chanhvinh.com

MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

ALPHA® WS600 SERIES FLUX

Water-Soluble Flux for Semiconductor Ball-Attach

DESCRIPTION

ALPHA WS600 series flux such as ALPHA WS600 and ALPHA WS600MHV water soluble fluxes are engineered to be used in the attachment of SnPb Eutectic or lead-free spheres onto BGA or CSP components. They are also available with red dye in their composition for ease of pre-reflow visual inspection and they are labelled as ALPHA WS600 RED and ALPHA WS600MHV RED

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

- Excellent wettability: Excellent activity reduces the occurrence of dark balls
- Excellent cleanability: Flux residues are removed easily with water even after the operation of baking at 150 ºC
- Long tackiness life

APPLICATION

- Pin Transfer
- Ball Dip
- Screen Print, Metal Mask, or Doctor-blade

chanhvinh.com

PHYSICAL AND CHEMICAL PROPERTIES

ALPHA WS600/WS600MHV TECHNICAL DATA			
Properties	**Method**	**Value**	**Remarks**
Appearance	Visual	Deep Amber or Red	
Flux Type Classification	J-STD-004	ORH0	
Tack Strength	JIS Z 3284	15gm/mm^2	
Stencil Life		8 hours	@ 40 to 60%RH, 20 to 25 ºC
Water Extract Resistivity		> 100,000 ohm.cm	
Halide Content	IPC-TM-650 Method 2.3.35	Halide free	
SIR (7 Days)	IPC-TM-650 Method 2.6.3.3	> 10^9	85%RH 85 ºC
Corrosion (Cu mirror)	IPC-TM-650 Method 2.3.32	Passes	After cleaning

VISCOMETRY (Spiral/Malcolm)			
Viscosity (Spiral/Malcolm)	**Method**	**Value**	**Remarks**
ALPHA WS600 @ 5 RPM	Alpha # ICPH213	550 to 800 Poise	@ 25 ºC
ALPHA WS600MHV @ 5 RPM	Alpha # ICPH213	800 to 1200 Poise	@ 25 ºC

chanhvinh.com

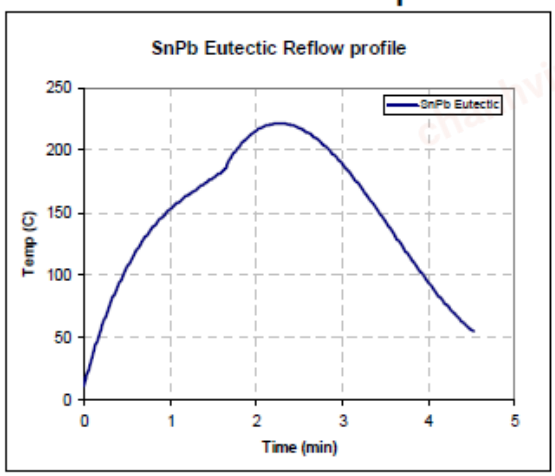
REFLOW

Reflow can be accomplished in air or nitrogen controlled atmosphere. The initial ramp rate should be at 30 to 60 °C per minute. If necessary, a dwell of 30 to 60 seconds at 150 to 160 °C is acceptable. (Because of the uniform furnace load in Flip Chip assembly to Ball Grid Array or Chip Scale Packages versus typical surface mount board assembly applications, equilibrium or dwells at a "preheat" temperature are not usually necessary.) Following this equilibrating period is a ramp of 60 to 120 °C to a peak temperature of up to 220 to 255 °C depending upon alloy. The time over alloy liquidus (183 °C for SnPb Eutectic, 217 to 221 °C for Sn/Ag/Cu alloys) should be 30 to 60 seconds. Cooling rate should be > 3 °C per second to room temperature.

Reflow Parameters (Pb Free)	
Ramp rate (ºC/sec)	0.5 to 1
Pre-heat dwell time 150 to 180 ºC(sec)	30 to 60
Peak range (ºC)	220 to 255
Time above liquidus (sec)	30 to 60
Cool down rate (ºC/sec)	> 3.0

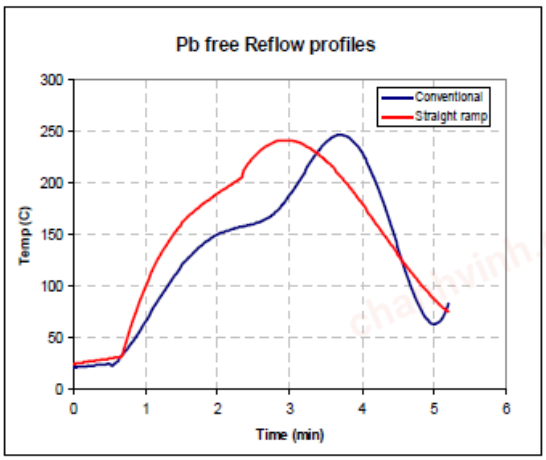
Example Reflow Profiles:

SnPb Eutectic reflow profile



chanhvinh.com

Lead-Free Reflow Profile



RESIDUE REMOVAL

Water at less than 60 °C without saponifier is suitable to achieve excellent results. Spray pressures of 35 to 65psi are sufficient to remove all residues. Cleaning results using ALPHA WS600 and ALPHA WS600MHV flux may exceed those achievable using traditional RMA materials.

STORAGE

This flux should be stored in sealed containers at 15 to 25 °C and should not be refrigerated. Temperatures above 27 °C should be avoided. Shelf life of unopened containers is nominally 12 months. Refrigeration is NOT required to store the flux, and temperatures below 15 °C should be avoided. If a container has been chilled, the container should be allowed to reach room temperature before opening in order to prevent moisture condensation from ambient air onto the flux.

chanhvinh.com

MacDermid Alpha ELECTRONICS SOLUTIONS

TECHNICAL DATA SHEET

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.**

WASTE TREATMENT

Prior to using any recommendations or suggestions for waste treatment, the user is required to know the appropriate local/state/federal regulations for on-site or off-site treatment which may require permits. If there is any conflict regarding our recommendations, local/state/federal regulations take precedent.

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** 14 Joo Koon Crescent, Singapore 629014 65.6430.0700

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

DISCLAIMER: All statements, technical information and recommendations contained herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. No statement or recommendation shall constitute a representation unless set forth in an agreement signed by officers of seller and manufacturer. NO WARRANTY OF MERCHANTABILITY, WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR ANY IMPLIED WARRANTY IS MADE. The following warranty is made in lieu of such warranties and all other warranties, express, implied, or statutory. Products are warranted to be free from defects in material and workmanship at the time sold. The sole obligation of seller and manufacturer under this warranty shall be to replace any noncompliant product at the time sold. Under no circumstances shall manufacturer or seller be liable for any loss, damage or expense, direct, indirect, incidental or consequential, arising out of the inability to use the product. Notwithstanding the foregoing, if products are supplied in response to a customer request that specifies operating parameters beyond those stated above, or if products are used under conditions exceeding said parameters, the customer by acceptance or use thereof assumes all risk of product failure and of all direct, indirect and consequential damages that may result from use of the products under conditions, and agrees to exonerate, indemnify and hold harmless MacDermid Incorporated and its affiliates therefrom. No suggestion for product use nor anything contained herein shall be construed as a recommendation to use any product in infringement of any patent rights, and seller and manufacturer assume no responsibility or liability for any such infringement.

© 2019 MacDermid, Inc. and its group of companies. All rights reserved. "(R)" and "TM" are registered trademarks or trademarks of MacDermid, Inc. and its group of companies in the United States and/or other countries.