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Norland Electronic Adhesive 121 & 123

Norland Electronic Adhesives 121 and 123 ("NEA 121 and 123") are single component adhesives that cure tack free in seconds to a tough, resilient polymer when exposed to ultraviolet light. NEA 121 is a low viscosity liquid, and NEA 123 is a thixotropic paste. They are recommended as an extremely fast and efficient way to tack, fill, seal or bond precision components or wires in place. With this system, a drop of adhesive is used to form a bridge between the component or wire, and the substrate. Exposure to UV light quickly cures them, and holds the component in place. Useful applications for NEA 121 and 123 include wire tacking, chip capacitor bonding, coil termination, bonding of head gimbal assemblies and tamper proofing adjustable components.

The unique advantage of these adhesives is that even though they cure in seconds, they are extremely stable when not exposed to ultraviolet light. Norland 121 and 123 are sensitive to the whole range of UV light from 320 to 380 nanometers with peak sensitivity around 365 nanometers. Cure time is dependent on light intensity and thickness of adhesive layer. The adhesives have been designed to be spot cured in small areas with hand held or desk top UV light sources that are safe and easy to use.

Recommended Light Sources		
HAND HELD	MANUFACTURER	APPROX. CURE TIME
RC-250	Xenon Corp. Wilmington, MA	5-30 seconds at 1/2 inch
Opticure Light Gun	Norland Products New Brunswick, NJ	10-60 seconds at 1/2 inch
DESK TOP	MANUFACTURER	APPROX. CURE TIME
Portascan 100	American Ultraviolet Chatham, NJ	5-30 seconds at 6 inches

Faster cure times are possible with medium pressure vapor lamps (typically 200 watts/linear inch). These are most commonly used in conveyerized applications because the light must be shielded from the operator. These types of lights are available from companies such as American Ultraviolet or Fusion UV Curing Systems.

In addition to the UV cure, Norland 121 and 123 contain a latent heat catalyst that can quickly cure areas that do not see the ultraviolet light. The catalyst allows the adhesive to cure in 10 minutes at 125° C in a convection oven, or 3 hours at 80°C. Faster cure times are possible with infrared ovens. Temperatures less than 60° C will not appreciably activate the adhesive. The advantage of the heat cure is to bring partially cured adhesive to full cure to get the maximum physical properties of the adhesive. The heat cure is not required if all the adhesive receives proper exposure to UV light.

NEA 121 and 123 have very good adhesion to glass, metals, printed circuit boards and many plastics. Since the cure is very exothermic, the adhesive should be allowed to cool back to room temperature before adhesive testing begins. Components bonded with NEA 121 and NEA 123 can withstand temperature conditions from -150° C to 150°C.

Typical Properties of NEA 121 & NEA 123		
UV energy required for full cure	3 joules/cm ²	4.5 joules/cm ²
Viscosity at 25° C	300 cps	200,000 cps
Elongation at Failure	30%	60%
Modulus of Elasticity (psi)	160,000	50,000
Tensile Strength (psi)	3,500	3,000
Hardness - Shore D	85	60
Total Mass Loss (TML)	3.14%	3.89%
Collected Volatile Condensable Material (CVCM)	0.41%	0.21%
Dielectric Constant (1 MHz)	4.04	4.00
Dissipation Factor (1 MHz)	0.045	0.044
Volume Resistivity (ohm-cm)	1.0 x 10 to the 15 power	1.0 x 10 to the 12 power
Surface Resistivity (Megohms)	10 x 10 to the 9 power	10 x 10 to the 8 power
Dielectric Strength (volts)	980	980
Arc Resistance (sec)	95	92

To remove uncured adhesive from substrate use an acetone or alcohol moistened cloth. The cured adhesive can be removed by prying the drop with a knife edge or soaking in a solvent combination of 90 parts methylene chloride and 10 part methanol.

Handling and Storage Precautions

Store in a cool dark place.

CAUTION: Norland Electronic Adhesive 121 and 123 may cause skin irritation and prolonged contact with skin should be avoided. If contact occurs wash well with soap and water. Use in well ventilated area.

CAUTION: Do not freeze material. Never expose the bulk material to high heat or ultraviolet light. It can generate an extremely exothermic reaction.

The data contained in this technical data sheet is of a general nature and is based on laboratory test conditions. Norland Products does not warrant the data contained in this data sheet. Norland does not assume responsibility for test or performance results obtained by users. It is the users responsibility to determine the suitability for their product application, purposes and the suitability for use in the user's intended manufacturing apparatus and methods. The user should adopt such precautions and use guidelines as may be reasonably advisable or necessary for the protection of property and persons. Nothing in this technical data sheet shall act as a representation that the product use or application will not infringe a patent owned by someone other than Norland Products or act as a grant of a license under any Norland Products Inc patent. Norland Products recommends that each user test its proposed use and application before putting into production.