



MEDICAL SOLUTIONS

STRINGENT QUALITY STANDARDS
AND OUTSTANDING PERFORMANCE



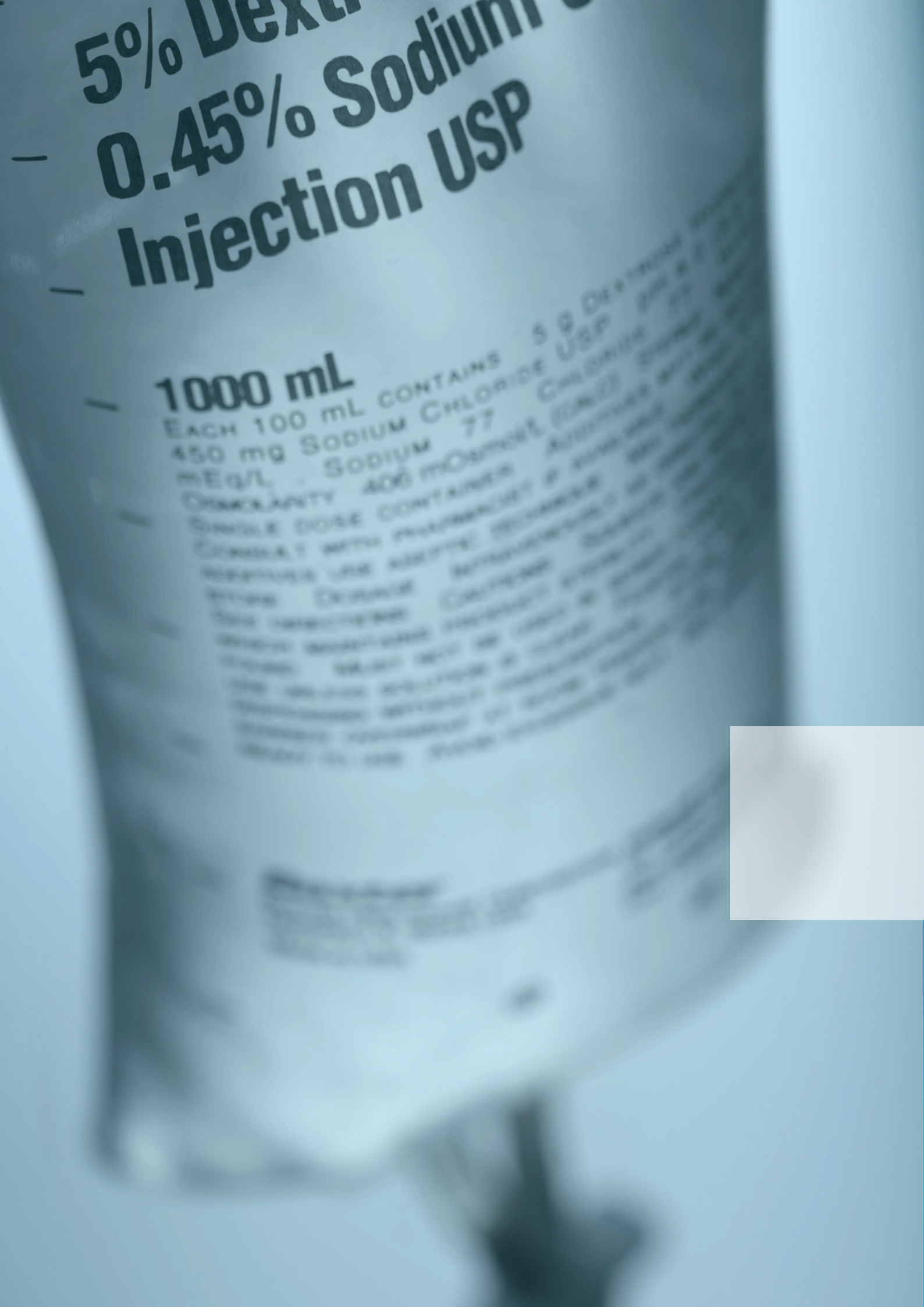
TSRC CORPORATION



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.

