

# ALPHA<sup>®</sup> PV-21

## Zero Halogen Liquid Flux for Multi-busbar Photovoltaic Assembly

### DESCRIPTION

**ALPHA PV-21** is a zero-halogen and halide-free organic based liquid flux designed specifically for Multi-busbar PV assembly. It is formulated to overcome the smaller surface area of wire used in Multi-busbar applications and deliver excellent peel force that result in long term stability of the solder joints. Cells are dry and cosmetically clean as they exit the tabber and stringer equipment. **ALPHA PV-21** is classified as ORL0 under J-STD-004.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

### FEATURES & BENEFITS

- Quick flux activation even under short soldering time and higher preheating loss
- Minimal and tack free residues for low equipment maintenance and downtime
- Excellent peel force resistivity
- Fast wetting
- Compatible with different encapsulants
- Suitable for dipping method

### APPLICATION GUIDELINES

ALPHA PV-21 flux is engineered for most standard and multi-busbar solar module assembly applications. Standard pre-heating and reflow temperature should be used with no special cooling or pre-bake required. Care should be taken to ensure flux is applied only to those areas being soldered and to avoid overspray. Like all no-clean fluxes, no post process cleaning is needed.

ALPHA PV-21 flux can be maintained by titration. Assistance in controlling the flux by this method can be obtained through our technical department.

**HALOGEN STATUS**

Halogen Standards			
Standard	Requirement	Test Method	Status
<b>JEITA ET-7304A</b> Definition of Halogen free Soldering Materials	<1000ppm Br, Cl, F, I in solder material solids	<b>TM EN 14582</b> Solids extraction per IPC TM 2.3.34	PASS
<b>IEC 61249</b>	Post soldering residues contain <900ppm each or total of <1500ppm Br or Cl from flame retardant source		PASS
<b>JEDEC</b> A Guideline for Defining “Low Halogen” Electronic Products	Post soldering residues contain <1000ppm Br or Cl from flame retardant source		PASS
Zero Halogens – No halogenated compounds have been intentionally added to this product			

**TECHNICAL DATA**

Item	Typical Values	Item	Typical Values
Appearance	Clear, Colorless to Light Straw liquid	Flash Point (T.C.C.)	11 °C
Solids Content, %wt/wt	2.1	Recommended Thinner	ALPHA 425
Specific Gravity@ 25 °C	0.799 +/- 0.003	Shelf Life (from Date of Mfg.)	540 Days
Acid Number (mg KOH/g)	17.1 +/- 1.1	IPC J-STD-004 Designation	ORL0

**CORROSION & ELECTRICAL TESTING**
**Corrosion Testing:**

Test	Requirement for ORL0	Results
Silver Chromate Paper Test IPC-TM 650 Test Method 2.3.33	No Detection of Halide	No discoloration of paper. Classified as "Halide Free"
Copper Mirror Test IPC-TM 650 Test Method 2.6.15	No Complete Removal of Copper	No evidence of mirror breakthrough. Classified as "L"
Copper Corrosion Test IPC-SF-818 10-day	No evidence of corrosion	Minor corrosion without pitting is observed. Classified as "L"

**IPC J-STD-004 SURFACE INSULATION RESISTANCE: (All values in ohms.)**

Test	Conditions	Requirements	Results
TM2.6.3.3 Class 3, Uncleaned	85 °C/85% RH, 7 days	$> 1.0 \times 10^8$	$> 1.0 \times 10^{10}$

**SAFETY & WARNING**

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available at [MacdermidAlpha.com/assembly-solutions/knowledge-base](http://MacdermidAlpha.com/assembly-solutions/knowledge-base)**

**STORAGE**

The minimum shelf life information is valid for Alpha products in factory-sealed containers stored in temperatures of 10 to 43 °C (50 to 110 °F). Prolonged exposure to temperatures outside this range may result in separation of ingredients. Containers of this material should also be protected from exposure to direct sunlight and precipitation which may cause container failure over time.

Please contact your Alpha representative if you have questions or concerns about the performance of this product as a result of improper handling or storage.

**CONTACT INFORMATION**

**To confirm this document is the most recent version, please contact  
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[www.macdermidalpha.com](http://www.macdermidalpha.com)**

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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