The Better Elastomer,
The Better Future
We are a tire solutions company.

The world is already tightening regulations on vehicle emissions and fuel consumption, with the aim to protect the environment. To that end, fuel efficient tires with both grip and wear resistance performance are becoming more common. JSR is a tire solutions company that not only manufactures and supplies tire materials, but also is a problem-solver with regard to materials for the tires of the future.

+ **Future Response Capability**
  
  Through our relationships with the world’s leading tire manufacturers, we are quick to grasp future tire trends. By sharing technology with tire material and device manufacturers, we enhance the development of synthetic rubber technology to meet and exceed future tire performance standards.

+ **Proposal Capability**
  
  JSR is a solutions company. To demonstrate the capability of synthetic rubber as an application base, we make prototypes and carry out road testing. We provide optimal model compounds to match customer target performance that, in turn, shortens development timing.

+ **Comprehensive Support Capability**
  
  From basic products to highly advanced products, we provide a full lineup of synthetic rubber for tire applications. Thanks for our broad material portfolio, we can identify solutions for the achievement of target performance.

+ **Technological Capability**
  
  Over our 60-year history of manufacturing synthetic rubber, we have continued to improve our production technology capabilities at a high level. The physical properties of rubber can have a great impact on tire performance, so we control it with great precision in order to eliminate fluctuations in quality, and this results in high degrees of quality stability and production stability. In this manner, we contribute to the production activities of tire manufacturers.

+ **Development Capability**
  
  Based on our strong chain-end functionalization and polymerization technology, we develop advanced products to meet a variety of customer needs. We are making progress in utilizing digital technologies to reduce development time for new products. In partnership with tire manufacturers, we have experience optimizing joint experiments and mixing trials.

+ **Supply Capability**
  
  SBRR plants in three different countries enable us to offer reduced lead times and logistics costs. With in-house production of butadiene and supply from strategic partners, we can assure a high degree of supply stability unique in this industry.
The Tires that will dominate the future are competitive, high-performance tires. The key to making these tires a reality is advanced SSBR Technology.

Tires with both low energy loss and grip performance, which were traditionally mutually exclusive performance measures, can be said to be the "high-performance" tires that will dominate the future tire industry. To develop these "high-performance" tires, you need the cutting-edge SSBR Technology of JSR. We minimize, to the greatest degree possible, the trade-offs between low energy loss, wet grip performance, and wear resistance performance, and partner with customers to hit target performance for their products.

**Constantly Evolving Chain-End Functionalization**

Chain-End Functionalization, where functionalized groups are introduced to SSBR Chain-Ends, is the key technology for developing "high-performance" tires. JSR, with cutting-edge research and development, is the global pioneer of this technology.

**SL series**
- Chain-end Functionalized SSBR for CB

**HPR3 series**
- Chain-end Functionalized SSBR for CB/Silica
  - 10% reduction in energy loss *

**HPR8 series**
- Chain-end Functionalized SSBR for Silica
  - 10% reduction in energy loss *

**HPR9 series**
- Chain-end Functionalized SSBR for Silica

**NT series**
- Ultra High Strength SSBR

**Time Line**

- **1980**: Oil glut
- **1990**: Birth of silica compound tires
- **2000**: Introduction of tire labeling (Japan)
- **2010**: Introduction of tire labeling (EU/South Korean)
- **2015**: EU CO2 emission regulations (120g/km)
- **2020**: EU CO2 emission regulations (130g/km)

**Continuous Improving Polymerization Technology**

Continuously Improving Polymerization is a Core Technology of JSR. With our solid foundation of Polymerization Technology, our polymer design already meets a wide variety of customer needs.

**Polymerization Technology**

With proprietary control of polymerization and production technology, we design polymers with macro structures (branch structures), micro structures (styrene content, 1, 2-units content), molecular weights, and molecular weight distributions, which augment and enhance compound performance and processability. This gives us wide latitude to develop polymer designs tailored to exacting and precise customer specifications and needs.

**SSBR Technology**

Creating advanced, high-performance tires by intermixing traditionally mutually exclusive performance areas!
The 21st Century is the era of fuel efficient tires. By utilizing our cutting-edge Chain-End Functionalization Technology, we overcome the traditional trade-off between low energy loss and wet grip. Our full lineup of SSBRs are designed to maximize and balance the most important performance indicators to meet a wide variety of customer needs.