VECTOR 8101 — A High Molecular Weight SBC Designed for Medical Applications

POLYMER DATA	VECTOR 8101
Polymer Structure	Linear
Styrene, wt%	32.5
Di-block, wt%	<1
Solution Viscosity cps 10 wt % in Toluene	1700
Ash% (w/o AB)	<0.1
Volatile Matters %	<0.5
Specific Gravity	0.91
Color	White
Product Form	Powder

- Features**
- ▶ Lower Ash to Meet Pharmacopeia Requirements
 - ▶ Medical GMP Management
 - ▶ Passed ISO 10993-5 Testing
 - ▶ Passed USP VI Testing

- Application**
- ▶ Combinational Closures of PP
 - ▶ Medical Stoppers / Liners
 - ▶ Syringe Plunger Tips



POLYOLEFINS CAP MODIFICATION

Delivers a Wide Range of Functions by Toughening TP Resin



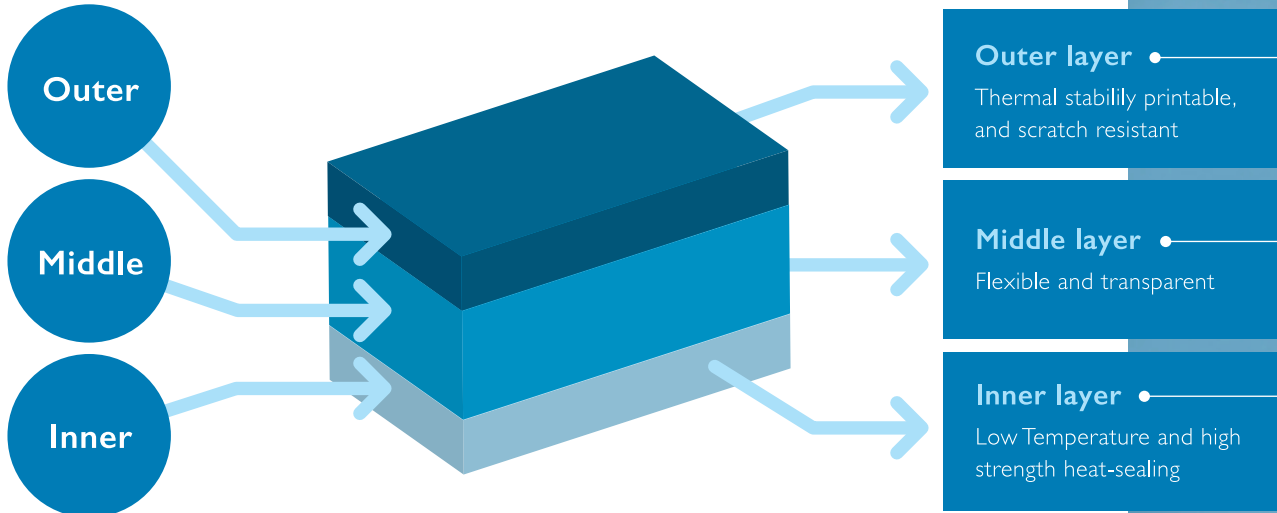
	PP	100%	80%	70%
FORMULATION	VECTOR 8101	0%	16%	24%
	Oil	0%	4%	6%
Hardness (Shore D)		70	63	58
Melt Flow Rate @ 230°C, 2.16kg		15	9	6.8
Izod Impact Strength @ Room Temp.		Complete Break	Partial Break	Non-Break
Fragmentation Test* (Number of Fragment)		23	15	0

*Refer to Chinese standard YBBO0242004-2015

3-LAYER CO-EXTRUDED IV BAG FILM

Improved Clarity & Flexibility in IV Bags with VECTOR 8245D

LAYER	COMPOSITION	THICKNESS (UM)		
		180	200	240
Outer	90% PP+ 10% SEBS	20	20	30
Middle	70% PP+ 30% SEBS	140	160	180
Inner	90% PP+ 10% SEBS	20	20	30



3-LAYER FILM			THICKNESS (UM)		
			180	200	240
Physical Properties	Yield Strength (MD / TD)	MPa	34 / 34	33 / 34	34 / 35
	Yield Elongation (MD / TD)	%	1030 / 1080	1050 / 1050	1136 / 1075
	Young's Modulus (MD / TD)	MPa	1.2 / 1.3	1.2 / 1.3	1.2 / 1.3
	M300 (MD / TD)	MPa	12 / 13	12 / 13	12 / 13
	Heat Sealing Strength (160°C)	N/15mm	30	30	35
Optical Properties	Transmittance	%	96	95	95
	Haze	%	4	5	5
	Yellow Index (YI)	-	3.1	3.5	3.8
Penetrate Properties	Water Vapor Transmission (WVTR)	g/m² day	3.6	3	2.6
	Oxygen Transmission (OTR)	cc/m² day	180	137	129



