

# A LEADING PRODUCER OF STYRENIC BLOCK COPOLYMERS

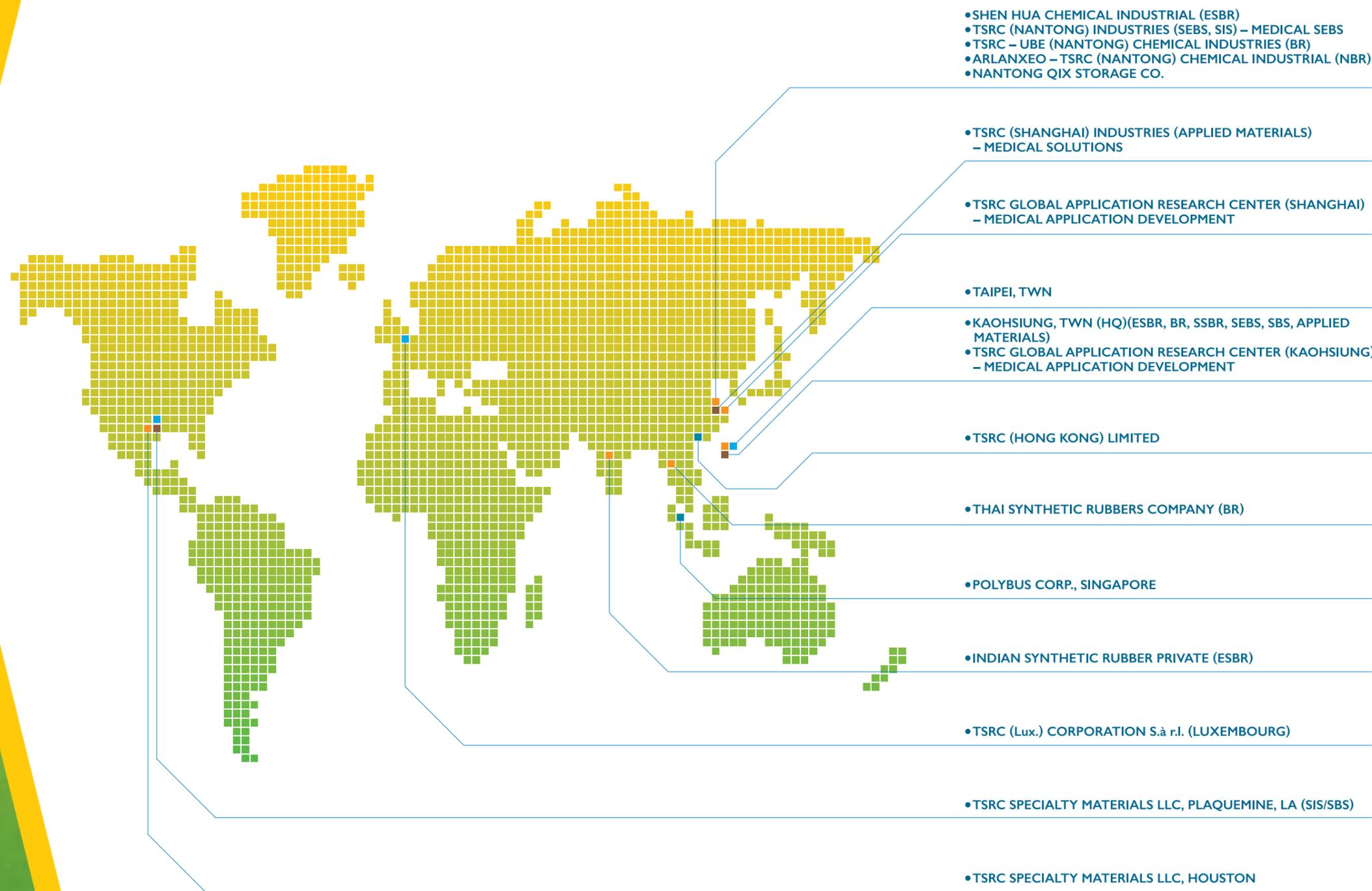


# About TSRC

For over 50 years, TSRC has been dedicated to providing Styrenic Block Copolymer (SBC) solutions. Widely applied in adhesives, hygiene materials, medical packaging materials, and automotive applications. TSRC collaborates closely with customers to create products that are safer, healthier, more sustainable, and eco-friendly.

## Tsrc Global Presence

■ Headquarters ■ Production Site ■ Sales Office ■ Technology Center





Styrene-Butadiene-Styrene (SBS)  
Copolymers

**VECTOR®**

Styrene-Isoprene-Styrene (SIS)  
Copolymers

**VECTOR®**

Styrene-Ethylene/  
Butylene-Styrene (SEBS)  
Copolymers

**TAIPOL®  
VECTOR®**

TSRC Corporation (formerly known as Taiwan Synthetic Rubber Corp.) was founded in 1973. We are a large elastomer manufacturer dedicated to the supply of specialty polymers for the automotive, consumer, industrial, and medical markets, among others. True to our mission statement and core values—innovation, service, and operational excellence, we spare no effort to serve as the most reliable partner to our customers and fulfill our social responsibilities as a global citizen.

TSRC continues to establish teams abroad to provide commercial, production, and technical support locally in regions across the globe. We currently operate in China (Nantong, Jiangsu and Songjiang, Shanghai); Thailand (Rayong); and the U.S. (Plaquemine, Louisiana) to meet the needs of customers worldwide.

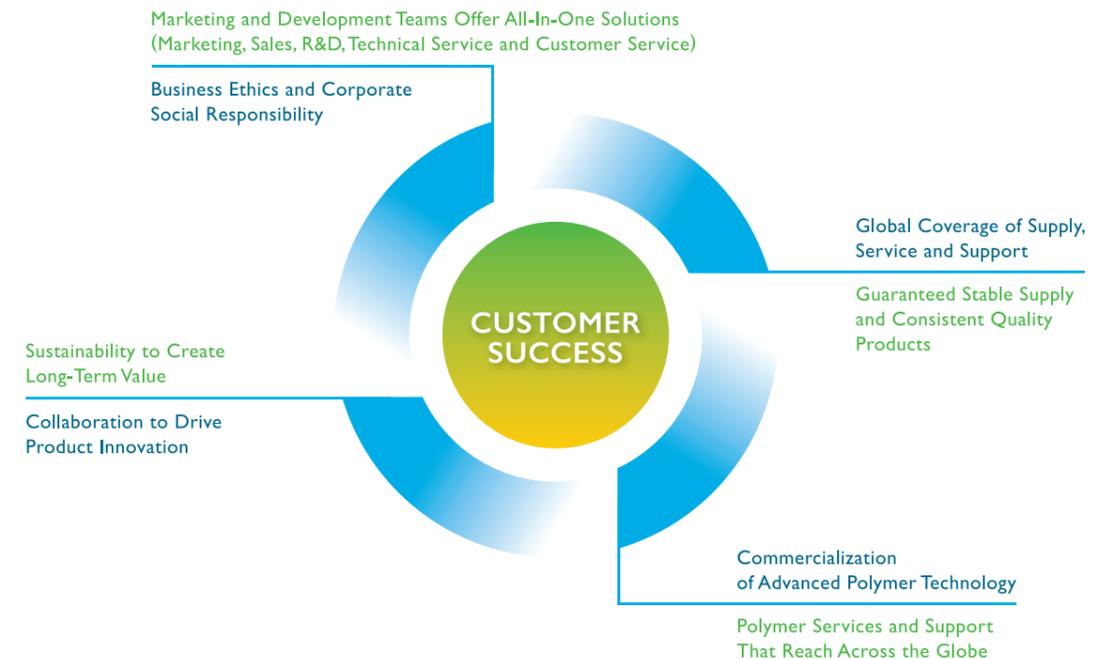
TSRC provides major competitive advantages to customers through:

- ▶ Superior quality systems and management
- ▶ Business ethics policy that emphasizes corporate social responsibility
- ▶ Supply chain reliability for guaranteed supply and business stability
- ▶ Technological innovation for customers to be on the cutting edge

Our core strategy to deliver value to customers is based on continuous improvement. We are always looking to expand our portfolio of specialty products to open up new horizons for our customers. TSRC's wide suite of styrenic block copolymers (SBC) includes:

- ▶ TAIPOL and VECTOR SBC products
- ▶ Hydrogenated SBS, also known as SEBS, and unique compounds from our Applied Materials Unit to deliver enhanced durability and functionality

### Marketing and Development Teams Integrated Commercial, Manufacturing and Technical Capabilities for Success





## SBS Polymer Grades

SBS are known for their strength, high durability, and easy processing. They:

- ▶ Impart impact resistance and toughness to thermoplastics (TP) like polystyrene (PS) and the polyolefins polyethylene (PE) and polypropylene (PP), among others.
- ▶ Improve low temperature resilience of thermoplastics.
- ▶ Add critical bond capability for adhesives in absorbent hygiene products (AHP).

VECTOR SBS made via VECTOR technology - created and patented by Dow Chemical and commercialized in partnership with ExxonMobil Chemical - offers pure triblock copolymers with a variety of structures to meet your needs. This portfolio offers formulation flexibility to achieve enhanced elasticity, cohesive strength, thermal aging resistance, and tensile strength through linear/zero di-block, linear/di-block, radial/di-block designs.

BRAND GRADES	VECTOR 2336A	VECTOR 2411A 2411AP	VECTOR 2518A 2518ALD	VECTOR 2518AP 2518APC	VECTOR 6241A	VECTOR 7000	VECTOR 8508A
Polymer Structure	Radial	Radial	Linear	Linear	Linear	Linear	Linear
Styrene, wt%	30	30	31	31	43	31	29
Oil, wt%	0	0	0	0	0	16.5	0
Di-block, wt%	12	12	<1	<1	<1	<1	<1
Melt Flow Rate g/10min, 200°C/5kg *g/10min, 200°C/10kg	<1	<1	5*	5*	23	17	12
Solution Viscosity cps 5wt% in Toluene; 25°C *15wt% in Toluene; 25°C **25wt% in Toluene; 25°C	16.6	20.4	3900**	3900**	350**	685**	1130**
Specific Gravity	0.94	0.94	0.94	0.94	0.96	0.93	0.94
Tensile Strength psi (MPa)	3600 (25)	3800 (26)	4600 (33)	4600 (33)	4000 (29)	3000 (21)	2800 (20)
Elongation at Break %	600	725	700	700	800	1000	900
Hardness, Shore A	82	82	80	80	85	58	67
Product Form	Porous Pellet	Porous Pellet/ Powder	Porous Pellet	Powder	Porous Pellet	Porous Pellet	Porous Pellet



## SIS Polymer Grades

SIS are known for their cohesive strength, softness, and thermal stability. They:

- ▶ Impart elasticity and toughness to thermoplastics like PS and polyolefins (PE and PP), among others.
- ▶ Are soft, tough, and resilient, suitable for elastic films used in stretch engines.
- ▶ Improve HMA spray ability.
- ▶ Add critical bonding capability for AHP adhesives.

