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Certificate No. TLE01A

Cert No(s) 1251.01, 1251.02, 1251.03

ISO/IEC 17025

Certificate No. A1330

TEST REPORT FOR:

PETERS RESEARCH GMBH & CO KG
Hooghe Weg 13
47906 Kempen Germany

Attn: Dr. Manfred Suppa

DATE IN:

February 18, 2005

P/O #:

04-2112-0796

SUBMISSION IDENTIFICATION:

One lot of conformally coated specimens, identified AR, ELPEGUARD SL 1307 FLZ/&, lot # 1-202-0-43625 (mfg date November 8, 2004) and lot #1-97-0-41256 (shelf life, mfg date May 6, 2004), and two uncoated specimens were tested in accordance with IPC-CC-830B, for the following tests:

Materials	FTIR	Fluorescence	Flexability
Shelf Life	Viscosity	Dielectric Withstanding Voltage	Thermal Shock
Cure	Appearance	Moisture and Insulation Resistance	Aging

SUMMARY:

The specimens met the test requirements of IPC-CC-830B.

APPROVED:

Renee J. Michalkiewicz
Laboratory Director

SAMPLE DISPOSITION:

Samples returned to the customer

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MATERIALS

TEST SPECIMENS:

ELPEGUARD SL 1307 FLZ/&, lot # 1-202-0-43625 (mfg date November 8, 2004) and lot #1-97-0-41256 (shelf life, mfg date May 6, 2004).

REFERENCE:

IPC-CC-830B, paragraph 3.3.1.

REQUIREMENT:

The conformal coating shall be free of deleterious substances.

METHOD:

The MSDS data sheets shall be provided by the supplier to insure that no deleterious substances are contained within the conformal coating.

RESULTS:

Supplier will provide the MSDS data sheets to provide proof that no deleterious substances are contained within the conformal coating.

SHELF LIFE

TEST SPECIMENS:

Five conformally coated specimens and one uncoated specimen.

REFERENCE:

IPC-CC-830B, paragraph 3.3.2.

REQUIREMENT:

The conformal coating shall meet all requirements of this standard within the shelf life and storage conditions specified by the conformal coating manufacturer. Shelf life of coating with two or more components shall be that of the component with the shortest shelf life. The tests shall consist of Insulation Resistance (IR) and Dielectric Withstanding Voltage (DWV).

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Insulation Resistance:

Coating material shall be tested in accordance with IPC-TM-650, method 2.6.3.1, Class H, except that the test coupon used shall be coupon D of the IPC-B-25A.

Table 3-2 Minimum Insulation Resistance Requirement	
Classes 1 and 2	100 MΩ
Class 3	500 MΩ

Dielectric Withstanding Voltage:

Test samples shall be prepared in accordance with 4.7 and Table 4-1. The coating materials shall be tested in accordance with IPC-TM-650, method 2.5.7, Class 3 with the following exception:

The test specimen shall be the D pattern of the IPC-B-25A board, which has been covered with cured conformal coating.

The leakage current shall be measured. There shall be no differentiation of class requirements.

There shall be no disruptive discharge evidenced by flashover (surface discharge), sparkover (air discharge), or breakdown (puncture discharge). The leakage rate shall not exceed 10 microamperes.

METHOD:

Moisture and Insulation Resistance:

Teflon insulated wires were soldered to the finger-tabs of the D comb patterns. The comb patterns were protected with an off-contact shield to insure no splattering of the flux onto the combs. The flux was not removed. The specimens were placed in an oven maintained at $50 \pm 2^{o}C$ for 24 hours. The specimens were cooled. The initial insulation resistance measurements were obtained with an applied test voltage of 100 VDC (which had been applied for 1 minute prior to taking the measurements).

Dielectric Withstanding Voltage:

Insulated wires were soldered to the corresponding finger tabs of the D pattern. The electrodes of the hi-pot tester were connected to the insulated wires. One hundred VDC were applied per second until achieving 500VDC. Once 500VDC was achieved, the coupons were held at this voltage for thirty seconds. The results were recorded.

