



# WS353 Sn62 and Sn63



## Water Soluble Solder Paste

### Features:

- Broad Printing Process Window
- Excellent Wetting
- Easily Cleaned Residues
- Lengthy Stencil Life and Tack Time
- Reduces Voiding Under BGAs
- Low Foaming during Washing

### Description:

WS353 water soluble solder paste has been developed in response to electronics manufacturers demand for an all-purpose, reliably consistent water-soluble solder paste. WS353 offers extended stencil life and tack time, robust environmental tolerance and printing characteristics, excellent activity, a broad cleaning process window, and compatibility with both tin-lead and lead-free solder alloys. WS353 can be used in fine pitch printing applications and has proven effective in the assembly of 0201 components. WS353 provides consistent printing characteristics and slump resistance during high-speed printing. The excellent activity of WS353 makes it a suitable choice when soldering to standard or difficult-to-wet parts, including lead-free alloys and finishes. In addition, WS353 has proven to substantially reduce voiding under micro-BGAs. The residues of WS353 may be cleaned easily in straight water, with the result being exceptional electrical reliability. In addition, WS353 is designed to not foam during washing, even in high-pressure wash systems.

### Paste Application:

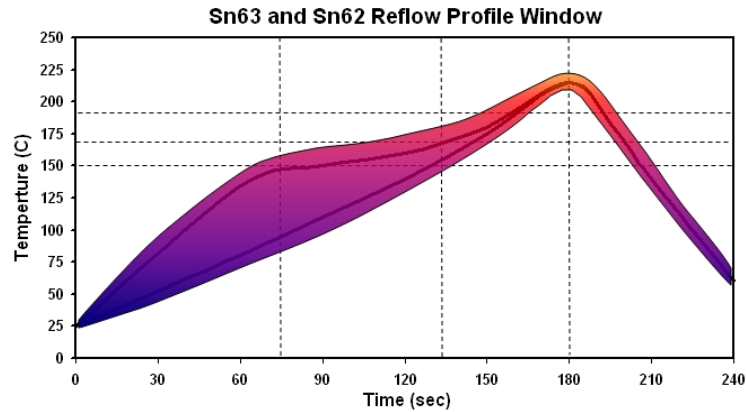
- Apply sufficient paste to the stencil to allow a smooth, even roll during the print cycle (a bead diameter of 12 to 16 mm ( $\frac{1}{2}$  to  $\frac{5}{8}$  inch) is normally sufficient to begin).
- Apply small amounts of fresh solder paste to the stencil at controlled intervals to maintain paste chemistry and workable properties.
- WS488 provides the necessary tack time and force for today's high speed placement equipment, which will enhance product performance and reliability.
- Cleaning of your stencil will vary by application; however, it can be accomplished using AIM 200AX-10 stencil cleaner.

### Printer Set-Up Recommendations:

- Snap-off distance = On Contact 0.00 mm (0.00")
- PCB Separation Distance = 0.75-2.0 mm (.030-.080")
- PCB Separation Speed = Slow-Medium
- Squeegee Pressure = 0.30-0.75 kg/cm (.6 - 1.7 lbs/In.) of blade
- Squeegee Stroke Speed = 25-50 mm/sec (1 - 2 In./sec)
- \* Note: Recommended initial printer settings above are dependent on PCB and pad design

### Reflow Profile:

Either a straight ramp-spike or ramp-soak-spike profile can be used as shown below. Both profiles would have a similar peak temperature and time above liquidus (TAL). The shaded area defines the process window. Oven efficiency, board size/mass, component type and density all influence the final profile for a given assembly. These profiles are starting points, and processing boards with thermal-couples attached is recommended to optimize the process.



<i>RATE OF RISE</i> 1.5-2 °C / SEC MAX	<i>RAMP TO</i> 150 °C ( 300°F)	<i>PROGRESS THROUGH</i> 150°C-170°C (300°F-340°F)	<i>TO PEAK TEMP</i> 210 °C-220°C (410°F-430°F)	<i>TIME ABOVE</i> 183 °C (380°F)	<i>COOLDOWN ≤</i> 4°C / SEC	<i>PROFILE LENGTH</i> AMBIENT TO PEAK
Standard Profile	≤ 75 Sec	30-60 Sec	45-75 Sec	30-60 Sec	45± 15 Sec	2.75-3.5 Min

- ❖ THE RECOMMENDED REFLOW PROFILE FOR WS353 IS PROVIDED AS A GUIDELINE. OPTIMAL PROFILE MAY DIFFER DUE TO OVEN TYPE, ASSEMBLY LAYOUT, OR OTHER PROCESS VARIABLES. CONTACT AIM TECHNICAL SUPPORT IF YOU REQUIRE ADDITIONAL PROFILING ASSISTANCE.
- ❖ THE REFLOW PROFILE FOR THE Sn/Pb PASTES USING A VAPOR PHASE REFLOW OVEN: PEAK TEMPERATURE RANGE IS 230°C – 245°C.

