FUJIPOLY

Fujipoly Data Sheet

SARCON NR-c series

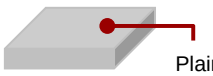
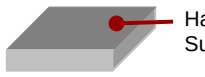
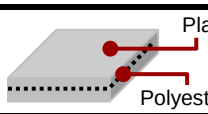
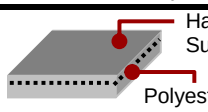
Non-Silicone Gap Filler Type

FEATURES

Highly Thermally Conductive and Non-Silicone Gel materials.

SARCON NR-c is a highly conformable, thermally conductive, acrylate resin (non-silicone) sheet with thermally conductive fillers. Available in sheets and die-cut forms for formal interface uses wherever gap filler pads are traditionally used.

CONSTRUCTIONS

Series	Characteristics	Constructions
SARCON NR-c	Non-Silicone compound / Acrylate Resin with double sticky surfaces and Thermal Conductivity of NR-c material is 1.5W/m-K by using Hot Wire (1.3W/m-K by using Hot Disk)	 Plain Type
SARCON NR-Hc	Non-Silicone compound as above NR-c plus additional hardening of the top surface to facilitate handling and installation during complex assemblies	 Hardened Surface
SARCON NR-Tc	Non-Silicone compound with Polyester mesh reinforcement stiffener to prevent stretching	 Plain Type Polyester Mesh
SARCON NR-HTc	Non-Silicone compound as above NR-Tc plus additional hardening of the top surface to facilitate handling and installation during complex assemblies	 Hardened Surface Polyester Mesh

THERMAL RESISTANCE

Unit：K-cm^2/W (K-in^2/W)

NR-c

Compression Force	1.0mmT	1.5mmT	2.0mmT	3.0mmT
100kPa /14.5psi	6.6 (1.02)	9.0 (1.39)	11.3 (1.75)	16.2 (2.52)
300kPa /43.5psi	5.1 (0.78)	7.5 (1.16)	8.5 (1.32)	12.5 (1.93)
500kPa /72.5psi	4.0 (0.61)	6.6 (1.02)	7.0 (1.08)	10.2 (1.58)

NR-Hc

Compression Force	1.0mmT	1.5mmT	2.0mmT	3.0mmT
100kPa /14.5psi	6.6 (1.03)	10.2 (1.58)	13.6 (2.10)	18.6 (2.88)
300kPa /43.5psi	5.5 (0.86)	8.9 (1.37)	11.0 (1.71)	14.4 (2.24)
500kPa /72.5psi	5.0 (0.77)	8.0 (1.24)	9.6 (1.48)	12.1 (1.87)

NR-Tc

Compression Force	0.5mmT	1.0mmT	2.0mmT
100kPa /14.5psi	4.0 (0.62)	7.6 (1.17)	13.4 (2.08)
300kPa /43.5psi	3.8 (0.59)	7.1 (1.09)	12.3 (1.90)
500kPa /72.5psi	3.7 (0.57)	6.8 (1.06)	11.2 (1.74)

NR-HTc

Compression Force	0.5mmT	1.0mmT	2.0mmT
100kPa /14.5psi	4.4 (0.68)	7.5 (1.16)	14.0 (2.17)
300kPa /43.5psi	4.3 (0.66)	7.1 (1.09)	12.4 (1.92)
500kPa /72.5psi	4.2 (0.64)	6.7 (1.04)	11.4 (1.77)

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		NR-c	Test method	Specimen
Physical Properties	Color	-		Light Gray	Visual	-
	Specific Gravity	-		2.1	ASTM D792	A
	Hardness Highest Value	Shore OO (ASKER-C)		53 (27)	ASTM D2240 JIS K7312	B
	Tensile Strength	MPa (psi)		0.2 (29.0)	ASTM D412	A
	Elongation	%		150	ASTM D412	A
	Tear Strength	N/mm (ppi)		1.5 (8.6)	ASTM D624	A
Electrical Properties	Volume Resistivity	Ohm-m		$1.0x10^9$	ASTM D257	C
	Breakdown Voltage	kV/mm (volts/mil)		11 (279)	ASTM D149	C
	Dielectric Constant	-	50Hz	9.12	ASTM D150	A
			110Hz	8.55		
			300kHz	5.83		
	Dissipation Factor	-	50Hz	0.152	ASTM D150	A
			110Hz	0.135		
			300kHz	0.034		
Thermal Properties	Thermal Conductivity	W/m-K		1.5 by Hot Wire	ASTM D2326	-
				1.3 by Hot Disk	ISO 22007-2	
	Useful Temperature	℃ (°F)		-40 to +105 (-40 to +221)	-	-

• Specimen A：2mmT • Specimen B：20mmW x 60mmL x 10mmT • Specimen C：120mmW × 120mmL × 1mmT

COMPRESSION FORCE

NR-c

Unit：N/6.4cm^2 (psi)

