



A1821-TX

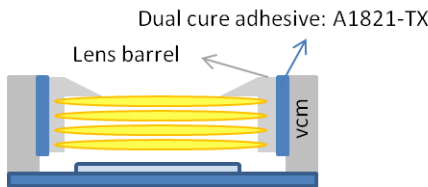
Dual cure epoxy adhesive: UV-Heat cure adhesive

PRODUCT DESCRIPTION:

- Base chemistry: epoxy only, cationic polymerization
- One component adhesive ready for use, solvent-free, UV and/or heat curing, thixotropic

PRODUCT USE:

- Active alignment of components for optoelectronics and semiconductor packaging
- Camera module bonding with active alignment: bond lens barrel to VCM



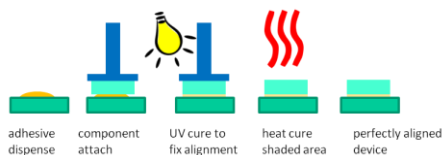
- Bonding of opaque substrates

FEATURES:

- Epoxy only, low thermal cure temperature with short cure time, UV-curable with LED-365nm and LED-405 nm, high adhesion, high Tg, long working life, not sensitive to oxygen in cure process, excellent reliability performances, robust for solder reflow process

INSTRUCTIONS FOR USE:

- 1) Clean the substrates to remove contamination, dust, moisture, salt and/or oil
- 2) Dispense adhesive on substrates
- 3) Bond substrates (with active alignment – optional)
- 4) UV cure to fix alignment or to bond
- 5) Thermal cure: to cure adhesive in shadow area and to improve adhesion of bonded parts



CURING CONDITIONS: 3 curing ways: UV + heat or heat or UV

- 1) **UV + Heat curing:** both UV and heat are used in the curing process

First step: UV cure

*Metal halide/Mercury UV: UV-A (320-400 nm), intensity: 100-1,000 mW/cm²

*or LED-365 nm, UV light intensity: 50 to 1,000 mW/ cm²

*or LED-405 nm, UV light intensity: 100 to 1,000 mW/ cm²

LED-365 nm	LED-405 nm	Metal Halide/Mercury (UV-A: 320-400 nm)
UV intensity x time (sec) (mW/cm ²)	UV intensity x time (sec) (mW/cm ²)	UV intensity x time (sec) (mW/cm ²)
50 90 sec or more	100 90 sec or more	50 50 sec or more
or 100 60 sec or more	or 200 60 sec or more	or 100 30 sec or more
or 200 30 sec or more	or 500 20 sec or more	or 200 15 sec or more
or 500 12 sec or more	or 1,000 10 sec or more	or 500 6 sec or more
or 1,000 4 sec or more		or 1,000 3 sec or more

Second step: heat cure: the adhesive is exposed to UV light first, then heat cure

* 80 to 85 °C for 30 to 60 minutes

- 2) **Heat curing:** heat is the only source for curing, the adhesive sees no UV light
 - 80°C for 1-2 hrs
 - or 75°C for 2-3 hrs
 - The actual heat cure time is dependent on the heating time of the bonded components. The heat time of the components must be added to the total cure time of the adhesive for the process
- 3) **UV Curing:** UV is the only source of curing
 - 1000 mW/cm² x 3 to 10 sec metal halide/mercury light source with UV-A (320-400 nm) or with LED-365 nm or with LED-405 nm
 - The recommended UV cure dose is at the adhesive if the substrate absorbs curing light, then the actual cure time needs to be increased.
 - The effect of humidity is greater for very thin film, if the adhesive layer is <25 μm, then longer cure time might be needed
 - To ensure good curing speed, the humidity should be <60% RH
 - Epoxy adhesives have post cure properties. Adhesion strength should be conducted at least 24 hrs after part assembly.

