

MP 218

MP 218 solder paste is a halide-free, no clean, pin testable solder paste, which has excellent humidity resistance and a broad process window both for reflow and printing. MP 218 has high tack force to resist component movement during high-speed placement, long printer abandon times and excellent solderability over a wide range of reflow profiles in air and nitrogen and across a wide range of surface finishes including HASL, Ni/Au, Immersion Sn, Immersion Ag and OSP copper.

FEATURES AND BENEFITS

- Colourless residues for easy post-reflow inspection
- Suitable for fine pitch, high speed stencil printing up to 150mm^s⁻¹
- Soft, non-sticky, pin testable residues allow easy in-circuit testing
- Halide-free flux classification: ROL0 to IPC/J-STD-004
- Outstanding humidity resistance – gives excellent coalescence even after 24 hours exposure to 75% RH, thus reducing process variation due to environmental conditions
- Extended open time and tack life leading to low wastage
- Effective over a wide range of reflow profiles in air or nitrogen

TYPICAL PROPERTIES

Solder Alloy/Powder:

The solder alloys used in MP 218 are manufactured meeting IPC J-STD-006 and EN29453 for impurity levels. The solder powder is manufactured in a carefully controlled production process to a quality level that exceeds IPC J-STD-005 requirements for sphericity, size distribution and oxide levels.

MP 218 63S4 solder paste offers an instant solution where tombstoning is a particular process problem. 63S4 alloy is a blend of different melting point alloys with a special mix of solder particle sizes. This modification extends the melting range of the alloy reducing the possibility that one solder deposit at a component termination can fully reflow before the other.

Code	Alloy Composition	Melting Point (°C)
63S4	Sn62.8Pb36.8Ag0.4	179-183
Sn63	Sn63Pb37	183
Sn62	Sn62Pb36Ag2	179
Powder Description	Particle Size Distribution (µm)	IPC Equivalent (J-STD 005A)
AGS	45-25	Type 3
ACP	45-10	-
DAP	38-20	Type 4

Minimum order requirements may apply to certain alloys and powder sizes. For availability contact your local Customer Service Department.

Solder Paste:

The properties of a solder paste depend in part on the metal content, the solder alloy and the solder powder particle size range. In general terms, increasing metal content reduces the tendency to slump and reduces the tackiness of the solder paste while the solder balling performance improves. The metal content (by weight) of lead-free solder pastes are often somewhat lower than tin/lead solder pastes for similar applications due to the lower density of lead-free alloys.

Alloy	Sn62, Sn63		63S4	Sn62, Sn63
Particle Size	AGS		ACP	DAP
Metal Content (%)	89.5	90	89.5	89.5
Brookfield Viscosity (cP)	850,000	950,000	850,000	840,000
Malcom Viscosity (Pa.s)	214	214	214	190
Thixotropic Index (Ti)	0.43	0.52	0.43	0.54
Slump, J-STD-005 (mm)				
150°C, 15 minutes				
0.33 x 2.03 mm pads	0.10	0.10	0.10	-
0.63 x 2.03 mm pads	0.33	0.33	0.33	-
Tack:				
Initial Tack Force (g/mm²)	1.6	1.6	1.6	-
Useful Open Time (hours)	>24	>24	>24	-

NOT FOR PRODUCT SPECIFICATIONS

THE TECHNICAL INFORMATION CONTAINED HEREIN IS INTENDED FOR REFERENCE ONLY. PLEASE CONTACT YOUR NEAREST HARIMA LOCATION FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT

DIRECTIONS FOR USE

Printing:

