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SUNKYOUNG S.T CO., LTD.

**SUNKYOUNG S.T**

# **PRODUCT GUIDE**

Conductive Silicone  
Conductive Coating Silicone  
Silver Coated Powder  
Metal Spring Gasket  
Thermal Pad  
Absorber Products  
Silicone Rubber Products





## CEO GREETING

Greetings,  
I am Richard Han, the president of SUNKYOUNG S.T CO.,LTD.  
"We are keeping research and development and doing work responsibly."  
Sunkyoung S.T Co.,Ltd. is a leading manufacturer of EMI/EMC Shielding Conductive Silicone, Conductive Coating Silicone, Silicone rubber, Metal Spring Gasket, Absorber, Thermal Pad products since 2002 in Korea.  
We have the ability to generate any products to meet customers' specifications and these are used for telecommunication, IT, medical, industrial electronic equipment, military equipment and many other industrial areas.  
Our company offers top-notch services (high quality, reasonable price, prompt delivery, co-working with customers for new design, quick response) and provides products that meet various customer's expectation through continuous innovation and R&D development. Thank you for your untiring support to our company's products and we expect your constant cooperation.

## Company History

- 2013. 09** Patent registered as Method of Conductive Silicone Material Mixture
- 09** Certified UL-94 V-O Silicone (SKG-505)
- 2012. 07** Certified UL JMLU2 (SKCS60U)
- 02** Certified UL JMLU2 (ICT-30U)
- 2011. 11** Certified UL94 V-O Conductive Silicone-Nickel and Graphite(SKCS-NCG)
- 06** Established a Laboratory attached to the Company.(KOITA)
- 06** Selected for one of the 2011 New Exporters 300 in South Korea.(KITA)
- 02** Selected for one of the 2011 New Exporters 300 in South Korea.(KITA)
- 2010. 12** Certified UL94 V-O Conductive Silicone (SKCS-NCG)
- 06** Certified UL94 V-O Conductive Silicone-Carbon (SK-CS60U)
- 06** Established a Laboratory attached to the Company.(KOITA)
- 03** Certified UL JMLU2 standard(SKG-505)
- 2009. 08** Certified Clean Workplace(KOSHA)
- 2008. 12** Certified UL Mark(Silicone Connector Gasket)
- 03** Transferred to Sunkyoung ST CO.,Ltd.
- 2007. 04** Patent registered as Dyad Extruded EMI Shielding Technology.
- 2006. 11** Company moved to Hwaseong Factory.
- 2005. 07** Patented Well Ring(health products) on new device
- 06** Well Ring design was registered at the Patent Office
- 05** EMI Dyad Extruded Technology launched.
- 03** Registered as Venture business (Small & Medium Business Administration)
- 2004. 12** Certified Well Ring Trademark/patent
- 11** Well Ring(health products) was launched
- 11** Certified ISO 9001
- 05** EMI Shielding products were exported to Taiwan, Hong kong, and USA.
- 2003. 11** EMI Shielding Products were launched.
- 2002. 07** Sunkyoung Silicone Co. was established.



### Patents

### Certification



UL Certification : UL Certification:  
Gaskets and Seals : JMLU2  
Plastics : QMFZ2(flame retarding)



UL Certification: Gaskets and  
Seals: JMLU2



ISO 9001:2000



Patent : 10-0708905  
Formula of Double-Extrusion  
for Electric noise shielding



Patent : 10-0708906  
Formula of Double-Extrusion  
for Electric Noise Shielding &  
Absorbing



