A1708-A

Dual cure epoxy adhesive: UV-Heat cure adhesive (updated 022017)

PRODUCT DESCRIPTION:

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

PRODUCT USE:

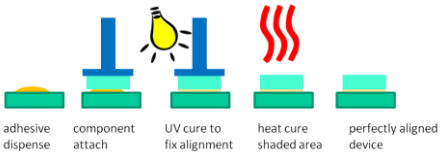
- Active alignment of components for optoelectronics and semiconductor packaging
- High precision bonding
- Bonding of opaque substrates and optical parts

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



GENERAL USAGE INFORMATION:

Shipment: no restriction on shipment and no cold shipment is needed

Storage: After the adhesive is received in black syringes or amber HDPE bottles, room temperature storage (15-30°C) in the original container is required.

Shelf life (20 - 25°C): 6 months

Pot life or working life (20 - 25°C): 3 months

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.

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/cm^2

*LED-365 nm, UV light intensity: 100 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)
100	100 sec or more	100	50 sec or more
or 200	50 sec or more	or 200	25 sec or more
or 300	35 sec or more	or 300	17 sec or more
or 400	25 sec or more	or 400	13 sec or more
or 500	20 sec or more	or 500	10 sec or more
or 1,000	10 sec or more	or 1,000	5 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 see no UV light
130°C for 4-5 hrs or 150°C for 2 to 3 hrs or 180°C for 1 to 2 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/cm^2 x 5 to 10 sec metal halide/mercury light source with UV-A (320-400 nm) or with LED-365 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

Uncured resin	
Viscosity at 25 °C, mPa.s or cps	4,200 to 4,500
Apperance of cured adhesive	yellow to amber or tan
Density (g/mL)	1.1
Cured film	
Outgas, weight % (per Telcordia GR-1221)	0.03
Outgas, weight % (per MIL-STD 883/5011)	0.08
Water permeability (g/m 24 hrs, 50 °C/95% RH, 75 µm film)	3 x 10^{-4}
Shrinkage (linear, %)	< 0.3
Hardness – Shore D	80-90
Glass transition temperature (DMA, °C)	168
Coefficient of thermal expansion (DMA)	
below Tg (x10^{-6}), °C^{-1}	33
above Tg (x10^{-6}), °C^{-1}	120
Physical properties tested at 25°C, 50% RH (ASTM D638)	
Tensile strength, MPa	520
Elongation (%)	4
Young's Modulus, MPa	3,300
Operating temperature, °C	-60 to 200

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