ALPHA® NR300F

VOC-Free, No-Clean, No Residue Flux

DESCRIPTION

ALPHA NR300F is essentially a VOC-free[1], halide-free, rosin/resin free, low solids, no clean flux. It is formulated for wave soldering of through-hole, mixed technology and surface mount assemblies. The flux produces a tack-free surface with high surface insulation resistance and no residue to interfere with electrical testing. It has a unique formulation that provides high activity with virtually no visible residue with most solder masks. ALPHA NR300F conforms to the requirements of Bellcore TR-NWT-000078 for non-VOC flux formulations.

ALPHA NR300F is supplied in a water based vehicle, free of organic solvents and is formulated to help meet the present and future volatile organic compound (VOC) emission regulations. The water vehicle results in a non-flammable product which does not require special storage conditions. A further unique property of the **ALPHA NR300F** formulation is its ability to keep the organic activator system in solution after being submitted to storage temperatures below freezing.

ALPHA NR300F flux uses a unique blend of organic activators which significantly reduces solder bridging, icicling and solder balling on difficult to solder assemblies.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

[1] Trace VOC content, primarily from flux activator volatilization during soldering, measured at 0.8% as determined per EPA Reference Method 24 using ASTM test procedure D2369. Conventional alcohol-based low solids, no-clean fluxes typically have VOC content in excess of 95%.

FEATURES & BENEFITS

- VOC-Free; Helps meet air quality regulations
- Non-Flammable; Eliminates equipment fires & special storage requirements
- High Activity; Good soldering with low defects
- No Thinners Required; Reduced operating costs & less frequent solids analysis required
- Meets Bellcore Requirements; High reliability assemblies
- No Visible Residue; Accurate pin testing & enhanced board cosmetics

APPLICATION GUIDELINES

ALPHA NR300F flux is designated for foam applications. The recommended topside preheat temperatures are 104 to 116 °C (220 to 240 °F). The optimum preheat settings and conveyor speed required to completely evaporate the water vehicle will be dependent upon the particular wave solder machine being used and the assemblies being processed. Insufficient preheat will be evident by spattering during wave soldering.

ALPHA NR300F produces a slower breaking foam head than typical alcohol base fluxes. This may result in a higher level of foam in the flux pot surrounding the foam chimney and possibly some foam drag out on the fluxed boards. To achieve the proper foam height, it is recommended that the flux be filled to a level approximately 1½ inches (4cm) above the foam stone element and the air flow rate carefully adjusted to produce the optimal foam head. Proper adjustment to the chimney opening can optimize the size and uniformity of the foam. An air knife at the flux pot exit will break any foam dragged out on the boards, assuring uniform coverage of the surface with a thin film of flux liquid.

ALPHA NR300F flux, unlike conventional fluxes, does not require frequent thinning. Flux solids can be monitored using Alpha's Flux Solids Control Kit #3. If thinning is required, the addition of deionized water is all that is necessary.

For applications which specify cleaning, a plain heated water cleaning step after soldering will remove any slight traces of flux residues.

TECHNICAL DATA

Item	Typical Values	Item	Typical Values
Appearance	Clear, colorless liquid	Flash Point (T.C.C.)	None
Solids Content, %wt/wt	3.0	Recommended Thinner	DI H_2O
Specific Gravity @ 25 °C (77 °F)	1.0095 ± 0.0030	Shelf Life (from Date of Mfg.)	540 Days
Acid Number (mg KOH/g)	27.2 ± 1.5	IPC J-STD-004 Designation	ORL0
Halides	None	Packaging Size	1, 5 & 55 Gallons

CORROSION & ELECTRICAL TESTING

Corrosion Test

Test	Requirement	Results
Silver Chromate Paper (IPC-TM 650 Test Method 2.3.33)	No detection of halide	PASS
Copper Mirror Test[2] (Modified IPC/Bellcore Method)	No complete removal of copper	PASS

[2] Passes the copper mirror test when the same flux formulation is prepared using isopropyl alcohol instead of water. Also passes the copper mirror test when the same flux formulation is reconstituted with isopropyl alcohol after evaporation of its water vehicle at 85 °C.

IPC J-STD-004 Surface Insulation Resistance

Test	Requirements	Results
"Comb-Down" Un-cleaned	> 1.0×10^8 Ω	7.0×10^9 Ω
"Comb-Up" Un-cleaned	> 1.0×10^8 Ω	5.1×10^9 Ω
Control Board	> 1.0×10^9 Ω	1.0×10^{10} Ω
IPC Test Condition (per J-STD-004):85°C/85%RH/7days/-48V, measurement @ 100V/IPC B-24 board (0.4mm lines, 0.5mm spacing.		

Bellcore Surface Insulation Resistance

Test	Conditions	Requirements	Results
"Comb-Down" Un-cleaned	35 °C/85% RH, 4 days	≥ 1.0×10^{11} Ω	7.4×10^{11} Ω
"Comb-Up" Un-cleaned	35 °C/85% RH, 4 days	≥ 1.0×10^{11} Ω	5.1×10^{11} Ω
Control Boards	35 °C/85% RH, 4 days	≥ 2.0×10^{11} Ω	7.4×10^{11} Ω
Bellcore Test Condition (per GR 78-CORE, Issue 1): 48 Volts, measurement @ 100V/25 mil lines/50 mil spacing.			

Bellcore Electromigration

Test	SIR (Initial)	SIR (Final)	Requirement	Result	Visual Result
"Comb-Up" Un-cleaned	3.6 x 10^9 Ω	4.5 x 10^9 Ω	SIR (Initial)/SIR (Final) < 10	PASS	PASS
"Comb-Down" Un-cleaned	3.6 x 10^9 Ω	2.3 x 10^9 Ω	SIR (Initial)/SIR (Final) < 10	PASS	PASS
Bellcore Test Condition (per TR-NWT-000078, Issue 3): 85 °C/85%RH/500 Hours/10V, measurement @ 100V/IPC B-25 B Pattern (12.5 mil lines, 12.5 mil 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 Assembly@MacDermidAlpha.com

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