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MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® EF-6100-R

Low-Solids, High-Reliability, Alcohol-Based, No-Clean Rework Flux for Lead-Free and Tin-Lead Applications

DESCRIPTION

ALPHA EF-6100-R was specifically developed to deliver excellent rework soldering performance combined with high reliability and outstanding board cosmetics. **ALPHA EF-6100-R** exhibits fast wetting in a variety of rework applications using different Pb-Free and SnPb alloys. **ALPHA EF-6100-R** should be considered for use by any assembler needing a highly reliable, easy to use, no-clean rework flux.

ALPHA EF-6100-R is a high-reliability, IPC, Bellcore, and JIS compliant, low solids, no-clean rework flux. It has been designed with a wide thermal process window enabling best-in-class productivity with Pb-Free soldering applications and is an excellent choice for remaining tin-lead production lines. **ALPHA EF-6100-R** is formulated with a proprietary mixture of organic activators and solvent system to give more thermal stability without sacrificing reliability, thereby reducing the occurrence of solder bridging during different rework methods.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Exhibits exceptional electrical reliability for a low-solids wave soldering flux. Complies with IPC-J-STD-004 SIR, Bellcore SIR, Bellcore ECM, JIS ECM, and JIS SIR.
- Thermally stable activators provide minimized solder bridging in a low-solids, no-clean flux for both lead-free and tin-lead rework applications.
- Reduces the surface tension between solder mask and solder to resist solder ball formation.
- Very low level of non-tacky residue to reduce interference with pin testing. Exhibits no visible residues.
- IPC-J-STD-004 Classification: ORL0

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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 (0.77µg/cm²) 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 rework flux to another the flux application container (i.e., spray bottle, etc.) should be replaced. Custom flux applicators, such as flux pens, should never be reused. Unused pens should be properly disposed.

Flux Application – ALPHA EF-6100-R is formulated to be applied via a flux pen or by brushing or spray bottle. A uniform coating of flux is essential to successful soldering.

Residue Removal – ALPHA EF-6100-R is a no-clean flux, and the residues are designed to be left on the board. However, if desired, ALPHA EF-6100-R residues can be easily removed with various cleaning products including ALPHA BC-2200 aqueous board cleaner, ALPHA 2110 saponifier, IPA or other commercial solvent cleaners.

TECHNICAL DATA

Parameters	Typical Values	Parameters/Test Method	Typical Values
Appearance	Clear, colorless liquid	Flash Point, T.C.C.	60 °F (15.6 °C)
Solids Content, % by wt	4.3	pH (5% aqueous solution)	3.2
Acid Number (mg KOH/g)	26.2 ± 1.3	IPC J-STD-004 Designation	ORL0
Specific Gravity @ 25 °C (77 °F)	0.818 ± 0.003	Shelf Life	12 Months

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CORROSION & ELECTRICAL TESTING

Corrosion Testing

Test	Requirements for ORL0	Results
Silver Chromate Paper Test	No Detection of Halide	No Detection of Halide
Copper Mirror Test	No Complete Removal of Copper	No Complete Removal of Copper
IPC Copper Corrosion Test	No evidence of corrosion	No evidence of corrosion

J-STD-004A Surface Insulation Resistance

Test Condition	Requirements	Results
IPC J-STD-004 Comb-Down – Un-cleaned	1.0×10^8 minimum	4.4×10^9
IPC-J-STD-004 Comb-Up – Un-cleaned	1.0×10^8 minimum	4.2×10^9
IPC J-STD-004 Control Board	2.0×10^8 minimum	3.7×10^9
IPC Test Condition (per J-STD-004A): 85 °C/85%RH/7days/-50V, measurement @ 100V/IPC B-24 board (0.4mm lines, 0.5mm spacing). All values in ohms.		

J-STD-004B Surface Insulation Resistance

Test Condition	Requirements	Results
IPC J-STD-004 Comb-Down – Un-cleaned	1.0×10^8 minimum	2.4×10^{12}
IPC-J-STD-004 Comb-Up – Un-cleaned	1.0×10^8 minimum	1.4×10^{12}
IPC J-STD-004 Control Board	2.0×10^8 minimum	2.5 x 1012
IPC Test Condition (per J-STD-004B TM2.6.3.7): IPC B-24 coupons, 12V, 40 ºC, 90% RH, measurements recorded @ 20min intervals. All values in ohms.		

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Bellcore Surface Insulation Resistance

Test	Conditions	Requirements	Results
"Comb-Down" Un-cleaned	35 °C/85% RH, 4 days	1.0 x 10^{11} minimum	4.9 x 10^{11}
"Comb-Up" Un-cleaned	35 °C/85% RH, 4 days	1.0 x 10^{11} minimum	8.5 x 10^{11}
Control Boards	35 °C/85% RH, 4 days	2.0 x 10^{11} minimum	1.4 x 10^{12}
Bellcore Test Condition (per GR 78-CORE, Issue 1: 48 Volts, measurement @ 100V/25 mil lines/50 mil spacing. All values in ohms.			

Bellcore Electromigration

Test	SIR (Initial)[1]	SIR (Final)[1]	Requirement	Result	Visual Result
"Comb-Up" Un-cleaned	4.8 x 10^{8} Ω	1.0 x 10^{10} Ω	SIR (Initial)/SIR (Final) <10	0.28	PASS
"Comb-Down" Un-cleaned	4.5 x 10^{8} Ω	5.2 x 10^{9} Ω	SIR (Initial)/SIR (Final) <10	0.08	PASS
Control	2.9 x 10^{8} Ω	3.0 x 10^{8} Ω	Not applicable	0.09	PASS
Bellcore Test Condition (per GR 78-CORE, Issue 1): 65 °C/85% RH/500 Hours/10V, measurement @ 100V/IPC B-25B 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.



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TECHNICAL DATA SHEET

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.**

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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