

ALPHA[®] WS-820

WATER SOLUBLE, LEAD FREE SOLDER PASTE

DESCRIPTION

ALPHA WS-820 is the newest Alpha brand lead free, halide free solder paste offering the ideal combination of printability and reflow profile process window, with excellent cleanability in a lead free alloy solder paste.

FEATURES & BENEFITS

- Excellent print volume and print volume repeatability down to 12 mil (0.3mm) features
- Able to spread and wet using straight ramp or soak reflow profiles in air
- High spread/wetting lead free paste compatible with lead free alloys and surface finishes
- High Reflow Yield with IPC Class II Voiding Performance when used to solder BGA components
- Excellent wetting characteristics on all common surface finishes (including Entek HT OSP). JIS Spread 88.6% on Entek HT OSP.
- Cleanable with water based cleaning systems

PHYSICAL PROPERTIES

- Alloys: SAC305 (96.5%Sn/3.0%Ag/0.5%Cu), SAC405 (95.5%Sn/4.0%Ag/0.5%Cu)
SACX Plus[®] 0807 (98.5%Sn/0.8%Ag/0.7%Cu)
- Application : Stencil printing (87.6% Metal Loading, M19 Viscosity)
Dispense application (84.8% Metal Loading, Type 3 Powder, M7 Viscosity)
- Powder Size: Type 3 (> 90% 25µ-45µ) - Type 4 (> 90% 20µ-38µ)
- RoHS Status: Completely free of Hazardous Materials per RoHS Directive 2002/95/EC

APPLICATIONS

ALPHA WS-820 was formulated to meet the requirements of water soluble solder lead free applications. ALPHA WS-820 was developed to increase the reflow profile window of WS-819, while offering exceptional post reflow cleanability and low BGA voiding.

This paste is designed to enable users of ALPHA WS-609, WS-709 and WS-809 and other leading water soluble paste brands to comply with RoHS and customer based demand for lead free materials.

SAFETY

While the ALPHA WS-820 flux system is not considered toxic, its use in typical reflow will generate a small amount of reaction and decomposition vapors. These vapors should be adequately exhausted from the work area. Consult the MSDS for additional safety information.

SHIPPING & STORAGE

ALPHA WS-820 is shipped in thermally controlled boxes and should be stored refrigerated upon receipt at 32⁰ - 50⁰F (0⁰ - 10⁰C). ALPHA WS-820 should be permitted to reach room temperature before opening the package prior to use. When stored properly in unopened containers, WS-820 has a shelf life of 6 months from date of manufacture.

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TECHNICAL DATA

Physical Properties		
Items	ALPHA WS-820 SAC 305/405 88-3-M19 (stencil printing)	Test Method
Appearance (flux residues after reflowed)	Light yellowish color (before water washed)	CEAMG PUT 001.05
Metal content (%)	88% -0.4% - +0.2%	CEAMG STM 0355
Viscosity (Poise, Malcom spiral viscometer @10rpm)	M19 for stencil printing (1,700 to 2,200 Poise) M7 for dispensing (600 to 800 Poise)	CEAMG STM 0541
Stencil life (50% +/-15%RH, @25°C)	5 hours	CEAMG PUT 001.01
Printability	Suitable for fine pitch printing applications (Down to 16 mil (0.4mm) pitch QFP components, 12 mil (0.3mm) BGA circles @) up to 100 mm/sec squeegee speed, using 5 mil (125µ) thick laser cut stencil	CEAMG PUT 001.01
Response to pause	0-1 Knead Stroke Required	CEAMG PUT 001.08
Tack	Initial 2.0 g/mm ² ; 1.8 g/mm ² after 4 hours at 25°C and 50% R.H.	IPC TM-650 2.4.44
Random Solder Balls	Preferred (Both Initial and after 4 hours at 25°C and 50% R.H.	IPC TM-650 2.4.43
Slump Resistance	Pass	IPC TM-650 2.4.35
Chemical Properties		
Items	ALPHA WS-820 Flux System	
Halide content (IPC J-Std-004)	ORH0	
Corrosivity (IPC J-Std-004)	Not applicable for water soluble solder paste	

