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MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® WS-826 SOLDER PASTE

Water Soluble, Lead-Free, Zero-Halogen Solder Paste

DESCRIPTION

ALPHA WS-826 is a water soluble, lead-free solder paste formulation developed for both nitrogen and air reflow applications. It offers a combination of excellent 8-hour stencil life at elevated temperatures and humidity levels, excellent solderability, and ease of water-based cleaning after 2x reflow while maintaining a zero-halogen flux formulation. **ALPHA WS-826** is a stable water soluble solder paste providing consistent stencil life and excellent print definition. It passes SIR & ECM requirements, after cleaning with DI water, and is classified as ORM0 under IPC J-STD-004B.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES & BENEFITS

- Excellent stencil life performance at extreme environmental conditions (30 °C, 70% RH)
- Highly cleanable with batch and inline aqueous systems after 1x and 2x reflow
- Passes SIR/ECM testing per IPC J-STD-004B after subjecting to aqueous cleaning process
- Consistent and repeatable print process window
- Reflowable in air and nitrogen conditions
- Exceeds IPC-7095 Class 3 classification

PRODUCT INFORMATION

Alloys:	SAC305
Powder Size:	Type 4, Type 5
Lead-Free:	Complies with RoHS Directive EU/2015/863
Halogen Content:	Zero-Halogen

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TECHNICAL DATA

ALPHA WS-826		
Category	**Results**	**Procedures/Remarks**
Chemical Properties		
Flux Classification	ORM0	IPC J-STD-004B
Halide / Halogen Content Test	No Halides / No Halogens detected	IPC J-STD-004B / BS EN 14582
Copper Mirror test	(M) Medium activity, <50% breakthrough of copper film	IPC J-STD-004B
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
SIR (7days, 40 °C/90% RH), Cleaned	≥10^8 Ohms for 7 days on BGA packages	IPC J-STD-004B
Electrochemical Migration, Cleaned	No visual evidence of corrosion, discoloration or electromigration for 596 hrs	IPC J-STD-004B
Physical Properties		
Tack Life	Maintains consistent tack strength over 24 hours	JIS Z 3284
Tack Life	Pass, Less than 1 unit change in tack over 24 hours	IPC J-STD-005A
Stencil Life at Ambient Condition	8-hour consistent transfer efficiency	@25 °C/50% RH
Stencil Life at Elevated Condition	8-hour consistent transfer efficiency	@30 °C/70% 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
Random Solder Balls	Preferred (Both initial & after 4 hrs at 25 °C and 50% RH)	IPC J-STD-004B; JIS Z 3284

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PROCESSING GUIDELINES

The following process settings are offered as a process window guideline based on a typical SMT assembly. The optimum process settings will need to be identified specifically for each individual user due to variation in assembly design across the industry.

Printing

- STENCIL: Recommend ALPHA CUT or ALPHA FORM stencils at 0.100 to 0.125 mm (4 to 5 mil) thick for 0.40 mm (16 mil) pitch. Stencil design is subject to many process variables. Contact your local Alpha sales site for advice.
- SQUEEGEE: Metal (recommended)
- PASTE ROLL: 1.5 to 2.0 cm (0.60 to 0.80 in) diameter and make additions when roll reaches 1.0 cm (0.40 in) diameter
- PRESSURE: 0.22 to 0.35 kg/cm (1.25 to 2.0 lb/in) successfully tested for AR≥0.60
- SPEED: 50 to 150 mm/sec for AR≥0.60
- RELEASE SPEED: >5.0 mm/s
- DEPOSIT TO SPHERE RATIO: 0.40 to 0.60 recommended

