

## Fujipoly Data Sheet

# SARCON® GR-d series

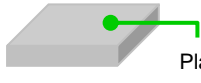
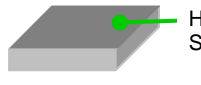
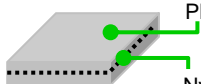
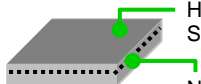
### Gap Filler Type

### FEATURES

**Highly Conformable, Non-Flammable, Isolation and High Heat Conducting Gel materials.**

- Gap filler materials are supplied in a fully cured state and remain pliable, easy conforming to minute surface irregularities.
- The basic Gap Filler Pad series can be further enhanced for special handling and die-cutting requirements.

### CONSTRUCTIONS

Series	Characteristics	Constructions
<b>SARCON® GR-d</b>	Silicone compound with double sticky surfaces and Thermal Conductivity of GR-d material is 1.5W/m-K by using Hot Wire (1.3W/m-K by using Hot Disk)	 Plain Type
<b>SARCON® GR-Hd</b>	Silicone compound as above GR-d plus additional hardening of the top surface to facilitate handling and installation during complex assemblies	 Hardened Surface
<b>SARCON® GR-F2d</b>	Silicone compound with Nylon mesh reinforcement stiffener to prevent stretching	 Plain Type Nylon Mesh
<b>SARCON® GR-HF2d</b>	Silicone compound as above GR-F2d plus additional hardening of the top surface to facilitate handling and installation during complex assemblies	 Hardened Surface Nylon Mesh

### THERMAL RESISTANCE

#### GR-d

Unit : K-cm<sup>2</sup>/W (K-in<sup>2</sup>/W)

Compression Force	0.5mmT	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT	4.0mmT	5.0mmT
100kPa /14.5psi	4.5 (0.69)	6.6 (1.03)	9.0 (1.39)	9.8 (1.52)	13.6 (2.10)	15.2 (2.35)	21.0 (3.25)	22.7 (3.52)
300kPa /43.5psi	3.4 (0.53)	5.3 (0.81)	6.3 (0.97)	7.3 (1.13)	11.0 (1.71)	11.4 (1.77)	15.6 (2.42)	16.7 (2.58)
500kPa /72.5psi	3.0 (0.46)	4.7 (0.73)	5.6 (0.87)	6.2 (0.97)	9.5 (1.47)	9.6 (1.48)	13.1 (2.03)	14.0 (2.17)

#### GR-Hd

Compression Force	0.5mmT	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT	4.0mmT	5.0mmT
100kPa /14.5psi	4.8 (0.74)	7.4 (1.15)	10.6 (1.64)	12.4 (1.92)	14.8 (2.29)	16.7 (2.59)	21.0 (3.26)	23.5 (3.64)
300kPa /43.5psi	3.7 (0.57)	6.5 (1.01)	9.0 (1.39)	10.1 (1.57)	12.9 (2.00)	14.6 (2.26)	16.5 (2.56)	19.0 (2.95)
500kPa /72.5psi	3.4 (0.53)	6.1 (0.95)	7.9 (1.22)	8.8 (1.36)	10.9 (1.69)	12.2 (1.89)	14.0 (2.17)	16.1 (2.50)

#### GR-F2d

Compression Force	0.5mmT	1.0mmT	2.0mmT
100kPa /14.5psi	4.9 (0.76)	7.4 (1.15)	12.9 (2.00)
300kPa /43.5psi	4.3 (0.66)	6.7 (1.03)	10.9 (1.69)
500kPa /72.5psi	4.0 (0.63)	6.1 (0.94)	9.8 (1.52)

#### GR-HF2d

Compression Force	0.5mmT	1.0mmT	2.0mmT
100kPa /14.5psi	4.9 (0.76)	7.6 (1.17)	13.3 (2.07)
300kPa /43.5psi	4.3 (0.66)	6.9 (1.07)	11.6 (1.79)
500kPa /72.5psi	4.1 (0.63)	6.4 (1.00)	10.5 (1.62)

Test method: Fujipoly Test method, FTM-P3050 by TIM Tester 1300 which is ASTM D5470 equivalent

- Specimen Area; DIA.33.0mm (1.30in)

