

A1452-S

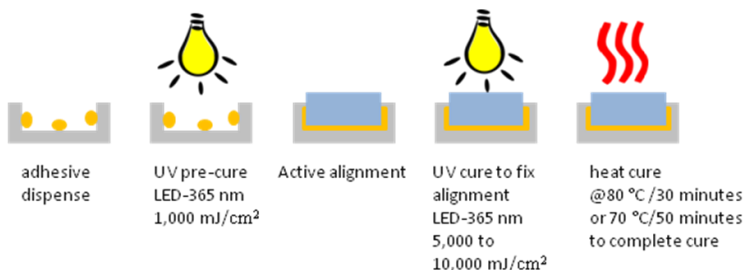
PRODUCT DESCRIPTION:

A1452-S is a one component UV Snap cure epoxy adhesive for optoelectronics and semiconductor bonding and packaging applications. A1452-S is a room temperature stable, UV Snap cure adhesive suitable to bonding many types of substrates. A1452-S is compatible with opaque and/or temperature sensitive components. The adhesive is dispensed and then activated with a short UV cure. The components are mated and held in alignment. A second UV cure step sets the alignment, and a thermal cure step of 30 minutes at 80 °C (or 50 minutes at 70 °C or 120 minutes at 60 °C) cures all adhesive in shaded areas.

FEATURES: 100% epoxy, No oxygen inhibition, Low thermal cure temperature with short cure time, High adhesion, High Tg, Long shelf and working life, Excellent reliability performances.

PROCESS STEPS

- 1) Dispensing step: adhesive is dispensed on substrate
- 2) Pre-cure: LED-365 nm or UV-A (315 to 400 nm) metal halide or mercury UV light source at low UV dose activates the adhesive.
- 3) Mating and alignment step: depending on the pre-cure dose, an OPEN TIME of seconds is available for mating and alignment of substrate 2
- 4) Fix cure: a second UV dose fixes the aligned substrates. This fix cure step is optional if active alignment is not necessary.
- 5) Thermal cure: a thermal cure at 60-80°C for 30-120 minutes ensures full curing of all adhesive in shaded areas.



CURING CONDITIONS:

LED-365 nm light source

- 1) Pre-cure at 1,000 to 2,000 mJ/cm²
- 2) Open time of 20 to 30 sec for mating and alignment of optical parts

Pre-cure vs. open time relation

Pre-cure dose	Open time
1,000 mJ/ cm ²	30 sec
2,000 mJ/ cm ²	20 sec

- 3) Second LED-365 nm cure at 5,000 to 10,000 mJ/ cm² to fix the aligned parts

Recommended LED-365 nm lamp intensity: 100 to 300 mW/ cm²

Metal Halide or Mercury UV light source (UV-A: 315-400 nm)

- 1) pre-cure at 500 to 1,500 mJ/cm²
- 2) Open time of 10 to 60 sec for mating and alignment of optical parts

Pre-cure vs. open time relation

Pre-cure dose	Open time
500 mJ/ cm ²	>60 sec
1,000 mJ/ cm ²	30 sec
1,500 mJ/ cm ²	10 sec

- 3) Second UV cure at 2,000 to 3,000 mJ/ cm² to fix the aligned parts

Recommended UV light intensity: 50 to 200 mW/ cm²

4) Thermal cure conditions:

60 °C	90 to 120 minutes
70 °C	30-60 minutes,
80 °C	for 30-45 minutes

90 °C	for 15 to 30 minutes
110 °C	for 5-15 minutes
120 °C	for 5-15 minutes

Optimization of pre-cure UV dose is required for obtaining the desired bond strength. The components to be bonded must be mated immediately after pre-cure and within the open time period. If the components are not mated during the open time, the liquid adhesive will solidify and complete wetting of the bonded substrates will not be possible, leading to poor bonding force.

TYPICAL PROPERTIES:

Liquid:		Cured Adhesive (continue)	
Viscosity at 25°C, mPa.s	3,200 – 3,800	Hardness – Shore D	85
Storage temperature	20 to 25 °C	Coefficient of thermal expansion (DMA), 75 µm	
Shelf life (20 – 25 °C)	6 months	below Tg (x10 ⁻⁶), °C ⁻¹	76
Working life (Pot life) (20 – 25 °C)	3 months	above Tg (x10 ⁻⁶), °C ⁻¹	189
Density (g/mL)	1.1	Physical properties @ 25°C, 50% RH (ASTM D638)	
		Tensile, MPa	180
		Elongation (%)	5
		Modulus, MPa	2,500
		Operating temperature (°C)	-40 to 150
Cured Adhesive			
Shrinkage (linear, %)	0.2		
Water permeability (g/m 24 hrs, 50 °C/95% RH, 75 µm film)	2.2 x 10 ⁻⁴		
Glass transition temperature (°C, DMA)	150		

SAFETY AND HANDLING

The un-cured adhesive can be cleaned from apparatus with isopropyl alcohol (IPA), methyl ethyl ketone (MEK), or commercial alcohol based cleaning solution. Use caution in handling this material. 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.

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