

SARCON® RUBBER TYPE

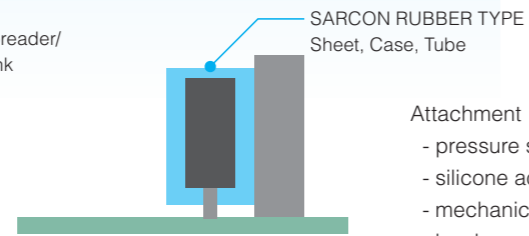
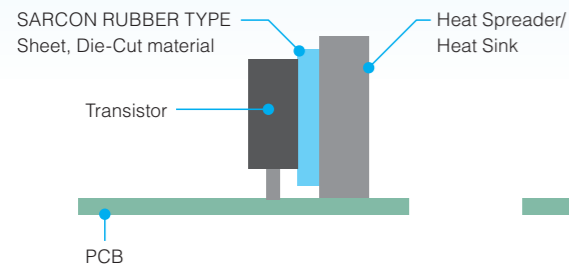
Thin Film with High Electric Isolation

SARCON® Rubber type developed by our original studies are the epoch-making silicone rubber products with high insulative and thermally conductive properties as well as a high flame resistant or non flammable property.

Features

- Has a thermal conductivity and excellent electrical insulation properties.
- Available for tubes, tapes, Cases and Die-cut Gaskets shapes to meet a various application (Shown on Page07 of Configuration).
- GTR, GHR, GSR; Heat conductive silicone rubber within Glass Fiber Cloth has excellent mechanical and physical characteristics.
- UL94 V-0 certified.
- Available with an Adhesive option (Shown on Page05-06).

Recommended Application



- Attachment
- pressure sensitive adhesive
 - silicone adhesive
 - mechanical clamping
 - hardware attachment - screw, rivets

SARCON® Rubber Type materials

QR	Thermally conductive insulation material that has soft and low compression rate characteristics, and is superior to cushioning and coherence that contributes to reliability maintenance of an IC tip.
TR	Available in press molding, co-extruded tape shape, tube shape, cap shape and more with desired designs.
HR	High-grade product whose thermal conductivity is made ultra drastically high by special combination agent with fine ceramics system.
YR-a	Very high thermal conductivity and excellent electrical insulation material that available for tubes, die cutting and tapes shapes to meet a various applications.
YR-b	Highest thermal conductivity and excellent electrical insulation material that available for tapes shapes and die cutting to meet a various applications.
GTR	Thermally conductive sheet shaped material with reinforcement which coated SARCON TR to Glass Fabric reinforcement.
GHR	Thermally conductive sheet shaped material with reinforcement which coated SARCON HR to Glass Fabric reinforcement.
GSR	Physical characteristics are much improved such as tensile strength, tear strength and so on with Glass Fabric reinforcement as the base material. Obtained three times higher thermal conductivity compared to SARCON GTR's.

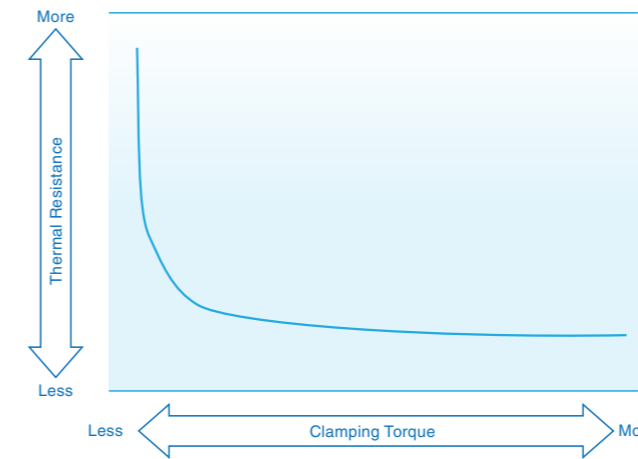
Configuring a Part Number of Rubber Type

