

UV15DC80LV Master Bond Polymer System

One component, UV and heat curable epoxy compound

Key Features

- ✓ Allows for curing in “shadowed out” areas
- ✓ Cures at temperatures as low as 80°C
- ✓ Convenient no mix system
- ✓ Excellent physical strength properties

Product Description

Master Bond UV15DC80LV is a special dual cure epoxy based system which offers a primary cure utilizing UV light along with a secondary heat curing mechanism. This system addresses the problem of curing areas on parts that do not allow UV light curing because of “shadowing” issues. Most noteworthy is that the heat cure portion can be initiated at only 80°C rather than at the more common 125°C. Another very useful feature of a dual cure UV is that it allows for rapid fixturing and then enables the cure to be completed by adding heat. As alluded to above, a secondary cure at 80°C is not very common and highly desirable because of the sensitivity of many plastics to elevated temperatures. Also, the decrease of fixturing time to seconds is highly advantageous in a production environment, or when fixturing is a laborious and expensive proposition. One innovative use of a dual cure UV is to fixture two optically opaque substrates, such as metals, with the UV light exposure and then completing the cure with heat.

This very low viscosity system features a cationic cure mechanism (for the UV portion) and has exceptionally low shrinkage upon curing. UV15DC80LV is not oxygen inhibited and has outstanding chemical resistance to many acids, bases, fuels and solvents. It is a superb electrical insulator

and bonds well to metals, glass, ceramics and most plastics. UV15DC80LV has a service temperature range of -60°F to +350°F.

Straight UV curing can be accomplished for thicknesses of 0.010” to 0.020” in seconds using UV light at 365 nm with 20-40 milliwatts/cm² of energy. Faster cures can be achieved at higher energy outputs. Areas not cured because of shadowing can be cured at 80°C for 40-60 minutes. In addition, post curing at 125-150°C for 15-30 minutes can increase the T_g from 90°C achieved by straight UV curing to over 125°C. The 80°C secondary cure is truly a remarkable innovation. It has wide applicability in the optical, electronic and optoelectronic industries.

Product Advantages

- One component system; no mixing needed
- Capable of dual cure by UV, heat or most often a combination of both
- Dual curing mechanism allows for curing in shadowed out areas and rapid fixturing time
- No oxygen inhibition
- Bonds well to a wide variety of substrates
- Excellent physical strength properties
- Very low viscosity

Typical Properties

Viscosity, uncured coating, 75°F	150-500 cps
Solvents and other volatiles	None
Hardness, 75°F	>70 Shore D
Tensile strength, 75°F	>5,000 psi
Tensile modulus, 75°F	>350,000 psi
Volume resistivity, 75°F	>10 ¹⁴ ohm-cm
Coefficient of linear expansion, 75°F	55-65 ppm/°C
Glass transition temperature with post cure	>125°C
Dielectric constant, 75°F, 60 Hz	3.49
Water resistance, 3 month immersion, 75°F, weight gain	<1%
Refractive index, 75°F	1.52
Shelf life, 75°F in original unopened containers	2 months
Refrigerated at 40-50°F in original unopened containers	6 months
Service temperature range	-60°F to +350°F [-62°C to +177°C]

Preparation of Adhesive & Bonding Surfaces

UV15DC80LV is a single part system that requires no special mixing or heating. Realistically, for the UV portion of the cure one of the substrates to be bonded must be optically clear with no UV blocking agents to allow the light to penetrate the surface of the substrate (although the side fixturing procedure mentioned earlier requires neither substrate to be optically clear). Many optically clear surfaces such as polycarbonates and acrylics (that do not contain UV blocking agents) do not require surface preparation. If bonding an optically clear substrate to a metal, plastic or rubber, it is advisable to use proper surface treatments, such as roughening or chemically etching, to optimize adhesion. All substrates should be clean and free of oils, dirt, grease, etc. for proper adhesion.

Adhesive Application

Master Bond UV15DC80LV, depending upon the viscosity, can be conveniently applied by spin coating, spraying or brushing. The system can be applied as a coating in thicknesses up to 0.015-0.020 inches. For bonding applications, bond line thicknesses of 0.001-0.003 inches are more than adequate. Porous surfaces may require somewhat more adhesive to fill the voids than non-porous ones. The parts to be bonded should then be fixtured together with just enough pressure to maintain intimate contact during cure. The beauty of the system, from a processing standpoint, is that it requires no mixing, it's fast curing and fixturing time is minimal. Since Master Bond Polymer System UV15DC80LV is 100% reactive and does not contain any solvents or diluents, shrinkage upon cure is minimal.

Cure

As previously noted, Master Bond UV15DC80LV is formulated as a dual cure system. Depending upon the application, it can cure fully with UV light at a wavelength of 320-365 nm with an energy intensity of 20-40 milliwatts/cm² or it will fully cure at 80°C. More to the point, the product is most often used where the initial cure is performed by UV light and the secondary cure is by heat. One significant rationale for using this kind of system is to cure the system in areas where UV light is "shadowed out". Another is to reduce fixture time to the bare minimum by utilizing the UV portion of cure and then concluding it

by adding heat. As mentioned previously, a post cure for 15-30 minutes at 125-150°C will greatly increase chemical and temperature resistance. One can remove the excess adhesive with a spatula, then wipe with a rag and solvent such as acetone or xylene.

Packaging

Product is available in:

- 1/2 Pints
- Pints
- Quarts
- Gallons
- 5 gallons



Handling and Storage

All materials of this type should be used with good ventilation and skin contact should be avoided. For safe handling details, please consult the product MSDS. Optimum storage is under refrigeration at 40-50°F in closed containers. Containers should be kept closed when not in use to avoid contamination. The material should be kept in a dark area to avoid any accidental exposure to sunlight. Cleanup of spills and equipment is readily achieved with aromatic or ketone solvents employing proper precautions of ventilation and flammability.

Certifications



Not to Be Used for Specification Purposes

The values contained herein are considered typical properties only and are not intended to be used as specification limits. For assistance in preparing specifications, please contact Master Bond technical support for further details.

Notice

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