VECTOR SIS is the first type of pure triblock SBC - created and patented by Dow Chemical and commercialized in partnership with ExxonMobil Chemical - and revolutionized HMA and elastic films. A full range of linear/zero di-block, linear/di-block, radial/di-block designs are available, providing formulation flexibility to meet your application performance requirements.

- ▶ Pure triblock VECTOR SIS provides a novel combination of elasticity, tensile strength, and processability for elastic components used in diaper parts or their assembly.
- ▶ High clarity and flexibility in photopolymer plates.



BRAND GRADES	VECTOR 4111	VECTOR 4113	VECTOR 4114	VECTOR 4116	VECTOR 4118	VECTOR 4186	VECTOR 4211	VECTOR 4411	VECTOR 4213	VECTOR 4255	VECTOR 4258	VECTOR 4359
Polymer Structure	Linear	Linear	Linear	Linear	Linear	Radial	Linear	Linear	Linear	Radial	Linear	Linear
Styrene, wt%	18	15	15	16	10	18	30	44	25	20	27	37
Di-block, wt%	<1	18	42	55	75	73	<1	<1	25	30	<1	<1
Melt Flow Rate g/10min, 200°C/5kg *g/10min, 200°C/10kg	12	11	25	12	12	22	13	40	12	13	12	14
Solution Viscosity cps 25 wt% in Toluene; 25°C	850	1240	700	780	1560	540	300	120	370	540	-	-
Specific Gravity	0.92	0.92	0.92	0.93	0.93	0.93	0.94	0.96	0.94	0.93	0.94	0.94
Tensile Strength psi (MPa)	3700 (26)	2800 (20)	1500 (11)	590 (4.1)	145 (1)	330 (2.4)	3300 (24)	3600 (25)	2200 (15)	2200 (15)	3220 (23)	2800 (20)
Elongation at Break %	1200	1300	1400	1500	1475	700	1000	1000	1100	1250	>980	>830
Hardness, Shore A	40	33	26	33	22	28	60	83	51	47	45	65
Product Form	Dense Pellet	Porous Pellet/ Dense Pellet	Dense Pellet	Dense Pellet	Dense Pellet	Dense Pellet						

# SEBS Polymer Grades

SEBS are known for their strength, weatherability (resistant to IR, ozone, and UV exposure), thermal stability, high service temperatures, and easy processing. They:

- ▶ Impart durability and toughness to thermoplastics like PS, polyolefins (PE and PP), and engineered resins (ABS, nylon, etc.)
- ▶ Are soft, tough, and resilient in elastic films and when used for stretch engines.
- ▶ Add critical bond capability and toughness for HMA.

TAIPOL 6-Series SEBS (High Flow)

- ▶ Can be melt processed by injection molding, extrusion, and casting methods.
- ▶ Provide an excellent balance of mechanical strength and elastomeric properties to improve performance in a variety of applications.
- ▶ High flow SEBS are the newest TAIPOL polymers and feature high flow and low styrene content for superior processability from the bag, without oil.

TAIPOL 7-Series SEBS

- ▶ Are maleic anhydride (MA) grafted polymers and contain mid-block functional groups.
- ▶ Are compatible with engineering plastics (EPs) and offer strong adhesion to polar substrates.
- ▶ Are used as a compatibilizer for polar/non-polar component blending.
- ▶ Are used as an impact modifier for EPs.

VECTOR 8-Series SEBS (Medical)

- ▶ Are designed for medical needs with ISO 10993-5 and USP Class VI.
- ▶ Are produced under Medical GMP policies, practices, and procedures.



BRAND GRADES	TAIPOL 6150	TAIPOL 6151	TAIPOL 6152	TAIPOL 6153	TAIPOL 6154	TAIPOL 6159	TAIPOL 6240	TAIPOL 6014	TAIPOL 6052	TAIPOL 6245	TAIPOL 7126	TAIPOL 7131	VECTOR 8101	VECTOR 8103	VECTOR 8104	VECTOR 8109	VECTOR 8014D	VECTOR 8245D
Type	Regular							High Flow			Functional Grafted		Regular Medical				High Flow Medical	
Polymer Structure	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	Linear	MA Grafted	MA Grafted	Linear	Linear	Linear	Linear	Linear	Linear
Styrene, wt%	29	32.5	29	29	32.5	29.5	32	18	23	13	29	29	32.5	29	32.5	29.5	18	13
Di-block, wt%	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Melt Flow Rate g/10min, 230°C/2.16kg *g/10min, 230°C/5kg	-	-	4	-	-	-	-	5	40	3.5	20*	10*	-	-	-	-	5	3.5
Solution Viscosity cps 5wt% in Toluene; 25°C *10wt% in Toluene; 25°C **20wt% in Toluene; 25°C	1450**	1700*	440**	2500**	280*	320	1500**	-	230**	-	-	-	1700**	2000**	280*	320	-	-
Specific Gravity	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.96	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Tensile Strength psi (MPa)	3900 (27)	-	4200 (29)	3900 (27)	-	-	-	2300 (16)	1400 (10)	1400 (10)	-	-	-	3900 (27)	-	-	2300 (16)	1400 (10)
Elongation at Break %	500	-	500	500	-	-	-	500	500	1000	-	-	-	500	-	-	500	1000
Hardness, Shore A	76	-	76	76	-	-	-	70	75	40	73	75	-	76	-	-	70	40
Product Form	Powder	Powder	Porous Pellet/ Powder	Powder	Powder	Powder	Powder	Porous Pellet	Porous Pellet/ Powder	Porous Pellet	Dense Pellet	Dense Pellet	Powder	Powder	Powder	Powder	Dense Pellet	Dense Pellet

# TAIPOL® & VECTOR® Product Family

FAMILY	APPLICATION	KEY FEATURES
SBS:VECTOR	<ul style="list-style-type: none"> <li>• Consumer Goods</li> <li>• Adhesives &amp; Sealants</li> <li>• Toys</li> <li>• Photopolymer Plates</li> <li>• Bitumen / Asphalt Modification</li> </ul>	<ul style="list-style-type: none"> <li>• Cohesive strength</li> <li>• Low tack &amp; odor</li> <li>• Higher viscosity if desired</li> <li>• High transparent</li> <li>• High tensile strength</li> <li>• Easy to process</li> <li>• Excellent low temperature properties</li> </ul>
SIS:VECTOR	<ul style="list-style-type: none"> <li>• Adhesives for Tape</li> <li>• Adhesives for Label</li> <li>• Adhesive for Hygiene</li> <li>• Elastic Film Stretch Engines</li> <li>• Photopolymer Plates</li> <li>• Waterproofing</li> </ul>	<ul style="list-style-type: none"> <li>• Softness, fine hand &amp; haptics</li> <li>• Tack if needed</li> <li>• Lower viscosity if desired</li> <li>• Outstanding melt processability</li> <li>• Elastic &amp; resilient</li> </ul>
SEBS:TAIPOL 6-Series	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Wire &amp; Cable</li> <li>• Consumer Goods</li> <li>• Toys and Gels</li> <li>• Adhesives &amp; Sealants</li> <li>• Foams</li> <li>• Films</li> <li>• Asphalt Modification</li> </ul>	<ul style="list-style-type: none"> <li>• Weather resistant to oxygen, ozone, UV, heat &amp; chemicals</li> <li>• Excellent oil absorption</li> <li>• Strength balanced between toughness &amp; compression set</li> <li>• Easy to process</li> <li>• High compatibility with polyolefins</li> <li>• Excellent elasticity with low hysteresis</li> </ul>
SEBS:TAIPOL 6-Series (High Flow)	<ul style="list-style-type: none"> <li>• Automotive</li> <li>• Wire &amp; Cable</li> <li>• Consumer Goods</li> <li>• Toys and Gels</li> <li>• Adhesives &amp; Sealants</li> <li>• Films</li> </ul>	<ul style="list-style-type: none"> <li>• Flowable from the bag</li> <li>• High compatibility with polyolefins especially PP</li> <li>• Excellent elastic properties</li> <li>• Low hardness to extend application range</li> </ul>
SEBS:TAIPOL 7-Series	<ul style="list-style-type: none"> <li>• EPs Modification</li> <li>• PA/ABS Overmolding</li> <li>• Adhesives &amp; Sealants</li> <li>• Films</li> </ul>	<ul style="list-style-type: none"> <li>• Excellent compatibility with EPs</li> <li>• Excellent adhesion to polar substrate</li> </ul>
SEBS:VECTOR 8-Series (Medical)	<ul style="list-style-type: none"> <li>• Medical Film, Tubing</li> <li>• Medical Stopper/Liners</li> <li>• Syringe Plunger Tip</li> </ul>	<ul style="list-style-type: none"> <li>• Passed ISO10993-5</li> <li>• Passed USP VI</li> <li>• Medical GMP Management</li> <li>• Excellent PVC alternative without phthalates plasticizer</li> <li>• Wide formulation latitude – processable both in Oil Free &amp; Oil-Extended</li> <li>• High Polypropylene (PP) compatibility with excellent clarity</li> <li>• Easy-to-process and recyclable</li> </ul>

# Product Selection Guides

SBS		POLYMER PROPERTIES		HYGIENE ADHESIVES			LABEL ADHESIVES	ELASTIC FILMS	COMPOUNDING	FOOTWEAR
BRAND	GRADES	STYRENE, WT%	DI-BLOCK, WT%	CONSTRUCTION	ELASTIC ATTACHMENT	FEMINE CARE POSITIONING	PERMANENT			
VECTOR	2518A	31	<1	•				•	•	
VECTOR	2518ALD	31	<1	•					•	
VECTOR	6241A	43	<1		•				•	
VECTOR	8508A	29	<1	•				•	•	

