

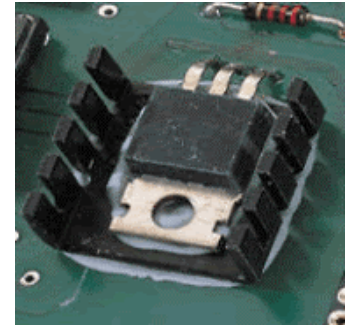
Thermally Conductive Adhesives – Two Part System

United Adhesives Inc. makes thermally conductive adhesives (TCA) for bonding electronic devices with heat dissipations. The two-part products have following features:

- Very high thermal conductivity.
- High bonding strength to most common plastics and metals
- Soft rubber and flexible to couple thermal stress while dissipating heat
- High dielectric strength for voltage insulation

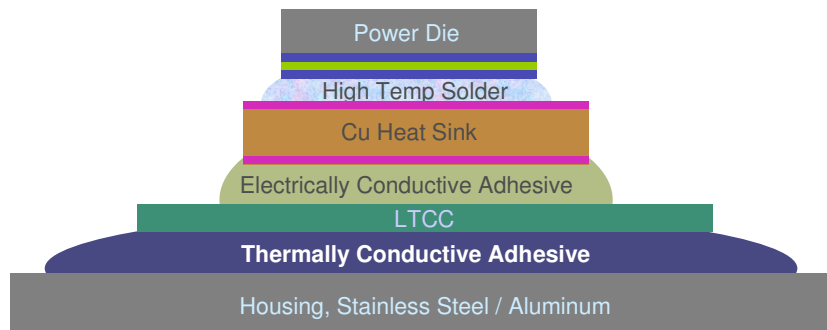
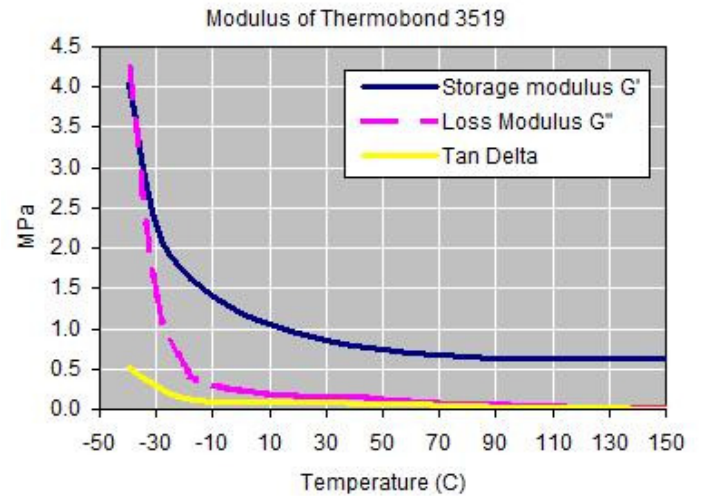
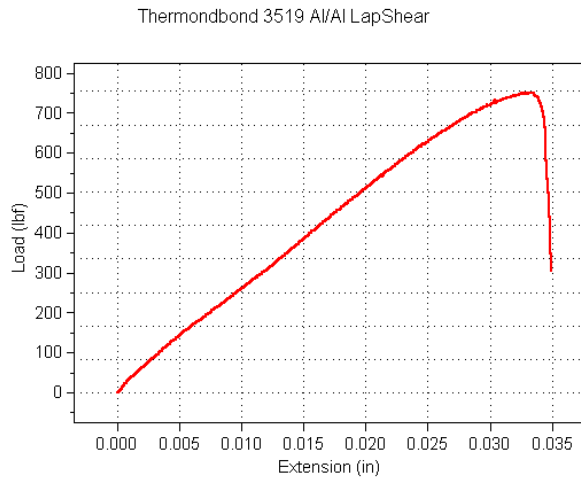
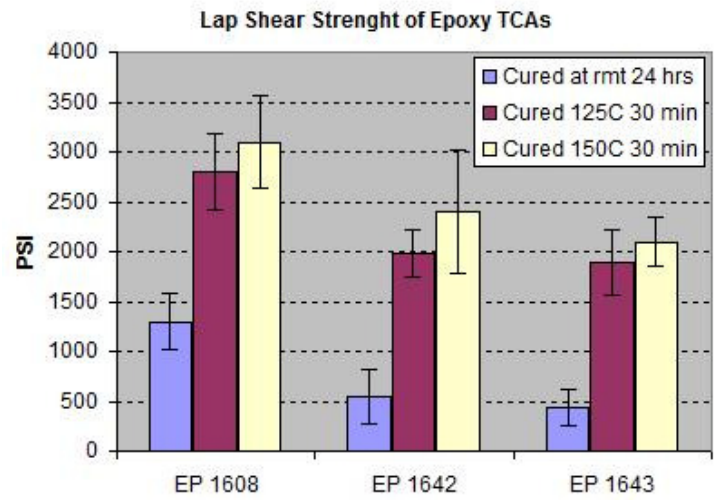
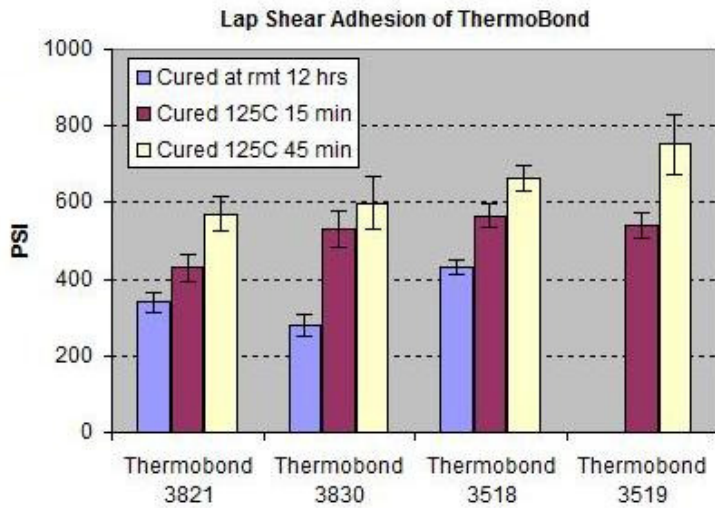
Structural bonding epoxy based thermally conductive adhesives are also available.