PROCESSING GUIDELINES

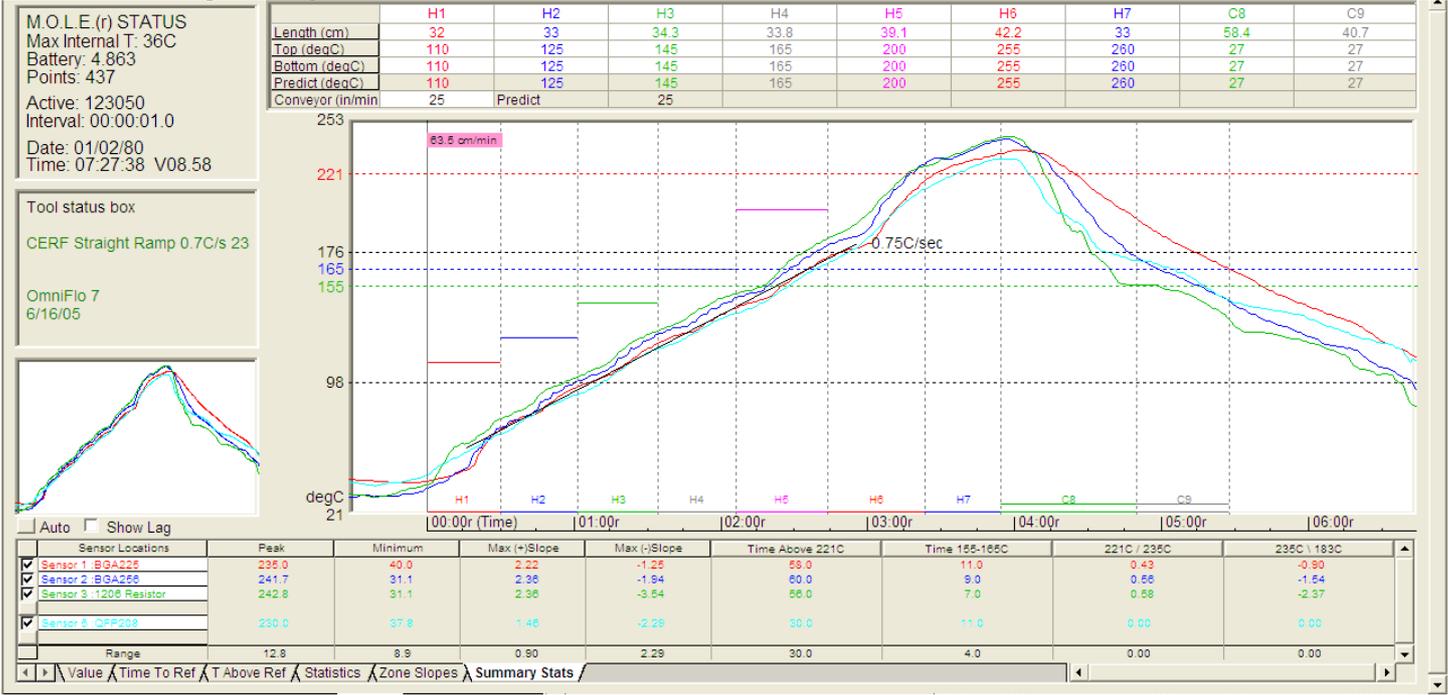
STORAGE-HANDLING	PRINTING / DISPENSING	REFLOW	CLEANING
<ul style="list-style-type: none"> Refrigerate to guarantee stability @ 32-50°F (0-10°C). Expected shelf life is 6 months from date of manufacture in unopened jars. Warm-up of 500g jar to room temperature (should be ~ 6 hours). Set up printer with room temperature paste. Check paste temperature with a thermometer. Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste. Do not shake or mix paste using automatic paste shaking equipment prior to opening jar. The plunger insert used may submerge into paste and produce difficulties with plunger removal. Paste is stable for up to two weeks at room temperature (25°C). 	<p><u>STENCIL:</u> Recommend ALPHA CUT Laser Cut Stencil @ 0.005 inch (5 mil, 127µ) thick for 0.012 inch (.30 mm) pitch QFPs</p> <p><u>SQUEEGEE:</u> Metal (Recommended)</p> <p><u>Print Speed:</u> 2.0 -4.0 in./sec (50-100 mm/sec.) 4.0 in/sec. optimal</p> <p><u>SQUEEGEE:</u> Pressure: 1.5 to 2.0 lbs./ linear in. (0357 Kg/cm)</p> <p><u>Stencil Release Speed:</u> .02 in/sec (0.5 mm/second)</p>	<p><u>ATMOSPHERE:</u></p> <ul style="list-style-type: none"> Clean-dry air Or Nitrogen <p><u>PROFILE (PRINTING):</u></p> <ul style="list-style-type: none"> See profiles evaluated in product development below If there is a significant ΔT (>10°C) between components, a soak profile may be required. (Slow ramp from 130°C to 180°C for 60-90 seconds) Ramp @ 0.5-2°C/sec to peak temperature 230°C - 250°C TAL for 40-80 seconds. Ramp down to R.T. @ 1-3°C/sec. 	<ul style="list-style-type: none"> ALPHA WS-820 is designed to be water rinsed in washing operations. With minimal foaming in recirculating systems. The flux residues from ALPHA WS-820 are completely water soluble. This allows for more flexible washing conditions which can be board design specific. Effective residue cleanability up to 48 hours after reflow. This allows maximum process flexibility. If lower/no foaming is desired in cleaning equipment, Alpha P-2000 defoamer may be used. Cleaning temperature of 150°F (65°C) may cause the undesirable formation of tin salts.

