United Adhesives

导热粘合剂

Thermally Conductive Adhesives

▶ 硅胶导热粘合剂 Silicone Thermally Conductive Adhesives

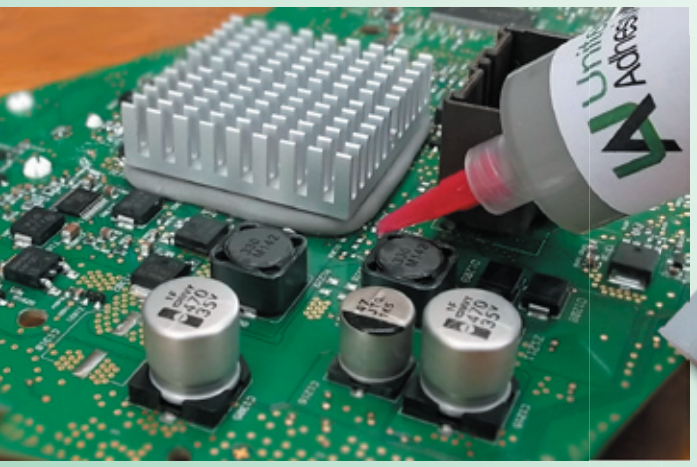
美国联合胶粘剂公司生产各种有机硅类导热粘合剂（TCAs），它们广泛用于粘结电子器件同时提供良好的导热。它们具有以下特点：

- 高导热和散热能力
- 与常用的塑料和金属有高粘结合强度
- 灵活的固化条件。有些可以室温固化
- 可以自动滴注, 或者印刷
- 柔软而有弹性从而耦合减少热应力，同时散热
- 高介电强度，良好的绝缘体

United Adhesives Inc. makes various silicone-based thermally conductive adhesives (TCAs) for bonding electronic devices with heat dissipations. They have the following features:

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

Name	Features / Advantages	Rheology	Part	Thermal Conductivity	Hardness / Modulus	Adhesion Al/Al, psi	Cure Rate
Thermobond 3513	Silicone with high bonding Strength. Low stress	Flowable 85,000 cPs	1-part	1.4 W/mK	Shore A =70	> 600	125°C 60 min
Thermobond 3517	Silicone with high thermal conductivity. Strong bonding. Non-Slumping	Thixotropic, 120,000 cPs	1-part	1.9 W/mK	Shore A = 90	> 550	125°C 60 min
Thermobond 3518	Silicone with high thermal conductivity. Strong bonding. Non-Slumping	Thixotropic, 120,000 cPs	2-part, 1:1 mix.	1.7 W/mK	Shore A = 65	> 400	125°C 30 min
Thermobond 3519	Strong bonding. High voltage insulation. Flowable	Flow 96,000 cPs	2-part 1:1 mix.	1.4 W/mK	Shore A = 45	> 400	125°C 30 min
Thermobond 3831	Boron nitride filled for very high thermal conductivity	Thixotropic, 230,000 cPs	1-part	3.2 W/mK	Shore A = 63	580	125°C 60 min
Silductor 6310	Silver filled silicone for very high thermal conductivity and low stress	41,000 cPs	1-part	> 4 W/mK	Shore A = 45	> 150	125°C 60 min
Silductor 6350	Silver-Copper filled silicone for high thermal conductivity and low stress	46,000 cPs	1-part	1.9 W/mK	Shore A = 68	> 180	125°C 30 min
Other Products	Silicones based Thermobond 3508, 3821, 3830, Silductor 6201, 6381 – One or two-pat silicone systems with various modifications Epoxy based ET1608, 1642, 1645NS, 1653BN, 1655, 1658 – One or two part epoxy systems with various modifications Refer to: UnitedAdhesives.com for the property details						



