

KCC SILICONE LSR

New world | New leader | New face

LSR

KCC SILICONE LSR CATALOG



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We are reaching out to the world
with quality and technology



A precision chemical corporation growing rapidly based on customer's confidence

With state-of-the-art technology and ultra-modern production facilities, KCC Silicone seeks perfection in the quality of its products and customer services. Each product that KCC Silicone introduces to the marketplace is the result of creative and intensive R&D activities benefiting the diverse need of every customer. KCC Silicone continues to remain deeply committed to improving the living environment and does this by leading the building and industrial materials industry through continuous research and development.

KCC Silicone Corporation Service Network



About KCC Silicone



We are reaching out to the world
with quality and technology

We produce and distribute various silicone products including silicone rubber, sealants for construction and industrial use, silane, silicone oil, silicone emulsion, and silicone dispersion products.

Today's building materials are essential blends or composites of organic and inorganic chemical products. KCC Silicone takes pride in being a market leader in these particular chemical fields. In the past, the two divisions within KCC Silicone operated separately, but they are now merged together to provide enhanced synergy, cost efficiency, and service to our multitude of highly valued customers. Korea Chemical Co. Ltd., that specialized in organic chemical products (mainly paints and resins for paints) has merged with Kumgang Chemical Co. Ltd., into a single legal entity entitled Kumgang Korea Chemical Co. Ltd. The company is known as KCC Silicone for short. The technical integration of the organic and inorganic chemistry business under the same roof ensures better products, better technical service, and more competitive prices. KCC Silicone continues to be a worldwide industrial player in the 21st century and continues to invest in innovative R&D activities.

Introduction to KCC Silicone Business

KCC Silicone constructed the first silicone monomer production plant in Korea in 2003. KCC Silicone has made great R&D advances for the silicone industry with researchers specialized in the field of silicone monomer, polymer synthesis, and the development of applicable products. Thus, KCC Silicone has completed the development in the silicone-related field successfully. KCC Silicone is ready to produce and provide silicone products including silicone sealant for construction, industrial RTV, silane, fluids, emulsion and dispersion, as well as rubber. Moreover, KCC Silicone makes contributions to promote the competitive power of our customers by supplying products corresponding to their needs and by concentrating our energies on R&D activities.

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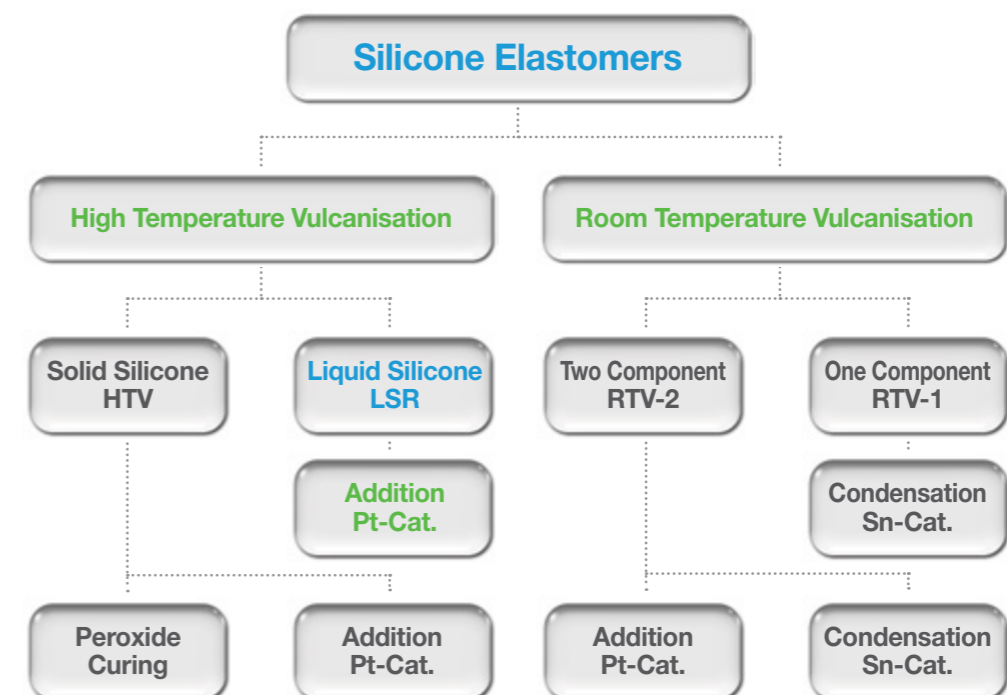
Primers

LSR Introduction

Liquid Silicone Rubber (LSR) consists mainly of silicone polymer and fumed silica being non-toxic and temperature resistant.

