



Rubber Resins

PRODUCT SELECTOR GUIDE

Unique Solutions for Rubber Resins

At SI Group, our unparalleled experience is what sets us apart. Our broad portfolio of tackifier, bonding, curing and reinforcing resins is used in rubber compounding to improve performance of rubber products like tires, technical rubber goods and vehicle parts. SI Group's rubber selector guide has been designed to make your product selection decisions faster and easier. Additionally, our teams of technical experts are available to provide guidance and expertise along the way.

Tackifier Resins

The high performance and consistent quality of our standard and super tackifier resins differentiate us. As a global leader in alkylphenolic resins, our offerings provide optimal tack for various time and environmental requirements. SI Group tackifier resins are added to rubber compounds to promote the bonding of different parts (plies) that make up a rubber product until they are cured or vulcanized.

Curing Resins

Our unique collection of curing resins reduce thermoplasticity while improving abrasion and chemical resistance with increased tensile strength. Compared to sulfur curing systems, SI Group resins provide better heat and moisture resistance, ideal for repeated heat cycles such as butyl curing bladders. Additionally, our brominated products save time and provide faster production capabilities by reducing curing time.

Bonding Resins

Our adhesion promoting offerings improve the overall bonding to mechanical reinforcements. Our ELAZTOBOND™ A bonding resins contain less than 0.5 percent free resorcinol while providing excellent rubber-to-rubber knit strength. SI Group bonding resins produce crosslinked secondary networks, high modulus, good adhesion and high reactivity.

Reinforcing Resins

Our reinforcing resin portfolio provides increased hardness, toughness, stiffness and abrasion and tear resistance to the rubber compound. All of our offerings have been developed to meet the reinforcing challenges of the rubber market. We provide several reinforcing resins options including phenol-formaldehyde, distilled tall oil modified, cashew nutshell liquid modified and low residual monomer grades.

RUBBER TYPES	
NR	Natural Rubber
SBR	Styrene Butadiene Rubber
BR	Butadiene Rubber
IIR	Isobutylene Isoprene Rubber
NBR	Nitrile Rubber
HNBR	Hydrogenated Nitrile Butadiene Rubber
CR	Chloroprene
EPDM	Ethylene Propylene Diene Monomer

SI Group's rubber resins improve the safety and durability of modern tires.



Tackifiers

SI Group's wide selection of tackifier resins have been developed to meet the broad variety of tack needs in many kinds of rubber and different applications. Several of our tackifiers are used in tires, but we offer several grades for use in specific situations including for low-polarity rubbers such as EPDM, for retreading, or for specific technical rubber applications.

	Tack Retention	Tack Level							Melting Point (°C), Ring and Ball				Benefits
		NR	SBR	BR	IIR	NBR	CR	EPDM	80	100	120	140	
Standard Tackifier													
SP-1068	standard												A general purpose PTOP based resin that provides industry standard tack. Widely used in tires and technical rubber goods.
SC-2066	improved												A higher melting point alkylphenol resin with enhanced tack retention making it ideal for retreading stocks.
SMD-31144	improved												A higher melting point alkylphenol resin with enhanced tack retention making it ideal for retreading stocks.
HRJ-10420	standard												A general purpose PTOP based resin that provides industry standard tack. Widely used in tires and technical rubber goods.
Super Tackifiers													
SP-1077	standard												A modified alkylphenol resin designed specially for increased tack in EPDM and other low polarity rubbers.
ELAZTOBOND™ T-5000	improved												A general purpose PTOP based resin with a higher melting point. Provides a good balance of initial and long-term tack.
ELAZTOBOND™ T-5600	excellent												A very high performance mixed-alkylphenols resin. Provides high tack in less polar rubbers.
ELAZTOBOND™ T-6000	excellent												A supertackifier resin with high tack retention ideally suited for highly filled compounds and low tack polymers.



Reinforcing Resins

SI Group offers a range of resins to meet the reinforcing requirements for many types of rubber and to provide low residual monomer solutions. The selection of a reinforcing resin system should consider the required static and dynamic physical properties, processing and curing. SI Group's reinforcing resin solutions provide increased hardness, toughness, stiffness, abrasion and tear resistance to the rubber compound.

	Residual Monomer	Form	Scorch Safety* in Sulfur Vulcanization		Effectiveness at 10 phr							Melting Point (°C)			Benefits
			NR	SBR/BR	NR	SBR	BR	IIR	NBR	CR	EPDM	80	100	120	
Standard Phenolic Resins															
SFP-118	low	pastilles	3	3											A general purpose reinforcing resin that provides good compromise between scorch safety and final hardness which allows for use in many applications.
SMD-30207	low	pastilles	3	3											A general purpose reinforcing resin that provides good compromise between scorch safety and final hardness which allows for use in many applications.
Modified Phenolic Resins															
SP-6700	low	flakes / pastilles	3	5											CNSL modified resin that provides higher hardness than PF or DTO resins in some rubbers, can be scorch sensitive.
HRJ-11995	low	flakes / pastilles	3	5											A CNSL modified resin with low residual monomer and a higher hardness than PF or DTO resins in some rubbers, can be scorch sensitive.
SP-6600	low	powder	3	5											A CNSL modified resin that offers high effectiveness with most rubbers. The powder form helps incorporation in final mixing stage. Contains 8% HMT.
SP-6601	low	powder	9	9											A DTO modified resin which offers great scorch safety. The powder form helps incorporation in final mixing stage. Contains 8% HMT.
SP-6701	low	flakes / pastilles	9	9											A DTO modified resin offers low viscosity which improves filler incorporation and has good scorch safety.
RX-6702	standard	flakes / pastilles	7	7											Oil modified resin with good scorch safety and reinforcing properties.



