



## TECHNICAL DATA SHEET

### UV-2531 UV CURABLE GLOSSY DIELECTRIC

UV-2531 is designed to have **outstanding adhesion** to print treated polyester films, conductive inks and copper used in flexible circuits and membrane switches. It can be used for **screen printed dielectric layers** in membrane switch **crossover** and **tail coat applications**

#### DESCRIPTION

- 100% solids, UV curable, screen printable glossy material that can be cured with UV light in seconds, allowing for high-speed production
- High strength, toughness, outstanding flexibility, inherent moisture resistance, and low odor make this material an excellent candidate for screen printed dielectric layers in membrane switch crossover and tail coat applications
- Cured UV-2531 will withstand extreme thermal shock cycling, from +150°C to well below -50°C, and maintains its electrical integrity over a wide temperature and frequency range.
- Available in transparent clear, blue or green colors
- Compatible with our silver-filled conductive inks, carbon resistive screen printable inks and silver conductive epoxies

#### TYPICAL PROPERTIES

Appearance	Clear or colored thixotropic liquid
Viscosity: Brookfield DV III Ultra SC4-14 @ 25°C , Shear 40	6,500-8,500 cps; Typical 7,460
Weight Per Gallon @ 25°C	9.4 lbs.
Specific Gravity @ 25°C	1.1
Flash Point, PMCC	>212°F (100°C)
Shelf Life @ 25°C	6 Months

#### PHYSICAL PROPERTIES AFTER CURE (Free Films)

Shrinkage On Cure (Volumetric)	2.4%
Tensile Strength	920 psi
% Elongation	11%
Tg by DMA	41°C
Volume Resistivity @ 25°C	1.2 x 10 <sup>14</sup> Ω-cm
Surface Resistivity @ 25°C	5.0 x 10 <sup>15</sup> Ω/square/mil
Dissipation Factor 60 Hz, @ 25°C	0.027
Dielectric Constant @ 25°C	3.6

# UV-2531 UV CURABLE GLOSSY DIELECTRIC

## Application Guidelines

UV-2531 can be applied by screen printing using stainless steel or monofilament polyester screens from 195 mesh or less, with emulsion thickness from .001" to .003". For thicker coatings, use smaller mesh sizes and thicker emulsions. A polyurethane squeegee with a Shore 'A' durometer between 60 and 70 is recommended. Other conventional methods of application include dip, roll or knife over roll coating, curtain coating or die application. The excellent pot life and UV cure mechanism allow for the heating of the material to precisely control viscosity for consistent application weights.

## Screening

When using this material as a screen printed dielectric for membrane switches and other additive circuits, it is essential to make sure that pinholes and contamination in the cured material do not allow shorting between conductive paths. It is recommended that two layers of UV-2531 be applied in order to assure that any pinholes or defects are eliminated. After screening the first layer of UV-2531, it should not be cured completely in order to allow for optimal chemical bonding between the two layers when the second layer of UV-2531 is screened and fully cured.

## Curing

UV-2531 must be exposed to ultraviolet light of the proper wavelength to activate the curing mechanism. This can be done with any ultraviolet light source, which puts out wavelengths of <380 nanometers. The most common commercial light source is the medium pressure mercury vapor (MPMV lamps), electrode or microwave activated arc, with or without spectral enhancement (doped). Cure can also be accomplished with xenon or carbon arc lamp sources, UV lasers or electron beam sources. These sources are available in increasing arc lengths and varying intensities for specific applications from a large number of manufacturers. It is highly recommended that a radiometer be used to verify energy levels in any UV curing system.

As a general guideline, lamp input power settings should be at the highest level (300 watts in most systems), and the belt speed should be adjusted until a reading of between 400 and 700 millijoules/square centimeter ( $\text{mj}/\text{cm}^2$ ) is obtained on the radiometer. Keep in mind that some systems may require values outside of this range in order to completely cure UV materials. Always verify completeness of curing of UV materials in an initial process capability study, and then use the energy readings that provide this optimal curing as a set up parameter each time the UV line is set up to run production.

## Adhesion Test

After screening and curing two layers of UV-2531 on a test substrate, perform a cross hatch/tape adhesion test. If the two layers of dielectric are separating from each other, then the UV lamp density needs to be reduced for curing the first layer, or the line speed needs to be increased for curing the first layer so that it is slightly under cured. Before screening the second layer of UV-2531, be sure to reset the line speed and lamp density to allow for complete curing.

## Health & Safety

Products manufactured by Applied Ink Solutions are intended for use in an industrial environment by trained personnel. Please follow proper health/safety processes regarding storage, handling and processing of the products.

Guidelines are intended to provide a starting point for evaluation. Applied Ink Solutions recognizes that each customer's manufacturing process is unique, and we are available to provide technical assistance to resolve your processing issues. Call us to discuss your application in more detail.

The properties are accurate to the best of our knowledge and Applied Ink Solutions makes no guarantees for customer specifications established in applications where this product is used. Customer assumes responsibility for determining fitness of use in their particular application.