TA 101-S

Thermal Conductive Dual-Curable Adhesive

PRODUCT DESCRIPTION:

- Base chemistry: acrylate, radical polymerization
- One component Boron Nitride filled non-electrically conductive adhesive ready for use, solvent-free, UV and heat curing, thixotropic
- Average particle size 7 µm and max size 30 µm

PRODUCT USE:

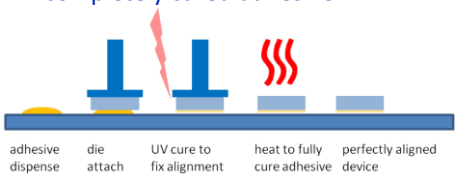
- Bonding integrated circuits and components in semiconductor packaging
- Heat transfer and heat dissipate
- Stress absorption adhesive
- Bonding of opaque substrates

FEATURES:

- Thermal conductive and electrical insulating, high adhesion, flexible, stress absorption, long shelf and working life

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
5) Thermal cure: heat is mandatory for completely cured adhesive



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, store at -40 to -20°C (freezer) in the original container is required.

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: 2 curing ways: UV + heat or heat

1) **UV + Heat curing**: fix aligned parts with UV, then use heat to completely cure adhesive including adhesive in shaded areas.

   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	50 sec or more	100	50 sec or more
or 200	25 sec or more	or 200	25 sec or more
or 300	15 sec or more	or 300	15 sec or more
or 400	10 sec or more	or 400	10 sec or more
or 500	5 sec or more	or 500	5 sec or more
or 1,000	2 sec or more	or 1,000	1 sec or more

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

   - 120 °C for 60 to 90 minutes

2) **Heat curing**: the adhesive will cure by only heat
   - 110°C for 2 to 3 hrs
   - or 120°C for 90 to 180 minutes
   - or 130°C for 60 to 90 minutes
   - 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
   - The effect of oxygen is greater for very thin film, if the adhesive layer is <25 µm, then longer cure time might be needed

TYPICAL PROPERTIES

Uncured resin	
Viscosity at 25 °C, mPa.s or cps (shear rate: 10/s)	30,000 to 34,000
Thixotropic index (shear rate: 1/s over 10/s)	2
Apperance of uncured adhesive	white paste
Shelf life (-40 to -20 °C, freezer)	6 months
Work life (Pot life) (20 – 25 °C)	14 days
Density (g/mL)	1.3
Cured film	
Shrinkage (linear, %)	< 0.3
Hardness – Shore A	85-90
Glass transition temperature (DMA, °C)	50
Volume Resistivity, ohm-cm	>10^{13}
Thermal Properties	
Thermal Conductivity:	2.7 W/m °K (75 µm film)
	1.2 W/m°K (500 µm film)
Physical properties tested at 25°C, 50% RH (ASTM D638)	
Tensile strength, MPa	28
Elongation (%)	300
Young's Modulus, MPa	9
Operating temperature, °C	-40 to 130

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