▶ 环氧树脂导热粘合剂 Epoxy Thermally Conductive Adhesives

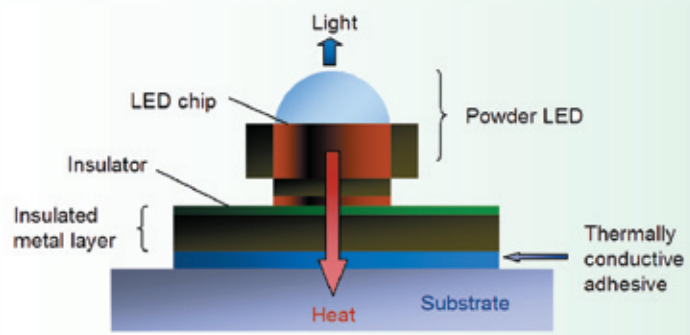
美国联合胶粘剂公司亦生产各种非有机硅类导热粘合剂，比如环氧树脂导热粘合剂，它们广泛用于粘结电子器件同时提供良好的导热。它们具有以下特点：

- 非常高的热导率。一些银填充环氧树脂有超过 10 W / mK的热导率。
- 对硅芯片，模块，以及大多数金属和通用塑料形成很高的粘合强度。
- 高的热稳定性。有些具有高Tg。它们可用于芯片的绑定粘结。
- 高介电强度， 良好的绝缘体性。
- 基于环氧树脂的导热粘合剂有较强的抗油和耐化学性腐蚀性。

United Adhesives Inc. also makes various nonsilicone-based thermally conductive adhesives (TCAs) for bonding electronic devices with heat dissipations. They have the following features:

- Very high thermal conductivity. Some silver-filled epoxies have over 10 W/mK conductivity.
- High bonding strength to silicon die, most metals and common plastics.
- High thermal stability. Some have high Tg. They are feasible for die attachments.
- High dielectric strength for voltage insulation.
- Epoxy based TCAs have strong oil and chemical resistance.

Name	Features / Advantages	Rheology	Part	Thermal Conductivity	Hardness / Modulus	Adhesion Al/Al, psi	Cure Rate
ET1628	High thermal conductivity. High bonding strength. Easy flow. Rmt curable.	160,000 cPs	2-part 2 : 1	2.3 W/mK	5.8 GPa	> 1500	25°C 8hrs, or 105°C 10 min
ET1643	High thermal conductivity. High bonding strength. Flowable. Low CTE.	210,000 cPs	2-part 1 : 1	2.0 W/mK	6.7 GPa	> 1800	25°C 18hrs, or 125°C 30 min
ET1645	High thermal conductivity. Good flow. High bonding Strength	50,000 cPs	1-part	1.5 W/mK	Shore D = 70	> 1000	150°C 45 min
ET1649	High thermal conductivity. Flowable High bonding strength. Low CTE	190,000 cPs	1-part	2.2 W/mK	Shore D = 90	> 1000	125°C 60 min 150°C 35 min
TF2619	High thermal conductivity gap filling silicone	Thixotropic, 260,000 cPs	1-part	2.0 W/mK	Shore OO = 40	N/A	125°C 45 min
TF2620	High thermal conductivity gap filling silicone, boron nitride filled	Thixotropic, 180,000 cPs	1-part	2.6 W/mK	Shore A = 15	N/A	125°C 30 min 150°C 15 min
Eposolder 6510	Silver filled epoxy for high thermal conductivity	35,000 cPs	1-part	> 5 W/mK	Shore D = 78	> 1200	85°C 120 min 125°C 60 min
Eposolder 6869	Silver filled epoxy for extremely high thermal conductivity	98,000 cPs	1-part	11 W/mK	Shore A = 70	> 400	125°C 60 min
Other Products	Silicones based Thermobond 3508, 3821, 3830, Silductor 6201, 6381 – One or two-pat silicone systems with various modifications Epoxy based ET1608, 1642, 1645NS, 1653BN, 1655, 1658 – One or two part epoxy systems with various modifications Refer to: UnitedAdhesives.com for the property details						