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RESULTS:

Insulation Resistance:

Insulation Resistance Measurements (Ω)				
	Test Points			
Specimen	**1 - 2**	**2 - 3**	**3 - 4**	**4 - 5**
1	9.8×10^{12}	6.9×10^{12}	7.9×10^{12}	1.9×10^{13}
2	7.8×10^{12}	1.1×10^{13}	7.2×10^{12}	6.7×10^{12}
3	7.5×10^{12}	9.9×10^{12}	7.7×10^{12}	6.9×10^{12}
4	7.6×10^{12}	1.2×10^{13}	1.0×10^{13}	7.9×10^{12}
Uncoated	4.2×10^{13}	3.5×10^{13}	4.5×10^{13}	4.8×10^{13}

Dielectric Withstanding Voltage:

There was no disruptive discharge evidenced by flashover (surface discharge), sparkover (air discharge), or breakdown (puncture discharge). The leakage rate did not exceed 10 microamperes.

CURE

TEST SPECIMENS:

Twenty-nine conformally coated specimens.

REFERENCE:

IPC-CC-830B, paragraph 3.3.3.

REQUIREMENT:

The conformal coating shall exhibit all desired properties when applied and cured using the procedures specified by the conformal coating manufacturer.

When coating materials are tested as specified, the coating material shall be cured to full hardness in the time and temperature recommended by the supplier.

METHOD:

The specimens were prepared at the customer's facility using the specified application and curing procedures.

RESULTS:
The cured conformal coating exhibited the desired hardness after utilizing the appropriate application and curing instructions specified by the conformal coating manufacturer.

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FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR)

TEST SPECIMENS:

One specimen coated with conformal coating.

REFERENCE:

IPC-CC-830B, paragraph 3.4.1.

REQUIREMENT:

The FTIR test shall be performed in accordance with IPC-TM-650, method 2.3.42, or equivalent, as part of data gathering for the conformal coating during qualification inspection. When used in qualification retention inspection, FTIR spectra shall be compared to those obtained during qualification inspection. Absorption peaks completely missing or additional peaks signify change in chemistry present within the conformal coating product. A change in chemistry as detected by FTIR may or may not constitute a product change. See paragraph 4.4 of the IPC-CC-830B for definition of product change.

METHOD:

A Fourier Transform Infrared Spectrometer was used to collect and process infrared wavelength absorbance/transmission spectra. Infrared spectra can indicate the chemical composition and/or bonding of organic, polymeric, and many inorganic substances.

The spectrometer radiates a broad band of infrared light through the specimen. Depending on their chemical bonding, individual materials will absorb, transmit, or reflect infrared light of various wavelengths. From the spectrum produced, information about chemical bonding is obtained from the location of group frequency peaks. Most spectra contain additional “fingerprint” peaks that are unique to a particular molecular structure. In addition, the microscope attachment (Micro-FTIR) enables analysis of areas as small as 25 microns in diameter.

The specimen’s spectrum can be compared with spectra of standard materials from an IR reference library or compared against customer-supplied references.

RESULTS:

See the attached FTIR scan of the submitted conformal coating.

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VISCOSITY

TEST SPECIMENS:

Uncured conformal coating materials (except type XY).

REFERENCE:

IPC-CC-830B, paragraph 3.5.1 and ASTM D1084-97, Method B.

REQUIREMENT:

Viscosity of uncured conformal coating materials, except type XY, shall be measured per ASTM-D-10804 and the test conditions shall be defined by the coating manufacturer. Viscosity shall be measured as part of data gathering for the conformal coating during qualification inspection. This viscosity data shall be used by the manufacturer to pre-determine an acceptable viscosity range for quality conformance inspection.

METHOD:

The sealed container was placed in a water bath maintained at 20 ± 0.5°C and was left undisturbed for 30 minutes to reach thermal equilibrium.

A #3 Zahn cup, with an orifice of 3.777 mm +0.0076, -0.0051 mm and a volume of 44 cc, was immersed into the fluid until the top of the cup was below the surface of the sample. Holding the ring attached to the end of the apparatus the cup was raised rapidly from the sample. By means of a stop watch the number of seconds from the time the top edge of the viscometer breaks the surface until the steady flow from the orifice first breaks was determined.

RESULTS:

Average of five determinations = 24 seconds

APPEARANCE

TEST SPECIMENS:

Four glass plates conformally coated and one uncoated glass plate.

REFERENCE:

IPC-CC-830B, paragraph 3.5.2.

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REQUIREMENTS:

Appearance shall be observed visually in all stages of evaluation, qualification, and conformance inspection with the aid of a 3 diopter (approximately 1.75X) minimum magnification. Referee inspections shall be accomplished at 10X magnification. Test samples shall be prepared in accordance with 4.7 and Table 4-1.

