

SM463

ALPHA SUPERLO[®] 26F

LOW SOLIDS, NO-CLEAN FLUX

ALPHA 26F provides the broadest process window for rosin/resin-free, no-clean flux. After wave soldering, ALPHA 26F leaves no visible residue to interfere with pin testing. ALPHA 26F is designed to provide excellent soldering results (low defects rates) to tin-lead coated PCB's and to bare copper with organic coatings.

GENERAL DESCRIPTION

ALPHA 26F is an active, rosin/resin-free, low solids, no-clean flux. It is formulated with a thermally stable activator system, comprised of a proprietary activator system. The activators are designed to provide the broadest operating window from a low solids, no-clean flux, while maintaining a high level of long-term electrical reliability. After wave soldering, **ALPHA 26F** leaves no visible residue with most solder masks, which can be pin tested.

FEATURES & BENEFITS

- High activity for excellent soldering and low defect rates.
- Leaves no visible residue to interfere with pin testing.
- Residues are compatible with a broad range of conformal coatings.
- Meets Bellcore requirements for long-term electrical reliability.

APPLICATION GUIDELINES

PREPARATION - In order to maintain a consistent level of soldering performance and electrical reliability, it is important to start the process with circuit boards and components which 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/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. When switching from one flux to another, the use of a new foam stone is recommended (for foam fluxing).

Conveyors, fingers and pallets should be cleaned. Bioact SC-10 Solvent Cleaner has been found to be very useful for these cleaning applications. When foam fluxing, do not use hot fixtures or pallets. Hot fixtures/pallets will deteriorate the foam head.

FLUX APPLICATION - ALPHA 26F is formulated to be applied by foam, wave or spray methods. If foam fluxing, the foam fluxer should be supplied with compressed air which is free of oil and water. Keep the flux tank full at all times. The top of the foam stone should be a maximum of 1-½ inches below the surface of the flux. Adjust the air pressure to produce the optimum foam height with a fine, uniform foam head. A uniform coating of flux is essential to successful soldering.

If using the foam or wave method of application, an air knife is recommended after the fluxing operation. An air knife will help ensure that the flux is uniformly distributed across the board and will remove the excess flux. If spray fluxing, the uniformity of the coating can be visually checked by running a piece of cardboard through the spray fluxer or by processing a board sized tempered glass plate through the spray and through the preheat section.

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GENERAL GUIDELINES FOR MACHINE SETTINGS

OPERATING PARAMETER	TYPICAL LEVEL
Amount of Flux Applied	Foam, Wave: 1,000 - 2,000 $\mu\text{g}/\text{in}^2$ of solids Spray: 450 - 750 $\mu\text{g}/\text{in}^2$ of solids
If foam fluxing	
Foam Stone Pore Size	20 -50 μm
Distance that top of stone is submerged below surface	1 - 1½ inches (25 - 40 mm) maximum
Foam Fluxer Chimney Opening	3/8 - 1/2 inch (10-13 mm)
Pressure of Air to Foam Fluxer	1 - 2 psi
If foam fluxing use an Air Knife	
Air Knife Hole Diameter	1 - 1.5 mm
Distance Between Holes	4 - 5 mm
Air Knife Pressure	about 2 psi
Distance from Fluxer to Air Knife	4 - 6 inches (10-15 cm)
Air Knife Angle Back toward Fluxer from Perpendicular	3° - 5°
Topside Preheat Temperature	190°F - 230°F (85°C - 110°C)
Bottomside Preheat Temperature	about 65°F (35°C) higher than topside
Maximum Ramp Rate of Topside Temperature	2°C/second (3.5°F/second) maximum
Conveyor Angle	5°-8° (6°C most common)
Conveyor Speed	4 - 6 feet/minute (1.2 - 1.8 meters/minute)
Contact Time in the Solder (includes Chip Wave and Primary Wave)	1.5 - 3.5 seconds (2-2½ seconds most common)
Maximum Change in Temperature from Preheat to Solder Wave	180°F (100°C) Maximum Temperature Change
Solder Pot Temperature	460 - 500°F (235-260°C)
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 designed experiment, optimizing the most important variables (amount of flux applied, conveyor speed, topside preheat temperature, and solder pot temperature).	

