TECHNICAL DATA SHEET

S-222NA (402LV)

(UL Name: S-222NA / HD-3)

THERMAL CURE SOLDER MASK

- **Screen Application**
- **Dark Green, Glossy Finish**
- **Compliant to RoHS**
- **Resistance to No-Clean Flux Residue**
- **Compatible to Lead-free Process**
- **Withstands ENIG and Immersion Tin**
- **Hard Surface Finish**

Revised May 16, 2016

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PROCESSING PARAMETERS FOR S-222NA (402LV)

S-222NA (402LV) is a two-component, dark green solder mask for screen printing application. This product has excellent printing characteristics, resistance to fluxes, and resistance subsequent processing. **S-222NA (402LV)** meets or exceeds the requirements of IPC SM-840E Class H and has a UL flammability rating of 94V-0.

S-222NA (402LV) COMPONENTS

	S-222NA (402LV)	/ HD-3
Mixing Ratio	100 parts	8.5 parts
Color	Green	Brown
Mixed Properties		
Solids	90%	
Specific Gravity	1.4	

MIXING

S-222NA (402LV) is supplied in pre-measured containers with a mix ratio by weight of 100 parts **S-222NA (402LV)** and 8.5 parts **HD-3.** **S-222NA (402LV)** can be mixed by hand with a mixing spatula for 10 – 15 minutes. Mixing can be done with a mechanical mixer at low speeds to minimize shear thinning for 10 – 15 minutes. Also, mixing can be done with a paint shaker for 10 – 15 minutes.

PRE-CLEANING

Prior to solder mask application, the printed circuit board surface needs to be cleaned. Various cleaning methods include Pumice, Aluminum Oxide, Mechanical Brush, and Chemical Clean. All of these methods will provide a clean surface for the application of **S-222NA (402LV)**. Hold time after cleaning the printed circuit board should be held to a minimum to reduce the oxidation of the copper surfaces.

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PROCESSING PARAMETERS FOR S-222NA (402LV)

SCREEN PRINTING Method: Mechanized or Hand Screening

- Screen Mesh: 110-180
- Screen Mesh Angle: 22.5° Bias
- Screen Tension: 16 - 24 Newtons
- Squeegee: 60 – 80 shore
- Printing Speed: 2.0 – 9.9 inches/sec
- Printing Pressure: 60 – 100 psi

FINAL CURE **S-222NA (402LV)** is thermally cured to give the final property performance. Thermal curing can be done in a batch oven or conveyorized oven.

- Temperature: 275 – 300°F (135 – 149°C)
- Time: 35 – 60 minutes

For Process Optimization please contact your local Taiyo America Representative

Taiyo America, Inc. (TAIYO) warrants its products to be free from defects in materials and workmanship for the specified warranty period **(S-222NA (402LV) /HD-3 Warranty period is 6 Months)** provided the customer has, at all times, stored the ink at a temperature of 68°F or less. TAIYO accepts no responsibility or liability for damages, whether direct, indirect, or consequential, resulting from failure in the performance of its products. If a TAIYO product is found to be defective in material or workmanship, its liability is limited to the purchase price of the product found to be defective. TAIYO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND MAKES NO WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR ANY PARTICULAR PURPOSE. TAIYO'S obligation under this warranty shall not include any transportation charges or costs of installation or any liability for direct, indirect, or consequential damages or delay. If requested by TAIYO, products for which a warranty claim is made are to be returned transportation prepaid to TAIYO'S factory. Any improper use or any alteration of TAIYO'S product by the customer, as in TAIYO'S judgment affects the product materially and adversely, shall void this limited warranty.

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FINAL PROPERTIES FOR S-222NA (402LV)

IPC-SM-840E, Class H, Solder Mask Vendor Testing Requirements

TEST	SM-840 PARAGRAPH	REQUIREMENT	RESULT
Visual	3.3.1	Uniform in Appearance	Pass
Curing	3.2.5.1	Ref: 3.6.1.1, 3.7.1 and 3.7.2	Pass
Non-Nutrient	3.2.6	Does not contribute to biological growth	Pass
Dimensional	3.4	No Solder Pickup and Withstand 500 VDC	Pass
Pencil Hardness	3.5.1	Minimum “F”	Pass – 7H
Adhesion	3.5.2.1	Rigid – Cu, Ni, FR-4	Pass
Machinability	3.5.3	No Cracking or Tearing	Pass
Resistance to Solvents and Cleaning Agents	3.6.1.1	Table 3 Solvents	Pass
Hydrolytic Stability and Aging	3.6.2	No Change after 28 days of 95-99°C and 90-98% RH	Pass
Solderability	3.7.1	No Adverse Effect J-STD-003	Pass
Resistance to Solder	3.7.2	No Solder Sticking	Pass
Dielectric Strength	3.8.1	500 VDC / mil Minimum	2600 VDC/mil
Thermal Shock	3.9.3	No Blistering, Crazing or De-lamination	Pass

Specific Class “H” Requirements

TEST	SM-840 PARAGRAPH	REQUIREMENT	RESULT
Flammability	3.6.3.1	UL 94V-0	Pass – File #E166421
Insulation Resistance	3.8.2		
Before Soldering		5 x 10^8 ohms minimum	Pass (5.0 x 10^{13} ohms)
After Soldering		5 x 10^8 ohms minimum	Pass (1.0 x 10^{13} ohms)
Moisture & Insulation Resistance	3.9.1		
Before Soldering–In Chamber		5 x 10^8 ohms minimum	Pass (3.9 x 10^{10} ohms)
Before Soldering–Out of Chamber		5 x 10^8 ohms minimum	Pass (6.8 x 10^{12} ohms)
After Soldering-In Chamber		5 x 10^8 ohms minimum	Pass (2.3 x 10^{10} ohms)
After Soldering-Out of Chamber		5 x 10^8 ohms minimum	Pass (1.3 x 10^{13} ohms)
Electrochemical Migration	3.9.2	>2.0 x 10^6 ohms, no dendritic growth	Pass (4.2 x 10^{11} ohms)

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