The uncured conformal coating materials shall be free of deleterious substances, bubbles, pinholes, whitish spots, blistering, wrinkling, cracking, and peeling. The cured conformal coating shall be smooth, homogeneous, transparent or translucent, and tack-free when observed at ambient conditions. In addition, the conformal coating on the test vehicles shall have no bubbles, pinholes, blisters, cracking, crazing, peeling, wrinkles, mealing or evidence of reversion, or cause corrosion.

METHOD:

The conformal coating was examined with 1.75 X magnification with various light sources. Any referee inspection was carried out with 10X magnification.

RESULTS:

The uncured conformal coating material was free of deleterious substances, bubbles, pinholes, whitish spots, blistering, wrinkling, cracking, and peeling. The cured conformal coating was smooth, homogeneous, transparent or translucent, tack-free, no bubbles, pinholes, blisters, cracking, crazing, peeling, wrinkles, mealing or evidence of reversion, or cause corrosion.

FLUORESCENCE

TEST SPECIMENS:

Four glass plates conformally coated and one uncoated glass plate.

REFERENCE:

IPC-CC-830B, paragraph 3.5.3.

REQUIREMENTS:

Conformal coating materials, except type XY, shall be fluorescent by ultra-violet illumination (black light).

METHOD:

An ultra-violet light was placed over each of the test specimens. The light was turned on and it was noted if the conformal coating was fluorescent.

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RESULTS:

The conformal coating was fluorescent.

FLEXABILITY

TEST SPECIMENS:

Four tin panels conformally coated.

REFERENCE:

IPC-CC-830B, paragraph 3.5.5.

REQUIREMENT:

When the coated panels are tested in accordance with IPC-TM-650, test method 2.4.5.1, there shall be no evidence of cracking or crazing on the cured conformal coating.

METHOD:

The conformally coated tin panel was placed on a granite surface plate, to insure a flat and smooth testing surface. The panel was fixed so that it remained in a stationary position during testing. A 0.3 cm (0.12") diameter mandrel was placed in the center of the coated tin panel. One end of the panel was selected and then bent, within one second, 180° around the mandrel. The specimens were visually examined using 10X magnification for evidence of cracking or crazing of the cured conformal coating

RESULTS:

No cracks were observed on any of the test samples.

DIELECTRIC WITHSTANDING VOLTAGE

TEST SPECIMENS:

Five conformally coated IPC-B-25A boards.

REFERENCE:

IPC-CC-830B, paragraph 3.6.1.

REQUIREMENTS:

Dielectric withstanding voltage of the cured conformal coating shall be measured in accordance with IPC-TM-650, test method 2.5.7.1.

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There shall be no disruptive discharge evidenced by flashover (surface discharge), sparkover (air discharge), or breakdown (puncture discharge). The leakage rate shall not exceed 10 microamperes.

METHOD:

Insulated wires were soldered to the corresponding finger tabs of the D pattern. The electrodes of the hi-pot tester were connected to the insulated wires, one electrode was connected to the 1, 3, and 5 finger tabs and the other electrode was connected to the 2 and 4. One hundred VDC were applied per second until achieving 1500VDC. Once 1500VDC was achieved, the specimens were held at this voltage for one minute. The results were recorded.

RESULTS:

There was no disruptive discharge evidenced by flashover (surface discharge), sparkover (air discharge), or breakdown (puncture discharge).

The leakage rate did not exceed 10 microamperes.

MOISTURE AND INSULATION RESISTANCE

TEST SPECIMENS:

Four conformally coated IPC-B-25A boards and one uncoated IPC-B-25A board.

REFERENCE:

IPC-CC-830B, paragraph 3.7.1.

REQUIREMENTS:

The conformal coating materials shall be tested in accordance with IPC-TM-650, test method 2.6.3.4. After completion of the moisture and insulation resistance test, the panels shall be maintained at the reference conditions at a temperature of 25 ±5°C (77 ±9°F) and a relative humidity of 50 ±5%, for a period of 24 hours.

The minimum insulation resistance shall be 100 MΩ for Class A and 500 MΩ for Class B products during humidity, after humidity, and one to two hours at reference conditions, and after 24 hours at reference conditions.

