



Elastomers


SMARTER STABILIZATION SOLUTIONS

SI Group
The Substance Inside

GLOBAL SOLUTIONS

SI Group is a global specialty chemicals company with leading positions in diversified markets. We build the chemistry that makes other products more durable, safer, cleaner and more efficient, in the building and construction, electrical and electronics, consumer, agricultural, industrial and transportation industries.

With more than 3,000 employees around the world, SI Group provides products and services in more than 100 countries and maintains manufacturing and research facilities around the world.



ALKANOX™
ANOX™
DURAZONE™
FLEXZONE™
LOWINOX™
NAUGARD™
NAUGAWHITE™
OCTAMINE™
ROYALAC™
WESTON™

OUR VISION

- *To be the world's most innovative supplier of solutions to the polymer industry*
 - *To be our customers' first choice as a committed supplier*
 - *To offer the best cost-performance solutions through real innovation*
 - *To invest in line with our customers' growth strategies*
 - *To offer the best service locally through integrated plants and supply chains*
-



OUR PRODUCTS

We are a leading global supplier of Antioxidants, Intermediates & Inhibitors, Polymer Modifiers and UV Stabilizer solutions. As a manufacturer that markets all major families of stabilizer, we offer the widest range of performance-based polymer additives in the industry. Our goal is to be the most innovative supplier of stabilizer solutions worldwide.

OUR STRENGTHS

- Technical expertise that adds value
- Customized, cost-effective dust-free solutions
- Service worldwide
- Regulatory compliance and corporate responsibility
- Committed to future growth

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DELIVERING TRUE INNOVATION

With a significant number of registered active patents, we continue to strongly invest in innovation to maintain our position at the forefront of polymer additive technology. Improved performance and cost optimization are key priorities.

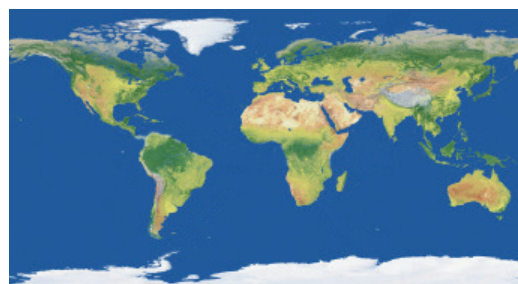
Expertise that adds value

SI Group is one of the world's largest supplier of liquid additive solutions with the broadest portfolio of specialty antioxidants. With our strong history and unrivalled technical expertise we can provide our customers with the best cost-performance solutions to fulfill their needs. Our technical experts continue to actively develop new products, synergistic customized solutions and new platforms such as self-emulsifying systems.



A global supplier offering local service

SI Group's Antioxidant and UV Stabilizer solutions are manufactured in multiple locations, with sales, technical, and laboratory facilities around the world. This organization brings us close to our customers in all regions, allowing us to offer better service and shorter lead times. As our customers invest heavily in the new, emerging markets, we have been focusing especially on our structure in those regions to guarantee service levels. Our new technical application centre in China is the latest example to add to our existing locations in the Middle East, South Korea, USA, Brazil, Europe and Taiwan. We have also consolidated our Customer Care and shipping points and ensured we field a highly trained sales and distribution team.



NEW TECHNOLOGIES BRING 'EASE OF USE'

Dispersions: Use Our Expertise

SI Group has two centers of expertise for the preparation and technical support of emulsions and dispersions: Waldkraiburg, Germany and Nanjing, China. Our technologists can help develop the best cost-performance dispersion or emulsion to meet your exact needs and enquiries to use our expertise for the benefit of our customers, are always welcomed. An extensive range of dispersions is available directly from SI Group or from our global network of partners specialized in dispersion technology.

Benefits of SI Group's Dispersion Technologies

- Liquid physical form, ease of use
- Improved dosage accuracy
- Finely dispersed additives, which guarantee efficiency
- Customized particle size and concentration
- Synergistic blends and solutions giving tailored performance for different applications
- Long term stability
- Improved HSE environment: No dust, no VOC, no explosion risk

Technology: Greater Value for You

A new 'self-emulsifying' form ('SE') has been developed for a large number of liquid products and blends that are used in an aqueous environment, such as natural or synthetic latex and the emulsion polymerization of synthetic elastomers. The SE products do not contain water; however, they can easily be added to water or latex. Mild stirring immediately creates the formation of a stable emulsion. The direct injection of the SE products into the production process allows productivity gains as one handling step is removed.

