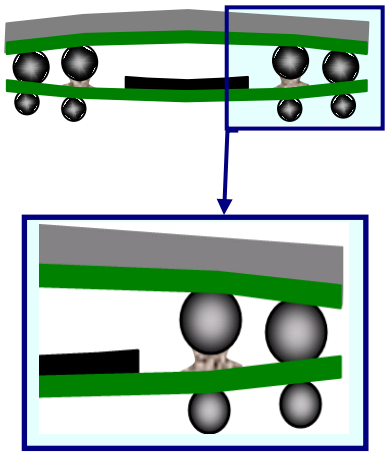
ALPHA® PoP33 SOLDER PASTE

No Clean, Zero Halogen, Lead-Free Solder Paste for Package on Package Assembly

DESCRIPTION

To meet the demand of high-density and memory/logic options for sophisticated electronic devices, many assemblers are evaluating package on package (PoP) technology. PoP assemblies allow for higher electronic functionality per unit circuit board area, and allows low cost product memory customization, and highly flexible manufacturing. Unlike PoP flux, **ALPHA PoP33 solder paste** uses flux and solder powder, to minimize defects associated with non-planar processor/memory combinations during the reflow process. The use of paste can help reduce costly defects associated with soldering known good memory devices to known good processor packages by bridging gaps that PoP flux alone may not.



ALPHA PoP33 was designed to minimize expensive rework and scrap by providing highly repeatable paste volumes to BGA memory packages. **ALPHA PoP33** maintains its rheology, even under frequent exposure to high shear, for 24 hours. This means highly reproducible volumes of paste pick up in normal PoP dipping applications, reducing defects, increasing yields and reducing scrap. **ALPHA PoP33** is a no-clean lead-free solder paste. By optimizing ultra-fine solder powder and physical properties of flux, it is ideal for 150 to 300µ offset BGA packages, while leaving a clear, colorless, residue with high electrical resistivity.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

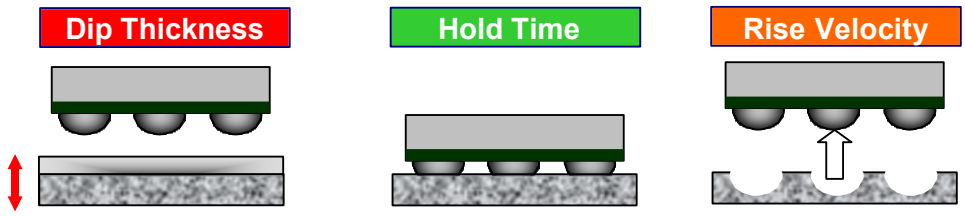
PRODUCT INFORMATION

Alloys:	SAC305 & SAC405
Powder Size:	Type 5 & Type 6
Packaging:	500 g Jar, 10 cc and 30 cc syringes