They are typically applied between high heat power device and heat sink; or any places where require coupling thermal stress while dissipating heat, or require thermally conductive vibration dampening; attachment of PCB to heat sink, cooling fans to devices, bonding or encapsulation of powder devices.



Name	Thermobond 3519	Thermobond 3821	Thermobond 3830	EP1608	EP1642	EP 1643
Chemical Base	Silicone	Silicone	Silicone / Boron Nitride	Epoxy	Epoxy	Epoxy
Features / Advantages	High thermal conductivity. Easy flow. Fast cure. Superior dielectric property	Very high thermal conductivity. Non-Slump. Fast cure	Boron nitride filled for very high thermal conductivity. High bonding Strength.	High thermal conductivity. High bonding Strength. Easy flow. Rmt curable.	High thermal conductivity. High bonding Strength. Low CTE. Easy flow	High thermal conductivity. High bonding Strength. Low CTE. Easy flow
Typical Application	For high heat dissipations potting or bonding. Applied between high heat power devices and heat sinks.	For high heat dissipations bonding. Applied between high heat power devices and heat sinks.	Strong bonding for heat dissipations in electronics. Low stress for thermally conductive vibration dampening.	Strong bonding or potting for heat dissipations in electronics.	For high heat dissipations in electronics.	Strong bonding or potting with heat dissipations in electronics.
Appearance	White - A White - B	White - A Grey - B	White - A White - B	Off White - A Amber - B	Grey - A Amber - B	Off White - A Off White - B
Rheology	Flowable	Thixotropic, Dispensable	Thixotropic, Dispensable	Flowable	Flowable	Dispensable
Viscosity @25C (cps)	96,000	210,000	230,000	180,000	160,000	210,000
Part / Component	Two parts (1:1)	Two parts (1:1)	Two parts (1:1)	Two parts (2:1)	Two parts (1:1)	Two parts (1:1)
Work life (hr)	120 min	30 min	30 min	30 min	30 min	15 min
Cure Rate	125C 30 min	25C 4 hr 125C 15 min	125C 15 min	25C 4 hrs 125C 10 min	85C 120 min 125C 30 min	25C 18 hs 125C 30 min
Shelf Life (days)	6 months @ < 30C	6 months @ < 30C	6 months @ < 30C	6 months @ 5C	6 months @ 5C	6 months @ 5C
Thermal Conductivity (W/mK)	1.4	2.0	3.2	1.7	1.5	1.7
Thermal Stability	-50 to 200C	-50 to 200C	-50 to 200C	-80C to 200C	-80C to 200C	-80C to 200C
Tg	-120C	-120C	-120C	85 to 125	85 to 125	85 to 125
CTE (ppm/C)	97 ppm/C	98 ppm/C	120 ppm/C	<120(> Tg) < 30 (<Tg)	<100(> Tg) < 30 (<Tg)	<100(> Tg) < 30 (<Tg)
Hardness / Modulus	Shore A = 45	Shore A = 90	Shore A = 63	Shore D = 70	Shore D = 70	6.7 GPa
Tensile Strength	n/a	1.1 Mpa	2.8 Mpa	n/a	n/a	n/a
Elongation	n/a	45%	120%	n/a	n/a	n/a
Volume Resistivity (Ohm-cm)	3x10E+14	> 10E+14	2.5x10E+14	> 10E+12	> 10E+12	> 10E+12
Dielectric Strength (KV/mm)	>420 V/mil	> 400 V/mil	500 V/mil	500 V/mil	500 V/mil	500 V/mil
Dielectric Constant (@ 100Hz)	4.3	3	3.5	n/a	n/a	n/a
Adhesion (Al/Al Lap Shear, psi)	> 550 psi	> 550 psi	580 psi	> 900 psi	> 1800 psi	> 1800 psi

► **Modulus and Adhesion of Thermobond Adhesives**



A power device where thermally conductive adhesive and electrically adhesives are applied