Cleaning

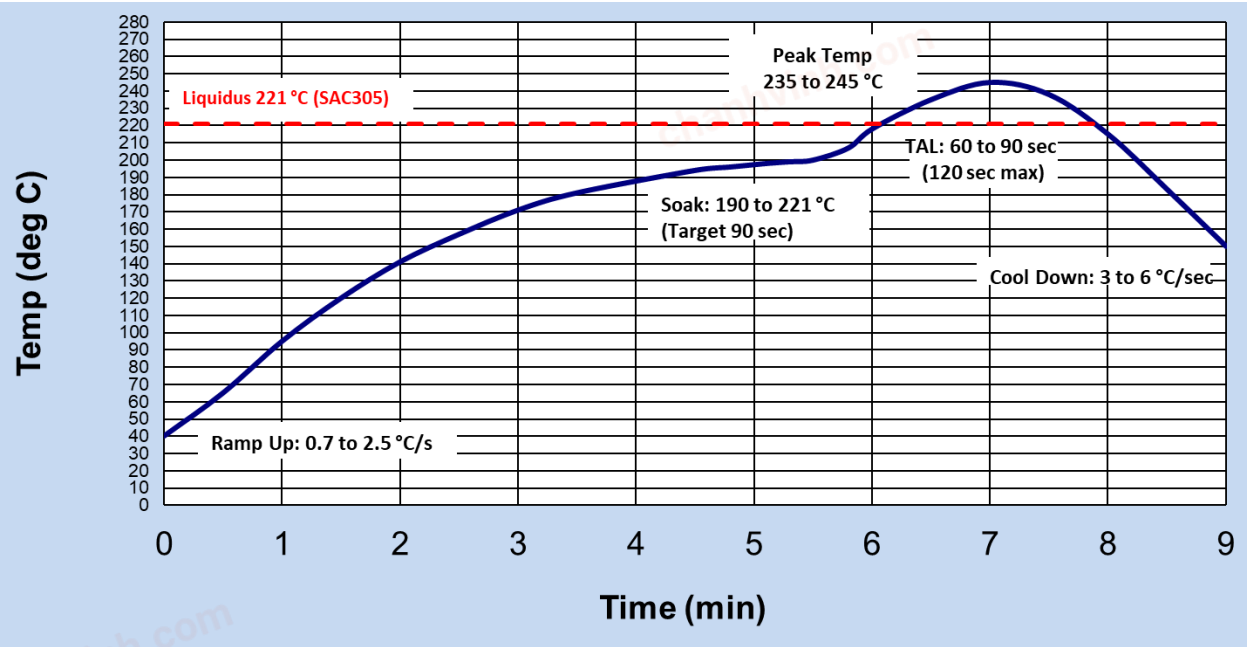
- ALPHA WS-826 can be cleaned with hot deionized water in batch and inline cleaning systems.
- Cleaning temperatures between 49 °C/120 °F to 60 °C/140 °F can effectively be used.
- It is recommended to increase cleaning duration and to use 54 °C/130 °F cleaning temperature to improve removal process effectiveness. Required cleaning duration depends on the type of cleaning hardware and process temperature employed.
- Effective residue cleanability within 48hrs after first reflow.

Reflow

- ATMOSPHERE: Air or Nitrogen (N_2)
- PROFILE (SAC305 alloy): The following settings have been determined to give optimal results, but other settings give excellent results as well.
  - Ramp: 0.7 to 2.5 °C/sec (1.26 to 4.5 °F/sec)
  - Soak: 190 to 221 °C (374 to 430 °F), 90 seconds
  - TAL: >221 °C Liquidus (>430 °F), 60 to 90 seconds (120 seconds max)
  - Peak: 235 to 245 °C (235 to 430 °F)

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Recommended Profile:



Note: These are only recommendations. Equipment and assembly factors may require adjustments to be made to the reflow profile.

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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.



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 & HANDLING

ALPHA WS-826 is shipped in thermally controlled boxes and should be stored refrigerated upon receipt at 32 to 50 °F (0 to 10 °C). This paste should be permitted to reach room temperature before opening the package prior to use. When stored properly in unopened containers, it has a shelf life of 6 months from date of manufacture.

CONTACT INFORMATION

www.macdermidalpha.com

North America 140 Centennial Avenue Piscataway, NJ 08854 1.800.367.5460	**Europe** Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400	**Asia** 8/F., Two Sky Parc 51 Hung To Road Kwun Tong, Kowloon, Hong Kong, SAR China 852.2500.5365

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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