

HF 200

HF 200 solder paste is a halogen-free (no intended added halogen in formulation), no clean, low voiding Pb-free solder paste, formulated to have excellent humidity resistance and solderability over a wide range of reflow profiles in both air and nitrogen across a wide range of challenging surface finishes.

FEATURES AND BENEFITS

- Halogen-free flux: passes IC with pre-treatment IPC-TM-650 2.3.34/EN14582
- Halogen-free flux classification: ROL0 to IPC/J-STD-004 Rev B
- Effective over a range of reflow profiles in air or nitrogen
- Suitable for fine pitch, high speed stencil printing up to 140mms⁻¹
- Colourless residues for easy post-reflow inspection

TYPICAL PROPERTIES

Solder Alloy/Powder:

The solder alloys used in HF 200 are RoHS and EICC compliant and 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.

Code	Alloy Composition	Melting Point (°C)
97SC	Sn96.5Ag3Cu0.5	217
Powder Description	Particle Size Distribution (µm)	IPC Equivalent (J-STD 005A)
AGS	45-25	Type 3
DAP	38-20	Type 4

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

Property	97SC	
Particle Size	AGS	DAP
Metal Content (%)	88.5	
Brookfield Viscosity (cP)	685,000	660,000
Malcom Viscosity (Pa.s)	130	124
Thixotropic Index (TI)	0.56	0.56
Slump, J-STD-005 (mm)		
150°C, 15 minutes		
0.33 x 2.03 mm pads	0.25	0.25
0.63 x 2.03 mm pads	0.41	0.41

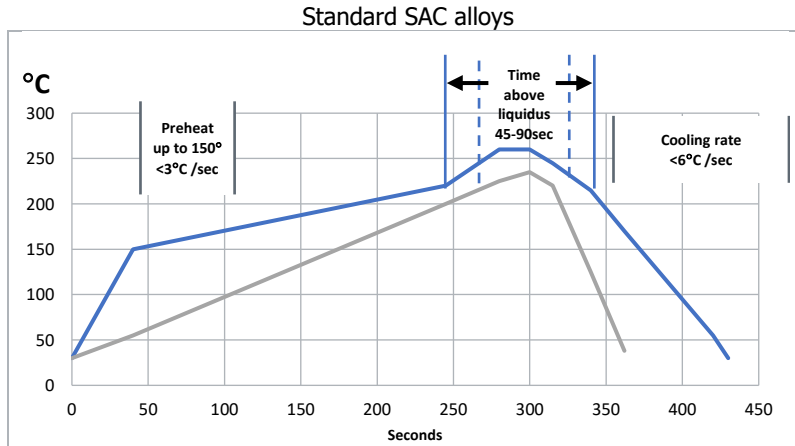
DIRECTIONS FOR USE

Printing:

HF 200 can be reliably printed between 60 and 140 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 2 hours without requiring a knead cycle.

Reflow:

HF 200 can be reflowed using any standard heating methods including IR, convection, hot belt, vapour phase and laser soldering. Whilst HF 200 can be reflowed under nitrogen this is not essential. HF 200 is not particularly sensitive to reflow profile type. 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 150°C <math><3^{\circ}\text{C}</math>
 Soak zone 150-200°C 60-180s
 200°C to peak <math><3^{\circ}\text{C}</math>
 Time above liquidus 40-90s
 Minimum peak temperature $\ge 235^{\circ}\text{C}$
 Time at peak temperature <math><40\text{s}</math>
 Cooling rate <math><6^{\circ}\text{C}/\text{s}</math>
 Time to peak from ambient <math><8\text{ mins}</math>
 Nitrogen (if required) $\le 1500\text{ppm O}_2$

Cleaning:

The residues from HF 200 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:

HF 200 contains a stable resin system and low odour, high boiling range solvents. HF 200 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-004B Telcordia GR-78-Core	2.6.3.7 13.1.3	Pass Pass
Electromigration (ECM) (without cleaning)	IPC/J-STD-004A	2.6.14.1	Pass
Halogen Content (Pre-treatment EN14582, 2.3.28.1)	IPC/J-STD-004B	2.3.34	Pass
Flux Activity Classification (without cleaning)	IPC/J-STD-004A		ROL0

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STORAGE AND SHELF LIFE

Storage:

HF 200 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.

HF 200 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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