Updated: May 30th 2006

Fujipoly New Product Technical Information

NEW PRODUCTS : SARCON® GR-Pm, XR-Pe

Highly Thermal Conductive and Non-Flammable Silicone Putty Sheets

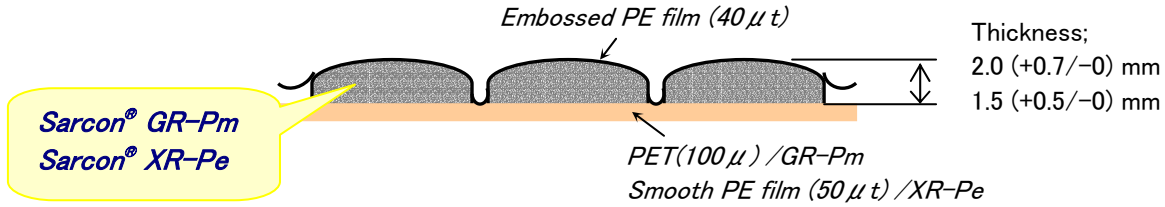
1. Features:

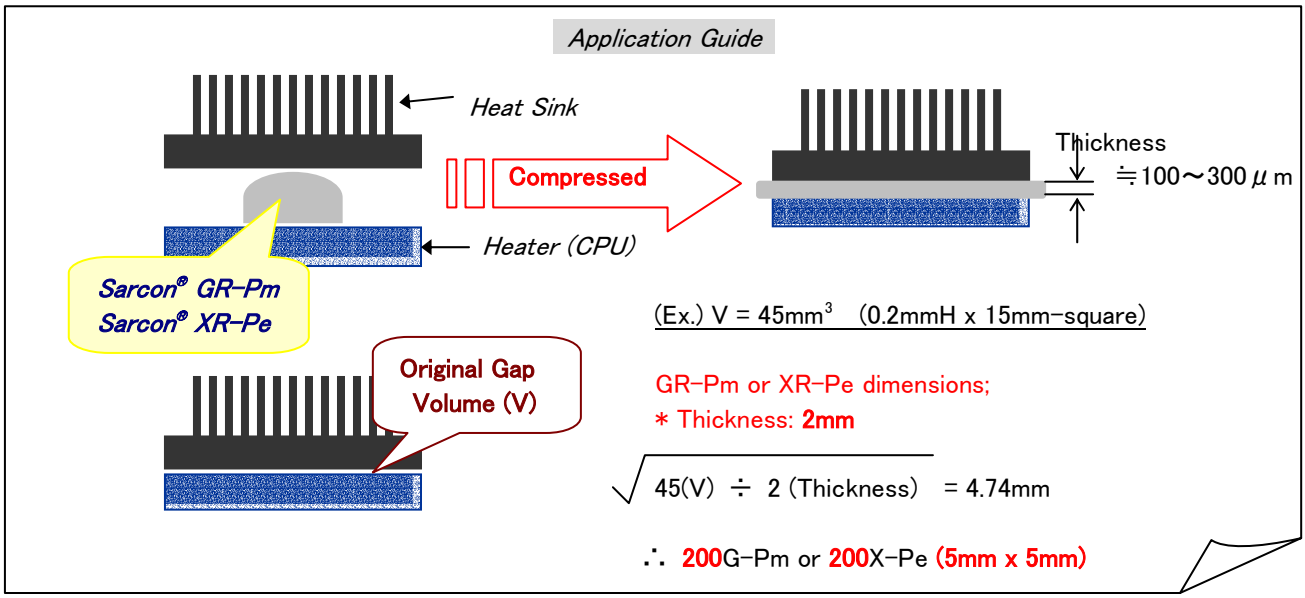
Sarcon® GR-Pm and XR-Pe are highly conformable/thermally conductive **putty materials**. They preserve thermal performance of the original Sarcon® GR-m and XR-e materials, **6 Watt/m-K** and **11 Watt/m-K** (electrically non-conductive) in a versatile sheet form that easily fit and adhere to most of shapes and sizes of components, and make reliable and complete physical contact.

The surface consistency of the pads is excellent for filling air gaps and uneven surfaces.

1) Easy to flow and fill gaps with low compression force at high compression rate.
2) Suitable for filling gapes of 0.3 mm or less.
3) Give the best thermal properties and reliability.
4) Have a flame retardancy of UL specification 94 V-0.
5) Low Molecular Siloxane content is very low.

