

Fujipoly® New Product Technical Information

Sarcon® GR45A Series



Thermally Conductive and No Electricity Conductive Silicone Rubber Sheet

1. Features.

Sarcon® GR45A Series is a highly conformable and high thermal conducting gel material in a versatile sheet form that easily fits and adheres to most all shapes and sizes of components, including protrusions and recessed areas. It has a good handling characteristics due to highly mechanical properties.

Sarcon® GR45A Series is better thermal properties and mechanical properties than Sarcon® GR-m series.

- 1) Low thermal resistance
- 2) Soft, low stress on component
- 3) Low content of Low Molecular Siloxane

Series	characteristics	Constructions
Sarcon® GR45A-00	Silicone compound with double sticky surfaces	
Sarcon® GR45A-0H	Silicone compound as above GR45A-00 plus additional hardening of the top surface to facilitate handling and installation during complex assemblies	 Hardened surface

2. Typical properties.

Property	Unit	Sarcon® GR45A-00		Test method	Specimen ^{*1}
Color	-	Gray		Visual	-
Specific Gravity	-	3.22		JIS K 6220/ASTM D 792	A
Hardness	ASKER-C (Shore 00)	35 (60) / 1.5T less than		JIS K 7312/SRIS 0101	B
		20 (45) / 1.5T or more			
Thermal conductivity	W/m·K	4.5		ISO/CD 22007-2 (Hot Disk)	C
		6.0		ASTM D 2326	
Volume resistivity	M-Ohm·m	1.4×10 ⁵		JIS K 6249/ASTM D 257	D
Breakdown Voltage	kV/mm	17		JIS K 6249/ASTM D 149	D
Withstand Voltage	kV/min	14		JIS C 2110-1/ASTM D 149	D
Dielectric Constant	-	50Hz	8.98	JIS K 6911 / ASTM D 150	E
		1kHz	8.63		
		1MHz	8.05		
Dissipation factor	-	50Hz	0.0249	JIS K 6911 / ASTM D 150	E
		1kHz	0.0219		
		1MHz	0.00675		
Elongation	%	50		JIS K 6251(No.2)/ASTM D 412	A
Tensile Strength	Mpa (psi)	0.15 (23.2)		JIS K 6251(No.2)/ASTM D 412	A
Tear Strength	N/mm (ppi)	0.5 (0.3)		JIS K 6252(Angle)/ASTM D 624	A
Extractable volatiles	wt%	D ₄	0.0032	Gas Chromatographic Analysis by Abstracting Carbon tetrachloride	-
		D ₅ ~ D ₁₉	0.0010 or less		
		D ₂₀	0.0014		
Flammability	-	V-0 Equivalent		UL 94	-

*1 Specimen A: 2.0mmT (GR45A-00)

Specimen B: 30mmW x 50mmL x 12mmT (GR45A-00, 3mmT x 4pcs)

Specimen C: 50mmW x 50mmL x 3mmT (GR45A-00, 3mmT x 4pcs)

Specimen D: 120mmW x 120mmL x 1.0mmT (GR45A-00)

Specimen E: 2.0mmT (GR45A-00)

4. Compression Load / Sarcon® GR45A-00

[Unit : N (psi)]

Compression Rate	0.5mmT	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT	4.0mmT	5.0mmT
10%	130 (30.2)	166 (38.5)	69 (16.0)	52 (12.1)	46 (10.7)	36 (8.4)	31 (7.2)	27 (6.3)
20%	341 (79.1)	406 (94.2)	201 (46.6)	160 (37.1)	141 (32.7)	116 (26.9)	95 (22.0)	81 (18.8)
30%	549 (127.4)	711 (165.0)	372 (86.3)	300 (69.6)	259 (60.1)	216 (50.1)	169 (39.2)	139 (32.3)
40%	782 (181.4)	1032 (239.4)	545 (126.5)	441 (102.3)	373 (86.5)	308 (71.5)	239 (55.5)	195 (45.2)
50%	1037 (240.6)	1361 (315.8)	720 (167.1)	582 (135.0)	490 (113.7)	410 (95.1)	315 (73.1)	257 (59.6)
Sustain 50%	727 (168.7)	769 (178.4)	282 (65.4)	219 (50.8)	182 (42.2)	152 (35.3)	117 (27.1)	93 (21.6)

*Test method:

Specimen's dimensions 25mm x 25mm

Measured the force at 50% compression with the 25x25mm specimen set between two aluminum plates (27mmW x 27mmL x 4.0mmT).

Compression Velocity: 5.0mm/minute with 1,960N (200kgf) load Cell

Equipment: Compression Load tester (Aikoh Engineering MODEL-310N)

Sustain 50%: Sustain 50% at 1 minute later

5. Thermal Resistance / Sarcon® GR45A-00

[Unit : K· cm²/W (K· in²/W)]

Compression Force	0.5mmT	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT	4.0mmT	5.0mmT
100kPa (14.5psi)	1.78 (0.28)	2.37 (0.37)	2.94 (0.46)	3.60 (0.56)	4.40 (0.68)	5.08 (0.79)	6.16 (0.95)	7.34 (1.14)
300kPa (14.5psi)	1.54 (0.24)	2.09 (0.32)	2.65 (0.41)	3.13 (0.49)	3.60 (0.56)	4.14 (0.64)	4.51 (0.70)	4.44 (0.69)
500kPa (72.5psi)	1.33 (0.21)	1.94 (0.30)	2.38 (0.37)	2.73 (0.42)	2.71 (0.42)	3.19 (0.49)	3.44 (0.53)	3.46 (0.54)