Compression Ratio	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT
10%	297 (67.3)	165 (37.3)	116 (26.3)	98 (22.2)	71 (16.1)
20%	548 (124.2)	355 (80.4)	271 (61.4)	201 (45.5)	168 (38.1)
30%	794 (179.9)	568 (128.7)	432 (97.9)	325 (73.6)	276 (62.5)
40%	1077 (244.0)	801 (181.5)	613 (138.9)	494 (111.9)	413 (93.6)
50%	1316 (298.2)	1014 (229.7)	826 (187.1)	687 (155.6)	568 (128.7)
Sustain 50%	445 (100.8)	379 (85.9)	310 (70.2)	284 (64.3)	226 (51.2)

NR-Hc

Compression Ratio	1.0mmT	1.5mmT	2.0mmT	2.5mmT	3.0mmT
10%	304 (68.9)	215 (48.7)	135 (30.6)	122 (27.6)	89 (20.2)
20%	599 (135.7)	454 (102.9)	305 (69.1)	250 (56.6)	210 (47.6)
30%	883 (200.0)	684 (155.0)	503 (114.0)	406 (92.0)	345 (78.2)
40%	1176 (266.4)	929 (210.5)	705 (159.7)	618 (140.0)	516 (116.9)
50%	1492 (338.1)	1253 (283.9)	957 (216.8)	858 (194.4)	710 (160.9)
Sustain 50%	621 (140.7)	572 (129.6)	351 (79.5)	355 (80.4)	283 (64.1)

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

NR-Tc

Unit：N/6.4cm^2 (psi)

Compression Ratio	0.5mmT	1.0mmT	2.0mmT
10%	140 (31.7)	212 (48.0)	323 (73.2)
20%	330 (74.8)	637 (144.3)	794 (179.9)
30%	570 (129.1)	1095 (248.1)	1303 (295.2)
40%	835 (189.2)	1540 (348.9)	1708 (387.0)
50%	1161 (263.0)	1887 (427.5)	2075 (470.1)
Sustain 50%	904 (204.8)	1332 (301.8)	1596 (361.6)

NR-HTc

Compression Ratio	0.5mmT	1.0mmT	2.0mmT
10%	156 (35.3)	224 (35.3)	317 (71.8)
20%	358 (81.1)	664 (81.1)	825 (186.9)
30%	599 (135.7)	1146 (135.7)	1319 (298.8)
40%	869 (196.9)	1609 (196.9)	1745 (395.4)
50%	1197 (271.2)	1973 (271.2)	2113 (478.7)
Sustain 50%	919 (208.2)	1388 (208.2)	1457 (330.1)

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

DURABILITY

Test Property	Unit	80℃		125℃	
		Initial	After 1,000hrs	Initial	After 1,000hrs
Specific Gravity	-	2.1	2.1	2.1	2.2
Hardness	ASKER C	27	30	27	57
Breakdown Voltage	kV/mm	11	18	11	26
Thermal Resistance	K-cm^2/W	6.8	7.5	6.8	9.9

Test Property	Unit	85℃/85%RH		-40℃	
		Initial	After 1,000hrs	Initial	After 1,000hrs
Specific Gravity	-	2.1	2.1	2.1	2.1
Hardness	ASKER C	27	28	27	37
Breakdown Voltage	kV/mm	11	15	11	27
Thermal Resistance	K-cm^2/W	6.8	7.3	6.8	10.4

Test Property	Unit	-40℃(30min)⇔+125℃(30min)	
		Initial	After 1,000hrs
Specific Gravity	-	2.1	2.1
Hardness	ASKER C	27	37
Breakdown Voltage	kV/mm	11	27
Thermal Resistance	K-cm^2/W	6.8	10.4

- Thermal Resistance：Measured by using TO-3 modified, refer to Fujipoly Test method FTM P-3020.
- Specimen：NR-c ・Specimen Area：15mm square ・Specimen is sandwiched between aluminum blocks.

reduced temperature

-40℃ = -40°F　60℃ = 140°F　70℃ = 158°F　85℃ = 185°F　150℃ = 302°F

TYPES AND CONFIGURATION

Series	Product Name	Thickness	Sheet Size
SARCON NR-c	100N-c	1.0mm ± 0.10mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)
	150N-c	1.5mm ± 0.15mm	
	200N-c	2.0mm ± 0.20mm	
	250N-c	2.5mm ± 0.25mm	
	300N-c	3.0mm ± 0.30mm	
SARCON NR-Hc	100N-Hc	1.0mm ± 0.10mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)
	150N-Hc	1.5mm ± 0.15mm	
	200N-Hc	2.0mm ± 0.20mm	
	250N-Hc	2.5mm ± 0.25mm	
	300N-Hc	3.0mm ± 0.30mm	
SARCON NR-Tc	50N-Tc	0.5mm ± 0.15mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)
	100N-Tc	1.0mm ± 0.20mm	
	150N-Tc	1.5mm ± 0.20mm	
	200N-Tc	2.0mm ± 0.30mm	
SARCON NR-HTc	50N-HTc	0.5mm ± 0.15mm	300mm × 200mm (Recommended Usable Size: 290mm×190mm)
	100N-HTc	1.0mm ± 0.20mm	
	150N-HTc	1.5mm ± 0.20mm	
	200N-HTc	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 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 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.
- 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.
- Statements concerning possible or suggested uses made herein may not be relied upon, or be constructed, as a guaranty of no patent infringement.
- Copyright© 2022 Fujipoly