

ALPHA[®] EF-8000V

Low Rosin, Pb-Free/Sn-Pb Capable Wave Flux

DESCRIPTION

ALPHA EF-8000V is a rosin-containing flux designed to provide the attributes of excellent solderability and reliability in general and high-density boards in both Lead-Free and eutectic Tin/Lead processes. It is designed to have low bridging on bottom side QFP's with 144-168 leads, as well as superior performance in hole filling and solderballing. Additionally, it provides good Lead-Free solder joint cosmetics with an evenly spread, tack-free residue.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

Features for Lead-Free:

- Good hole-fill demonstrated by >96% yield in 10-mil holes
- Low bridging performance on connectors
- Good micro-solder ball performance in Lead-Free applications
- Pin-testable

Benefits:

- Excellent Lead-Free soldering performance on various board finishes
- Evenly spread, tack-free residue
- Capable for high density, as well as general purpose Lead-Free soldering processes
- Can be used in Lead-Free or Sn/Pb processes

APPLICATION GUIDELINES

Preparation: To maintain consistent soldering performance and electrical reliability, it is important to begin the process with circuit boards and components that meet established requirements for solderability and ionic cleanliness. It is suggested that assemblers establish specifications on these items with their suppliers and that suppliers provide Certificates of Analysis with shipments and/or assemblers perform incoming inspection. A common specification for the ionic cleanliness of incoming boards and components is 5µg/in² maximum, as measured by an Omegameter with heated solution.

Care should be taken in handling the circuit boards throughout the process. Boards should always be held at the edges. The use of clean, lint-free gloves is also recommended.

Conveyors, fingers and pallets should be cleaned. Alpha brand stencil cleaner is recommended for this process.

Flux Application: ALPHA EF-8000V can be applied by spray or foam. When spray fluxing, the uniformity of the coating can be visually checked by running a piece of cardboard over the spray fluxer or by processing a board-sized piece of tempered glass through the spray and then through the preheat section.

When replacing ALPHA EF-8000 with ALPHA EF-8000V, the flux loading should be recalibrated with the spray fluxer settings. Your Alpha Assembly Solutions Representative can show you how to make this simple adjustment.

Operating Parameter	SAC305	63Sn/37Pb
Flux application	Spray, Foam	
Amount of Flux Applied	Spray: 1200 to 1600 $\mu\text{g}/\text{in}^2$ of solids/ in^2 for dual wave and 1000 to 1200 $\mu\text{g}/\text{in}^2$ of solids/ in^2 for single wave soldering	Spray: 1000 to 1200 $\mu\text{g}/\text{in}^2$ of solids/ in^2 for dual wave and 600 to 900 $\mu\text{g}/\text{in}^2$ of solids/ in^2 for single wave soldering
Top-Side Preheat Temperature	80 to 110 °C	75 to 95 °C
Bottom-Side Preheat Temperature	0 to 22 °C (0 to 40 °F) vs Top-Side Temperature	
Recommended Preheat Profile	Straight ramp to desired Top-Side Temperature	
Maximum Ramp Rate of Topside Temperature (to avoid component damage)	2 °C/second (3.5 °F/second) maximum	
Conveyor Speed	1.5 to 2.0 meters/minute for single wave, 1.8 to 2.2 meters/minute for dual wave. ALPHA EF-8000V is capable of running at a slower conveyor speed to accommodate certain types of Lead-Free wave soldering processes.	1.5 to 2.0 meters/minute for single wave, 1.8 to 2.2 meters/minute for dual wave.
Contact Angle	5 to 8° (6° most recommended by equipment manufacturers)	
Contact Time	1.5 to 4.0 seconds (2 ½ to 3 seconds most common)	
Solder Pot Temperature	255 to 265 °C	240 to 250 °C

Operating Parameter	SAC305	63Sn/37Pb
These are general guidelines which have proven to yield excellent results; however, depending upon your equipment, components, and circuit boards, your optimal settings may be different. To optimize your process, it is recommended to perform a design experiment, optimizing the most important variables (amount of flux applied, conveyor speed, topside preheat temperature, solder pot temperature and board orientation).		

Flux Solids Control: If rotary drum spray fluxing, the flux solids will need to be controlled via thinner addition. For measuring the solids content, Alpha's Flux Solids Control Kit #3, a digital titrator, is suggested. Request Alpha's Technical Bulletin SM-458 for details on the kit and titration procedure.

