Conformal Coatings with Combination of Hydrophobic and Moisture Blocking Performance

for

Unparalleled Protection and Reliability of Printed Circuit Boards

Powering Performance for Advanced Conformal Coatings for Printed Circuit Protection:

What distinguishes AIT's Conformal Coatings are their unparalleled ability to adhere to all components on the printed circuit board (PCB) or printed wiring board (PWB) and induce zero stress while providing outstanding moisture, salt-fog and water barrier. These capabilities are achieved with unconventional polymer engineering and designs. AIT's advanced conformal PCB or PWB protection products are ideal for large high performance devices operating at harsh ship board electronics and electrical contacts.

- Moisture, salt-fog immune and immersion capable conformal coating for extreme reliability requirements
- Proven to outperform all market leading conformal coating in protecting high temperature high humidity exposure for aeronautic electronics
- UV-blocking and moisture barrier microelectronic and electronic system coating for long-term usage under direct sun and rain exposure.
- Exceeds RTCA DO 160 coating requirements
- RoHS, REACH and WEEE compliant to meet UL94V-0 rating.

Enhancing Reliability with Stress Management and Moisture Barrier

What distinguishes AIT's Conformal Coatings in comparison to the traditional acrylic, epoxy, polyurethane and silicone conformal coatings are the unique combination of hydrophobic (water repelling) and low moisture permeability (moisture blocking) capabilities. PRIMA-COAT™ CC7130-PR, CC7130-PRTC and SC-7130-CC are flexible like silicone and rework easily like acrylic while providing stress-free protection at thickness from 10-30 micron.

- Effective moisture protection for large and small printed circuit boards in low and high temperature from -55 to 125°C.
- Passed with proven records in use and passed all Radio Technical Commission for Aeronautics (RTCA DO 160) beyond traditional conformal requirements.
- Effective moisture and water condensation protection in long-term high humidity to saturation.
- Proven water and moisture barrier (not just low moisture absorption) to protect against salt fog and ions dissolved in highly industrial zones with sulfides, nitrides and corrosive elements.
- SC-7130-CC proven to outperform existing coatings in extreme performance aeronautic electronics that that requires blocking against moisture penetration, resisting salt-fog corrosion, and effective even with short term direct water immersion.
- SC7050-UVB is the only UV-blocking and moisture barrier microelectronic and electronic system coating for long-term usage under direct sun and rain exposure.
- RoHS, REACH and WEEE compliant to meet UL94V-0 rating.

PRIMA-COAT™ is effective for consumer electronics that may be accidentally immersed in water

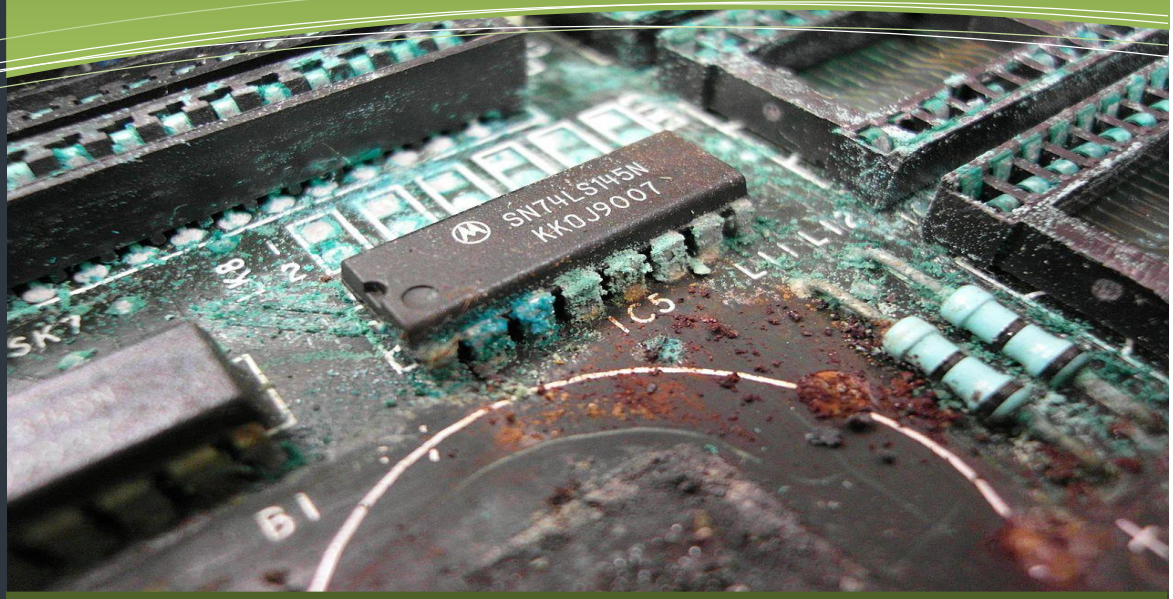
PRIMA-COAT™ is effective in protecting battery terminals exposed to saturated moisture and salt mist