MEDICAL TUBING

VECTOR 8245D Provides Adjustable Hardness to Enable Diverse Applications

ITEM		UNIT	Outer Diameter (OD) / Inner Diameter (OD) = 4/3 (mm)			
SEBS / PP RATIO			80%/20%	70%/30%	60%/40%	50%/50%
Tubing Properties	Hardness	Shore A	60	70	80	90
	Kink Resistance	mm	17	14	15	16
	Clamp Resistance	Second	<1	<1	<1	<1

ITEM		UNIT	Outer Diameter (OD) / Inner Diameter (ID) = 2/1 (mm)			
SEBS / PP RATIO			80%/20%	70%/30%	60%/40%	50%/50%
Tubing Properties	Hardness	Shore A	60	70	80	90
	Kink Resistance	mm	4.3	3	3.6	4
	Clamp Resistance	Second	<1	<1	<1	<1

MEDICAL COMPOUNDING

APPLICATIONS

- Medical Film
- Medical Device
- Protective Cover

PROCESSING MODE

- Extrusion Blowing
- Extrusion Casting

SURGICAL DRAPES

- ▶ Passed ISO 10993-5 and GB/T16886 Test
- ▶ Environmental friendly and recyclability
- ▶ Soft touch
- ▶ Good skid resistance
- ▶ Excellent elasticity
- ▶ Good air permeability
- ▶ Good heat sealing performance

T-BLEND GRADE		UNIT	6002-75L		6007-75L		6008-75L	
Form		-	Pellets		Pellets		Pellets	
Color		-	Blue		Blue		Blue	
Hardness		Shore A	76		75		79	
Specific Gravity		-	0.95		0.95		0.93	
Melt Flow Rate (180°C/5kg)		g/10min	6		3		6	
Tensile Strength		MPa	65		7		80	
M300		MPa	45		5		50	
Elongation		%	500		500		600	
Tear Strength		MPa	30		4		45	
FILM	Material Orientation	-	MD	CD	MD	CD	MD	CD
	Tensile Strength	Kgf/cm²	123	102	150	140	240	220
	Elongation	%	634	597	780	750	802	741
	300% Modulus	Kgf/cm²	57	49	51	46	53	59
	Permanent Set	%	16	16	14	14	8.5	8.5



