



Team spirit Solution



Dynasol
Group
dynamolgroup.com

Experience

Expertise in a particular sport
can be acquired through
different combinations
skills, attributes and capabilities





SOLUTION

In 1999 Repsol and KUO group joined forces in a global business project focused on the production of synthetic rubber based on solution and the development of new products. The team consists of seven different nationalities and has three production centers located in Spain, Mexico and China.

Sales offices serve more than 500 clients in 70 different countries. In 2015 during this international expansion strategy Repsol and Kuo Group strengthen their partnership with the incorporation of the Spanish company General Química one of the leading producers of catalysts, specialty chemicals and organic dyes.

As part of the new agreement KUO Group brings to the new JV its emulsion business unit, Industrias Negromex who has more than 40 years of experience producing Emulsion Synthetic Rubber and has plants located in Altamira, Mexico, and China; the company's wide range of products serve the tire, industrial, friction, adhesive, footwear, chewing gum, and retread segments.

All these businesses have now join forces as Dynasol Group becoming one of the world leaders in the Synthetic Rubber and Rubber Chemical markets with revenues estimated at up to more than 700 million dollars and a production of 500,000 tons per year.



Performance

Preparation, research and knowledge of the environment, are essential to achieve the maximum performance





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Solution

The production sites are located in **Altamira, Tamaulipas, Mexico and Santander, Spain**. The total production capacity is **110,000 TPY of SSBR and SBS in Altamira and 120,000 TPY of SBS and SEBS in Santander**.

Dynasol Group has a JV in **China located in Panjin Liaoning** province with a production capacity of **110,000 TPY of SBS and SSBR**.

The main markets we serve are **asphalt modification, adhesives, seals, polymer modification, thermoplastic compounds, shoes soles, industrial vulcanized articles**.

SOLUTION

SOLUTION

SSBR Solprene

Solution Partial Block SBR

Styrene-butadiene copolymers with tapered block monomer configuration, linear structure and very narrow molecular weight distribution. They are highly appreciated for their high purity, clear color and very low gel content. Due to the total styrene can be designed in a partial block content combined with a random domain of styrene and butadiene, these copolymers have excellent processability for mixing operations. Their structural characteristics permit also the applications in asphalt modification for road paving and polymer modified asphalt emulsion, formulation of adhesives, vulcanized rubber goods, footwear and impact modification for HIPS and ABS plastics.

The Solprene SBR product portfolio consists also of a range of rubber grades developed for the high performance tire segment. Composition variations and levels of functionalization are applied to meet and/or exceed the new tire labeling requirements. The polymer compositions include oil-extended SSBR, dry high vinyl SSBR and polar functionalized SSBR grades with commercial availability. Specific emphasis is given in performance criteria and maximizing the key “magic-triangle” properties of Rolling-Resistance, Wetgrip and Wear. Select grades are effectively used in other non-tire applications such as extruded and molded goods.



SEBS Calprene

Solution Styrene-Butadiene Hydrogenated Block Copolymers

Styrene-butadiene hydrogenated block copolymers are polymerized in solution and present a fully saturated structure. They are very suitable for high demanding applications such as technical compounding for automotive, medical, toys or food contact applications. They are also used in weather resistance sealants and are very suitable for low temperature applications. Due to their saturated structure they show an excellent thermal resistance as well as superior weatherability (UV light and ozone resistance).

They are FDA and EU regulation food approved materials. These copolymers have a very good oilability, excellent mechanical performance, improved resistance to ageing tests. They can be used for high transparency compounds and are steam sterilisable. They can be available in a wide range of viscosities and in several physical presentations as fluffy crumbs, undusted or dusted with silica and powder form dusted with silica.



SBS Calprene / SBS Solprene

Solution Styrene-Butadiene Block Copolymers

Styrene-butadiene block copolymers are polymerized in solution and present different structures, linear, radial and multiarm. They are free flowing materials that show different viscosities to adapt their properties to the multiple applications where they can be used in. Lower linear molecular weight grades offer very good flowability, are appreciated for their transparency and easy processability. Radial grades show higher melt strength, and offer higher mechanical properties with a high modification performance. Multiarm grades show a combination of low viscosity with temperature

resistance. This performance make them suitable for a wide range of applications such as technical compounding, adhesives and sealants, bitumen modification for road pavements and waterproofing membranes. They are also used in shoe sole applications and polymer modification. They comply with different food contact applications. Typical physical aspects can go from fluffy crumbs to powder versions.