METHOD:

Teflon insulated wires were soldered to the finger-tabs of the D comb patterns. The comb patterns were protected with an off-contact shield to insure no splattering of the flux onto the combs. The flux was not removed. The specimens were placed in an oven maintained at 50 ± 2°C for 24 hours. The specimens were cooled to ambient conditions

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of 25°, +2, -5°C with 40-50% relative humidity prior to obtaining initial insulation resistance measurements. The initial insulation resistance measurements were obtained with an applied test voltage of 100 VDC (which had been applied for 1 minute prior to taking the measurements). The specimens were then placed in the center of a humidity chamber. A polarizing voltage of 50 VDC was applied using a power supply, for the duration of the chamber time. The 1, 3, and 5 test points were connected to the positive terminal and the 2 and 4 test points were connected to the negative terminal. The test specimens were exposed to 160 hours of temperature and humidity. Polarizing voltage was maintained throughout the entire period. Humidity was maintained at 85% minimum throughout the cycles, except at the low temperature, step (c), the humidity may drop to 80% minimum.

One cycle is as follows:

a) Start test at 25°C and raise temperature to 65°C over a time span of 1.75 ± 0.75 hours.

b) Maintain temperature at 65°C for 3, ± 0.5, -0 hours.

c) Lower temperature from 65 to 25°C over 1.75 ± 0.5 hours.

Note: There shall be no delay between cycles.

The polarizing voltage of 50 VDC was disconnected prior to taking the required insulation resistance measurements. While in the chamber the insulation resistance was measured and recorded at the following intervals: first, fourth, seventh, and tenth cycles. The measurements, during chamber exposure, were taken between hours 2 and 3 of the high temperature phase of each cycle specified.

After completion of the 160 hours, the bias voltage was disconnected and the specimens were removed from the chamber. The insulation resistance measurements were taken after an hour and before two hours at ambient laboratory conditions of 25°, +2, -5°C with 40-50% relative humidity. The specimens were then stabilized for 24 hours at laboratory conditions of 25°, +2, -5°C with 40-50% relative humidity prior to obtaining the final required insulation resistance measurements.

After completion of all electrical testing, the test specimens were examined for appearance and tested for dielectric withstanding voltage.

Appearance:

The conformal coating was examined with 1.75 X magnification with various light sources. Any referee inspection was carried out with 10X magnification.

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Dielectric Withstanding Voltage:

The D coupons previously wired for moisture and insulation resistance were utilized for the dielectric withstanding voltage test. The electrodes of the hi-pot tester were connected to the insulated wires, one electrode was connected to the 1, 3, and 5 finger tabs and the other electrode was connected to the 2 and 4. One hundred VDC were applied per second until achieving 1500VDC. Once 1500VDC was achieved, the specimens were held at this voltage for one minute. The results were recorded.

RESULTS:

Insulation Resistance

Insulation Resistance Measurements (MΩ) Initial				
	Test Points			
Specimen	**1 - 2**	**2 - 3**	**3 - 4**	**4 - 5**
1	1.5×10^6	1.4×10^6	1.4×10^6	1.5×10^6
2	1.4×10^6	1.5×10^6	1.5×10^6	1.7×10^6
3	1.7×10^6	1.5×10^6	1.9×10^6	1.7×10^6
4	2.1×10^6	1.4×10^6	1.6×10^6	1.9×10^6
Uncoated	1.6×10^6	1.8×10^6	1.5×10^6	1.6×10^6

Insulation Resistance Measurements (MΩ) First Cycle				
	Test Points			
Specimen	**1 - 2**	**2 - 3**	**3 - 4**	**4 - 5**
1	2.0×10^5	2.2×10^5	2.9×10^5	2.0×10^5
2	2.1×10^5	2.3×10^5	3.2×10^5	3.2×10^5
3	2.1×10^5	2.5×10^5	3.5×10^5	2.8×10^5
4	2.2×10^5	2.6×10^5	2.6×10^5	2.2×10^5
Uncoated	2.6×10^5	2.5×10^5	3.9×10^5	2.6×10^5

Insulation Resistance Measurements (MΩ) Fourth Cycle				
	Test Points			
Specimen	**1 - 2**	**2 - 3**	**3 - 4**	**4 - 5**
1	2.7×10^5	1.9×10^5	3.1×10^5	3.3×10^5
2	2.4×10^5	2.2×10^5	2.6×10^5	3.0×10^5
3	2.5×10^5	2.0×10^5	2.5×10^5	2.4×10^5
4	1.5×10^5	3.0×10^5	3.4×10^5	2.9×10^5
Uncoated	1.1×10^5	2.0×10^5	1.8×10^5	1.2×10^5

