



LMPA™ - Q6

Low melting point lead-free, halide free solder paste

Description

LMPA™ - Q6 is a no-clean, absolutely halide free and lead-free solder paste with the patent pending LMPA™ low melting point alloys.

The LMPA™ alloys have increased mechanical properties compared to the SnBi(Ag) alloys.

Moreover they are suitable for wave soldering and selective soldering.

This makes them the perfect drop-in alloys for many electronic applications that are today being soldered with Sn (Ag)Cu alloys

The low melting point allows for lower and shorter reflow profiles.

This will result in reduced energy consumption, lower costs and increased line capacity and production speeds.

Board and components will experience less stress, resulting in less ageing and longer life time of the electronic unit.

LMPA™ - Q6 substantially reduces the tombstone phenomenon and exhibits extremely low voiding after reflow.

LMPA™ -Q6 has improved life time, stability and residue cosmetics compared to DP 5600 LMPA™. Residue after reflow is smooth and transparent.

The solder paste is designed for fast printing speeds and suitable for Pin-in-Paste applications.

The solder paste is classified as RO LO according IPC and EN standards.



Products pictured may differ from the product delivered



Key properties

- Anti-tombstone
- Extremely low voiding
- Fast printing speeds
- Low transparent residue
- Absolutely halogen free
- Increased mechanical reliability
- Alloy suitable for wave and selective soldering
- Reduced cost of production
- Increased line capacity
- Lower thermal stress on electronic unit
- Longer life time of the electronic unit



LMPA[™]-Q6

Availability

alloy	metal content	melting T°	powder size	packaging
LMPA [™] -Q	printing: 89% dispensing : 86%	139°C-176°C	Type 3 / Type 4	jars: 500g Semco syringes 5/10/30 CC Syringes with manual plunger 5/10/30 CC

Handling

Storage

Store the solder paste in the original packaging, tightly sealed at a preferred temperature of 7° to 15°C.
Shelf life 6 months.

Handling

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

Printing

Assure good sealing between PCB and stencil. A negative print gap of 0,2 to 0,4mm is advisable.
LMPA[™]-Q6 is a solder paste that has been designed for fast printing speeds. Minimal advised printing speed is 50mm/s. The paste requires less squeegee pressure than conventional solder pastes. Apply no more than enough squeegee pressure to get a clean stencil. 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 recommended as cleaning agent in pre saturated wipes and USC liquid.

Reuse

Avoid mixing used and fresh paste in a jar. Do not put packages back into refrigeration when already opened. Store used paste in a separate jar at room temperature. A test board before reusing in production is advisable.



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Test results

conform IPC J-STD-004B/J-STD-005

Property	Result	Method
Chemical		
qualitative copper mirror	pass	J-STD-004A IPC-TM-650 2.3.32D
silver chromate (Cl, Br)	pass	J-STD-004B IPC-TM-650 2.3.33D
fluoride spot test	pass	J-STD-004B IPC-TM-650 2.3.35.1
corrosion test	pass	J-STD-004B IPC-TM-650 2.6.15
flux classification	RO LO	J-STD-004B
spread test	99,89 mm²	J-STD-004B IPC-TM 650 2.4.46
Environmental		
SIR test	pass	J-STD-004B IPC-TM-650 2.6.3.7

Property	Result	Method
Mechanical		
solder ball test		
after 15min	pass	J-STD-005 IPC-TM-650 2.4.43
after 4h	pass	J-STD-005 IPC-TM-650 2.4.43
wetting test	pass	J-STD-005 IPC-TM-650 2.4.45
slump test		
after 15min at 25°C	pass	J-STD-005 IPC-TM-650 2.4.35
after 10min at 100°C	pass	IF SLMP LMPA [™]



- ✓ Low temp soldering alloy
- ✓ Higher reliability
- ✓ Environmentally friendly

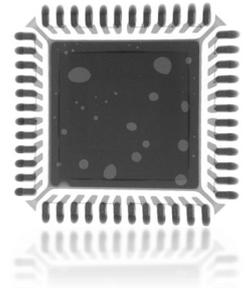
LMPA[™]-Q6

Profile recommendations for LMPA[™]-Q6

LMPA[™] - Q6 allows for lower and shorter reflow profiles compared to Sn(Ag)Cu– alloys. This drastically reduces the risk of overheating temperature sensitive components. However it is always advisable to measure a thermal profile with thermocouples on a variety of components and locations to get a good thermal mapping of the board. 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.

In general a ramp profile is used but a soak is also possible.

As NiAu needs more energy to be wetted, the advised profile is a bit higher and longer than for other PCB and component finishes.



Extremely low voiding

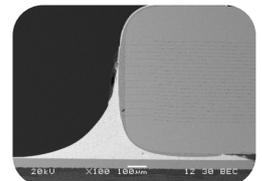
Profile duration

Profile duration (s) is the time that the board spends in the heating zones. It is the total length of all heating zones (m) divided by the conveyor speed (m/min) times 60.

Advised min : 150s

Advised min NiAu : 200s

Advised max : 270s



Good wetting

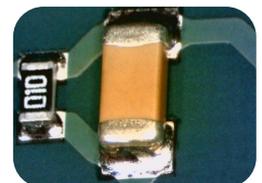
Preheat

To allow absorbed moisture in the components to evaporate slowly and avoid component cracking, keep heating rate below 3°C/s. Try to avoid a hot air temperature setting in the first heating zone above 150°C.