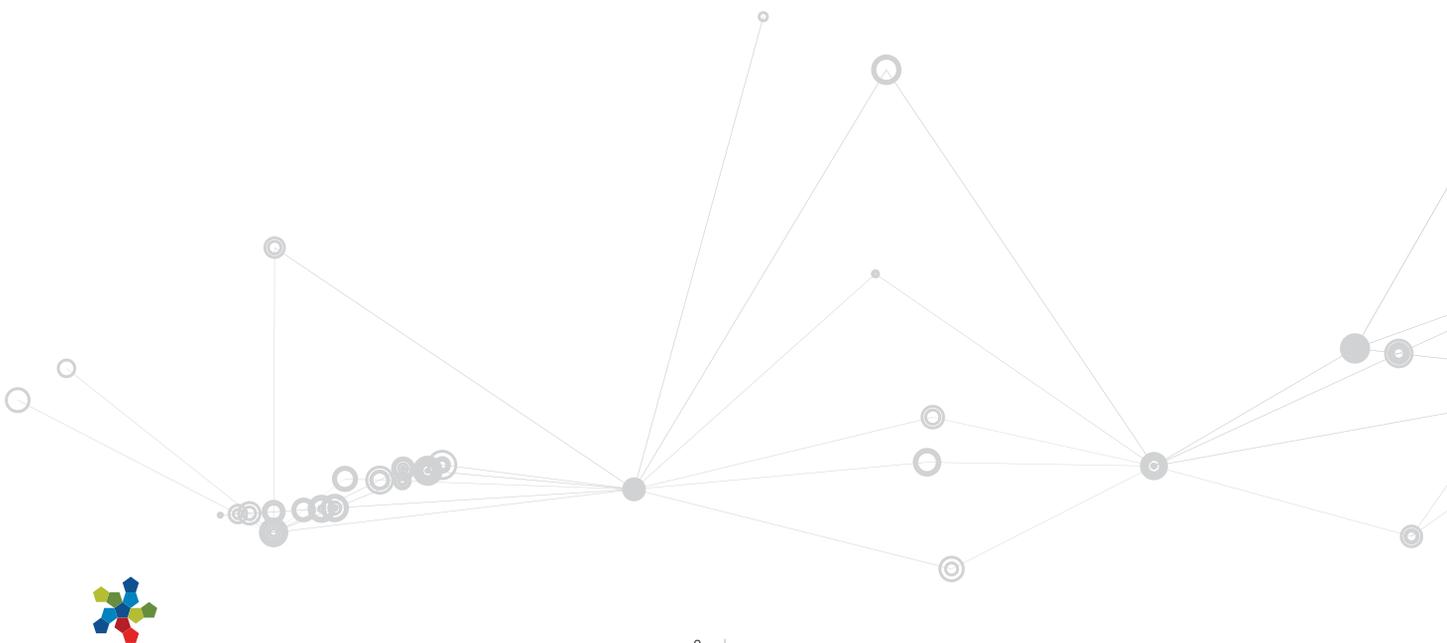


SOLUTION

APPLICATION GUIDE

PRODUCT

Type	Brand	Grade	Styrene	Polystyrene	Structure	ML	Brookfield viscosity 20% wt, 25 C. cP	Brookfield viscosity 10% wt, 25 C. cP	Brookfield viscosity cPs, 25% solid content toluene	TSV Viscosity cSt, 5,23% solid content toluene, 25 C	Melt flow index 190 C, 5 Kg (g/10 min)
SSBR	Solprene	303	46	11		48					
SSBR	Solprene	1106	10	6		65					
SSBR	Solprene	1110	15	10		147					
SSBR	Solprene	1205	25	17,5		47					
SSBR	Solprene	1217	25	17,5		47					
SSBR	Solprene	1322	30	22		130					
SSBR	Solprene	1430	40	30		176					
SSBR	Solprene	1433	45	33		61					
SSBR	Solprene	7101	25			55					
SSBR	Solprene	7201	40			67					
SSBR	Solprene	7301	21			55					
SSBR	Solprene	7302	21			65					
SEBS	Calprene	H6110	30		Linear	470					
SEBS	Calprene	H6120	32		Linear	1900					
SEBS	Calprene	H6140	31		Linear		400				
SEBS	Calprene	H6144	30		Linear		400				
SEBS	Calprene	H6170	33		Linear		2300				
SEBS	Calprene	H6174	33		Linear		2300				
SBS	Calprene	401	20		Radial			9,700	20		
SBS	Calprene	405	33		Radial			3,700	13,5		
SBS	Calprene	411	30		Radial			18,500	26		
SBS	Calprene	412	31,5		Radial			23,100	28		
SBS	Calprene	419	30		Radial			11,100	20		
SBS	Calprene	500	30		Linear			1,100		5	
SBS	Calprene	501	31		Linear			5,000	13		
SBS	Calprene	540	40		Linear			600		5	
SBS	Calprene	700	30		Linear			1,100		5	
SBS	Calprene	701	31		Linear			5,000	13		
SBS	Calprene	710	30		Linear			1,700	8		
SBS	Calprene	711	30		Radial			18,500	26		
SBS	Calprene	718	25		Linear			1500		6	
SBS	Calprene	719	30		Radial			11,100	20		
SBS	Calprene	7318	32		Linear			700		5	
SBS	Solprene	411	30		Radial			20,000	28		
SBS	Solprene	416	30		Radial			2,200	11		
SBS	Solprene	490	30		Radial			3,100	12		
SBS	Solprene	4301	33		Linear			3,000	11		
SBS	Solprene	4302	31		Linear			890	7		
SBS	Solprene	4318	32		Linear			700		5	
SBS	Solprene	9618	31		Multi-Arm			600		13	