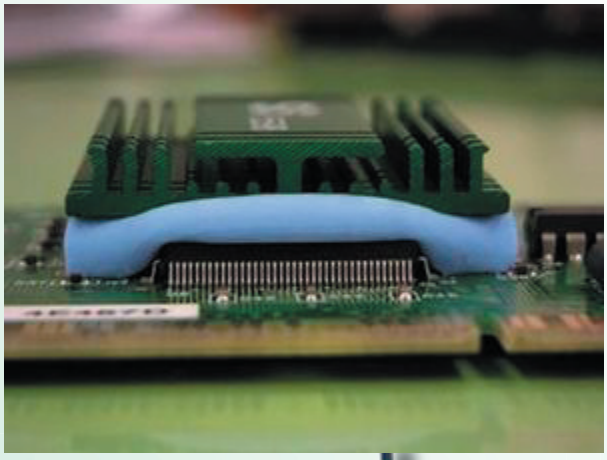
▶ 典型应用 Applications

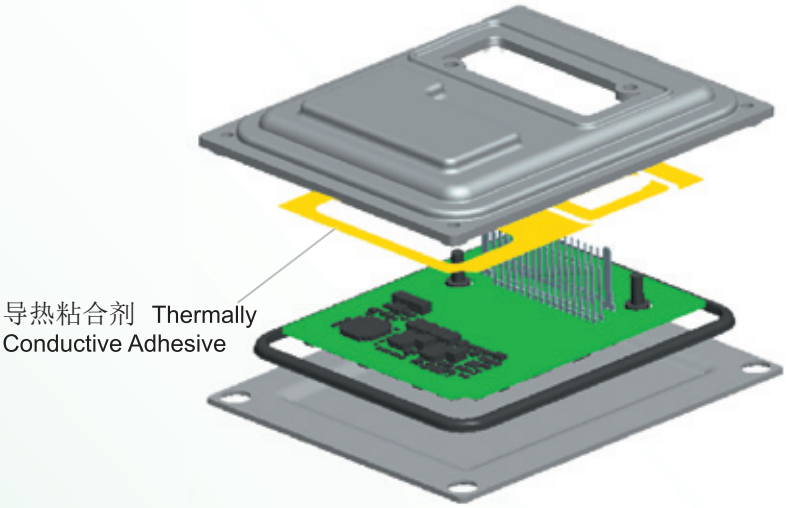
【主要用途】

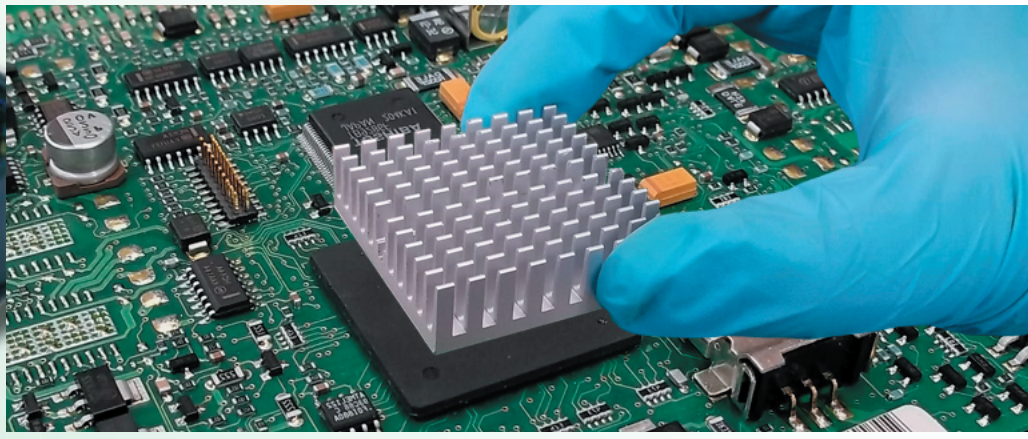
用于航空航天,汽车电子，半导体和电信等电子工业中的导热粘结。 通常用于高热功率器件和散热器件之间；或者用于需要热应力的耦合，同时散热，或者需要导热减震的任何地方；PCB板与散热基板之间的粘结，冷却风扇设备的粘接，或功率器件的粘结与封装。