It has the characteristics as follows.

- Heat resistant : Usable over 200 °C for a long period of time
- Cold resistant : Flexible at -50 °C
- Good mechanical properties : At high temperature condition
- Good electrical properties : Less affected by temperature change
- Ozone resistant & Good weatherability
- Flame retardant : Low-toxic gas & good flame retardant
- Good chemical resistant : Low swelling in acid, base & polar organic compound
- Excellent gas permeability : Usable for medical devices by optional gas permeability
- Water repellent & releaseability



LSR Advantages

There are several kinds of silicone rubber and among them is LSR. LSR enables the customer to increase productivity. Since it is in a liquid phase, it is ready to use in Liquid Injection Molding machines. Due to this powerful advantage, large volumes of surge amestors, very delicate seals, and silicone adhesives for plastic materials are produced readily and in a large scale. These Advantages are as follows.

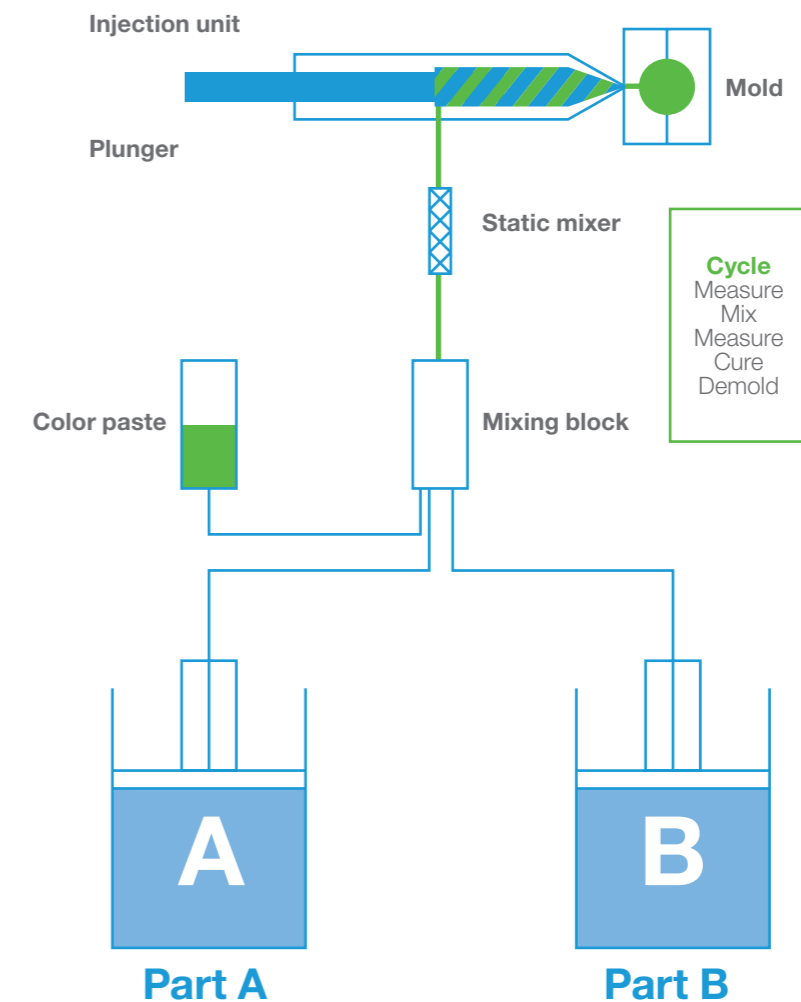
- Ready-to-use material
- Very short cycle times above 110 °C mold temperature
- Fully automated injection molding process
- No by-products because of addition-cure system
- Flash free articles with high precision
- Good hot-tear properties
- Easily Pigmentable

Comparison of LSR and HTV

Classification	LSR	HTV	
		Peroxide cure	Addition cure
Cure system	Addition cure	Peroxide cure	Addition cure
Process	Automation	Manual	Partly automation
By-product	none	A little	None
Cure rate	Very fast	Slow	Fast
Law material	Liquid		Solid
Material loss	Little		Many
Large volume articles & Delicate articles production	possible		Difficult
Cycle time	Short		Long
Small quantities production	Not suitable		Suitable

Liquid Injection Molding

Liquid silicone rubber is cured automatically in liquid injection molding machines. Two Components (part A and B) are supplied at a regular ratio by dosing pumps. Part A and B are then mixed together in a mixing block and a static mixer. At this time, if color paste is necessary, it is then mixed. This mixed compound is measured by volume using some mechanical tools in the injection unit. Finally heat curing is done very quickly in a hot mold. After the fixed cure time, de-molding is completed and the cured articles are taken from the mold.