SSBR | SOLPRENE

Brand Grade	Description	Uses	Styrene (%)	ML 1+4 100°C
Solprene 303	Solprene 303 is a linear random-block styrene-butadiene copolymer with 46% styrene content, 11% present as a polystyrene block.	It is used in vulcanized microcellular shoe soles; it provides hardness and translucent properties, and can be combined with inorganic fillers using high concentration of them with good dispersion in compounding. It can be blended with other rubbers to reduce die swell and increase processability in extruded and molded goods by compression.	46	48
Solprene 1106	Solprene 1106 is a high molecular weight linear random -block styrene/butadiene copolymer with a total content of 10% of styrene, 6% present as a polystyrene block.	FDA approved for use in food contact applications. It is essentially gel free with a clear color. It is mainly used as an impact modifier in polystyrene products.	10	65
Solprene 1110	Solprene 1110 is a linear high molecular weight random-block styrene/butadiene copolymer with 15% styrene, 10% present as a polystyrene block.	FDA approved for use in food contact applications and it is essentially gel free with a clear color. It is mainly used as elastomeric modifier for asphalt and as an impact modifier in polystyrene products.	15	147
Solprene 1205	Solprene 1205 is a linear random-block styrene-butadiene copolymer with a total content of 25% of styrene, 17.5% is present as a polystyrene block.	FDA approved for use in food contact applications. Is an excellent modifier for asphalt, formulations of caulks and sealants; it is also an excellent processing aid for most polymers, giving a good resistance to low temperature. Used in extruded goods, soles and heels. It can also be used as modifier for thermoplastic resins and in adhesive formulations.	25	47
Solprene 1217	Solprene 1217 is a linear random-block styrene-butadiene copolymer with a total content of 25% of styrene, 17.5% is present as a polystyrene block.	FDA approved for use in food contact applications. It is used as compounding ingredient for adhesives, as modifier for thermoplastic resins. It is an excellent modifier for asphalt, formulations of caulks and sealants; it is also an excellent processing aid for most polymers, giving resistance to temperature. Used in extruded goods, soles, and heels.	25	47
Solprene 1322	Solprene 1322 is a high molecular weight linear random -block styrene-butadiene copolymer with a total content of 30% of styrene, 22% present as a polystyrene block.	FDA approved for use in food contact applications. It is a high purity polymer, essentially gel free with a clear color. It is used as an elastomeric impact modifier for plastics, especially in high gloss HIPS and ABS through "in situ" polymerization process.	30	130
Solprene 1430	Solprene 1430 is a high molecular weight linear random -block styrene/butadiene copolymer with a total content of 40% of styrene, 30% present as a polystyrene block.	FDA approved for use in food contact applications. It is a high purity polymer, essentially gel free with a clear color. It is used as an elastomeric impact modifier for plastics, especially in high gloss HIPS by "in situ" polymerization process. It is also used in vulcanized shoe soles giving high hardness, flexibility and abrasion resistance with good processability.	40	176
Solprene 1433	Solprene 1433 is a linear random-block styrene/butadiene copolymer having 45% of styrene content, 33% present as a polystyrene block.	It is a SSBR copolymer that provides low shrinkage and dimensional uniformity at the final product in vulcanized compounds. It also maintains an excellent balance of high hardness and oil absorption; therefore it is possible to increase the extender oil in formulation to reduce costs without losing in quality and properties.	45	61
Solprene 7101	Solprene 7101 is a Solution Styrene Rubber (SSBR) manufactured by anionic batch polymerization. The polymer is extended with TDAE oil and is protected with a non-staining antioxidant.	It is used in Tyre tread applications such as all-season, summer, winter and Technical rubber articles	25	55
Solprene 7201	Solprene 7201 is a Solution Styrene Rubber (SSBR) manufactured by anionic batch polymerization. The polymer is extended with TDAE oil and is protected with a non-staining antioxidant.	It is used in High performance tyre treads and technical rubber articles.	40	67
Solprene 7301	Solprene 7301 is a Solution Styrene Rubber (SSBR) manufactured by anionic batch polymerization. The polymer is protected with a non-staining antioxidant.	It is used in Tyre tread applications such as all-season, summer, winter and Technical rubber articles	21	55
Solprene 7302	Solprene 7302 is a Solution Styrene Rubber (SSBR) manufactured by anionic batch polymerization. The polymer is protected with a non-staining antioxidant.	Used in High performance tyre treads and technical rubber articles.	21	65