Patent : 10-1307238  
Formula of Silver Coated  
Copper for Electric Shielding



Patent : 10-1324322  
Formula of Mixed Conductive  
Material with Silicone

01

## EMI/EMC SHIELDING PRODUCTS CONDUCTIVE SILICONE

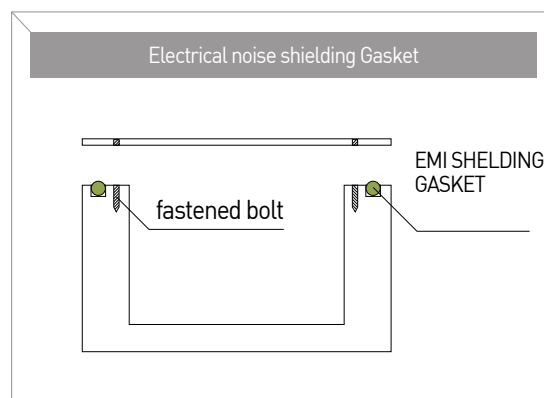
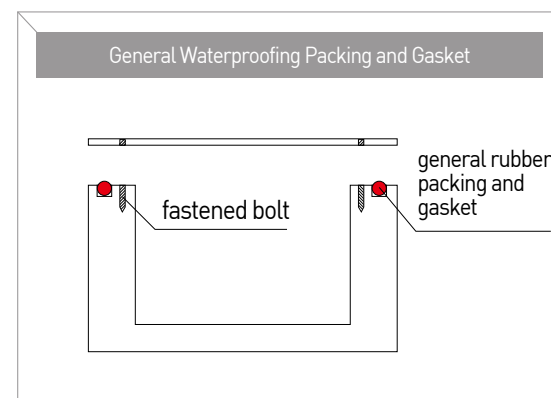
### General Description



We offer EMI Elastomers that are made of metal particles mixed with Silicone. These products are manufactured with technology for compounding and controlling shapes. The products have high conductivity and excellent shielding & sealing effectiveness. With these appealing characteristics, the products are used for telecommunication, information technology, medical and industrial electronic equipment and military equipment and many more areas.

### Features

- High conductivity
- Excellent sealing effectiveness (waterproof & dustproof)
- Halogen free
- Great resiliency
- Heat-resisting property
- RoHS compliant
- Quick delivery
- Excellent EMI shielding effectiveness



The general rubber packing or gasket is for waterproofing and protection against dust, but the shielding gasket is for noise shielding as well as waterproofing and protection.

### Electrically Conductive Silicone

Conductive Filler		SCC	SCA	SCN	SCG	NCG	CNT- NCG	Carbon	CNT- Carbon	CNT- Carbon SPG	TEST METHOD
Binder		Silicone									
Electrical Properties	Volume Resistivity ( $\Omega \cdot \text{cm}$ )	0.02	0.08	0.03	0.05	0.1	0.02	7.0	1.0	9.0	MIL-G- 83528
	Shielding Effectiveness (dB)	>80	>70	>70	>70	>40	>60	>20	>40	>30	ASTM D4935
Physical Properties	Specific Gravity(g/cm <sup>3</sup> )	3.8±0.2	2.0±0.2	2.2±0.2	2.5±0.2	3.0±0.2	3.0±0.2	1.3±0.2	1.3±0.2	1.0±0.2	ASTM D792
	Hardness (Shore A)	50~80 (±5)	50~80 (±5)	50~80 (±5)	50~80 (±5)	50~80 (±5)	50~80 (±5)	60~70 (±5)	60~70 (±5)	40~60 (±5)	ASTM D2240
	Tensile Strength (kgf/cm <sup>2</sup> )	30	20	20	20	20	20	60	60	1.9	ASTM D412
	Tear Strength (kgf/cm)	7	6	6	6	7	7	17	17		ASTM D624
	Elongation (%)Min	200	200	200	200	200	200	330	330	156	ASTM D412
	Service Temp. (°C)	-50~ +125	-50~ +150	-50~ +150	-50~ +150	-50~ +150	-50~+150	-50~+170	-50~+170		

Carbon Silicone : You can choose UL-V0 grade.