**TYPICAL PROPERTIES**

Properties	unit	GR-d	Test method	Specimen		
Physical Properties	Color	-	Dark Gray	Visual	-	
	Specific Gravity	-	2.6	ASTM D792	A	
	Hardness Highest Value	Shore OO (ASKER C)	50 (18)	ASTM D2240 (ISO 7619)	B	
	Tensile Strength	MPa (psi)	0.3 (43.5)	ASTM D412	A	
	Elongation	%	100	ASTM D412	A	
	Tear Strength	N/mm (ppi)	1.0 (5.7)	ASTM D624	A	
Electrical Properties	Volume Resistivity	Ohm-m	1.0x10 <sup>12</sup>	ASTM D257	C	
	Breakdown Voltage	kV/mm (volts/mil)	18 (457)	ASTM D149	C	
	Dielectric Strength	kV/mm (volts/mil)	14 (356)	ASTM D149	C	
	Dielectric Constant	-	50Hz	5.82	ASTM D150	A
			1kHz	5.56		
			1MHz	5.46		
	Dissipation Factor	-	50Hz	0.0483	ASTM D150	A
1kHz			0.0147			
1MHz			0.0029			
Thermal Properties	Thermal Conductivity	W/m-K	1.5 by Hot Wire	ASTM D2326	-	
			1.3 by Hot Disk	ISO/CD 22007-2		
	Useful Temperature	°C (°F)	-40 to +150 (-40 to +302)		-	-
	Low molecular Siloxane	wt%	D <sub>4</sub> to D <sub>20</sub> Total	0.0099	Gas Chromatography	-
Flame Retardant	-	GR-d = V-0 (See.P4)		UL 94	-	

- Specimen A: 2mmT • Specimen B: 30mmW x 50mmL x 12mmT (3mmT x 4pcs) • Specimen C: 120mmW x 120mmL x 1mmT
- Test methods of Thermal Conductivity are based on Fujipoly Test Method, FTM P-1612 by Hot Disk and FTM P-1620 by Hot Wire.

**COMPRESSION FORCE****GR-d**Unit : N/6.4cm<sup>2</sup> (psi)

Compression Ratio	0.5mmT	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT	4.0mmT	5.0mmT
10%	142 (32.2)	121 (27.4)	101 (23.0)	100 (22.7)	78 (17.7)	60 (13.6)	46 (10.3)	40 (9.1)
20%	250 (56.6)	198 (44.9)	172 (39.0)	155 (35.1)	140 (31.7)	124 (28.1)	98 (22.1)	84 (19.0)
30%	394 (89.3)	308 (69.8)	279 (63.1)	249 (56.4)	221 (50.2)	202 (45.8)	175 (39.7)	157 (35.6)
40%	558 (126.4)	441 (99.9)	417 (94.5)	385 (87.2)	346 (78.4)	309 (70.0)	270 (61.2)	236 (53.5)
50%	720 (163.1)	626 (141.8)	597 (135.3)	579 (131.2)	519 (117.5)	463 (104.9)	395 (89.5)	337 (76.4)
Sustain 50%	360 (81.6)	340 (77.0)	292 (66.1)	306 (69.3)	270 (61.2)	252 (57.1)	189 (42.8)	152 (34.4)

**GR-Hd**

Compression Ratio	0.5mmT	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT	4.0mmT	5.0mmT
10%	198 (44.9)	147 (33.3)	134 (30.4)	123 (27.9)	95 (21.5)	86 (19.5)	76 (17.2)	61 (13.8)
20%	468 (106.0)	342 (77.5)	241 (54.6)	201 (45.5)	180 (40.8)	152 (34.4)	133 (30.1)	116 (26.3)
30%	712 (161.3)	530 (120.1)	402 (91.1)	307 (69.6)	275 (62.3)	240 (54.4)	232 (52.6)	190 (43.0)
40%	949 (215.0)	720 (163.1)	588 (133.2)	452 (102.4)	406 (92.0)	361 (81.8)	319 (72.3)	292 (66.2)
50%	1167 (264.4)	955 (216.4)	788 (178.5)	645 (146.1)	582 (131.9)	530 (120.1)	489 (110.8)	434 (98.3)
Sustain 50%	822 (186.2)	621 (140.7)	457 (103.5)	429 (97.2)	378 (85.6)	313 (70.9)	306 (69.3)	284 (64.3)

Test method: Measured by ASTM D575-91 for reference

- Specimen Area; DIA.28.6mm (1.13in) • Platen Area; DIA. 28.6mm (1.13in) • Sustain 50%: Sustain 50% at 1 minute later
- Compression Velocity; 5.0mm/minute

