FUJIPOLY

Fujipoly Data Sheet

SARCON TR / GTR series

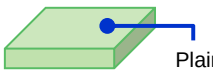
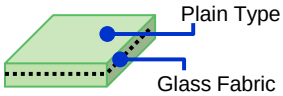
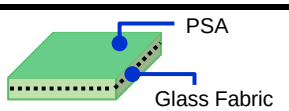
Rubber Type

FEATURES

Thin Film with High Thermal Conductivity , Electric Isolation and Non-Flammable.

- SARCON TR is available in press moldings, die-cut Gaskets, extrusion shapes and more with desired designs.
- UL 94 V-0 and UL 746 150℃ certified.

CONSTRUCTIONS

Series	Characteristics	Constructions
SARCON TR	Fine heat conductive particles are mixed with insulative silicone rubber to produce this excellent insulative, high heat conductive silicone material : 1.2W/mK (by Hot Wire)	
SARCON GTR	Thermalley conductive sheet shaped material with reinforcement which coated SARCON TR to Glass Fabric for excellent mechanical and physical characteristics.	
SARCON GTR-AD	SARCON GTR is available with a PSA (Pressure Sensitive Adhesive) mounting option, simply remove the protective liner and press into position to attach.	

THERMAL RESISTANCE

TR

Compression Force	30T (0.3mmT)	45T (0.45mmT)	85T (0.85mmT)
1.5Mpa	3.89 (0.60)	5.24 (0.81)	8.86 (1.37)
2.5MPa	3.89 (0.60)	5.14 (0.79)	8.64 (1.33)
3.6MPa	3.67 (0.56)	4.80 (0.74)	8.01 (1.24)

GTR

Unit : K-cm^2/W (K-in^2/W)

Compression Force	15GTR (0.15mmT)	20GTR (0.2mmT)	30GTR (0.3mmT)
1.5Mpa	1.83 (0.28)	2.70 (0.41)	4.19 (0.64)
2.5MPa	1.77 (0.27)	2.64 (0.40)	4.10 (0.63)
3.6MPa	1.70 (0.26)	2.57 (0.39)	4.01 (0.62)

1.Test Method by FTM P-3070

Fujipoly test method FTM P-3070 which gives ASTM D5470 equivalent value. The sample is sandwiched between aluminum blocks with thermocouples installed, screwed with a specified torque, constant power is applied to the heater to generate constant heat, and the thermal resistance value is measured from the temperature difference between the upper and lower thermocouples.

2.Principle

A thermal impedance is given by the equation below.

Rt=(TC-Tf) x S/P0 Rt : Thermal resistance (K-cm^2/W)

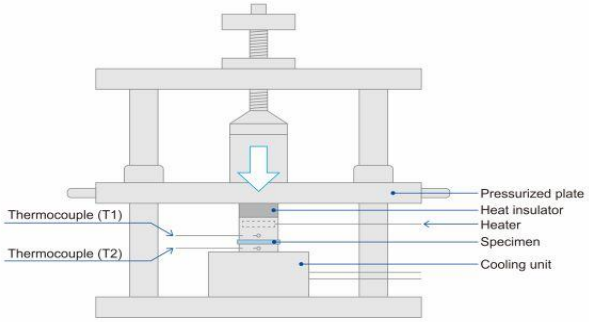
Tc : T1 temperature(K)

Tf : T2 temperature(K)

S : Sample installation area(cm^2)

P0 : Electric power(W)

