United Adhesives

光学透明粘合剂

Liquid Optically Clear Adhesives

▶ 液体光学透明粘合剂 Liquid Optically Clear Adhesives

美国联合粘合剂公司配方并生产的液体光学透明粘合剂适用于光电应用。我们的创新解决方案基于光学级环氧树脂和硅胶密封剂，涂料，粘合剂和密封剂。

环氧树脂产品,因为具有高密度的芳香烃结构的交联网络结构,具有较高的折射率。用该产品进行封装后，光学装置表现出增强的光输出。

硅胶为基础的产品提供了柔性特点，能减少系统中的张力，减少机械冲击力和热冲击力，对水分和其他媒体的攻击敏感的光电子组件的提供优异的保护。

它们被用于粘结和灌封光纤电缆，连接器和端子，LCD背光，显示器，交通和其它照明，提高电光组件的振动和冲击阻力，胶结和涂覆光学部件，灌封LED器件，光学复制和涂层或灌封各种各样的电光学和激光元件。

United Adhesives Inc. formulates and manufactures liquid optically clear adhesives for optoelectronic applications. Our innovative solutions are with optical-grade epoxy and silicone encapsulants, coatings, adhesives, and sealants.

The epoxy-based products have a high refractive index of 1.6 resulting from the high density of aromatic structure in the cross-linked network. Packaged with this encapsulant, the optical device is shown to exhibit an increased light output. The silicone-based products provide flexibility to reduce stress in the system and superior protection of sensitive photonics assemblies from mechanical shock, thermal shock, moisture and other media attacks.

They are applied in bonding and potting fiber-optic cables, connectors and terminations, LCD backlighting, displays, traffic and other lightings, upgrading the vibration and shock resistance of electro-optic assemblies, cementing and coating optical parts, potting LED devices, optical replications, and coating or encapsulating a wide variety of electro-optic and laser components.

特点

- 优良的光传输特性。
- 低温快速固化环氧树脂灌封胶具有较高的折射率
- 优良的无黄变性能或抗黄变性能
- 基于硅胶的产品可以固化成低应力的弹性体
- 耐臭氧和紫外线降解
- 较宽的操作温度为-40至180℃
- 高附着力，高纯度，高耐湿性
- 有机硅胶产品可以返修
- 可在低温下进行固化，或在升高的温度下用较短的时间固化

Features

- Excellent light transmission characteristics.
- Low-temperature fast cure epoxy encapsulant with high refractive index
- Superior non-yellowing properties or anti-yellowing
- Silicone based system can cure to low-stress elastomer
- Resistance to ozone and UV Degradation
- Broad operating at temperatures of -40 to 180°C.
- High adhesion, high purity, moisture resistance
- Reworkable for silicones
- Can be cured at low temperature or cured at elevated temperature with short time

▶ 技术参数和特点 Technical Datasheets and Features

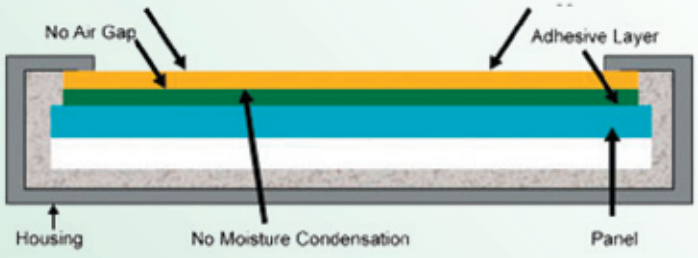
	具体技术参数 TDS	OP4035	OP4036	OP1581	OE1582
固化前性能 Property Before cure	化学基础 Chemical Base	硅胶 Silicone	硅胶Silicone	环氧树脂 Epoxy	环氧树脂 Epoxy
	颜色/组分 Color / Component	无色透明, 单组分 Clear transparent One Part	无色透明, 双组分 Clear transparent Two Part 1:1	无色透明, 单组分 Clear transparent One Part	无色透明, 双组分 Clear transparent Two Part 2:1
	粘度 Viscosity at 25°C @10 1/s (cP.s)	4,600	4,900	1,470	
	密度 Density (Gram /cc)	0.98	0.98	1.05	1.05
固化后性能 Property as Cured	颜色 Color	无色透明, Clear transparent	无色透明, Clear transparent	无色透明, Clear transparent	无色透明, Clear transparent
	硬度 Hardness (25 °C)	35 A	40 A	70 D	77 D
	折射率，589纳米 n_D (25°C) Refractive Index (589 nm)	1.41	1.41	1.564	1.564
	%透光率 % Transmittance (360 nm to 1000 nm), 1 mm Thick	97% to 99%	97% to 99%	95% to 99%	95% to 99%
	抗拉强度 Tensile Strength (Mpa)	4.2	4.8	N/A	N/A
	伸长率 Elongation (%)	160	140	N/A	N/A
	介电常数 Dielectric Constant @100Hz	2.5	2.5	N/A	N/A
	耗散因数 Dissipation Factor @100 Hz	< 0.003	< 0.003	N/A	N/A
	介电强度 Dielectric Strength (Volt/mil AC)	> 480	> 480	> 500	> 500
	体积电阻率 Volume Resistivity (Ohm-cm)	> 10^{14}	> 10^{14}	> 10^{12}	> 10^{12}
	柔性强度 Flexible Strength (MPa)	N/A	N/A	120	120
	压缩强度 Compress Strength (Mpa)	N/A	N/A	150	150
	粘结强度 Adhesion (Al / Al, Lap Shear, Psi)	N/A	N/A	> 800	> 1200
	热膨胀系数 Coefficient of Thermal Expansion (ppm/°C)	280	270	120 (> Tg) 60 (< Tg)	123 (> Tg) 58 (< Tg)
	Tg (°C)	-120	-120	75	80
	使用温度范围 Useful Temperature Range (°C)	-55 to 200	-55 to 200	-80 to 180	-80 to 180
	保质期 Shelf Life (Month)	6 at < 5°C	6 at < 25°C	6 at - 40°C	12 at < 25°C
固化条件 Cure Profile	125 °C固化 Cure at 125 °C (Minute)	20	5	30	15
	80 °C固化 Cure at 80 °C (Minute)	90	10	2 to 3 hrs	1 hr
	65 °C固化 Cure at 65 °C	2 to 5 hrs	20 min		2 hrs
	25 °C固化 Cure at 25 °C	N/A	4 to 6 hrs		24 hrs
	工作时效 Pot / Work Life at 25°C (weeks)	> 1	30 min after mix	> 8	> 8