SIS		POLYMER PROPERTIES		HYGIENE ADHESIVES			TAPE ADHESIVES		LABEL ADHESIVES		ELASTIC FILMS
BRAND	GRADES	STYRENE, WT%	DI-BLOCK, WT%	CONSTRUCTION	ELASTIC ATTACHMENT	FEMINE CARE POSITIONING	PACKAGING	MASKING	PERMANENT	REMOVABLE	
VECTOR	4111	18	<1	•		•	•	•		•	
VECTOR	4113	15	18	•		•	•	•		•	
VECTOR	4114	15	42				•		•	•	
VECTOR	4116	16	55				•		•		
VECTOR	4118	10	75				•		•		
VECTOR	4186	18	73						•		
VECTOR	4211	30	<1	•					•		•
VECTOR	4411	44	<1	•	•						
VECTOR	4213	25	25	•	•	•		•		•	
VECTOR	4255	20	30				•	•			
VECTOR	4258	27	<1								•
VECTOR	4359	37	<1								•

SEBS		POLYMER PROPERTIES		COMPOUNDING	PLASTIC MODIFICATION	PACKAGING	ELASTIC FILMS	ADHESIVES	MEDICAL	AUTOMOTIVE	WIRE / CABLE	FOOTWEAR / FOAM
BRAND	GRADES	STYRENE, WT%	DI-BLOCK, WT%									
TAIPOL	6014	18	<1		•	•	•	•			•	
TAIPOL	6052	23	<1		•		•	•				
TAIPOL	6150	29	<1	•	•	•	•	•			•	
TAIPOL	6151	32.5	<1	•	•					•	•	•
TAIPOL	6152	29	<1		•	•	•	•			•	
TAIPOL	6153	29	<1	•	•	•	•	•			•	
TAIPOL	6154	32.5	<1	•	•					•	•	•
TAIPOL	6159	29.5	<1	•						•		
TAIPOL	6240	32	<1	•	•	•				•	•	
TAIPOL	7126	29	<1	•	•					•		
TAIPOL	7131	29	<1	•	•					•		
VECTOR	8101	32.5	<1	•	•				•	•	•	•
VECTOR	8103	29	<1	•	•	•	•	•	•		•	
VECTOR	8104	32.5	<1	•	•				•	•	•	•
VECTOR	8245D	13	<1	•	•	•	•	•	•	•		
VECTOR	8014D	18	<1		•	•	•	•	•		•	
VECTOR	8109	29.5	<1	•					•	•		

# Medical Solution

TSRC focuses on the development of new polymer technology platforms and applications, including high-end hydrogenated styrenic block polymer (HSBC) novel technology platforms, the development of medical SEBS products and technologies, among others. The US Food and Drug Administration (FDA) believes that SEBS materials are non-toxic, non-allergenic, non-mutagenic, and do not react with human tissues. They present good performance across aspects of sealing, temperature stability, and anti-aging, and can also be directly sterilized by autoclave, gamma radiation and EO. Such qualities make it a suitable material for medical device applications such as IV bags, IV tubing, surgical drapes, resuscitators, tourniquets, etc.

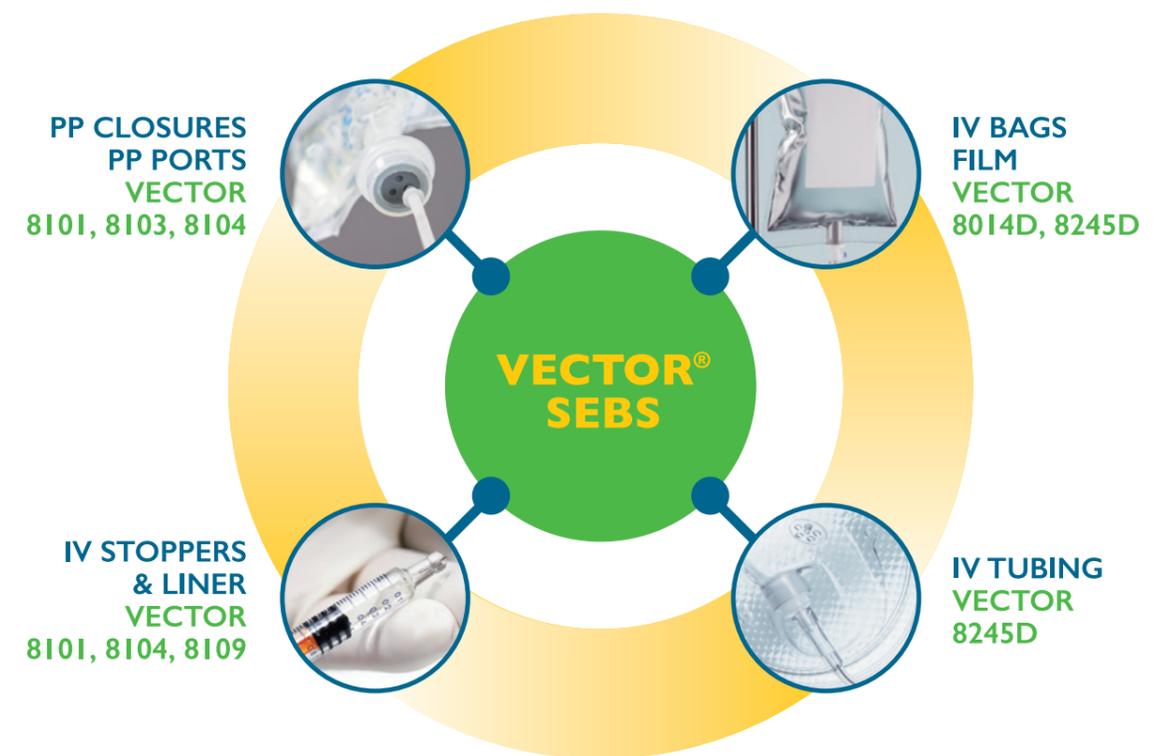
TSRC series products can meet market needs for medical applications. Among its key features as compared with traditional materials, TSRC series products do not contain any plasticizers and provide excellent mechanical properties, high transparency, and excellent polyolefin compatibility. Its qualities allow it to meet the stringent quality control requirements of medical applications.



## VECTOR® for Medical Applications

VECTOR SEBS is designed for medical applications as alternative to PVC due to its eco-friendliness. VECTOR SEBS passed ISO 10993-5 cytotoxicity testing, USP Class VI testing, complies with medical GMP production, and is well-suited for general modification of articles in medical applications.

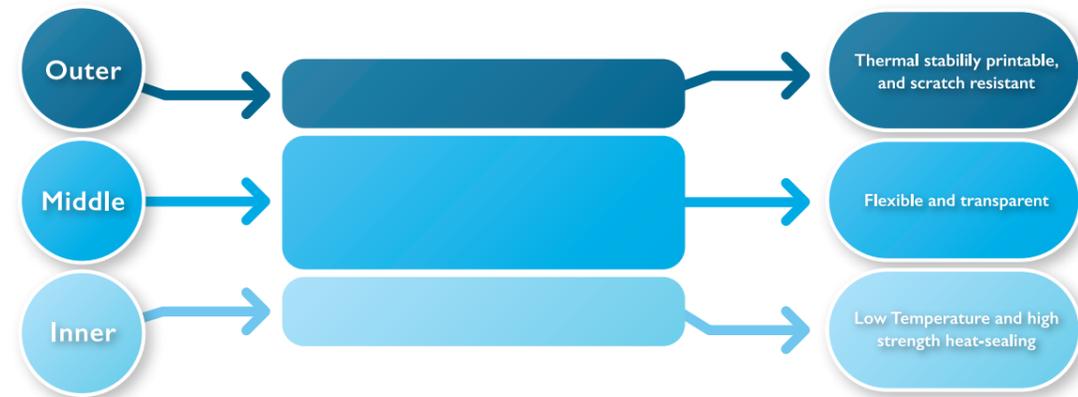
### Medical Solutions



# IV Bag/Film

3-Layer Co-Extruded IV Bag Film

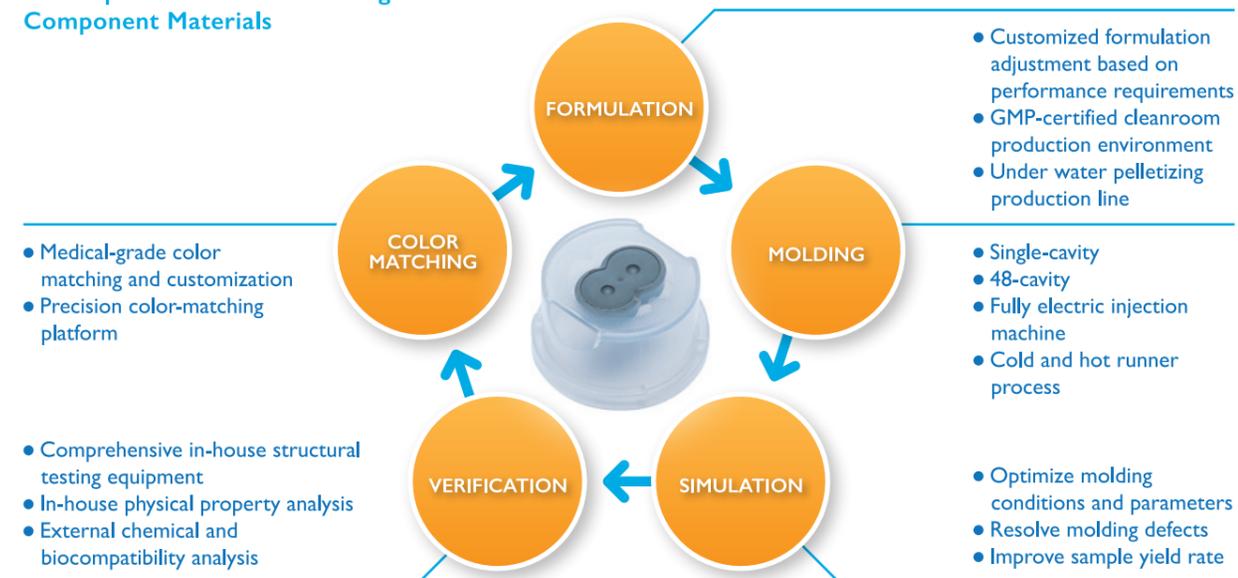
Improved Clarity & Flexibility in IV Bags with VECTOR 8245D



# IV Sealing Components



Development of Medical Sealing Component Materials



## IV Tubing

- Material is easily recyclable and serves as an eco-friendly alternative to PVC, free from environmental hormones.
- Enhanced heat resistance allows sterilization by high-pressure steam; also suitable for EtO and gamma sterilization.
- Tubing characteristics: High transparency, excellent flexibility, kink resistance, and high production efficiency.