SEBS | CALPRENE

Brand Grade	Description	Uses	Styrene (%)	Structure
Calprene H6110	Calprene H6110 is a 70/30 ethylene-butylene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure with excellent ozone resistance. Calprene H6110 meets the requirements of the USP class VI plastic classification.	It is used in applications like Adhesives/sealants, Oil gels, Plastic modification and asphalt modification	30	Linear
Calprene H6120	Calprene H6120 is a 68/32 ethylene-butylene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure with excellent ozone resistance. Calprene H6120 meets the requirements of the USP class VI plastic classification.	It is used in applications like Compounding, Asphalt modification, Plastic modification and Adhesives/-sealants.	32	Linear
Calprene H6140	Calprene H6140 is a 69/31 ethylene-butylene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure with excellent ozone resistance.	It is used in applications like Compounding, Plastic modification and sealants.	31	Linear
Calprene H6144	Calprene H6144 is a 69/31 ethylene-butylene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure with excellent ozone resistance.	It is used in applications like Compounding, Plastic modification and sealants.	30	Linear
Calprene H6170	Calprene H6170 is a 67/33 ethylene-butylene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure with excellent ozone resistance.	It is used in applications like Compounding and Plastic modification.	33	Linear
Calprene H6174	Calprene H6174 is a 67/33 linear structure ethylene-butylene/styrene thermoplastic copolymer, polymerized in solution, with a high molecular weight and excellent ozone resistance. This product gives an excellent surface appearance to the injected or extruded compounds and meets the requirements of the USP class VI plastic classification.	Technical Compounding: especially indicated for high quality surface appearance compounds transformed by injection or by extrusion. It can be used in Plastic modification.	33	Linear



SBS | CALPRENE

Brand Grade	Description	Uses	Styrene (%)	Structure
Calprene 401	Calprene 401 is an 80/20 butadiene/styrene thermoplastic copolymer, polymerized in solution and having a radial structure.	It is used in applications like asphalt modification, Footwear, Mechanical rubber goods, Plastic modification and solvent based adhesives.	20	Radial
Calprene 405	Calprene 405 is a 67/33 butadiene/styrene thermoplastic copolymer, polymerized in solution. It has a radial structure.	It is used in applications like Footwear, Sportswear, Mechanical rubber goods, asphalt modification and solvent based adhesives.	33	Radial
Calprene 411	Calprene 411 is a 70/30 Butadiene/Styrene thermoplastic copolymer, polymerized in solution and has a radial structure.	Used in applications to asphalts modification, Footwear, Mechanical rubber goods, Plastic modification and solvent based adhesives.	30	Radial
Calprene 412	Calprene 412 is a 69/31 butadiene/styrene thermoplastic copolymer, polymerized in solution and has a radial structure.	It is used in asphalt modification.	31.5	Radial
Calprene 419	Calprene 419 is a 70/30 Butadiene/Styrene thermoplastic copolymer, polymerized in solution and has a radial structure.	It Is used in applications like Asphalts modification, Footwear, Mechanical rubber goods, Plastic modification and solvent based adhesives.	30	Radial
Calprene 500	Calprene 500 is a 70/30 butadiene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure.	FDA approved for use in food contact applications. It is used in adhesive and sealants formulation, in thermoplastic injected shoe sole formulations, and transparent compounds.	30	Linear
Calprene 501	Calprene 501 is a 69/31 butadiene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure.	It is used in applications like Asphalts modification, Footwear, Mechanical rubber goods, Plastic modification and Adhesives.	31	Linear
Calprene 540	Calprene 540 is a 60/40 butadiene/styrene thermoplastic copolymer, polymerized in solution and having a linear structure.	FDA approved for use in food contact applications. It is used in adhesive formulation, thermoplastic injected shoe sole formulations, and transparent compounds.	40	Linear
Calprene 700	Calprene 700 is a new 70/30 butadiene/styrene Thermoplastic copolymer, polymerized in solution and having a linear structure. This product is a BHT* free SBS, especially suitable for food contact and textile contact applications.	New Dynasol product specially designed for FDA food contact applications. It is mainly used in adhesive and sealants formulation, and offering excellent transparency and clarity in thermoplastic injected shoe sole formulations	30	Linear
Calprene 701	Calprene 701 is a new 69/31 butadiene/styrene Thermoplastic copolymer, polymerized in solution and having a linear structure.	New Dynasol product specially designed for FDA food contact applications. It is Used in applications like Technical compounding, Plastic modification, and solvent based Adhesives.	31	Linear
Calprene 710	Calprene 710 is a 70/30 linear structure butadiene/styrene thermoplastic copolymer, polymerized in solution.	It is used in applications like Plastic modification Adhesives, sealing gaskets and coatings, Transparent compound and Asphalt modification.	30	Linear
Calprene 711	Calprene 711 is a new 70/30 butadiene/styrene Thermoplastic copolymer, polymerized in solution and having a radial structure.	New Dynasol product specially designed for FDA food contact applications and technical compounds. It develops an outstanding oil absorption.	30	Linear
Calprene 718	Calprene 718 is a new 75/25 butadiene/styrene Thermoplastic copolymer, polymerized in solution and having a radial structure.	New Dynasol product specially designed for flexography applications and adhesives with excellent flowability.	25	Radial
Calprene 719	Calprene 719 is a new 70/30 butadiene/styrene Thermoplastic copolymer, polymerized in solution and having a radial structure.	New Dynasol product specially designed for FDA food contact applications and technical compounds. It develops an outstanding oil absorption.	30	Linear
Calprene 7318	Calprene 7318 is a new 68/32 butadiene/styrene thermoplastic copolymers polymerized in solution and having linear structure.	New Dynasol product specially designed for FDA food contact adhesive applications.	32	Radial