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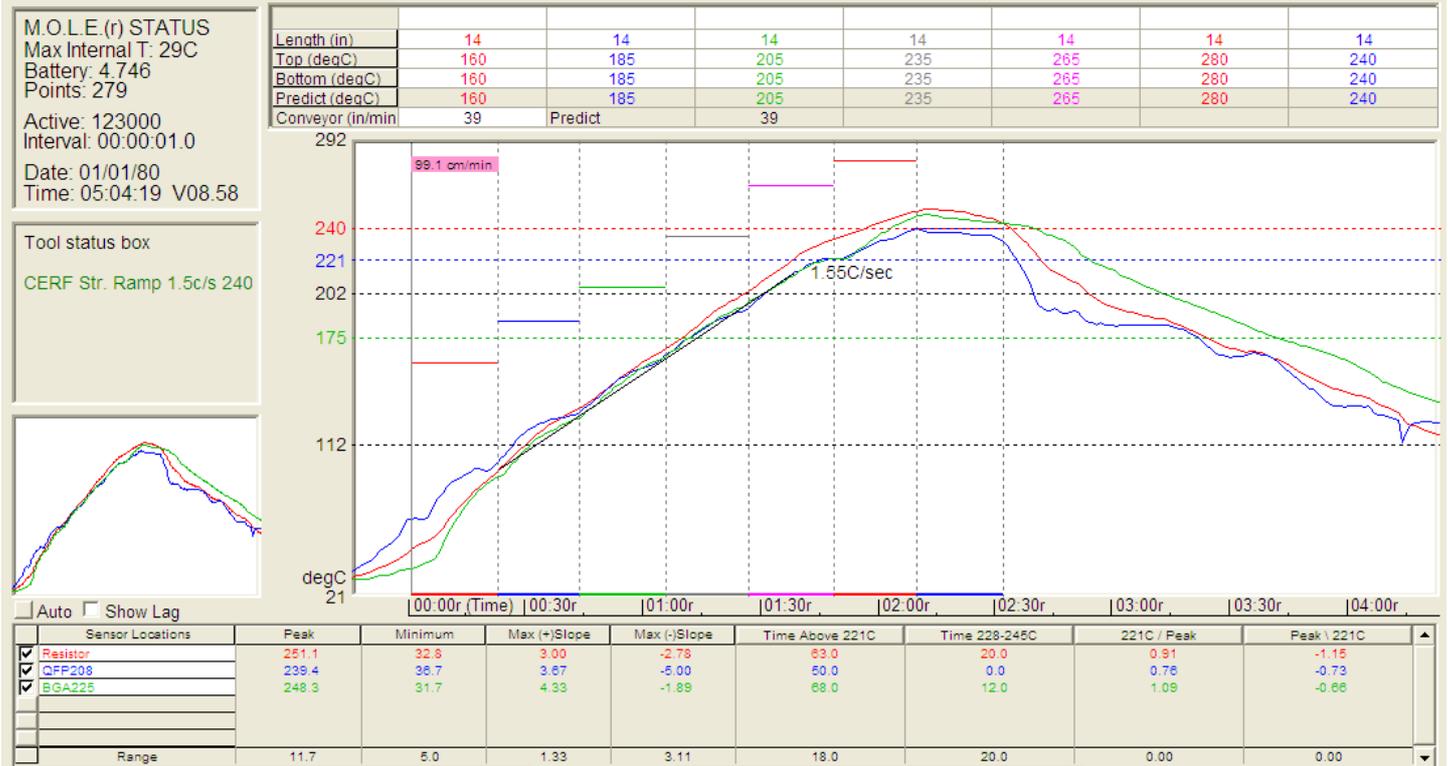
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PROCESSING GUIDELINES

Reflow Profiles Tested, using Clean, Dry Air
CERF Straight Ramp 0.7C/s 235C Peak 60s TAL



CERF Straight Ramp 1.5C/s 240C Peak 60s TAL



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PROCESSING GUIDELINES

CERF 60s Soak @ 175°C/ 240C Peak 60s TAL

