BR)
- Liquid Polyisoprene (L-IR)
- Liquid Polystyrene-Butadiene (L-SBR)
- Functionalized: carboxylated, UV-curable, silane-modified
- Bio-based: Liquid Farnesene Rubber (L-FR)



Liquid Farnesene Rubber

Bio-based liquid rubber

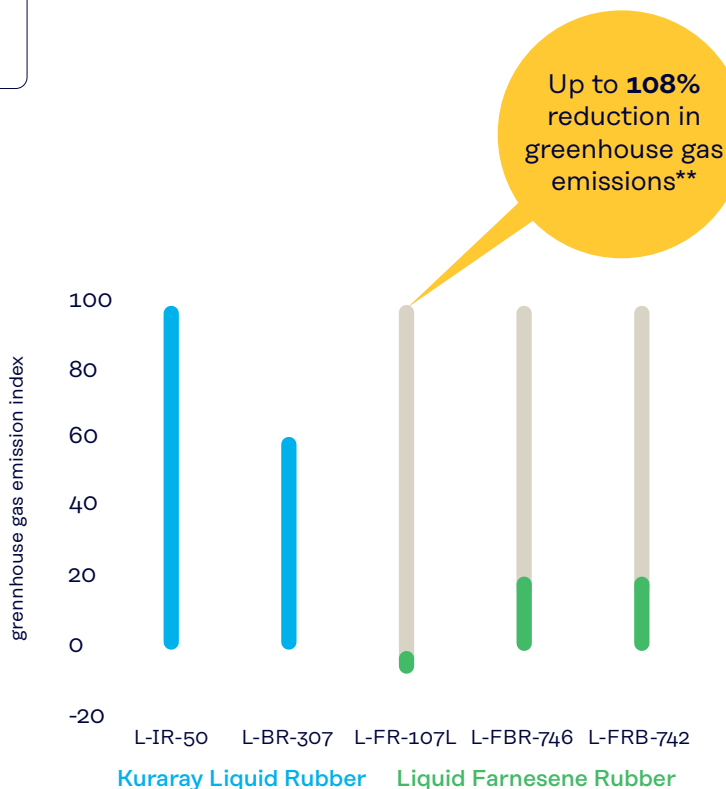
Kuraray has expanded its liquid rubber portfolio with liquid farnesene rubber, a product based on natural and renewable materials. It contains a polymerized form of beta-farnesene, a bio-based monomer. Liquid farnesene rubber functions like a reactive plasticizer, but has a much higher molecular weight than normal plasticizers. The co-vulcanizable material significantly reduces migration, which improves the durability of rubber compounds. Its use during the rubber compounding stage significantly reduces processing time while maintaining the physical properties of rubber compounds. This results in lower processing costs.

Features and benefits

- Bio-based material
- Good plasticizing effect
- Low migration
- Low $\tan \delta$ over a wide temperature range
- Excellent softening effect at low temperature (low T_g)
- Less entanglement between molecules
- High reactivity of branched double bonds
- High molecular weight and low viscosity

Applications

- Adhesives, coatings, sealants
- Rubber compounding
- Mobility
- Sporting goods & footwear



*For certain applications, liquid farnesene rubber cannot be introduced due to raw material supply relations. Please contact our sales representatives.

**Assumptions & Limitations
For detailed information on measurements, assumptions and limitations, please contact our sales representatives.

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System Boundaries
• Cradle to gate
• Biogenic carbon absorption is included
• Incineration and transportation to customer sites are not included

ISOBAM™

Water-soluble polymer

ISOBAM™ is an alkali, water-soluble copolymer made of isobutylene and maleic anhydride. The material has a white, powdery appearance and offers outstanding properties, such as hardness and heat resistance that conventional water-soluble polymers such as polyvinyl alcohol and cellulose derivatives have not yet achieved. ISOBAM™ reacts with chemicals such as sodium hydrate, ammonia and amine, and can be used as an aqueous solution. An important field of application for ISOBAM™ is metal processing, where it is used as a forging lubricant. With excellent water resistance and tackiness, it can also be used as an adhesive, in glass fibers, as a binder for ceramic powders, and in other applications.

