

ADHESIVES for LiDAR SENSORS

UV cure adhesives

Dual cure adhesives

- 1 part epoxies
- Suitable for manual or automated production lines
- Syringe dispensing
- UV curable or UV+heat curable
- Easy to process



LiDAR Sensors for Autonomous and smart driving

Autonomous cars, drones, robots will be the essential elements of the modern society. Manufacturers are outfitting cars and drones with many advanced control and sensing functions. Highly or fully autonomous vehicles use multiple sensor technologies to create an accurate long- and short-range map of a vehicle's surroundings under a range of weather and lighting conditions.

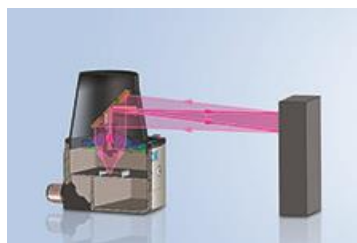
Light detection and ranging (LiDAR) sensors have the potential to be the essential components in autonomous vehicles, as well as in current systems for adaptive cruise control (ACC), collision avoidance systems, traffic sign recognition, blind spot detection, and lane departure warning. LiDAR is the sensing method that detects objects and maps their distances. The working principle for LiDAR is to illuminate a target with an optical pulse and measure the characteristics of the reflected return optical signals. Major advantages of LiDAR are long range detection of >500 m, allowing clarification of objects for decision making for safe navigation, and high functionality in all types of conditions; rain, snow, fog, light, dark. These are critical features for autonomous automobiles, self driven drones, and robots.



ACW Adhesives for LiDAR Sensors



With anticipation of the exciting potential of LiDAR sensors as the critical components in the safety of autonomous driving, ACW provides a full range of dual cure adhesives for many assembly tasks including lens bonding, laser diode assembly, and packaging. ACW adhesives provide a variety of features including light filtering (400 to 1600 nm), thermal conductivity, active alignment, and hermetic sealing.



ACW Adhesives for LiDAR Sensors

Applications:

- Laser diode packaging
- Active Alignment
- Lens and mirror to housing
- Hermetic package sealing
- Waveguides device bonding

Advantages as compared to competitors and other techniques:

- Filtered Near IR wavelength for “no-light-leak” LiDAR
- Flexible curing processes: UV or UV+heat
- Automotive Applications
- No movement in aligned components after reliability testing
- **High yield process** – low manufacturing cost
- Long shelf and working life – low manufacturing cost
- READY-TO-USE package – low manufacturing cost



	A1708-FT	A1853-TX	AC A1855-TX	A1902-FT	TCL-202	DA-101R
Typical applications	Lens to components	Packaging: UV active alignment then heat for shaded areas	Packaging: UV active alignment then heat for shaded areas	Packaging: UV active alignment then heat for shaded areas	Thermal conductive active alignment	Die attach Hermetic seal bonding
Base chemistry	1-part epoxy	1-part epoxy	1-part epoxy	1-part epoxy	1-part epoxy	1-part epoxy
Active Alignment	By UV	By UV	By UV	By UV	By UV	no
Filter Near IR light	Yes	No	No	Yes	Yes	no
Cure in shaded area	Yes, by heat	Yes, by heat	Yes, by heat	Yes, by heat	Yes, by heat	Yes, by heat
Curing LED-365 nm or UV-A light source	UV + heat: 10 J/cm ² + 150 °C/60 minutes	UV + heat: 3 J/cm ² + 80-85 °C/60 minutes	UV + heat: 10 J/cm ² + 80-85 °C/60 minutes	UV + heat: 40 J/cm ² + 100 °C/60 minutes	UV + heat: 5 J/cm ² + 90 °C/60 minutes	Cure by heat only: 180 °C/ 2minutes or 90 °C / 1 hour
Maximum Depth of cure in UV step	300 micron	250 micron	750 micron	1,000 micron	100 micron	n/a
Viscosity (mPas or cps at 25 °C)	96,000 to 100,000 @ 10/s, thixotropic index: 5	60,000 – 70,000 @ 10/s, thixotropic index: 7	60,000 – 70,000 @ 10/s, thixotropic index: 7	58,000 to 65,000 @ 10/s, thixotropic index: 6	30,000 – 34,000 @ 10/s, thixotropic index: 3.5	20,000 – 24,000 @ 10/s, thixotropic index: 5
Glass Transition temperature, Tg °C	174	165	180	145	183	157
Young’s modulus, Mpa	3,200	2,000	2,000	2,500	15,700	3,200
Operating temperature, °C	-60 to 180	-40 to 150	-40 to 150	-40 to 180	-60 to 200	-40 to 180



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