ALPHA® OM-5300

TIN-LEAD PASTE FOR MIXED ALLOY ASSEMBLIES

DESCRIPTION

ALPHA OM-5300 no clean solder paste was developed to meet the demands of tin lead soldering when lead free components are present in the circuit assembly. Like all ALPHA solder pastes, OM-5300 has excellent print volume repeatability to minimize variation in the print process. OM-5300 minimizes print cyle times through high print speeds and extended number of prints between stencil undercleaning.

OM-5300 is different due to its ability to withstand long, hot soak reflow profiles, allowing better wetting of lead free surfaces with tin lead paste alloy. Very low BGA voiding, in conjunction with very high post reflow SIR readings make OM-5300 ideal for tin lead soldering when lead free components are used.

OM-5300 is also a zero halogen product with no halogens intentionally added to the formulation..

PROCESS FEATURES & BENEFITS

- **Print Consistency**: Lower “deposit to deposit” variation drives maximisation of first pass print and reflow yields
- **Fine Feature Capability:** High print deposit volumes and low volume variability down to 12 mil (0.30mm) circle feature sizes.
- **Low BGA Voiding:** Class III voiding resistance even when SAC 305 BGA speres are used.
- **Electrical Reliability:** Exceeds the requirements of the IPC and Bellcore SIR electrical reliability tests.
- Suitable for fine pitch applications such as 0.5 mm (20mil) pitch Flip-Chip and 0201 assembly.
- Excellent response to pause performance, generating fewer defects due to start up.
- High print speed, up to 150 mm/sec (6 inch/sec)
- Efficient activation system providing defect free soldering with a wide range of oven profiles
- High yield for in circuit testing (low level of false negatives)

PRODUCT INFORMATION

Alloy:	63Sn/37Pb, 62Sn/36Pb/2Ag, and 62.8Sn/36.8Pb/0.4Ag (NT4S, Anti Tombstoning Alloy)
Powder Size:	Type 3 (25 - 45µm per IPC J-STD-005) Type 4 (20 - 38µm per IPC J-STD-005)
Packaging:	500 gram jars and 6” and 12”cartridges, ProFlow™ Cassettes.

APPLICATION

Formulated for both standard and fine pitch SMT stencil printing with apertures down to 0.3mm (12 mil) diameter and print speeds up to 150mm/sec (6”/sec) with standard stencil thickness of 0.1mm (4 mil) to 0.15mm (6 mil), particularly when used in conjunction with Alpha Stencils.

SAFETY

While the ALPHA OM-5300 flux system is not considered toxic, its use in typical reflow will generate a small amount of reaction and decomposition vapours. These vapors should be adequately exhausted from the work area. Consult the MSDS for additional safety information, and for toxicity data on alloys containing lead and silver. The most recent version of the MSDS is available at www.alpha.alent.com.

ALPHA Global Headquarters
300 Atrium Drive, Somerset, NJ 08873 USA ♦ 1-800-367-5460 ♦ www.alpha.alent.com

ALPHA® OM-5300

TIN-LEAD PASTE FOR MIXED ALLOY ASSEMBLIES

STORAGE

ALPHA OM-5300 should be stored in a refrigerator upon receipt at 35 - 45°F (1-10°C). Permit paste to reach room temperature prior to opening. This will prevent condensation of moisture on the solder paste. Other storage conditions are shown below.

ALPHA OM-5300 TECHNICAL DATA		
CATEGORY	RESULTS	PROCEDURES/REMARKS
CHEMICAL PROPERTIES		
Activity Level	ROL0 = J-STD Classification Corrosivity - Cu Mirror Pass (L)	IPC J-STD-004
Halide Content	Halide free (by titration). Passes Ag Chromate Test	IPC J-STD-004
ELECTRICAL PROPERTIES		
SIR (IPC 7 days @ 85° C/85% RH)	7.7×10^8 ohms	Pass, IPC J-STD-004 Pass = 1×10^8 ohm min, uncleaned
SIR (Bellcore 96 hours@35°C/85% RH)	1.3×10^{11} ohms	Pass, Bellcore GR78-CORE Pass = 1×10^{11} ohm min
PHYSICAL PROPERTIES (using 90% Metal, Type 3 Powder)		
Flux Residue Cosmetics	Clear, Colorless Flux Residue.	63Sn/37Pb alloy
Tack Force vs. Humidity (6 hours)	Less than $1 g/mm^2$ change at 25%,50% and 75% RH	IPC J-STD-005
Viscosity	90-3-M17, designated M17 is suitable for all typical stencil-printing applications. Target Viscosity of 1700 poise at 10 RPM Malcom	Malcom Spiral Viscometer; J-STD-005
Solderball	Pass < 10 count (63Sn/37Pb alloy)	Pass IPC J-STD-005
Stencil Life	> 8 hours	@ 50%RH, 74°F (23°C)
Slump	Hot Slump & Cold Slump Pass	IPC J-STD-005
	Pass	DIN Standard 32 513, 5.3