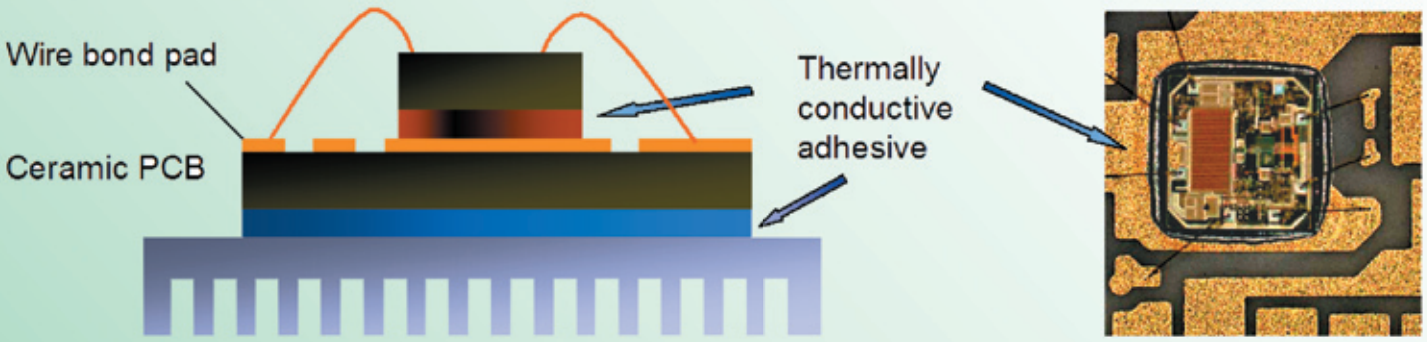
【Potential Uses 】

For high heat dissipation and bonding in automotive electronics, semiconductors, and telecommunications, typically applied between a high heat power device and heat sink; any places that require coupling of 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 power devices.









▶ 流程指南 Process Guidance

▶准备
对于50cc，200cc的连体双管，我们推荐使用EFD手动或气动涂胶枪和活塞。胶粘剂连体双管很容易装入涂胶枪，并通过静态混合管混合滴灌。这可以避免对粘合剂,封装剂，和涂料的称重及混合。

对于可以随时使用的单组分的注射器，罐装，桶装产品，从冰箱中取出来后，请先让它解冻到室温。

对于大量的应用，各种类型的自动液体分配滴灌设备可以用于这些粘合剂。它们包括：手工分配/时间压力阀;螺旋式的阀门;线性活塞泵和喷射阀。设备选型应以应用需求来决定。有关设备选型和工艺优化，用户应采纳相应供应商的技术服务的建议。

▶脱气
对于单组份产品，或用自动分配设备滴灌A / B胶时，只要没有气泡被截留在机械零件的下方，通常不需要脱气，因为它们出厂前预先被脱过气。

对于手工混合A / B胶时，脱气是必需的。可以是635毫米汞柱（25英寸汞柱）或更大的真空下脱气。真空脱气时，注意观察未固化流体的气泡形成,逐步增加真空度，以避免流体快速发泡溢出。保持真空度直至气泡在液体表面崩溃。

▶基材制备
基材应该免费灰尘，油污和指纹的脏污。使用适当的工业清洗技术用于清洁光电表面。如果使用烃类溶剂清洗（例如己烷，甲苯），建议再用试剂级异丙醇作最终漂洗干燥。如果使用含水洗涤剂清洗，建议再用去离子水作多次最终漂洗干燥,或用试剂级异丙醇作最终漂洗干燥。对于某些塑料，例如聚乙烯，聚丙烯和氟塑料的表面可以进行预处理，比如化学蚀刻或等离子蚀刻，以改善粘合剂的粘合性。

