



# Stockwell Elastomerics, Inc.

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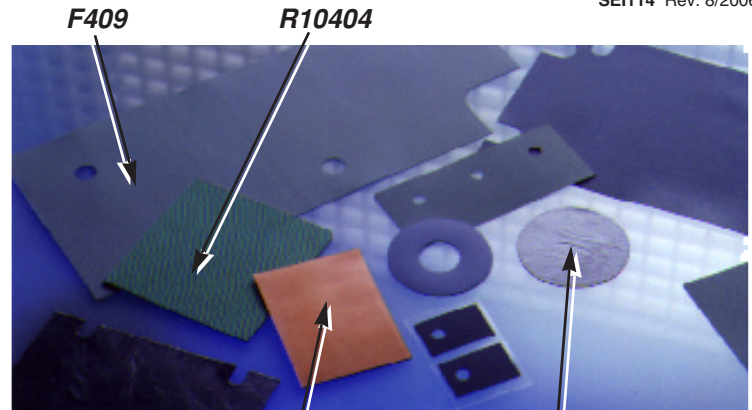
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High Performance Elastomeric Components and Materials



SEI114 Rev. 8/2006

## Thermally Conductive Silicone Rubber Heat Transfer Pads and Gaskets from Gap Filling Compounds



TC3001 HCT Gap Filler

C695

Stockwell Elastomerics, Inc. supplies Thermally Conductive pads and gaskets in standard and made-to-drawing configurations from a variety of Gap Filling products.

This family of conformable silicones is available from .008" thick uncured product to .250" thick closed cell silicone sponge.

Air trapped between a heat generating device and a heat spreader or heat sink inhibits the effective transfer of heat away from hot spots to the exterior of a closed system.

Gap filler products seal this space and provide a fast functioning thermal path between the components.

**Stockwell Elastomerics, Inc. also has in-house capability to mold certain thermally conductive silicone rubber compounds to obtain specific custom profiles. Contact us for particulars.**

### Comparative Properties of Thermally Conductive Gap Filler Materials Available from Stockwell Elastomerics, Inc.

Stockwell Compound	Color	Hardness Shore A ASTM D2240	Thermal Conductivity W/mK ASTM E1530	Thermal Impedance °C in <sup>2</sup> / W ASTM E1530	Dielectric Strength volts / mil ASTM D149	UL Recognized 94	Finished Component Availability		
							Die Cut Parts	Sheets	w/Adhesive Backing
TC100	Lt. Blue	65	1.3	1.25 (1/16")	450	HB	X	X	X
TC100U (uncured)	White	65 (cured)	1.3 (cured)	1.25 (1/16") (cured)	450	--	X		
TC3001	Red	5-10	1.6	1.2	300	V-0	X	X	
TC3001 HCT	Lt. Red	5-10	3.0	1.2	300	V-0	X	X	
TC3005	Red	<5	1.6	1.2	300	V-0	X	X	
R10404	Green	13	0.30 - 0.65 *	6.0 - 1.0 *	100	V-1 (1/8" & up)	X	X	X

TC100 is available in 18" wide rolls, .025", .032", .050" and .062" thicknesses.

TC3000 Series is available in sheets .020" to .250" x 24" x 24". The series is available plain or supported with either fiberglass cloth or aluminum foil.

R10404 is a unique closed cell silicone sponge that is truly compressible. It is available in sheets or continuous length, .032" to .250" thick.

\* Thermal Conductivity and Thermal Impedance are dependent on the compressed thickness.

R10404 and TC100 can be supplied with thermally conductive acrylic adhesive TR3 (.003") to aid in assembly. TR3 offers solvent resistance, high bond strength and is formulated to enhance flame retardant properties.

## Thermally Conductive Silicone Coated Fiberglass

The TF400 Series offers high temperature resistance and conformability in a low cost heat sink gasket. The TF500 Series is formulated with a unique blend of ceramic filler offering low thermal impedance at a reasonable cost. Fiberglass reinforcement provides dimensional stability and cut-through resistance.

Typical end use applications are found in computer hardware, automotive control systems, power supplies, electronic components in business machines and consumer electronics, telecommunications equipment and medical equipment.