When operating a rotary drum fluxer continuously, the acid number should be checked every eight hours. Over time, debris and contaminants will accumulate in recirculating type flux applicators. For consistent soldering performance, dispose of spent flux every 40 hours of operation. After emptying the flux, the reservoir should be thoroughly cleaned with IPA.

Residue Removal: ALPHA EF-8000V is a no-clean flux and the residues are designed to be left on the board. If desired, flux residues can be removed with ALPHA 2110 saponifier cleaner and with other commercially available solvent cleaners and saponifier cleaners.

TECHNICAL DATA

Item	Typical Values	Item	Typical Values
Appearance	Clear light amber liquid	Flash Point (T.C.C.)	5 °C
Solids Content, wt/wt	6.0%	Recommended Thinner	ALPHA 426
Specific Gravity @ 25 °C (77 °F)	0.809 ± 0.005	Shelf Life (from Date of Mfg.)	360 days
Acid Number (mg KOH/g)	27.0 ± 1.5	IPC J-STD-004 Designation	ROL0
pH, 5% w/w aqueous solution	3.1		

CORROSION & ELECTRICAL TESTING – SAC305 Alloy
Corrosion Test

Test		Requirement	Results
IPC TM-650	Silver Chromate Paper (2.3.33)	No Detection of Halide	PASS
	Copper Mirror Test (2.6.15)	No Complete Removal of Copper	PASS
	Copper Corrosion Test (2.3.32)	No Evidence of Corrosion	PASS

J-STD-004 Surface Insulation Resistance

Test	Conditions	Requirements	Results
"Comb-Down" Un-cleaned	85 °C / 85% RH, 7 days	1.0 x 10 ⁸ Ω minimum	9.2 x 10 ⁹ Ω
"Comb-Up" Un-cleaned	85 °C / 85% RH, 7 days	1.0 x 10 ⁸ Ω minimum	1.0 x 10 ¹⁰ Ω
Control Boards	85 °C / 85% RH, 7 days	2.0 x 10 ⁸ Ω minimum	8.3 x 10 ⁹ Ω
Test Condition (per IPC J-STD-004): -50V, measurement @ 100V / IPC B-24 board (0.4mm lines, 0.5mm spacing)			

JIS Surface Insulation Resistance

Test	Conditions	Requirements	Controls	Results
Initial	Ambient	1.0 x 10 ¹¹ Ω minimum	1.0 x 10 ¹¹ Ω minimum	1.0 x 10 ¹² Ω
After 7 Days	40 °C / 90% RH	1.0 x 10 ¹¹ Ω minimum	1.0 x 10 ¹¹ Ω minimum	2.0 x 10 ¹¹ Ω
Recovered	25 °C / 75% RH, 7 days	1.0 x 10 ¹¹ Ω minimum	2.0 x 10 ¹¹ Ω minimum	1.0 x 10 ¹² Ω
Test Condition: All measurements @ 100V, JIS boards (0.32mm lines, 0.32mm spacing, same as IPC B-25 boards)				

Bellcore Surface Insulation Resistance

Test	Conditions	Requirements	Results
"Comb-Down" Un-cleaned	35 °C / 85% RH, 5 days	1.0 x 10 ¹¹ Ω minimum	3.9 x 10 ¹¹ Ω
"Comb-Up" Un-cleaned	35 °C / 85% RH, 5 days	1.0 x 10 ¹¹ Ω minimum	2.5 x 10 ¹¹ Ω
Control Boards	55 °C / 85% RH, 5 days	2.0 x 10 ¹¹ Ω minimum	9.2 x 10 ¹¹ Ω
Test Condition (per Bellcore GR 78-CORE, Issue 1): 48V, measurement @ 100V / 25mil lines, 50mil spacing			

Bellcore Electromigration

Test	SIR (Initial)	SIR (Final)	Requirement	Result	Visual Result
"Comb-Up" Un-cleaned	4.6 X 10 ¹⁰ Ω	2.0 X 10 ¹¹ Ω	SIR (Initial) / SIR (Final) < 10	PASS	PASS
"Comb-Down" Un-cleaned	2.4 X 10 ¹⁰ Ω	7.4 X 10 ¹⁰ Ω	SIR (Initial) / SIR (Final) < 10	PASS	PASS
Test Condition (per Bellcore GR 78-CORE, Issue 1): 65 °C / 85% RH / 500 hours / 10V, measurements @ 100V / IPC B-25B Pattern (12.5mil lines, 12.5mil spacing.)					

RECYCLING SERVICES

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area or [link here](#).



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.**

CONTACT INFORMATION

**To confirm this document is the most recent version, please contact
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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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