FLUX SOLIDS CONTROL - If foam, wave, or rotary drum spray fluxing, the flux solids will need to be controlled via thinner addition to replace evaporative losses of the flux solvent. As with any flux with less than 5% solids content, specific gravity is **not** an effective measurement for assessing and controlling the solids content. Monitoring and controlling the acid number is recommended for maintaining the solids content. The acid number should be controlled to between 17.4 and 19.4. 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 the foam fluxer continuously, the acid number should be checked every two-to-four hours. Over time, debris and contaminants will accumulate in recirculating type flux applicators. For consistent soldering performance, dispose of spent flux every 40 hour of operation. After emptying the flux, the reservoir and foam stone should be thoroughly cleaned with flux thinner.

RESIDUE REMOVAL - ALPHA 26F is a no-clean flux and the residues are designed to be left on the board. However, if desired, **ALPHA 26F** residues can be removed with Alpha 2110 or with Bioact Solvent Cleaner.

TOUCH-UP/REWORK - For a touch-up flux, use of the Cleanline Write Flux Applicator with NR205 flux and Telecore Plus cored solder are recommended for hand soldering applications.

TECHNICAL SPECIFICATIONS

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Parameters	Typical Values	Parameters/Test Method	Typical Values
Appearance		pH (as is)	
Solids Content, wt/wt		Recommended Thinner	26F Additive
Acid Number (mg KOH/g)	18.4	Shelf Life	18 Months
Halide Content (equiv. chlorides)	None	Container Size Availability	1, 5, and 55 Gal.
Specific Gravity @ 25°C (77°F)	0.806 ± 0.005	Bellcore TR-NWT-000078, Issue 3 Compliant	Yes
Pounds Per Gallon	6.7	IPC Classification (per IPC-SF-818)	M3LC
Flash Point (T.C.C.)	65°F (18°C)	J-Standard Classification	

CORROSION AND ELECTRICAL RELIABILITY TESTING

<u>Corrosion Testing</u>	<u>Requirements</u>	<u>Results</u>
Silver Chromate Paper Test	No Detection of Halide	Passes
Copper Mirror Test	No Complete Removal of Copper	Passes
IPC Copper Corrosion Test		Type M

SURFACE INSULATION RESISTANCE (all values in ohms)

<u>Test Condition</u>	<u>Requirement</u>	<u>Results</u>
Bellcore "Comb-Up" - Uncleaned	2.0×10^{10} minimum	9.6×10^{10}
Bellcore "Comb-Down" - Uncleaned	2.0×10^{10} minimum	3.3×10^{10}
Bellcore Control Board	4.0×10^{10} minimum	3.0×10^{12}
IPC-SF-818, Class 3 - Uncleaned	1.0×10^8 minimum	9.7×10^9

Bellcore Test Condition (per TR-NWT-000078, Issue 3): 35°C/85%RH/120 Hours/-50 volts, measurement @ 100V/

B-25 B board (12.5 mil lines/12.5 mil spacing).

IPC Test Condition (per IPC-SF-818, Class 3): 85°C/85%RH/168 Hours/-50V, measurement @ 100V/IPC B-25 B board (12.5 mil lines, 12.5 mil spacing).

ELECTROMIGRATION (all values in ohms)

<u>Test Condition</u>	<u>SIR (Initial)</u>	<u>SIR (Final)</u>	<u>Requirement</u>	<u>Result</u>	<u>Visual Result</u>
Bellcore "Comb-Up" Uncleaned	1.7×10^{10}	2.1×10^{10}	SIR (Initial)/SIR (Final) < 10	Passes	No Dendrites or Corrosion
Bellcore "Comb-Down" Uncleaned	5.4×10^9	6.9×10^9	SIR (Initial)/SIR (Final) < 10	Passes	No Dendrites or Corrosion

Bellcore Test Condition (per TR-NWT-000078, Issue 3): 85°C/85%RH/500 Hours/10V, measurement @ 100V/IPC B25 B Pattern (12.5 mil lines, 12.5 mil spacing)

HEALTH & SAFETY

Please refer to the Material Safety Data Sheet as the primary source of health and safety information. Inhalation of the flux solvent and volatilized 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.