

## DCR

### Modified Alkyd Conformal Coating (Scc3)

#### DESCRIPTION

**DCR** is a flexible, red opaque version of **DCA** specifically designed for the protection of electronic circuitry. It has been formulated to meet the highest defence standards in both Europe and the United States.

READ ENTIRE TECHNICAL BULLETIN BEFORE USING THIS PRODUCT

#### FEATURES AND BENEFITS

- Red opaque coating provides camouflage of PCB design
- Heat-cured coating is resistant to many solvents used within aerospace and automotive industries
- Suitable for use at temperature extremes; very wide operating temperature range
- Can be reworked using specialist removal product, Electrolube CCRG

#### APPROVALS

Standard	Status
RoHS Compliant (2015/863/EU)	Yes
IPC-CC-830	Meets approval
UL Approval	UL746C-QMJU2 - Meets Approval

#### PRODUCT INFORMATION

For available packaging sizes please visit:

[electrolube.com](http://electrolube.com)

### PHYSICAL PROPERTIES

Category	Results
<b>Liquid Properties</b>	
Appearance	Red Opaque
Density @ 20 °C (g/mL)	
Bulk	1.08
Aerosol	0.78
VOC Content	
Bulk	40%
Aerosol	61%
Flash Point	
Bulk	27 °C
Aerosol	<23 °C
Solid Content	
Bulk	60%
Aerosol	39%
Viscosity (mPa s @ 20 °C)	
Bulk	410 to 650
Touch Dry	50 to 55 minutes
Cure Time*	2 hours @ 20 °C followed by: 2 to 24 hours @ 90 to 120 °C
Coverage @ 25µm	
Bulk	24 m <sup>2</sup> /L
Aerosol	3 m <sup>2</sup> (200 mL Aerosol)
<b>Cured Film Coating</b>	
Color	Red Opaque
Operating Temperature Range (°C)	-70 to 200
Flammability	Meets UL94 V-1
Thermal Cycling (MIL-1-46058C)	Meets Approval
Coefficient of Expansion (ppm)	85

Category	Results
Dielectric Strength (kV/mm)	90
Dielectric Constant @ 1MHz	4.75
Surface Insulation Resistance	$1 \times 10^{15} \Omega$
Dissipation Factor @ 1MHz, 25 °C	0.044
Moisture Resistance (MIL-1-46058C)	Meets Approval

\* Maximum Solvent Resistance Achieved @ 120 °C; Ambient Curing Schedule: 24 hours @ 20 to 25 °C

### APPLICATION GUIDELINES

DCR can be sprayed, dipped or brushed. The thickness of the coating depends on the method of application (typically 25 to 75 microns). Temperatures of less than 16°C or relative humidity in excess of 75% are unsuitable for the application of DCR. As is the case for all solvent based conformal coatings, adequate extraction should be used (refer to MSDS for further information).

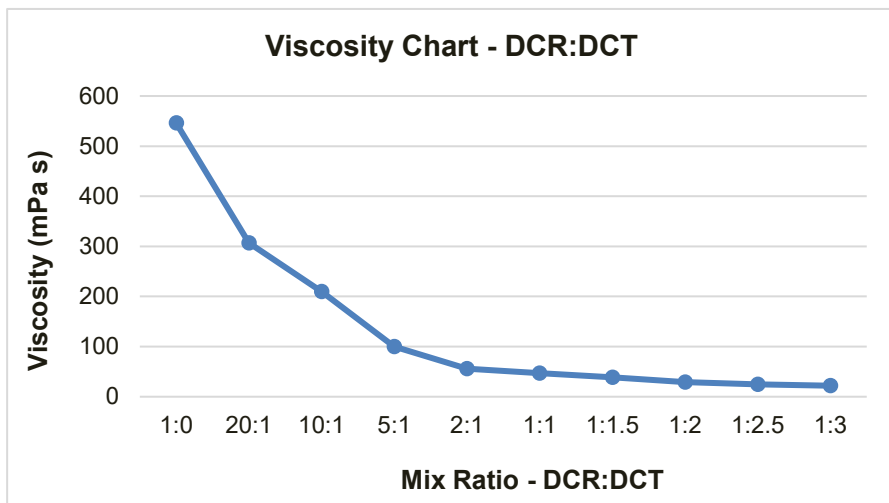
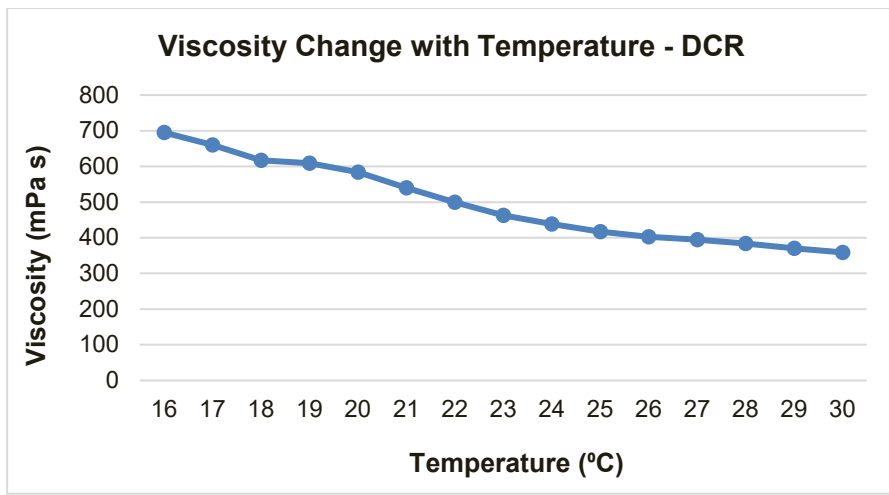
Substrates should be thoroughly cleaned before coating. This is required to ensure that satisfactory adhesion to the substrate is achieved. Also, all flux residues must be removed as they may become corrosive if left on the PCB. We manufacture a range of cleaning products using both hydrocarbon solvent and aqueous technology. Our cleaning products produce results within Military specification.