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Insulation Resistance Measurements (MΩ) Seventh Cycle				
	Test Points			
Specimen	1 - 2	2 - 3	3 - 4	4 - 5
1	3.6×10^5	2.9×10^5	3.2×10^5	4.4×10^5
2	3.2×10^5	2.7×10^5	3.4×10^5	1.7×10^5
3	4.2×10^5	3.8×10^5	2.8×10^5	2.5×10^5
4	3.7×10^5	3.6×10^5	3.4×10^5	2.2×10^5
Uncoated	1.6×10^5	1.0×10^5	1.1×10^5	1.7×10^5

Insulation Resistance Measurements (MΩ) Tenth Cycle				
	Test Points			
Specimen	1 - 2	2 - 3	3 - 4	4 - 5
1	2.9×10^5	2.5×10^5	2.8×10^5	3.9×10^5
2	2.6×10^5	3.2×10^5	1.8×10^5	2.9×10^5
3	3.5×10^5	3.6×10^5	1.1×10^5	1.9×10^5
4	2.9×10^5	3.9×10^5	2.7×10^5	2.1×10^5
Uncoated	9.6×10^4	1.8×10^5	1.6×10^5	1.2×10^5

Insulation Resistance Measurements (MΩ) After 1-2 Hours Reference Conditions				
	Test Points			
Specimen	1 - 2	2 - 3	3 - 4	4 - 5
1	6.2×10^5	8.3×10^5	6.8×10^5	4.6×10^5
2	6.7×10^5	5.3×10^5	4.9×10^5	4.8×10^5
3	6.3×10^5	4.6×10^5	5.1×10^5	6.1×10^5
4	6.6×10^5	6.8×10^5	6.2×10^5	5.3×10^5
Uncoated	3.2×10^5	4.4×10^5	5.2×10^5	8.2×10^5

Insulation Resistance Measurements (MΩ) After 24 Hours Stabilization				
	Test Points			
Specimen	1 - 2	2 - 3	3 - 4	4 - 5
1	1.8×10^6	1.3×10^6	2.9×10^6	1.8×10^6
2	1.2×10^6	1.8×10^6	1.7×10^6	2.0×10^6
3	1.1×10^6	1.5×10^6	2.0×10^6	1.0×10^6
4	1.3×10^6	1.6×10^6	2.4×10^6	1.3×10^6
Uncoated	1.1×10^6	1.2×10^6	1.8×10^6	1.1×10^6

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Appearance

The coating did not have bubbles, pinholes, blisters, cracking, crazing, peeling, wrinkles, mealing or evidence of reversion, or cause corrosion after moisture and insulation resistance exposure.

The coating did not mask or obliterate the identification markings, conductors, and base materials greater than the discoloration caused by conditioning when uncoated after moisture and insulation resistance exposure.

Dielectric Withstanding Voltage

There was no disruptive discharge evidenced by flashover (surface discharge), sparkover (air discharge), or breakdown (puncture discharge) after moisture and insulation resistance exposure.

The leakage rate did not exceed 10 microamperes after moisture and insulation resistance exposure.

THERMAL SHOCK

TEST SPECIMENS:

Five conformally coated IPC-B-25A boards.

REFERENCE:

IPC-CC-830B, paragraph 3.7.2.

REQUIREMENTS:

Conformal coating products shall be tested in accordance with IPC-TM-650, method 2.6.7.1, with test conditions of -65°C (-85°F) to 125°C (257°F), 100 cycles.

After the temperature cycles are completed, the coated test vehicles shall be maintained at the reference conditions at a temperature of 25 ±5°C (77 ±9°F) and a relative humidity of 50 ±5% for a period of 24 hours; after which appearance shall be assessed and dielectric withstanding voltage shall be tested and meet the requirements as specified in 3.5.2 and 3.6.1 respectively.

METHOD:

The IPC-B-25A boards were placed in Thermal Shock Chamber. The cold chamber was set at -65^{o}C, and the hot portion of the chamber was set at 125^{o}C. The dwell time was set at 15 minutes. The temperature recovery time was established at 1.2 minutes in hot and 0.7 minutes in cold.

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The chamber was set for 100 cycles. Upon removal from the chamber, the specimens were conditioned at 25 ±5°C and a relative humidity of 50 ±5% for a period of 24 hours. The specimens were tested for appearance and dielectric withstanding voltage.

