MULTICORE

Technical Data Sheet

MP 218

June 2022

PRODUCT DESCRIPTION

MP 218 provides the following product characteristics:

Technology	Solder paste
Application	Sn/Pb soldering

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

- Outstanding humidity resistance - gives excellent coalescence even after 24 hours exposure to 75% RH, thus reducing process variation due to environmental conditions
- Clear residues for easy post-reflow inspection
- Soft, non-stick, pin testable residues allow easy in-circuit testing
- Suitable for fine pitch, high speed printing up to 150mm/s (6"/s)
- Extended open time and tack life leading to low wastage.
- Halide free flux classification: ROL0 to ANSI/J-STD-004 (Jan. 1995)

TYPICAL PROPERTIES

Solder Alloy *(J-STD 006)*

Harima Code	Alloy	Melting Point,ºC
Sn62	Sn62Pb36Ag2	179ºC
Sn63	Sn63Pb37	183ºC
63S4	Sn62.8Pb36.8Ag0.4	179 to 183ºC

Based on T3 powder
Solder Paste Typical Properties

Alloys	Sn62, SN63
Powder Particle Size, µm	25-45
Powder Size Coding	T3
IPC Equivalent	Type 3
Metal Loading (Weight %)	89.5% and 90%
Slump J-STD-005, mm	IPC A21 Pattern
RT, 15 minutes	
0.33 x 2.03 mm pads	0.08
0.63 x 2.03 mm pads	0.33
150°C, 15 minutes	
0.33 x 2.03 mm pads	0.1
0.63 x 2.03 mm pads	0.33
Brookfield Viscosity TF spindle, 25°C, 5rpm after 2 minutes, mPa·s	89.5% metal 850,000 90% metal 950,000
Thixotropic Index (TI), 25°C (1.8/18 s^{-1})	89.5% metal 0.43 90% metal 0.52
Malcom Rheology, 25°C Shear rate 6 s^{-1}	89.5% metal 2,140 90% metal 2,170
Initial tack force, gF	126
Useful open time, hours	>24

Based on T4 powder
Solder Paste Typical Properties

Alloys	Sn62, Sn63
Powder Particle Size, µm	38-20
Powder Size Coding	DAP
IPC Equivalent	Type 4
Metal Loading (Weight %)	89.5
Brookfield Viscosity @ 25ºC, mPa.s Spindle TF, Speed 5 rpm, 2 minutes	840,000
Thixotropic Index (Ti) Ti = log (1.8/18 s^{-1})	0.54
Malcom Viscosity @ 25ºC, Pa.s @ Shear Rate of 6 s^{-1}	1,900

63S4 ANTI-TOMBSTONING ALLOY

63S4 alloy 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.

Solder Powder:

Careful control of the atomisation process for production of solder powders for **MP 218** solder pastes ensures that the solder powder is produced to a quality level that exceeds IPC/J-STD-006 & EN29453 requirements for sphericity, size distribution, impurities and oxide levels. Minimum order requirements may apply to certain alloys and powder sizes.

DIRECTIONS FOR USE

Printing:

1. **MP 218** is available for stencil printing down to 0.4mm (0.016") pitch QFP devices, with type 3 (AGS) powder.
2. Printing at speeds between 25 mm/s (1 "/s) and 150 mm/s (6 "/s) can be achieved by using laser cut, electropolished or electroformed stencils and metal squeegees (preferably 60°).
3. Acceptable first prints have been achieved at 0.4 mm (16 mils) pitch after printer down times of 60 minutes without requiring a knead cycle.

Reflow:

- Any of the available methods of heating to cause reflow may be used including IR, convection, hot belt, vapor phase and laser soldering.
- **MP 218** is not particularly sensitive to reflow profile type.
- There is no single reflow profile which is suitable for all processes and applications, but the following graphs show profile examples

NOT FOR PRODUCT SPECIFICATIONS
THE TECHNICAL INFORMATION CONTAINED HEREIN IS INTENDED FOR REFERENCE YOUR NEAREST HARIMA LOCATION FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.

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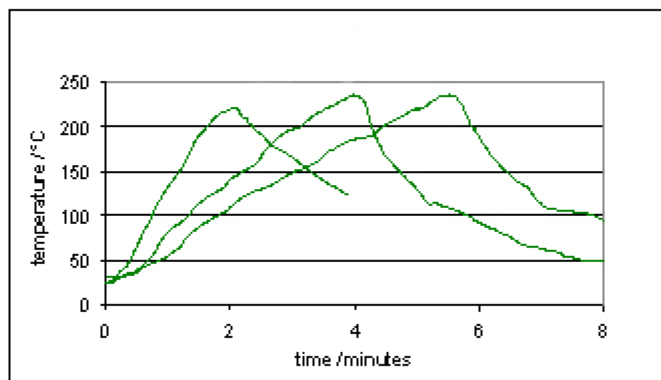
that have given good results in practice.

- 63S4 anti-tombstoning is selected when tombstone defects are experienced with standard alloys and when it is not possible to eliminate by design changes.
- Typical reflow profile as follows:
  1. Ramp to 130 to 165ºC at no more than 2ºC s^{-1} .
  2. Hold at 130 to 165ºC for 60 to 120 seconds.
  3. Ramp to peak reflow temperature at no more than 2ºC s^{-1} .
  4. Recommended peak reflow temperature is 205 to 225ºC.
  5. Dwell time above liquidus of 30 to 75 seconds.



Cleaning:

1. **MP 218** solder pastes are no-clean and are designed to be left on the PCB in many applications post-assembly since they do not pose a hazard to long-term reliability.
2. Residue removal can be achieved using conventional cleaning processes based on solvents such as MCF 800 or suitable saponifying agents.
3. For stencil cleaning and cleaning board misprints, LOCTITE MSC 01 solvent cleaner is recommended.

RELIABILITY PROPERTIES

Solder Paste Medium:

MP 218 medium contains a stable resin system and slow evaporating solvents. The formulation has been tested to the requirements of ANSI/J-STD-004 for a type ROL0 classification.

Test	Specification	Results
Copper Plate Corrosion	ANSI/J-STD-004	Pass
Copper Mirror Corrosion	ANSI/J-STD-004	Pass
Chlorides & Bromides	ANSI/J-STD-004	Pass
Surface Insulation Resistance (without cleaning)	ANSI/J-STD-004	Pass Pass
Electromigration (ECM)	Telecordia GR-78-Core	Pass
Flux Activity Classification (without cleaning)	ANSI/J-STD-004 (Jan. 1995)	ROL0

STORAGE AND SHELF LIFE

Storage:

It is recommended to store **MP 218** at 0 to 10°C. (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 minimize flux separation on storage but should this occur, gentle stirring for 15 seconds will return the product to the correct rheological performance.

To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Center.

Shelf Life:

Provided **MP 218** is stored tighly sealed in the original container at 0 to 10°C, a minimum shelf life of 183 days can be expected. Air shipment is recommended to minimize the time the containers are exposed to higher temperatures. Short term storage at room temperature during use is acceptable provided the paste is sealed in original containers. Laboratory testing has shown that the paste remains in a useable condition after 2 months of storage at room temperature.

DATA RANGES

The data contained herein may be reported as a typical value and/or a range. Values are based on actual test data and are verified on a periodic basis.

GENERAL INFORMATION

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

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.

Conversions

(°C x 1.8) + 32 = °F
kV/mm x 25.4 = V/mil
mm / 25.4 = inches
µm / 25.4 = mil
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm² x 145 = psi
MPa x 145 = psi
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
mPa·s = cP

Disclaimer

Note:

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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