- **SCC** : Silver Coated Copper
- **SCA** : Silver Coated Aluminum
- **SPG** : SPONGE
- **SCN** : Silver Coated Nickel
- **SCG** : Silver Coated Glass
- **NCG** : Nickel Coated Graphite
- **CNT** : Carbon Nano Tube

### Products



- Tubing
- Hose / Gasket
- Round
- Hollow Square
- Gasket / O-ring
- Seal / Sheet
- Packing
- Bushing

### Applications



- EMI shielding
- Moisture sealing
- Electrical grounding
- Electrostatic discharge[ESD]

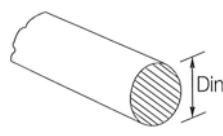


# 01 EMI/EMC SHIELDING PRODUCTS CONDUCTIVE SILICONE

## General Shapes & Parts number

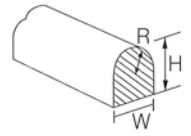
### Extruded Products

**O-strips**



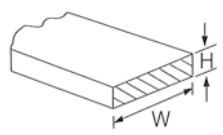
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① ② ③  
1. Serial number 2. Size(mm)  
3. Material : SC, SA, NG, Carbon

**D-Strips**



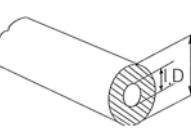
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3. H: Size(mm)  
4. Material : SC, SA, NG, Carbon

**Rectangular**



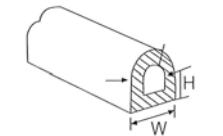
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4. Material : SC, SA, NG, Carbon

**O-Strips Tubing**



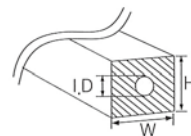
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① ② ③ ④  
1. Serial number 2. O.D: Size(mm)  
3. I.D: Size(mm)  
4. Material : SC, SA, NG, Carbon

**D-strips Tubing**



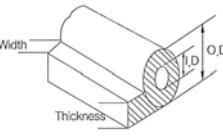
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① ② ③ ④  
1. Serial number 2. O.W(I.W): Size(mm)  
3. O.H(I.H): Size(mm)  
4. Material : SC, SA, NG, Carbon

**Rectangular Tubing**



P/N:SKCSRO-000-000-00-00  
① ② ③ ④ ⑤  
1. Serial number 2. W: Size(mm)  
3. H: Size(mm) 4. I.D: Size(mm)  
4. Material : SC, SA, NG, Carbon on

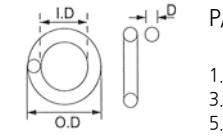
**P-Strips**



P/N:SKCSP-000-000-000-000-00  
① ② ③ ④ ⑤  
1. Serial number 2. W: Size(mm)  
3. Thickness: Size(mm)  
4. Material : SC, SA, NG, Carbon  
5. O.D: Size(mm) 6. I.D: Size(mm)

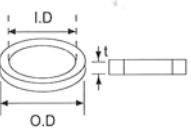
### Molded Products

**O-Strips Gasket**



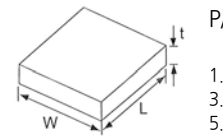
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① ② ③ ④ ⑤  
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3. Material 4. O.D: Size(mm)  
5. I.D: Size(mm)

**Washer Gasket**



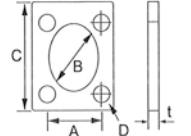
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① ② ③ ④ ⑤  
1. Serial number 2. Thickness(mm)  
3. Material 4. O.D: Size(mm)  
5. I.D: Size(mm)

**Sheet Type**



P/N:SKCSG-000-00-000-000  
① ② ③ ④ ⑤  
1. Serial number 2. Thickness(mm)  
3. Material 4. W: Size(mm)  
5. L: Size(mm)

**Connector Gasket**



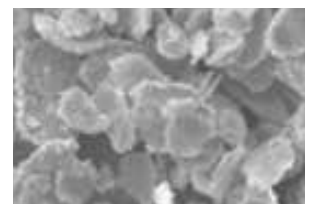
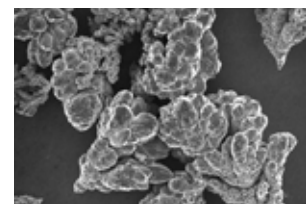
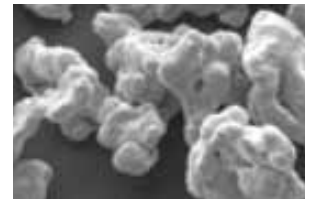
P/N:SKCMG-000-00-000-000-000  
① ② ③ ④ ⑤ ⑥ ⑦  
1. Serial number 2. Thickness(mm)  
3. Material 4. A Size(mm)  
5. B Size(mm) 6. C Size(mm)  
7. D Size(mm)