## IV Tubing

Complies with Medical Regulations

"0" Plasticizers

High Transparency

Suitable for EtO and Gamma Sterilization

Key Properties



Excellent Kink Resistance



Excellent Clamp Resistance



Good Bonding Strength

## IV Chamber

Complies with Medical Regulations

Contains "0" Plasticizers

Supports Multi-cavity Molding and Easy Demolding

Suitable for EtO and Gamma Sterilization

Key Properties



Excellent Scratch Resistance



High Transparency



Multi-cavity Molding



# Innovative Mindset, Reliable Solutions

TSRC offers a broad and versatile portfolio of styrenic block copolymers (SBC) featuring a unique property set ideally suited for adhesive applications ranging from personal hygiene and diaper materials to tapes and labels. The portfolio includes styrene-isoprene-styrene (SIS), styrene-butadiene-styrene (SBS) and styrene-ethylene-butylene-styrene (SEBS) product families. These polymers can be easily formulated with other ingredients such as resins, plasticizers, fillers, antioxidants to produce adhesives with a wide range of properties capable of adhering to a variety of different substrates: nonwovens, polyolefin films or pulp-based surfaces.

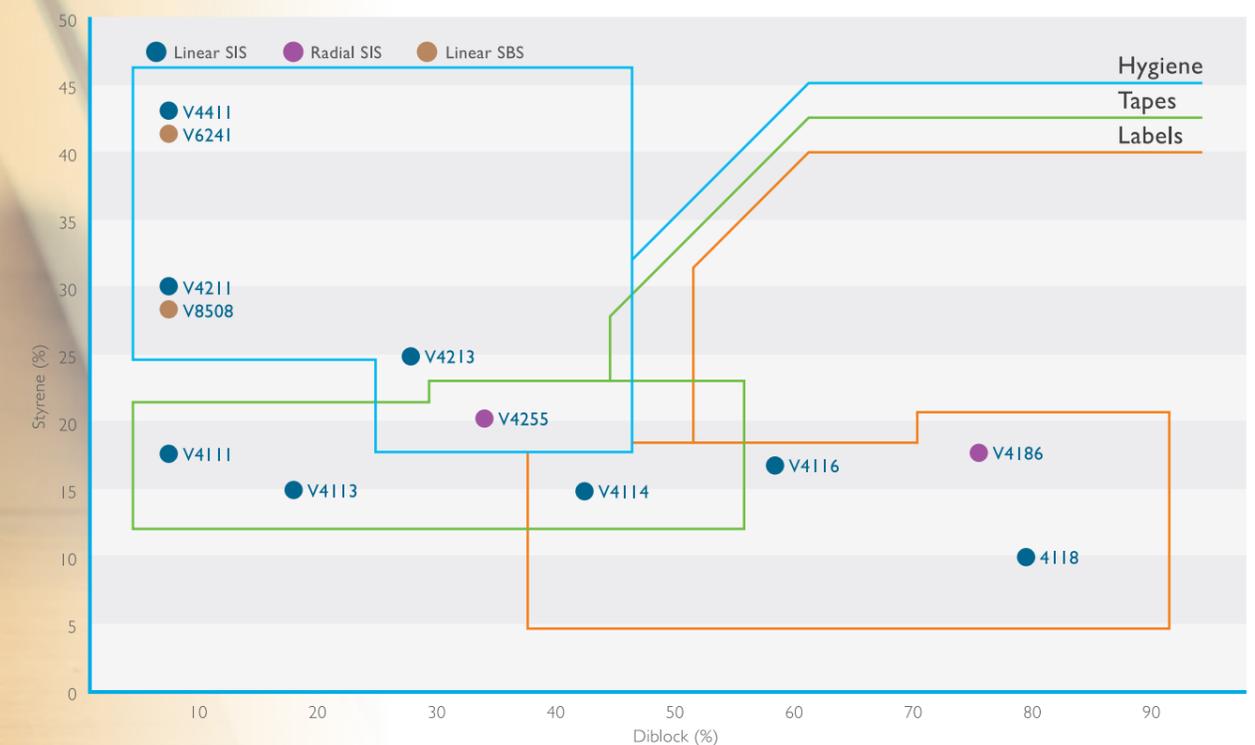
## Typical Properties of SBCS

SIS	SBS	SEBS
Unsaturated	Unsaturated	Saturated
Soft and Tacky, Low Viscosity (High-speed Coating Lines)	More Cohesive, Higher Viscosity	Less Tacky, More Cohesive, Higher Viscosity, Excellent Thermal Stability
Tg ~ - 60°C	Tg ~ - 90°C	Tg ~ - 60°C
Processing Temperature	Processing Temperature	Processing Temperature
< 180 - 225°C	< 180 - 225°C	< 260 - 280°C

# TAIPOL® & VECTOR® for Adhesives & Films

TAIPOL and VECTOR SBC products are well-known in the adhesives industry. Today, they include a full grading range of linear/zero di-block, linear/di-block, radial/di-block designs. The SBC polymer portfolio provides formulation flexibility to achieve enhanced elasticity, cohesive strength, and heat and aging resistance.

## SIS and SBS Product Range





### SBC Product Range Suitable for Hygiene Hot Melt Adhesive (HMA) Applications

GRADE	TYPE	STRUCTURE	STYRENE (%)	DIBLOCK (%)	MFR g/10 min	FEATURES
VECTOR 4211 S/ND	SIS	Linear	30	<1	13*	General Purpose Grade
VECTOR 4411 S/ND	SIS	Linear	44	<1	40*	High Cohesion, Low Viscosity
VECTOR 4213 ND	SIS	Linear	25	25	12*	Optimal Balance of Cohesion and Adhesion
VECTOR 4255 AS	SIS	Radial	20	30	13*	Optimal Balance of Cohesion and Adhesion
VECTOR 8508 A	SBS	Linear	29	<1	12*	Balance of Adhesion and Cohesion
VECTOR 6241 A	SBS	Linear	43	<1	24*	High Cohesion, Low Viscosity
TAIPOL 6152	SEBS	Linear	29	<1	4**	High Cohesion, Excellent Thermal Stability
TAIPOL 6014	SEBS	Linear	18	<1	6**	Balanced Adhesion and Cohesion Coupled with Excellent Thermal Stability
TAIPOL 7126	MAH-g-SEBS	Linear	29	<1	20***	Enhanced Adhesion to Polar Substrates

\*200°C/5kg \*\*230°C/2.16kg \*\*\*230°C/5kg

Hygiene applications require hot melt adhesives which can bond various components of the diaper such as porous nonwovens to polyolefin films or elastic components. TSRC's products, formulated with functional additives (tackifying resins, oils, stabilizers), provide the optimal balance of properties required for this type of application: high cohesion strength, excellent creep resistance, appropriate adhesion and enabling high-speed processing.

### Selection Guidelines

APPLICATIONS	REQUIREMENTS	RECOMMENDED GRADES
<b>Construction Adhesives</b> Enables lamination of NWs to polyolefin structures	Moderate cohesive strength and excellent adhesion Excellent application properties on high-speed lines	<b>TAIPOL 6014</b> <b>VECTOR 4111, 4113, 4211, 4411, 8508</b>
<b>Elastic attachment adhesives</b> Adhere elastic treads to polyolefin NWs to form elastic waist and leg bands	High cohesive strength and creep resistance Excellent application properties on high-speed lines	<b>VECTOR 4213, 4411, 6241</b>
<b>Feminine care:</b> <b>Positioning and Core adhesive</b> Keeping sanitary napkins in place where they supposed to stay and adhesives to stabilize the core	Excellent adhesion on specific substrates Optimal balance between adhesion and transfer resistance	<b>TAIPOL 6014, 6152</b> <b>VECTOR 4111, 4113, 4213, 8245</b>

# Absorbent Hygiene Product Assembly Adhesives

Adhesives in hygiene products, normally used in diaper assembly, elastic attachment, and positioning of feminine hygiene products, require the highest quality. TSRC has a comprehensive SBC product portfolio to meet customer needs and market trends.

## Assembly Adhesives

**TAIPOL 6014**

**VECTOR 4111, 4113, 4211, 4411, 8508**

## Elastic Attachment Adhesives

**VECTOR 4213, 4411, 6241**



DIAPER CONSTRUCTION FORMULATION		APPLICATIONS	REQUIREMENTS
VECTOR 8508A	100 phr	Construction	<ul style="list-style-type: none"> <li>Moderate cohesive strength and excellent adhesion</li> <li>Excellent application properties at high line speeds</li> </ul>
Escorez 5600	190 phr		
Escorez 5400	100 phr	Elastic Attachment	<ul style="list-style-type: none"> <li>High cohesive strength and moderate adhesion</li> <li>Excellent application properties at high line speed</li> </ul>
Nyflex 223	85 phr	Feminine Hygiene Positioning	<ul style="list-style-type: none"> <li>Excellent adhesion on specific substrates</li> <li>Good balance between adhesion and transfer resistance</li> </ul>
Irganox 1010	2 phr		

## Feminine Hygiene Product Positioning Adhesives

**TAIPOL 6014, 6152**

**VECTOR 4111, 4113, 4213, 8245D**





# Tapes

Tapes make up a broader market segment because of various environmental factors. In terms of performance, a variety of properties are required for each specific market segment, from industrial, medical, and office applications, to packaging. TSRC provides a wide portfolio from SIS to SEBS, offering flexibility for adhesive formulations to achieve balance between adhesive and cohesive strength in a broad temperature range.