●Measurement diagram



TYPICAL PROPERTIES

Properties		unit		TR			GTR			Test method
				30T	45T	85T	15GTR	20GTR	30GTR	
Physical Properties	Color	-		Greenish Gray			Greenish Gray			Visual
	Thickness	mm		0.3 +0.1/-0	0.45 ±0.05	0.85 ±0.05	0.15 +0.02/-0.04	0.2 +0.02/-0.04	0.3 +0.10/-0	ISO 463:2006
	Specific Gravity	-		2.3			2.2			ASTM D792
	Hardness Highest Value	IRHD		75	75	75	87	87	92	ISO 7619
	Tensile Strength	MPa		4.8	5.0	4.8	71.9*	53.9*	30.8*	ASTM D412
		psi		696	725	696	10426*	7816*	4466*	
	Elongation	%		100	100	100	2 or less*	2 or less*	2 or less*	ASTM D412
	Tear Strength	N/mm		3 (Die-B)	4 (Die-B)	8 (Die-B)	-	-	-	ASTM D624
Electrical Properties	Volume Resistivity	Ohm-m		$1x10^{13}$	$1x10^{13}$	$1x10^{13}$	$1x10^{13}$	$1x10^{13}$	$1x10^{13}$	ASTM D257
	Breakdown Voltage	kV(AC)		10	11	15	4	6	8	ASTM D149
	Dielectric Strength	kV(AC)		7	8	10	4	6	7	ASTM D149
	Dielectric Constant	-	50Hz	4.4	4.5	4.9	2.5	3.2	3.5	ASTM D150
			1kHz	4.4	4.5	4.9	2.5	3.2	3.5	
			1MHz	4.4	4.5	4.9	2.5	3.2	3.5	
	Dissipation Factor	-	50Hz	0.004	0.004	0.003	0.008	0.007	0.007	ASTM D150
			1kHz	0.002	0.002	0.002	0.004	0.003	0.003	
			1MHz	0.003	0.003	0.003	0.004	0.004	0.003	
Thermal Properties	Thermal Conductivity	W/m-K		1.2			0.9			ASTM D2326 (Hot Wire)
	Recommended Operating Temp.	℃		-40 to +150			-40 to +150			-
		°F		-40 to +302			-40 to +302			
	Relative Thermal Index	℃		150			150			UL 746
	Flame Retardant	UL94		V-0			V-0			UL 94

* Tensile Strength/Elongation on GTR according to ASTM D1458, Fully Cured Silicone Rubber - Coated Glass Fabric Cloth.

** Excludes Glass Fabric reinforcement

DURABILITY・TR

Heat Aging Test : 150℃ (300°F)

Properties	unit	30T			45T			85T		
		Before	500hrs	1,000hrs	Before	500hrs	1,000hrs	Before	500hrs	1,000hrs
Hardness	IRHD	75	81	83	75	80	85	75	82	83
Tensile Strength	MPa	4.8	5.0	5.0	5.0	5.2	5.7	5.0	5.3	5.3
Elongation	%	100	50	50	100	50	60	100	40	70
Volume Resistivity	Ohm-m	$2.9x10^{13}$	$6.5x10^{13}$	$5.6x10^{13}$	$2.1x10^{13}$	$7.6x10^{13}$	$6.5x10^{13}$	$6.7x10^{12}$	$2.5x10^{13}$	$3.7x10^{13}$
Breakdown Voltage	kV	10.0	8.5	8.4	11.0	10.0	10.0	15.0	14.0	15.0
Dielectric Constant	50Hz	4.4	4.2	4.2	4.5	4.3	4.4	4.9	4.8	4.9
	1kHz	4.4	4.2	4.3	4.5	4.3	4.4	4.9	4.8	4.8
	1MHz	4.4	4.2	4.3	4.5	4.3	4.4	4.9	4.8	4.8
Dissipation Factor	50Hz	0.004	0.003	0.004	0.004	0.003	0.002	0.003	0.003	0.003
	1kHz	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	1MHz	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.002	0.002

Heat Aging Test : 200℃ (390°F)