**GR-F2d**Unit : N/6.4cm<sup>2</sup> (psi)

Compression Ratio	0.5mmT	1.0mmT	2.0mmT
10%	157 (35.6)	260 (58.9)	117 (26.5)
20%	344 (77.9)	535 (121.2)	254 (57.5)
30%	587 (133.0)	783 (177.4)	416 (94.3)
40%	845 (191.4)	1051 (238.1)	622 (140.9)
50%	1115 (252.6)	1345 (304.7)	877 (198.7)
Sustain 50%	885 (200.5)	791 (179.2)	561 (127.1)

**GR-HF2d**

Compression Ratio	0.5mmT	1.0mmT	2.0mmT
10%	178 (40.3)	245 (55.5)	154 (34.9)
20%	426 (96.5)	598 (135.5)	353 (80.0)
30%	679 (157.9)	877 (198.7)	584 (132.3)
40%	972 (220.2)	1170 (265.1)	849 (192.4)
50%	1259 (285.2)	1495 (338.7)	1103 (249.9)
Sustain 50%	1057 (239.5)	1078 (244.2)	690 (156.3)

Test method: Measured by ASTM D575-91 for reference

- Specimen Area; DIA.28.6mm (1.13in) • Platen Area; DIA. 28.6 (1.13in) • Sustain 50%: Sustain 50% at 1 minute later
- Compression Velocity; 5.0mm/minute

**DURABILITY**

Test Property	Unit	70°C		150°C	
		Initial	After 1,000hrs	Initial	After 1,000hrs
Specific Gravity	-	2.6	2.6	2.6	2.6
Hardness	ASKER C	18	22	18	21
Breakdown Voltage	kV/mm	18	20	18	21
Thermal conductivity	W/m-K	1.5	1.5	1.5	1.5

Test Property	Unit	60°C/95%RH		-40°C	
		Initial	After 1,000hrs	Initial	After 120hrs
Specific Gravity	-	2.6	2.6	2.6	2.6
Hardness	ASKER C	18	20	18	18
Breakdown Voltage	kV/mm	18	20	18	18
Thermal Conductivity	W/m-K	1.5	1.5	1.5	1.5

Test Property	Unit	-40°C(30min)↔+85°C(30min)	
		Initial	After 120hrs
Specific Gravity	-	2.6	2.6
Hardness	ASKER C	18	20
Breakdown Voltage	kV/mm	18	18
Thermal Conductivity	W/m-K	1.5	1.5

- Specimen : GR-d • Test methods of Thermal Conductivity base on Fujipoly Test Method, FTM P-1620 by Hot Wire.

reduced temperature

-40°C = -40°F

60°C = 140°F

70°C = 158°F

85°C = 185°F

150°C = 302°F

## TYPES AND CONFIGURATION

Series	Product Name	Thickness	Sheet Size	Flame Retardant
SARCON® GR-d	50G-d	0.5mm ± 0.05mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)	UL94 V-0
	100G-d	1.0mm ± 0.10mm		
	150G-d	1.5mm ± 0.15mm		
	200G-d	2.0mm ± 0.20mm		
	250G-d	2.5mm ± 0.25mm		
	300G-d	3.0mm ± 0.30mm		
	350G-d	3.5mm ± 0.30mm		
	400G-d	4.0mm ± 0.30mm		
	450G-d	4.5mm ± 0.30mm		
	500G-d	5.0mm ± 0.30mm		
SARCON® GR-Hd	50G-Hd	0.5mm ± 0.05mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)	UL94 V-0
	100G-Hd	1.0mm ± 0.10mm		
	150G-Hd	1.5mm ± 0.15mm		
	200G-Hd	2.0mm ± 0.20mm		
	250G-Hd	2.5mm ± 0.25mm		
	300G-Hd	3.0mm ± 0.30mm		
	350G-Hd	3.5mm ± 0.30mm		
	400G-Hd	4.0mm ± 0.30mm		
	450G-Hd	4.5mm ± 0.30mm		
	500G-Hd	5.0mm ± 0.30mm		
SARCON® GR-F2d	50G-F2d	0.5mm ± 0.15mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)	UL94 V-1
	100G-F2d	1.0mm ± 0.20mm		
	150G-F2d	1.5mm ± 0.20mm		
	200G-F2d	2.0mm ± 0.30mm		
SARCON® GR-HF2d	50G-HF2d	0.5mm ± 0.15mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)	UL94 V-1
	100G-HF2d	1.0mm ± 0.20mm		
	150G-HF2d	1.5mm ± 0.20mm		
	200G-HF2d	2.0mm ± 0.30mm		

## 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.

## WARRANTY STATEMENT

- Fujipoly has been utilizing Hot Disk method and TIM Tester method since Fujipoly defined them as Fujipoly standard.
- 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 conditions and for verifying the expected performances.
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