

ALPHA[®] PV-61

Low Solids, High Reliability, Pb-Free/Sn-Pb Capable Tabbing & Stringing Flux

DESCRIPTION

ALPHA PV-61 is a flux designed to provide the attributes of excellent solderability and high reliability for solar applications in both Lead-Free and tin/lead processes. Additionally, it provides outstanding solder joint cosmetics with an evenly spread, tack free residue.

FEATURES & BENEFITS

Features for Pb-Free:

- Good fillet formation
- Uniform application of flux to ribbon
- Excellent wetting to various metallizations
- Good micro-solder ball performance in Lead-Free applications

Benefits:

- Excellent Lead-Free soldering performance
- Evenly spread, clear, 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 cells 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.

FLUX APPLICATION - ALPHA PV-61 can be applied by roll coating, brushing, dipping or spraying.

SAFETY

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

FLUX SOLIDS CONTROL - 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. Request Alpha's Technical Bulletin SM-458 for details on the kit and titration procedure. When operating the 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.

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SAFETY

RESIDUE REMOVAL - ALPHA PV-61 is a no-clean flux, and the residues are designed to be left on the cell. If desired, flux residues can be removed with BC-2200 aqueous cleaner, Alpha 2110 saponifier cleaner and with other commercially available solvent cleaners and saponifier cleaners.

TECHNICAL SPECIFICATIONS

Physical Properties	Typical Values	Parameters/Test Method	Typical Values
Appearance	Clear Liquid	pH, 5% v/v aqueous solution	3.3
Solids Content, wt/wt	3.8	Recommended Thinner	ALPHA 425
Specific Gravity @ 25°C (77°C)	0.794 ± 0.003	Shelf Life	12 months
Acid Number (mg KOH/g)	24.0 ± 1.2	IPC J-STD-004 Designation	ORL0
Flash Point (T.C.C.)	12°C		

CORROSION & ELECTRICAL TESTING - SAC305 ALLOY

CORROSION TESTING

Test	Requirement for ROL0	Results
Silver Chromate Paper IPC-TM 650 Test Method 2.3.33	No detection of halide	PASS
Copper Mirror Tests IPC-TM 650 Test Method 2.6.15	No complete removal of copper	PASS
Copper Corrosion Test IPC-TM 650 Test Method 2..3.32	No evidence of corrosion	No Evidence of Corrosion

J-STD-004 SURFACE INSULATION RESISTANCE

Test	Conditions	Requirements	Results
"Comb-Down" Un-cleaned	85°C/85% RH, 7 days	1.0 x 10 ^{8Ω} minimum	2.3 x 10 ^{10Ω}
"Comb-Up" Un-cleaned	85°C/85% RH, 7 days	1.0 x 10 ^{8Ω} minimum	2.2 x 10 ^{10Ω}
Control Boards	85°C/85% RH, 7 days	2.0 x 10 ^{8Ω} minimum	2.3 x 10 ^{10Ω}

IPC Test Condition (per J-STD-004): -50V, measurement @ 100V/IPC B-24 board (0.4 mm lines, 0.5 mm spacing).

JIS STANDARD SURFACE INSULATION RESISTANCE

Test	Conditions	Requirements	Controls	Results ¹
Initial	Ambient	1.0 x 10 ^{11Ω} minimum	5.5 x 10 ^{11Ω} minimum	5.8 x 10 ^{11Ω}
After 7 days	40°C / 90% RH	1.0 x 10 ^{10Ω} minimum	5.9 x 10 ^{11Ω} minimum	1.4 x 10 ^{11Ω}
Recovered	25°C/75% RH, 7 days	1.0 x 10 ^{11Ω} minimum	1.1 x 10 ^{12Ω} minimum	4.5 x 10 ^{11Ω}

All Measurements @ 100V, JIS Boards (0.32 mm lines, 0.32 mm spacing, same as IPC B25 Boards)

BELLCORE SURFACE INSULATION RESISTANCE

Test	Conditions	Requirements ¹	Results ¹
"Comb-Down" Un-cleaned	35°C/85% RH, 5 days	1.0 x 10 ^{11Ω} minimum	1.1 x 10 ^{12Ω}
"Comb-Up" Un-cleaned	35°C/85% RH, 5 days	1.0 x 10 ^{11Ω} minimum	3.6 x 10 ^{11Ω}
Control Boards	35°C/85% RH, 5 days	2.0 x 10 ^{11Ω} minimum	7.8 x 10 ^{11Ω}

Bellcore Test Condition (per GR 78-CORE, Issue 1: 48 Volts, measurement @ 100V/25 mil lines/50 mil spacing).

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BELLCORE ELECTROMIGRATION

Test	SIR (Initial) ¹	SIR (Final) ¹	Requirement	Result	Visual Result
"Comb-Up" Un-cleaned	$9.3 \times 10^{9\Omega}$	$2.3 \times 10^{11\Omega}$	SIR (Initial)/SIR (Final) <10	PASS	PASS
"Comb-Down" Uncleaned	$7.2 \times 10^{9\Omega}$	$6.6 \times 10^{9\Omega}$	SIR (Initial)/SIR (Final) <10	PASS	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).					