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 AND STORAGE

ALPHA® WS-820 is shipped in thermally controlled boxes and should be stored refrigerated upon receipt at 32^0 - 50^0F (0^0 - 10^0C). **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.

02.15.2011

Cookson Electronics ASSEMBLY MATERIALS

ALPHA® WS-820 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/mm²; 1.8 g/mm² 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

ALPHA® WS-820 PROCESSING GUIDELINES

STORAGE-HANDLING

- 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).

PRINTING / DISPENSING

STENCIL: Recommend ALPHA CUT Laser Cut Stencil @ 0.005 inch (5 mil, 127µ) thick for 0.012 inch (.30 mml) pitch QFPs

SQUEEGEE: Metal (Recommended)

Print Speed: 2.0 -4.0 in./sec (50-100 mm/sec.) 4.0 in/sec. optimal

SQUEEGEE: Pressure: 1.5 to 2.0 lbs./ linear in. (0357 Kg/cm)

Stencil Release Speed: .02 in/sec (0.5 mm/second)

REFLOW

ATMOSPHERE:

- Clean-dry air

Or Nitrogen

PROFILE (PRINTING):

- 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.

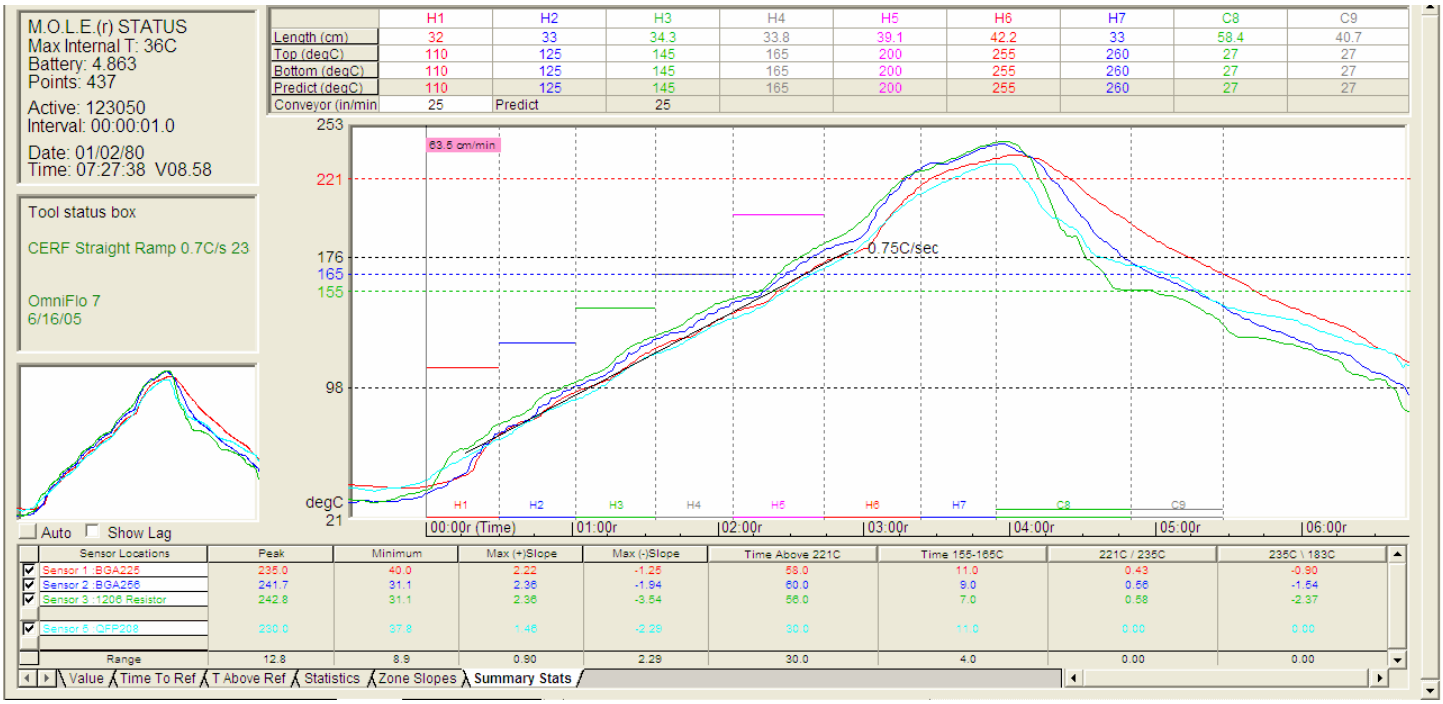
CLEANING

- 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.
- If lower/no foaming is desired in cleaning equipment, Alpha P-2000 defoamer may be used.
- Clearing temperature of 150°F (65°C) may cause the undesirable formation of tin salts.