2. Construction:





3. Variety of Sarcon® GR-Pm & XR-Pe products:

Series	Construction	Application Guidelines
Sarcon® GR-Pm **Sarcon® XR-Pe**	Silicone compound	Between chassis wall and other surface. Between CPU and heat sink. Between semiconductor and heat sink.

* Can be designed for custom applications. (Cutting. Punching)

FUJI POLYMER INDUSTRIES CO., LTD. Overseas Dept.

4. Typical Product Properties:

4-1. Thermal properties and Flame retardancy: (Typical Value)

Item	Sarcon® GR-Pm		Sarcon® XR-Pe		Test Method
Thermal Conductivity (Watt/m-K)	6		11		ASTM D 5470
Thermal Resistance (°C-inch²/Watt)	Compression / Original thickness: 1.5 mm				ASTM D 5470
	30% (0.45mm)	0.26	30% (0.45mm)	0.18	
	50% (0.75mm)	0.20	50% (0.75mm)	0.14	
	70% (1.05mm)	0.14	70% (1.05mm)	0.10	
	90% (1.35mm)	0.08	90% (1.35mm)	0.06	
	Compression / Original thickness: 2.0 mm				
	30% (0.6mm)	0.32	30% (0.6mm)	0.22	
	50% (1.0mm)	0.25	50% (1.0mm)	0.18	
	70% (1.4mm)	0.18	70% (1.4mm)	0.12	
	90% (1.8mm)	0.08	90% (1.8mm)	0.06	
Flame Retardancy	V-0				UL94 standard

4-2. Extractable Volatile (Low Molecular Siloxane Content): (Typical Value)

Dn	Sarcon® GR-Pm	Sarcon® XR-Pe	Test Method
Total less D_{20}	≒0.0031 wt%	≒0.0014 wt%	Gas Chromatographic Analysis by Abstracting Acetone

5. Typical Material Properties:

Item		Sarcon® GR-Pm	Sarcon® XR-Pe	Test Method
Color		Dark Reddish Gray	Gray	Visual
Plasticity number (mm)		0.23	0.25	JIS K6300 (ASTM D962 equivalent)
Specific Gravity		3.1	3.3	JIS K6249 (ASTM D792 equivalent)
Volume resistivity (MΩ·m)		$1.3x10^6$	$7.0x10^3$	JIS K6249 (ASTM D257 equivalent)
Dielectric strength (kV/mm)		13	11	JIS K6249 (ASTM D149 equivalent)
Dielectric constant	50Hz	6.4	N.A.	JIS K6911 (ASTM D149 equivalent)
	1kHz	6.4	7.5	
	1MHz	6.4	7.5	
Dissipation Factor	50Hz	0.035	N.A.	
	1kHz	0.005	0.018	
	1MHz	0.001	0.008	

Note; Test was implemented with cured specimens in order to measure accurate electrical properties.

6. Typical Compressibility data;

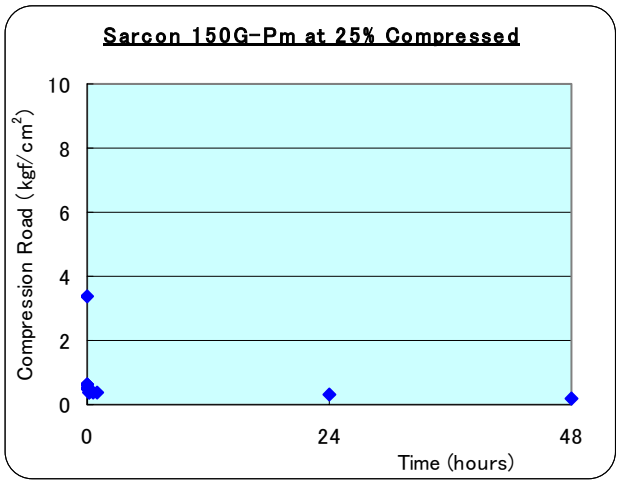
6-1. The Compression Load;