General Purpose Grades

Liquid silicone rubber is heat resistant at high temperatures, such as 200 °C. In addition, the cure system includes being cured by platinum catalyst so therefore, it is physiologically inert.

These properties make LSR applicable to baby nipples, swimming bands, mouthpiece for health care, food contact products for home appliances, and parts for electronics devices.

Product	Test method	General					
		SL7220	SL7901	SL7230	SL7935	SL7240	SL7250
Mixing ratio		A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Translucent					
Viscosity (Pa·s)*1	ASTM D 4287	220 / 220	290 / 290	260 / 260	290 / 290	330 / 330	350 / 350
Specific Gravity	ASTM D 792	1.11	1.11	1.11	1.10	1.12	1.13
Hardness (Shore A)	ASTM D 2240	20	25	30	35	40	50
Tensile strength (MPa)	ASTM D 412	6.5	6.0	7.0	8.0	8.5	9.5
Elongation (%)	ASTM D 412	950	800	800	700	750	700
Tear strength (N/mm)	ASTM D 624 B	40	20	35	20	35	30
Food contact*2	FDA, BfR	√	√	√	√	√	√

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

*2 : Having technical files based on the defined test methods

Caution) Typical property data values should not be used as specifications



Applications

- Baby products (nipple, etc.)
- Cake molds
- Kitchenware
- Keypads
- Parts for electronic devices
- Medical parts (evacuators, etc.)

Product	Test method	General					
		SL7250-M	SL7260	SL7260-M	SL7270	SL7270-M	SL7280(H)
Mixing ratio		A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Translucent					
Viscosity (Pa·s)*1	ASTM D 4287	350 / 350	330 / 330	200 / 200	300 / 300	330 / 330	400 / 400
Specific Gravity	ASTM D 792	1.12	1.13	1.12	1.13	1.12	1.14
Hardness (Shore A)	ASTM D 2240	51	60	58	66	65	78
Tensile strength (MPa)	ASTM D 412	9.9	9.5	8.5	9.3	9.0	8.0
Elongation (%)	ASTM D 412	625	600	400	410	400	350
Tear strength (N/mm)	ASTM D 624 B	40	40	40	46	40	10
Food contact*2	FDA, BfR	√	√	√	√	√	

General Purpose Grades



Product	Test method	Low Tack	Low Viscosity	Medical grades	
		SL7215(L)	SL7240(L)	SL8840	SL7260(S)
Mixing ratio		A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Translucent			
Viscosity (Pa·s)*1	ASTM D 4287	220 / 170	260 / 260	350 / 350	480 / 480
Specific Gravity	ASTM D 792	1.08	1.12	1.12	1.13
Hardness (Shore A)	ASTM D 2240	22	42	40	59
Tensile strength (MPa)	ASTM D 412	5.2	8.5	7.5	10.0
Elongation (%)	ASTM D 412	810	600	700	600
Tear strength (N/mm)	ASTM D 624 B	14	28	35	45
Food contact*2	FDA, BfR			√	√
Medical*2	USP ClassVI			√	√

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

*2 : Having technical files based on the defined test methods

Caution) Typical property data values should not be used as specifications

Airbag Coating Grades

LSR as a coating material brings the unique properties to airbag fabrics. LSR coated fabrics have thermal resistance, flame resistance, high tear strength and good adhesive properties

Applications

- Airbags (cut & sewn type)



Product	Test method	SL9051	SL9920
Mixing ratio		A:B = 10:1	A:B = 10:1
Appearance	ASTM E 1767	Light yellow	Translucent
Viscosity (Pa·s)*1	ASTM D 4287	20 / 20	15 / 18
Specific Gravity	ASTM D 792	1.07	1.03
Hardness (Shore A)	ASTM D 2240	28	30
Tensile strength (MPa)	ASTM D 412	2.5	3.5
Elongation (%)	ASTM D 412	300	400
Scrub (Stroke)	ISO 5981	> 600	> 600

