

# **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:**

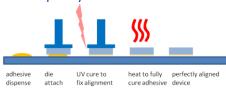
- Bonding integrated circuits and components in semiconductor packaging
- Heat transfer and heat dissipate
- Stress absorption adhesive
- Bonding of opaque substrates

#### **FEATURES:**

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

#### **INSTRUCTIONS FOR USE:**

- Clean the substrates to remove contamination, dust, moisture, salt and/or oil
- 2) Dispense adhesive on substrates
- 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

 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<sup>2</sup> \*LED-365 nm, UV light intensity: 100 to 1,000 mW/ cm<sup>2</sup>

LED-365 nm		Metal Halide/Mercury(UV-A: 320-400 nm)		
UV intensity (m)	N/cm <sup>2</sup> ) x time (sec)	UV intensity (mW/	<u>/cm²)</u> x <u>time (sec)</u>	
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
  - $\bullet~$  The effect of oxygen is greater for very thin film, if the adhesive layer is <25  $\mu m,$  then longer cure time might be needed

#### **TYPICAL PROPERTIES**

<u>Uncured resin</u>	
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)

Apperance of uncured adhesive

Shelf life (-40 to -20 °C, freezer)

Work life (Pot life) (20 – 25 °C)

Density (g/mL)

Cured film

Shrinkage (linear, %)

Hardness – Shore A

2

white paste

6 months

14 days

1.3

4 0.3

85-90

Hardness – Shore A

Glass transition temperature (DMA, °C)

Volume Resistivity, ohm-cm

90.3

85-90

50

>10<sup>13</sup>

Thermal Properties

Thermal Conductivity: 2.7 W/m  $^{\circ}$ K (75  $\mu$ m film) 1.2 W/m $^{\circ}$ K (500  $\mu$ m 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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