AsahiKASEI

Novel Hydrogenated SSBR

Improved durability and reduction of 6PPD pollutants

Product Overview

The ongoing evolution in the automotive industry is rapidly raising the requirements towards the durability of tires and the environmental impact of raw materials.

In comparison to conventional diene rubbers, HSBR provides several advantages:

- Superior mechanical properties
- Enhanced strength
- Increased toughness
- Resistance to heat, aging, and chemicals
- Potential to reduce 6PPD antioxidant

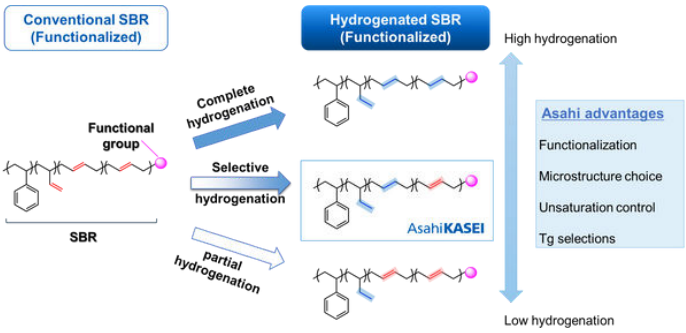
Asahi Kasei employs selective hydrogenation - a proprietary process designed to maintain the desirable attributes of solution styrene butadiene rubber (SSBR), such as miscibility, compounding efficiency, processability, and vulcanization, while simultaneously enhancing the polymer's performance, stability and durability.

The optimized unsaturation levels achieved through this process result in superior fatigue performance, thermal stability, and resistance to oxidation and ozone.

Application Fields

- Tire treads and side walls
- Rubber parts for automotive applications
- Industrial rubber applications (rubber crawlers)
- Footwear

What is HSBR?



Material Properties

	Conventional SSBR	Hydrogenated SSBR
Curing System	Sulfur & peroxide vulcanization	
Tensile properties	+	++
Fatigue resistance	+	++
Ozone resistance	-	++

Sustainability/Benefits

- Potential reduction of 6PPD pollutant while maintaining high material durability
- Reduced microplastic generation

Further Information

Creating for Tomorrow

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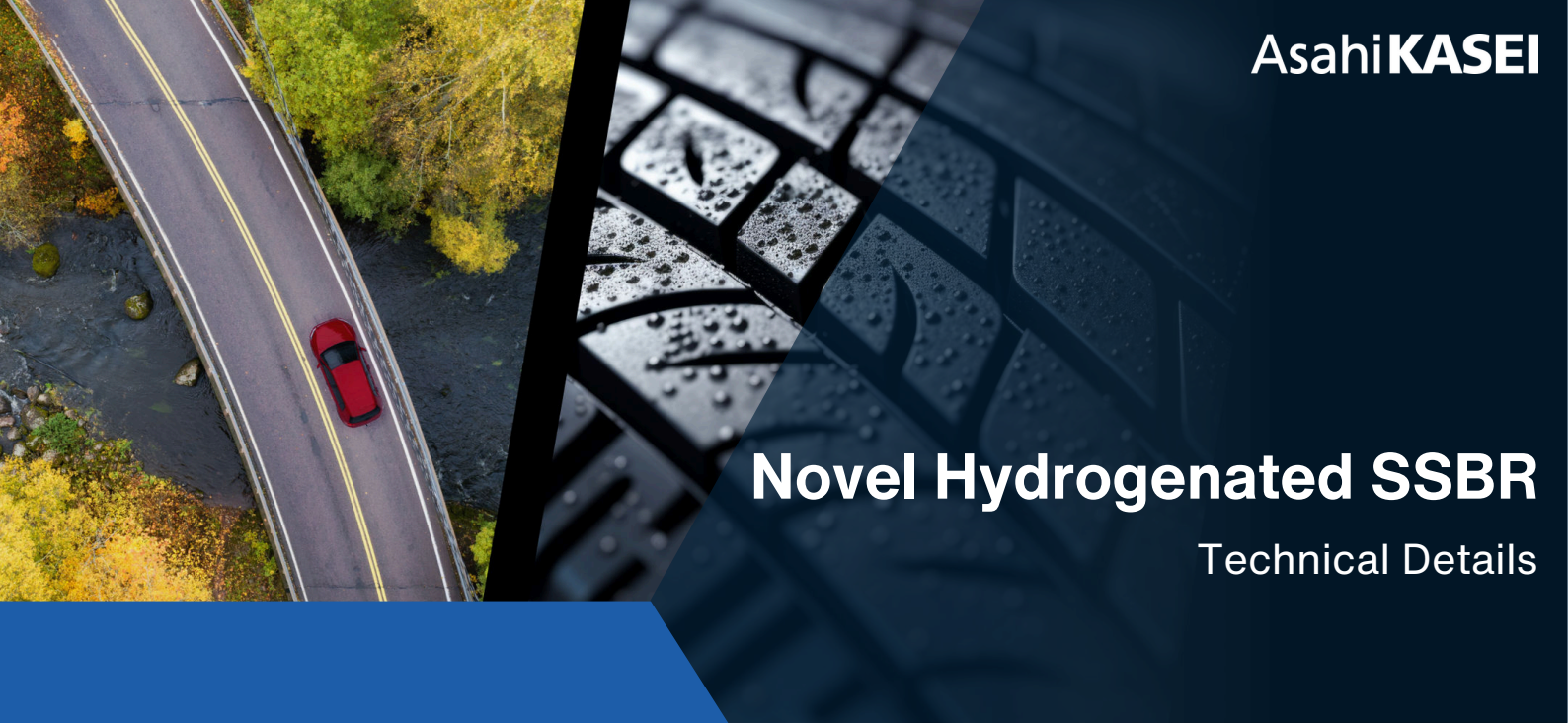