Keep a steady heating rate till about 180°C. At this point, the alloy will totally liquid.

Preheat time : between 50-160s

Advised rate: between 1 - 1,5 °C/s



Shiny joints

Anti-tombstone

Reflow

Peak temperature between 190°C and 220°C. Higher temperatures are possible. The time over liquidus (where the alloy is entirely in liquid phase) can be between 30s and 90s.

Advised Peak T° : 200°C

Advised Peak T° NiAu: 210°C

Cooling

It is advisable to cool not faster than -4°C/s because of differences in thermal expansion of different materials (component and boards). Faster cooling in general gives stronger solder joints. Avoid vibration and mechanical shock during the cooling phase when exiting the reflow zone. For thermally heavy units an additional fan cooling may be beneficial.



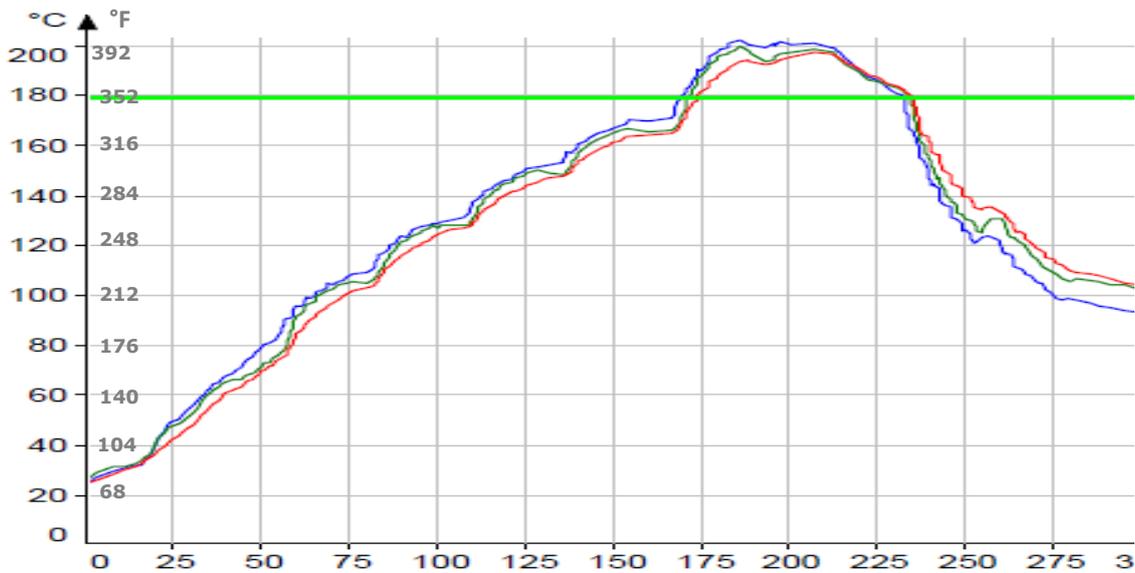
Low, clear residue



- ✓ Low temp soldering alloy
- ✓ Higher reliability
- ✓ Environmentally friendly

LMPA[™] - Q6

Example profile LMPA[™]-Q6



Example profile LMPA[™]-Q6 for NiAu





Situations that might need an adjustments

HAL finish of the PCB

When too high Cu content in the HAL bath of the PCB manufacturer causes a reduced wettability of the HAL finish.

When the HAL thickness is too thin and causes a reduced wettability.

Through hole connectors used as an SMD component

When wetting is not sufficient , typical for NiAu

Possible remedies:

- Reduce belt speed with about 20-25%
- Increase temperature settings of all zones with 10°C, repeat until problem has been solved

Components with leads sunk too deep into the plastic body of the component

Some batches of Elco's and crystal oscillators can have their leads sunk too deep into their plastic body . This can inhibit the solder to make good contact with the component leads with lower temperature profiles.

Possible remedies:

- Increase stencil thickness to 150-200µm



- ✔ Low temp soldering alloy
- ✔ Higher reliability
- ✔ Environmentally friendly

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Health and safety

Please always consult the safety datasheet of the product.

Operating parameter recommendations

Printing

speed:	50—100 mm/sec
squeegee pressure:	125g—300g/cm length
stencil life:	>24 hours
U.S.C. interval:	every 5-7 boards
temperature range:	15 to 25°C
humidity range:	40% to 75% r.H.

Mounting

tack time: > 8 hours

Reflow

reflow profile:	linear and soak
heating type:	convection, ...

I.C.T

flying probe testable
pin-bed testable

Cleaning

Cleaning of the paste from stencils and tools is recommended with Interflux[®] **ISC 8020**.

The post reflow residues of LMPA[™] - Q6 are highly reliable and do not need to be cleaned, however they can be cleaned if desired.

Trade name : LMPA[™] - Q6 Low Melting Point Solder Paste

Note

LMPA[™] is a trade mark of Interflux[®] Electronics N.V.

LMPA[™] alloys are patent pending and intellectual property Interflux[®] Electronics N.V.

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