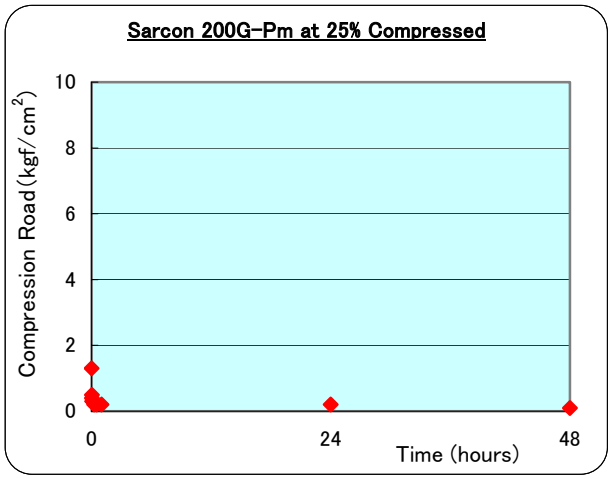
Specimen		150G-Pm/200G-Pm	150X-Pe/200X-Pe
Compression (kgf)	10%	0.4 / 0.4	0.8 / 0.8
	20%	1.1 / 1.0	2.1 / 1.9
	30%	2.0 / 1.8	3.3 / 3.0
	40%	3.1 / 3.4	4.1 / 4.4
	50%	4.0 / 6.0	5.4 / 7.0
	Sustain 50%	0.8 / 1.4	1.4 / 2.0

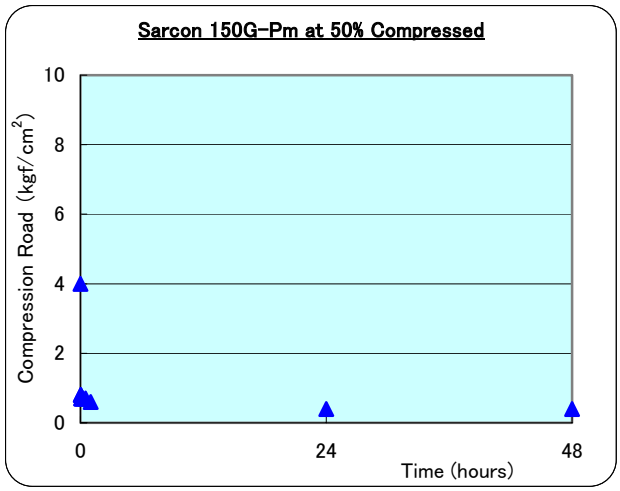
Notes/Test method;
Fujipoly test method (Fig.1)
*Specimen: 10mm square,
1.5mm & 2.0mm thick
*Compression Velocity:
5.0mm/minute
with 200 kgf load cell
*Sustain 50% at 1 minute after

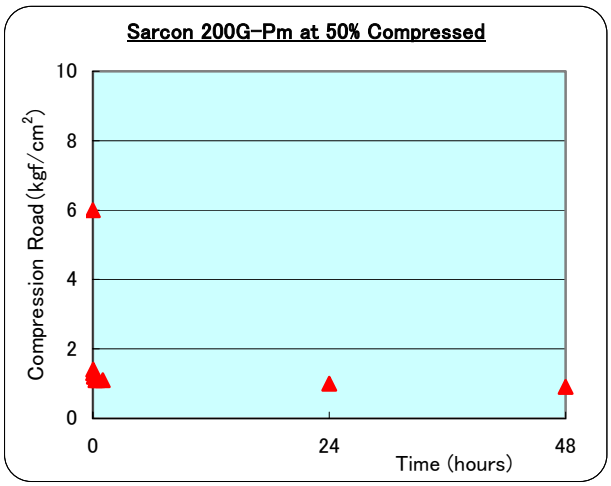
6-2. The Relaxation of Compression Load;

Specimen	150G-Pm		200G-Pm	
Comp. Rate	25%	50%	25%	50%
Time	Comp. Load (kgf/cm^2)		Comp. Load (kgf/cm^2)	
Peak (0)	3.4	4.0	1.3	6.0
1 minute	0.6	0.8	0.5	1.4
2 minutes	0.6	0.8	0.4	1.3
3 〃	0.6	0.7	0.3	1.3
5 〃	0.5	0.7	0.3	1.2
10 〃	0.4	0.7	0.3	1.2
15 〃	0.4	0.7	0.2	1.1
30 〃	0.4	0.7	0.2	1.1
60 〃	0.4	0.6	0.2	1.1
24 hours	0.3	0.4	0.2	1.0
48 〃	0.2	0.4	0.1	0.9