APPLICATIONS

- Tourniquet
- Elastic Band
- Elastic Tape

PROCESSING MODE

- Extrusion



APPLICATIONS

- Respiration Equipment

PROCESSING MODE

- Injection

TOURNIQUETS

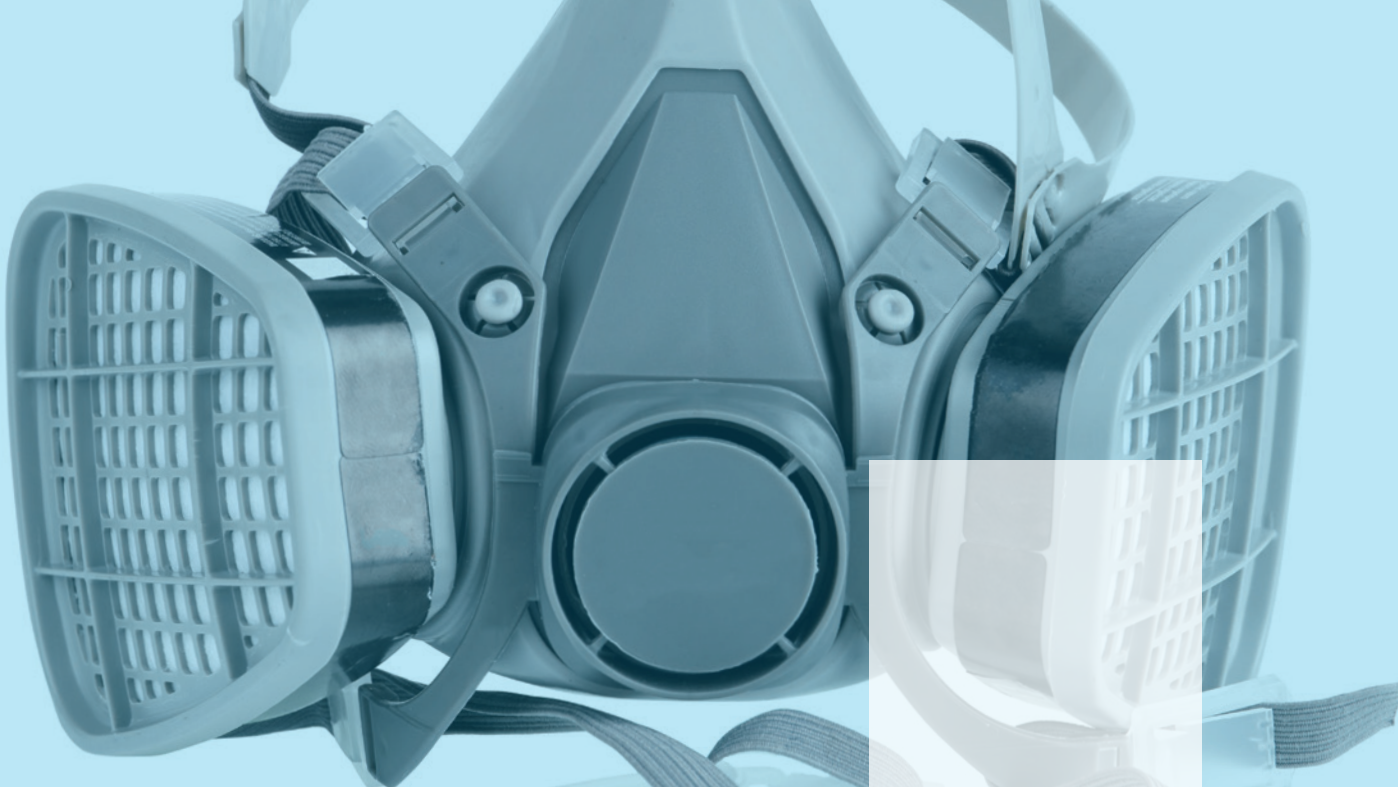
- ▶ Passed ISO 10993-5 and GB/T16886 Test
- ▶ Environmental friendly and recyclability
- ▶ Soft touch
- ▶ Good skid resistance
- ▶ Excellent elasticity

T-BLEND GRADE	UNIT	6102-50N
Form	-	Pellets
Color	-	Natural
Hardness	Shore A	50
Specific Gravity	-	0.91
Melt Flow Rate (180°C/5kg)	g/10min	3
Tensile Strength	MPa	40
M300	MPa	20
Elongation	%	700
Tear Strength	MPa	20

RESPIRATION EQUIPMENT

- ▶ Passed ISO 10993-5 and GB/T16886 Test
- ▶ FDA 177.1210
- ▶ Soft touch
- ▶ Good skid resistance
- ▶ Excellent elasticity
- ▶ Good heat sealing

T-BLEND GRADE	UNIT	2105-50C	2122-55T	2123-55T
Form	-	Pellets	Pellets	Pellets
Color	-	Transparency	Translucent	Translucent
Hardness	Shore A	55	55	55
Specific Gravity	-	0.88	0.88	0.88
Melt Flow Rate (180°C/5kg)	g/10min	80	25	25
Tensile Strength	MPa	45	70	70
M300	MPa	25	20	20
Elongation	%	500	700	700
Tear Strength	MPa	15	20	20



APPLICATIONS

- Protective Mask
- Medical Device
- Protective Cover

PROCESSING MODE

- Injection



APPLICATIONS

- Rehabilitation Caster
- Industrial Caster

PROCESSING MODE

- Injection

PROTECTIVE MASKS

▶ Passed ISO 10993-5 and GB/T16886 Test ▶ FDA 177.1210 ▶ Soft touch	▶ Good skid resistance ▶ Excellent elasticity ▶ Good air permeability	▶ Low odor
---	---	--

T-BLEND GRADE	UNIT	2113-35T	2113-45T	2116-50T	2141-55N	2122-55T	2116-60T
Form	-	Pellets	Pellets	Pellets	Pellets	Pellets	Pellets
Color	-	Translucent	Translucent	Translucent	Natural	Translucent	Translucent
Hardness	Shore A	37	45	50	55	58	62
Specific Gravity	-	0.88	0.88	0.88	1.14	0.88	0.88
Melt Flow Rate (180°C/5kg)	g/10min	40	50	50	40	30	100
Tensile Strength	MPa	2.5	3	3	4	6	8
M300	MPa	1.5	2	2	2	2	3
Elongation	%	600	600	400	700	600	700
Tear Strength	MPa	1	1.5	1.5	2	2	2