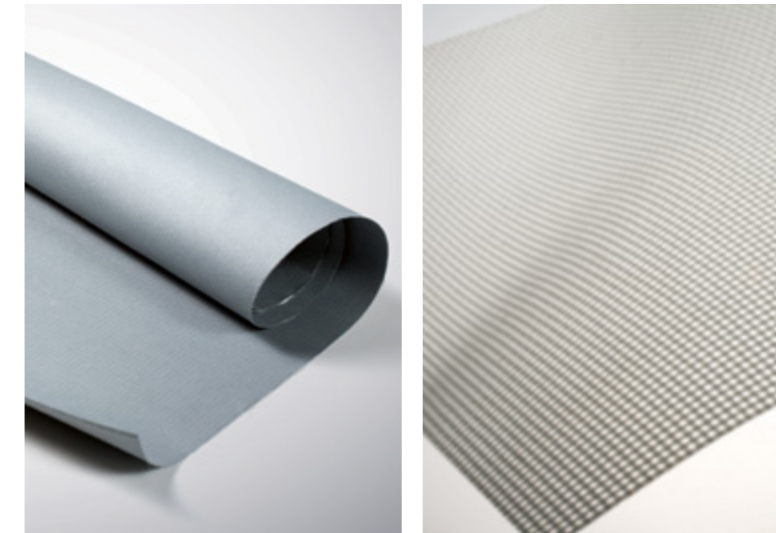
Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

Caution) Typical property data values should not be used as specifications

Coating Grades

LSR is applied to many coating applications. This is because LSR has good adhesion to textiles and glass fabrics. These LSR coated textiles and fabrics have non-slip and excellent mechanical properties.



Applications

- Label / Logo
- Silk-screen coating
- Trouser waistbands
- Sports / Leisure fabrics
- Stocking tops / Non-slip Socks
- Shoes
- Conveyor Belts
- Electrical Sleeve
- Protective Clothing / Gloves
- Glass-fiber coating

Product	Test method	SL3331	SL3358	SL6300	SL6351	SL6352	SL6530	SL7740	SL9300
Mixing ratio		A:B = 10:1	A:B = 1:1	B:C = 100:3	B:SL9300B = 100:0.3	B:SL9300B = 100:0.3	B:SL9300B = 100:0.3	A:B = 1:1	A:B = 100:0.3
Appearance	ASTM E 1767	Trans-parent	Translucent						
Viscosity (Pa·s) ^{*1}	ASTM D 4287	40 / 10	30 / 120	40 / 0.12	90	190	50	130 / 130	80
Specific Gravity	ASTM D 792	1.00	1.09	1.06	1.08	1.13	1.08	1.07	1.10
Hardness (Shore A)	ASTM D 2240	35	22	14	40	60	30	39	40
Tensile strength (MPa)	ASTM D 412	3.0	3.0	3.5	4.0	5.8	6.0	4.5	5.0
Elongation (%)	ASTM D 412	200	500	500	400	200	600	380	500
Tear strength (N/mm)	ASTM D 624 C	-	-	-	-	20	-	15	20
ECO PASSPORT ^{*2}			√	√	√		√		√

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

*2 : Having technical files based on the defined test methods

Caution) Typical property data values should not be used as specifications

Product	Test method	SL9055	SL9056	SL9602(P)	SL9061	SL9603	SL9903	SL9906
Mixing ratio		A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 10:1	B:SL9300B = 100:0.3	A:B = 10:1	A:B = 10:1
Appearance	ASTM E 1767	Translucent (Light yellow)			White	Translucent		Ivory
Viscosity (Pa·s) ^{*1}	ASTM D 4287	100 / 70	150 / 90	42 / 42	24 / 1.5	11	32 / 0.45	340 / 5.7
Specific Gravity	ASTM D 792	1.09	1.05	1.07	1.16	1.01	1.04	1.23
Hardness (Shore A)	ASTM D 2240	19	10	23	39	24	42	42
Tensile strength (MPa)	ASTM D 412	4.0	4.0	4.0	40	1.5	5.0	5.5
Elongation (%)	ASTM D 412	750	1450	600	360	300	250	500
Tear strength (N/mm)	ASTM D 624 C	-	-	-	-	-	20	17
ECO PASSPORT ^{*2}			√	√		√		

LSR for Railway Industry

There are several requirements for silicone products that are applied to railway industry. One of the most important and essential factors is the fire resistance. This is mandatory for bellows, gangways, etc.