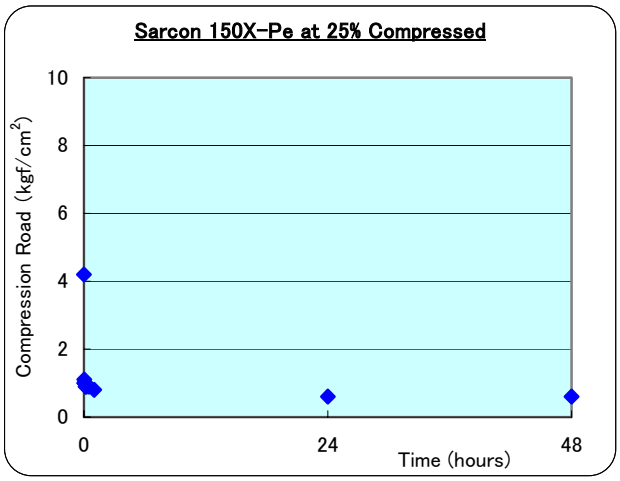
Notes / Test method; Fujipoly Test method (Fig.1)

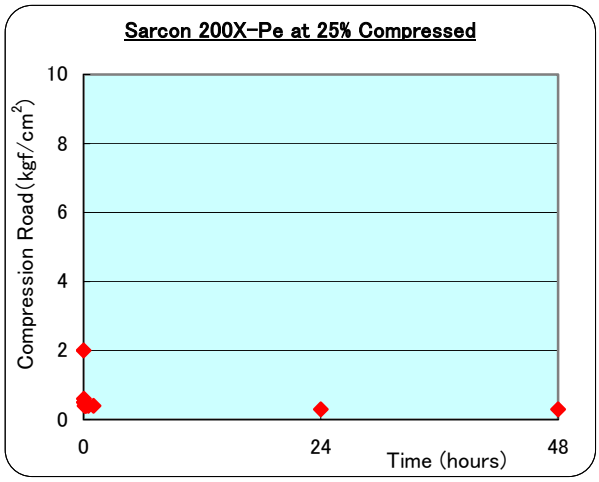
*Specimen: **10mm square, 1.5mm thickness**

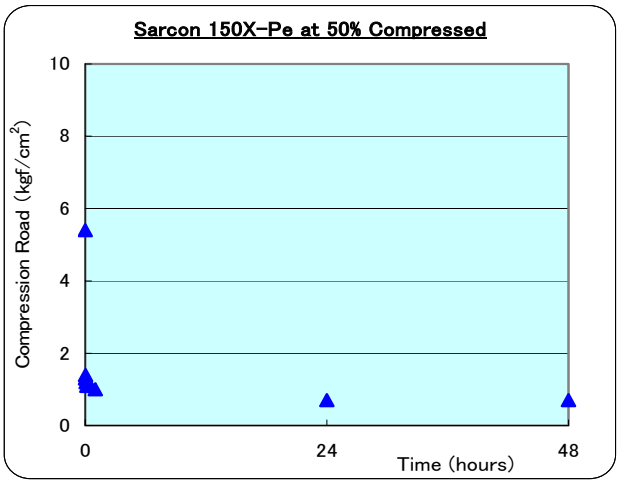
*Compression Velocity: 5.0mm/minute with 200kgf load cell

