INTERFLUX® ELECTRONICS

LMPA-Q

- Environment friendly
- Lower production costs
- High reliability

LMPA-Q7

Low melting point lead-free, halide free solder paste

Description

LMPA-Q7 is a no-clean, absolutely halide free and lead-free solder paste with the LMPA-Q low melting point alloy.

LMPA-Q7 is an adapted version of the LMPA-Q6 for better printing stability and optimised use in cartridges.

The LMPA-Q alloy has increased mechanical properties compared to the SnBi(Ag) alloys.

Moreover the alloy is suitable for wave soldering and selective soldering.

This makes it the perfect drop-in alloy 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.

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

LMPA - Q7 substantially reduces defects related to high soldering temperatures like hidden pillow, hot tear, delamination,cracking…

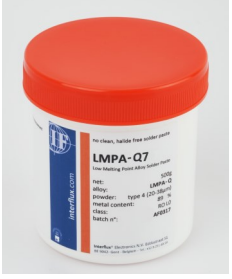
This will also result in reduced energy consumption, lower costs and increased line capacity and production speeds.

The solder paste also exhibits extremely low voiding after reflow, in general <10%, and low tombstoning.

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

The residue after reflow is smooth and transparent.

The solder paste is classified as RO L0 according IPC and EN standards.



Products pictured may differ from the product delivered

RoHS compliant

Key properties

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

S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

Availability

alloy	metal content	melting T°	powder size	packaging
LMPA-Q	printing: 89% jetting : 84%	139°C-176°C	**Type 4**(*) / Type 3 Type 5 (conditional)	Jars: 250g, 500g Semco cartridges : 500g, 1kg, 1,2kg Syringes: 30CC (Iwashita)
(*)= standard				

Handling

Storage

Store the solder paste in unopened condition in refrigeration around 7°C.

Store cartridges in a horizontal position.

Shelf life 6 months.

Handling

Allow the paste to come to room temperature in a closed condition. When opening the jar, stir well for 2min with a spatula that is big enough. The use of automated mixing is possible.

Printing

Assure good sealing between PCB and stencil. A negative print gap of 0,2 to 0,4mm is advisable.

LMPA-Q7 is a solder paste with a large printing speed window: 25-100mm/s. 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. The dwell height of the idle squeegee should be high enough so it does not touch the solder paste. Regularly replenish fresh solder paste.

Maintenance

Set an under stencil clean interval which provides continuous printing quality. **Do not use water based or IPA based stencil cleaners. ISC8020** is recommended as cleaning agent in pre saturated wipes and USC liquid.

Reuse

Avoid mixing used and fresh paste in a jar. Store used paste in a separate jar at room temperature. The use of automated mixing is advisable. A test board before reusing in production is advisable.

S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

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

Property	Result	Method
Chemical		
qualitative copper mirror	**pass**	J-STD-004B 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 L0**	J-STD-004B
spread test	**97,26 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

S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

Profile recommendations for LMPA-Q7

LMPA-Q7 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. A peak soak profile at 190°C is typically used for some BGAs, LGAs, QFNs that are very sensitive to warping. As NiAu needs more energy to be wetted, the advised profile is a bit higher and longer than for other PCB and component finishes.

Nitrogen can be used but is not necessary.

If required, the LMPA-Q alloy can be soldered with lead-free soldering temperatures as used for SnAgCu-alloys (230°-250°C peak). In this case, it is recommended to check and observe if the solder paste chemistry has not been exhausted. This would manifest itself in solder joints that do not look as they should.

