

TECHNICAL DATASHEET

SC123CF

Description

SC123CF is a flexible, transparent modified silicone conformal coating.

It is designed to meet the highest defence standards in both Europe and the United States, is approvable to the British Ministry of Defence (MOD) DEF_STAN 59/47 Issue 4, and Underwriters Laboratories (UL) QMJU2.

SC123CF is suitable for dip coating, spraying and brushing and is designed to be resistant to most common solvents and may be soldered through to allow rework.

Coloured versions are available on request and are used to camouflage the PCB to make copying designs more difficult. SC123CF is for use in the protection of electronic circuitry to meet the highest defence and aerospace industry requirements. Common uses include telecommunications, radar and associated applications.

SC123CF is a fast air-drying version of SC123C and contains both a UV trace and anti-fungal agents.

Features

Approvable to UK defence standards DEF STAN 59/47 Issue 4

UL approvable for use on recognisable printed wiring boards QMJU2

Excellent adhesion under all climatic conditions including high altitude/decompression to BS.3G100, MIL-STD-810C, RTCA D0160A, ARINC 600

Resistant to most solvents, lubricants and cooling fluids

Excellent resistance to mould growth, ultra violet light, prolonged exposure to tropical life and salt spray.

Wide temperature range -70°C to 200°C

High gloss finish and surface resistivity

Good dielectric properties at all frequencies to DEF-STAN 59-4/2 Annex C, coating thickness typically being 25 to 50 micron

Fluorescent under ultra violet light as an aid to subsequent inspection

Can be soldered through without fear of toxic gases being produced, e.g. isocyanate

Non-corrosive to Cadmium and Zinc plate (contains no Phenol)

Properties

Colour	Clear pale straw
Non-volatile Content	38% approx
Viscosity	165-215 @ 20°C cPs
Specific gravity	0.93 @ 20°C
Flash point	27°C (Xylene)(bulk) 0 (aerosol)
Dielectric Strength	90 kV/mm
Electrical resistivity	1 x 10 ¹⁵ Ohms/cm
Hardness	265 seconds Perzos 60 seconds Sward
Flammability	Self-extinguishing
Temperature range	-70 to +200°C
Drying time	<40 minutes @ 25°C

Application

SC123CF can be dipped, sprayed or brushed.

The thickness of the coating depends on the method of application, but a dip coater normally deposits a film thickness of about 25 microns (single coat).

Workshop temperatures of less than 16°C or relative humidity's in excess of 75% are unsuitable for the application. All PCBs being composite materials absorb moisture.

If this is not removed, the conformal coating may not protect to its fullest extent.

Pre-drying, or better still, vacuum desiccation, will remove most of the moisture.

SC123CF contains a UV trace that allows inspection of the PCB after coating to ensure complete and even coverage. The stronger the reflected light, the thicker the coating layer is.

Boards should be thoroughly cleaned before coating.

This is required to ensure that satisfactory adhesion to the substrate is possible.

Also all flux residues must be removed as they become corrosive if left on the PCB.

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. TS106 thinner should be used to keep the coating at a

suitable viscosity for dipping. TS106 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 dipping tank in the vertical position, or at an angle as close to vertical as possible. Connectors should not be immersed in the liquid unless they are very carefully masked. Leave submerged for about 1 minute until the air bubbles have dispersed. The board or boards should then be withdrawn **VERY SLOWLY** so that an even film covers the surface. After withdrawing, the boards should be left to drain over the tank 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 for 2 hours at room temperature prior to any heat curing.

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. Gently apply the coating with a good quality brush so as not to leave brush marks and so that the components and wiring are not disturbed. When the brushing operation is complete the boards should be placed in an air-circulating drying cabinet and left to dry for 2 hours at room temperature prior to any heat curing.

Spraying

Bulk material needs to be thinned with TS106 thinners before spraying. The optimum viscosity to give coating quality and thickness depends on the spray equipment and conditions but a starting point could be 2 parts coating to 1-part thinners. Allow bulk material to stand if it has been agitated, until air bubbles have dispersed. SC123CF is suitable for use in manual spray guns and computer controlled airless spray equipment that only coats the required areas of the PCB, eliminating the need for masking. The nozzle of the spray gun requires to be selected to give and even spray to suit the prevailing viscosity of the coating material. The normal spray gun pressure required is $27.6 \times 10^6 \text{ kN/m}^2$ to $34.5 \times 10^6 \text{ kN/m}^2$ (40 –50lbs/sq. inch) 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 and left to dry for 2 hours at room temperature prior to any heat curing.

Double coating

Two coats are not usually required if the curing schedule is followed. However if two coats are required, the second coating should be applied within 15 minutes of the first. This will ensure that the two coats will bond satisfactorily.

Drying times and curing conditions

The properties gained are dependant 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. SC123CF will be touch-dry after 50-55 minutes at room temperature.

Most 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 such as 113 trichlorofluoroethane. If the assemblies are to be used under hazardous 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. This curing schedule will give resistance to more aggressive solvents such as 1.1.1 trichloroethane. It is recommended that the coating be thoroughly cured on circuits, which have design areas of very high impedance that require adjustment after application.

Plastic compatibility

Please note the solvent system for this product contains Xylene that could possibly affect polystyrene and polycarbonates.

Copyright Robnor Resins Limited

The results and information above does not constitute a specification and is given in good faith and without warranty. The information is derived from test/or extrapolations believed to be reliable and is quoted for guidance only. The product is offered for evaluation on the understanding the customer satisfies himself that the product is suitable for his intended by proper evaluation and testing.

Robnor Resins Limited, Hunts Rise, South Marston Park, Swindon, Wiltshire SN3 4TE
Tel No: 01 793 823 741 Fax No: 01 793 827 033 e-mail: support@robnor.co.uk