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AC A539-DM

Low Temperature Dual-Curable Epoxy Sealant for Packaging Applications

Product Description:
AC A539-DM is a one component dual curable epoxy for attachment of components in semiconductor and optoelectronics packaging.

Features

- High Tg
- Low moisture permeability
- Good adhesion to various substrates: glass, metal and ceramic
- Excellent thermal stability
- Excellent for hot solder process of >235 °C
- Low CTE
- Dual curable: UV curable or heat curable
- Long work life at room temperature
- Operating temperature: -60 to 200 °C

Description

- Dual-curable epoxy sealant

APPLICATIONS

AC A539-DM is suitable for bonding glass to glass, glass to ceramic, ceramic to ceramic, ceramic to metal or plastic parts to ceramic or metal parts, etc. It is recommended to be used where instant fix for the aligned parts can be accomplished by UV, then thermal post cure of the fixed parts provides complete cure in areas where UV light cannot penetrate.

TYPICAL PROPERTIES

Liquid:

Viscosity (cps, 25 °C)	1,900 to 2,200
Storage (°C)	3-5
Shelf life (3 –5 °C)	3 months
Work life (Pot life) (20 – 25 °C)	1 week

Cured film (fully cured film properties)

Shrinkage (linear, %)	<0.3
Water permeability (g/m 24 hrs) (50 °C/95% RH, 75 μm film)	3 x 10^{-4}
Refractive index of cured film (25°C)	
@ 589 nm	1.57
@ 1310 nm	1.56
@ 1550 nm	1.55
Outgas, weight % (per Telcordia GR-1221)	0.01
Outgas, weight % (per MIL-STD 883/5011)	0.03
Hardness – Shore D	90
Glass transition temperature (°C) (DMA)	145
Physical properties tested at 25°C, 50% RH (ASTM D638)	
Tensile, psi	70,000
Elongation (%)	4
Modulus, psi	400,000
Coefficient of thermal expansion (TMA), 75 μm film	
below Tg (x10^{-6}), °C^{-1}	25
above Tg (x10^{-6}), °C^{-1}	64

UV curing conditions (film thickness 5-500 μm)
** AC A539-DM can be cured by exposure to UV of adequate intensity. Cure rate depends on light intensity, spectral distribution of light source and exposure time.
** For maxium performance, UV+Heat cure is recommended

Flood system (metal halide or mercury, 320 to 400 nm) – UV dose (J/cm^2)	3 to 6
Spot cure system (metal halide or mercury, 320 to 400 nm) – UV dose (J/cm^2)	5 to10
LED 365 nm light - UV dose (J/cm^2)	5 to 10

Heat curing conditions for film thickness of 25-500 μm

@ 100 °C	(if use heat only)	1 to 2 hr
	(if use UV and heat)	0.75 to 1 hr
@ 125 °C	(if use heat only)	1 hr
	(if use UV and heat)	0.5 to 1 hr
@ 150 °C	(if use heat only)	0.5 to 1 hr
	(if use UV and heat)	0.5 hr

IF film thickness is <25 μm, then dual cure (UV+heat) is recommended for curing.
EXCESS UV dose up to 4X is acceptable.
If the substrate is glass, UV curing or UV+heat curing is recommended

***Minimum intensity recommended for Spot lamp system: 100 mW/cm^2
***Minimum intensity recommended for Flood lamp system: 49 WPcm or 125 WPI or 100 mW/cm^2
To ensure good curing speed, the humidity is recommended to be < 50% RH

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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