## Packaging Tape

### VECTOR 4111, 4113, 4255

BOPP TAPE FORMULATION	
VECTOR 4111	100 phr
Piccotac 1095	120 phr
Nyflex 223	20 phr
Irganox 1010	2 phr



## Cloth Tape

### VECTOR 4111, 4113, 4114, 4116, 4255

MASKING TAPE FORMULATION	
VECTOR 4113	100 phr
Wingtack 98	120 phr
Nyflex 223	27.5 phr
Irganox 1010	2.5 phr

APPLICATIONS	REQUIREMENTS
Packaging	<ul style="list-style-type: none"> <li>High tack, tear strength, high temperature resistance, and melt viscosity</li> </ul>
Masking	<ul style="list-style-type: none"> <li>Medium tack, no damage to the substrate, no residue when removed</li> <li>High cohesion</li> </ul>
Cloth	<ul style="list-style-type: none"> <li>High tack, shear strength, and universal bonding</li> </ul>

## Masking Tape

### VECTOR 4111, 4113, 4211, 4213, 4255





# Labels

The label industry requires a great deal of versatility for pressure sensitive adhesives (PSA) in order to accomplish the broad range of properties required for various products. TSRC provides a wide portfolio from SIS to SEBS, offering flexibility for adhesive formulations to achieve balance between adhesion and die-cutting strength in a broad temperature range.

## Permanent Labels

### VECTOR 4114, 4116, 4186, 4118

PERMANENT LABEL FORMULATION	
VECTOR 4116	100 phr
T-REZORC	157 phr
Nyflex 223	43 phr
Irganox 1010	3 phr



## Removable Labels

### TAIPOL 6014, 6152

### VECTOR 4111, 4113, 4114, 4213, 8245D



## Repositionable Labels

### TAIPOL 6014, 6152

### VECTOR 4111, 6241



MASKING TAPE FORMULATION	
VECTOR 4113	100 phr
Wingtack 98	120 phr
Nyflex 223	27.5 phr
Irganox 1010	2.5 phr

APPLICATIONS	REQUIREMENTS
Permanent	• High tack, good bleed resistance, and acceptable die-cutting
Removable	• Medium tack, no damage to the substrates, no residues when removed, and high cohesion
Repositionable	• Medium-to-low tack, no residues when removed, and proper adhesion



Introducing a revolutionary Styrene-Isoprene Block Co-Polymer for Hot Melt Label Adhesives, a top-performing solution in label adhesives due to its ability to easily form pressure-sensitive adhesives (PSA) that bond to olefin substrates, offer superior moisture resistance, and display good low-temperature properties. Die-cutting the adhesive has never been easier, TSRC has developed a novel SIS polymer that provides a low elasticity PSA.

### VECTOR SIS Grades for Labels

VECTOR 4114S, a medium diblock linear polymer, is an excellent choice due to its outstanding adhesive properties. For even greater workability, choose VECTOR 4186AS, a high diblock radial SIS, which offers superior workability compared to VECTOR 4114S. Or opt for VECTOR 4118, a linear SIS polymer with a very low styrene content, making it unique among SIS polymers. VECTOR 4118 is the ideal choice for labeling applications where a low styrene content is preferred.

POLYMER	TYPE	STYRENE (%)	DIBLOCK (%)	HARDNESS, SHORE A	MFR g/10 min	SOLUTION VISC. mPa s
4114S	SIS/SI	15	42	26	25	700
4186AS	(S)n/SI	18	73	28	22	540
4118	SIS/SI	10	78	19	12	1910

\*200°C, 5kg; \*\*25% wt./wt. in toluene.





### Introducing VECTOR 4118 for PSA Labels

Introducing the VECTOR 4118, the innovative answer to your label cutting and efficient skeleton removal issues. Confirmed by DMA to be theoretically equivalent to acrylic PSAs, its high diblock and low styrene content results in a soft polymer that blocks less than other high diblock SIS polymers. But that's not all – 4118 also boasts higher oil retention than 4114S, reducing costs, improving face stock appearance, and reducing viscosity. Plus, its lower Tg adhesive makes it perfect for refrigerated food labels and no oil labels. Upgrade your label game with 4118 today.

TSRC's product provides immense value by making it easier to handle and create low-oil or oil-free HMA formulations. These formulations are crucial for removable PSAs and to reduce or eliminate MOSH in food contact labels. With our product, customers can improve the safety and compliance of their products while maintaining the same level of performance and convenience. Choose TSRC and elevate your label formulations to the next level.

Due to its low styrene, 4118 is a very soft polymer. With a Shore A of 19, the hardness of 4118 is like pure polyisoprene. 4118 can provide the softness of polyisoprene without the need for milling. The material is available in 20kg bags and in 1mt supersacks.

POLYMER PROPERTIES	TEST METHOD	UNIT	TYPICAL VALUE <sup>(1)</sup>
Specific Gravity	ASTM D792	-	0.93
Hardness (2)	ASTM D2240	Shore A	19
Tensile at Break (3)	ISO 37	MPa	0.94
Stress at 300% Elongation (3)	ISO 37	MPa	0.26
Elongation at Break (3)	ISO 37	%	1796
Solution Viscosity (4)	ASTM D2196	cP	1910

POLYMER PROPERTIES	TEST METHOD	UNIT	RANGE	
			MIN	MAX
Styrene	TSRC Method	wt%	7	12
Diblock Content	TSRC Method	wt%	68	87
Volatile Matter	TSRC Method	wt%	0.0	0.5
Ash	ASTM D5630	wt%	0.25	0.5
Melt Flow Rate (200°C/5kg)	ASTM D1238	g/10 min	8	21

(1) Typical values intended only as guidelines and should not be construed as specifications

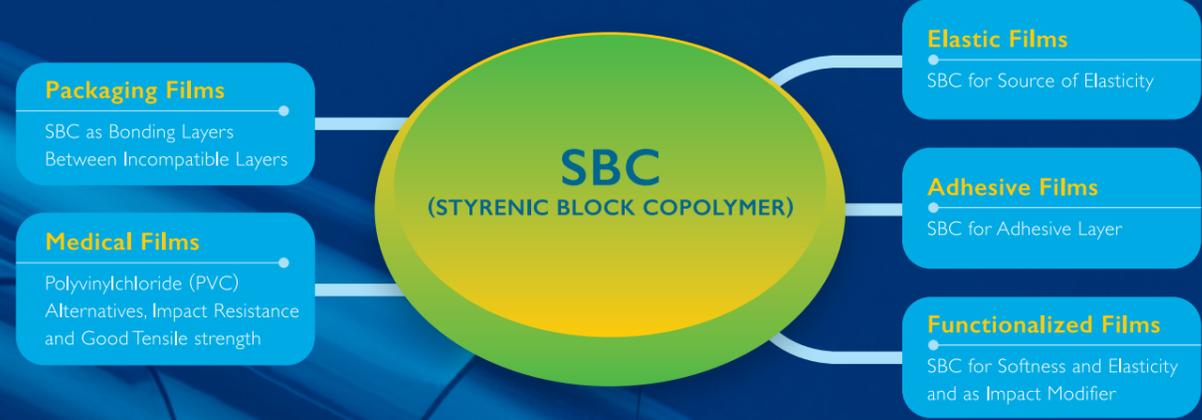
(2) Dwell time - 1 second

(3) Roll-milled, compression-molded plaques

(4) 25 wt% in Toluene; 25°C

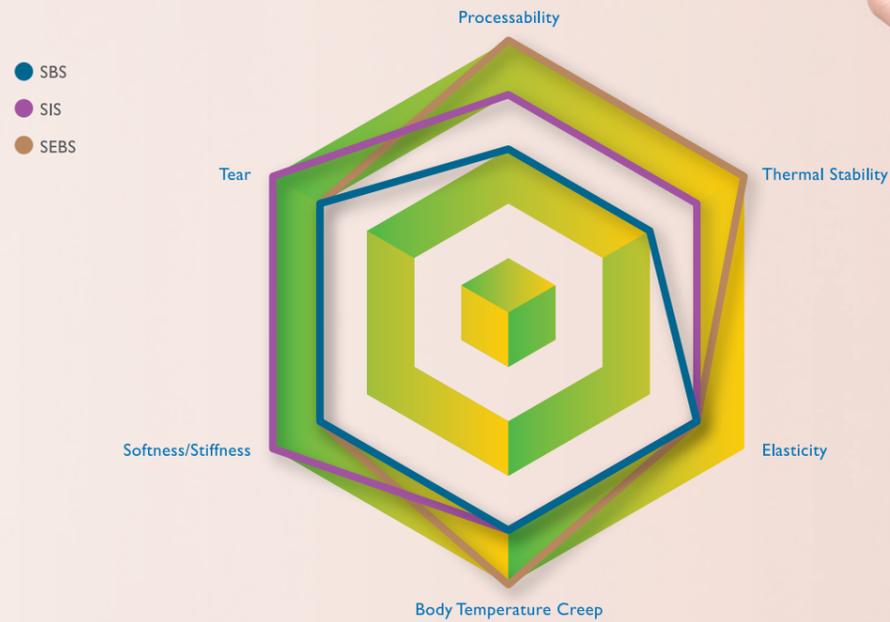
# Elastic Film, Stretch Engines and Protective Films

TSRC provides a wide portfolio from SBS and SIS to SEBS, as well as various film blowing and extrusion processes. These copolymers can provide suitable softness and elasticity while maintaining a balanced morphology with polyolefins in elastic films and stretch engines.



# Elastic Stretch Engines — Enabling Freedom of Movement

Comfort, freedom of movement is the most critical trend for absorbent hygiene products (AHP). TSRC is ideally equipped to satisfy these trends with our broad and versatile portfolio of styrenic block copolymers (SBC) featuring unique properties to perfectly match hygiene industry needs. The portfolio includes styrene-isoprene-styrene (SIS), styrene-butadiene-styrene (SBS), and styrene-ethylene-butylene-styrene (SEBS) product families. These differentiated polymers stretch and retract with a high level of elasticity for improved fit, comfort, and discretion while enduring body temperatures without any effect.