# 02 EMI/EMC COATING POWDER PRODUCTS SILVER COATED COPPER POWDER

## General Description



Sunkyoun ST's Silver coated Copper powder is made up of copper granules coated with silver. These metallic ingredients make the powder conductive, chemically stable. Due to these characteristics, the powder is used as a very stable filler for silicone elastomers.



### Products

- Conductive sheet(by pressing or extrusion)
- Conductive coatings
- Conductive Lubricants and Grease

## Typical Properties

	Test Method	Specifications
1	Appearance	Tiny Powder Color of Pale yellow
2	Powder type	Flake, Granule, Dendritic
3	Mean Particle Size	5 ~ 30 μm
4	Ag Composition(%)	8 ~ 20 %
5	Apparent Density(g/cm <sup>3</sup> )	> 3.0

# 03 Metal Spring Gasket SPIRAL GASKET

## General Description



This product uses heat treated beryllium copper and stainless steel as the main materials that have a great restoring force. It has a surface coated with tin, nickel, gold to prevent corrosion, and is designed as a spring shape aimed at excellent elasticity. This characteristic allows spring gasket to fit into material tightly even though the surface of material is not perfectly flat.



## Features

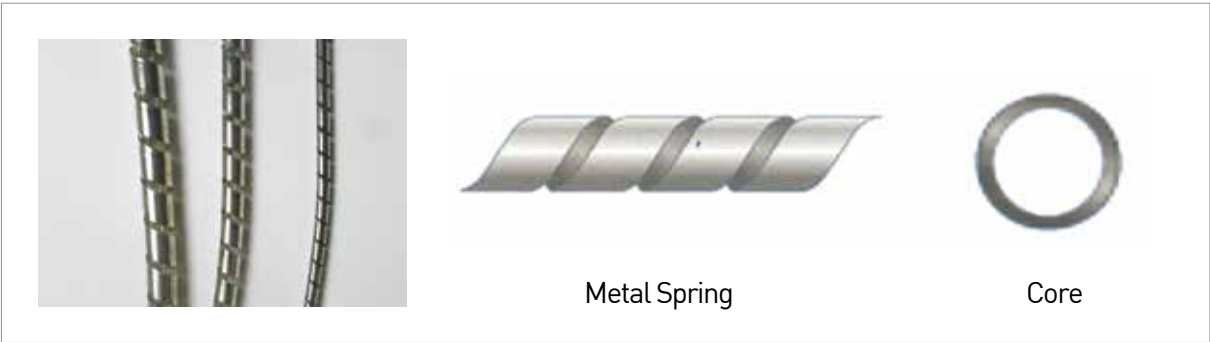
- RoHS compliant
- Excellent elasticity
- Excellent shielding performance

## Applications

This gasket solved the shielding problem that other metallic gaskets had not been able to by applying its high shielding ability. This high shielding effect of Metal Spring Gasket makes it perfect for military and aerospace projects. In spite of its great shielding effect, the price is still highly competitive, and this economical aspect of the product makes it suitable for many other commercial applications as well that require high shielding effect.

- Semiconductor manufacturing equipment
- Box of communications Equipment
- Various kinds of Equipment which need high-shielding

