

## UVIKUR 794

### 1-COMPONENT, DUAL CURING CONFORMAL COATING

UVIKUR 794 is a one-part, low viscosity, solvent free, dual curing acrylated polyurethane conformal coating. The cured coating offers excellent chemical resistance, surface hardness, flexibility, and moisture resistance. The coating cures to a tack free state after exposure to UV light and the secondary moisture cure will fully cure any unexposed areas of the coating within 2-3 days under ambient conditions. The coating will fluoresce when exposed to UV light to allow for coating inspection. The coating can be applied by all selective coating equipment and is in full compliance with the RoHS Directive 1002/95/EC.

Many variations on the standard UVIKUR 794 coating are possible including custom colors, modified viscosities, and many other special properties. Please contact us to discuss your application if you think such a variant would be helpful for your application.

#### APPLICATIONS & BENEFITS:

- Conforms to Mil-I-46058C type UR
- Conforms to IPC CC830 class B & UL 746E

<u>HANDLING PROPERTIES</u>	<u>VALUE</u>	<u>TEST METHOD</u>
Visual Appearance		
Density	1.06 g/cm <sup>3</sup>	ASTM E-201
Viscosity @ 25°C	250 cps	ASTM D-2393
Flash Point	> 70°C (158°F)	
Percent Solids (non-volatile %)	100%	
Recommend Coating Thickness	1 – 5 mils	
Recommend UV Cure*	1-4 W/cm <sup>2</sup> *	
*(Fusion "H" Style bulb, power output of 120 W/cm, total power of 1800 W)		
Secondary Cure (shadowed areas)	2-3 days at 25C or 2-4 hrs @ 60 – 80C**	
**in an oven with a pan of water to provide moisture during curing		
Shelf-life:	12 months from date of shipment when stored at room temperature	
<u>PHYSICAL PROPERTIES</u>	<u>VALUE</u>	<u>TEST</u>
<u>METHOD</u>		
Color	Transparent lt. yellow to clear	Visual
Flexibility	Excellent	Mil-I-46058C
Adhesion	Excellent	ASTM D 2197
Glass Transition Temp. by DMA (Tg)	35°C	
Coefficient of Thermal Expansion:		
Alpha 1 (below Tg) / Alpha 2 (above Tg)	94 ppm/°C / 178 ppm/°C	
Flammability - per ASTM D-635 / per UL 94: Self-extinguishing / 94V0		
Thermal cycling (-65°C to 125°C)	passes	Mil-I-46058C
Continuous Use Range	-65°C to 135°C	
Weather Resistance	Very Good	
Dielectric Constant @ 1MHz	2.5	ASTM D150
Dissipation @ 1MHz	0.01	ASTM D150
Insulation Resistance	8.0 x 10 <sup>14</sup> ohms	Mil-I-46058C
Moisture Resistance	4.7 x 10 <sup>10</sup> ohms	Mil-I-46058C
Fungus Resistance	Passes	ASTM G21

**NOTE :** Values are based on laboratory or average production results – not for specification purposes.

## **SUGGESTED PROCESSING GUIDELINES:**

Cleanliness of the substrate is of extreme importance for the successful application of a conformal coating. Surfaces must be free of moisture, dirt, wax, grease and all other contaminants. Contamination under the coating will cause problems that may lead to assembly failures.

**Dipping:** UVIKUR 794 is not designed for dipping – please contact us for a suitable variation if this application method is preferred.

**Spraying:** UVIKUR 794 can be applied via standard selective coating equipment or by conventional hand spray equipment. The source air used for spraying must be dry (a dry inert gas is highly recommended) to prevent premature moisture curing. The spraying should be done with adequate ventilation so that the vapor and mist are carried away from the operator.

**Brushing:** UVIKUR 794 may be applied by brush. The uniformity of the finished coating will depend on component density and operator technique. Brushes should be cleaned promptly after use, using solvent.