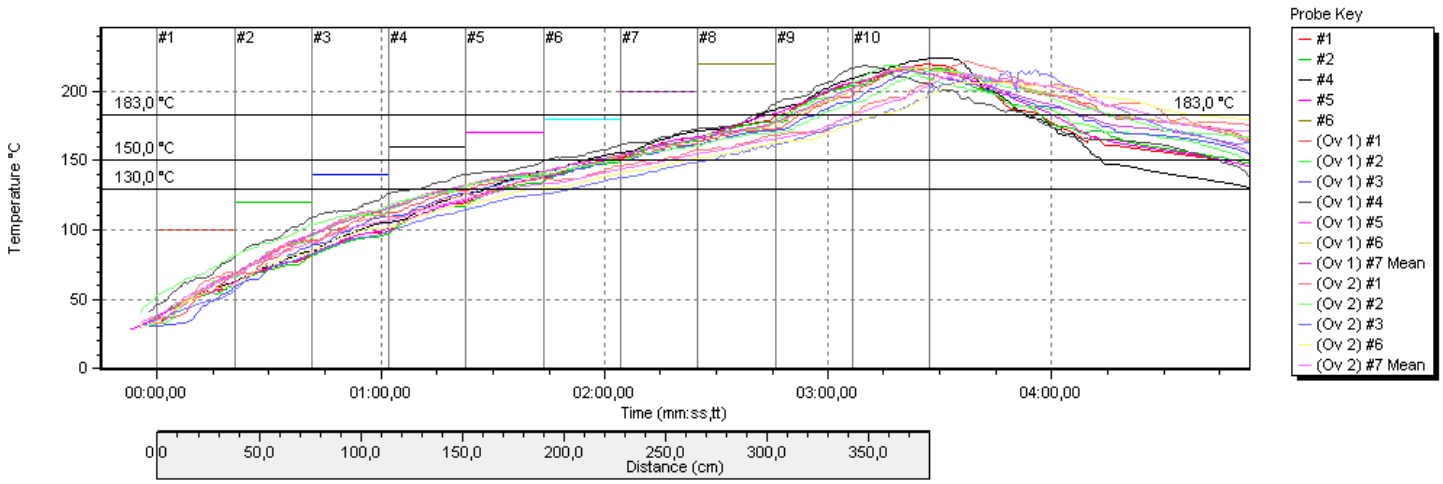
ALPHA® OM-5300

TIN-LEAD PASTE FOR MIXED ALLOY ASSEMBLIES

ALPHA OM-5300 Processing Guidelines

STORAGE-HANDLING	PRINTING	SnPb REFLOW (See Figures 1 & 2)	CLEANING
• Refrigerate to guarantee stability @ 1-10°C (35- 45 °F) • **Shelf life of refrigerated paste is six months** • Required warm-up of paste container to room temperature for up to 8 hours. Paste must be room temperature before processing. • Verify paste temperature is above 19°C (66°F) with a thermometer. Printing can be performed at temperatures up to 28°C (82°F). • Do not remove worked paste from stencil and mix with unused paste in jar. This will alter rheology of unused paste. • Working conditions: 19°C to 32°C	**STENCIL:** Recommend ALPHA CUT or ALPHA FORM stencils @ 0.1 mm (4 mil) to 0.15 mm (6 mil) thick **SQUEEGEE:** Metal. **PASTE ROLL:** 1.5-2.0 cm diameter and make additions when roll reaches 1 cm diameter. Maximum roll size will depend upon blade **PRESSURE:** 0.15 to 0.3 kg per cm (0.8-1.5 pounds per linear inch) of squeegee length. **PRINT SPEED:** 1 to 6 inches (25mm to 150 mm) per second. type. **RELEASE SPEED:** within 3-10 mm/s To define under microscope. Bad setting will give icicle or solderpaste missing in small apertures. PRINT PUMP HEAD: ALPHA OM-5300 is suitable for use in both MPM RheoPump™ and DEK ProFlow™ systems.	**ATMOSPHERE:** Clean-dry air or nitrogen atmosphere. **Profile window (SnPb alloys):** From 40°C to 183°C: 2mn30 to 3mn30 From 150°C to 183°C: 45 s to 90 seconds From 130°C to 183°C: 1mn to 2 mn Time above 183◦C = 30-90 secs Peak temperatures: **200°C to 235°C**. The upper end of the peak temperature range may be required to collapse lead free BGA components…etc.	ALPHA OM-5300 residue is designed to remain on the board after reflow. Reflowed flux residue can be removed with Alpha BC 2200 Aqueous cleaner, ALPHA SM-110E or Kyzen Micronox MX2501. 5 minute agitation is required for the 2 solvent based cleaners. For misprints and stencil cleaning, Alpha SM 110E , SM-440, Bioact BC-2200 may be used.

Figure 1 and 2: Typical SnPb Alloy Reflow Profiles



ALPHA® OM-5300

TIN-LEAD PASTE FOR MIXED ALLOY ASSEMBLIES