United Adhesives

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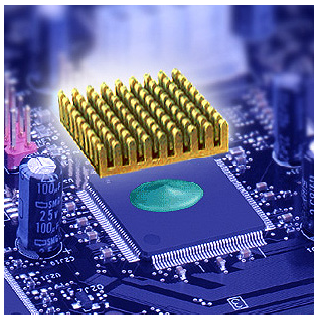
Thermal Gap Filling Materials

Thermal gap filling materials made by United Adhesives Inc. are for coupling thermal stress while dissipating heat. They have the following features:

- Very high thermal conductivity & heat dissipating capacity.
- Soft and flexible for stress-free gap filling.
- Flexible cure profile. Some are room temperature curable
- Both dispensable and printable versions are available.
- All are reworkable.

They are used in semiconductor, computer, telecommunication, and automotive electronic industries. They are typically applied between high heat power devices and heat sinks, and any places where require to couple thermal stress while dissipating heat, or require thermally conductive vibration dampening.

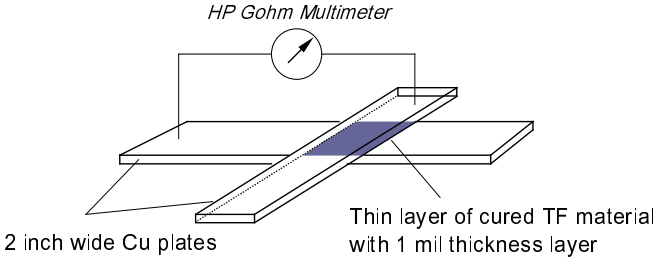


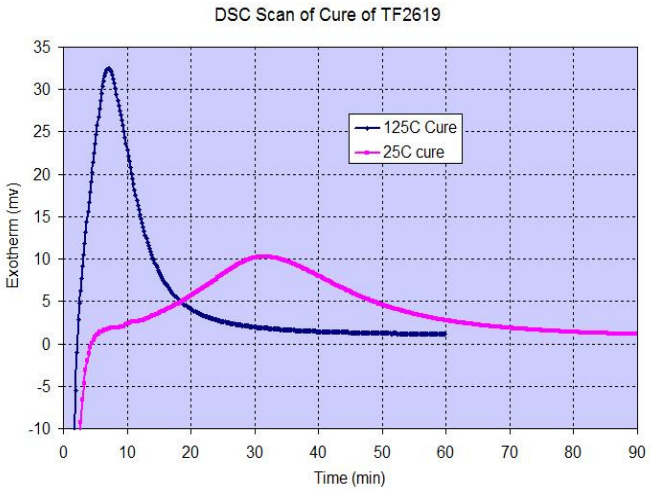
Name	ThermoFill TF2620	ThermoFill TF2419	ThermoFill TF2619	ThermoFill TF2612	Thermal Grease TG 2120	Thermal Grease TG 2730
Features / Advantages	Very high thermal conductivity. BN Filled. Non-Sag. Fast cure Reworkable	Pre-formed gel type material. Dielectric. Reworkable. No need to cure	High thermal conductivity. Non-Sag. Fast cure and room temp curable. Reworkable	Extremely soft for stress free. Non-Sag. Dielectric. Reworkable. Strong tack after Cure	High thermal conductivity. Low cost. Non-Sag. Reworkable	Boron nitride as filler to reach superior thermal conductivity. No cure required
Typical Applications	For high heat dissipations in electronic devices. Applied between high heat power devices and heat sinks	Especially designed for coupling thermal stress while significantly dissipating heat in electronic devices	For electronic applications. Applied between high heat power devices & heat sinks. Excellent for thermally conductive vibration dampen	For coupling thermal stress while dissipating heat. Excellent for thermally conductive vibration dampen	For high heat dissipations in electronics. Applied between high heat power devices and heat sinks	Especially designed for high heat dissipation while providing stress-free coupling in electronic devices
Appearance	Off-White	White - A White / Grey - B	White / Grey	White - A White / Grey - B	White / Grey	White / Grey
Rheology	Dispensable, thixotropic	Extrudable	Printable & Dispensable	Dispensable	Dispensable, thixotropic	Dispensable, thixotropic
Viscosity @25C (cps, as mixed)	180,000	30 Gram / Min (Extrusion)	260,000	55,000	180,000	250,000
Part / Component	One Part	One Part	One Part	A/B (1:1 wt mixing)	One Part	One part
Density (g/ml)	1.6	2.4	2.9	2.4	2.9	1.6
Work life (hr)	N/A	N/A	N/A	30 min	N/A	N/A
Cure Rate	125C 30 min	Not required	125C 60 min	rmT 3 hrs 125C 30 min	Not required	Not required
Shelf Life (days)	> 3 month @ < 4C	> 6 month @ < 30C	15 days @ < 25C	> 6 month @ < 30C	> 12 month @ < 30C	> 12 month @ < 30C
Thermal Conductivity (W/mK)	2.6	0.8	2.0	1.2	2.1	3.0
Thermal Stability	-50 to 200C	-50 to 200C	-50 to 200C	-50 to 200C	-50 to 200C	-50 to 180C
Tg	-120C	-120C	-120C	-120C	-120C	N/A
Hardness	Shore A =15	Shore OO < 10	Shore OO=40	Shore OO = 45	Grease / paste	Grease / paste
Volume Resistivity (Ohm-cm)	> 10E+14	> 10E+14	> 10E+14	> 10E+14	> 10E+14	> 10E+13
Dielectric Strength (KV/mm)	> 400 V/mil	> 400 V/mil	> 400 V/mil	> 400 V/mil	> 400 V/mil	> 400 V/mil

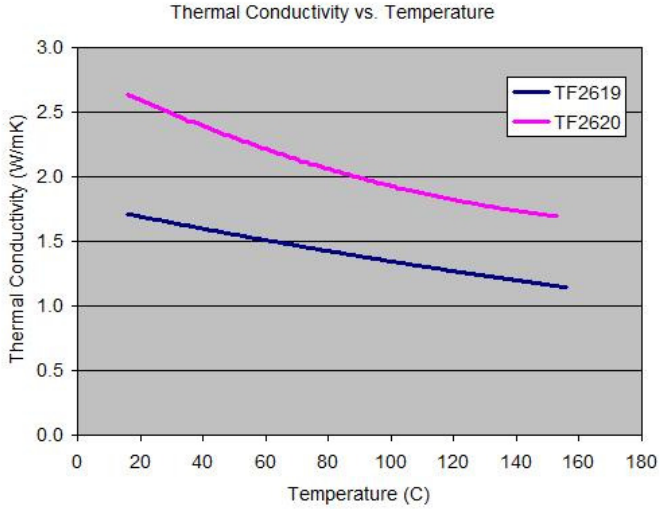
▶ Properties of Thermal Gap Filling Materials

Resistivity of ThermoFill Materials at Various Temperatures

Temperature (C)	Resistance (Gohm)	Resistivity (Ohm-cm)
- 40	> 1.2	> 10^{13}
25	> 1.2	> 10^{13}
55	0.625	6.25 x 10^{12}
85	0.157	1.57 x 10^{12}
115	0.0842	8.42 x 10^{11}
125	0.0527	5.27 x 10^{11}







Mechanical stability with environmental treatment