## Metal Spring Gasket

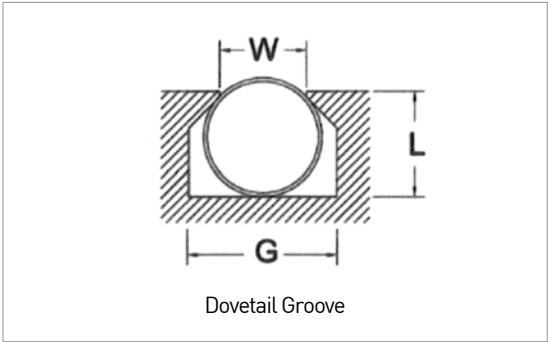
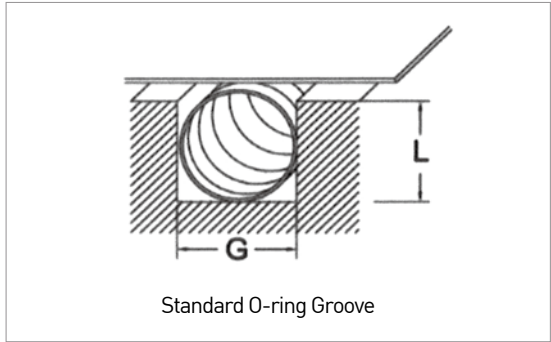


## Products Dimension

Parts No.	Diameter (mm)	Tolerance (±mm)	Thickness (mm)	Width (mm)	Weight (g/m)
SK-MSG-240-BeCu	2.4	0.1	0.07	3.2	3.501
SK-MSG-240-SUS			0.08	3.2	3.476
SK-MSG-320-BeCu	3.2	0.1	0.07	3.2	4.642
SK-MSG-320-SUS			0.08	3.2	4.642
SK-MSG-440-BeCu	4.4	0.1	0.1	4.6	10.417
SK-MSG-440-SUS			0.1	4.6	10.346
SK-MSG-470-BeCu	4.7	0.1	0.1	4.6	11.127
SK-MSG-470-SUS			0.1	4.6	11.042
SK-MSG-640-BeCu	6.4	0.1	0.12	6.3	21.314
SK-MSG-640-SUS			0.15	6.3	21.171

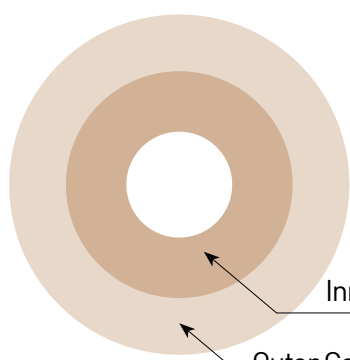
- ① Beryllium copper: BeCu ② Stainless steel : Sus  
 - Enable surface to be coated with Tin, Nickel, Gold  
 - Size can be various on request

## Applications



# 04 EMI/EMC CONDUCTIVE COATING PRODUCTS CONDUCTIVE COATING SILICONE


## General Description



Inner Core Silicone


Outer Coating Layer

Setting new standards for Conductive silicone out of Sunkyoun S.T's accumulated technology on conductive silicone, Sunkyoun S.T's conductive coating silicone product is an excellent way to achieve optimum compression force while maintaining excellent conductive properties.



Material : Conductive Filler (outer) + Silicone(inner)

- Better inner core resilience, compared to conventional solid-filled conductive silicone products.
- Thin conductive coating layer provides excellent EMI shielding effectiveness.
- More reasonable shielding cost due to using conductive filler only on thin layer.
- Very low compression force required to seal the applied places.



## Features

- High Conductivity
- RoHS compliant
- Great Resiliency
- Excellent Sealing Effectiveness
- Halogen Free Passed
- Low Compression Force



## EMI Shielding Conductive Silicone

Property		Unit	S.C.C	Test method
Electrical Properties	Conductive Coating Filter		Silver Coated Copper	
	Volume Resistivity	Ω/cm	0.02	MIL-G-83528 Surface Probe
	Shielding Effectiveness	dB	>80	ASTM D4935
Physical Properties	Binder		Silicone	
	Specific Gravity (filler/Base)	g/cm <sup>3</sup>	3.8±0.2/1.13	ASTM D792
	Hardness	Shore A	30~80(±5)	ASTM D2240
	Tensile Strength	Mpa	9.1	ASTM D412
	Tear Strength	N/m	27	ASTM D624
	Elongation	%	530	ASTM D412
	Service Temp.	°C	-50~+125	

- **SCN** : Silver Coated Nickel
- **SCA** : Silver Coated Aluminum
- **NCG** : Nickel Coated Graphite
- **SCG** : Silver Coated Glass
- **Pure Ag** : (Silver) Available

## Applications



- The Products have high conductivity and excellent shielding effectiveness
- Repeater
  - Medical Equipment
  - Army Equipment
  - Aero-Space Industry



05

## SILICONE RUBBER PRODUCTS SILICONE & SPONGE TYPE

### SILICONE RUBBER

SUNKYOUNG S.T's Silicone elastomer has various specifications – heat-resistant, proof against cold & oil, good electrical staffs can supply the products in customer ways to meet exact customers' requests.



