



Lead free solder paste Delphine 5503

INTERFLUX®
ELECTRONICS N.V.



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Lead free, No-clean and halide free solder paste

Description:

Interflux® **Delphine 5503** is optimized for stencil-life, stability and hot slump properties when compared to Delphine 5502 solder paste. The standard powder size (type3, 25µ-45µ) solder paste is capable of printing 0,3mm pitch components and 0,200mm apertures with printing speeds up to 150mm/sec.

Delphine 5503 works very well in closed printing systems like Proflow™. The solder paste shows excellent performance in Pin-in-Paste applications, also with normal squeegees.

Because this solder paste is absolutely halogen free, it eliminates the risk of formation of dangerous metal salts which is typical for solder chemistry using halides. These metal salts, formed between halides and lead-free alloy metals are easily soluble in water and therefore pose an increased risk on corrosion.

The post reflow solder residue of **Delphine 5503** is very safe.

Delphine 5503 can be reflowed with commonly used lead-free solder profiles under both air and nitrogen. It also performs very well in vapour phase soldering systems.

The solder paste has good wetting ability on lead-free surface finishes.

The residue can be cleaned off easily with conventional cleaning



Availability

| alloy | metal content | powder size | packaging |
|------------------|-------------------------|------------------------------|-------------------------------------|
| Sn96,5Ag3Cu0,5 | printing: 88 - 88,5% | Standard type 3 (25- 45µ) | 500g jar |
| Sn95,5Ag4Cu0,5 | | | 500g in 6Oz. Cartridge |
| Sn95,5Ag3,8Cu0,7 | dispensing: 84-85% | other sizes upon request | 1kg-1,2kg-1,3kg in 12 Oz. cartridge |
| Sn96,5Ag3,5 | | | 5-10-30cc syringes |
| Sn95,8Ag4,2 | | | PuckPack™ and ProFlow™ cassettes |
| Sn99,3Cu0,7 | | | |

More information:

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Key advantages:

- Absolute halide free
- For high and low volume/ speed assembly lines
- Classification to IPC and EN: **RE LO**
- Suited for pin-in-paste applications
- Suited for vapour phase soldering
- Good wetting on all finishes including OSP
- Increased slump resistance
- Printer abandon time
2h at 18-25°C and 40-60% R.H.
- Print life exceeding
24h at 18-25°C and 40-60% R.H.



Reflow profile for SAC and SnAg alloys

General description

In general a soak profile is advised and may be used when temperature differences across a board, due to a high mix of components or large board sizes, need to be levelled out. Or when the number of voids, if present because of material combination, need to be decreased.

When soldering in air the profile's peak temperature should occur within a frame time of maximum 300sec or 5 minutes from the profile's starting point.

The correct conveyor speed (m/min) can be calculated by dividing the total chamber length (m) of the heating zones by the desired process time (min). Soldering under nitrogen has fewer

limitations.

When soldering an assembly in a lead free solder process, care must be taken not to overheat components especially when using air convection or IR ovens. It is very important to know the temperature limitations of the components used on the board. To get a good thermal mapping of the board it is advised

to use thermocouples and a thermal measuring tool. Measure on small outline, big outline and temperature sensitive components. Measure on the board side near the conveyor chain, in the middle of the board and close to, or on heat sinks.

Profile recommendations

Preheat

From room temperature until about 200°C at a rate of 1-3°C/seconds. Higher heating rates could result in component cracking due to absorbed moisture.

Soak

From 180°C to about

200°C at a rate of 0,5-1°C/seconds.

In some cases a temperature holding soak zone is used to level out differences on a board. It is often used on high mix boards or to reduce voids in certain lead free processes. To reduce voids

a 90 sec soak between 180°C and 200°C is recommended.