Applications

- Automotive & Transport
- Railway(Gangway)

Product	Test method	Primer	Base
		SL9913	SL9914
Mixing ratio		A:B = 1:1	A:B = 10:1
Appearance	ASTM E 1767	Translucent (Light yellow)	Gray
Viscosity (Pa-s)*1	ASTM D 4287	110 / 70	20 / 30
Specific Gravity	ASTM D 792	1.07	1.42
Hardness (Shore A)	ASTM D 2240	8	70
Tensile strength (MPa)	ASTM D 412	5.0	7.0
Elongation (%)	ASTM D 412	1400	120
LOI (%)	ASTM D 2863	-	36
Spread of flame (KW/m ²)	ISO 5658-2	-	> 20
Heat release rate*2 (KW/m ²)	ISO 5660-1	< 60	
Density of smoke*2	EN ISO 5659-2	< 150	
Toxic fume*2	EN ISO 5659-2	< 0.75	

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

*2 : In the form of 2.1 mm slab containing 2 layers of aramid fabric

Caution) Typical property data values should not be used as specifications

Silicone Leather Grades

Silicone leather is waterproof and easy to clean from contamination. Silicone leather is able to apply various patterns of a release paper to materialize natural leather.



Applications

- Furniture
- Mat

Product	Test method	Binder	Skin	Top
		SL9608	SL9670	SL9807
Mixing ratio		A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Translucent		
Viscosity (Pa-s)*1	ASTM D 4287	65 / 70	80 / 70	12.5 / 5 cP
Specific Gravity	ASTM D 792	1.07	1.10	1.06 / 0.97
Hardness (Shore A)	ASTM D 2240	40	70	-
Tensile strength (MPa)	ASTM D 412	7.0	8.9	-
Elongation (%)	ASTM D 412	500	220	-

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

Caution) Typical property data values should not be used as specifications

Highly Transparent Grades

Transparent LSR has high transparency.
 Silicone MQ resin is used for this product as a replacement of fumed silica.
 Transparent LSR is applied to nose pads, light guides, and various parts of electronic devices.

Product	Test method	SL9503	SL9508	SL8150	SL8160	SL8170	SL8180
Mixing ratio		A:B = 10:1	A:B = 10:1	A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Highly Transparent					
Viscosity (Pa·s)*1	ASTM D 4287	3 / 0.05	25 / 50 cP	45 / 42	100 / 40	63 / 35	60 / 13
Specific Gravity	ASTM D 792	1	0.98	1.03	1.03	1.03	1.03
Hardness (Shore A)	ASTM D 2240	50	40	55	65	68	77
Tensile strength (MPa)	ASTM D 412	5.5	4	6	6	7	4
Elongation (%)	ASTM D 412	100	190	300	300	200	50
Tear strength (N/mm)	ASTM D 624 C	14	-	25	28	17	-

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

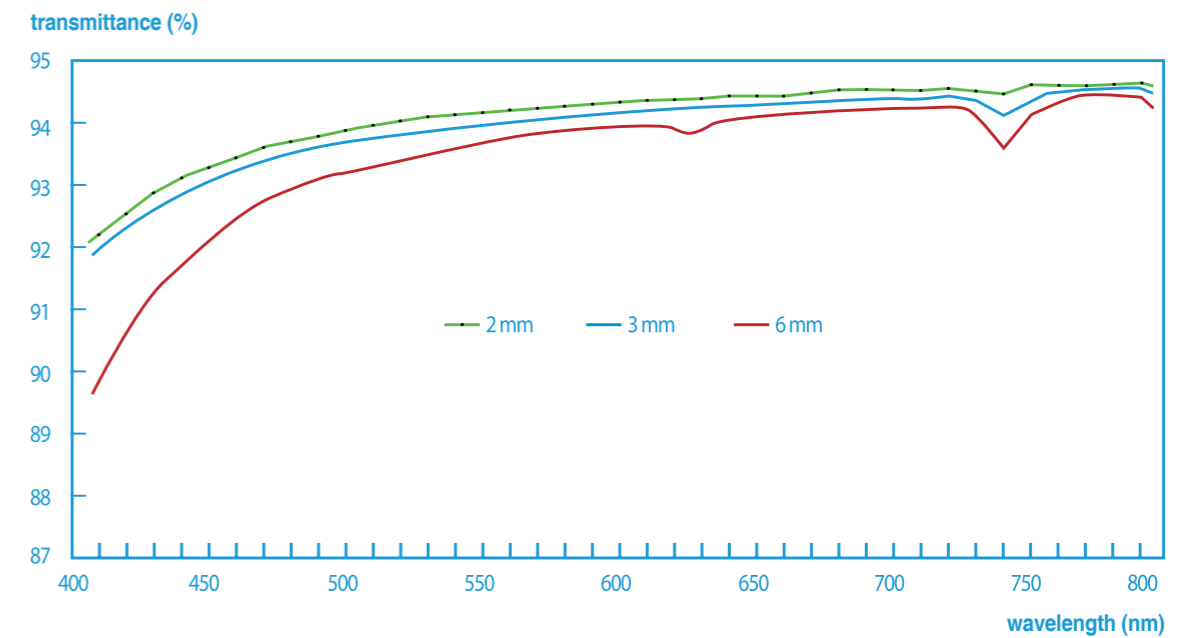
Caution) Typical property data values should not be used as specifications