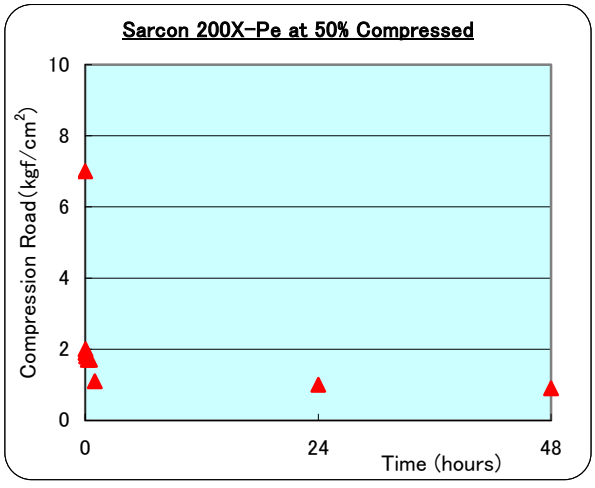
*Compression Rate: 25%, 50%

Specimen	150X-Pe		200X-Pe	
Comp. Rate	25%	50%	25%	50%
Time	Comp. Load (kgf/cm^2)		Comp. Load (kgf/cm^2)	
Peak (0)	4.2	5.4	2.0	7.0
1 minute	1.1	1.4	0.6	2.0
2 minutes	1.0	1.3	0.5	1.9
3 〃	1.0	1.2	0.5	1.9
5 〃	0.9	1.1	0.4	1.8
10 〃	0.9	1.1	0.4	1.8
15 〃	0.9	1.1	0.4	1.7
30 〃	0.9	1.1	0.4	1.7
60 〃	0.8	1.0	0.4	1.1
24 hours	0.6	0.7	0.3	1.0
48 〃	0.6	0.7	0.3	0.9









Notes / Test method; Fujipoly Test method (Fig.1)

*Specimen: **10mm square, 2.0mm thickness**

*Compression Velocity: 5.0mm/minute with 200kgf load cell

*Compression Rate: 25%, 50%

7. Typical Reliability data;

Specimen: **Sarcon® GR-Pm (200G-Pm)**

Temperature: +120℃ (Thermal Resistance: ℃·in²/W)

Compression Rate	30%	70%	90%
Area of compressed	1.43 cm²	3.33 cm²	2.50 cm²
Before test	0.33	0.20	0.08
After 100 hours	0.33	0.18	0.09
After 250 hours	0.34	0.18	0.08
After 500 hours	0.35	0.16	0.06
After 1,000 hours	0.30	0.20	0.07

Temperature: +150℃ (Thermal Resistance: ℃·in²/W)

Compression Rate	30%	70%	90%
Area of compressed	1.43 cm²	3.33 cm²	2.50 cm²
Before test	0.34	0.20	0.08
After 100 hours	0.33	0.23	0.06
After 250 hours	0.32	0.21	0.06
After 500 hours	0.30	0.22	0.06
After 1,000 hours	0.32	0.21	0.06

Specimen: **Sarcon® XR-Pe (200X-Pe)**

Temperature: +120℃ (Thermal Resistance: ℃·in²/W)

Compression Rate	30%	70%	90%
Area of compressed	1.43 cm²	3.33 cm²	2.50 cm²
Before test	0.22	0.14	0.06
After 100 hours	0.23	0.15	0.05
After 250 hours	0.27	0.16	0.06
After 500 hours	0.30	0.17	0.08
After 1,000 hours	0.32	0.21	0.08

Temperature: +150℃ (Thermal Resistance: ℃·in²/W)

Compression Rate	30%	70%	90%
Area of compressed	1.43 cm²	3.33 cm²	2.50 cm²
Before test	0.22	0.14	0.06
After 100 hours	0.41	0.18	0.05
After 250 hours	0.38	0.20	0.06
After 500 hours	0.42	0.22	0.05
After 1,000 hours	0.42	0.24	0.07

Notes / Test method; ASTM D 5470 method equivalent (Fig.2)
Compressed 200G-Pm **10mm-square** and 200X-Pe **10mm-square** at **30% and 70%** between 2 Aluminum plates.
Compressed 200G-Pm **5mm-squre** and 200X-Pe **5mm-squre** at **90%** between 2 Aluminum plates.

Fig.1 Compression Load

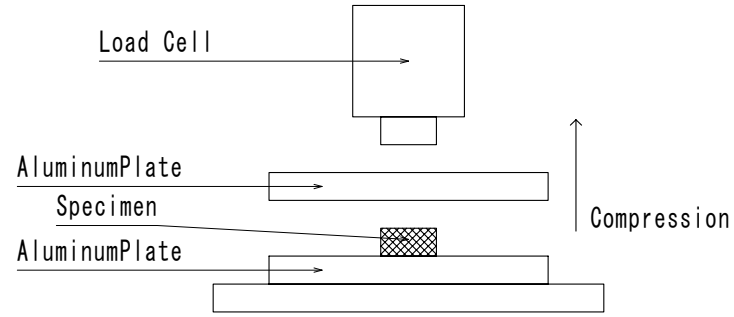


Fig.2 Thermal Resistance