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LOW OUTGASSING
NORLAND ELECTRONIC ADHESIVE 123TKHGA
(NEA 123TKHGA)

Overview: NEA 123TKHGA is a low outgassing, one part, thixotropic adhesive similar to NEA 123. When exposed to UV light, it cures in seconds to a tack free, tough resilient polymer.

Applications: NEA 123TKHGA is recommended as an extremely fast and efficient way to tack, fill, seal or bond precision components or wires in place. Applications include wire tacking, chip capacitor bonding, coil termination, tamper-proofing adjustable components, and bonding of head gimbal assemblies. It is particularly effective when gaps need to be bridged because NEA 123 TKHGA tends to resist sagging, dripping or flowing into cavities. In a typical application, a drop of the adhesive is used to form a bridge between the component or wires and a substrate.

UV-Curing: Exposure to UV light quickly cures the adhesive and holds the components in place. Generally, about 6 joules/cm^2 of UV-A cure energy are required for a full cure. The exact time depends on thickness, lamp intensity and individual requirements. UV-A light sources with peak intensity near 365 nm (such as medium pressure mercury, halide or xenon lamps) are very effective.

Heat Curing: In addition to the UV cure, the NEA 123TKHGA contains a latent heat catalyst that can quickly cure areas where UV light cannot reach. The catalyst allows the adhesive to cure in 10 minutes at 125°C or 3 hours at 80°C. Thermal curing is not necessary if all the adhesive receives proper UV light. Heating a previously UV-cured material may be redundant but will not be harmful and it generally lowers the outgassing.

Oxygen inhibition is not a concern during usual UV-curing. Nor is oxygen inhibition a problem with thermal curing near 125°C. But at lower temperatures, near 80°C, the surface layer of adhesive directly exposed to air may still be tacky. An inert atmosphere (nitrogen) will allow tack-free low temperature curing. Below 70°C, curing is not practical. The cure process is exothermic whether accomplished by light or heat. Test samples should be allowed to return to room temperature before evaluating.

Adhesion of NEA 123TKHGA is excellent for glass, silica, silicon, stainless steel, aluminum, copper and metals in general. Adhesion to plastics is fair to good for polypropylene, polycarbonate, acrylics, vinyl and polyacetal.

Typical Physical Properties of Cured NEA 123TKHGA

Viscosity	400,000-450,000 cps
Mechanical	
Tensile Modulus, ASTM D638-97 (psi)	321,000
Tensile Strength, ASTM D638-97 (psi)	3,790
Tensile Elongation at break, ASTM D638 (Percent)	25
Shore Hardness, D-scale	80 D
Electrical	
Dielectric Constant, 1 MHZ, IPC TM 650 2.5.5.3C	3.852
Dissipation factor, 1 MHZ,	0.040
Resistivity, Volume, ASTM D 257-93 (ohm-cm)	1.7×10^{15}
Resistivity, Surface, ASTM D 257-93 (ohms)	$>1.0 \times 10^{15}$
Dielectric Strength ASTM D 149-97 (volts/mil)	814
Arc Resistance, (sec)	100

NASA Outgassing Test, ASTM E-595-90

Type of Cure	% TML	% CVCM	% WVR
UV-Cure (only)	1.74	0.03	0.20
UV-Cure plus 125°C/12-min	1.55	0.03	0.22

TML = Total Mass Loss. CVCM = Collectable Volatile Condensable Material.
WVR =Water Vapor Regain.

Handling and Storage Precautions

NEA 123TKHGA may cause skin sensitization in some susceptible individuals. Avoid prolonged skin contact. We recommend wearing gloves made of latex or other impervious material. If contact occurs, wash with soap and water. Alcohol or other solvents should not be used for washing because they may remove the protective oils from skin. While the vapor pressure of NEA 123TK HGA is low and the fumes not especially toxic, good manufacturing procedures dictate adequate ventilation. Read the accompanying MSDS for more details.

Although Norland Products' adhesives cure in seconds on exposure to UV light, they are very stable when not exposed to UV or excessive heat. Store in a cool, dark place. Refrigeration, while not generally necessary, is an ideal way to store NEA 123TKHGA. If refrigerated, allow the material to come to room temperature before using. Exposure to direct sunlight or heat can cause an exothermic curing reaction and must be avoided.