KCC SILICONE LSR

New world, New leader, New face

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KCC Silicone I Introduction

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

With state-of-the-art technology and ultra-modern production facilities, KCC seeks perfection in the quality of its products and customer services. Each product that KCC introduces to the marketplace is the result of creative and intensive R&D activities benefiting the diverse need of every customer. KCC 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 Worldwide Service Network









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.

within KCC 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 into a single legal entity entitled Kumgang Korea Chemical Co. Ltd. The company is known as KCC for short. products, better technical service, and more competitive prices. KCC 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 constructed the first silicone monomer production plant in Korea in 2003. KCC has made great R&D advances for the silicone industry with researchers specialized in the field of silicone products including silicone sealant for construction, industrial RTV, silane, fluids, emulsion and dispersion, as well as rubber.

Moreover, KCC makes contributions to promote the competitive power of our customers by supplying products corresponding to their needs and by concentrating

KCC KCC Silicone | Introduction



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KCC Silicone LSR Introduction

Liquid Silicone Rubber (LSR) consists mainly of silicone polymer and fumedsilica 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 ~ -90 °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 advatages are as follows.

• Ready-to-use material

KCC Silicone

- 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		H	τv
Classification	LON	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	Suit	able



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.



Liquid Injection Molding



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 platunum 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.

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Product	SL7220	SL7901	SL7230	SL7240
Mixing ratio	A:B = 1:1	A:B = 1:1	A:B = 1:1	A:B = 1:1
Appearance	translucent	translucent	translucent	translucent
Viscosity (Pa s)	210/210	290 / 290	260 / 260	330 / 330
Hardness (Shore A)	20	25	30	39
Tensile strength(MPa)	6	6	8	8
Elongation (%)	900	800	800	750
Tear strength (N/mm)	25	20	35	36
Food contact * (FDA, BfR)	\checkmark	\checkmark	\checkmark	\checkmark
Medical * (USP Class VI)				

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

* Having technical files based on the defined test methods

Product	SL7250	SL7260	SL7270	SL7270-M	SL8070	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	translucent, white	translucent, gray	translucent	translucent	translucent	translucent
Viscosity (Pa s)	350 / 350	330 / 330	300 / 300	300 / 300	225 / 225	400 / 400
Hardness (Shore A)	49	59	67	65	70	79
Tensile strength(MPa)	10	9	9	9	8.5	8.5
Elongation (%)	600	500	400	400	200	350
Tear strength (N/mm)	27	40	40	40	40	11
Food contact * (FDA, BfR)		\checkmark				
Medical * (USP Class VI)	\checkmark	\checkmark				

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



LSR is applied in 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.



Product	SL7220	SL7740	SL3331	SL3358	SL9200
Mixing ratio	A:B = 1:1	A:B = 1:1	A:B = 10:1	A:B = 10:1	A:B = 10:1
Appearance	Translucent	Off-white	Transparent	Translucent	Translucent
Viscosity (Pa s)	220	130	40 / 10	25 / 75	40 / 6.5
Hardness (Shore A)	20	38	35	22	33
Tensile strength(MPa)	7	4.5	3	6	4
Elongation (%)	900	380	250	900	300
Tear strength (N/mm)	35	15	-	-	20
Curing time*	<5min@ 150 °C	<5min@ 150 °C	<5min@ 120 °C	<5min@ 120 °C	<5min@ 150 °C

Product SL9300A SL9415 A:B = 100:0.3 A:B = 1:1 A:H Mixing ratio Light Appearance Translucent Tra yellow 80/0.2 Viscosity (Pa s) 90 / 75 24 16 Hardness (Shore A) 40 Tensile strength(MPa) 7 6.5 Elongation (%) 400 1000 Tear strength (N/mm) 23 _ <5min@ <5min@ Curing time 150 °C 150 °C

Curing time* : for thickness 2mm

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



- 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

L9903	SL9909	SL9503	SL9504
B = 10:1	A:B = 1:1	A:B = 10:1	A:B = 10:1
nslucent	Translucent	Highly transparent	Highly transparent
4 / 0.38	45 / 45	3 / 0.05	3 / 0.05
40	45	50	38
4	6	5.5	2
250	450	100	80
20	15	14	4
5min@ 150 °C	<5min@ 150 °C	<5min@ 150 °C	<5min@ 150 °C



LSR 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	SL8150	SL8160	SL9503	SL9504
Mixing ratio	A:B = 1:1	A:B = 1:1	A:B = 10:1	A:B = 10:1
Appearance	Highly transparent	Highly transparent	Highly transparent	Highly transparent
Viscosity (Pa s)	45 / 45	100 / 40	3 / 0.05	3 / 0.05
Hardness (Shore A)	55	65	50	38
Tensile strength(MPa)	6.5	6	5.5	2
Elongation (%)	350	300	100	80
Tear strength (N/mm)	30	28	14	4
Curing time	<10min@ 150 °C	<10min@ 150 °C	<10min@ 150 °C	<10min@ 150 °C
Refractive index	1.41	1.41	1.41	1.41

Transmittance according to thickness



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

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



Self lubricating LSR

There are many seals used for automotive. Just a few examples are connector seals, wire seals, and O-rings. Automotive parts are going to become smaller and lighter.