30 GSR -AD - Width(mm) × Length(mm)

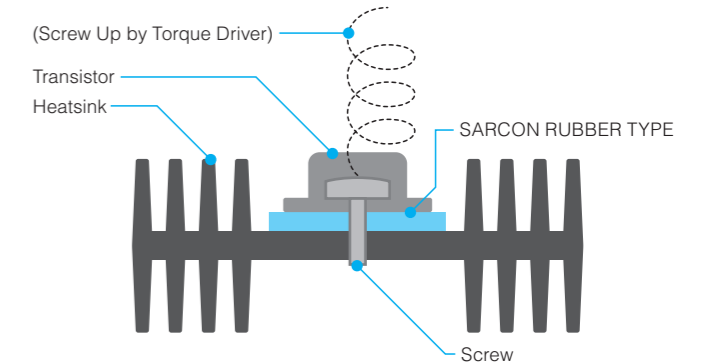
Thickness	Series	Option
15 = 0.15mm	Q = QR	blank = without
20 = 0.2mm	T = TR	-AD = Adhesive Coating
30 = 0.3mm	H = HR	
45 = 0.45mm	Y-a = YR-a	
85 = 0.85mm	Y-b = YR-b	
	GTR = GTR	
	GHR = GHR	
	GSR = GSR	

available to Adhesive Coating option : GTR,GHR,GSR

Clamping Torque



- Clamping torque of the installed SARCON Rubber : Thermal resistance decrease as the torque is increased.
- Test method : Fujipoly Test Method FTM P 3010 (ASTM D 5470 Equivalent) by TO-3 package



Clamping Torque versus Thermal Resistance

unit : K-in²/W

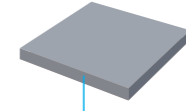
Clamping Torque	QR			TR			HR		
	30Q	45Q	85Q	30T	45T	85T	30H	45H	85H
0.29Nm (0.22lbf-ft)	0.61	0.83	1.42	0.65	0.76	1.37	0.44	0.54	0.76
0.49Nm (0.36lbf-ft)	0.57	0.77	1.25	0.62	0.73	1.35	0.42	0.52	0.73
0.69Nm (0.51lbf-ft)	0.52	0.71	1.18	0.59	0.71	1.32	0.39	0.51	0.74

Clamping Torque	GTR			GHR			GSR			
	15GTR	20GTR	30GTR	15GHR	20GHR	30GHR	20GSR	30GSR	45GSR	85GSR
0.29Nm (0.22lbf-ft)	0.58	0.60	0.68	0.58	0.61	0.67	0.31	0.37	0.40	0.52
0.49Nm (0.36lbf-ft)	0.51	0.56	0.66	0.55	0.57	0.61	0.30	0.34	0.39	0.51
0.69Nm (0.51lbf-ft)	0.50	0.54	0.64	0.53	0.54	0.59	0.30	0.33	0.37	0.50

Thermal Resistance to measure by ASTM D 5470 equivalent, refer to Fujipoly Test method "FTM-P3010" by transistor unit. → See P.33