Features and benefits

- Alkali, water-soluble
- Excellent heat and water resistance
- Environmentally friendly compared to solvent

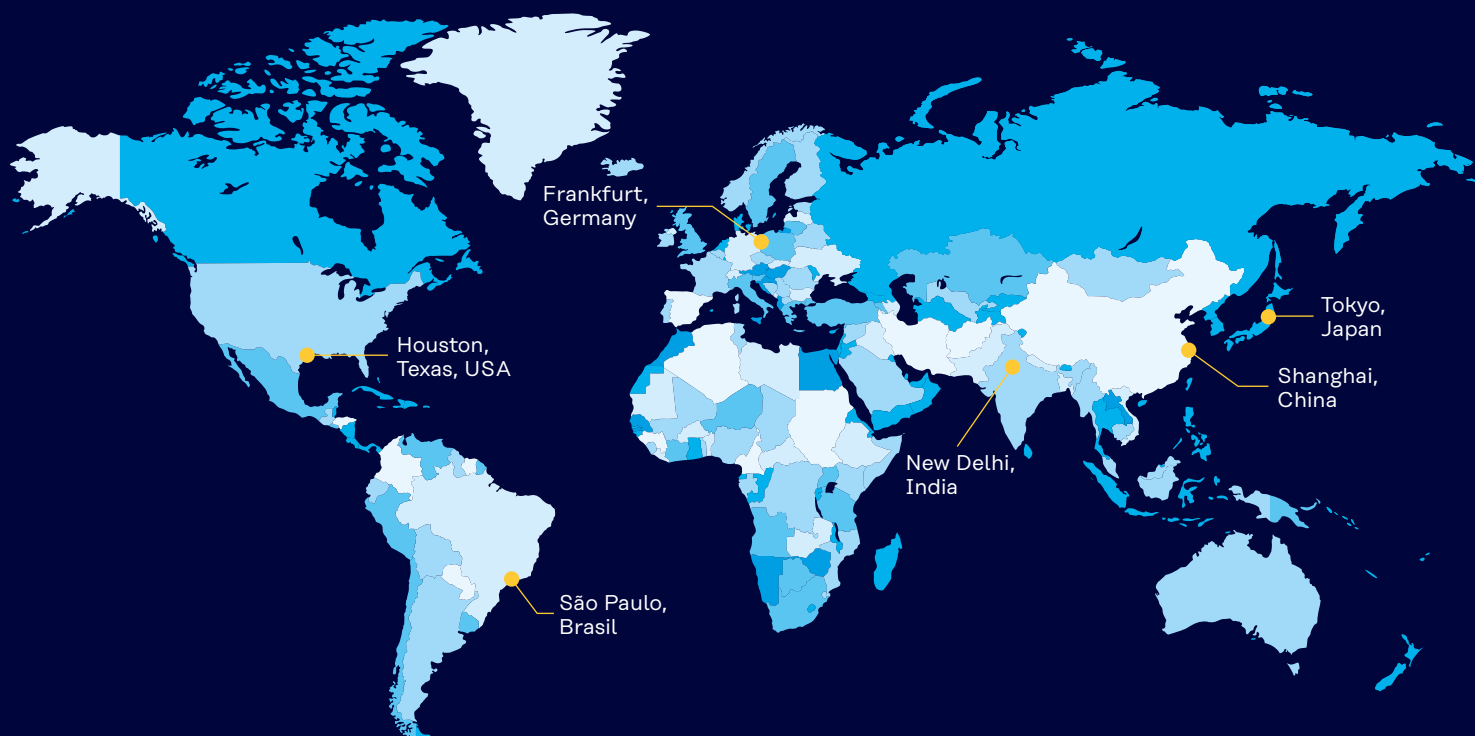


Applications

- Metal processing
- Adhesives
- Glass fibers
- Binder for ceramics



Adding value to your products—worldwide



Kuraray is a world leader in specialty chemicals and functional materials. We are committed to developing products that ensure quality and value while helping our customers differentiate themselves from their competition.

Kuraray's Elastomer Division started in 1972 with the production of polyisoprene rubber and the development of new rubber materials based on Isoprene in the Kashima Plant. From the first

production line, the Elastomer Division continuously grew and invented new products such as KURARAY LIQUID RUBBER, ISOBAM™, SEPTON™, HYBRAR™ and KURARITY™.

Kuraray strives to develop new and innovative high-performance products for customers around the globe. Learn more about Kuraray's Elastomer products, visit elastomer.kuraray.com.

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