Outstanding protection for Extreme Temperatures Against Moisture and Salt Fog Exposure

UV Blocking Moisture Barrier for Sensitive Electronics

PRIMA-COAT™ CONFORMAL COATINGS:

- **SC7130-CC, CC7130-PRTC and CC7130-PR Proven to Protect Electronics against Salt Fog-Spray besides Moisture**
- **SC7130-CC Proven Protection Against Acid Rain**



Stress-Free and Electrical Insulating Moisture Protection

Ultra Hydrophobic Moisture Blocking Conformal Coatings for Printed Circuit Boards and Electronic Devices Protection, Protective Coatings for Electrical Contacts, Battery Terminals and Printed Circuit Boards:

- Traditional acrylic, epoxy and polyurethane conformal coatings are not hydrophobic and do not provide adequate protection in heavy moisture and particularly susceptible to salt-fog and other industrial corrosive gases in heavy industrial and traffic environments.
- Silicone based conformal coating while hydrophobic to water, still allows very high moisture penetration (as much as 5 times of the rate of acrylic conformal coatings); and also susceptible to the same attacks of high concentration of moisture that carries with it the corrosive elements such as sodium and chloride ions in salt-fog, sulfur dioxide and other corrosive agents in air pollutants.
- AIT has developed an ultra hydrophobic (water repelling), super non-hygroscopic (non moisture absorbing or retention) and the only moisture blocking conformal coatings that has been proven to provide unparalleled effective protection against moisture, water, salt fog, salt spray and even direct salt water immersion for printed circuit boards.

Acrylics, epoxies, polyurethane conformal coatings allow some moisture to penetrate and also retain from 0.3-1.0% of moisture in the material, meaning they are somewhat hygroscopic. Water tends to spread fairly well on these conformal coating materials as well as demonstrated by its relatively low contact angles when water drops on these surfaces.

Silicone has a very low contact angle when what drop on its surface and thus very hydrophobic. However, it also has 10-20 times higher moisture permeability through these conformal coating that will enables the printed circuit boards and its metallization to retain these moisture and water to cause potential corrosion.

Proven Salt Mist Protection for Extreme Aeronautic Electronics Conditions

Reworking, Re-Soldering and Re-Coating:

Unlike silicone, epoxy or polyurethane that is difficult to rework, prima-coat can be removed, component replaced and re-coat or touch-up with same prima-coat over the existing coating

Proven Next Generation Conformal Coating Materials

PROPERTY	CC7130-PR	CC7130-PRTC (Thin Coating Version)	SC7130-CC
Water Absorption, (D570)	<0.01% (Typical Acrylic >0.4%)	<0.01% (Typical Acrylic >0.4%)	<0.01% (Typical Acrylic >0.4%)
Water Permeability, (gm.mm/m^2.d) @ 1atm	<0.05 (Typical Acrylic >5.2)	<0.05 (Typical Acrylic >5.2)	<0.0009 (Typical Acrylic >5.2)
Electrical Resistivity	>2X10^{14} Ω-cm	>2X10^{14} Ω-cm	>2X10^{14} Ω-cm
Viscosity @10.0 rpm	6,000 cps	700 cps (Thin Coating Version)	800 cps
Dielectric Strength (KV/mil)	0.7	0.7	0.8
Dielectric Constant/Loss (1MHz)	2.9/0.01	2.9/0.01	3.9/0.03
Glass Transition Tg (°C)	-55	-55	-45
Modulus of Elasticity (psi)	20,000	20,000	40,000
Hardness (Type)	~ 60 (A)	~ 60 (A)	~ 40 (D)
Cured Density (gm/cc)	1.0	1.0	1.6
Thermal Conductivity	> 0.16 W/m-°K	> 0.16 W/m-°K	> 0.2 W/m-°K
Thermal Expansion Coefficient (ppm/°C)	105 (X=Y=Z, Isotropic)	105 (X=Y=Z, Isotropic)	85 (X=Y=Z, Isotropic)
Maximum Continuous Operation Temperature (°C)	>125	>125	>125
Decomposition Temperature @1% weight loss (°C)	>325	>325	>350
Recommended Drying-Curing Temperature (°C/Min)	Ambient/60, 80/5	Ambient/60, 80/5	Ambient/30, 60/5
Material Form Factors	Spray, Brush and Dip Coating Liquid	Spray, Brush and Dip Coating Liquid	Spray, Brush and Dip Coating Liquid

Moisture Blocking and Hydrophobic Conformal Coating with Low Glass Transition (Tg):

AIT PRIMA-PROTECT™ SC7130-CC, CC7130-PRTC and CC7130-PR were designed to have the same and better moisture and water protection than the vacuum deposited Parylene conformal coating at an affordable costs in materials and costs of ownership.