Properties	unit	30T			45T			85T		
		Before	500hrs	1,000hrs	Before	500hrs	1,000hrs	Before	500hrs	1,000hrs
Hardness	IRHD	75	85	90	75	86	87	75	85	86
Tensile Strength	MPa	4.8	5.0	5.9	5.0	5.0	7.0	5.0	5.2	5.9
Elongation	%	100	50	30	100	50	40	100	50	40
Volume Resistivity	Ohm-m	$2.9x10^{13}$	$7.6x10^{13}$	$7.2x10^{13}$	$2.1x10^{13}$	$4.0x10^{13}$	$6.9x10^{13}$	$6.7x10^{12}$	$7.0x10^{13}$	$6.7x10^{13}$
Breakdown Voltage	kV	10.0	9.8	8.0	11.0	10.0	10.0	15.0	14.0	15.0
Dielectric Constant	50Hz	4.4	4.2	4.2	4.5	4.3	4.5	4.9	4.8	4.9
	1kHz	4.4	4.2	4.2	4.5	4.3	4.5	4.9	4.8	4.9
	1MHz	4.4	4.2	4.2	4.5	4.4	4.5	4.9	4.8	4.9
Dissipation Factor	50Hz	0.004	0.005	0.004	0.004	0.003	0.003	0.003	0.003	0.003
	1kHz	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	1MHz	0.003	0.003	0.003	0.003	0.002	0.002	0.003	0.002	0.002

Water Resistance Test : 60℃ (140°F)

Properties	unit	30T			45T			85T		
		Before	250hrs	500hrs	Before	250hrs	500hrs	Before	250hrs	500hrs
Hardness	IRHD	75	75	73	75	74	73	75	74	74
Volume Resistivity	Ohm-m	$2.9x10^{13}$	$9.5x10^{11}$	$6.1x10^{11}$	$2.1x10^{13}$	$9.5x10^{11}$	$7.4x10^{11}$	$6.7x10^{12}$	$1.6x10^{11}$	$1.1x10^{11}$
Breakdown Voltage	kV	10.0	8.0	6.0	11.0	9.0	7.0	15.0	11.0	10.0
Dielectric Constant	50Hz	4.4	4.8	4.8	4.5	5.1	5.2	4.9	5.5	5.2
	1kHz	4.4	4.6	4.6	4.5	4.8	5.0	4.9	5.3	5.1
	1MHz	4.4	4.5	4.5	4.5	4.8	4.9	4.9	5.2	5.0
Dissipation Factor	50Hz	0.004	0.029	0.030	0.004	0.034	0.039	0.003	0.030	0.022
	1kHz	0.002	0.013	0.014	0.002	0.015	0.016	0.002	0.014	0.009
	1MHz	0.003	0.006	0.006	0.003	0.002	0.005	0.003	0.004	0.003

Chemical Resistance Test : (Chemical : HCFC AK-225 (Substitutive Freon))

Properties	unit	30T		45T		85T	
		Before	24hrs	Before	24hrs	Before	500hrs
Volume Resistivity	Ohm-m	$2.9x10^{13}$	$1.3x10^{12}$	$2.1x10^{13}$	$4.1x10^{12}$	$6.7x10^{12}$	$4.7x10^{12}$
Breakdown Voltage	kV	10	9	11	10	15	13
Thermal Resistance*	$K\text{-}in^2/W$	0.62	0.62	0.73	0.70	1.35	1.36

*Thermal resistance is measured with FTM P-3010.

DURABILITY・GTR

Heat Aging Test : 150℃ (300°F)

Properties	unit	15GTR			20GTR			30GTR		
		Before	500hrs	1,000hrs	Before	500hrs	1,000hrs	Before	500hrs	1,000hrs
Hardness	IRHD	87	87	87	87	88	89	92	92	92
Tensile Strength	MPa	71.9	59.5	59.5	52.9	48.0	37.7	35.9	32.7	22.9
Elongation	%	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less
Volume Resistivity	Ohm-m	$5.7x10^{13}$	$1.1x10^{13}$	$9.1x10^{13}$	$1.1x10^{13}$	$6.8x10^{13}$	$5.8x10^{13}$	$1.3x10^{13}$	$4.5x10^{13}$	$8.4x10^{13}$
Breakdown Voltage	kV	4.0	3.6	3.5	6.5	6.0	6.0	8.0	7.4	7.3
Dielectric Constant	50Hz	2.5	2.3	2.3	3.2	2.6	2.7	3.5	3.4	3.3
	1kHz	2.5	2.3	2.2	3.2	2.6	2.7	3.5	3.4	3.3
	1MHz	2.5	2.3	2.3	3.2	2.6	2.7	3.6	3.4	3.3
Dissipation Factor	50Hz	0.008	0.002	0.002	0.007	0.003	0.003	0.007	0.002	0.002
	1kHz	0.004	0.002	0.002	0.003	0.002	0.002	0.003	0.001	0.001
	1MHz	0.004	0.003	0.003	0.004	0.003	0.003	0.003	0.003	0.003