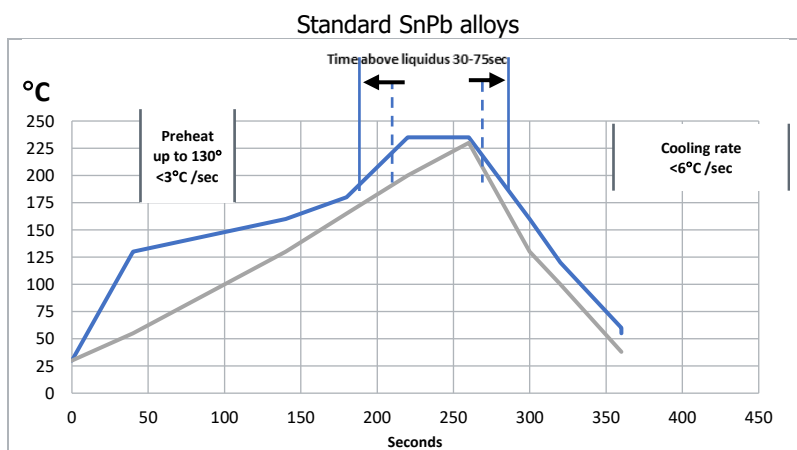
MP 218 can be reliably printed between 25 and 150 mms⁻¹ using electroformed or laser-cut stencils with a metal blade squeegee (preferably 60°). This is due to a unique rheology which ensures that the higher shear rate viscosity is relatively low, and the thixotropic index is high enough to ensure excellent definition and slump resistance, while maintaining good roll and drop off behaviour. Acceptable first prints have been achieved at 0.4mm pitch after printer down times of 60 minutes without requiring a knead cycle. Unlike some pastes, high squeegee pressures are not required, making MP 218 particularly useful for second side printing processes.

Reflow:

MP 218 can be reflowed using any standard heating methods including IR, convection, hot belt, vapour phase and laser soldering. Whilst MP 218 can be reflowed under nitrogen this is not essential. MP 218 is not particularly sensitive to reflow profile type.

63S4 anti-tombstoning should be selected when tombstone defects are experienced with standard alloys and when it is not possible to eliminate tombstoning by design changes.

No single reflow profile is deemed suitable for all processes and applications, but the following example profiles have given good results in practice.



Preheat ramp up to 130°C <3°C
Soak zone 130-160°C 60-120s
160°C to peak <3°C
Time above liquidus 30-75s
Peak temperature 205-225°C
Time at peak temperature <30s
Cooling rate <6°C/s
Time to peak from ambient < 8 mins
Nitrogen (if required) ≤1500ppm O₂

Cleaning:

The residues from MP 218 solder pastes may be left on the PCB in many applications since they do not pose a hazard to long term reliability. Should there be a specific requirement for residue removal, this may be achieved using conventional cleaning processes based on solvents such as MCF 800. For stencil cleaning and cleaning board/misprints MSC 01 solvent cleaner is recommended.

RELIABILITY PROPERTIES

Solder Paste Medium:

MP 218 contains a stable resin system and slow evaporating solvents. MP 218 is classified as Type ROL0 to IPC/J-STD-004 standard.

Test	Specification	Test Method	Results
Copper Plate Corrosion	IPC/J-STD-004A	2.6.15C	Pass
Copper Mirror Corrosion	IPC/J-STD-004A	2.3.32D	Pass
Chlorides & Bromides	IPC/J-STD-004A	2.3.33	Pass
Surface Insulation Resistance (SIR) (without cleaning)	IPC/J-STD-004A	2.6.3.7	Pass
Electromigration (ECM) (without cleaning)	Telcordia GR-78-Core	13.1.3	Pass
Flux Activity Classification (without cleaning)	Telcordia GR-78-Core	13.1.4	Pass
Flux Activity Classification (without cleaning)	IPC/J-STD-004A		ROL0

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STORAGE AND SHELF LIFE**Storage:**

MP 218 solder pastes should be stored at 0 to 10°C in tightly sealed in the original container (NB cartridges should be stored tip down to prevent the formation of air pockets). The paste should be removed from cold storage a minimum of 8 hours before use. Do not use forced heating methods to bring solder paste up to temperature.

MP 218 solder paste has been formulated to reduce separation on storage to a minimum, but should it occur gentle stirring for 15 seconds will return the product to its correct rheological performance.

Shelf Life:

A minimum shelf life of 6 months can be expected. Air shipment is recommended to minimize the time the containers are exposed to higher temperatures.

GENERAL INFORMATION

For safe handling information on this product consult the relevant Safety Data Sheet (SDS)

Disclaimer

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. HARIMA is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product. Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

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