

TEKSIL® Thermal Management Materials



THERMAL CONDUCTIVITY CONVERSION TABLE

Thermal Conductivity	BTU-in / hrft²F	Cal/cm · °C · sec	Watt/m-K
BTU-in / hrft²F	1	3.4×10^{-4}	0.14
Cal / cm · sec · °C	2.9×10^3	1	4.2×10^2
Watt / m-K	6.9	2.4×10^{-3}	1

APPLICATIONS:

- Thermal conductive insulators for semiconductors
- Compression jointing materials for thermistors and temperature sensors
- Thermal conductive material for all types of heaters

FORMULATIONS/CONFIGURATIONS: A variety of specific compounds are available for a wide range of performance requirements in Sheets, Rolls, Die-cuts, Sleeves, Gel, Extrusions, Moldings

TEK-SIL® Type	Application Guidelines	Typical Thermal Conductivity	
		Cal/cm · sec · °C	W/m-K
TEK-SIL® SCT	General purpose for moldings and extrusions	2.9×10^{-3}	1.20
TEK-SIL® SCH	High heat conductivity	4.1×10^{-3}	1.70
TEK-SIL® SR	General purpose extrusion with 0.05 mm glass cloth reinforcement	2.2×10^{-3}	0.90
TEK-SIL® SH	High heat conductivity with 0.05mm glass cloth reinforcement	3.4×10^{-3}	1.40
TEK-SIL® SB	Highest heat conductivity with 0.05mm glass cloth reinforcement	7.0×10^{-3}	2.90
TEK-SIL® SU	Very high heat conductivity	6.2×10^{-3}	2.60
TEK-SIL® SQ	Low hardness with high heat conductivity	2.6×10^{-3}	1.10
TEK-SIL® GPX	High heat conductivity gap filler/ pad	5.5×10^{-3}	2.30
TEK-SIL® GP	General purpose gap filler pad	3.6×10^{-3}	1.50
TEK-SIL® GPS	Lowest modulus gap filler material	3.4×10^{-3}	1.40
TEK-SIL® GP-10	High heat conductivity mesh reinforced gap filler pad, 0.25mm thin, available in rolls	3.6×10^{-3}	1.50
TEK-SIL® GP1X	General purpose gap filler pad, UL94 V0-V1 class	2.9×10^{-3}	1.20
TEK-SIL® GP2X	General purpose gap filler pad, UL94 V-0 class	6.8×10^{-3}	2.80
TEK-SIL® GP4X	High heat conductivity gap filler pad	14.4×10^{-3}	6.00
TEK-SIL® GP3X	Very high heat conductivity gap filler pad	18.9×10^{-3}	7.90
TEK-SIL® GP5X	Extremely high performance heat conductivity gap filler pad	26.3×10^{-3}	11.00
TEK-SIL® GP6X	Highest performance heat conductivity gap filler pad	33.4×10^{-3}	14.00
TEK-SIL® GP7X	New low thermal resistance gap filler pad	40.8×10^{-3}	17.00
TEK-SIL® GP8X	Highly conformable non-flammable (non-silicone) rubber sheet	6.0×10^{-3}	2.50
Mica	Shown for comparison purposes only	1.4×10^{-3}	0.59
Polyester	Shown for comparison purposes only	$.34 \times 10^{-3}$	0.14

All dimensions in millimeters

Phone : 800.576.9981

TEK-SIL® TECHNICAL INFORMATION

TYPICAL MATERIAL PROPERTIES

Test Properties		TEK-SIL® SCT			TEK-SIL® SCH			TEK-SIL® SU			TEK-SIL® SQ		
Physical properties	Color	Greenish Gray			Brown			Gray			Black		
	Hardness (ASTM D2240, type A)	75			85			79			55		
	Tensile strength (MPa)	5.4			4.9			2.5			2.3		
	Elongation (%)	100			60			110			250		
	Tear Strength (KN/m) (Angle Non-slit)	9			7			8			13		
Heat aging (Aging test by heating in air, to 200° C)	Change in hardness (Point)	3 days	10 days	20 days	3 days	10 days	20 days	3 days	10 days	20 days	3 days	10 days	20 days
		±0	±5	+9	+1	+1	+3	+8	+11	+15	±0	+1	+5
	Change in tensile strength (%)	±0	±0	+6	-12	-12	-12	+19	+42	+62	±0	+14	+24
	Change in elongation (%)	-16	-26	-34	-18	-24	-35	-46	-49	-49	-7	-15	-27
Electrical properties	Volume resistivity (MΩ-m)	1.0 x 10 ⁷			1.0 x 10 ⁷			1.0 x 10 ⁷			1.0 x 10 ⁷		
	Dielectric breakdown strength (kV/mm)	20			19			17			22		
	Dielectric constant	50Hz	10 ³ Hz	10 ⁶ Hz	50Hz	10 ³ Hz	10 ⁶ Hz	50Hz	10 ³ Hz	10 ⁶ Hz	50Hz	10 ³ Hz	10 ⁶ Hz
		4.9	4.9	4.9	5.7	5.4	4.9	5.34	5.32	5.33	4.67	4.61	4.62
	Dielectric dissipation factor	0.002	0.001	0.002	0.004	0.002	0.002	0.0026	0.0014	0.0010	0.0031	0.0015	0.0008
Thermal properties	Thermal conductivity (W/m-K)	1.2			1.7			2.6			1.1		
	Flame retardant (UL94)	V-0			V-0			V-0			V-0		