有机硅产品，应与清洁的基片材料固化粘结。避免使用在一些表面上含有诸如，硫，胺，磷，有机金属，酸和某些丁基，亚硝酸盐，氯化，和EPDM弹性体，某些塑料与浸出增塑剂，和某些粘合剂的固化残留物，包括紫外线固化环氧树脂和胺固化环氧树脂。可以在粘结表面某些施加涂层或粘合促进剂以增强粘合力。

▶固化时间
根据粘合剂的TDS所列出的相应的温度和时间进行固化。一般对于有机硅产品，推荐在升高的温度下固化，以增强粘附力。

▶Preparation
For 50cc, 200cc ducal cartridges, we recommend use EFD manual or pneumatic dispensing applicator and plunger. Adhesive filled with cartridges are easily loaded into the dispensing gun and dispensed through static mixers. This eliminates the need to weigh or mix adhesives, potting compounds, and coatings.

For products that is supplied in a ready-to-use one component syringe, jar, and pail, please let it thaw to room temperature after pull out from refrigerator.

For high volume application, a variety of auto dispensing equipment types are suitable for applying these adhesives. They include: hand dispense / time pressure valve; auger style valve; linear piston pump and jet valve. Selection of equipment should be determined by application requirements. For advice on equipment selection and process optimization users should contact the corresponding supplier's Technical Services.

▶De-aeration
De-aeration is typically not needed for one-component products, or auto dispensing with A/B parts, as long as no pockets of air are trapped beneath mechanical parts. For manually mixed A/B parts, the de-aeration is required. The assembly may be vacuum deaerated using a pressure of 635 mmHg (25 inHg) or greater. Apply the vacuum while observing the uncured fluid for presence of bubble formation and increase vacuum slowly enough to avoid rapid foaming. Hold vacuum until bubbles at the fluid surface collapse.

▶Substrate Preparation
Substrates should be free of dust, oil, and fingerprint soils. Use suitable industrial techniques for cleaning electro-optics. If using hydrocarbon solvent cleaning (e.g. hexane, toluene), a final rinse with reagent grade isopropanol is recommended. If using aqueous detergent cleaning, multiple final rinses with de-ionized water or a single rinse with reagent grade isopropanol followed by drying is recommended. For certain plastics, such as polyethylene, polypropylene, and fluoroplastics, the surface may be pre-treated with chemical etching or plasma etching to improve the adhesion.

For silicones products, it needs to cure in contact with most properly cleaned substrate materials. Avoid using them on any place that contains sulfur, amine, phosphorous, organo-metals, acid, and certain butyl, nitrite, chlorinated, and EPDM elastomers, certain plastics with leachable plasticizers, and the cure residues of certain adhesives including UV-cured epoxies and amine-cured epoxies. A certain primer or adhesion promoter may be applied on bonding surfaces to enhance the adhesion.

▶Cure Schedule
Cure the assembled part at corresponding temperature and time according to the TDS of the adhesives. Generally for silicone products, a cure at elevated temperature is recommended for adhesion enhancement.

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The data presented in this leaflet are in accordance with the present state of our knowledge, but do not absolve the user from carefully checking all supplies immediately on receipt. We reserve the right to alter product constants within the scope of technical progress or new developments. The recommendations made in this leaflet should be checked by preliminary trials because of conditions during processing over which we have no control, especially where other companies' raw materials are also being used. The recommendations do not absolve the user from the obligation of investigating the possibility of infringement of third parties' rights and, if necessary, clarifying the position. Recommendations for use do not constitute a warranty, either express or implied, of the fitness or suitability of the products for a particular purpose. For technical, quality, or product safety questions, please contact directly to United Adhesives Inc.

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