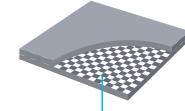
Construction

TR
HR
QR



Plain Type

GTR
GHR
GSR



with Glass Fiber Cloth

Typical Product Properties

Test Properties	Unit	GTR			QR			TR			GHR			HR			YR-a				GSR				YR-b			
		15GTR	20GTR	30GTR	30Q	45Q	85Q	30T	45T	85T	15GHR	20GHR	30GHR	30H	45H	85H	20Y-a	30Y-a	45Y-a	85Y-a	20GSR	30GSR	45GSR	85GSR	20Y-b	30Y-b	45Y-b	85Y-b
Physical Properties	Adhesive Coating	-																										
	Thickness*	mm																										
	Specific Gravity	-																										
	Hardness	IRHD	87 87 92 55 55 55 75 75 75 92 92 95 85 85 85 85 86 89 85 90 90 90 88 68 74 72 74																									
		Shore A	87 (20GTR) 55 75 92 (20GHR) 85 81 97 (20GSR) 65																									
	Color	-																										
	Tensile Strength	Mpa	11.0 11.0 11.0 0.8 1.0 2.0 1.7 2.3 4.2 8.0 8.0 8.0 1.7 2.3 4.3 2.9 1.6 2.1 3.5 14.0 15.0 18.0 15.0 0.4 1.0 1.3 2.5																									
psi		1,595.0 1,595.0 1,595.0 116.0 145.0 290.0 246.5 333.5 609.0 1,160.0 1,160.0 1,160.0 246.5 333.5 623.5 420.5 232.0 304.5 507.5 2,030.0 2,175.0 2,610.0 2,175.0 58.0 145.0 188.5 362.5																										
Elongation	%	2 or less 2 or less 2 or less 250 250 250 100 100 100 2 or less 2 or less 2 or less 60 60 60 50 73 80 80 3 or less 3 or less 3 or less 3 or less 78 72 90 88																										
Electrical Properties	Volume Resistivity	Ohm-m 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹² 1x10 ¹² 1x10 ¹² 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹² 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³ 1x10 ¹³																										
	Breakdown Voltage	kV/mm 4 6 8 11 12 16 10 11 15 3 6 9 9 10 14 6 10 11 14 6 10 15 20 10 14 15 18																										
	Dielectric Strength	kV / Thickness 3 6 7 7 8 11 7 8 10 2 4 8 6 7 10 3 7 6 10 3 5 7 10 6 11 12 15																										
	Dielectric Constant	50Hz	2.5 3.2 3.5 4.2 4.3 4.9 4.4 4.5 4.9 3.0 3.3 3.9 4.6 4.6 5.4 - 6.2 6.3 6.0 2.6 3.0 3.2 3.7 2.8 3.6 4.1 4.8																									
		1kHz	2.5 3.2 3.5 4.1 4.2 4.9 4.4 4.5 4.9 3.0 3.3 3.9 4.9 4.5 5.7 - 5.8 5.9 5.7 2.6 3.0 3.2 3.7 2.8 3.6 4.1 4.8																									
		1MHz	2.5 3.2 3.5 4.1 4.2 4.9 4.4 4.5 4.9 3.0 3.3 3.9 4.9 4.5 5.7 - 5.6 5.7 5.4 2.6 3.0 3.2 3.7 2.8 3.6 4.1 4.8																									
	Dissipation Factor	50Hz	0.008 0.007 0.007 0.006 0.006 0.007 0.004 0.004 0.003 0.02 0.009 0.006 0.008 0.007 0.004 - 0.030 0.030 0.028 0.003 0.002 0.002 0.001 0.01 0.007 0.007 0.003																									
		1kHz	0.004 0.003 0.003 0.004 0.004 0.003 0.002 0.002 0.002 0.005 0.003 0.003 0.004 0.004 0.002 - 0.025 0.025 0.023 0.0007 0.0005 0.0001 0.0004 0.003 0.005 0.003 0.001																									
		1MHz	0.004 0.004 0.003 0.002 0.002 0.002 0.003 0.003 0.003 0.003 0.004 0.004 0.003 0.003 0.003 0.002 - 0.010 0.010 0.010 0.0004 0.0003 0.0002 0.0009 0.003 0.001 0.001 0.001																									
Thermal Properties	Thermal Conductivity unit : W/m-K	Hot Wire	1.2** 1.1 1.2 1.7** 1.7 2.2 - 3.9																									
		Hot Disk	1.0** 1.0 1.0 1.5** 1.5 2.0 4.7** 3.0																									
	Recommended Operating Temp.	°C	-40 to +150 -40 to +150 -40 to +150 -40 to +150 -40 to +150 -40 to +150																									
		°F	-40 to +302 -40 to +302 -40 to +302 -40 to +302 -40 to +302 -40 to +302																									
Flame Retardant	UL94	V-0 V-0 V-0 V-0 V-0 V-0 V-0 V-0 V-0																										

a) Products Hardness according to IRHD of all and Shore A on GTR, GHR, GSR. Material Hardness according to Shore A. The measured highest value of IRHD and Shore A Hardness.
 b) Thermal Conductivity : Measured by Hot Wire Test method for reference. → See P.31
 : Measured by Hot Disk Test method according to ISO/CD 22007-2. → See P.31
 c) Tensile Strength / Elongation on QR, TR, HR, YR-a, YR-b according to ASTM D 412.
 d) Tensile Strength / Elongation on GTR, GHR, GSR according to ASTM D 1458, Fully Cured Silicone Rubber - Coated Glass Fabric Cloth.

