A1721-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

PRODUCT USE:

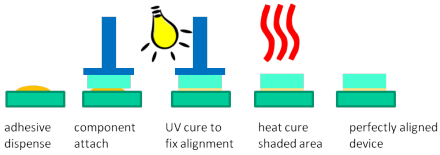
- Active alignment of components for optoelectronics and semiconductor packaging
- Bonding of opaque substrates and optical parts

FEATURES:

- Epoxy only, high adhesion, high Tg, long shelf and working life, room temperature stable, 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, or heat or UV+heat

1) UV CURING CONDITIONS for film thickness of 5 to 250 micron:

- UV Metal Halide or Mercury UV light source with UV-A (320-400 nm) with UV light intensity: 200 to 1,000 mW/ cm^2
- LED-365 nm with UV light intensity: 200 to 1,000 mW/ cm^2

LED-365 nm		Metal Halide/Mercury(UV-A: 320-400 nm)	
UV intensity(mW/cm^2)	x time (sec)	UV intensity(mW/cm^2)	x time (sec)
200	60 sec or more	200	60 sec or more
or 300	40 sec or more	or 300	40 sec or more
or 500	25 sec or more	or 500	25 sec or more
or 1,000	12 sec or more	or 1,000	12 sec or more

UV cure: Application notes for curing at thick film: 0.75 to 1.2 mm

It is possible to cure A1721-TX at thick section with UV dose of ≥ 40 J/cm^2

LED-365 nm		Metal Halide/Mercury(UV-A: 320-400 nm)	
UV intensity(mW/cm^2)	x time (sec)	UV intensity(mW/cm^2)	x time (sec)
250	160 sec or more	250	160 sec or more
or 500	80 sec or more	or 500	80 sec or more
or 1,000	40 sec or more	or 1,000	40 sec or more

2) Heat curing: heat is the only source for curing, the adhesive sees no UV light

100°C for 1-2 hrs or 120°C for 1 hr or 125°C for 1 hr

For heat cure, the adhesive is expected to be cured in the absence of air or sandwiched between two substrates. If the adhesive surface is exposed to air during cure, surface stickiness might result.

3) UV + heat cure: UV light is used to cure the exposed adhesive, then heat is use to cure the adhesive in the shaded areas. Please see the conditions used for UV cure and heat cure listed above.

Maximum depth of cure in the heat step or UV+heat step: 1,500 µm

- 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.

The maximum adhesion strength is achieved by HEAT cure. For best adhesion, UV fix cure should be kept at a minimum and the majority of the bonded components should be cured by HEAT

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A1721-TX (continued)

TYPICAL PROPERTIES

Uncured resin

Viscosity at 25 °C, mPa.s or cps (shear rate: 10/s)	11,000 to 14,000
Thixotropic index (shear rate: 1/s over 10/s)	2
Density (g/mL)	1.2
Shelf life (-40 to -20°C)/(3 to 5°C):	6 months/3months
Pot life or working life (20 - 25°C):	10 days

Cured film

Outgas, weight % (per Telcordia GR-1221)	0.1
Outgas, weight % (per MIL-STD 883/5011)	0.4
Shrinkage (volume %)	1
Hardness – Shore D	90
Glass transition temperature (DMA, °C)	165
Refractive index of cured film (25°C)	
@ 589 nm	1.57
@ 1310 nm	1.56
@ 1550 nm	1.55
Coefficient of thermal expansion (DMA)	
below Tg (x10^{-6}), °C^{-1}	48
above Tg (x10^{-6}), °C^{-1}	149
Physical properties tested at 25°C, 50% RH (ASTM D638)	
Tensile strength, MPa	500
Elongation (%)	4
Young's Modulus, MPa	3,000
Operating temperature, °C	-40 to 150

GENERAL USAGE INFORMATION:

Shipment: adhesive is shipped in cold pack for safety. Receiving temperature of 15 to 30 °C is OK

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 (20-25°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 3-30 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), 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 Material Safety Data Sheet before handling.