#### Extruded & Molded Products

Silicone Products have two working ways; extruding and compressing.

Extruded products are long gaskets like tubes and hoses that are usually used for sealing, such as water & dust proofs in kitchen utensils, car door gaskets, semi-conductive equipment fields and many more. These products are non-toxic, high resilient, heat-resistant products.

Compressing product is used for parts of construction products. Using compressing ways, our staffs can make diverse shapes for various customers' needs.



### SILICONE SPONGE

If you want best resiliency and sealing effects, we recommend the silicone sponge products to you. We can fancy ourselves as the best techniques for compounding and molding, We have the perfect equipment for producing Silicone Sponge item.

Using different ways of compounding, we can manufacture Closed Cell Sponge.



#### Applications for Extruded Products

- Tubing
- Waterproof Gasket
- Dry-oven Gaskets
- Door/Window Gaskets
- Weather Strips
- FOOD Container Gaskets.
- Packing
- Hose
- Refrigerator Gaskets
- Cushions
- Building Airtight Gasket
- Extruded Sheet(Roll Type)
- Structure Glazing Gaskets
- Automobile/Shipbuilding Gaskets



#### Applications for Molded Products

- O-Ring/Seal
- Gaskets/Packing
- Diaphragm
- Switch Caps, Key-Pads
- Sheets
- Electronic Parts
- Medical Parts
- Flex Tubes
- Bushing



#### Applications for Sponge Products

- High temperature, Soft Packings/Gaskets
- Building Airtight Gaskets
- Automobile parts
- Cold storage packings
- Refrigerator Gaskets
- Electrical/Electronic parts
- Door Waterproof Gaskets
- Cushions, Sheets

## 06 EMI/EMC FOAM GASKET PRODUCTS CNT-CARBON FOAM GASKET

### General Description



CNT-CARBON FOAM GASKET developed by Sunkyoun ST Co., Ltd. It is combined CARBON and CNT, which is fine particle, and also possible to produce in the form of elastic conductive sponge by adding the function of electromagnetic shielding with the properties of carbon.

We also develop CARBON SPONGE material that does not contain CNTs, and it has functions such as anti-static, electromagnetic shielding conductivity and applicable to products of various sizes and shapes.

Conductive Filler		UNIT	Carbon	CNT-Carbon	CNT-Carbon SPG	TEST METHOD
Binder		Silicone				
Electrical Properties	Volume Resistivity	Ω	7.00	1.00	9.00	MIL-G-83528
	Shielding Effectiveness	dB	> 20	> 40	> 20~40	ASTM D4935
Physical Properties	Specific	g/cm <sup>3</sup>	1.3±0.2		1.0±0.2	ASTM D792
	Hardness	shore A	60~70 ± 5		40~60 ± 5	ASTM D2240
	Tensile strength	kgf/cm <sup>2</sup>	60		1.9 [N/mm <sup>2</sup> ]	ASTM D412
	Elongation	% min	17		155	ASTM D412
	Service temp.	℃	-20 ~ +85			

• CNT : Carbon Nano Tube

• SPG : SPONGE

### Features

- Anti-static
- RoHS compliant
- High-temperature automotive materials
- Biocompatible