INDUSTRIAL CASTER

▶ Passed ISO 10993-5 and GB/T16886 Test ▶ Silent ▶ Anti-sliding	▶ Wear resistance ▶ Excellent elasticity ▶ Suitable for PP overmolding
---	--

T-BLEND GRADE	UNIT	0112-45N	0112-55N	0112-65T	0112-75N	0113-75T
Form	-	Pellets	Pellets	Pellets	Pellets	Pellets
Color	-	Natural	Natural	Translucent	Natural	Translucent
Hardness	Shore A	45	55	65	75	75
Specific Gravity	-	1.03	1.02	0.88	0.97	0.88
Melt Flow Rate (180°C/5kg)	g/10min	150	160	8	180	150
Tensile Strength	MPa	5	6	5	10	10
M300	MPa	1.5	2	3.5	3	3
Elongation	%	800	800	600	700	700
Tear Strength	MPa	1.5	1.5	2	3	3



TESTING KIT

- ▶ Passed ISO 10993-5
- ▶ Clarity and visibility
- ▶ Viable sterilization through gamma radiation
- ▶ Excellent durability and strength

T-BLEND GRADE	UNIT	6101-90T
Form	-	Pellets
Color	-	Translucent
Hardness	Shore D	43
Specific Gravity	-	0.89
Melt Flow Rate (180°C/5kg)	g/10min	40
Tensile Strength	MPa	150
M300	MPa	100
Elongation	%	500
Tear Strength	MPa	60

REAGENT GASKET

- ▶ Passed ISO 10993-5
- ▶ Passed Leakage Test(60°C*240h)
- ▶ Viable EO sterilization
- ▶ Improved compression set and tightness properties.

T-BLEND GRADE	UNIT	3002-45N
Form	-	Pellets
Color	-	Natural
Hardness	Shore A	45
Specific Gravity	-	0.89
Melt Flow Rate (180°C/5kg)	g/10min	1.5
Tensile Strength	MPa	30
M300	MPa	30
Elongation	%	300
Tear Strength	MPa	10



