

# Conformal Coating Planar Electroluminescent Displays

*Application Note 122-01*

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*This Application Note describes specifications to assist customers in the evaluation and use of conformally coated Planar displays. Topics include coating description, handling, safety information, warranty, and ordering information.*

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## Introduction

Planar offers conformally coated products in response to specific application needs of our customers. The customer is responsible for determining the suitability and functionality of these products in their applications. The following details are provided to assist customers in the evaluation and use of conformally coated Planar displays.

Applications that are likely to benefit from the addition of conformal coating include those in transportation, portable devices, or heavily industrial environments where dust or high humidity are likely to violate the device integrity and diminish display performance. Conformal coating may also be effective in environments where salt mist can cause corrosion of electrical components.

## Description

Planar uses ShadowCure™ Type AR aerosol conformal coating, manufactured by Loctite, which is formulated without chlorinated solvents or CFCs. The coating is spray-applied and air dried to provide a tough environmental and solvent-resistant coating. The conformal coating is a 2-3 mil clear acrylic which is applied to the completed circuit board before the display is assembled. Conformal coating is used to protect electrical components against elements such as humidity, conductive particles, and other airborne foreign matter that might compromise a display's operation by affecting the circuit board.

## Appearance of Coated Displays

A conformally coated display will have a uniform, clear film covering the primary circuit board side of the display. The coated areas of each display type is unique due to the mechanical structure of each display. The coating may be absent from those small areas of the display that must remain uncoated for display assembly or testing, such as on connecting pins. Diagrams of the masks—specific to the type of display—are available which show the areas of a display that are not coated. Contact Planar Applications Engineering for more information.

## Circuit Board Repairs

Due to the techniques and equipment required to service a conformally coated display, Planar recommends returning displays requiring service to our customer service department. If a display is serviced, the coating will be restored to original specifications after repairs have been performed.

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## Handling and Treatment

As with any electronic device, care should be taken to protect against damage from chemical solvents. Conformally coated boards are particularly susceptible to 1,1,1 trichloroethane, methylene chloride, and acetone which can degrade the film and impair the effectiveness of the conformal coating.

## Safety Data

The product shipped by Planar contains cured conformal coating. Should the need arise for an end user to know more about the *uncured* coating, a Material Safety Data Sheet is available from Loctite (800-LOC-TITE) or a Planar Applications Engineer.

## Typical Properties of Cured ShadowCure Material

The following technical data, along with the other information in this application note, is intended for reference only. Please contact a Planar Applications Engineer for assistance or information specific to your display.

**Table 1. Coating Material Properties**

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<b>Appearance</b>		
Transparent, colorless film		
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<b>Tensile Properties (ASTM D882 method A)</b>		
Tensile strength	850 psi	
Elongation	1.5%	
Elastic modulus	85,000 psi	
Hardness	60 psi (Shore D-2, ASTM D2240)	
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<b>Water Vapor Transmission (ASTM E96)</b>		
0.325 gram/hr/M <sup>2</sup>		
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<b>Useful Operating Temperature*</b>		
-40 to 257° F, -40 to 125° C		
* Parameters of the coating exceed those specified for the display. Limit application temperatures to those specified in the display operations manual.		
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<b>Electrical Properties</b>		
Dielectric strength	(ASTM D149)	1652 V/mil
Dielectric constant	(ASTM D150 at 77° F (25° C))	100 Hz 3.37 1 KHz 3.07
Dissipation factor	(ASTM D150 at 77° F (25° C))	100 Hz 0.062 1 KHz 0.052 1 MHz
Volume resistivity	(ASTM D257)	$7.21 \times 10^{15} \Omega/\text{cm}$
Surface resistivity	(ASTM D257)	$1.88 \times 10^{17} \Omega$

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## Warranty

Conformally coated Planar EL displays are covered under the same warranty as any other Planar EL display. The addition of conformal coating does not enhance or degrade the optical performance of the display. Please refer to the Planar Sales Agreement for complete warranty details. No additional performance or specifications are implied. The customer is responsible for testing performance of conformal coating in their application.

## Ordering Information

Conformal coating is an option on many of Planar's EL displays. Design requirements vary from application to application. Please contact your local Planar Sales Representative or Sales Associate for a quote for a particular display.

Planar Applications Engineering may be contacted at:

<b>North &amp; South America OEM Sales:</b>	<b>Europe &amp; Asia-Pacific OEM Sales:</b>	<b>Federal and End-User System Sales:</b>
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