Technical Data Sheet

WBC
Aquacoat – Aqueous Conformal Coating

Product Description

Aquacoat is a water based conformal coating, based on polymeric materials which has been specifically formulated for the protection of electronic circuitry. It offers an excellent blend of both physical and electrical properties whilst eliminating the need for extraction and other precautions associated with the application of conventional solvent based conformal coatings. Aquacoat is non-flammable and contains very low levels of VOC's.

Features

- Environmentally friendly and eliminates hazards associated with solvent based conformal coatings
- Very low VOC content
- Fluoresces under UV light for ease of inspection.
- Wide operating temperature range.
- Excellent adhesion on a wide variety of substrates.
- Can be soldered through without fear of highly toxic gases being produced (contains no isocyanates).
- Non-corrosive to Cadmium and Zinc plate (contains no phenols).
- Cured coating can be removed with Electrolube Remover Gel (DRG).
- Excellent Dielectric properties and resistant to mould growth.

Approvals	**MIL Approval (MIL-1-46058C):**	**Meets approval**
	RoHS Compliant (2002/95/EC):	**Yes**
	IPC-CC-830	**Meets approval**
Liquid Properties	Appearance:	Milky white
	Specific Gravity (Density) @ 20°C g/ml:	1.03
	VOC Content:	<10%
	Flash Point:	>100°C
	Solids content:	35%
	Viscosity @ 20°C:	150 - 220 Centipoise
	Touch Dry:	30-40 minutes
	Recommended Drying Time:	8 Hours @ 20°C or 40 minutes @ 20°C then 40 minutes @ 70°C
	Coverage per litre @ 25µm (m^2):	14 m^2
Dry Film Coating	Colour:	Clear transparent
	Operating Temperature Range:	-50°C to +170°C with excursions up to 190°C
	Flammability:	Self-extinguishing (ASTM Method D56)
	Thermal cycling (MIL-1-46058C):	Pass
	Coefficient of Expansion:	130ppm
	Dielectric Strength:	**50 kV/mm**
	Dielectric Constant:	2.7
	Insulation Resistance:	5×10^{10} Ohms/cm (DEF-STAN 59/47)
	Dissipation Factor @ 1MHz @ 25°C	0.04
	Moisture Resistance (MIL-1-46058C):	Pass

Comb Test Pattern (0.0125''/ 0.318mm) IPC B25 circuit board. Resistance (ohms):

	Initial	After Humid Ageing (1 Wk at 50°C/ 100% RH)	After Thermal Cycling (-40 to 125°C) (6 cycles 1 hour at each temperature)
Aquacoat	5.0×10^{10}	5.0×10^{9}	$>1.0 \times 10^{12}$
Typical Acrylic * (MIL spec)	4.5×10^{12}	7.0×10^{12}	$>1.0 \times 10^{12}$
Typical Silicone * (high spec)	3.6×10^{12}	7.0×10^{11}	$>1.0 \times 10^{12}$

*** = solvent based materials**

After Thermal Cycling then immersion in water for 24 hours at 23°C

Typical Acrylic (MIL spec)	1.0×10^{7}
Aquacoat	6.0×10^{11}

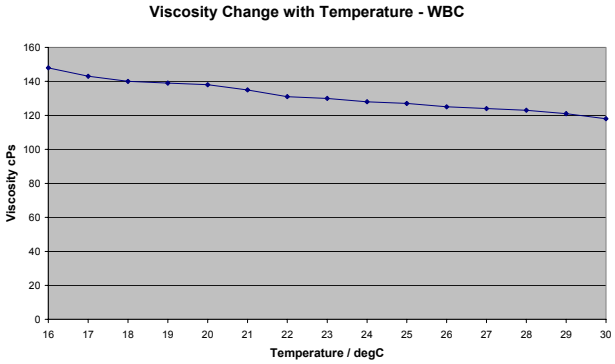
Packaging	Description	Order Code	Shelf Life
WBC Conformal Coating	5 Litre Bulk	WBC05L	36 Months
Deionised Water Thinners	5 Litre	DEI05L	36 Months
Removal Solvent	1 Litre Bulk	DRG01L	36 Months

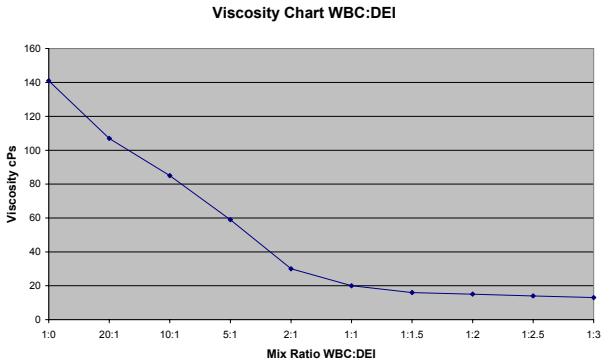
Directions For Use

WBC can be sprayed, dipped or brushed. The thickness of the coating depends on the method of application (typically 25 microns). Temperatures of less than 16°C or relative humidity in excess of 75% are unsuitable for the application of WBC.
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.
Electrolube manufacture a range of cleaning products using both hydrocarbon solvent and aqueous technology. Electrolube cleaning products produce results within Military specification.

Spraying – Bulk

WBC needs to be diluted with the appropriate thinners (DEI) before spraying. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions, but normally a dilution ratio of 5:1 to 2:1 (WBC to DEI). Suitable spray viscosity is typically 50-80 centipoise. If bulk coating material has been agitated, allow to stand until air bubbles have dispersed.
WBC is suitable both for use in manual spray guns.
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 – 413 kPa (40 - 60 lbs/sq.inch)
After the spraying operation is complete, the boards should be placed in an air-circulating drying cabinet and left to dry.





Dip Coating*

Ensure that the coating material in the container has been agitated thoroughly and has been allowed to stand for at least 2 hours for all the air bubbles to disperse.
Deionised water (DEI) should be used to keep the WBC coating at a suitable viscosity for dipping (200 – 300cps @20°C). DEI 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 WBC 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. Electrolube Peelable Coating Mask (PCM) is ideal for this application.
Leave submerged for approximately 10 seconds until the air bubbles have dispersed. The board or boards should then be withdrawn very slowly (1 to 2mm / sec) 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 and left to dry.

*** Dip coating equipment using diaphragm pumps are not suitable for the application of WBC**

Brushing

Ensure that the coating material has been agitated 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 and left to dry.

Inspection

WBC contains a UV trace, which allows inspection of the PCB after coating to ensure complete and even coverage. The stronger the reflected UV light, the thicker the coating layer is.