* Some details of thickness → See P.11, 12, 28
 ** Excludes Glass Fabric reinforcement

Thermal Resistance

unit : K-cm²/W (K-in²/W)

Pressure	QR			TR			HR			YR-a				YR-b			
	30Q	45Q	85Q	30T	45T	85T	30H	45H	85H	20Y-a	30Y-a	45Y-a	85Y-a	20Y-b	30Y-b	45Y-b	85Y-b
100kPa (14.5psi)	5.67 (0.88)	7.65 (1.19)	12.27 (1.90)	5.01 (0.78)	6.89 (1.07)	10.77 (1.67)	4.55 (0.71)	5.05 (0.78)	8.25 (1.28)	2.12 (0.33)	3.94 (0.61)	4.33 (0.67)	5.36 (0.83)	1.88 (0.29)	2.17 (0.34)	2.2 (0.34)	4.33 (0.67)
300kPa (43.5psi)	5.50 (0.85)	7.13 (1.11)	12.23 (1.90)	4.58 (0.71)	6.30 (0.98)	9.97 (1.55)	3.92 (0.61)	4.62 (0.72)	6.86 (1.06)	1.70 (0.26)	3.44 (0.53)	3.77 (0.58)	5.14 (0.80)	1.34 (0.21)	1.65 (0.26)	1.97 (0.31)	3.99 (0.62)
500kPa (72.5psi)	5.19 (0.80)	6.10 (0.95)	12.03 (1.86)	4.36 (0.68)	5.95 (0.92)	9.65 (1.50)	3.57 (0.55)	4.37 (0.68)	6.40 (0.99)	1.56 (0.24)	3.2 (0.50)	3.48 (0.54)	4.86 (0.75)	1.15 (0.18)	1.54 (0.24)	1.9 (0.29)	3.8 (0.59)
1000kPa (145psi)	5.09 (0.79)	6.05 (0.94)	10.73 (1.66)	4.14 (0.64)	5.54 (0.86)	9.29 (1.44)	3.05 (0.47)	3.91 (0.61)	5.89 (0.91)	1.32 (0.20)	2.81 (0.44)	3.03 (0.47)	4.61 (0.71)	0.91 (0.14)	1.42 (0.22)	1.79 (0.28)	3.59 (0.56)

Pressure	GTR			GHR			GSR			
	15GTR	20GTR	30GTR	15GHR	20GHR	30GHR	20GSR	30GSR	45GSR	85GSR
300kPa (43.5psi)	2.28 (0.35)	3.11 (0.48)	5.35 (0.83)	2.84 (0.44)	2.94 (0.46)	4.09 (0.63)	2.45 (0.38)	2.83 (0.44)	3.17 (0.49)	5.01 (0.78)
500kPa (72.5psi)	2.06 (0.32)	2.82 (0.44)	4.94 (0.77)	2.46 (0.38)	2.48 (0.38)	3.68 (0.57)	2.25 (0.35)	2.30 (0.36)	2.95 (0.46)	4.78 (0.74)
1000kPa (145psi)	1.83 (0.28)	2.55 (0.40)	4.47 (0.69)	1.82 (0.28)	2.03 (0.31)	3.19 (0.49)	1.65 (0.26)	2.04 (0.32)	2.71 (0.42)	4.52 (0.70)

e) Test method: Fujipoly Test method, FTM-P3050 by TIM 1300 Tester which is ASTM D 5470 equivalent. → See P.32

