



ORIEM TECHNOLOGY SDN. BHD. (597413-T)

Plot 25, Bayan Lepas Industrial Estate, Non-FTZ, Phase 4,
Bayan Lepas, 11900 Penang, Malaysia.
Tel: (6)04-642 6363 Fax: (6)04-642 6366

PRODUCT TECHNICAL BULLETIN

Rev. E

SH 0208

(*Epoxy Encapsulant*)

PRODUCT DESCRIPTION

SH 0208 is a two component, unfilled, rigid potting epoxy resin for encapsulation of mainly LED Lamps or Radial devices. SH 0208 is designed to withstand the stringent JIS requirement for outdoor accelerated testing. Special UV retardant can be added depending on the application requirement. SH 0208 has a special stress relieving mechanism that will allow superior reliability performance. When casted, SH 0208 provides excellent clarity, thermal shock resistant and excellent environmental protection.

Key advantages of SH0208:

- Achieve full cure in less than 4 hours
- High purity material to ensure good consistency
- Low mixed viscosity to allow easy casting
- Stress relieving mechanism to offer superior reliability performance
- Lower cost than most similar Tg material in the market

TYPICAL PROPERTIES

Uncured:

<u>Property</u>	<u>02 (Part A)</u>	<u>08 (Part B)</u>	<u>Test Method</u>
Color	Blue	Clear	Visual
Viscosity @ 25°C, cP Brookfield (Spindle 2)	5000 ± 600	95 ± 55	ASTM 2393
Mix Viscosity @ 25°C, cP Brookfield (Spindle 2)	1000 ± 500		ASTM2393
Shelf life @ 30°C (from date of manufacturing), month	15	12	Use test



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Cured:

<u>Property</u>	<u>SH 0208</u>	<u>Test Method</u>	
Color	Water clear	Visual	
Glass transition temperature (midpoint), °C	135 ± 5	ASTM D3418	
Coefficient of thermal expansion (α_1 and α_2), ppm	$\alpha_1 = 70$ max.	$\alpha_2 = 180$ max.	ASTM D696
Flexural modulus, Pa @25°C (Pa)	4.1×10^9		ASTM D790
Moisture uptake @ 100 °C / 24hrs, %	0.85		ASTM D570

HANDLING & MIXING

Pre-Heating Part A (before mixing)	= 70°C/ 1hour
Mix Ratio (R02 : H08)	= 110 : 100
Recommended weighing tolerance	= ± 0.1g
Pot Life (upon mixing Part A&B)	= 4 hours

Caution!

Visually inspect containers of the resin before use. The Part B may crystallize upon storage due to high purity of the material. Do not use the material directly if crystal or sedimentation is visible. The Part B can be heated up to 60°C for 1 to 3 hours until material is totally liquid. Allow the Part B to cool down naturally to about 35°C before use. The anhydride system in Part B is moisture sensitive. Always reseal the opened container immediately after use. It is a good practice to purge with nitrogen before resealing. Shake the bottle right before use and make sure that all ingredients inside are properly mixed after storage. Preheat Part A to 70°C for an hour to reduce the viscosity and allow ease of flow. No reaction will take place. Pour the required quantity of Part B into the container first. This is important as Part A has high viscosity and will adhere very well to the side wall of the container making it difficult to mix homogeneously. Then stir gently manually to have partial mix. Then use automated (preferably vacuum mixer) mixer to mix the Part A and Part B. Proceed to degassing if necessary. The degassing process can be facilitated with slight heating up to 35°C. Application of pressure should be around -30in Hg. Due to low molecular weight of Part B, continuous bubbling may occur. Do not over degas the Part A and B mixture as continuous evaporation of Part B may offset the optimum mix ratio (10 to 20 minutes should be sufficient).



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CURE PROCEDURE

Cure profile

Pre cure = $135 \pm 5^{\circ}\text{C}$ / 1 hour
(exclude ramp up and ramp down)
Post cure = $150 \pm 5^{\circ}\text{C}$ / 4 hours
(exclude ramp up and ramp down)

Important!

SH 0208 was found to be superior when cured using a step cure profile (continuous). Curing should have a ramp up from room temperature. Then after curing at above suggested temperature, a ramp down to room temperature is necessary. The curing time suggested above does not include ramp up from room temperature and ramp down from curing temperature.

After cured the epoxy will have good adhesion with the lead frame and mold cup interface. It is critical that customer apply mold release to the mold cup prior to casting this material. If not increased demolding stress will compromise the package performance. It is recommended to apply the mold release before casting to reduce the demolding force after cured if the demolding process is necessary for the package.

For demolding, it is recommended that the demolding temperature is $\sim 50^{\circ}\text{C}$ below T_g to avoid undesirable crazing or micro-crack (i.e. If product initial cure yields T_g of 100°C , the max recommended demolding temperature is at $< 50^{\circ}\text{C}$).

SAFETY AND FIRST AID

Prevent prolonged or frequent skin contact. Wear protective gears when mixing. Avoid inhalation of vapor. Mix in a well ventilated area. If contact occurs, was with soap and water. Please refer to MSDS for more information.

PACKAGING & STORAGE

SH 0208 available in 20kg per box (small packaging in 5kg for Part A and 1kg for Part B). SH 0208 should be stored in a dry place, preferably in the sealed original container.