### Handling and Storage:

- WS353 has a refrigerated shelf life of 6 months at 4° C (40° F) - 12° C (55° F).
- Recommended operating environment 35-55% Rh and 20°C (68°F) to 23°C (74°C). Product is capable of performing from 5-70% Rh and 20°C (68°F) to 30°C (85°F) with suitable printer settings for the conditions.
- Allow the solder paste to warm up completely and naturally to ambient temperature (8 hrs.) prior to breaking the seal for use. Do not force warm.
- Mix the product lightly and thoroughly (1-2 mins. max) to ensure even distribution of any separated material
- Do not store new and used paste in the same container, and reseal any opened containers while not in use.
- Replace the internal plug and cap of the 500 gram jars to ensure the best possible seal.

### Cleaning:

WS353 can be cleaned easily with normal tap water. Deionized water is recommended for the final rinse. A temperature of less than 120° F is sufficient for removing residues. An in-line or other pressurized spray cleaning system is suggested, but is not required.

### WS353 Compatible Products:

- Electropure Solder Bar
- WS Tacky Flux
- WS715; WS735 Spray Flux
- WS482 Cored Wire
- Epoxy 4089 – Chip Bonding Epoxy
- 200AX – Stencil Cleaner

### Physical Properties:

<i>ITEM</i>	<i>SPECIFICATION</i>
Appearance	Gray, Smooth, Creamy
Alloy	Sn63 and Sn62
Melting Point	183°C
Particle Size	T3, T4, T5
General Metal Loading	89.5% (T3)
Viscosity	Print/Dispense
Packaging	Available in all industry standard packaging.

## Test Data Summary:

<b>CLASSIFICATION</b>			
Product Name	IPC Classification to J-STD-004	Copper Mirror TM 650 2.3.32	Silver Chromate TM 650 2.2.33
WS353	ORM0	< 50% Breakthrough - M	Pass
<b>POWDER TESTING</b>			
No.	Item	Results	Test Method
1	Powder Size	Type 3 – 45-25 micron Type 4 – 38-20 micron	J-STD-004 IPC TM 650 2.2.14
2	Powder Shape	Spherical	Microscope
<b>FLUX MEDIUM TESTING</b>			
No.	Item	Results	Test Method
1	Acid Value	26.42 mg KOH/g flux	J-STD-004 IPC TM 650 2.3.13
2	Halide Content	0%	J-STD-004 IPC TM 650 2.3.35
3	Fluorides Spot Test	Pass	J-STD-004 IPC TM 650 2.3.35.1 J-STD-004 IPC TM 650 2.3.35.2
4	Corrosivity Test/ Copper Mirror	< 50% Breakthrough - M	J-STD-004 IPC TM 650 2.3.32
5	Corrosion Flux	Pass	J-STD-004 IPC TM 650 2.6.15
6	Halide-Free/Silver Chromate Paper Test	Pass	J-STD-004 IPC TM 650 2.3.33
7	Non-Volatile Residue	82.10%	J-STD-004 IPC TM 650 2.3.34
8	Surface Insulation Resistance (Solder paste was reflowed on test coupons, left at ambient temperatures for 2 weeks, then cleaned with 55-58°C tap water for 120 sec, and allowed to air dried for 30 min before testing)	- Control Coupons > 1E9Ω at 96 & 168 h. 2.58E+10 and 2.17E+10 - Pass - Sample Coupons > 1E8Ω at 96 & 168 h. 2.13E+09 and 3.44E+09 - Pass - No dendrite growth or corrosion, after a visual inspection - Pass	J-STD-004 IPC TM 650 2.6.3.3
9	Compatibility Test	See list of recommended products above	GR-78-CORE
<b>VISCOSITY TESTING</b>			
No.	Item	Results	Test Method
1	T-Bar Spindle Test Method	750 ± 10% kcps	J-STD-005 IPC TM 650 2.4.34
<b>SOLDER PASTE TESTING</b>			
No.	Item	Results	Test Method
1	Tack Test	40.0 gf	J-STD-005 IPC TM 650 2.4.44
2	Tack Test	81.1 gf	JIS Z 3284 Annez 9
3	Solder Ball Test	Pass	J-STD-005 IPC TM 650 2.4.43
4	Wetting Test	Pass	J-STD-005 IPC TM 650 2.4.45
5	Paste Shelf Life	4°C (39°F) = 6 months	AIM TM 125-11
6	Solder Paste Slump Test	Pass	J-STD-005 IPC TM 650 2.4.35

### Manufacturing and Distribution Worldwide

Americas +1-401-463-5605 · Europe +44-1737-222-258 · Asia-Pacific +86-755-2993-6487 · info@aimsolder.com · www.aimsolder.com  
AIM IS ISO9001:2000 CERTIFIED

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