Heat Aging Test : 200℃ (390°F)

Properties	unit	15GTR			20GTR			30GTR		
		Before	500hrs	1,000hrs	Before	500hrs	1,000hrs	Before	500hrs	1,000hrs
Hardness	IRHD	87	88	88	87	89	89	92	92	92
Tensile Strength	MPa	71.9	48.3	43.1	52.9	34.3	31.4	35.9	31.4	27.8
Elongation	%	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less	2 or less
Volume Resistivity	Ohm-m	$5.7x10^{13}$	$1.2x10^{13}$	$1.1x10^{13}$	$1.1x10^{13}$	$9.8x10^{13}$	$9.8x10^{13}$	$1.3x10^{13}$	$1.4x10^{13}$	$8.1x10^{13}$
Breakdown Voltage	kV	4.0	3.2	3.0	6.5	6.0	4.1	8.0	7.4	5.5
Dielectric Constant	50Hz	2.5	2.1	2.1	3.2	2.7	2.7	3.5	3.2	3.2
	1kHz	2.5	2.1	2.1	3.2	2.7	2.7	3.5	3.2	3.1
	1MHz	2.5	2.1	2.1	3.2	2.7	2.7	3.5	3.2	3.1
Dissipation Factor	50Hz	0.008	0.003	0.003	0.007	0.002	0.003	0.007	0.002	0.002
	1kHz	0.004	0.002	0.002	0.003	0.002	0.002	0.003	0.001	0.002
	1MHz	0.004	0.002	0.002	0.004	0.003	0.003	0.003	0.003	0.003

Water Resistance Test : 60℃ (140°F)

Properties	unit	15GTR			20GTR			30GTR		
		Before	250hrs	500hrs	Before	250hrs	500hrs	Before	250hrs	500hrs
Hardness	IRHD	87	87	87	87	87	87	92	92	92
Volume Resistivity	Ohm-m	$5.7x10^{13}$	$1.3x10^{11}$	$9.1x10^{11}$	$1.1x10^{13}$	$4.9x10^{10}$	$2.3x10^{10}$	$1.3x10^{13}$	$4.0x10^{11}$	$1.3x10^{11}$
Breakdown Voltage	kV	4.0	3.5	3.0	6.5	5.0	4.0	8.0	7.0	6.0
Dielectric Constant	50Hz	2.5	2.9	2.7	3.2	3.5	3.6	3.5	3.9	3.9
	1kHz	2.5	2.7	2.7	3.2	3.3	3.4	3.5	3.7	3.7
	1MHz	2.5	2.7	2.7	3.2	3.3	3.4	3.5	3.6	3.6
Dissipation Factor	50Hz	0.008	0.059	0.024	0.007	0.055	0.052	0.007	0.042	0.041
	1kHz	0.004	0.008	0.008	0.003	0.018	0.017	0.003	0.018	0.020
	1MHz	0.004	0.005	0.005	0.004	0.005	0.005	0.003	0.005	0.005

Chemical Resistance Test : (Chemical : HCFC AK-225 (Substitutive Freon))

Properties	unit	15GTR		20GTR		30GTR	
		Before	24hrs	Before	24hrs	Before	500hrs
Volume Resistivity	Ohm-m	$5.7x10^{12}$	$8.6x10^{12}$	$1.1x10^{13}$	$2.9x10^{13}$	$1.3x10^{13}$	$2.5x10^{13}$
Breakdown Voltage	kV	4	4	7	6	8	9
Thermal Resistance*	K-in^2/W	0.51	0.50	0.56	0.57	0.66	0.69

Thermal resistance is measured with FTM P-3010.

HANDLING NOTES

- 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

- 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.
- Statements concerning possible or suggested uses made herein may not be relied upon, or be constructed, as a guaranty of no patent infringement.
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