Applications

- Nose pad
- Light guides
- Various parts of electronic devices

Transmittance according to thickness



LSR for Insulators & Cable Accessories

Insulators

Silicone is non-conductive because of its chemical nature. It is a good electrical insulator and has powerful hydrophobicity. In addition, LSR is easy to make and handle, and is lighter than porcelain.



Applications

- Insulators
- Surge arrester

Product	Test method	Insulator		Hollowcore Insulator
		SL8601	SL8609	SL8740
Mixing ratio		A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Gray, Light gray	Light gray	Light gray
Viscosity (Pa·s)*1	ASTM D 4287	65 / 65	200 / 200	30 / 25
Specific Gravity	ASTM D 792	1.08	1.11	1.15
Hardness (Shore A)	ASTM D 2240	42	49	40
Tensile strength (MPa)	ASTM D 412	6.0	8.0	7.5
Elongation (%)	ASTM D 412	400	500	400
Tear strength (N/mm)	ASTM D 624 B	20	30	25
Dielectric Strength (kV/mm)	ASTM D 149	25	25	25

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

Caution) Typical property data values should not be used as specifications

Cable accessories

Power transmission and distribution need cable joints to connect between cables. This cable joint needs high elongation, because the cable must be inserted easily. Even in cold conditions the cable joint is very durable.



Applications

- Cable joint (cold shrink, etc.)
- Cable terminators
- Switchgear

Product	Test method	Cable Accessories
		SL8640
Mixing ratio		A:B = 1:1
Appearance	ASTM E 1767	Translucent
Viscosity (Pa·s)*1	ASTM D 4287	80 / 70
Specific Gravity	ASTM D 792	1.08
Hardness (Shore A)	ASTM D 2240	40
Tensile strength (MPa)	ASTM D 412	7.0
Elongation (%)	ASTM D 412	550
Tear strength (N/mm)	ASTM D 624 B	18
Dielectric Strength (kV/mm)	ASTM D 149	25

OA Roller Grades

Many roller materials are being replaced with liquid silicone rubber. This is because LSR has a high temperature resistance for long periods of time and low compression set.



Applications

- Pressure rollers

Product	Test method	SL8335	SL8340
Mixing ratio		A:B = 1:1	A:B = 1:1
Appearance	ASTM E 1767	Reddish Brown	Reddish Brown
Viscosity (Pa·s)*1	ASTM D 4287	30 / 28	32 / 30
Specific Gravity	ASTM D 792	1.06	1.07
Hardness (Asker C)	ASTM D 2240	62	68
Tensile strength (MPa)	ASTM D 412	4.0	5.0
Elongation (%)	ASTM D 412	200	150
Compression set (%) *2	ASTM D 395	7	7

Curing condition : 170°C*10min press cure

*1 : Shear Rate 10s⁻¹

*2 : After post cure 200°C*4Hr, 180°C*22Hr

Caution) Typical property data values should not be used as specifications

Primers

Since LSR is difficult to adhere to plastic such as TPU and PE, primer is necessary. First, primer is sprayed or coated onto the surface of substrate. This primer should be cured in an oven at relatively low temperature. On the primer coated substrates, LSR is supplied and cured in the mold or oven.

Applications

- Keypads for mobile phones
- Gaskets for electronic device
- Insulators

Product	Test method	SL9801(K)	SL9805(S)
Mixing ratio		10:1	9:1
Appearance (A/B)	ASTM E 1767	Translucent / Transparent	Brown / Transparent
Viscosity (Pa·s)*1	ASTM D 4287	10 / 15 cP	0.45 / 8 cP
Solvent		Silicone (Cyclosiloxane)	Hydrocarbon base
Solid content (%)		50	33
Substrate		TPU, PC	FRP, Al, Zn, Cu, Fe, SUS 304, glass
Curing time		60min/70°C	20min/80°C

*1 : Shear Rate 10s⁻¹

Caution) Typical property data values should not be used as specifications