## Grades For Elastic Films and Laminates

GRADE	TYPE	STYRENE (%)	MFR g/10 min	FEATURES & BENEFITS
VECTOR 4111 S/ND	SIS	18	12*	<ul style="list-style-type: none"> <li>• Excellent elasticity</li> <li>• MD soft stretch elastic films</li> <li>• Cast film process</li> </ul>
VECTOR 4258 ND	Novel SIS	27	13*	<ul style="list-style-type: none"> <li>• Enable Blown &amp; Cast film process</li> <li>• Enhanced melt strength for better processability</li> <li>• Excellent elasticity</li> <li>• Improved mechanical properties</li> </ul>
VECTOR 4211 S/ND	SIS	30	12*	<ul style="list-style-type: none"> <li>• Excellent elasticity</li> <li>• Improved mechanical properties</li> <li>• Cast film process</li> </ul>
VECTOR 4359 ND	Novel SIS	37	14*	<ul style="list-style-type: none"> <li>• Enable Blown &amp; Cast film process</li> <li>• Enhanced melt strength for better processability</li> <li>• Excellent elasticity</li> <li>• Improved mechanical properties</li> </ul>
TAIPOL 6014	SEBS	18	6**	<ul style="list-style-type: none"> <li>• Excellent elasticity</li> <li>• Superior thermal stability</li> <li>• Extraordinary mechanical properties</li> <li>• Low odour</li> </ul>

\*200°C/5kg \*\*230°C/2.16kg

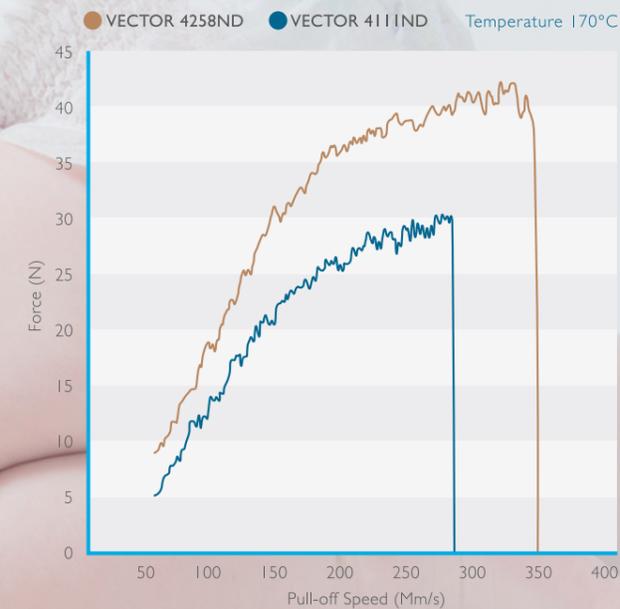


Typical Properties of Monolayer Elastic Films\*

GRADE	MECHANICAL PROPERTIES				200% HYSTERESIS PROPERTIES			TEAR PERFORMANCE
	TENSILE STRENGTH (N/25 MM)		ELONGATION (%)		PERMANENT SET (%)	STRESS RELAXATION (%)	UNLOAD FORCE @50% (N/25 MM)	TEAR RESISTANCE (MN/MICRON)
	CD	MD	CD	MD	CD	CD	CD	CD
VECTOR 4111 S/ND	17	22	1300	1150	5.5	12	0.55	11
VECTOR 4258 ND	22	28	1300	1100	6.0	12	0.55	14
VECTOR 4211 S/ND	22	35	1200	1100	7.0	17	0.65	51
VECTOR 4359 ND	27	36	1100	1100	8.5	19	0.5	44
TAIPOL 6014	62	79	710	820	13	19	1	17

\*Data constructed on 50-micron thick films containing 75wt. % of a polymer

A new generation of SIS resins (VECTOR 4258 ND and VECTOR 4359 ND) offer extraordinary melt strength so novel converting technologies such as blown film processing can be used. These novel SIS polymers allow our customers to differentiate and offer unique stretch engine solutions to the hygiene market. Improved tensile strength is another feature of these polymers due to their unique molecular design. Higher tensile strength enables thinner film structures using less material with elastic and mechanical performance at current or higher levels.

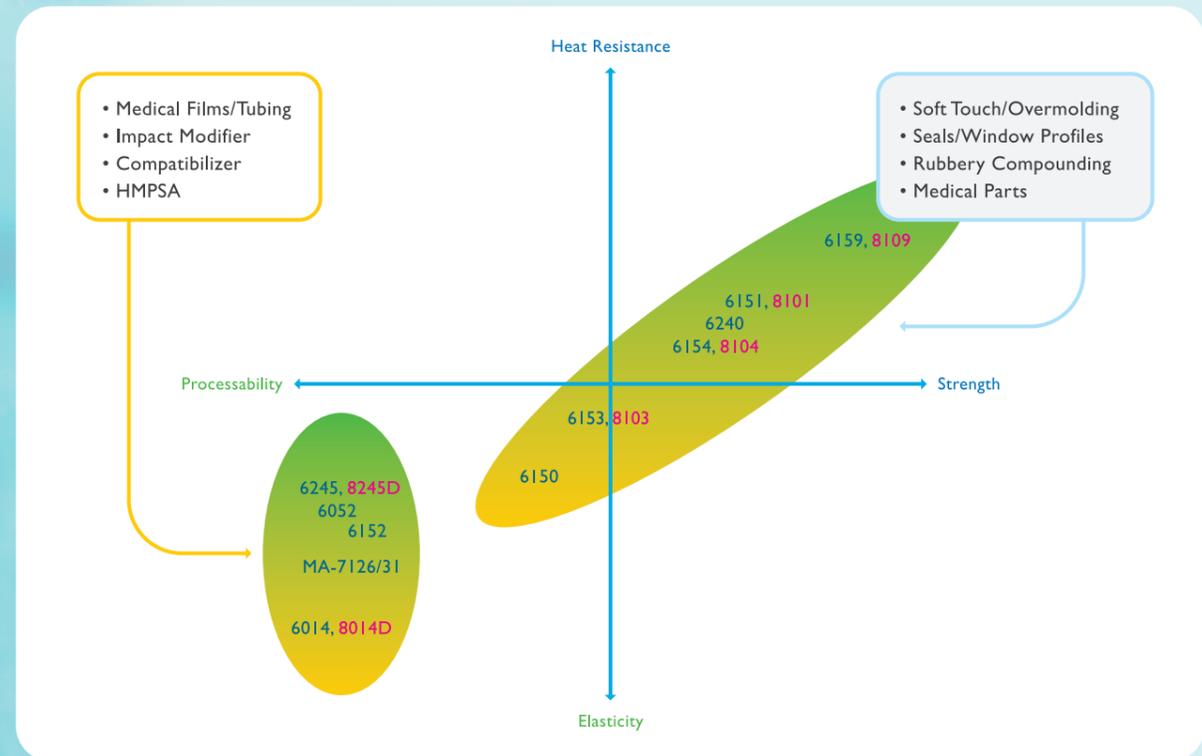
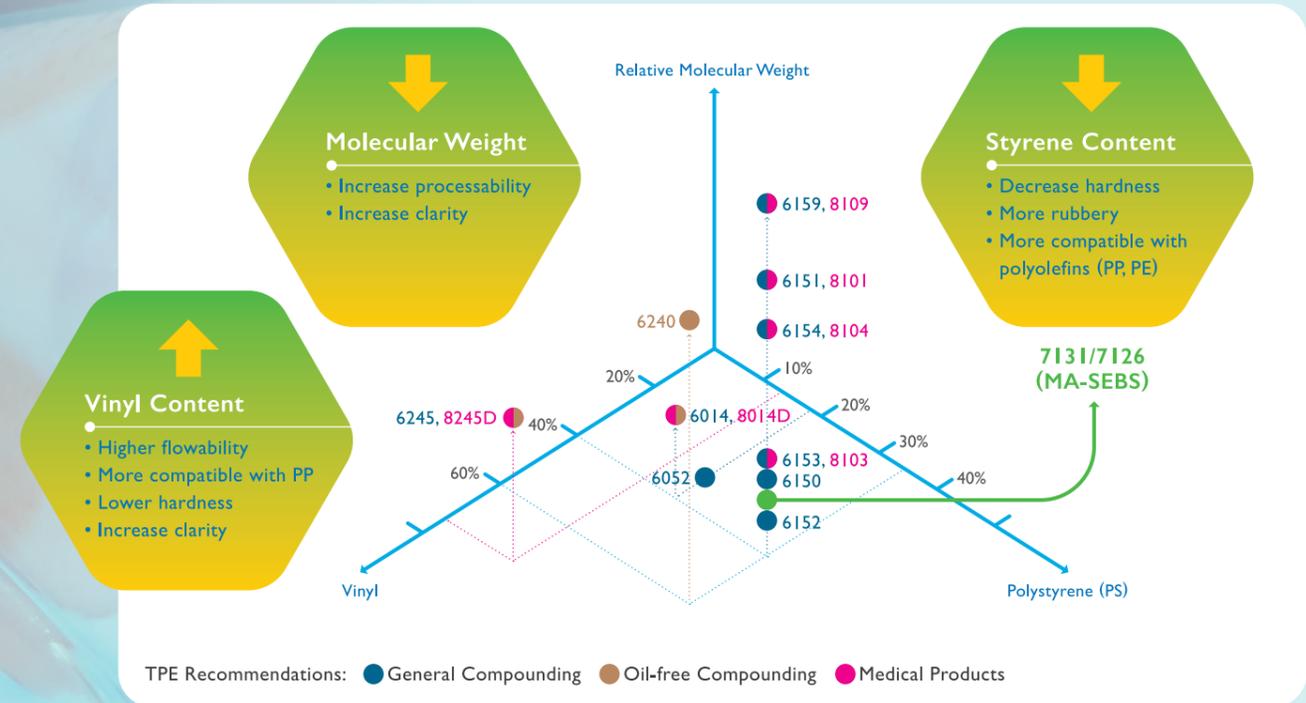


# Compounding

TAIPOL and VECTOR SBC are easily processed. They can be mixed and compounded to meet your requirements, whether through single or twin-screw extrusion, injection, or blow molding.

## TAIPOL® & VECTOR® for Compounding and as Modifier

TAIPOL and VECTOR SBC provide strong performance and benefits in terms of manufacturing and production. They combine strength and elasticity with the ability to process directly, with or without additives.