### Applications

- Electrochemical capacitors
- Dynamic charge propagation

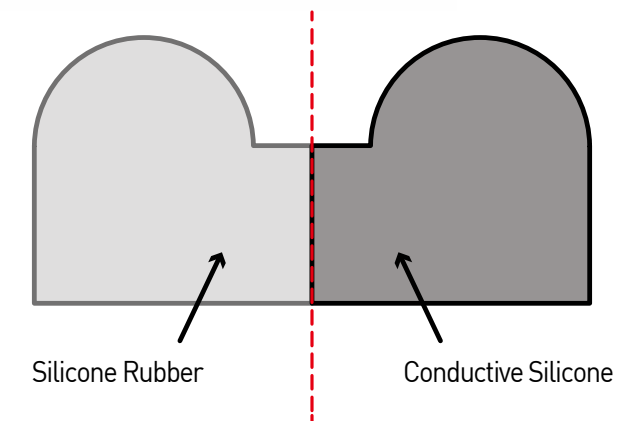
## 07 EMI/EMC SHIELDING PRODUCTS CONDUCTIVE DOUBLE SILICONE

### General Description



Double-extruded gasket has two layers of different materials in one single gasket.

While the outer layer prevent water, dust and other unwelcoming substances from getting into, the inner conductive part performs EMI shielding.



### Features

- RoHS compliant
- Excellent elasticity
- Excellent shielding performance

### Applications

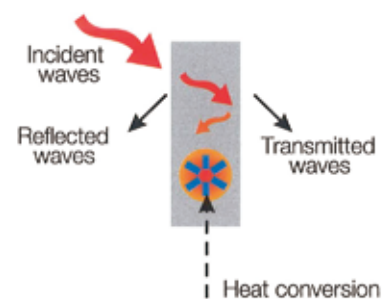
- Gaskets in metal-housings and electronics enclosure
- Especially useful in shore areas



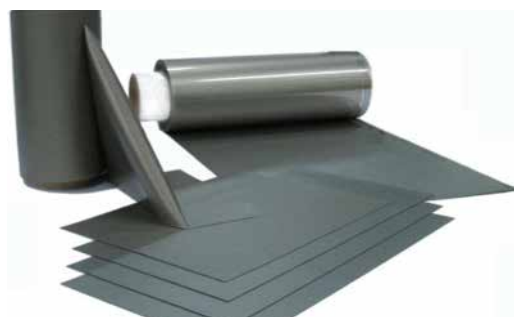
# 08

## ABSORBER PRODUCTS

### General Description



The 'SKAP' series is developed by SUNKYOUNG S.T.'s accumulated technologies of magnetic materials, and it eliminates undesirable noise effectively. You can solve EMC/EMI problems by simply attaching 'SKAP' series to the parts causing noise.

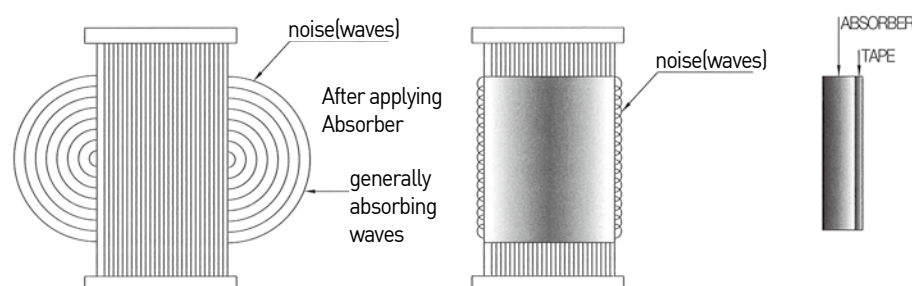


#### Part number construction (SKAP SERIES)

SKAP-0000-00

① ②

① Series ② Thickness



Absorber is used when electromagnetic waves have a negative effect on other components to drive a problem such as malfunction or false signal. You can solve problems by simply attaching the products to designated places