**SSBR Portfolio**

**SL series**

Better processability grade for CB

<table>
<thead>
<tr>
<th>Grade</th>
<th>Low Energy Loss</th>
<th>Wet Grip</th>
<th>Wear Resistance</th>
<th>Primary applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSR SL563</td>
<td>★★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Truck / Bus Tire</td>
</tr>
<tr>
<td>JSR SL568</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Truck / Bus Tire</td>
</tr>
</tbody>
</table>

**HPR3 series**

Basic grade for CB/silica compounds

<table>
<thead>
<tr>
<th>Grade</th>
<th>Low Energy Loss</th>
<th>Wet Grip</th>
<th>Wear Resistance</th>
<th>Primary applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSR HPR355</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Fuel Efficient Summer Tire</td>
</tr>
<tr>
<td>JSR HPR355H</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Fuel Efficient Summer Tire</td>
</tr>
</tbody>
</table>

**HPR8 series**

Grade for silica compound with low energy loss and processability

<table>
<thead>
<tr>
<th>Grade</th>
<th>Low Energy Loss</th>
<th>Wet Grip</th>
<th>Wear Resistance</th>
<th>Primary applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSR HPR850</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Fuel Efficient Winter Tire</td>
</tr>
<tr>
<td>JSR HPR840</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Fuel Efficient Winter Tire</td>
</tr>
</tbody>
</table>

**HPR9 series**

Silica compound with improved low energy loss

<table>
<thead>
<tr>
<th>Grade</th>
<th>Low Energy Loss</th>
<th>Wet Grip</th>
<th>Wear Resistance</th>
<th>Primary applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSR HPR950</td>
<td>★★★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Ultra Fuel Efficient Summer Tire</td>
</tr>
</tbody>
</table>

**HP series**

High-strength grade suitable for high-performance tires

<table>
<thead>
<tr>
<th>Grade</th>
<th>Low Energy Loss</th>
<th>Wet Grip</th>
<th>Wear Resistance</th>
<th>Primary applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSR HP776</td>
<td>★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>All Season Tire</td>
</tr>
</tbody>
</table>

**NT series**

Low energy loss grade with twice the strength of SSBR

<table>
<thead>
<tr>
<th>Grade</th>
<th>Low Energy Loss</th>
<th>Wet Grip</th>
<th>Wear Resistance</th>
<th>Primary applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>JSR NT120</td>
<td>★★★★★★</td>
<td>★★★★</td>
<td>★★★★</td>
<td>Fuel efficient tires with long life performance</td>
</tr>
</tbody>
</table>

**HPR950**

Eco Tire

**HPR9 series**

Eco Tire

**HPR3 series**

Eco Tire

**SL series**

Eco Tire

**HP series**

Eco Tire

**NT series**

Eco Tire

**RR and Processability (CB Compound)**

**RR and Processability (Silica Compound)**

**Stress – Strain Curve (Silica Compound)**

**RR and Driving Stability (Silica Compound)**

**JSR Chain-End Functionalization Technology is a game-changer that has successfully disabled the trade-off between low energy loss and wet grip in a super-polymer that delivers performance previously thought impossible.**
BR Portfolio

Providing total solutions for tire performance, such as tire durability and low temperature performance, requires application of polybutadiene rubber (BR). Similar to SSBR, we use our proprietary technology to produce high-performance BR products. Our lineup consists of materials that can be used for all applications—passenger car tire treads, truck/bus tire treads, sidewall and inner tire parts such as base treads.

AT is a syndiotactic 1, 2-polybutadiene and thermoplastic elastomer containing at least 90% 1, 2-bonds, which have a melting point derived from its syndiotactic structure. Blending compounds with AT yields improved processability (compound viscosity, green strength, and mill shrinkage), and physical properties (strength and hardness) of the bead and tread.

**BR01**
Basic grade with superior wear resistance and processability

<table>
<thead>
<tr>
<th>Grade</th>
<th>Cis content</th>
<th>Low Energy Loss</th>
<th>Wear Resistance</th>
<th>Processability</th>
<th>Primary applications</th>
</tr>
</thead>
</table>
| JSR BR01 | High | ⬤ ⬤ ⬤ ⬤ ➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋➋�otype
Synthetic Rubber Lineup for Various Tire Applications

We have synthetic rubber products needed to meet a variety of tire manufacturing needs. We are a one-stop shop for all synthetic rubber used in the tire industry.

Our Broad Lineup of Synthetic Rubber Materials meets the needs for all areas of the tire. JSR’s global comprehensive support network gives customers the confidence they need to be highly successful in the Tire Industry.