SBS | SOLPRENE

Brand Grade	Description	Uses	Styrene (%)	Structure
Solprene 411	Solprene 411 is a 70/30 butadiene/styrene thermoplastic copolymer, polymerized in solution and has a radial structure.	It is used in applications like solventbased Adhesives, modified asphalt (paving and roofing) and thermoplastics compounding.	30	Radial
Solprene 416	Solprene 416 is a radial styrene/butadiene block copolymer having 30% of styrene content, most of it forming a polystyrenes block which gives the polymer a thermoplastic behavior.	It is FDA approved, suitable for food contact applications. It is used mainly for paving asphalts modifications, plastic modifier, thermoplastic compounding and adhesives.	30	Radial
Solprene 490	Solprene 490 is a 70/30 butadiene/styrene SBS thermoplastic copolymer polymerized in solution. It has a radial structure and is extended with 32% naphthenic oil.	Get high softening point and modulus properties as well as easy polymer time dispersion on polymer modified asphalt. This product was designed to give adequate rheological and heat flow resistance on asphalt shingles. Also, can be used in footwear compounding to give high mechanical properties.	30	Radial
Solprene 4301	Solprene 4301 is a linear block copolymer of styrene and butadiene, having 33% of styrene content, most of it forming a polystyrene block, which gives the polymer a thermoplastic behavior.	It is FDA approved for use in food contact applications . It is used as compounding ingredient for adhesives formulations , as impact modifier for plastics and as elastomeric modifier for asphalt mixtures used in paving and roofing.	33	Linear
Solprene 4302	Solprene 4302 is a linear block copolymer of styrene and butadiene, having 31% of styrene content, most of it forming a polystyrene block, which gives the polymer a thermoplastic behavior.	It is FDA approved for use in food contact applications . It is used t for adhesives formulation, as an impact modifier for plastics and as elastomeric modifier for asphalt mixtures used in paving and roofing.	31	Linear
Solprene 4318	Solprene 4318 is a linear block copolymer of styrene and butadiene, having 32% styrene content, most of it forming a polystyrene block, which gives the polymer a thermoplastic behavior.	It is FDA approved for use in food contact applications . It is used in adhesive formulations . The product is an excellent modifier for asphalt applications including self-adhesive roofing membrane and sealant. Also it is used in thermoplastic injected shoe soles formations.	32	Linear
Solprene 9618	Solprene 9618 is a 69/31 Butadiene-Styrene Dynasol exclusive multi arm copolymer, polymerized in solution process.	It is specially designed for high performance hot melt adhesive formulations. It develops an excellent balance between adhesive properties and low viscosity.	31	Multi-Arm



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