

ALPHA[®] EF-8000-TF

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

DESCRIPTION

ALPHA EF-8000-TF is a rosin-containing flux designed to provide excellent solderability and reliability in general, as well as in high-density boards for both Lead-Free and eutectic Tin-Lead processes. **ALPHA EF-8000-TF** is designed to be a drop-in replacement for **ALPHA EF-8000** for any user wishing to use an NPE/OPE-Free formulation. The formulation is designed to have superior hole filling performance, as well as a low tendency for solderballing and bridging even on boards with narrowly spaced components. Additionally, it provides good solder joint cosmetics with an evenly spread, tack-free residue.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

Features for Lead-Free:

- Good hole-fill demonstrated by >96% yield on 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 Pb-Free or Sn-Pb processes

APPLICATION GUIDELINES

PREPARATION: In order 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 5 µg/in² maximum, as measured by an ionic contamination tester.

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-8000-TF 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.

OPERATING PARAMETER	Recommendation for SAC305	Recommendation for 63/37 SnPb
Amount of Flux Applied by Spray	1200 to 1600 µg/in ² of solids/in ² for dual wave and 1000 to 1200 µg/in ² of solids/in ² for single wave soldering	1000 to 1200 µg/in ² of solids/in ² for dual wave and 600 to 900 µg/in ² of solids/in ² for single wave soldering
Topside 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 Temp.	0 to +22 °C (0 to +40 °F) vs. Top-Side Temp.
Recommended Preheat Profile	Straight ramp to desired Top-Side Temp.	Straight ramp to desired Top-Side Temp.
Maximum Ramp Rate of Topside Temperature (to avoid component damage)	2 °C/second (35 °F/second) max.	2 °C/second (35 °F/second) max.
Conveyor Angle	5 to 8° (6° most common recommended by equipment manufacturers)	5 to 8° (6° most common recommended by equipment manufacturers)
Conveyor Speed	1.5 to 2.0 m/min for single wave, 1.8 to 2.2 m/min for dual wave; ALPHA EF-8000-TF is capable of running at a slower conveyor speed to accommodate certain types of Lead-Free wave soldering process.	1.5 to 2.0 m/min for single wave; 1.8 to 2.2 m/min for dual wave
Contact Time in the Solder (includes Chip Wave and Primary Wave)	1.5 to 4.0 seconds (2.5 to 3 seconds most common)	1.5 to 4.0 seconds (2.5 to 3 seconds most common)
Solder Pot Temperature	255 to 265 °C (491 to 509 °F)	240 to 250 °C (464 to 482 °F)
<i>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. In order 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).</i>		

FLUX SOLIDS CONTROL: If using 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. 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-8000-TF 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** cleaner and with other commercially available solvent cleaners and saponifiers.

TECHNICAL DATA

Item	Typical Values	Item	Typical Values
Appearance	Clear, Colorless to Light Amber Liquid	Flash Point (T.C.C.)	12 °C
Solids Content, wt/wt%	6.0	Recommended Thinner	ALPHA 425
Specific Gravity @ 25 °C (77 °F)	0.807 ± 0.003	Shelf Life (from Date of Mfg.)	360 days
Acid Number (mg KOH/g)	27.0 ± 1.5	IPC J-STD-004B Designation	ROLO
pH (5% aqueous solution)	~3.1		

CORROSION & ELECTRICAL TESTING

Corrosion Testing

Test	Requirements	Results
Copper Mirror Tests IPC J-STD-004; TM-650 2.3.32	No evidence of mirror breakthrough for L Classification	PASS
Copper Corrosion Test IPC J-STD-004; TM-650 2.6.15	No evidence of corrosion	PASS

IPC J-STD-004 Surface Insulation Resistance (All values in ohms)

Test	Condition	Requirement	Result
"Comb-Up" Uncleaned	85 °C/85% RH, 7 days	$>1.0 \times 10^8$	4.01×10^{10}
"Comb-Down" Uncleaned	85 °C/85% RH, 7 days	$>1.0 \times 10^8$	1.00×10^9
Control Boards	85 °C/85% RH, 7 days	$>1.0 \times 10^9$	2.47×10^{11}
IPC Test Condition (per IPC-TM-650 2.6.3.3): -48 V, measurement @ 100 V/IPC B-24 board (0.4 mm lines, 0.5 mm spacing).			

IPC J-STD-004B Surface Insulation Resistance (All values in ohms)

Test	Requirements ($<1.0 \times 10^9$ allowed during initial 24 hrs)	Result		
		<24 hrs	24 - 168 hrs	Visual
"Comb-Up" Uncleaned	$>1.0 \times 10^8$	1.69×10^{10}	2.37×10^{10}	PASS
Comb-Down" Uncleaned	$>1.0 \times 10^8$	2.11×10^9	1.93×10^9	PASS
Control	$>1.0 \times 10^9$	7.69×10^{11}	1.62×10^{12}	NA
IPC Test Condition (per IPC-TM-650 2.6.3.7): IPC B-24 coupons, 12 V, 40 °C, 90% RH, measurements recorded @ 20 min intervals				

IPC J-STD-004B Electrochemical Migration Resistance (All values in ohms)

Test Condition	SIR (Initial)	SIR (Final)	Requirement	Result
"Comb-Up" Uncleaned	3.93×10^{10}	1.46×10^{11}	$SIR(Final) > SIR(Initial) / 10$	PASS
Comb-Down" Uncleaned	8.90×10^8	2.86×10^9	$SIR(Final) > SIR(Initial) / 10$	PASS
IPC Test Condition (per IPC-TM-650 2.6.14.1): 65 °C/85 % RH/596 Hours/10 V, measurement @ 100 V/IPC B-25B Pattern (12.5 mil lines, 12.5 mil spacing).				

SAFETY & WARNING

Inhalation of the volatilized flux activator fumes, which are generated at soldering temperatures, may cause headaches, dizziness and nausea. Suitable fume extraction equipment should be used to remove the flux from the work area. An exhaust at the exit end of the wave solder machine may also be needed to completely capture the fumes. Observe precautions during handling and use. Suitable protective clothing should be worn to prevent the material from coming in contact with skin and eyes.

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 AlphaAssembly.com.**

CONTACT INFORMATION

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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 directory assistance: Chemtrec 1 - 800 - 424 - 9300.

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