### Comprehensive Lineup of Synthetic Rubber Used in Tires

**Motorcycle Tire**

- **Tread**
  - Required properties: Low Energy Loss / Grip Performance / Wear Resistance / Driving Stability / Low Temperature Performance (Winter Tires)
  - JSR Product: SSBR / ESBR / High Cis BR

- **Sidewall**
  - Required properties: Low Heat Build Up / Stiffness / Resilience Performance
  - JSR Product: High Cis BR

- **Bead**
  - Required properties: Strength / Adhesion
  - JSR Product: AT / IR / SSBR / High Cis BR

- **Inner Liner**
  - Required properties: Gas Impermeability
  - JSR Product: B-IIR / C-IIR

**Truck / Bus Tire**

- **Carcass**
  - Required properties: Driving Stability / Strength / Adhesion
  - JSR Product: AT / IR

- **Tread**
  - Required properties: Low Energy Loss / Grip Performance / Wear Resistance / Driving Stability / Low Temperature Performance (Winter Tires)
  - JSR Product: SSBR / ESBR / High Cis BR

- **Sidewall**
  - Required properties: Low Heat Build Up / Stiffness / Resilience Performance
  - JSR Product: High Cis BR
Speedy Development and Quick Mass Production Launches

We work closely with our Tire Materials Technology Development Center at our Yokkaichi Plant to develop polymers, processes and establish mass production technologies. We know speed is of the essence to our customer base.

Applying Digital Technologies for Research and Development and Mass Production Technologies.

We utilize AI and Big Data to tackle improvements in speed and efficiency and achieve stable quality and stability in mass production.

Development of Tire Materials

JSR partners with the most successful global tire manufacturers to develop innovative polymeric materials with unique properties and functions.

Supporting Customers with Technology Know-How

We share technologies with a variety of tire material and device manufacturers. We can provide proposals for solutions that go as far as compound recipes. We support tire development utilizing our extensive technological know-how.

Design and Development Analysis Technologies

We use our high-level analysis technologies to design and develop optimized materials tailored to each type of rubber compound.

Joint Experiments and On-Site Problem-Solving

We engage collaboratively in joint experiments at customer laboratories and test facilities. We provide quick and accurate feedback allowing customers to zero-in on target performance and speed new products to market.

Fuel Efficient High Performance Tire (235/55R18)

(JSR Product)

- Chain-end Functionalized SSBR: HPR850
- High Molecular Weight SSBR: HP725
- High Cis BR: BR730

Chain-end Functionalized SSBR: HPR840
High Molecular Weight SSBR: HP725
High Cis BR: BR730

We achieved a high level of tire performance!

High Wear Resistance All Season Tire (205/55R16)

(JSR Product)

- Chain-end Functionalized SSBR: HPR850
- High Molecular Weight SSBR: HP725
- High Cis BR: BR730

We achieved a high level of tire performance!
Serving the Tire Industry with Stable Supply and Timely Customer Support

With global expansion of JSR Plants and Technical Support Teams, we provide a stable supply of synthetic rubber along with timely customer support. We take a wide variety of approaches to solving each customer’s unique issues. These approaches enable the creation of success chains, by which, we assist the tire manufacturer to solve automotive industry’s most pressing problems and help create an efficient mobility society.

- Producing SSBR at 3 Global Manufacturing Sites
  We produce SSBR at 3 production sites; in Japan, Thailand and Hungary. This gives us a unique logistical flexibility to support the global tire industry.

- In-House Production of Butadiene and Procurement from Strategic Partners
  In addition to In-House production of butadiene, the main component of synthetic rubber, we also utilize a robust network of strategic global material suppliers. Our goal is to provide a steady stream of synthetic rubber products, both upstream and downstream, throughout the supply chain.

- Communication Centers at 6 Locations Throughout the World
  With 6 Sales and Technical Offices in all major markets, we promptly respond to tire manufacturer requests with timely electronic, telephone or face-to-face contact as needed.

- Creating New Tire Products in Less Than 1 Year Using Unique Compound Proposals
  With technologically tailored solutions proposals, tire manufacturers reduce tire development time. In concert with JSR, tire manufacturers have reduced development time to less than 1 year.

- Connected to Most of the Top 30 Global Tire Companies
  JSR has strong relationships with and its products are used by the vast majority of global tire manufacturers. Since we focus on materials solutions, we have achieved a great deal of success with motor sports tires, used by the most demanding drivers in the industry. All of this has JSR on the cutting-edge as the pioneer of polymeric material solutions for the global tire industry.

Creating the future of the mobility society
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