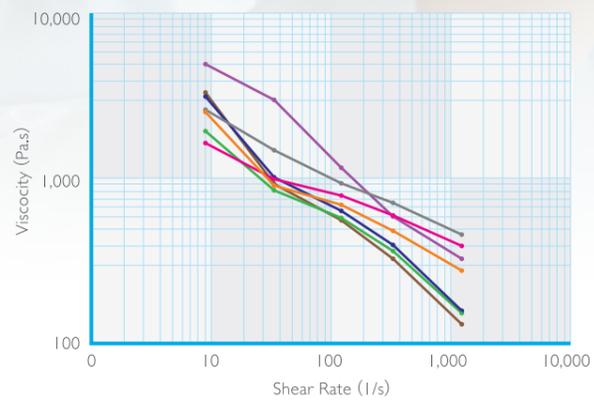


# Modification

TAIPOL and VECTOR SBCs can be blended with many plastics, such as styrenics, polyolefins and engineering thermoplastics, to improve their performance in aspects like impact strength or optical transparency.

## Polyolefin (PP) Modification

6014 Rheology is Similar to PP for Easy Mixing to a Homogenous Compound



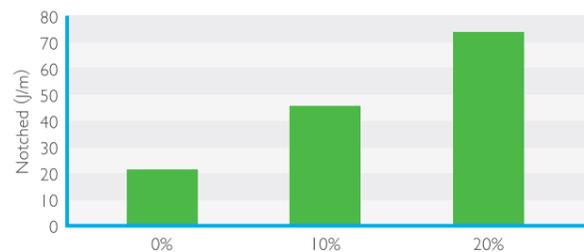
- 6014
- Homopolymer PP
- Random Copolymer PP
- Propylene-based random copolymer (POE)
- Ethylene-based random copolymer (POE)
- Olefin Block Copolymer (OBC)
- General purpose polystyrene (GPPS)

Low Styrene & High Rubber Content Improves Impact Resistance for PP

25°C Izod Impact Strength

6014 ADDITION	IMPACT STRENGTH, NOTCHED (J/M)
0%	28
10%	63
20%	Not Broken

-30°C Izod Impact Strength



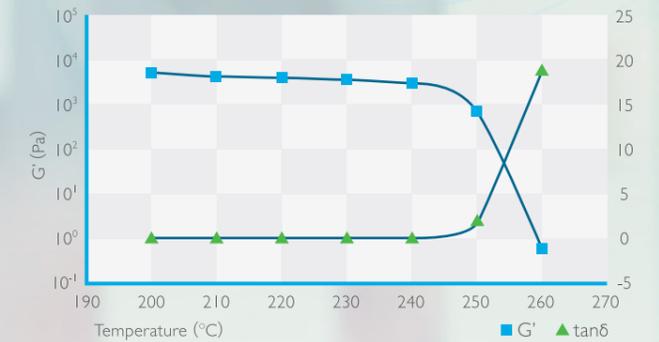
## 8245D High-vinyl SEBS — A Soft SBC with High-flow & Lower Hardness

POLYMER DATA	VALUE
Polymer Structure	Linear
Styrene, wt%	13
Di-block, wt%	<1
Hardness, Shore A	40
Melt Flow Rate (230°C/2.16 kg)	3.5
Ash % (w/o AB)	<0.1
Volatile Matters %	<0.5
Product Form	Dense Pellet

### Feature

- High Clarity
- Impact Resistance
- Easy To Process Without Oil
- Excellent PP Compatibility
- Passed ISO 10993-5 Testing and USP Class VI Testing

Easy to Process without Oil



## 8245D Provides Hardness from 40A to 60D with PP to Fit Your Needs



## High Clarity Enabled by 8245D — Excellent Compatibility with RCPP

Clarity (3mm thick injection molding sample sheet)



RCPP : 8245D 100% : 0%



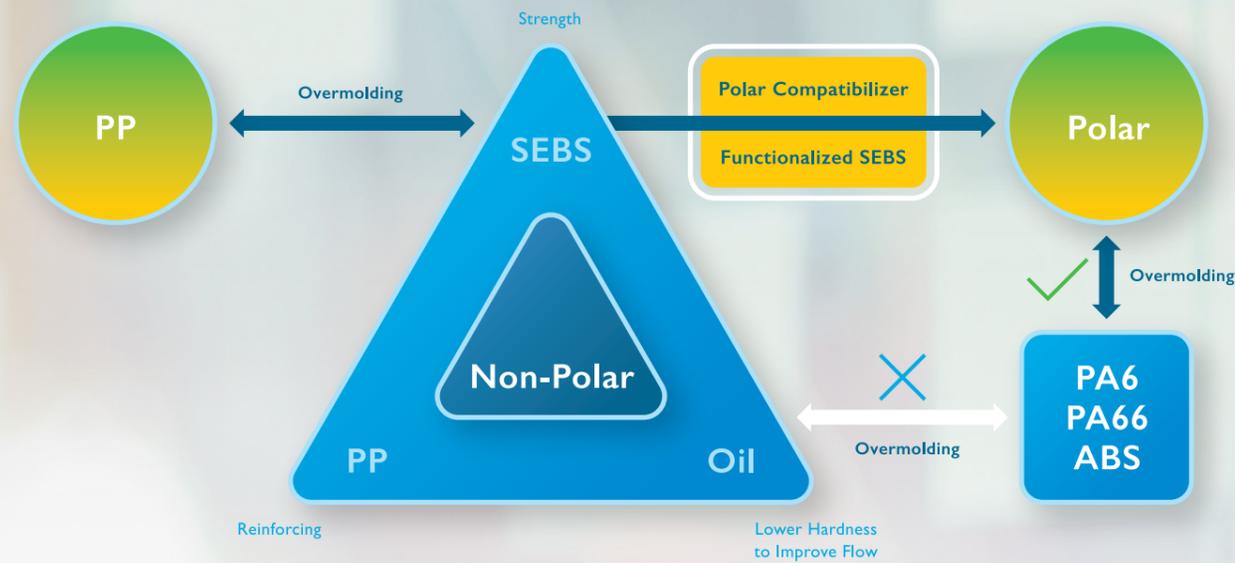
RCPP : 8245D 50% : 50%



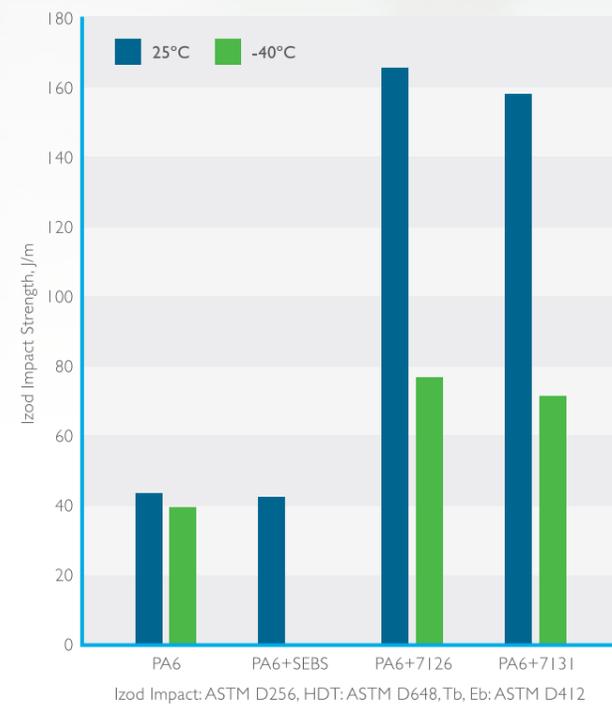
RCPP : 8245D 0% : 100%

## Polyamide Modification

Unique TAIPOLE MA-SEBS Addition Improves Compatibility & Bonding Strength with Plastics



## Exceptional Performance for Nylon (PA-6) Impact Modification



COMPOSITION, WT%				
PA-6	100	90	90	90
TAIPOL 6152		10		
TAIPOL 7126			10	
TAIPOL 7131				10

PROPERTIES				
NOTCH IZOD IMPACT STRENGTH				
25°C, J/m	50	45	168	158
-40°C, J/m	40	-	76	70
HDT, °C	62.8	-	55.2	53.5
Tensile Strength, MPa	70.5	59.5	61.6	59.3
Elongation, % I50	150	30	300	295

# PA/ABS Overmolding

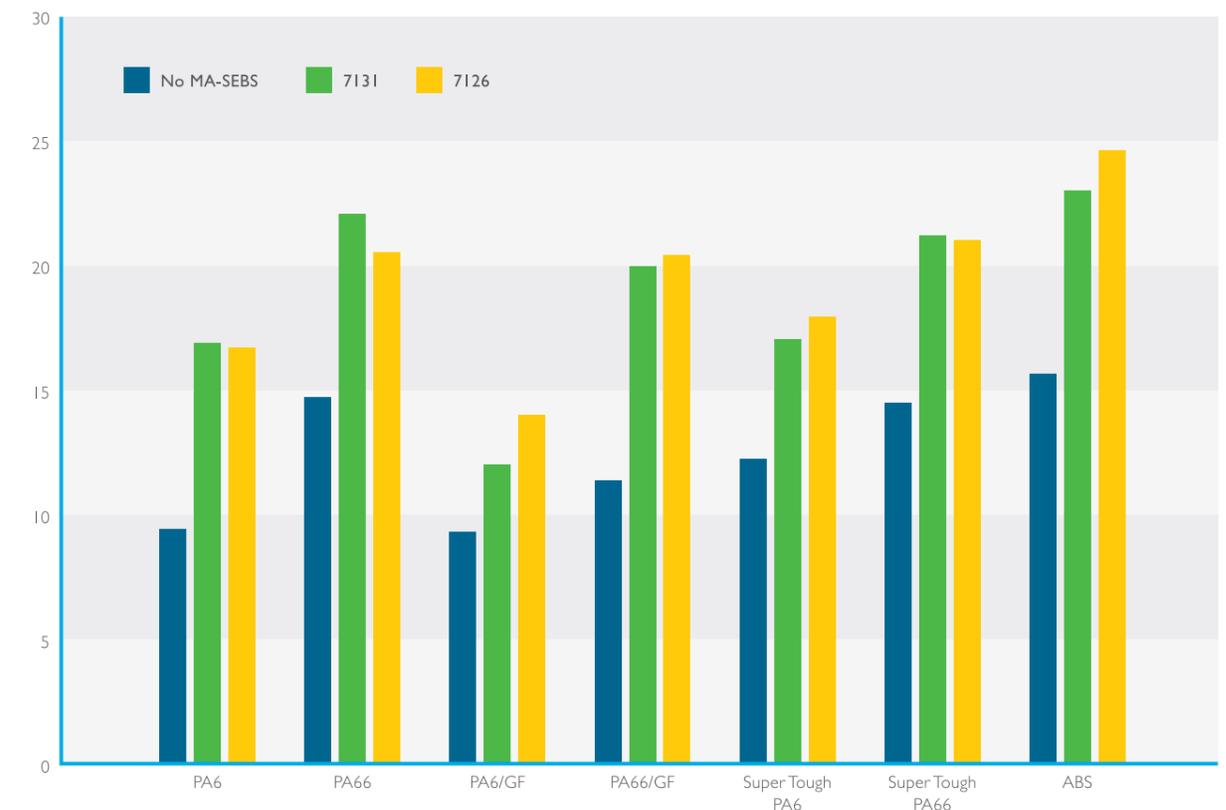
Thanks to MA-SEBS's chemical structure, it can increase the adhesion between polar and nonpolar materials such as overmolding adhesion to polyamide and ABS substrates.