TYPICAL PROPERTIES

Liquid

Viscosity at 25 °C, mPa.s or cps (shear rate: 10/s)	19,000 to 25,000
Thixotropic index (shear rate: 1/s over 10/s)	5
Density (g/mL)	1.1
Shelf life (-40 to -20°C)/(3 to 5°C):	6 months/3months
Pot life or working life (20 - 25°C):	3 days

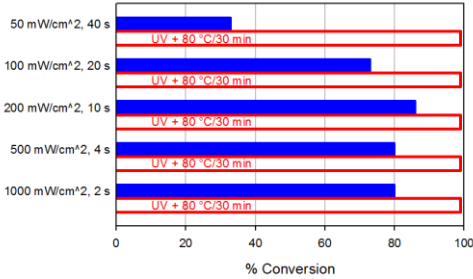
Cured film

Appearance of cured adhesive	light yellow to tan
Outgas, weight % (per Telcordia GR-1221)	0.01
Outgas, weight % (per MIL-STD 883/5011)	0.03

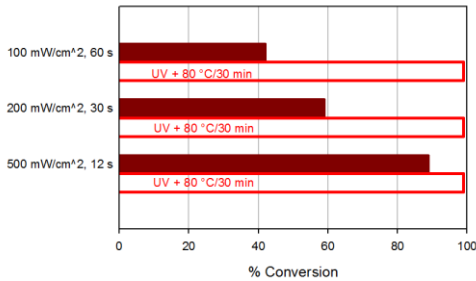


CURING DATA:

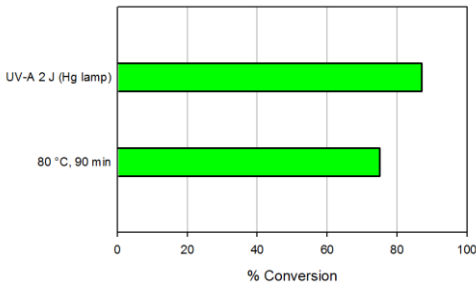
A1821TX, 365 nm LED dose of 2 J, varying intensity



A1821TX, 405 nm LED dose of 6 J, varying intensity

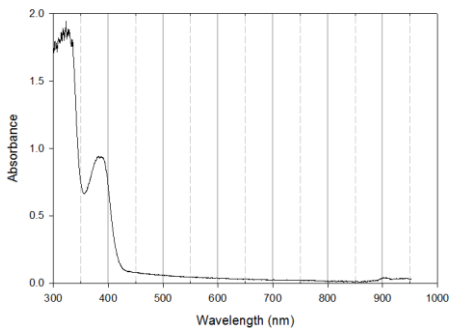


A1821TX UVA and heat curing



ABSORBANCE SPECTRA:

A1821TX, uncured 5% in PM



Cured film properties (continued)

Water permeability (g/m 24 hrs, 50 °C/95% RH, 75 μm film)	2.2 x 10 ⁻⁴
Shrinkage (linear, %)	< 0.3
Hardness, shore D	80
Glass transition temperature (DMA, °C)	160
Coefficient of thermal expansion (DMA)	
below Tg (x10 ⁻⁶), °C ⁻¹	40
above Tg (x10 ⁻⁶), °C ⁻¹	100
Physical properties tested at 25°C, 50% RH (ASTM D638)	
Tensile strength, MPa	165
Elongation (%)	4
Young's Modulus, MPa	2,500

Operating temperature, °C -40 to 150

GENERAL USAGE INFORMATION:

Shipment: adhesive is shipped in cold pack

Storage: After receipt, cold storage at 3 to 5 °C, or -20 °C or -40 °C in the original container is required

Before use: The cold adhesive needs to reach RT (23-25°C) before use. The container needs to sit at RT, adding heat is not allowed. Room temperature equilibration time is dependent on container size, but a 10-30 gram syringe equilibration time is approximately 30-60 minutes. Condensed water on the container must be removed prior to use

SAFETY AND HANDLING

The uncured adhesive can be cleaned from apparatus with isopropyl alcohol (IPA), methyl ethyl ketone (MEK), acetone or commercial alcohol based cleaning solution. Avoid direct skin and eye contact. Use only in well ventilated areas. Use protective clothing, **gloves and safety goggles**. Read Safety Data Sheet before handling.

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