ALPHA® WS-820 Solder Paste

Water Soluble, Lead-Free

DESCRIPTION

ALPHA WS-820 a 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.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Excellent print volume and print volume repeatability down to 10 mil (0.25mm) features with AR≥0.60
- 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-7095 Class 3 classification for 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
- Highly cleanable with batch and inline aqueous systems

PRODUCT INFORMATION

Alloys:	SAC305, SAC405, SACX® Plus 0807
Powder Size:	Type 3, Type 4
RoHS Status:	Completely free of Hazardous Materials per RoHS Directive 2015/863/EU

APPLICATION GUIDELINES

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 ALPHA WS-819, while offering exceptional post reflow cleanability and low BGA voiding.

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

TECHNICAL DATA

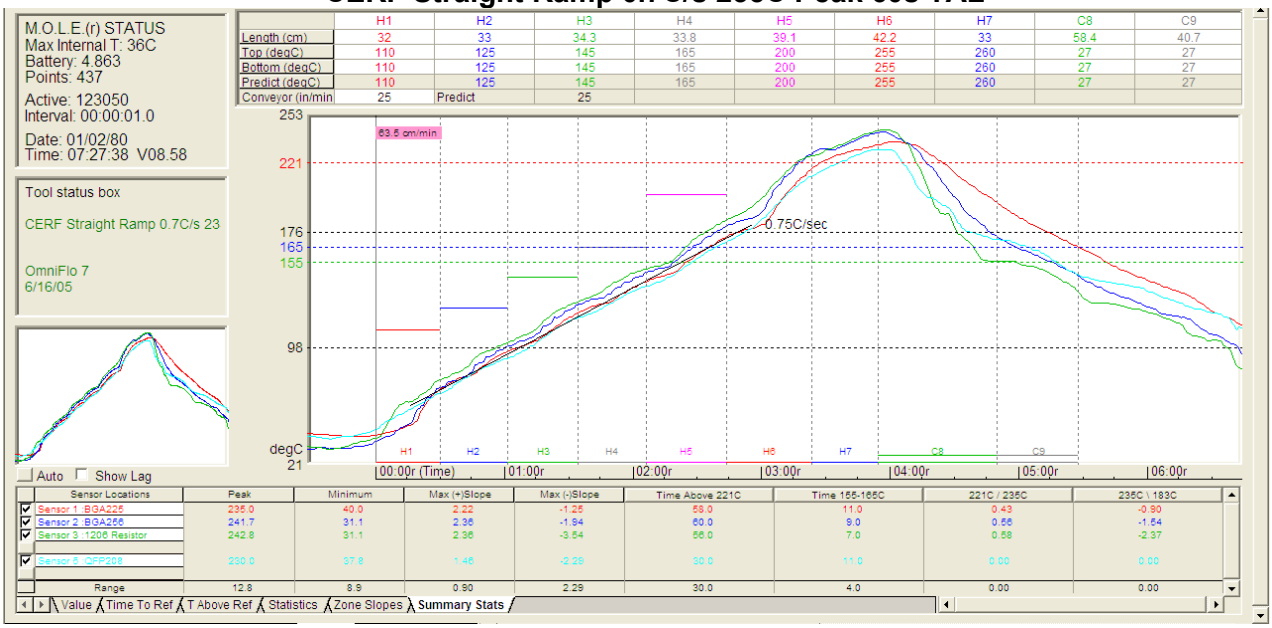
ALPHA WS-820		
Category	**Results**	**Procedures/Remarks**
Chemical Properties		
Flux Classification	ORH0	IPC J-STD-004
Halide Content	Halide-free	IPC J-STD-004
Electrical Properties		
SIR (7 days, 40 °C/90% RH), Cleaned	≥10^8 Ohms for 7 days down to 100µm spacing	Modified IPC J-STD-004B
Electrochemical Migration, Cleaned	No visual evidence of corrosion, discoloration or electromigration for 596 hrs	Bellcore GR-78-CORE Issue 1
Physical Properties		
Tack Life	Maintains consistent tack strength over 16 hours	JIS Z 3284
	Less than 1 unit change in tack over 16 hours	IPC J-STD-005A
Stencil Life at Ambient Condition	8-hour consistent transfer efficiency	@25 °C/50% RH
Cold Slump (25 °C/50% RH)	Pass, no bridging above 0.20 mm	IPC J-STD-005A
Hot Slump (150 °C/10 min)	Pass, no bridging above 0.25 mm	IPC J-STD-005A