APPLICATION GUIDELINES

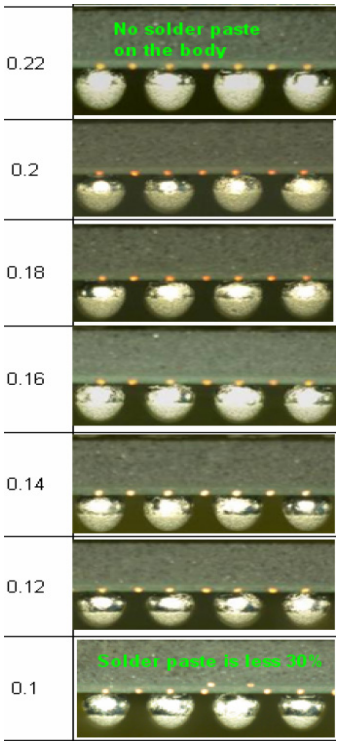
Transfer Property

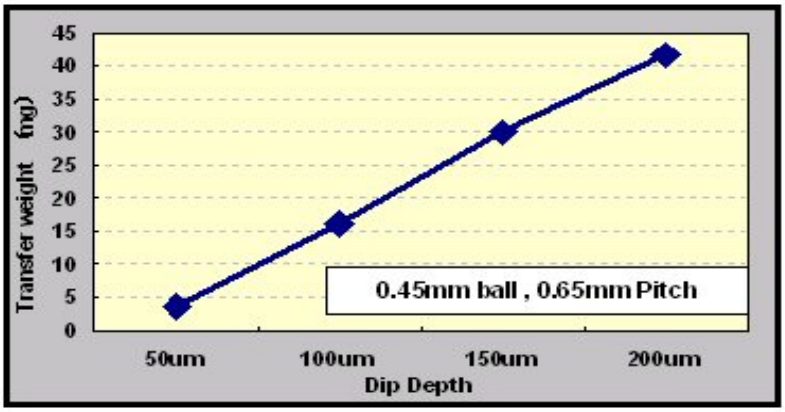
For some PoP pastes, transfer weight depends on process parameters such as dip thickness, hold time and rise velocity. ALPHA PoP33's pick up weight is primarily determined by dip thickness. Hold time and rise velocity have little or no effect. This gives assemblers using PoP packages a broad process window for dwell time and rise velocity.



Dip Thickness

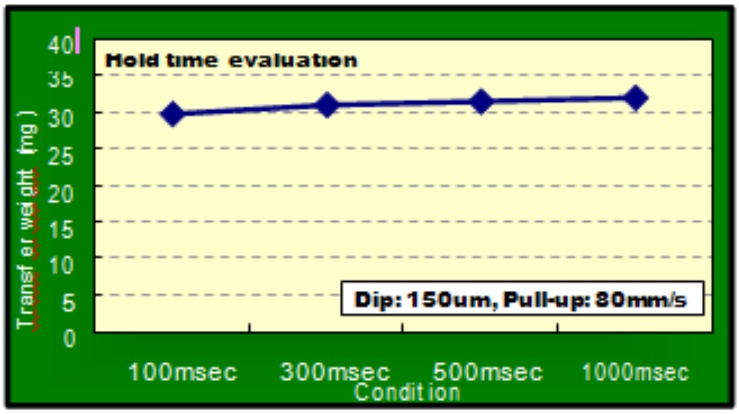
In general, transfer amounts depend on dip depth and the ball diameter. The recommended dip depth is 30 to 50% of the ball diameter. Adjust the paste thickness according to the ball diameter.





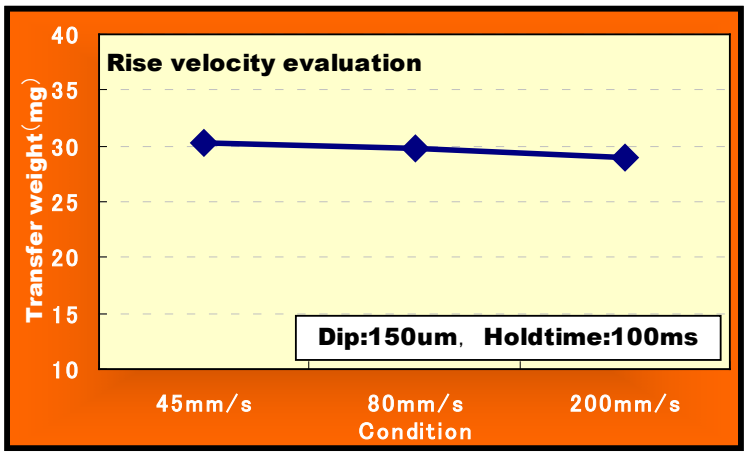
Hold Time

Hold time has less effect on transfer amounts. ALPHA PoP33 paste shows equivalent pick up weight in a window of dwell times between 100 milliseconds and 1 second.