Physical Properties of Thermally Conductive Silicone Coated Fiberglass									
Product	Color	Thickness mils ASTM D374	Thermal Conductivity W / mK ASTM E1530	Thermal Impedance °C in <sup>2</sup> / W ASTM D1530*	Dielectric Strength volts - AC ASTM D149	Volume Resistivity ohm - cm ASTM D257	Break Strength psi ASTM D412	Elongation % ASTM D412	UL Recognized 94
TF407	Gray	7.0	0.9	0.45	3500	1 x 10 <sup>14</sup>	100	<5	V-0
TF409	Gray	9.0	0.9	0.50	4500	1 x 10 <sup>14</sup>	100	<5	V-0
TF412	Gray	12.0	0.9	0.65	6000	1 x 10 <sup>14</sup>	100	<5	V-0
TF1818	Gray	18.0	1.0	0.71	9000	1 x 10 <sup>14</sup>	60	<5	V-0
TF1877	Green	7.0	1.2	0.23	3000	1 x 10 <sup>14</sup>	100	<5	V-0
TF1879	Green	9.0	1.2	0.29	3500	1 x 10 <sup>14</sup>	100	<5	V-0

TF400 and TF1870 series are available as 36" wide rolls. TF1818 is available as an 18" wide roll.  
All styles are available with low tack thermally conductive pressure sensitive adhesive on one or both sides. Thermally conductive adhesive increases thermal impedance by 0.1 °C in<sup>2</sup> / W.  
Operating temperature range for all series listed is -80° to 400° F. \* ASTM E1530 @ 300 psi.

## Thermally Conductive Pressure Sensitive Tape Using Kapton® Film

Kapton® (MT) film minimizes thermal resistance while providing excellent cut-through and dielectric resistance. K271 and K275 are made using .001" film. K271 is coated on one side with 2 mils of thermally conductive silicone rubber and 1.5 mils of

thermally conductive acrylic pressure sensitive adhesive on the other side. K275 is made with 2 mils of thermally conductive acrylic pressure sensitive adhesive on each side.

Properties of Kapton® Thermally Conductive Tape Products							
Product	Color	Total Thickness mils ASTM D1000	Thermal Conductivity W / mK ASTM E1530	Thermal Impedance °C in <sup>2</sup> / W ASTM E1530 *	Dielectric Strength volts - AC ASTM D149	Adhesion To Steel oz / in ASTM D1000	Operating Temperature °F
K271	Green/White	4.5	0.60	0.30	7000	25	-20 to 300
K272	Green	6.0	0.80	0.30	7000	---	-20 to 300
K275	White	5.0	0.40	0.49	6500	30 / 30	-20 to 300

\* ASTM E1530 @ 10 psi  
K271 is recommended where electrical isolation is required and where replacement or upgrade of components is common.  
K275 is designed to bond electrical components to heat sinks and heat spreaders. It contains no halides or silicones.  
Thermosetting the adhesive enhances bond strength and solvent resistance, while optimizing thermal performance.  
Typical cure cycles are: 15 seconds @ 200°C or 5 seconds at 250°C.

## Non-Electrically Insulating Thermally Conductive Products for Isolated Components

Stockwell Elastomerics offers several products for use in applications that do not require the thermally conductive interface material to be an electrical insulator.

Properties for Non-Electrically Insulating Thermally Conductive Tapes						
Product	Color	Total Thickness mils ASTM D1000	Thermal Conductivity W / mK ASTM E1530	Thermal Impedance °C in <sup>2</sup> / W ASTM E1530	Adhesion oz / in ASTM D1000	Operating Temperature °F
C675	Aluminum	6.0	2.0	0.10*	30	-20 to 300
C695	Metallic Black	6.0	2.0	0.12**	30	-20 to 300
C6910	Metallic Black	11.0	2.6	0.16**	30	-20 to 300

\* ASTM E1530 @ 10 psi. \*\* ASTM E1530 @ 100 psi / 100° C.  
C695 and C6910 feature 5 mil and 10 mil flexible graphite film backings respectively, with 1 mil of thermally conductive acrylic pressure sensitive adhesive on one side. C675 has thermally conductive acrylic pressure sensitive adhesive on both sides.

Phase Change Thermal Interface Material is an excellent replacement for thermal grease.

Properties of Phase Change Thermal Interface Material						
Product	Color	Thickness nominal (mils)	Thermal Conductivity W / mK ASTM E1530	Thermal Impedance °C in <sup>2</sup> / W ASTM E1530	Phase Change Temperature °C	Adhesion to Steel PSTC - 1
C1100	White	3.0	1.0	0.03	35	125