### EMI Shielding Conductive Silicone

Properties	UNIT	SKAP-3000 SERIES	SKAP-4000 SERIES	SKAP-6000 SERIES
Permeability	$\mu'$ @3MHz	30	40	100 ~ 250
Standard size	mm	210 (Width)		
Standard Thickness	mm	0.12 ~ 1.0		0.03 ~ 0.5
Frequency band		10MHz~6GHz		
Specific Gravity Density	g/cm <sup>3</sup>	2.8	3.3	3.7~4.0
Surface Resistance	$\Omega$	> 1 X 10		
Thermal Conductivity	W/mK	0.8		0.5
Tensile Strength	Kg/cm <sup>2</sup>	> 100		
Elongation	%	> 60		
Temperature	℃	-20 ~ +85		-30 ~ +100

### Features

- Excellent thermal conductivity
- Easy to assemble
- Flame Retardant UL94V-0
- RoHS compliant
- High resiliency & flexibility
- Great insulator

### Applications

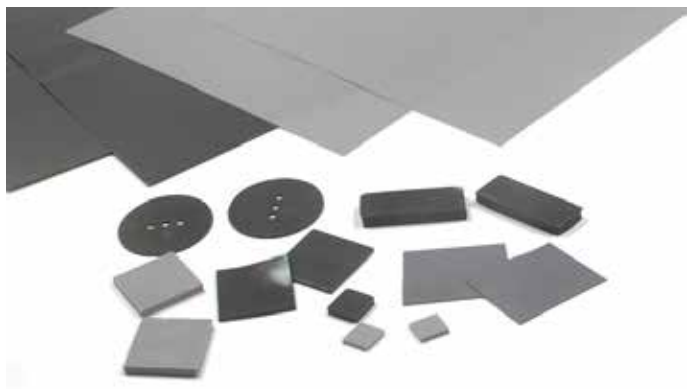


- Integrated Circuit(IC)
- Military equipment for Radar
- Flexible Printed Circuit(FPC)
- Computer, Camera module, Mobile Phone
- RFID Antenna
- Digital Satellite Television STB

09

Thermal Management Products  
**THERMAL PAD**

### General Description



SUNKYOUNG S.T 's thermal sheets are soft and flexible. Elastic thermal pad made of silicone material. They have so high thermal conductivity that can easily radiate heat outside of the electronic equipments. Thermal pads are used for heat spreader in Semi-conductor. (CPU, CO ROM, etc.)

### Features

- RoHS compliant
- Excellent elasticity
- Excellent shielding performance

### Part number construction (ST SERIES)

ST-00-00

① ②

① Thermally Conductivity ② Thickness

Properties	UNIT	ST01	ST02	ST03	ST05	ST07
Color		Gray	Light Pink	Blue	Pink	Gray
Binder		SILICONE				
Specific Gravity	g/cm <sup>3</sup>	2.51±0.1	2.84±0.1	2.96±0.1	3.10±0.1	3.20±0.1
Thickness	mm	0.5~11.0 ±10%	0.5~11.0 ±10%	0.5~11.0 ±10%	0.5~4.0 ±10%	0.5~5.0 ±10%
Hardness	shore 00	20~60±10	40,60±10	40,60±10	40,60±10	65±10
Thermal Conductivity	W/mk	>1.50	>2.0	>3.0	>5.0	>7.0
Flame retardant level	UL	V-0				
Volume Resistivity	Ω	>10 <sup>13</sup>				
Dielectric Breakdown	kV/mm	>6				
Use Temperature	℃	-50~180				

\*\*ST- Both Side Tacky / SST- Single Side Tacky -->1.5W ~ 3W Available

### Applications



- Integrated Circuit(IC)
- Military equipment for Radar
- Flexible Printed Circuit(FPC)
- Computer, Camera module, Mobile Phone
- RFID Antenna
- Digital Satellite Television STB



SUNKYOUNG S.T

Since 10 years, Sunkyoung st is electromagnetic professional enterprises, to become a necessary company as a part of the industry.

It is effort to develop our selves continually, forecast to preparing again 10 years Sunkyoung st.

***\*Most responsibility to enterprises!***

***\*Best Quality of enterprises!***

We will always concern & impression for customers.

We will do our best.

Thank you.

 **SUNKYOUNG S.T CO., LTD.**

**Sunkyoung ST,  
EMI Conductive Silicone  
Toward the best Quality  
and Technology**



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