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 (See note about NiAu and shock resistance on P.7)

Advised max : 270s

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

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

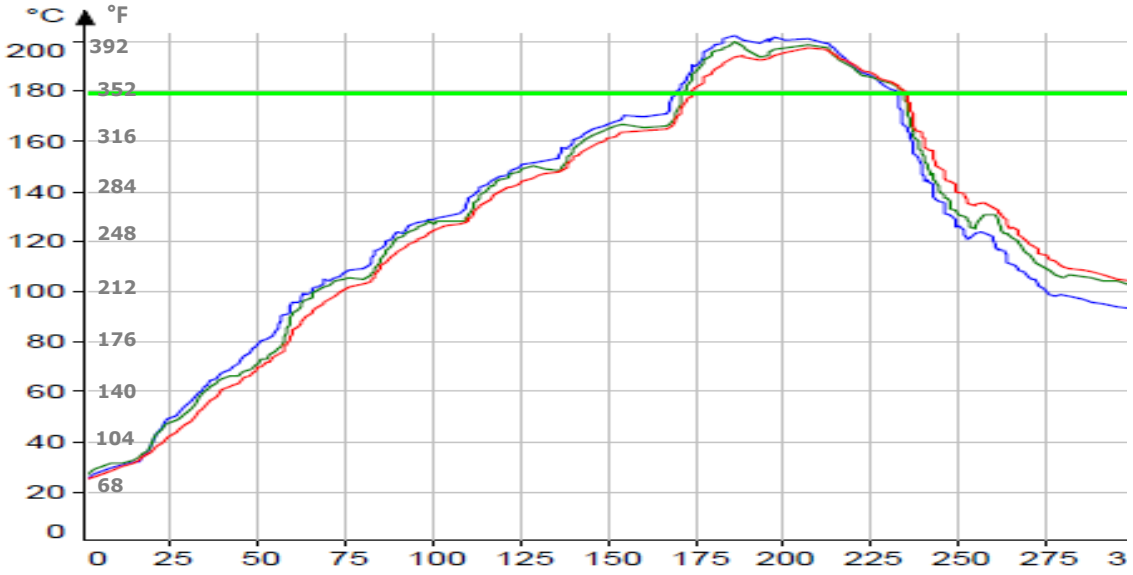
Advised Peak T° NiAu: 210°C (See note about NiAu and shock resistance on P.7)

Cooling

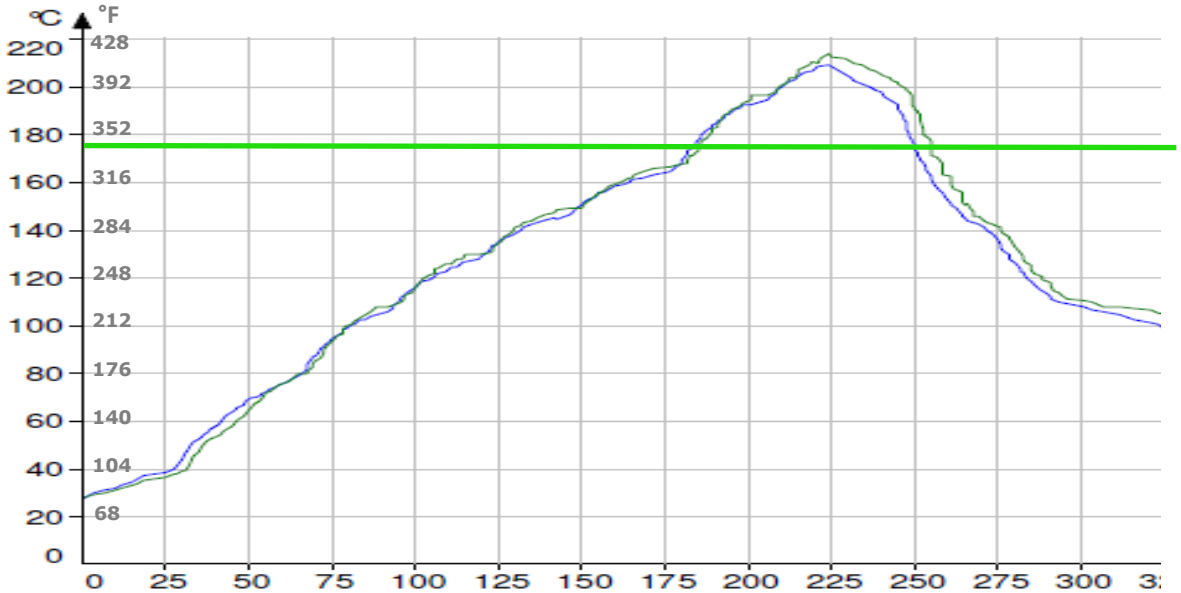
Cooling is advisable. Set cooling fan speeds to high but do not cool faster than -4°C/s because CTE differences of different materials (component and boards). If the oven has no cooling, external cooling fans are advisable. Faster cooling in general gives stronger solder joints. Avoid vibration and mechanical shock during the cooling phase when exiting the reflow zone.