*Remarks / Test piece size : φ33mm
Measuring device : ANALYSIS TECH
Thermal Interface Material Tester TIM Tester 1300

6. Aging Test

Property	Unit	70°C × 1,000hrs		150°C × 1,000hrs		
		Initial	After 1,000hrs	Initial	After 1,000hrs	
Specific Gravity	-	3.22	3.22	3.22	3.24	
Hardness	1.5mmT less than	ASKER-C (Shore 00)	35 (60)	42 (64)	35 (60)	78 (85)
	1.5mmT or more		20 (45)	25 (44)	20 (45)	78 (85)
Thermal conductivity	W/m· K	4.5	4.6	4.5	4.8	
Dielectric strength	kV/mm	17	18	17	20	

Property	Unit	60°C/95%RH × 1,000hrs		-40°C × 1,000hrs		
		Initial	After 1,000hrs	Initial	After 1,000hrs	
Specific Gravity	-	3.22	3.22	3.22	3.22	
Hardness	1.5mmT less than	ASKER-C (Shore 00)	35 (60)	36 (61)	35 (60)	35 (60)
	1.5mmT or more		20 (45)	25 (50)	20 (45)	20 (45)
Thermal conductivity	W/m· K	4.5	4.6	4.5	4.8	
Dielectric strength	kV/mm	17	17	17	16	

Property	Unit	+125°C(30min)⇌-40°C(30min) × 1,000hrs		
		Initial	After 1,000hrs	
Specific Gravity	-	3.22	3.23	
Hardness	1.5mmT less than	ASKER-C (Shore 00)	35 (60)	45 (69)
	1.5mmT or more		20 (45)	29 (54)
Thermal conductivity	W/m· K	4.5	4.6	
Dielectric strength	kV/mm	17	19	

7. Types and configuration.

Type	Product Name	Thickness	Sheet Size
Sarcon® GR45A-00	Sarcon® GR45A-00-50GY	0.5mm ± 0.15mm	300mm × 200mm (Recommended Usable Size: 280mm × 190mm)
	Sarcon® GR45A-00-100GY	1.0mm ± 0.20mm	
	Sarcon® GR45A-00-150GY	1.5mm ± 0.20mm	
	Sarcon® GR45A-00-200GY	2.0mm ± 0.30mm	
	Sarcon® GR45A-00-250GY	2.5mm ± 0.30mm	
	Sarcon® GR45A-00-300GY	3.0mm ± 0.30mm	
	Sarcon® GR45A-00-350GY	3.5mm ± 0.35mm	
	Sarcon® GR45A-00-400GY	4.0mm ± 0.40mm	
	Sarcon® GR45A-00-450GY	4.5mm ± 0.45mm	
	Sarcon® GR45A-00-500GY	5.0mm ± 0.50mm	
Sarcon® GR45A-0H	Sarcon® GR45A-0H-50GY	0.5mm ± 0.15mm	300mm × 200mm (Recommended Usable Size: 280mm × 190mm)
	Sarcon® GR45A-0H-100GY	1.0mm ± 0.20mm	
	Sarcon® GR45A-0H-150GY	1.5mm ± 0.20mm	
	Sarcon® GR45A-0H-200GY	2.0mm ± 0.30mm	
	Sarcon® GR45A-0H-250GY	2.5mm ± 0.30mm	
	Sarcon® GR45A-0H-300GY	3.0mm ± 0.30mm	
	Sarcon® GR45A-0H-350GY	3.5mm ± 0.35mm	
	Sarcon® GR45A-0H-400GY	4.0mm ± 0.40mm	
	Sarcon® GR45A-0H-450GY	4.5mm ± 0.45mm	
	Sarcon® GR45A-0H-500GY	5.0mm ± 0.50mm	

* Unit Conversion

- Thermal Resistance	°C·cm ² /W	→ × 0.155	→ °C·in ² /W
- Tensile Strength	MPa	→ × 10.2	→ kgf/cm ²
- Tear Strength	N/mm	→ × 1.02	→ kgf/cm
- Thermal Conductivity	W/m·K	→ × 2.39×10 ⁻³	→ cal/cm·sec·°C
- Compression Load	N	→ × 0.12	→ kgf

8. Handling Notes.

- It is recommended to use the material in up to 30% of compression ratio. Using the material beyond the recommended compression rate may result in excessive silicone oil exudation.
- It is recommended to compress the material with the equal ratio on the whole surface. Partial excessive stress may also result in excessive silicone oil exudation.

Statement of Lieu of Warranty

- Properties of the products may be revised due to some changes for improving performance.
- Properties values in this document are not specification or guaranteed.
- This product is made of silicone, and silicone oil may exude from the product.
- This product is made of silicone, and low molecular siloxane may vaporize depending on operating conditions.
- The product is designed, developed, and manufactured for general industrial use only. Never use for medical, surgical, and/or relating purposes. Never use for the purpose of implantation and/or other purposes by which a part of or whole product remains in human body.
- Before using, a safety must be evaluated and verified by the purchaser.
- Contents described in the document do not guarantee the performances and qualities required for the purchaser's specific purposes. The purchaser is responsible for pre-testing the product under the purchaser's specific
- Statements concerning possible or suggested uses made herein may not be relied upon, or be constructed, as a guaranty of no patent infringement.
- Copyright© 2013 Fujipoly®