

## SBR Rubber Introduction 3

By [styrene butadiene rubber sheets](#) - [www.dongrubber.com](http://www.dongrubber.com), [sales@dongrubber.com](mailto:sales@dongrubber.com), Date: Jun.19.06

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### 5. Oil and carbon black carbon black filled styrenebutadiene rubber mixing

Oil and carbon black carbon black filled [SBR rubber](#) mixing is when the emulsion polymerization, adding oil and carbon black in rubber latex and styrene butadiene rubber production by condensation. Characterized by mixing time can be shortened to 25% ~ 30%, and rubber mixing temperature is low, low scorch risk, facilitate at continuous mixing; Improve the working conditions and simplifies the operation process; Carbon black dispersed evenly, reinforcing performance is good; Calendering, pressing is good performance; The strength of the vulcanized and heat aging, wear resistance, fatigue resistance are improved and hotless. Its main characteristic is:

- (1) Does not need the molding, can be mixed directly.
- (2) Shorten the mixing time, improve efficiency.
- (3) Rubber produces less heat, low energy consumption.
- (4) Cooperate agent is easy to blend, and good dispersion, which can better improve performance.
- (5) Improve the machining process.
- (6) Mixing environment greatly improved, and can reduce the input of rubber mixing equipment, and plant area can be reduced, so that saved investment.

### 6. High styrene rubber/styrene butadiene rubber and blend rubber

High styrene resin and high styrene rubber is generally has the following characteristics.

- (1) Has certain reinforcing effect on rubber.
- (2) The relative density is small, can improve the rubber hardness of the rubber.
- (3) With thermoplastic.
- (4) Aging resistance, abrasion resistance and good electrical insulation performance.
- (5) Can be formulated with white or light color products.
- (6) When consumption increases, the vulcanized rubber has improved stretching stress, tensile strength and tear strength, the hardness increased, abrasion performance improved, but the compression deformation and flexible crack performance degradation.

### 7. Soluble poly styrene butadiene rubber

Soluble poly styrene butadiene rubber is solution polymer using alkyl as catalyst. According to different polymerization conditions and catalyst, the polymer can be divided into random model, part block type and symmetric block three types. Among all the random model has the general characteristics of styrene-butadiene rubber, can be used to produce tires and other rubber industrial products; Type block copolymer is thermoplastic, more used for injection molding and extrusion products. Its main characteristic is:

- (1) Mixing rubber with small shrink, the surface is smooth.
- (2) Sulfide started faster than emulsion styrene butadiene rubber, good vulcanizing flatness.
- (3) Flexible crack and the crack growth resistance performance are good.

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(4) The low temperature performance is good.

(5) Used with natural rubber, emulsion butadiene styrene rubber can have good performance.

(6) Because of the high polymer chemistry molecular design and technology development, some new varieties have new breakthroughs, the performance of slip resistance, rolling resistance and wear resistance has a better balance.

### 8. High trans styrene butadiene rubber

High trans [styrene butadiene rubber](#) is using barium-magnesium-aluminum complex catalyst solution polymerization of butadiene and styrene. The microstructure of butadiene unit in copolymer is: trans-1, 4 content reaches 88% ~ 90%, 1, 2 - structure content of 2% ~ 3%. Containing styrene 15% and trans 1, 4 – butadiene 85% copolymer, after proved styrene is not completely random distribution, and its glass transition temperature  $T_g$  is 83.5 °C, the crystallization rate is about 10 times higher than the natural rubber, code-named HTSBR. High trans styrenebutadiene rubber is considered to be promising rubber. Its characteristics are as follows:

(1) Compared with natural rubber, high trans styrenebutadiene rubber crystallization rate is very high, its crystallization are temperature sensitive, while smaller strain induced crystallization compared with natural rubber.

(2) The strength of the unvulcanized rubber is low, but with high bonding strength.

(3) Excellent oxidation stability.

(4) Low hysteresis.

(5) Used with natural rubber makes good fatigue life.

Due to high trans styrenebutadiene rubber has above advantages that applies to the meridian tire lateral structure, it is also beneficial to tread compound too.

### 9. Liquid styrene butadiene rubber

(1) It has the general properties of liquid rubber.

(2) Due to containing styrene, comprehensive physical performance is good.

Liquid styrene butadiene rubber is mainly used in the production of laminated products, injection molding products, varnish, sealing materials, and pay or used in the production of adhesive agent, also used for styrene butadiene rubber, butyl rubber and neoprene plasticizer.

### 10. Alfin rubber

As a new type of poly styrene butadiene rubber, it is to use alcohol as catalyst, polymer with different proportions of butadiene and styrene or butadiene and isoprene copolymer. Its performance is similar to emulsion poly [styrene butadiene rubber sheet](#), and some performances superior than emulsion poly styrene butadiene rubber, such as adhesive strength, good processability, relative molecular weight distribution even. It can be used in the manufacture of tires and other products.

## Part 4 Varieties and Properties of SBR Rubber

1. Emulsion polymerization styrene butadiene rubber (hereinafter referred to as emulsion poly styrene butadiene rubber)

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2. Solution polymerization styrene butadiene rubber (hereinafter referred to as soluble poly styrene butadiene rubber)

Part V Application of styrene-butadiene rubber

[SBR rubber sheet](#) is a kind of biggest consumption general synthetic rubber, its application is extensive, can be generally used in situations except where requires oil resistant, heat resistant, special performance medium resistant places.

Styrene butadiene rubber is mainly used in tire industry. In the tire industry, styrene butadiene rubber in car tires and small tractor tires and motorcycle tyres applications proportion is larger, and the application in the truck tire and radial tyre ratio is small.

Styrene butadiene rubber also has wide applications in no special requirement adhesive tape, rubber hose, and some industrial products. Such as used for conveyor belt cover, glue, water hose, rubber soles, rubber roller, waterproof rubber, adhesive products, etc.