**Curing:** Dose and irradiance are key concepts when curing UV coatings. Those concepts are different but closely related together and defined as below:

UV irradiance (mW/cm<sup>2</sup>): is the power or the intensity of the UV energy, which is delivered to a surface per unit area. It is a characteristic of the lamp and geometry of the reflector and does not vary with the speed. The intense focused peak directed under the lamp is referred to as “peak irradiance”.

UV dose (mJ/cm<sup>2</sup>): is the total energy delivered to a surface per unit area, passes under a UV light source. It is inversely proportional to the speed under the light source and proportional to the number of exposures or rows of lamps.

Energy is the product of power and time. A low irradiance for a long time does not give the same cure results as a higher irradiance for a proportionally shorter time, due to the differing kinetics of the curing reaction that take place under the 2 conditions

### **Process control of a UV curing material**

Controlling the curing process is easily quantifiable with a sensing system called a radiometer. This instrument measures the total UV dose and irradiance on 4 different channels (UV-A, UV-B, UV-C and UV-V) simultaneously, thus ensuring a repeatable and controlled curing process, and continuous monitoring of the output from the UV lamps being used for curing. The procedure is as simple and fast as passing the radiometer through the UV curing process along with your boards and then reviewing the logged UV dose and energy data. An example of such as device is shown to the right.



UVIKUR 794 will exhibit different responses to spectral distribution, dose and irradiance. Curing a coating without sufficient energy results in a sticky film; too much energy results in residual stress, cracking, and excess shrinkage. Use of an inappropriate wavelength will give a softer film than when cure with the appropriate bulb type.

Trying to increase production throughput by increasing the intensity of light while decreasing the duration of exposure may not always be successful since it must be ensured that sufficient UV dose has been applied to the coating. It is extremely important to cure a UV coating within the

adequate recommended process window in order to obtain maximum reliability and performance of the coating. It is therefore essential to choose the correct UV curing equipment that will enable you to work adequately within this window process.

The suggested UV doses for correct curing of the UVIKUR 794 are the following.:

<u>Channel</u>	<u>Minimum Dose</u>	<u>Maximum Dose</u>
UV-A	0.72 J/cm <sup>2</sup>	3.0 J/cm <sup>2</sup>
UV-B	0.70 J/cm <sup>2</sup>	3.0 J/cm <sup>2</sup>
UV-C	0.15 J/cm <sup>2</sup>	0.62 J/cm <sup>2</sup>
UV-V	0.77 J/cm <sup>2</sup>	3.6 J/cm <sup>2</sup>

Conveyor speed can vary between 1m/min to 3m/min depending on height of lamp, power output of the lamp, shape of the reflector, height of components, etc.:

### **STORAGE GUIDELINES:**

Store this material in a clean, dry environment in its tightly closed original container. Keep at room temperature. Tightly reseal containers after use. If the recommended storage conditions are observed the products will have a minimum shelf-life of 12 months from the date of shipment.

### **HANDLING PRECAUTIONS:**

Mandatory and recommended industrial hygiene procedures should be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets and see the general precautions listed below:

**CAUTION: AS WITH ALL INDUSTRIAL MATERIAL USE CAUTION WHEN WORKING WITH THIS MATERIAL.** Avoid breezing vapors. Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves when handling. Extending exposure could cause a slight irritation of the nasal passages, eyes, or skin. cause severe eye & skin irritation. Wash thoroughly after handling. Use only with adequate ventilation. Do not take internally.

### **FIRST AID**

In case of contact: **Skin** – Immediately wash skin thoroughly with mild soap and water. Remove contaminated clothing and wash before reuse. Destroy contaminated shoes and other articles made of leather. **Eyes** – Immediately flush eyes with plenty of water for 15 minutes and get prompt medical attention. **Inhalation** - Remove person to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician. **Ingestion** - Do not induce vomiting. Dilute with plenty of water and contact physician immediately. Never give anything by mouth to an unconscious person.

### **DISCLAIMER:**

**IMPORTANT:** The following supercedes Buyer's documents. **SELLER / MANUFACTURER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller / Manufacturer be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results presented are based on controlled or laboratory work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended

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