TECHNICAL DATA SHEET
Semiconductor Solutions

ALPHA® WS608

Water-Soluble Flux for Semiconductor Ball-Attach

DESCRIPTION

ALPHA WS-608 water soluble flux is engineered to be used in the soldering of a variety of lead-free and tin-lead eutectic alloys onto area array packages. The flux is highly compatible with Cu-OSP, electrolytic Ni-Au, and ENIG pad finishes. **ALPHA WS-608** is a halogen-free compliant material with very high fluxing activity for performance advantages in the areas of wetting, spread, and missing ball rate/yield.

ALPHA WS-608 is also an excellent flux for pre-cleaning oxidized Cu-OSP pad to achieve pristine soldering surface for ball attach.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Excellent activity allows for excellent soldering to ENIG and Cu OSP soldering process
- Excellent activity allows for pristine, and oxide free pre-cleaning of Cu-OSP soldering pads
- Superior wetting maximizing assembly yields to provide lowest missing ball rates
- Excellent material stability whereas the flux maintains tack and viscosity over multiple print cycles (without replenishment)
- Excellent clean-ability performance in that residues are easily cleaned with DI water
- IPC Halogen free formulation

APPLICATION

- Pin Transfer
- Ball Dip
- Printing

PHYSICAL AND CHEMICAL PROPERTIES

ALPHA WS-608 Technical Data		
Category	**Results**	**Procedures/Remarks**
Chemical Properties		
Activity Level (J-STD Classification)	ORH0	IPC J-STD-004
Copper Corrosion Test (after washing)	Pass, (No evidence of Corrosion)	IPC J-STD-004
Physical Properties		
Appearance	Light Amber, Smooth	ASP-WI-QC-009FS
Tack Strength (Time-0)	~ 140 gF	IRC-SOP-CSP 0011
Viscosity; Malcom Spiral Viscometer (@10 rpm)	~ 250 to 550	GLB-AMG-STM00541
Acid Number	~ 65 to 85	ASP-WI-QC-001FS

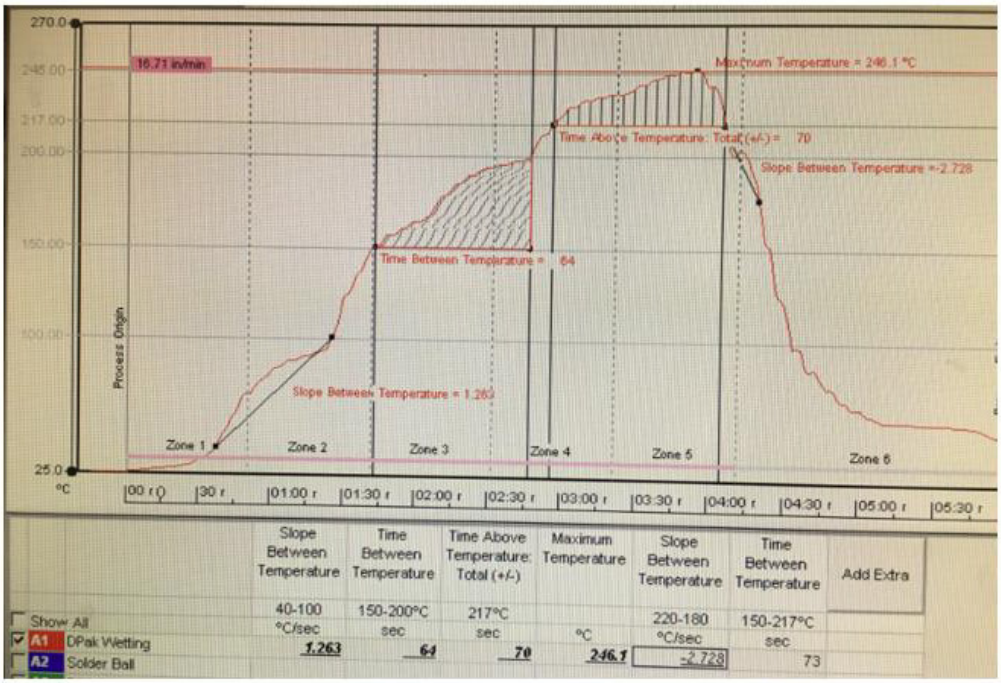
REFLOW

Reflow can be accomplished in an air or nitrogen controlled atmosphere. Nitrogen reflow with O2 levels of 300 ppm and below is preferred and will typically provide significantly improved yield results.

The below table lists general reflow profile parameters. The initial ramp rate should be at 30 to 60 °C per minute to a peak temperature of 230 to 245 °C for SAC lead-free type alloys or 210 to 225 ºC for Sn63/Pb37 & Sn62/Pb36/Ag2 lead bearing eutectic alloys. The liquidus temperatures are 183 °C for Sn63Pb37 and 218 °C for SAC305/405 alloys. Cooling rate should > 3 °C per second to room temperature.

Given the uniform furnace loading and low mass associated with typical BGA/CSP packaging assemblies, a lengthy soak or dwell is usually not required and may negatively impact yield rates. Pb free bearing alloys typically employ a slower ramp rate than that used for tin lead eutectic solder alloy reflow processing.

Example reflow profiles:



- ***Ramp-up rate (40 – 100°C)*** : ***1.2 ~ 1.5 °C/sec***
- ***Pre-Soak Time (time between 150° – 200°C)*** : ***60 ~ 70 secs***
- ***Dwell time (TAL) @ 217°C*** : ***65 ~ 75 secs***
- ***Peak Temperature*** : ***243 ~ 247 °C***
- ***Cooling Rate*** : ***2.5 ~ 5.0 °C/sec***

Zone	Temperature Settings (°C)
1	95
2	170
3	200
4	240
5	250
Belt Speed: 21 in/min	
O2 ppm: 100ppm	

RESIDUE REMOVAL

Cleaning using deionized water at temperatures of 50 to 60 °C, without the use of a saponifier, achieves excellent results. Spray pressures of 35 to 60 psi are sufficient to remove all residues.

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.**

STORAGE

While ALPHA WS608 flux is not considered toxic, their use in typical reflow processes will generate a small amount of decomposition and reaction vapors. These vapors should be adequately exhausted from the work environment and away from personnel. Consult the Material Safety Data Sheet for additional safety information.

CONTACT INFORMATION

To confirm this document is the most recent version, please contact techinfo@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

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