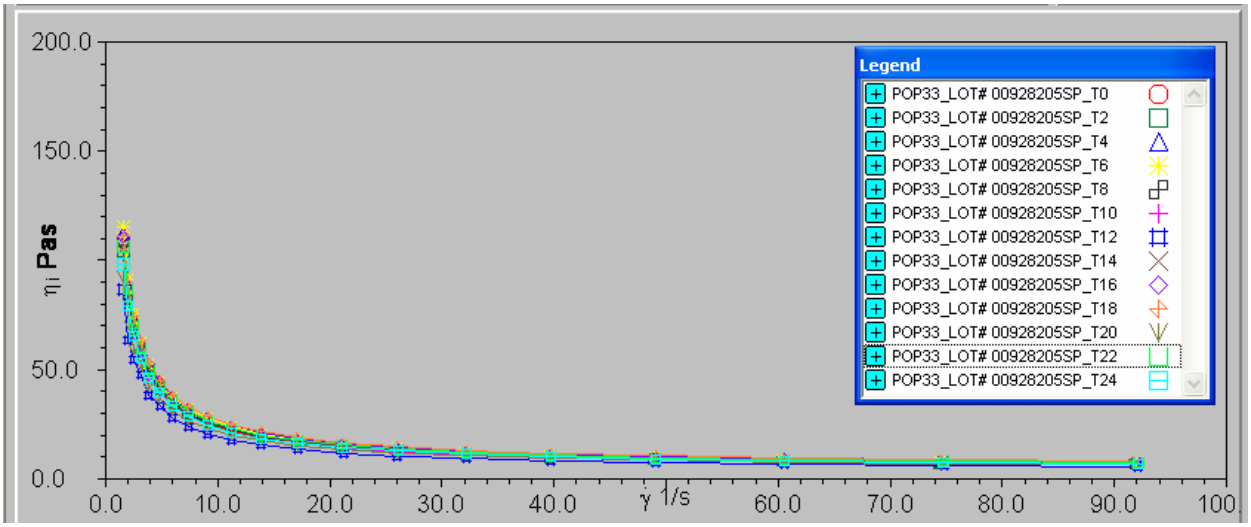
Rise Velocity

Rise velocity has no effect on transfer amount between 50mm /sec and 200mm/sec.



Continuous Squeegee Stability

ALPHA PoP33 specializes in bump transfer property by designing unique flux system. Also, its viscosity is stable after continuous squeegee for 24 hours (25 °C/50%RH). This graph shoes how the rheology of PoP33 remains stable over 24 hours exposure to shear. The shear was generated by a doctor blade passing at a height of 200 microns over the paste at a speed of 50mm/sec. (2 inches/sec.) in 30 second intervals. Paste samples were then tested every 2 hours using a Bohlin Rheometer. No significant change in rheology over 24 hours was observed.



TECHNICAL DATA

Category	Result	Procedure/Remarks
Chemical Properties		
Activity Level	ROL0 = J-STD Classification	IPC J-STD-004
Halide Content	Halide free (by titration & IC)	IPC J-STD-004
Halogen Content	Zero halogen,	EN-14582-B Oxygen Bomb, IC
Ag Chromate Test	No halogen intentionally added PASS	IPC J-STD-004
Copper Corrosion Test	PASS	IPC J-STD-004
	PASS	JIS Z 3197-1986
Talc Test	PASS	JIS Z 3197
Electrical Properties		
IPC SIR (7 days @ 40 °C/90% RH, 12V)	>1.8 x 10^8 ohms PASS, Electrical and Visual requirements	IPC J-STD-004B, IPC-TM-650 (2.6.3.7) (Pass ≥ 1 x 10^8 ohm min)
Bellcore SIR (96 hours @ 35 °C/85%RH)	9.8 x 10^{12} ohms PASS, Electrical and Visual requirements	Bellcore GR78-CORE (Pass ≥ 1 x 10^{11} ohm min)

Category	Result	Procedure/Remarks
JIS SIR (7 days, 100V)	PASS Initial (Ambient): 1.1 x 10^{13} ohms After 7 days: 4.9 x 10^{10} ohms Recovered: 7.2 x 10^{12} ohms	JIS Z 3197:1999
Physical Properties		
Color	Clear, Colorless Flux Residue	
Viscosity	77.5% metal designated M05 Viscosity (Typical) 500 poise 10 RPM Malcom	Malcom Spiral Viscometer; JIS Z 3284 Annex 6
Solder ball	**Acceptable** Tested after 4 hours storage @ 25%, 50% and 85% RH.	IPC TM-650 2.4.43/JIS Z3284 Annex 11
Stencil Life	> 24 hours	25 °C (77 °F)
Spread	> 75 %	JIS Z 3197:1999 8.3.1.1

