



# No clean solder paste Delphine 5504

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ELECTRONICS N.V.



Technical data D5504

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## Low voiding, No-clean, Lead free solder paste

### Description:

Delphine **5504** is a lead free solder paste for SnAgCu, SnAg and SnCu-alloys.

Delphine **5504** has been specially formulated to give extremely **low voiding** with BGA and conventional joints.

Delphine **5504** exhibits good tackiness and good stencil life. It keeps its rheological characteristics during screening, resulting in a stable screen process. It is hydrophobic and has a high resistance to humidity.

To assure the highest reliability, the solder paste is absolutely halogen free. It does not contain rosin and requires less oven maintenance.

The residues after reflow are minimal and clear, they are easy to be penetrated by flying probe- and ICT-test pins.



### More information:

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### Key advantages:

- Extremely low voiding
- Absolutely halogen free
- Wide process window
- High abandon time
- Good wetting on HASL, Ni/Au, OSP Cu, I-Sn
- Low residue after reflow

## Availability

alloy	metal content	powder size	packaging
Sn96,5Ag3Cu0,5	printing: 88 – 88,5%	Standard type 3 (25– 45µ)  other sizes upon request	500g jar  1kg—1,2kg—1,3kg in 12 Oz. cartridge  other packages are available upon request
Sn95,5Ag3,8Cu0,7			
Sn95,5Ag4Cu0,5			
Sn96,5Ag3,5			
Sn95,8Ag4,2			
Sn99,3Cu0,7			



## Reflow profile for SAC and SnAg alloys

### **General description**

In general profile with limited soak is advised. Also ramp profiles and soak profiles are possible. Soak profiles 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 voids, if present, need to be decreased.

When soldering in air the profile's peak temperature should occur within a time frame of maximum 300sec or 5 minutes from passing the 40°C 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 (SnAgCu type alloys)

### **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.

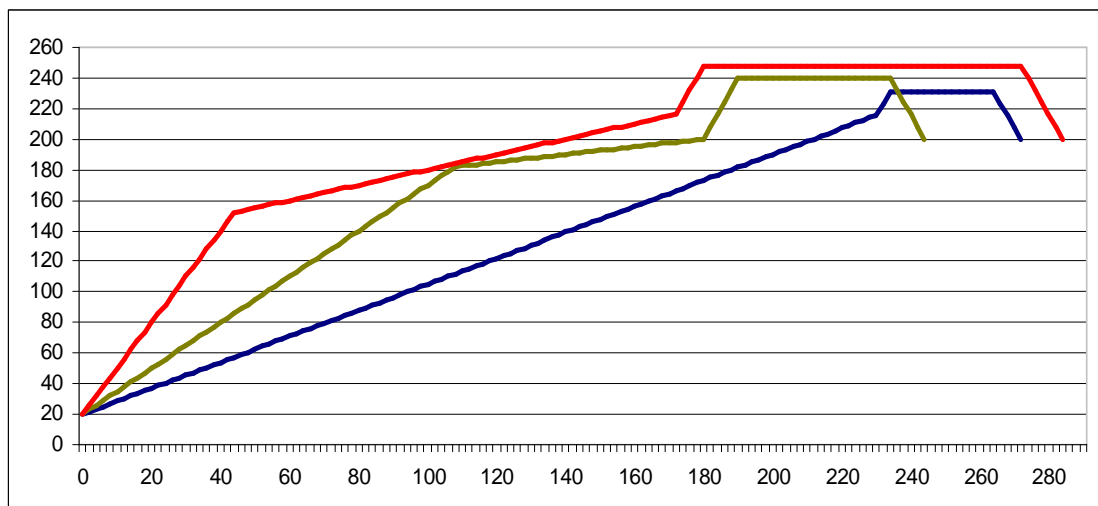
### **Reflow**

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. Regular replenish fresh solder paste.

### Maintenance

Set an under stencil clean interval which provides continuous printing quality. ISC8020 is recom-

mended as cleaning agent in pre saturated wipes and USC liquid.

### 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 on page 2

## Test results

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

Property	Result	Method
<b>Chemical</b>		
qualitative copper mirror	<b>pass</b>	J-STD-004A IPC-TM-650 2.3.32
qualitative halide		
silver chromate (Cl, Br)	<b>pass</b>	J-STD-004A IPC-TM-650 2.3.33
flux classification	<b>RELO</b>	J-STD-004A
<b>Environmental</b>		
SIR test	<b>pass</b>	J-STD-004A IPC-TM-650 2.6.3.3

Property	Result	Method
<b>Mechanical</b>		
solder ball test after 15min	<b>preferred</b>	J-STD-005 IPC-TM-650 2.4.43
after 4h	<b>acceptable</b>	J-STD-005 IPC-TM-650 2.4.43
wetting test	<b>pass</b>	J-STD-005 IPC-TM-650 2.4.45
slump test after 15min at 25°C	<b>pass</b>	J-STD-005 IPC-TM-650 2.4.35
after 10min at 150°C	<b>pass</b>	J-STD-005 IPC-TM-650 2.4.35



## Operating parameter recommendations

Printing speed:	20—120 mm/sec
squeegee pressure:	250g—350 / cm
length	
U.S.C. interval:	every 10 boards
temperature range:	15°C to 25°C
Mounting tack time:	> 8 hours
Reflow reflow profile:	linear and soak
heating type:	convection, vapour phase, etc
I.C.T	
flying probe testable	
pin-bed testable	

D i s c l i m e r

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