PROCESSING GUIDELINES

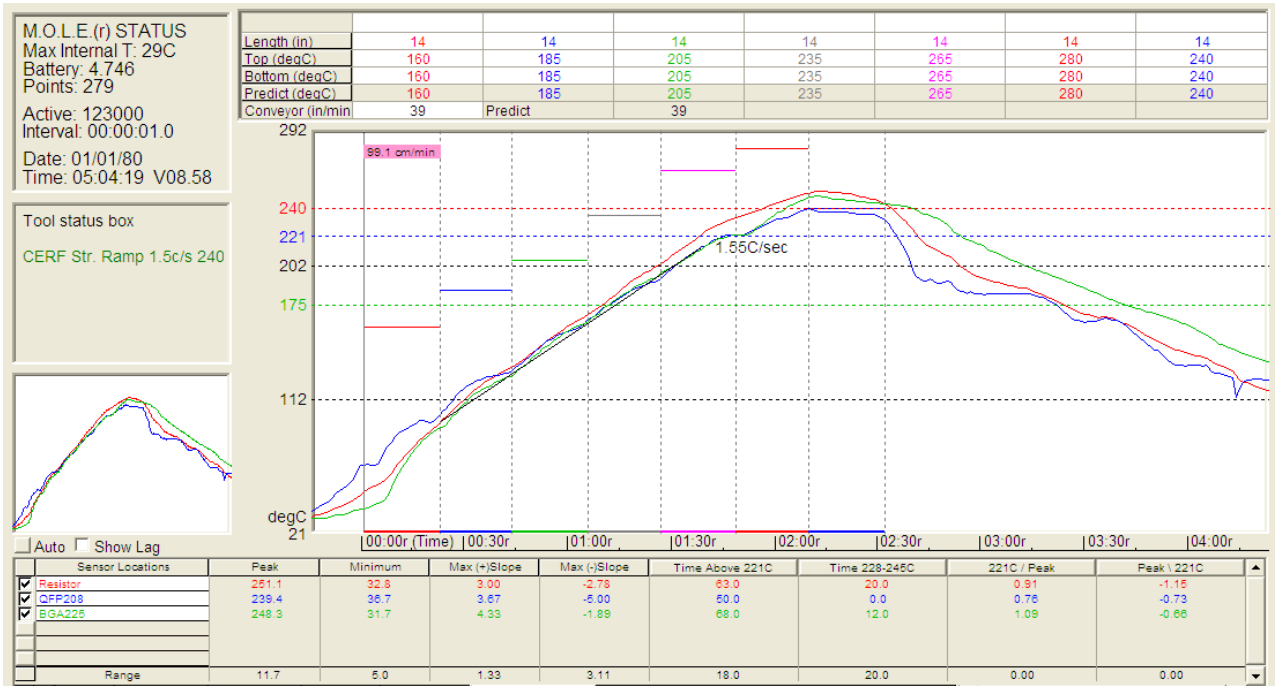
Storage-Handling	Printing	Reflow	Cleaning
• Refrigerate to guarantee stability @ 32 to 50 ◦F (0 to 10 ◦ C). Expected shelf life is 6 months from date of manufacture in unopened jars. • Warm-up of 500g jar to room temperature (should be ~ 6 hours). Set up printer with room temperature paste. Check paste 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).	**Stencil:** Recommend ALPHA CUT Laser Cut Stencil @ 0.005 inch (5 mil, 127 µm) thick for 0.012 inch (0.30 mm) pitch QFPs **Squeegee:** Metal (Recommended) **Print Speed:** 50 to 150 mm/sec (2.0 to 6.0 in/sec) at AR≥0.6 **Pressure:** 0.22 to 0.35 kg/cm (1.25 to 2.0 lb/in) at AR≥0.6 **Stencil Release Speed:** >5.0 mm/sec (0.2 in/sec)	**Atmosphere:** • Clean-dry air or Nitrogen **Reflow Profile:** • 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 to 90 seconds) • Ramp @ 0.5 to 2 °C/sec to peak temperature 230 to 250 °C TAL for 40 to 80 seconds. • Ramp down to R.T. @ 1 to 3 °C/sec.	• 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 2002D defoamer may be used. • Cleaning temperatures between 49 °C/ 120 °F to 65 °C/150 °F can be effectively used. It is recommended to increase cleaning duration to improve removal process effectiveness. Required cleaning duration depends on the type of cleaning hardware and process temperature employed. • Cleaning temperature above 150 °F (65 °C) may cause the undesirable formation of tin salts.

