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Norland Optical Adhesive 83H

Norland Optical Adhesive 83H ("NOA83H") is a single component liquid adhesive that cures in seconds to a tough, hard polymer when exposed to ultraviolet light. It is recommended as an extremely fast and efficient way to precisely bond optical components. In addition to UV light, heat can also be used to cure this one part adhesive.

The outstanding characteristic of this material is its extremely fast cure. Thin films can be initially set in under 10 seconds and thick films in 20 seconds using the light sources listed below. It is also extremely stable when not exposed to UV light. NOA 83H will not gel up in dispenser tips or cure before you want it to.

NOA 83H is sensitive to the whole range of UV light from 320 to 380 nanometers with peak sensitivity around 365nm. The recommended energy required for curing a film is 2 Joules/sq. cm. A drop or bead will require more energy and is dependent on the thickness applied. The adhesive is designed to be cured with small hand held or desktop UV light sources that are easy to use.

In addition to the UV cure, NOA 83H contains 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. Areas in contact with air will cure tacky unless exposed to UV light or given the 125° C cure. Temperatures less than 80°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.

Recommended Light Sources

HAND HELD	**MANUFACTURER**	**APPROX. CURE TIME**
RC-250	Xenon Corp. Wilmington, MA	10-60 seconds at 1/2 inch
Opticure 4 Light Gun	Norland Products Cranbury, NJ	10-60 seconds at 1/4 inch
DESK TOP	**MANUFACTURER**	**APPROX. CURE TIME**
Portascan 100	American Ultraviolet Chatham, NJ	10-60 seconds at 6 inches
SB-100P Mercury* Spot Lamp	Spectronics Corp. Westbury, NY	10-60 seconds at 6 inches

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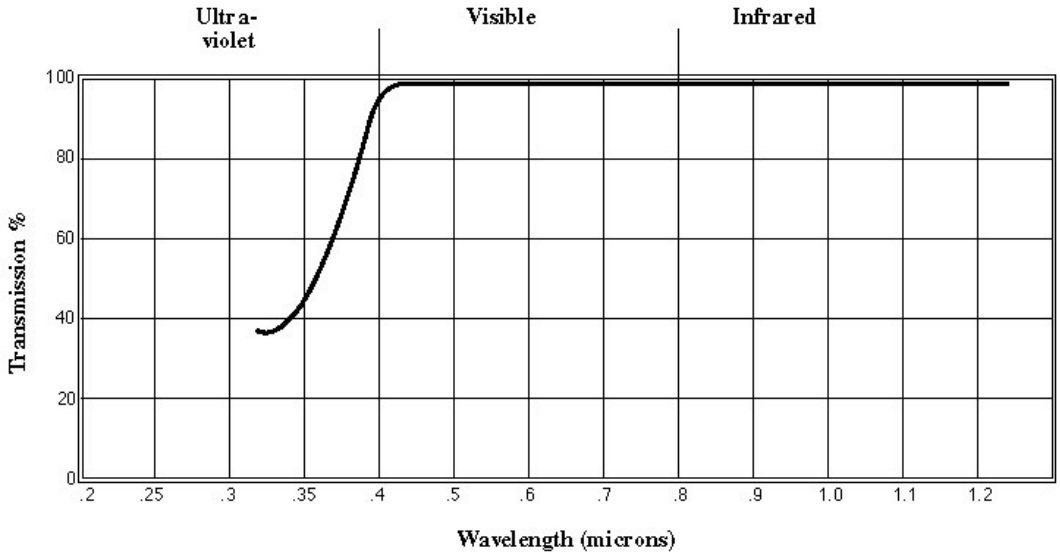
NOA 83H cures to a hard film but it will not become brittle. It has a small amount of resiliency that provides strain relief from vibrations or temperature extremes. This toughness insures long-term performance of the bond. NOA 83H cures from the surface down and longer cures are required for thicker films to allow the UV light to penetrate to the full depth. After curing it has very good adhesion to glass, metals, printed circuit boards and other glass filled plastics. This adhesion improves with age with optimum adhesion reached after room temperature aging for one week. The cured adhesive can withstand temperatures from -150° C to +125° C.

To remove uncured adhesive from the substrate use an acetone or alcohol moistened cloth. The cured adhesive can be debonded by soaking in a chlorinated solvent such as methylene chloride. This normally will occur overnight if only precured. Longer times will be necessary depending upon the extent of the cure and the size of the bond area.

Typical Properties of NOA 83H	
Solids	100%
Viscosity at 25° C	250 cps
Refractive Index of Cured Polymer	1.56
Elongation at Failure	30%
Modulus of Elasticity (psi)	160,000
Tensile Strength (psi)	3,500
Hardness - Shore D	85

Shelf life of the liquid is at least 4 months from the date of shipment if stored in a cool (5-22° C), dark place in the original container. If refrigerated, allow the adhesive to come to room temperature prior to use.

Spectral Transmission of NOA 83H



Care should be taken in handling this material. The Material Safety Data Sheet should be read for this product as well as for any associated products such as alcohol, acetone or methylene chloride. Prolonged contact with skin should be avoided and affected areas should be thoroughly washed with copious amounts of soap and water. If the adhesive gets into the eyes, flush with water for 15 minutes and seek medical attention. Use the material in a well ventilated area, otherwise a NIOSH approved organic vapor mask is recommended.