

HF 212

HF 212 solder paste is a halogen-free (no intended added halogen in formulation), no clean, low voiding Pb-free solder paste, formulated to have excellent solderability over a wide range of reflow profiles in both air and nitrogen across a wide range of challenging surface finishes including Ni/Au, Immersion Sn, Immersion Ag OSP copper and CuNiZn alloys. HF 212 is available in standard SAC alloys as well as the high reliability 90iSC alloy designed for applications where resistance to issues caused by thermal cycling is required, such as in automotive and aerospace environments.

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
- Suitable for fine pitch, high speed stencil printing up to 150mm^s⁻¹
- Clear residues for easy post-reflow inspection
- Printing: Fine pitch capability (0.3mm), stencil life (>8 hours) and abandon time (>4 hours)
- Reflow: effective over a wide range of reflow profiles in air or nitrogen
- Reflow: solders challenging surfaces such as CuNiZn and OSP copper

TYPICAL PROPERTIES

Solder Alloy/Powder:

The solder alloys used in HF 212 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.

90iSC solder paste contains a modified Pb-free solder alloy developed in a collaborative project for improved thermal reliability (compared with standard SAC alloys). It should not be used to solder to components or PCB finishes containing lead (Pb), as a low melting point alloy (initial melting point 98°C) will form.

Code	Alloy Composition	Melting Point (°C)
96S	Sn96.3Ag3.5	221
97SC/SAC305	Sn96.5Ag3Cu0.5	217
SAC0307	Sn99Ag0.3Cu0.7	217-228
90iSC*	Sn90.85Ag3.8Cu0.7Bi3.0Sb1.5Ni0.15	205-218
Powder Description	Particle Size Distribution (µm)	IPC Equivalent (J-STD 005A)
AGS	45-25	Type 3
DAP	38-20	Type 4
KBP/T5	25-15	Type 5

*Proprietary high reliability alloy

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.

Property	SAC0307, 97SC, 90iSC, 96S	SAC0307, 97SC, 90iSC	97SC/SAC305
Particle Size	AGS	DAP	KBP/T5
Metal Content (%)		88.5	
Brookfield Viscosity (cP)	750,000	750,000	900,000
Malcom Viscosity (Pa.s)	175	175	165
Thixotropic Index (Ti)	0.50	0.50	0.50
Slump, J-STD-005 (mm) 150°C, 15 minutes			
0.33 x 2.03 mm pads	0.25	0.25	0.25
0.63 x 2.03 mm pads	0.33	0.41	0.33

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

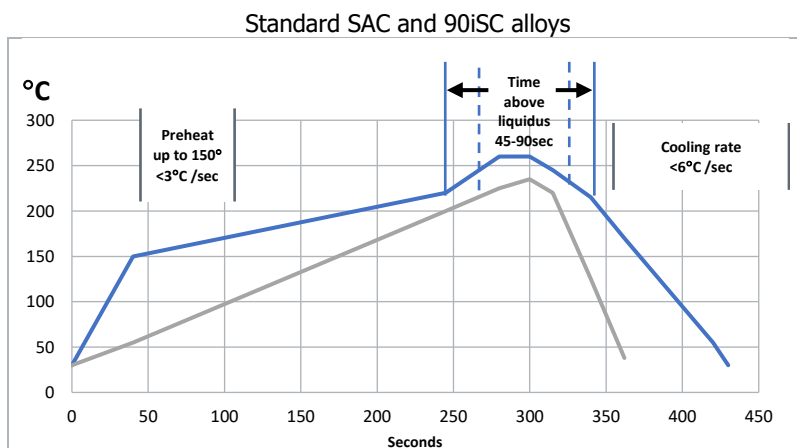
DIRECTIONS FOR USE

Printing:

HF 212 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 4 hours without requiring a knead cycle. Unlike some pastes, high squeegee pressures are not required, making HF 212 particularly useful for second side printing processes.

Reflow:

HF 212 can be reflowed using any standard heating methods including IR, convection, hot belt, vapour phase and laser soldering. Whilst HF 212 can be reflowed under nitrogen this is not essential. HF 212 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 <3°C
 Soak zone 150-200°C 60-180s
 200°C to peak <3°C
 Time above liquidus 40-90s
 Minimum peak temperature ≥235°C
 Time at peak temperature <40s
 Cooling rate <6°C/s
 Time to peak from ambient < 8 mins
 Nitrogen (if required) ≤1500ppm O₂

Cleaning:

The residues from HF 212 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 212 contains a stable resin system and low odour, slow evaporating solvents. HF 212 is classified as Type ROL0 to IPC/J-STD-004 standard.

Test	Specification	Test Method	Results
Copper Plate Corrosion	IPC/J-STD-004B	2.6.15C	Pass
Copper Mirror Corrosion	IPC/J-STD-004B	2.3.32D	Pass
Chlorides & Bromides	IPC/J-STD-004B	2.3.33	Pass
Surface Insulation Resistance (SIR) (without cleaning)	IPC/J-STD-004B	2.6.3.7	Pass
	Telcordia GR-78-Core	13.1.3	Pass
Electromigration (ECM) (without cleaning)	Belcore TR-NWT-000078	13.1.5	Pass
	Telcordia GR-78-Core	13.1.4	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-004B		ROL0

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STORAGE AND SHELF LIFE**Storage:**

HF 212 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 212 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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