Benefits from Self-emulsifying Technology

- Simplified process - as direct injection is possible
- Easier handling and dosage
- Lower costs - no need to ship water/dispersions around the world
- Lower costs for emulsion preparation—no need for emulsifiers
- No issues related to emulsion/dispersion stability and storage
- Improved productivity as mixing is instantaneous and homogeneous
- Easier dispersion into latex



Self-emulsifying technology



Current technology

Self-emulsifying technology

Instantaneous and homogeneous mixing allows a simplified process and productivity gains

POLYMERIZATION SELECTOR GUIDE

Emulsion		Polymerization Stabilizers			Solution	
SBR - Non Staining Grades	NBR	CR			BR	CR
Phenolics						
○	○		NAUGAWHITE™ Liquid bis-phenolic stabilizer			
			LOWINOX™ CPL Highly effective, polymeric, non discoloring	●	●	○
			LOWINOX™ 22M46 Excellent non-discoloring, non-staining stabilizer	●	●	○
●	○	●	ANOX™ 1315 High-efficiency, low-viscosity stabilizer	●	●	●
		○	ANOX™ PP18 High-purity phenolic stabilizer	●	●	●
		○	ANOX™ 20 High-purity, multifunctional phenolic stabilizer	○	○	
ETHANOX™ 330 Multifunctional high chemical stability phenolic stabilizer						
Phosphites						
			WESTON™ TNPP Cost-effective high purity phosphite	●	●	●
●	○		WESTON™ 399 Cost-effective with increased hydrolytic stability	●	●	●
●	○		WESTON™ 705 Highly-effective nonylphenol-free phosphite stabilizer	●	●	●
			ALKANOX™ 240 General purpose phosphite stabilizer	○	○	○
New Blends						
			ANOX™ BT120 High-performance phenolic/phosphite liquid blend			
○			WESTON™ 502 Cost-effective phosphite/phenolic blend	●	●	●
○			WESTON™ 802 Cost-effective with improved hydrolytic stability	●	●	●
●	●		NAUGARD™ E-1 High performance synergistic blend with optimum processing and long-term stability	●	●	○

Symbols

- Recommended use
- Suggested use

Physical Form:

- PW Powder
- GR Granular
- AM Amorphous
- PL Pellet
- NDB Non Dust Blend
- L Liquid

Elastomer Food Contact

- ✓ = Product has food contact clearance in polyolefins in at least one country.

For more specific approvals, please contact your SI Group sales representative.

Solution							
SIS	SEBS	IR	IIR	Physical Form	FDA Approval	European Food Approval	Self Emulsifying Available
		○	○	L, PW	✓		
		○	○	PW, PL	✓	✓	
		○	○	PW, GR			
		○	○	L	✓		Y
		○	○	PW, GR, NDB, PW, GR, AM	✓	✓	
		○	○	NDB	✓	✓	
	●			PW, GR	✓	✓	
●		●	●	L	✓	✓	Y
●		●	●	L	✓	✓	Y
●		●	●	L			Y
○	●			PW, GR, NDB	✓	✓	
				L	✓	✓	
				L			
		○	○	L			Y

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ELASTOMER COMPOUNDING SELECTOR GUIDE