Test Properties	Test Method
Thickness	ASTM D 734
Specific Gravity	ASTM D 792
Hardness	IRHD / ISO 7619
	Shore A / ASTM D2240
Color	Visual
Tensile Strength	ASTM D 412 / 1458
Elongation	ASTM D 412 / 1458
Volume Resistivity	ASTM D 257
Breakdown Voltage	ASTM D 149
Withstand Voltage	ASTM D 149
Dielectric Constant	ASTM D 150
Dielectric Tangent	ASTM D 150
Thermal Conductivity	Hot Wire : ASTM D 2326
	Hot Disk:ISO/CD 22007-2
Recommended Operating Temp.	(Recommended Temp.)
Flame Retardant	UL94

SARCON® RUBBER TYPE / Form line up

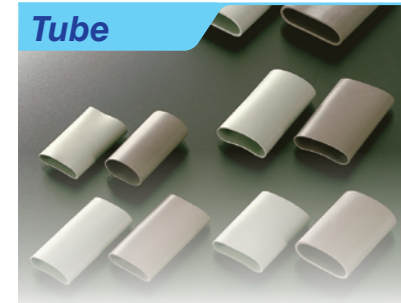
Thermal Management Components

SARCON RUBBER TYPE's versatility in thermal management applications is doubly enhanced by way of the variety of end-use configurations possible, and the many standard material formulations available in each. The silicone rubber based materials offer other useful elements such as electrical insulation, protective covering and gasketing as integral features in most designs.

Configuration

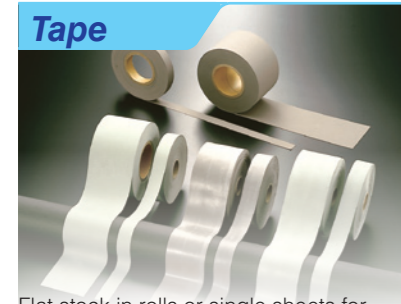
	Color	Form				Hardness (Shore A)	Thermal Conductivity [w/m-k]	
		Tape	Sheet	Tube	Case		Hot Wire	Hot Disk
TR	Greenish Gray	○	×	○	○	75	1.2	1.0
HR	Brown	○	×	○	○	85	1.7	1.5
QR	Black	○	×	○	○	55	1.1	1.0
GTR	Greenish Gray	○	○	×	×	87 (20GTR)	1.2*	1.0*
GHR	Brown	○	○	×	×	92 (20GHR)	1.7*	1.5*
GSR	White	×	○	×	×	90 (20GSR)	-	4.7*
YR-a	Dark Gray	○	×	○	×	81	2.2	2.0
YR-b	Gray	○	×	×	×	65	3.9	3.0

* Excludes Glass Fabric reinforcement.



Tube shapes available in three thicknesses. TR, HR or UR formulations. The flexible structures conform to most applications. All standard items in stock; custom lengths and diameters available.

		TR	HR	QR	YR-a	(mm)			
Part Number	Usable Transistors	Thickness	Inner Diameter	Length	Ordering unit				
30T-11-25L, 30T-11-30L	TO-220 type	0.30 ^{+0.1} / ₋₀	φ 11±1	25±1, 30±1	500 integral multiples				
45T-11-25L, 45T-11-30L		0.45±0.05	φ 11±1	25±1, 30±1					
85T-11-25L, 85T-11-30L		0.85±0.05	φ 11±1	25±1, 30±1					
30T-13.5-25L, 30T-13.5-30L	TO-3P type	0.30 ^{+0.1} / ₋₀	φ 13.5±1	25±1, 30±1	500 integral multiples				
45T-13.5-25L, 45T-13.5-30L		0.45±0.05	φ 13.5±1	25±1, 30±1					
85T-13.5-25L, 85T-13.5-30L		0.85±0.05	φ 13.5±1	25±1, 30±1					

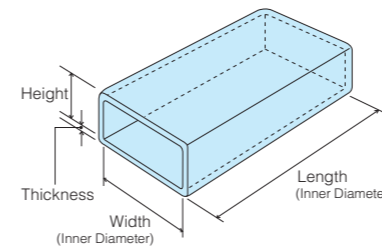


Flat stock in rolls or single sheets for your custom finishing. Can be diecut or trimmed to any proprietary shape on your finishing equipment. Available in five thicknesses and all SARCON formulations.