02.15.2011

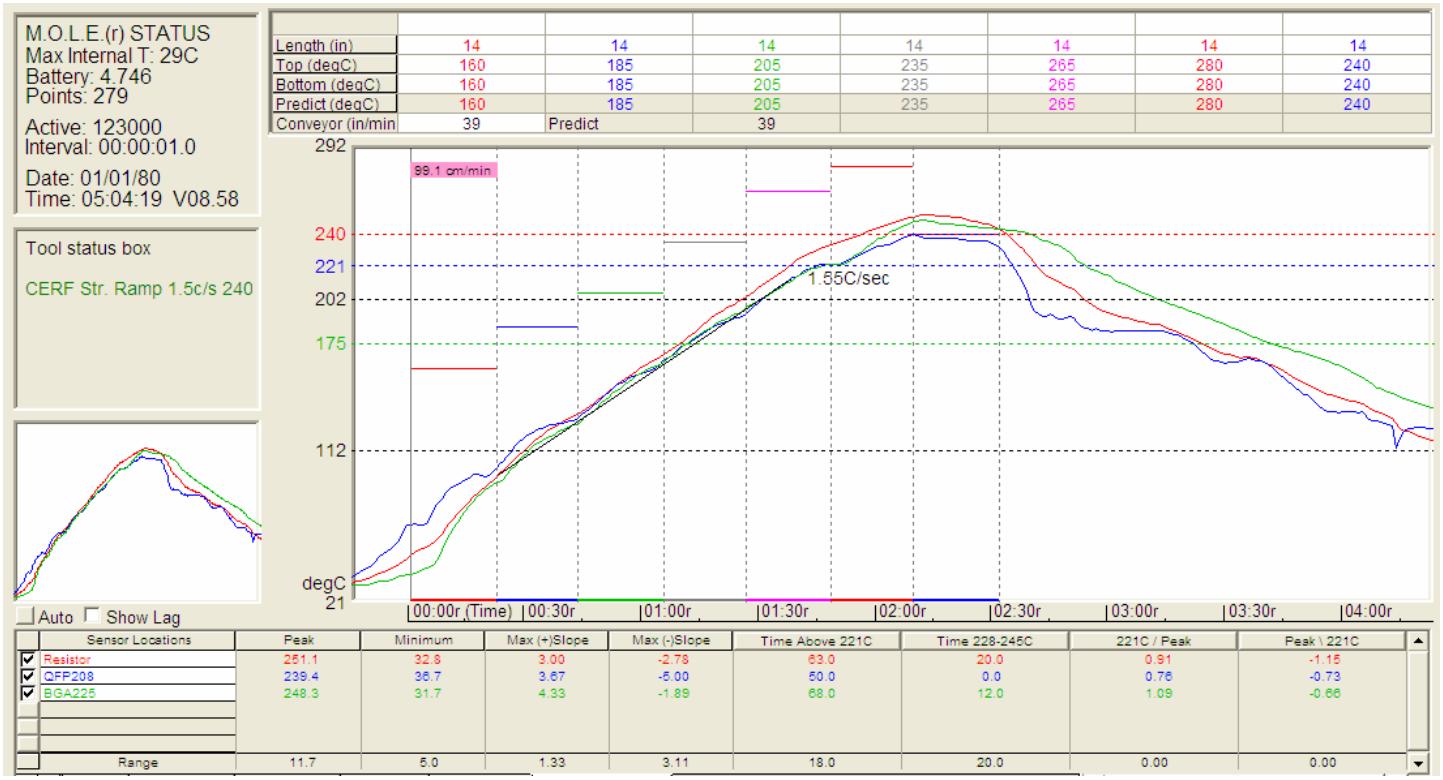
Cookson Electronics ASSEMBLY MATERIALS

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



Cookson Electronics ASSEMBLY MATERIALS

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



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

Cookson Electronics ASSEMBLY MATERIALS