○ Excellent ● Good ▲ Not Recommended

SUBSTRATE	CONTROL	ADD MA-SEBS*	
	NO MA-SEBS	7131	7126
PA6	▲	○	○
PA66	▲	○	○
PA6/GF	▲	▲	●
PA66/GF	▲	○	○
Super Tough PA6	▲	○	○
Super Tough PA66	▲	○	○
ABS	▲	○	○

\*MA-SEBS Content: 10%

## Overmolding Peeling Strength

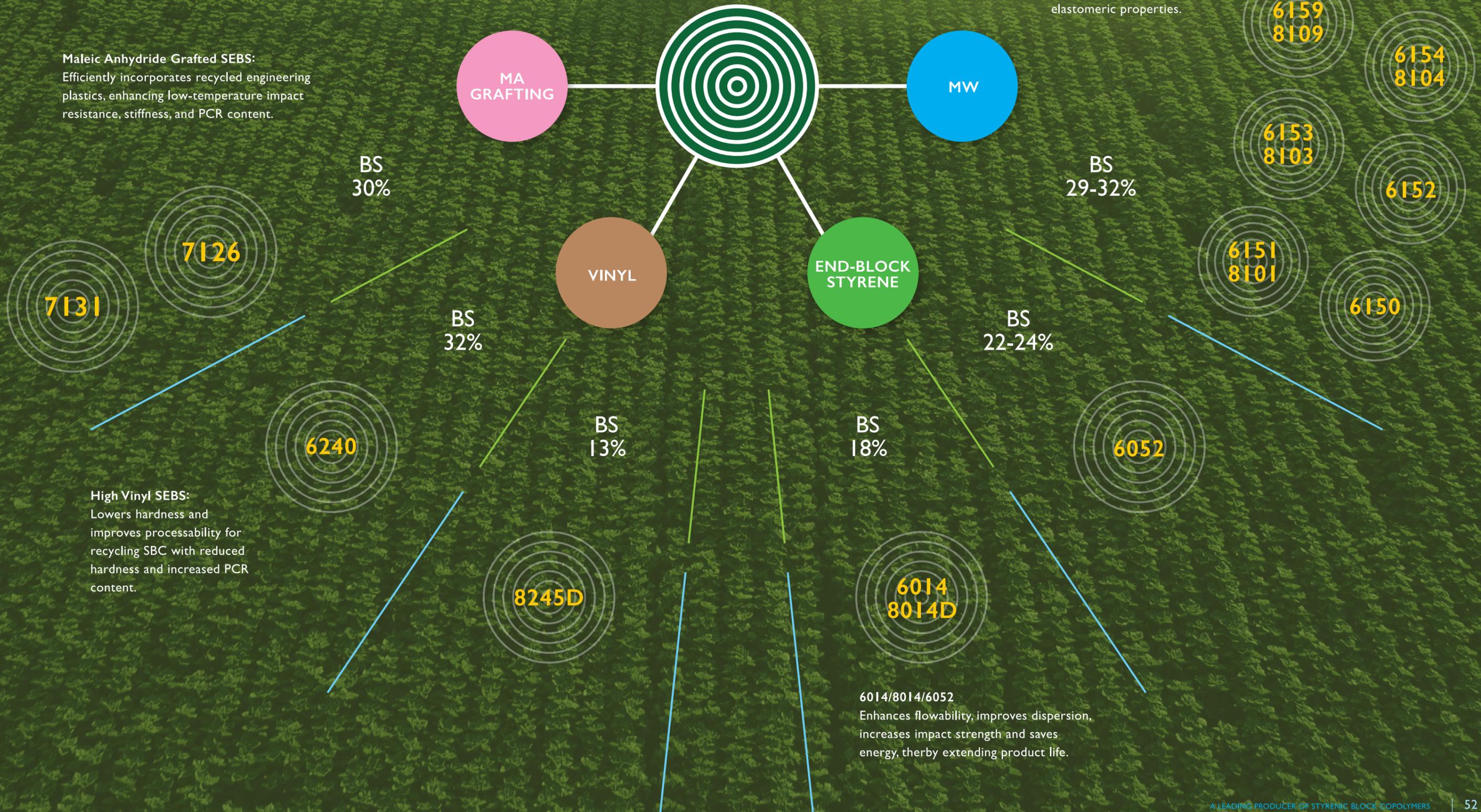


# ESG Implication of New SEBS

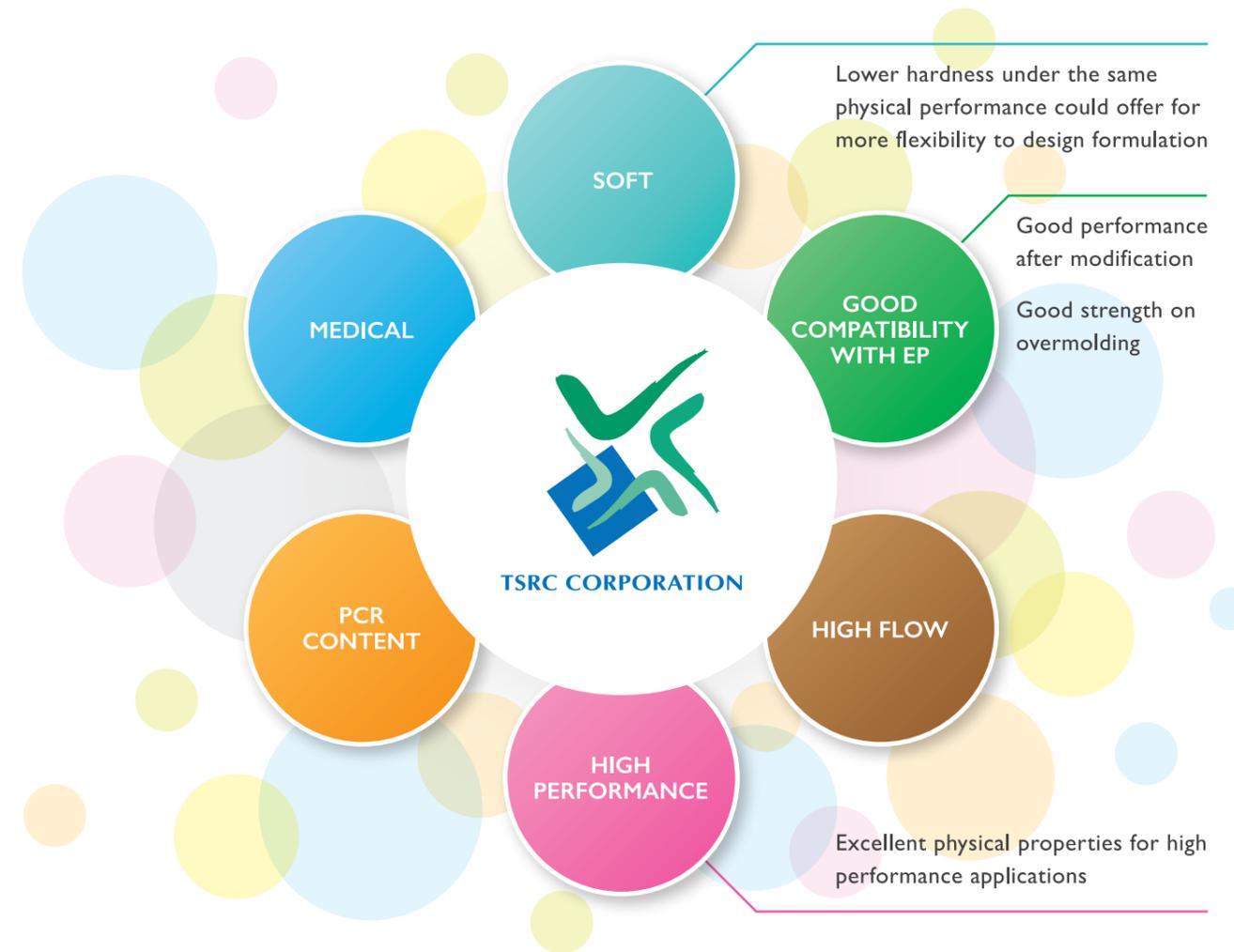


SEBS exhibits strong physical performance enhancing product durability and offering an exceptional combination of mechanical strength and elastomeric properties.

**Maleic Anhydride Grafted SEBS:**  
Efficiently incorporates recycled engineering plastics, enhancing low-temperature impact resistance, stiffness, and PCR content.



# SEBS Product Design plan



## ISCC Plus Certification

TSRC's factory in Kaohsiung, Taiwan, dedicated to TAIPOL® SEBS, has successfully obtained the prestigious ISCC PLUS certification. ISCC PLUS is a widely recognized system for verifying the sustainability of products.



- ▶ This achievement represents a significant milestone in our ongoing commitment to the circular economy and, above all, reducing carbon emissions.
- ▶ In line with our dedication to expanding the use of biomass-based products through a mass balance approach, TSRC is planning to pursue ISCC PLUS certification to other production sites. This initiative aligns with our mission to encourage the adoption of biomass for a more sustainable society.
- ▶ As a result, TAIPOL SEBS is now eligible for ISCC PLUS certification in various essential applications, including Automotive, Wire & Cable, Consumer Goods, Adhesives & Sealants, and Polymer Modification.



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