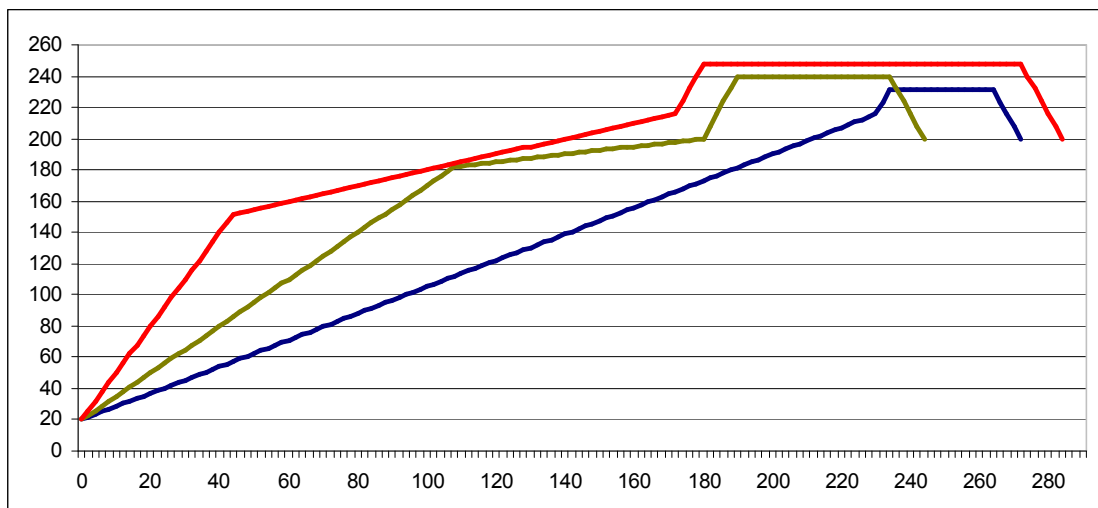
Reflow

Peak temperature used is related to component specifications. In general between 235°C and 250°C. The time in

liquidus (over melting point of the alloy used) could be between 45 seconds and 90 seconds.

Cooling

Cooling rate around -4°C/ second because of differences in thermal expansion of different materials





Handling

Storage

Store the solder paste in the original packaging, tightly sealed at a preferred temperature of 3° to 7°C

Handling

Let the solder paste reach room temperature prior to opening the packaging. Stir well before use.

Printing

Apply enough solder paste to the stencil to allow smooth rolling during printing. Regularly replenish fresh solder paste.

Maintenance

Set an under stencil clean interval which provides continuous printing quality.

Reuse

Do not mix used and fresh paste. Do not put packages back into refrigeration when already opened. Store used paste in a separate jar at room temperature.

Reflow

Consult profile.

Test results

conform EN 61190-1-2(2002) and IPC J-STD-004A/J-STD-005

| Property | Result | Method |
|-----------------------------|-------------------|--------------------------------|
| Chemical | | |
| flux designator | RE / LO | J-STD-004A |
| qualitative copper mirror | pass | J-STD-004A IPC-TM-650 2.3.32 |
| qualitative halide | | |
| silver chromate (Cl, Br) | pass | J-STD-004A IPC-TM-650 2.3.33 |
| spot test (F) | pass | J-STD-004A IPC-TM-650 2.3.35.1 |
| quantitative halide | 0,0% | J-STD-004A IPC-TM-650 2.3.35 |
| Environmental | | |
| SIR test | pass | J-STD-004A IPC-TM-650 2.6.3.3 |
| SIR | pass | GR-78-CORE, Rev. 9/97 |
| qualitative corrosion, flux | pass | J-STD-004A IPC-TM-650 2.6.15 |
| electro chemical migration | pass | GR-78-CORE, Rev. 9/97 |
| ECM | pass | Siemens Prüfprotokoll (2006) |
| Property | Result | Method |
| Mechanical | | |
| solder ball test | preferred | J-STD-005 IPC-TM-650 2.4.43 |
| after 15min | | |
| after 4h | acceptable | J-STD-005 IPC-TM-650 2.4.43 |
| wetting test | pass | J-STD-005 IPC-TM-650 2.4.45 |
| slump test | pass | J-STD-005 IPC-TM-650 2.4.35 |
| after 10min @ 25°C | | |
| after 15min @ 150°C | pass | J-STD-005 IPC-TM-650 2.4.35 |



Operating parameter recommendations

P r i n t i n g
speed: 20—150 mm/sec
squeegee pressure: ±250g / cm length
U.S.C. interval: every 15 boards
abandon time: 2 h o u r s
temperature range: 15°C to 25°C

Mounting
tack time: > 24 hours

Reflow
reflow profile: linear and soak
heating type: convection, vapour
phase, etc

I.C.T
flying probe testable
pin-bed testable

Cleaning
safe residues (no-clean formulation
100% halide free)
no post reflow cleaning necessary, however,
residue is easily completely removed
Un-reflowed paste and stencil cleaning re-
commended with
VIGON® : SC200, SC202, SC400
ZESTRON® : SD300, SD301
ATRON® : SP200
INTERFLUX® : SC8020*

(spray in air in stencil cleaning equipment -* in Under Stencil
Cleaners of printers or pre-saturated wipes)

reflowed paste residue is easily removed with
following recommended cleaning agents :
VIGON® : A200, A300
ZESTRON® : FA+, VD

D i s c l i m e r

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