- They are hydrophobic and thus repel direct water in immersion and can be used in direct water and salt-water immersion applications.
- They block moisture from penetrating with almost zero moisture permeability that is even better than the Parylene conformal coating in this aspect of printed wiring boards protection.
- Also critical for the proven unparalleled protection for the printed wiring boards is its unique property in absorbing zero or undetectable water in moisture or water form.
- PRIMA-PROTECT™ SC7130-CC and CC7130-PR and CC7130-PRTC have been engineered for boards to be coated easily and reworked easily just like the acrylic based conformal coating.
- Majority of the conformal coatings such as acrylics, epoxies and polyurethanes have Tg at around 40-90°C that will induce undue stresses to cause excessive failure when coating thickness is not carefully controlled. AIT engineered its PRIMA-PROTECT™ CC7130-PR, CC7130-PRTC and SC7130-CC with Tg @-55°C to provide stress-free protection against moisture penetration, corrosive salt fog, acid rain, and salt water immersion in cold and hot weather.

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CONFORMAL AND UV-BLOCKING COATINGS

WITH ENGINEERED MOLECULAR STRUCTURE FOR PROVEN PERFORMANCE

ADVANCED CONFORMAL COATINGS

Conformal Coatings and UV Protection Coatings

FUNCTION	AIT PART#	Moisture, Water, Electrical other Relevant Properties
Transparent UV Resistant, Proven Hot Weather Salt-Fog Conformal Coating for PWB	SC7130-CC	• Conforms to properties in IPC-CC-830, IPC-TM-650, MIL-I-46058, ASTM-D-1005, UL 94; Parylene equivalent performance • Proven performance in use for Radio Technical Commission for Aeronautics (RTCA DO 160) conformal coating requirements • Designed to also conform to NASA-STD-8739.1 • Optically translucent with ultra-moisture blocking function • Outstanding protection for water, moisture, salt-fog and UV for exposed plastics and protecting metals from tarnishing and rust
"Parylene Replacement" Conformal Coating for PWB	CC7130-PRTC CC7130-PR	• Conforms to properties in IPC-CC-830, IPC-TM-650, MIL-I-46058, ASTM-D-1005, UL 94; Parylene equivalent performance • Proven performance in use for Radio Technical Commission for Aeronautics (RTCA DO 160) conformal coating requirements • Designed to also conform to NASA-STD-8739.1 • Optically translucent with ultra-moisture blocking function • Outstanding protection for water, moisture, salt-fog for exposed plastics and protecting metals from tarnishing and rust
Non-Transparent UV Blocking Coating	SC713X-UVB	• Optically opaque and UV blocking coating with "X" colors • Outstanding protection for moisture, salt-fog and UV for exposed plastics and protecting metals from tarnishing and rust • Similar in effectiveness as SC-7130-CC in conformal protection • For protecting plastics, decorating coating and metal from corrosion

About AI Technology, Inc. in Chip and Board Protection

Since pioneering the use of flexible epoxy technology for electronic packaging in 1985, AI Technology (AIT) has been one of the leading forces in developing advanced materials and adhesive solutions for electronic interconnection and packaging.

AIT has recently focused a lot more effort in products for flip-chip Under-fill, glob-top or conformal coating actively. However, AIT is meeting these challenges and developing modified epoxies and modified cyanate esters for the new generation of chip and component level packaging that must withstand lead-free soldering. With the introduction of AIT's patented solar materials and solutions (US8,394,650 and others pending), AIT offers UV blocking and UV transparent coatings as well as proven materials for electronic board level and system level protection against moisture, salt-fog and water immersion.

AI Technology, Inc. (AIT) offers one of the most comprehensive lines of advanced materials for packaging and protection from chip to board level:

- Die attach film and dicing die-attach film adhesive for chip stacking and high power microelectronic devices
- Die-Attach films and pastes for extreme high temperatures, extreme stress management requirements and extreme high power applications
- Thermal interface materials including greases, gels, adhesives, patented compressible phase-change pads, high compressibility and conforming "gum-pads" with unparalleled performance
- EMI/RFI mitigation material solutions for component and systems with conductive caulks and adhesives
- Advanced flexible and Insulated Metal Circuit Substrates for camber-free modules
- Insulated metal substrate for high temperature and high power modules

AIT develops and manufactures its product in an ISO 9001:2015 certified 16 acres facility campus in Princeton Junction, NJ, USA with service centers in China.

Products are available worldwide with distributors and agents besides direct office in Shenzhen, China .

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