TYPICAL PRODUCT PROPERTIES

Properties		SCT			SCH			SU			SQ		
		SCT-12	SCT-18	SCT-33	SCH-12	SCH-18	SCH-33	SU-12	SU-18	SU-33	SQ-12	SQ-18	SQ-33
Color	visual	Greenish Gray			Brown			Gray			Black		
Thickness	mm	0.30 ^{+0.1/-0}	0.45 ^{+0.05}	0.85 ^{+0.05}	0.30 ^{+0.1/-0}	0.45 ^{+0.05}	0.85 ^{+0.05}	0.30 ^{+0.1/-0}	0.45 ^{+0.05}	0.85 ^{+0.05}	0.30 ^{+0.1/-0}	0.45 ^{+0.05}	0.85 ^{+0.05}
Material	Binder	Silicone			Silicone			Silicone			Silicone		
	Filler	Alumina			Alumina+ALN			Alumina			Alumina		
	Reinforcement	n/a			n/a			n/a			n/a		
Thermal Resistance	°Cin ² /W	0.62	0.73	1.35	0.42	0.52	0.76	0.26	0.35	0.56	0.57	0.77	1.25
Thermal Resistance w/PSA*	°Cin ² /W	n/a			n/a			n/a			n/a		
Specific Gravity	g/cm ³	2.29			2.44			2.57			2.20		
Hardness (ASTM D2240)	type A	75			85			79			55		
Tensile Strength	kN/m	1.7	2.3	4.2	1.7	2.3	4.2	0.9	1.2	2.2	0.8	1.0	2.0
Elongation	%	100			60			110			250		
Tear Strength	kN/m	0.3	0.4	0.8	0.2	0.3	0.6	0.3	0.4	0.7	0.5	0.6	1.1
Volume Resistivity	MΩ-m	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷	1x10 ⁷
Withstand Voltage	kV/minute	7	8	10	6	7	10	6	8	11	7	8	11
Dielectric Constant	1KHz	4.4	4.5	4.9	4.9	4.5	5.7	4.3	4.6	5.3	4.1	4.2	4.9
Maximum Use Temperature	°C	-60°C - 180°C			-60°C - 180°C			-60°C - 180°C			-60°C - 180°C		
Adhesive coating		n/a			n/a			n/a			n/a		

* FTM P-3010 (ASTM D5470 Equivalent)

Properties		SR			SH			SB			
		SR-06	SR-08	SR-12	SH-06	SH-08	SH-12	SB-08	SB-12	SB-18	SB-33
Color	visual	Greenish Gray			Brown			White			
Thickness	mm	0.15 ^{+0.02/-0.04}	0.20 ^{+0.02/-0.04}	0.30 ^{+0.1/-0}	0.15 ^{+0.02/-0.04}	0.20 ^{+0.02/-0.04}	0.30 ^{+0.1/-0}	0.20 ^{+0.05}	0.30 ^{+0.1/-0}	0.45 ^{+0.05}	0.85 ^{+0.05}
Material	Binder	Silicone			Silicone			Silicone			
	Filler	Alumina			Alumina+ALN			Boron Nitride			
	Reinforcement	Fiberglass			Fiberglass			Fiberglass			
Thermal Resistance	°Cin ² /W	0.51	0.56	0.66	0.55	0.57	0.61	0.30	0.34	0.39	0.51
Thermal Resistance w/PSA*	°Cin ² /W	0.78	0.83	0.93	0.63	0.66	0.72	0.64	0.66	0.71	0.83
Specific Gravity	g/cm ³	2.18			2.36			1.69			
Hardness (ASTM D2240)	type A	87	87	92	92	92	95	85			
Tensile Strength	kN/m	11			8			14	15	18	15
Elongation	%	2 or less			2 or less			3 or less			
Tear Strength	kN/m	-			-			-			
Volume Resistivity	MΩ-m	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷	1.0x10 ⁷
Withstand Voltage	kV/minute	4	6	7	2	4	8	3	5	7	10
Dielectric Constant	1KHz	2.5	3.2	3.5	3.0	3.3	3.9	2.6	3.0	3.2	3.7
Maximum Use Temperature	°C	-60°C to +180°C			-60°C to +180°C			-60°C to +180°C			
Adhesive coating	-	Available			Available			Available			

* FTM P-3010 (ASTM D5470 Equivalent)

All dimensions in millimeters