*Higher number denotes better protection. Higher number indicates small reduction in scorch time, lower number indicates bigger reduction in scorch time.

Curing Resins

SI Group's innovative rubber curing solutions have been developed through years of product and application testing with our customers. Phenolic curing resins work in rubbers that have activated C=C unsaturation and, in most cases, they are ideal for low unsaturation polymers because they provide exceptional heat and aging resistance.

Rubber Type*	Resin Cure Suitability
NR, SBR, BR	Will crosslink but generally not used due to high unsaturation; used for NR based adhesives
IIR	Gives exceptional heat aging performance; widely used for bladder production
NBR, HNBR	Gives exceptional aging properties
CR	The non-brominated resins require an activator, normally a Lewis acid system. CR cannot be crosslinked using phenolic resin.
EPDM	Gives exceptional aging properties; especially suitable for thermoplastic vulcanate (TPV) production.

*See definitions on Page 1 of the Rubber Resins Product Selector Guide

	Cure Speed	Form	Methylol Content (%)					Melting Point (°C)				Benefits
			6	8	10	12	14	80	90	100	110	
Octylphenol Resol												
SP-1044	standard	flakes										An octylphenol resol based curing resin that offers moderate cure speed. Ideal for use in tire bladder manufacture to cure IIR.
SP-1045	standard	flakes										An octylphenol resol based curing resin that offers moderate cure speed. Ideal for use in tire bladder manufacture to cure IIR.
SP-1045P	standard	pastilles										An octylphenol resol based curing resin that offers moderate cure speed. Ideal for use in tire bladder manufacture to cure IIR.
HRJ-10518	improved	flakes										An octylphenol resol curing resin that offers faster cure speed than other non-brominated alternatives.
Octylphenol Resol, Brominated												
SP-1055	excellent	flakes										A brominated octylphenol based curing resin that offers very fast cure. With this product there is no need for added halogen donor. Ideal for small cross section parts with short cure cycles.
SP-1056	best	flakes										A brominated octylphenol based curing resin that offers extremely fast cure. No need for added halogen donor. Also ideal for small cross section parts with short cure cycles.
Butylphenol Resol												
ELAZTOBOND™ C 730	standard	flakes										A butylphenol based resin that offers fast cure speed with the benefit of being PTOP-free.
Alkylphenol Resol in Mineral Oil												
SMD-31214	standard	liquid (30% solids content)	*					N/A				A liquid alkylphenol resol oil that is designed to cure EPDM for continuous production of TPV.

* on solid resin, 3.4%

Bonding Resins

SI Group's bonding resin offerings are used to meet the optimal performance required by our customers in rubber compounds as solid resins or as part of a water-based dipping system as liquid resins. Bonding resin selection needs to take into account the rubber, the mechanical reinforcement (wire or textile), the surface treatment of the reinforcement, the process conditions and the service conditions of the final product. All solid bonding resins require a curative such as HMMM or HMT.

	Low Fume Level	Type	Form	Compatibility							Melting Point (°C)			Benefits
				NR	SBR	BR	IIR	NBR	CR	EPDM	100	120	140	
Solid Phenolic Resin														
R-7576HR	improved	Modified phenolic resin	pastilles										A modified phenolic resin that offers a very low fume level while maintaining good aging properties.	
ELAZTOBOND™ A220	good	Very low free resorcinol, modified phenolic resin	flakes										A modified phenolic resin designed to give long-term bonding with exceptional flex resistance and aging properties. Provides a very low fume level and very low free resorcinol.	
ELAZTOBOND™ A250	excellent	Very low free resorcinol, modified phenolic resin	flakes										A modified phenolic resin designed to give long-term bonding with exceptional flex resistance and aging properties. Provides a very low fume level and very low free resorcinol.	



	Type	Form	Viscosity (mPas)	pH	Solids Content %	Benefits
Liquid Phenolic Resin						
SRF-1524	Resorcinol / formaldehyde resin in water	liquid	3000–5000	1.2–2.5	73–77	Used as a component of latex dip systems for tire cord or belt and hose fabric.



Our bonding resins help to provide permanent bonds between rubber and mechanical reinforcements such as wire and textiles.



SI Group offers a wide range of tackifier resins that provide the optimal tack for specific compounds, time and condition requirements, while also ensuring high quality and consistent performance.



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