REFLOW PROFILES

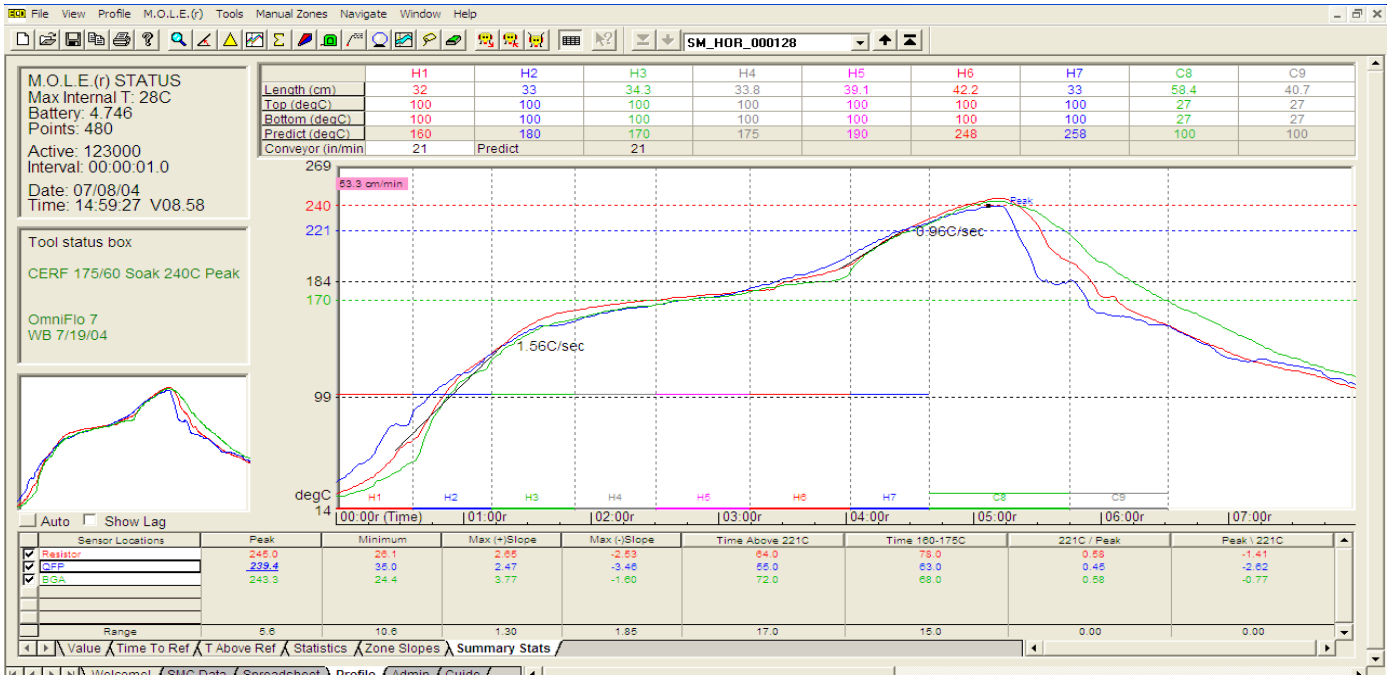
Reflow Profiles Tested, using Clean, Dry Air / CERF Straight Ramp 0.7C/s 235C Peak 60s TAL



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



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



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 or link here.

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 at MacdermidAlpha.com/assembly-solutions/knowledge-base.**

STORAGE

ALPHA WS-820 is shipped in thermally controlled boxes and should be stored refrigerated upon receipt at 32 to 50 °F (0 to 10 °C). Paste should be permitted to reach room temperature before opening the package prior to use. When stored properly in unopened containers, this paste has a shelf life of 6 months from date of manufacture.

CONTACT INFORMATION

To confirm this document is the most recent version, please contact Assembly@MacDermidAlpha.com

www.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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