Heraeus

Technical Data Sheet

Solder Paste Series F 540

Lead Free, Water Soluble Solder Pastes with Excellent Print Characteristics

1. Description

F540 is a state of the art water-soluble solder paste that features robust OA activity for unparalleled solderability. Optimized rheology and careful chemical selection result in consistent print volume and excellent print definition. A sophisticated flux activation system insures excellent wetting and minimal void formation with a variety of substrates. The flux composition is completely water soluble with good temperature resistance so that all residues are removed after cleaning in either hot or cold deionized water.

Key Benefits

- Easy Cleaning
- Excellent wetting
- Minimal voiding
- Excellent print characteristics

2. Product Name

Flux Series:	F540
Alloy:	Cu0.5 = Sn95.5/Ag4/Cu0.5 Ag35 = Sn96.5/Ag3.5 Ag5 = Sn96.5/Ag5 Sb5 = Sn95/Sb5

3. Physical Properties

Metal powder:

Particle size:

Particle Size Chart

Mesh Size	Microns Size	Particle Type
-325 +500	45-25	3
-400 +500	38-20	4
-500 +625	25-10	5

Shape:	Spherical	
Melting Point:	Cu0.5 = Sn95.5/Ag4/Cu0.5	(217-219°C)
	Ag35 = Sn96.5/Ag3.5	(221°C)
	Ag5 = Sn96.5/Ag5	(221-240°C)
	Sb5 = Sn95/Sb5	(232-240°C)

Solder Paste:

Metal Content:	Standard 90% ± 1%
Flux Content:	10 +/- 1%
Viscosity Range: (Brookfield RVT, TF Spindle, 5 RPM @25°C)	**H:** 800-1000 Kcps **M:** 600-800 Kcps **D:** 300-450 Kcps

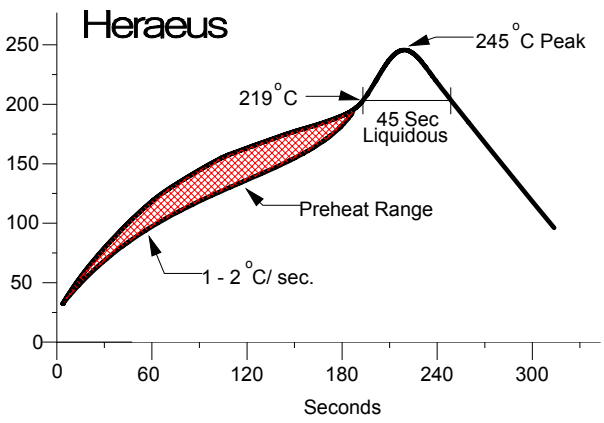
4. Performance Properties

Flux Activity: According to J-STD-004A	H1
Solder Ball Test: Per IPC-TM-650 2.4.43	Pass
Hot Slump : Per IPC-TM-650 2.4.35	Pass
Wetting: Per IPC-TM-650 2.4.45	Pass
Typical Print Thickness:	≥ 0.5 mm pitch: 150 – 200 microns <0.5 mm pitch: 100 - 125 microns
Minimum Pitch:	0.4 mm with type 4 mesh powder
Minimum Aperture Width:	200 microns with type 4 mesh powder
Print after wait:	1 hour

5. Reflow Parameters (recommendation)

- For optimum results the paste should be reflowed at 20-30°C above the liquidus point of the alloy.
- The time above liquidus should be from 30-60 seconds.
- The temperature ramp should be as fast as the components will withstand with no soak zone necessary.
- Reflow can be accomplished with any industry accepted process.
- Reflow at or below 200ppm O_2 for type 5 or smaller powder.

Cu0.5 (Sn 95.5/Ag 4/Cu 0.5) Reflow Profile



6. Recommended Processing Guidelines

Cleaning:

- Clean reflowed residues with hot deionized water at a minimum temperature of 40°C.
- If pressurized cleaners are used a minimum pressure of 40 psi should be maintained.
- If co-solvents or saponifiers are used with ultrasonic cleaners then a minimum of two deionized rinse baths should be used to insure complete removal of the residues and cleaning solvents.
- For optimal results clean parts as soon after reflow as possible.
- To clean wet paste prior to reflow use isopropyl alcohol or similar solvents.

Printing:

- For optimum performance, temperature should be between 23-27°C

Dispensing:

- Set up dispensing equipment according to manufacturer's guideline. Always try to maximize air pressure to reduce chance of tip clogging or flux separation.

- Avoid excessive heat during syringe usage. If dispenser is not going to be used for an extended period of time, the syringe should be removed from the machine and purging flux SF39 (supplied in syringes from Heraeus) should be injected through the dispensing equipment until clear gel comes out of the machine. This will lubricate the equipment and reduce the chance of drying or clogging after down time.
- Reverse the process with solder pastes for start up.

General Cleaning:

For equipment and stencil cleaning IPA, Acetone or similar solvent can be used.

7. Packaging

- Available in 5, 10 and 30cc syringes
- 250, 400 and 1000 gram jars
- 6 ounce, 12 ounce and Pro*Flow*™ cartridges

8. Safety

- When using, do not eat, drink or smoke.
- Avoid contact with skin and eyes.

9. Storage

- All paste should be refrigerated and should not exceed 10°C. **
- Avoid direct sunlight and exposure to temperatures exceeding 35°C.
- Allow paste to come to room temperature for a minimum of 2 hours prior to opening.
- Paste packaged in syringes and cartridges should be stored tip down.

** Solder paste packaged in jars may be stored at room temperature (20 - 25° C) if used within 2 months of shipment.

10. Warranty

- Material guaranteed to meet specifications for 9 months from date of manufacture.

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