PROCESSING GUIDELINES

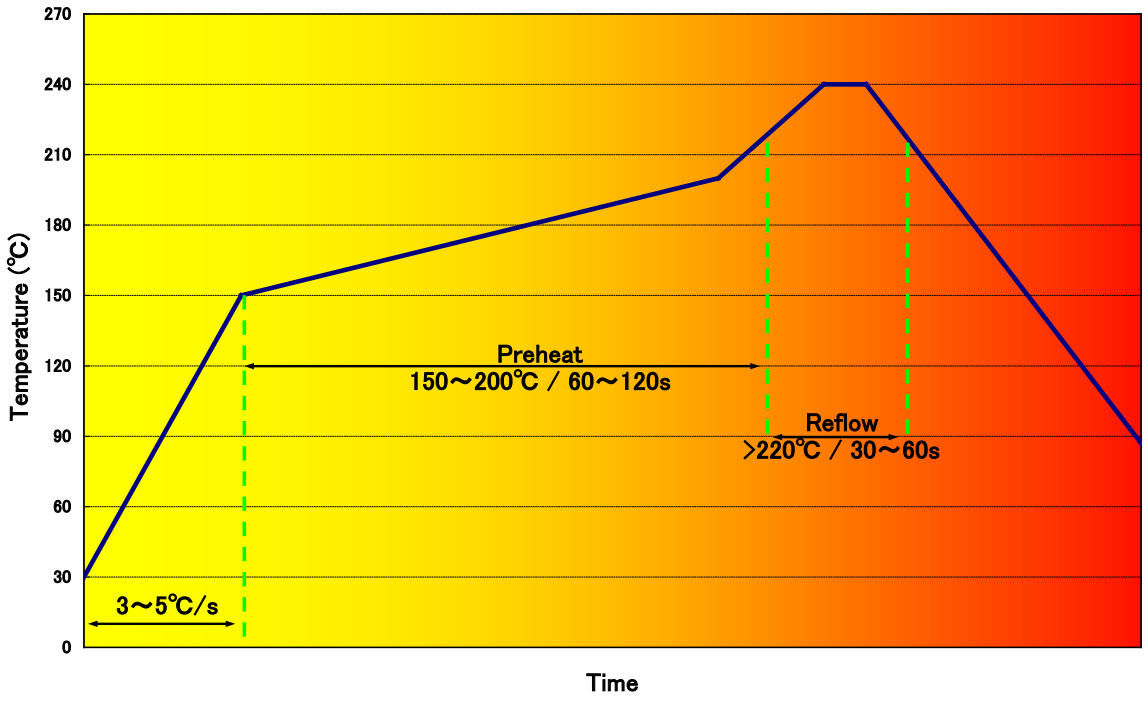
Storage & Handling
ALPHA PoP33 should be stored in a refrigerator upon receipt at 0 to 10 °C (32 to 50 °F). When stored under these conditions, PoP33 has a 6 month shelf life. PoP33 has a 2 week room temperature shelf life.

ALPHA PoP33 should be permitted to reach room temperature prior to use. When refrigerated, allow paste container to warm to room temperature for up to four hours in a sealed jar/cartridge. If the paste is in syringe, please allow to warm to room temperature for up to 2 hours. Paste must be >/= (19 °C/66 °F) before processing. Verify paste temperature with a thermometer to ensure paste is (19 °C/66 °F) or greater before set-up.

ALPHA PoP33 has a working range of 19 to 28 °C, 30 to 70%RH.

REFLOW PROFILE

Atmosphere	N_2 100ppm and below for pre-stack Air reflow for On-board-stack
Ramp Rate	3 to 5 °C/sec
Preheat	150 to 200 °C, 60 to 120 seconds
TAL for Reflow	220 °C and above for 30 to 60 seconds
Peak Temperature	240 to 250 °C



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.**

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