

Technical Data Sheet

EL-1040 LO

Two component, room temperature curing epoxy system offering very low CTE

Product Description

EL-1040 LO is a two component epoxy system suitable for bonding, sealing, coating and encapsulation applications. It has a 10:1 mix ratio by weight and it offers extremely low coefficient of thermal expansion (CTE) and is capable of passing NASA low outgassing test. The optimal cure schedule is an overnight room temperature set-up followed by a heat cure at 70°C - 90°C for 3 - 5 hours. Additionally, full cure properties can also be achieved by allowing curing at room temperature for 2-3 days.

EL-1040 LO can withstand extreme thermal environments down to cryogenic temperatures. It offers an extensive serviceable temperature range of 4K (-269.15°C) to +120°C and has outstanding physical and dimensional stability. It adheres well to a wide variety of substrates including metals, ceramics, most plastics and glass. It is highly resistant to a variety of chemicals fuels, oils and water. Owing to its vacuum compatibility and extremely low CTE, EL-1040 LO is recommended for use in electronics, aerospace, optical, semiconductor and various OEM applications.

Product Highlights

Very high thermal conductivity.
Exceptional electrical insulation properties.
Very Low coefficient of thermal expansion
Excellent dimensional stability.
Cryogenically serviceable

Typical Applications

Bonding
Sealing
Coating
Encapsulation
Potting

Physical Properties

Base Chemistry	Epoxy
Pot Life (100g mixed epoxy) @ RT	45-75min
Viscosity, Part A @ RT	35,000-72,000 cps
Viscosity, Part B @ RT	300-500 cps
Cure Schedule	
23°C	2-3 days
70°C-90°C	2-3 hours
Hardness @ RT	>85 Shore D
Tensile Strength @ RT	>6,500 psi
Tensile Lap Shear Strength (Al to Al) @ RT	>1,700 psi
Thermal Conductivity, 23°C	1.4 - 1.5 W/m/K
Coefficient of Thermal Expansion, 23°C	15×10^{-6} in/in/°C
Dielectric Constant, 60 Hz, 23°C	4.12
Volume Resistivity, 23°C	$> 10^{15}$ ohm-cm
Service Temperature	-269°C to +120°C
Shelf Life @ RT in original unopened container	5months

Room Temperature (RT) maintained @ 23°C



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Surface Preparation

Bonding surfaces must be degreased and cleaned of any oil, dust or any other contaminants and then dried prior to the application of the adhesive. Smooth surfaces must be chemically etched whenever necessary and/or roughened using sand paper or grit blasting. To ensure proper surface preparation kindly perform a simple water bead test. If the water beads up, repeat the cleaning and roughening procedures before applying the adhesive, Even spreading of water indicates good surface preparation providing superior bond strength.

Mixing procedure

EL-1040 LO is prepared by efficiently mixing Part A with Part B in a 10:1 mix ratio by weight. Slowly mix the two parts to avoid any entrapment of air bubbles. Gently stirring the individual components prior to mixing might be necessary to avoid settling of filler particles. You can prolong the working life (45-75min for 100g mixed epoxy) by mixing a smaller batch.

Application of adhesive

EL-1040 LO can be very conveniently applied with a syringe manually or through an auto dispensing unit.. Dispense appropriate amount of epoxy to achieve the desired bond line thickness in your application. A minimum adhesive layer thickness of 2-6 mils is suggested. Since EL-1040 LO does not contain any volatiles or solvents, applying thicker layers of adhesive does not necessarily provide higher bond strength. Being a 100% solid system, it also provides minimum shrinkage upon cure. Porous substrates may require more adhesive to fill up the voids in comparison to non-porous substrates. Bonded substrates should be clamped snugly with enough pressure to maintain good contact during cure. Vacuum degassing may be necessary while casting to remove any entrapped air bubbles.

Curing Procedure

EL-1040 LO can obtain the required NASA low outgassing properties with an overnight room temperature set-up, followed by a heat cure at 70°C - 90°C for 3 - 5 hours. Alternatively, It can also be cured at elevated temperatures i.e. 2 - 3 hours at 90°C or at room temperature for 2-3 days. Remove any excess adhesive using a spatula and wipe it with a lint free wipe. Acetone or xylene may be used to assist in removal for the excess adhesive. Thinner epoxy sections cure slowly.

Storage & Handling

EL-1040 LO must be ideally stored at or below 23°C in closed containers. Tightly close the containers when not in use to avoid any contamination. No other special storage conditions are imperative. Kindly refer to the MSDS (Material Safety Data Sheet) for safe handling. Allow for good ventilation and avoid skin contact while handling the product. Ketone or aromatic solvents can facilitate efficient cleaning of equipment or any spills. However, please exercise proper ventilation and flammability precautions while use of solvents.

Packaging

- 1Kg container
- 5Kg containers

Do not use for specification purposes

The values mentioned in this TDS are considered typical properties only. They are not intended to be used as a basis for preparing specifications. Please contact Elixir-India for assistance in establishing particular specifications

Disclaimer

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