▶ 典型应用 Applications

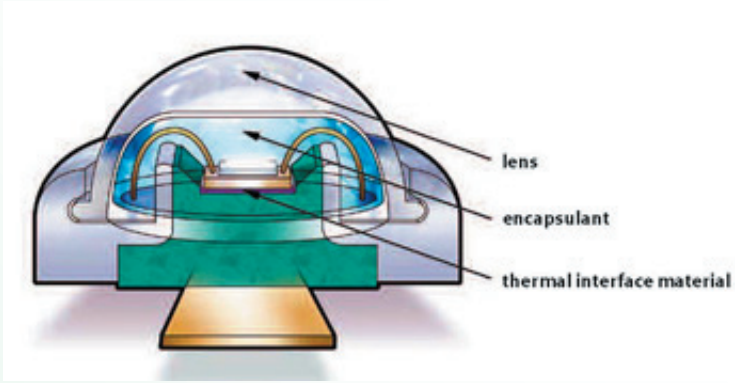
典型应用包括:

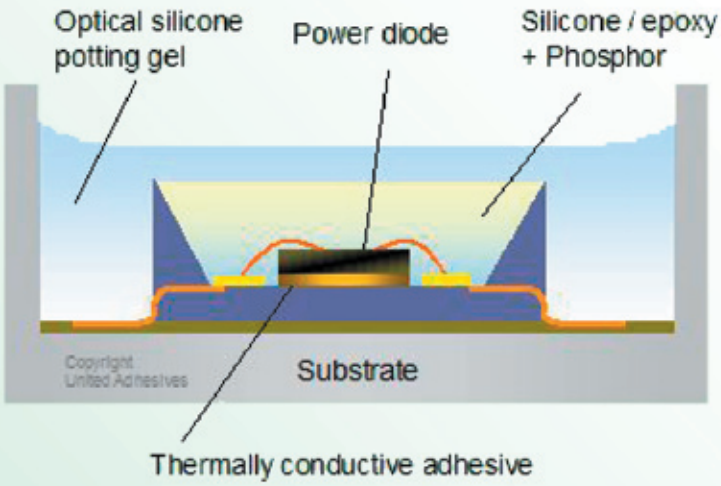
•封装光电电子零件，以保护免受振动，潮湿和污染。
•用于粘接和保护光纤电缆，连接器和终端，LCD背光源，显示屏，交通及其他照明。
•光学组装，如光电子，光电子，LED灯。太阳能电池板和电子设备。
•铸造和成型高性能光学元件
•作为粘合剂，底部填充剂，密封剂，或需要高光传输的光学电子应用
•为了提高电光组件的抗振动和抗冲击性。
•胶结和涂覆光学部件，灌封LED器件，光学复制和涂层或灌封各种各样的电光学和激光元件等等。

• Encapsulate opto-electronic parts to protect them from vibration, moisture & contaminants.
• For bonding and protection of fiber-optic cables, connectors and terminations, LCD backlighting, displays, traffic and other lightings.
• Optical assembly such as in opto-electronics, photonics, LEDs. Solar panels and electronic devices.
• For casting and molding high performance optical components
• As an adhesive, underfill, or encapsulant in optical electronic applications requiring high optical transmission
• For enhancing the vibration and shock resistance of electro-optic assemblies.
• Cementing and coating optical parts, potting LED devices, optical replications, and coating or encapsulating a wide variety of electro-optic and laser components.



光学绑定 Optical Bonding





LED 芯片的灌封 LED Potting

▶ 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，如OE1583，OP4035，从冰箱中取出来后，请先让它解冻到室温。解冻时间为，30毫升注射器约30分钟，1升大小的瓶子约60分钟，5加仑的桶约2小时。

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，而且具有低粘度。

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（OP4035，4036），应与清洁的基片材料固化粘结，包括光学玻璃，光学塑料和光电半导体。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, such as OE1583, OP4035, please let it thaw to room temperature after pull out from refrigerator. The thawing time is 30 min for 30cc syringe, and 60 min for 1 liter size jar and 2 hrs for the 5 gallon pails.

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, since they are pre-de-aired and their low viscosity 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 (OP4035, 4036) cures in contact with most properly cleaned substrate materials including optical glasses, optical plastics, and photonic semiconductors. 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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