Appearance:

The conformal coating was examined with 1.75 X magnification with various light sources. Any referee inspection was carried out with 10X magnification.

Dielectric Withstanding Voltage:

Insulated wires were soldered to the corresponding finger tabs of the D pattern. The electrodes of the hi-pot tester were connected to the insulated wires, one electrode was connected to the 1, 3, and 5 finger tabs and the other electrode was connected to the 2 and 4. One hundred VDC were applied per second until achieving 1500VDC. Once 1500VDC was achieved, the specimens were held at this voltage for one minute. The results were recorded.

RESULTS:

Appearance

The coating did not have bubbles, pinholes, blisters, cracking, crazing, peeling, wrinkles, mealing or evidence of reversion, or cause corrosion after thermal shock exposure.

The coating did not mask or obliterate the identification markings, conductors, and base materials greater than the discoloration caused by conditioning when uncoated after thermal shock exposure.

Dielectric Withstanding Voltage

There was no disruptive discharge evidenced by flashover (surface discharge), sparkover (air discharge), or breakdown (puncture discharge) after thermal shock exposure.

The leakage rate did not exceed 10 microamperes after thermal shock exposure.

TEMPERATURE AND HUMIDITY AGING
(Hydrolytic Stability)

TEST SPECIMENS:

Five conformally coated y-patterns.

REFERENCE:

IPC-CC-830B, paragraph 3.7.3.

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REQUIREMENT:

Class B conformal coating products shall be tested in accordance with IPC-TM-650, test method 2.6.11.1.

The control specimen shall be maintained at the reference conditions at 25 ±5°C (77 ±9°F) and 50 ±5% relative humidity. The aged conformal coating shall be tack free to touch.

There shall be no evidence of softening, chalking, blistering, surface tack, cracking, loss of adhesion or reversion to the liquid state. The clarity of the conformal coating must remain suitable for the viewing of identification markings and color codes used to identify components over which the conformal coating is applied.

METHOD:

The specimens were placed in a suitable test vehicle in which the appropriate test conditions of 85 ±2°C with a maximum of 98% relative humidity were maintained. The test was run for one hundred and twenty (120) days. After the required time exposure, the specimens were removed from the chamber and were returned to 25 ±5°C and 50 ±5% relative humidity and held for seven days.

The specimens were tested for tackiness in accordance with method 4061 of FED-STD-141.

The boards were visually examined for evidence of softening, chalking, blistering, surface tack, loss of adhesion or reversion to the liquid state.

Tackiness Test Method:

1. The test panel was placed in the horizontal position at a height such that, when the thumb is placed horizontally on the conformal coating, the arm of the operator is in a vertical straight line from the wrist to shoulder.
2. Bear down on the conformal coating with the thumb, exerting the maximum pressure of the arm and at the same time turning the thumb through an angle of 90° in the plane of the film.
3. The film shall be considered dry-through when no loosening, detachment, wrinkling, or other distortion of the conformal coating occurs.

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RESULTS:

Visual Examination:

Visual Exam Interval	Test Specimen			
	1 (Control)	2	3	4
Initial	Clear	Clear	Clear	Clear
After 28 days	Not Applicable	No Change	No Change	No Change
After 56 days	Not Applicable	No Change	No Change	No Change
After 84 days	Not Applicable	No Change	No Change	No Change
After 127 days	Not Applicable	No Change	No Change	No Change

Hydrolytic Stability:

There was no evidence of reversion as indicated by softening, chalking, blistering, cracking, tackiness, loss of adhesion, or liquefaction of the conformal coating.

Discoloration:

The visual examination verified that the conformal coating did not obliterate legibility and distinguishability of the identification markings and color codes of the resistors.

Tackiness:

There was no loosening, detachment, wrinkling, or other distortion of the conformal coating.

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Trace Laboratories-East certifies that the test equipment used complies with the calibration test purposes of ISO 10012-1, ANSI/NCSL Z540-1-1994, and MIL-STD-45662A and that the data contained in this report is accurate within the tolerance limitation of this equipment.

All test procedures detailed within this report are complete. The results in this report relate only to those items tested. If any additional information or clarification of this report is required, please contact us. This test report shall not be reproduced except in full, without the written approval of Trace Laboratories-East.

Thank you for selecting Trace Laboratories-East for your testing requirements.

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