### APPLICATION GUIDELINES - BULK

#### Spraying – Bulk

DCR needs to be diluted with the appropriate thinners (DCT) before spraying. In addition, DCR should be stirred thoroughly allowing for air bubbles to disperse before application. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions, but normally a dilution ratio of 2:1 (DCR:DCT) is required. Suitable spray viscosity is typically 50 to 80mPa s.

DCR is suitable both for use in manual spray guns and selective coating equipment. The selected nozzle should enable a suitable even spray to be applied in addition to suiting the prevailing viscosity. The normal spray gun pressure required is 274 to 413 kPa (40 to 60 lb/sq.in.). After spraying, the boards should be placed in an air-circulating drying cabinet following the curing schedule highlighted on page 4.



## TYPICAL PRODUCT APPLICATION

### Spraying - Aerosol

When applying DCR in aerosol form, the can must be shaken before use (typically 2 to 3 minutes). The can should be held at 45° and 200 mm from the substrate to be coated. The valve should then be depressed when the can is pointing slightly off target and moved at about 100 mm/s across the target. To ensure the best coating results are achieved try to use a smooth sweeping motion with small overlap for successive rows.

To ensure penetration of the coating beneath the components and in confined spaces, spray the assembly from all directions to give an even coating. After spraying, the boards should be placed in an air-circulating drying cabinet following the curing schedule highlighted on page 4.

### Dip Coating

Ensure that the coating material in the container has been stirred thoroughly and has been allowed to stand for at least 2 hours for all the air bubbles to disperse. Conformal Coating Thinners (DCT) should be used to keep the DCR coating at a suitable viscosity for dipping (180 to 250 mPa s @ 20 °C). DCT is added periodically as the solvent evaporates. The viscosity should be checked using a viscosity meter or "flow cup".

The board assemblies should be immersed in the DCR dipping tank in the vertical position, or at an angle as close to the vertical as possible. Connectors should not be immersed in the liquid unless they are very carefully masked. Our Peelable Coating Masks (PCM/PCS) are ideal for this application. Leave submerged for approximately 10 seconds until the air bubbles have dispersed. The board or boards should then be withdrawn slowly (1 to 2 s/mm) so that an even film covers the surface. After withdrawing, the boards should be left to drain over the tank or drip tray until the majority of residual coating has left the surface. After the draining operation is complete, the boards should be placed in an air-circulating drying cabinet following the curing schedule highlighted on page 4.

### Brushing

Ensure that the coating material has been stirred thoroughly and has been allowed to settle for at least 2 hours. The coating should be kept at ambient temperature. When the brushing operation is complete, the boards should be placed in an air-circulating drying cabinet following the curing schedule highlighted on page 4.

### Drying Times and Curing Conditions

The properties gained from DCR are dependent on the curing schedule employed. It is essential that the coating be allowed a minimum of two hours drying time at ambient temperature prior to any heat curing. This is necessary to allow the solvent system to evaporate.

- Ambient** Ambient curing is via solvent evaporation only. Eliminating the heat curing step will reduce solvent resistance. Other properties, such as resistance to humid and corrosive environments, may also reduce but still meet the requirements of many industry standards. Coated boards should be left at room temperature for the solvent to evaporate; extraction is required in the curing area.
- Commercial** Most commercial users will gain satisfactory performance from this coating by curing for two hours at 90 °C after the two-hour ambient cure. This will give limited resistance to solvents.
- Military** If the assemblies are to be used under conditions of high temperature or be exposed to extremes of thermal cycling, the coating should be cured for 12 hours at ambient followed by 24 hours at 90 °C. For maximum solvent resistance cure at 2 hours at ambient following by 24 hours @ 120 °C. This curing schedule will give resistance to the more aggressive solvents.

It is recommended that the coating be thoroughly cured on circuits, which have design areas of very high impedance that require adjustment after application.

### ADDITIONAL INFORMATION

#### Shelf Life

Description	Shelf Life
DCR Conformal Coating	48 Months
Conformal Coating Thinners	36 Months
Conformal Coating Removal Gel	36 Months

### SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available.**

### CONTACT INFORMATION

To confirm this document is the most recent version, please contact  
**TechnicalSupportTeam@hkw.co.uk**  
[www.electrolube.com](http://www.electrolube.com)

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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