

COMPONENT - COATINGS FOR USE ON RECOGNIZED PRINTED WIRING BOARDS

A P P E N D I X E

VERIFICATION INSTRUCTIONS TO FIELD REPRESENTATIVE

The field representative should verify by examining cartons
*or labels of bulk materials, that "Fine-L-Kote SR" is produced
using Recognized Component (QMJU2) Dow Corning 1-2577 silicone
*rubber in combination with a solvent system.

D E S C R I P T I O NPRODUCT COVERED:

Component - Coatings for use in printed wiring boards - silicone resin "Fine-L-Kote SR" conformal coating. Temperature index and minimum thickness as shown in Table I. Color - natural.

Marking - Shipping containers are marked with the material designation and the material manufacturer's name.

GENERAL DESCRIPTION OF MATERIAL (NOT FOR INSPECTOR'S USE):

The material covered by this Report is a tacky viscous liquid shipped in sealed containers. It is a one-part RTV type room temperature cured silicone resin. Typical container sizes are 16 oz, 1 gal, 5 gal or drums.

The materials are intended for use as conformal coatings on printed circuit boards.

GENERAL DESCRIPTION OF INVESTIGATION (NOT FOR INSPECTOR'S USE):

Several laminate specimens of the ANSI FR-4 type were provided with a printed test pattern and coated with the material under study.

These assemblies were subjected to dielectric proof voltage and breakdown tests as received and after certain conditions chosen to accelerate degradation of the substrate-coating interface.

Long term thermal aging was not considered necessary for these materials at the temperature index shown in Table I.

ENGINEERING CONSIDERATIONS (NOT FOR INSPECTOR'S USE):

Use - For use only in products where the acceptability of the combination is determined by Underwriters Laboratories Inc.

Conditions of Acceptability - The following are among the considerations to be made in judging the use of this material in an end use product.

1. This material has been evaluated for use as a conformal coating only on Recognized printed wiring boards having ANSI Type FR-4, G-10, G-11, CEM-1 and CEM-3 base laminates

2. The temperature limitation, minimum thickness, and other Recognition criteria shall not exceed those specified in Table I.

3. Printed circuit patterns conformally-coated with this material may employ over surface spacings no less than 0.029 in. (nominal 1/32 in.).

4. During the end product submittal, attention should be directed to the adequacy of the coating over solder points and live components if reduced spacings exist at these points.

5. The adequacy of the construction for its operating voltage shall be determined by dielectric withstand tests as required by the end product standard.

6. The material has been evaluated for flammability in accordance with UL 94, for the range of coating thickness specified on specimens of the minimum thickness laminate specified in Table I. The flammability Classification with consideration to coating and laminate thickness should comply with the flammability level acceptable for the applicable UL end product standard or requirements outlined in the Standard for Polymeric Materials - Use in Electrical Equipment Evaluations, UL 746C.

7. Board surface preparation and coating application process must be documented during the end product submittal and reviewed a sure adhesion of "Fine-L-Kote SR", boards having reduced over surface spacings must be properly primed with Dow Corning 1204. Refer to Table II for typical board preparation and cure times for the coating.

8. Conformally-coated boards must undergo 100 percent visual examination for uniformity and completeness of coating, and periodic thickness measurements.

9. Conformal coating employed in lieu of through-air spacings must be subjected to 100 percent production dielectric withstand tests. The test potential shall be applied between a conductive probe on the outer surface of the coating and the component or pattern to which minimum spacings exist.

10. The engineer must consider the need to investigate the part for other than the properties investigated in accordance with the applicable UL end product or requirements outlined in the Standard for Polymeric Materials - Use in Electrical Equipment Evaluations, UL 746C.

11. Suitability for use when exposed to weathering, oils, soaps, chemicals, X-rays, and the like has not been determined by this investigation.

TABLE I

Use Evaluation Data

Designation	Color	Coating			Laminate	
		Minimum Thickness Mils (MIC)	Elec. Temperature Index	UL 94 Flame Class	ANSI Grades	Minimum Thickness in. (mm)
Fine-L-Kote SR	Natural (Clear)	8 (203)	105	94V-0	FR-4,	0.055 (1.40)
					CEM-1, CEM-3	0.057 (1.45)
Mic-Microns		8 (203)	105	94HB	G-10,	0.055 (1.40)
					G-11	

Board Preparation and Coating Application

A. Board Preparation

1. Boards must be clean. Method of cleaning not specified.
2. Coat with Dow Corning 1204 primer and allow to dry.

B. Coating Application

1. Apply conformal coating so as to insure a complete and uniform build to the minimum thickness specified.

C. Cure - (Alternates)

1. Room temperature, or
2. Oven at 100°C

D. Examination

1. Visually examine boards for coating uniformity and the possibility of undesirable air pockets, bubbles, uncoated areas, etc.

T E S T R E C O R D N O. 2

General - The manufacturer requested to change the solvent system used in Fine-L-Kote SR conformal coating. Only the following tests were considered necessary.

SAMPLES:

Specimens of the Conformal Coating materials designated Fine-L-Kote SR "2102-Old" Fine-L-Kote SR "2102-New", were subjected to the tests described below. The specimens were in the "as received" condition (maintained for a minimum of 40 h at 23°C and 50 percent RH, unless otherwise stated).

TEST METHODS:

The analytical test was conducted in accordance with the method referenced in the Standard for Polymeric Materials - Short Term Property Evaluations, UL 746A, Third Edition.

POLYMER IDENTIFICATION TEST:

METHOD

Qualitative infrared analysis (IR) tests were conducted in accordance with the Standard for Polymeric Materials - Short Term Property Evaluations, UL746A, Latest Edition.

RESULTS

Infrared analysis (IR) indicated the composition of the old formulation (N4-21-93) compared favorable with the composition of the new formulation (N4-22-93).

<u>Material</u>	<u>Composition Ascertained From IR</u>	<u>Reference Dates IR</u>
Fine-L-Kote SR	Silicone	N4-22-93