APPLICATIONS

● Cryogenic Vials

PROCESSING
MODE

● Injection

CRYOGENIC VIALS

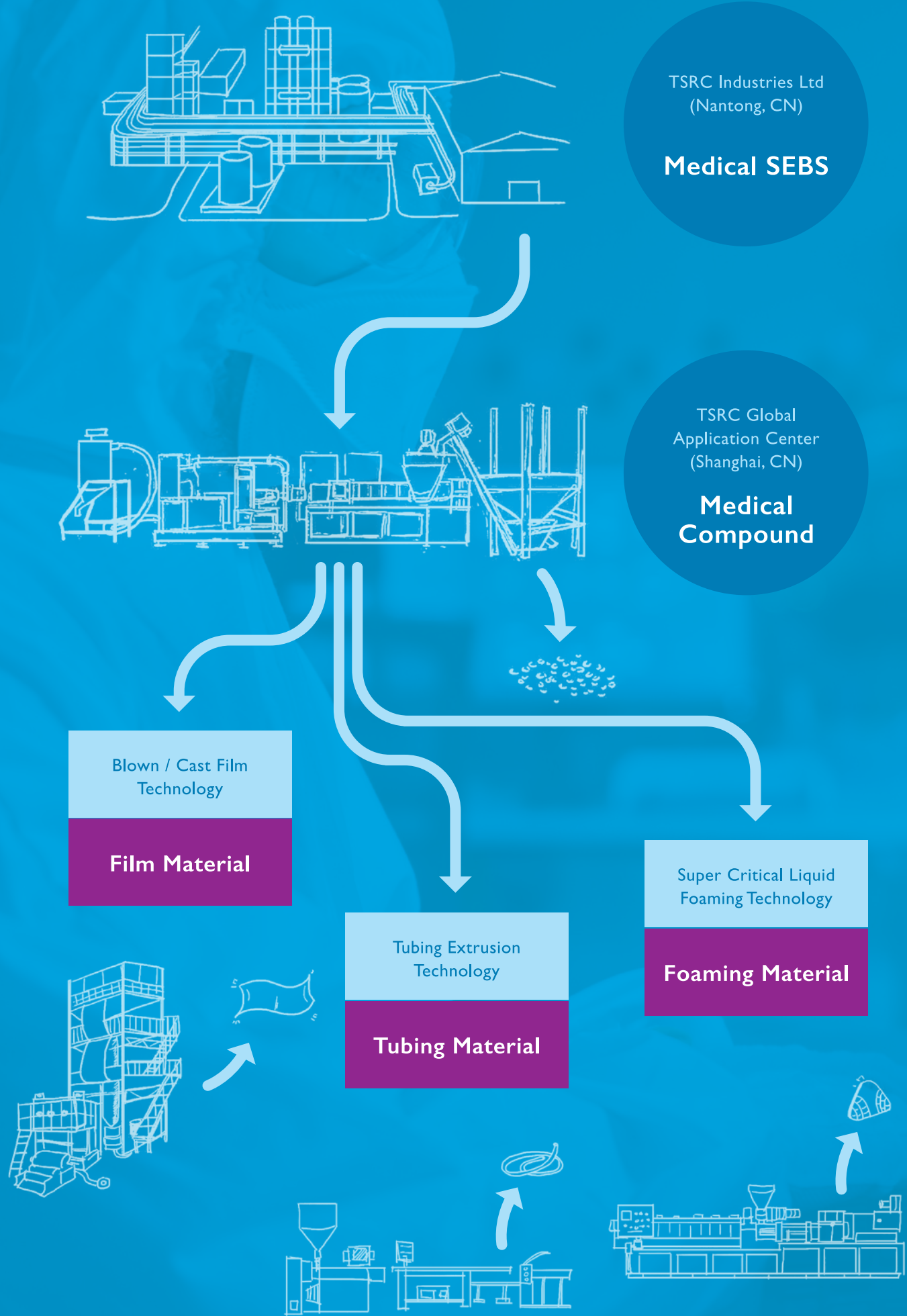
- ▶ Passed ISO 10993-5

▶ Clarity and visibility

▶ Viable sterilization through gamma radiation
- ▶ High Izod notched impact strength

▶ Excellent resistant to cryogenic embrittlement, at -196°C for 10 minutes

T-BLEND GRADE	UNIT	2100-95T-50
Form	-	Pellets
Color	-	Translucent
Hardness	Shore D	50
Specific Gravity	-	0.90
Melt Flow Rate (230°C/2.16kg)	g/10min	15
Tensile Strength	MPa	-
M300	MPa	-
Elongation	%	-
Tear Strength	MPa	-





TSRC CORPORATION

TSRC Corporation – Global Business Headquarter

18F, 95, Sec. 2, Dunhua S. Rd., Taipei City 106, Taiwan R.O.C.
Tel: +886(2)3701-6000

TSRC Corporation – Global Headquarter / Kaohsiung Factory

No.2 Singgong Rd., Dashe Dist., Kaohsiung City 815, Taiwan R.O.C.
Tel: +886(7)351-3811
info.asia@tsrc-global.com

TSRC(Nantong) Industries Ltd.

No.22 TongWang Road, Nantong Economic and Technological Development Zone,
Nantong, Jiangsu, P.R.China (PC 226017)
Tel: +86(513)8599-9966
Info.china@tsrc-global.com

TSRC Specialty Materials LLC

No.23027 Elkana Deane Ln, Katy, TX 77449, U.S.A
Tel: +1(281)505-1800
Info.Americas@tsrc-global.com

TSRC(Lux.) Corporation S.à r.l.

39-43 Avenue de la Liberté L-1931 Luxembourg
Tel: +352(26)29-72-31
Info.europe@tsrc-global.com

TSRC Corporation - Gangshan Factory

No. 39, Bengong 1st Rd., Gangshan Dist., Kaohsiung City 820, Taiwan, R.O.C.
Tel: +886(7)623-3005

TSRC (Shanghai) Industries Ltd.

No. 1406 Yu-Shu Road, Songjiang Zone, Shanghai, P.R.C. (PC:201600)
Tel: +86(21)5773-4288

TSRC (Vietnam) Co. Ltd.

No. 8 VSIP II-A Street 31, Vietnam Singapore Industrial Park II-A, Binh Duong Province, Vietnam
Tel: +84-274-222-2233
Email: info.t-blend@tsrc-global.com



www.tsrc.com.tw