Therefore, very precise articles and produced by the LIM process. Also, in order to insert cable into complicated connectors, these seals must have very low friction energy using lubricant oils from the articles.

After curing is completed and several hours have past, it starts to bleed.

These grades are milky white. These LSR coated textiles and fabrics have non-slip and excellent mechanical properties.

Product	SL8534	SL8543	SL8544
Oil contents (%)	4	3	4
Hardness (Shore A)	31	41	42
Specific gravity	1.11	1.12	1.12
Viscosity (Pa·s)	330 / 330	320 / 320	380 / 340
Tensile strength (MPa)	7	7	7.5
Elongation (%)	800	650	640
Tear strength (N/mm)	30	35	34
Compression set (%)	22	20	201)

1) Post cure (4hrs at 200°C)

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



Product	SL8551	SL8552	SL8554
Oil contents (%)	1	2	4
Hardness (Shore A)	50	50	54
Specific gravity	1.13	1.12	1.13
Viscosity (Pa·s)	380 / 370	330 / 330	380 / 330
Tensile strength (MPa)	8	7	7
Elongation (%)	650	600	600
Tear strength (N/mm)	38	38	35
Compression set (%)	18	22	19



- Connector seals
- Wire seals
- O-rings



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





Cable accessories

between cables. be inserted easily.

Applications

- Switch gear

Product	SL8601	SL8609
Mixing Ratio	1:1	1:1
Appearance	white , gray, light gray	gray, light gray
Viscosity (mPa.s)	65	185
Hardness (Shore A)	44	49
Specific gravity	1.08	1.11
Tensile strength (MPa)	7	8
Elongation (%)	500	450
Tear strength (N/mm)	23	40

Caution) Typical property data values should not be used as specifications For the additional data, please contact our sales office.

Product	SL8640	SL7230
Mixing Ratio	1:1	1:1
Appearance	translucent	translucent
Viscosity (mPa.s)	70	260
Hardness (Shore A)	40	30
Specific gravity	1.08	1.11
Tensile strength (MPa)	6	8
Elongation (%)	550	800
Tear strength (N/mm)	18	35

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

• Cable joint (cold shrink, etc.) Cable terminators



Specialty grades

Airbags

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)
- Airbags (one piece woven)





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Product	SL9051	SL9055
Mixing ratio	A:B = 10:1	A:B = 1:1
Appearance	Light Yellow	Translucent
Viscosity (Pa·s)	20 / 20 1)	120 / 150 ²⁾
Hardness (Shore A)	28	10
Tensile strength (MPa)	2.5	4.2
Elongation (%)	300	1450
Scrub (stroke)	> 600	> 600
Airbag type	Cut & Sewn	One Piece Woven

Product SL830 Mixing ratio A:B = 1Reddish br Appearance Hardness (Asker C) 17 (C) 90 Viscosity Specific gravity 1.27 Tensile strength (MPa) 0.8 Elongation (%) 250 5 Compression set (%)

1) Rheometer shear rate 10 s-1 @ 25°C

2) Brookfield spindle 7 / 20 rpm @ 25°C

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

OA rollers

Many roller materials are replaced with liquid silicone

is because LSR has a high temperature resistance for long periods of time and low compression set.

Applications

• Pressure rollers

5	SL8312	
:1	A:B = 1:1	
rown	Reddish brown	
	26 (C)	
	90	
	1.27	
	1.4	
	250	
	5	



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

- Insulators
- Printing rollers

Product **SL9800AB** SL9801AB Mixing Ratio 10:1 10:1 Appearance (A / B) translucent / transparent translucent / transparent Viscosity (mPa.s) 12000 / 22 12000 / 22 Solvent Cyclosiloxane Toluene 50% Solid content 50% Substrate TPU, silicone rubber TPU, silicone rubber Curing time 50min/70°C 50min/55°C

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

Product	SL9805(T)	SL9805(S)
Mixing Ratio	1:1	9:1
Appearance (A / B)	yellowish / yellowish	brown / transparent
Viscosity (mPa.s)	3/3	450 / 8
Solvent	N-heptane	Hydrocarbon base
Solid content	5%	33%
Substrate	PFA	FRP, Al, Zn, Cu, Fe, SUS 304, glass
Curing time	3min/90°C	20min/80°C

• Keypads for mobile phones Gaskets for electronic devices

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