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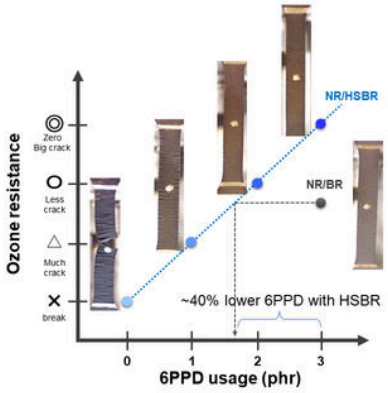
Technical Details

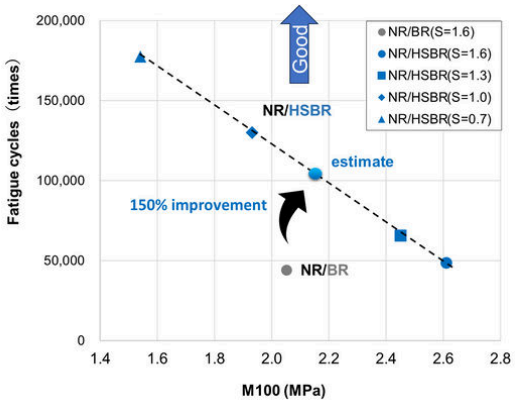
HSBR enables a 40% reduction in 6PPD

Dynamic ozone tests indicate that with 3 phr of 6PPD the NR/HSBR show no cracks, unlike the NR/BR reference. The ratings evidences much lower 6PPD levels would suffice for a NR/HSBR system to achieve a similar ozone stability like NR/BR, thanks to HSBR's superior stability.



HSBR improves fatigue performance up to 150%

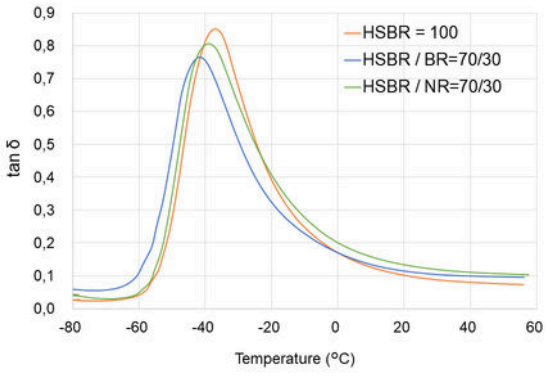
Fatigue experiments comparing (sidewall) recipes with NR/HSBR against NR/BR demonstrated upto 150% improvement, resulting from HSBR's higher entanglements, stability against oxidation & ozone, and residual crystallinity.



HSBR shows miscibility with other rubbers

The solubility parameters of HSBR are in between the solubility parameters of NR, BR and SSBR. This enables the rubbers to be compatible and miscible with each other.

Furthermore, HSBR are also available in a variety of Tg, offering a wider selection based on desired application



Are you interested in learning more?

"Selective hydrogenated Styrene Butadiene Rubbers (HSBR): A realistic Approach towards 6PPD Reduction in Rubber Compounds", Kautschuk Gummi Kunstoffe, 1/2024, Pg. 51-57.

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