		TR	HR	QR	YR-a	YR-b	GTR	GHR	(mm)	
Part Number	Thickness	Length	Ordering unit							
30T-36W, 30H-36W, 30Q-36W	0.30 ^{+0.1} / ₋₀	36±1	100m integral multiples							
30T-85W, 30H-85W, 30Q-85W		85±1								
45T-36W, 45H-36W, 45Q-36W	0.45±0.05	36±1	50m integral multiples							
450T-85W, 45H-85W, 45Q-85W		85±1								
85T-36W, 85H-36W, 85Q-36W	0.85±0.05	36±1								
85T-85W, 85H-85W, 85Q-85W		85±1								



Box-shaped caps for transistors. High thermal dissipation rate. Open on one end; installs by just slipping over the desired components. Available in TR and HR materials. All standard items in stock; custom sizes available.



		TR	HR	QR	(mm)			
Part Number	Usable Transistors	Thickness	Dimensions	Ordering unit				
30T-TO-220-02225, 30H-TO-220-02225	TO-220 type	0.30 ^{+0.1} / ₋₀		500 integral multiples				
45T-TO-220-01220, 45H-TO-220-01220		0.45 ^{+0.1} / _{-0.05}						
90T-TO-220-01220, 90H-TO-220-01220		0.90 ^{+0.15} / _{-0.1}						
30T-TO-3P-03281, 30H-TO-3P-03281	TO-3P type	0.30 ^{+0.1} / ₋₀		500 integral multiples				
50T-TO-3P-02275, 50H-TO-3P-02275		0.50 ^{+0.05} / _{-0.1}						
90T-TO-3P-01280, 90H-TO-3P-01280		0.90 ^{+0.15} / _{-0.1}						
90T-TO-3P-01340, 90H-TO-3P-01340		0.90 ^{+0.1} / _{-0.1}						

Die-cut Gaskets

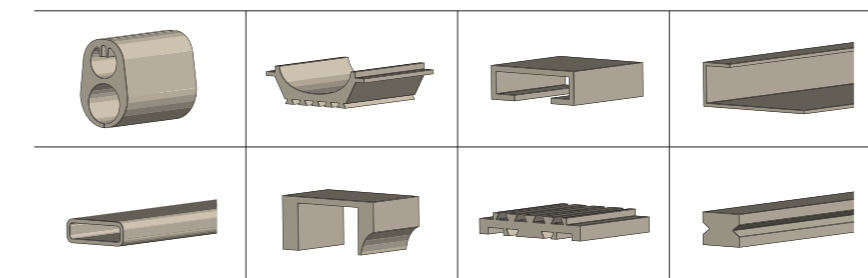


Standard die-cut parts. Effective also as a mounting cushion to prevent deformation. Custom designs available in unlimited sizes and shapes.

		TR	HR	QR	YR-a	YR-b	GTR	GHR	GSR	(mm)	
Part Number	Thickness	Dimensions	Ordering unit								
30T-TO-220, 30H-TO-220, 30GTR-TO-220, 30GHR-TO-220, 30GSR-TO-220	0.30 ^{+0.1} / ₋₀		500 integral multiples								
45T-TO-220, 45H-TO-220	0.45±0.05										
30T-TO-3PF, 30H-TO-3PF, 30GTR-TO-3PF, 30GHR-TO-3PF, 30GSR-TO-3PF	0.30 ^{+0.1} / ₋₀		500 integral multiples								
45T-TO-3PF, 45H-TO-3PF	0.45±0.05										
30T-TO-3, 30H-TO-3, 30GTR-TO-3, 30GHR-TO-3, 30GSR-TO-3	0.30 ^{+0.1} / ₋₀		500 integral multiples								
45T-TO-3, 45H-TO-3	0.45±0.05										

Custom - Rubber Extrusions // E-Mold Products

SARCON E Mold products are co-extruded products of highly thermally conductive and non-flammable silicone rubber, SARCON, and available in various shapes and designs.



AD series

Available to Adhesive Coating option: GTR, GHR, GSR

