

## ALPHA NR300-A4

VOC-Free, No-Clean, No Residue Flux

### DESCRIPTION

**ALPHA NR300-A4** is an essentially VOC-free<sup>1</sup>, 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.

**ALPHA NR300-A4** provides excellent soldering on bare copper boards with organic coatings. The soldering of bare copper boards is extremely difficult due to the thermal treatments which most boards have previously experienced (reflow and adhesive cure), which generates a strong oxide coating. The flux produces a tack-free surface with high surface insulation resistance and no residue to interfere with electrical testing. **ALPHA NR300-A4** has a unique formulation that provides high activity with virtually no visible residue with most solder masks.

**ALPHA NR300-A4** 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 NR300-A4** formulation is its ability to keep the organic activator system in solution after being submitted to storage temperatures below freezing.

**ALPHA NR300-A4** 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

<sup>1</sup> Trace VOC content, primarily from flux activator volatilization during soldering, measured at 1% 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**

Features	Benefits
Voc-Free	Helps Meet Air Quality Regulations
Non-Flammable	Eliminates Equipment Fires & Eliminates Special Storing Requirements
High Activity	Excellent Soldering, Particularly On Bare Copper Boards
No Thinners Required	Reduced Operating Costs & Less Frequent Solids Analysis Required
No Visible Residue	Accurate Pin Testing & Enhanced Board Cosmetics

**APPLICATION GUIDELINES**

ALPHA NR300-A4 flux can be applied by spray or wave applications (not intended for foam application). Topside preheat temperatures of 93 to 104 °C (200 to 220 °F) for spray application and of 104 to 116 °C (220 to 240 °F) for wave application are recommended. 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 NR300-A4 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	4.0	Recommended Thinner	DI Water
Specific Gravity @ 25 °C (77 °F)	1.010 ± 0.002	Shelf Life (from Date of Mfg.)	540 Days
Acid Number (mg KOH/g)	35.6 ± 2.0	IPC J-STD-004 Designation	ORL0
pH	3.0 ± 0.5	Packaging Size	25 Liters; 5 Gallons
Halides	None		

**CORRSION AND ELECTRICAL TESTING**
**Corrosion Test**

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

<sup>2</sup> 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.

**Bellcore Surface Insulation Resistance**

Test	Conditions	Requirements	Results
"Comb-Down" Un-cleaned	35 °C/85% RH, 4 days	> 1.0 x 10 <sup>11</sup> Ω	2.9 x 10 <sup>11</sup> Ω
"Comb-Up" Un-cleaned	35 °C/85% RH, 4 days	> 1.0 x 10 <sup>11</sup> Ω	2.4 x 10 <sup>11</sup> Ω
Control Boards	35 °C/85% RH, 4 days	> 2.0 x 10 <sup>11</sup> Ω	1.2 x 10 <sup>12</sup> Ω

Bellcore Test Condition (per TR-NWT-000078, Issue 3: 48 Volts, measurement @ 100V/25 mil lines/50 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](http://MacdermidAlpha.com/assembly-solutions/knowledge-base).**

**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 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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