	SBR				EPDM				Natural Rubber						
	Tires	Molded & Mechanical Goods NBR	Floor Coverings & Mats	Electric Cables	Conveyor Belts	Washing Machine Seals	Roof Coverings	Electric Cables	Car Window & Door Seals	Tires	Bridge Bearings	Engine Mountings	Hose	Shoe Soles	Toys & Articles for Children
Aminic Antioxidants (Staining and Discoloring)															
AMINOX™				●			●								
BLE™ 25										●					
NAUGARD™ 445	●	●		●	●	●	●	●	●		●	●	●	●	
NAUGARD™ PS30															
OCTAMINE™				●	●	●		●	●						
NAUGARD™ Q	●	●			●					●	●	●	●		
Phenolic Antioxidants (Non-Staining Non-Discoloring)															
LOWINOX™ 22M46	●	●	●			●		●						●	●
LOWINOX™ CPL		●	●			●		●						●	●
NAUGARD™ PS48															
NAUGAWHITE™														●	●
Antiozonants															
DURAZONE™ 37	●	●		●		○	○	○	○	●	●	●	●	●	●
FLEXZONE™ 4L	●			●			●			●	●	●	●		
NOVAZONE™ AS							●								
SUNPROOF™ EXTRA	●									●	●	●	●		
SUNPROOF™ IMPROVED	●									●	●	●	●		
SUNPROOF™ JUNIOR FT	●									●	●	●	●		
SUNPROOF™ SUPER	●									●	●	●	●		
Curing Agents															
HEPTEEN BASE™															
TRIMENE BASE™															
ROYALAC™ 150 LIQUID						●	●	●	●						
RETARDER ESEN	○	○								○	○	○	○		
BONDING AGENT P-1	●									●					

Polychloroprene						Natural & Synthetic Latex							
Adhesives	Conveyor Belts	Hoses	Electric Cables	Foamed Insulations	Timing Drives & V-Belts	Gloves	Mattresses & Pillows	Carpet Back	Adhesives	Elastic Thread	Physical Form	FDA Approval	European Food Approval
	○	○	○	○	○						PW, FL, PS	✓	
											L, PW	✓	
	●	●	●	●	●						PW, GR	✓	
		●	●		●						L		
	●	●	●	●	●						PW	✓	
											FL, PS		
●						○	○	○	○		PW, GR		
						●	●	●	●	●	PW, PL	✓	
●											L		
●						●	●	●	●	●	L, PW	✓	
	○	○	○	○	○						FL		
											L		
											FL	✓	
											FL	✓	
											FL	✓	
											PS	✓	
											FL	✓	
										●	L	✓	
							●				L	✓	
											L		
											PW	✓	
●											PW		

Symbols
● Recommended use
○ Suggested use

Physical Form:
PW Powder
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NDB Non Dust Blend
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INNOVATIVE HIGH-PERFORMANCE SOLUTIONS FOR ELASTOMERS

SI Group is the largest liquid additive solutions provider, with the broadest range of specialty antioxidants. We create unique synergistic liquid blends to meet our customers' safety, cost, and efficiency requirements. Recently, we successfully commercialized one innovative liquid antioxidant that has gone through rigorous food contact safety scrutiny: WESTON™ 705T.

WESTON™ 705T was designed to replace TNPP and does not contain nonylphenol. It opens the door for new safety and innovation in polymer stabilization solutions.



WESTON™ 705T

The Next-Generation Food Contact Polymer Solution for Elastomers (SBS, SIS, EPDM etc.)

WESTON™ 705T offers an array of advantages:

- Zero nonylphenol content
- Meets or exceeds current food safety standards
- Best-in-class efficiency allowing for up to 20% loading reduction compared to TNPP
- Improved polymer protection and increased discoloration resistance
- Liquid form provides easy handling, safety, and health to workers
- Excellent solubility in common solvents makes it more efficient and higher performance

NAUGARD™ E-1

Next-Generation Antioxidant for Emulsion Elastomers (ESBR and NBR)

NAUGARD™ E-1 offers an array of advantages:

- Zero nonylphenol content
- Superior color protection
- Protect Mooney Viscosity better than benchmark products
- More stable initial color of elastomer
- May be used at lower loading levels than current solutions providing lower cost-in-use in elastomer production



WHY SI GROUP?

Because we offer:

- True innovation and partnership in development
- One of the largest ranges of Antioxidant and UV Stabilizer products
- Global reach and supply capabilities
- Unbeatable technical expertise and application knowledge
- Continued strategic investments in emerging markets
- Significant investments in regulatory compliance

Because we are committed:

- To be the world's most innovative supplier of solutions to the polymer industry
- To be our customers' first choice as a committed supplier
- To offer the best cost-performance solutions through real innovation
- To invest in line with our customers' growth strategies
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**Please contact your sales representative
directly for more information.**

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