S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

Example profile LMPA-Q7

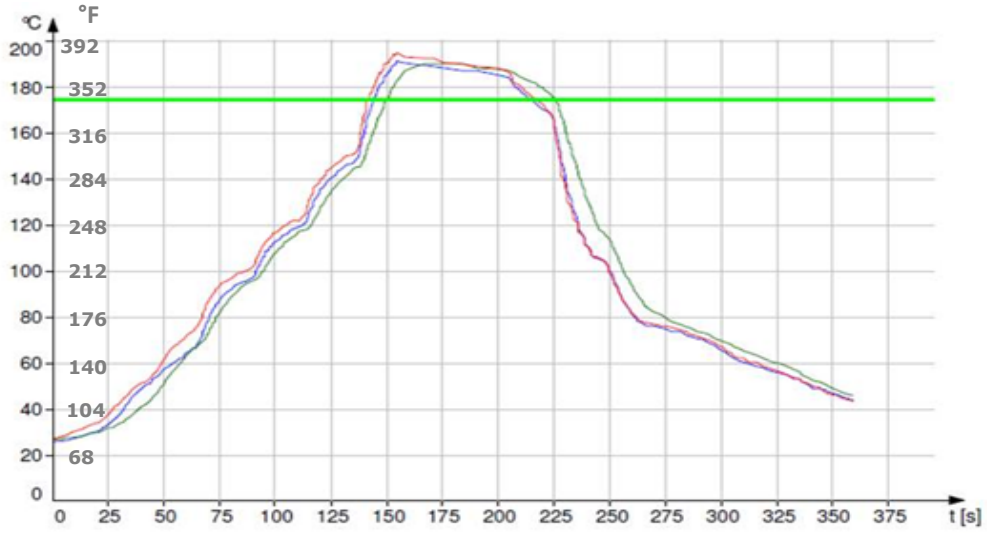


Example profile LMPA-Q7 for NiAu



S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

Example profile LMPA-Q7: peak soak profile at 190°C for some BGAs, LGA's, QFNs that are very sensitive to warping



S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

Applications that might need an adjustment

Applications that require a shock resistance

The use of NiAu finish will have a negative impact on the shock resistance of low melting point solder joints.

When the electronic unit will experience mechanical shock in the field, it is recommended to use other finishes like Cu-OSP, I-Sn, I-Ag or HAL.

For BGAs, non solder mask defined pads will give better shock resistance than solder mask defined pads.

Some components that require attention:

- SMD connectors that experience forces

SMD connectors can experience forces during final assembly or in the field.

- Some components with leads sunk into the plastic body of the component

Some Elco's and crystal oscillators can have their leads sunk too deep into their plastic body . Also some LED connectors may be affected. This can cause floating and inhibit the solder to make good contact with the component leads resulting in a solder joint with lower mechanical strength.

Possible adjustments:

- Increase stencil thickness to 150-200µm
- Add extra solder paste by dispensing
- Use cooling after reflow
- Use low melting point preforms

NOTE: A design rules document for low melting point alloys is available on request : td@interflux.com

S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com

Health and safety

Please always consult the safety datasheet of the product.

Operating parameter recommendations

Printing

speed:	25—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.**

Trade name : LMPA - Q7 Low Melting Point Solder Paste

Note

The LMPA-Q alloy is intellectual property of Interflux® Electronics N.V.

Disclaimer

www.interflux.com

S.A. INTERFLUX® ELECTRONICS N.V - Eddastraat 51 - BE-9042 Gent - Belgium
tel.: +32 9251 49 59 - fax.: +32 9251.4970
www.interflux.com - Info@interflux.com