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Solder Paste Test Program (SPTP)

NC676 Solder Paste

Alloy: **63/37 Type 3** Metal Loading: **89.5%**
QC/Lot#: **23826** Mfg Date: **7/18/2012**

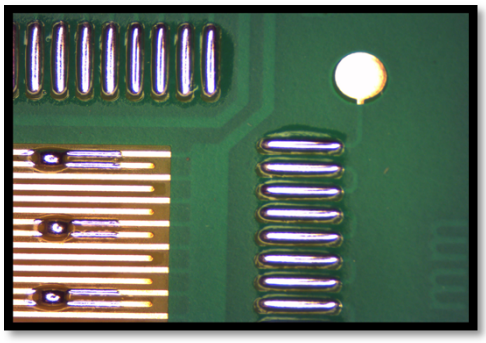
Contents

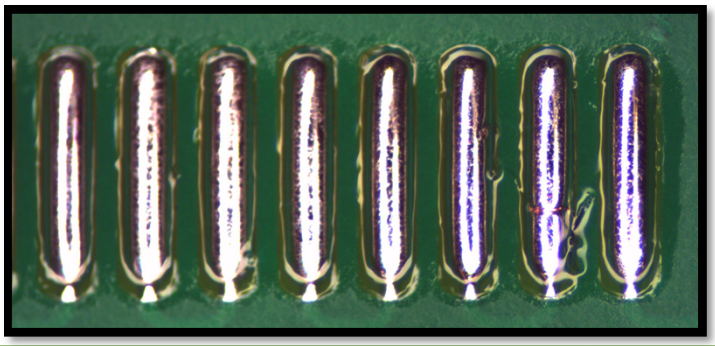
Summary

Leaded paste that is no clean, pin probable and halogen free. Attributes compared to the other products that were tested are below:

* Minimal Graping
* Low slump with low viscosity
* Excellent wetting
* Great open time with tack life over 72 hours
* Fantastic Cosmetics

Cosmetics





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Solder Paste Test Program

Standards Tests

NC676 Solder Paste

Metal Loading

Metal	89.4%

Viscosity

Brookfield	625 Kcps
Malcom	130 Pa·s

Silver Chromate

Pass

Copper Mirror

Pass (No evidence of mirror breakthrough)

IPC Classification

ROL0

Flouride

Pass

Tack Testing

0 Hours	24 Hours	48 Hours	72 Hours	96 Hours
104.48	111.12	112.02	115.28	80.68

SIR

Pass

Electromigration

Pass

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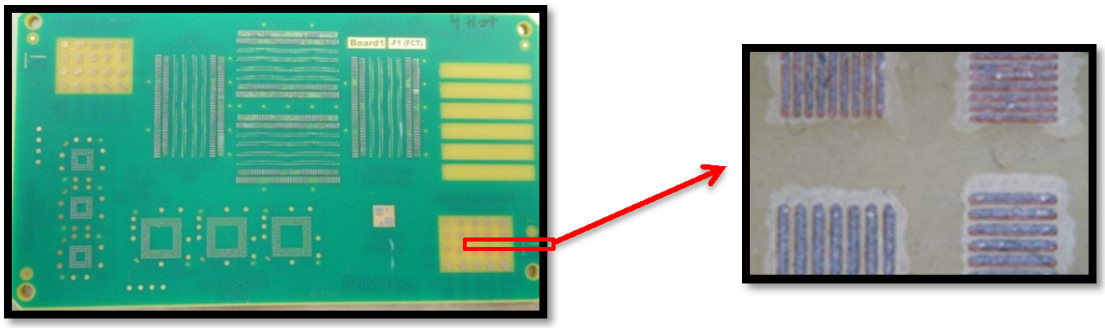
Solder Paste Test Program

Cold Slump

NC676 Solder Paste



Cold Slump

Bridging Quantity

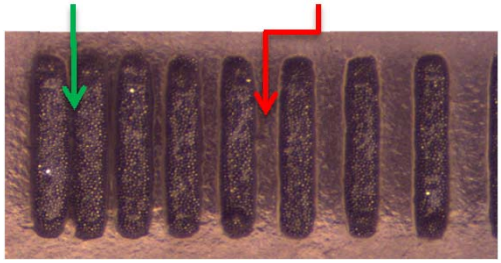
Pad	Defect Count
0.10mm	0
0.15mm	0
0.20mm	0
0.225mm	0
0.25mm	0

IPC Slump Results

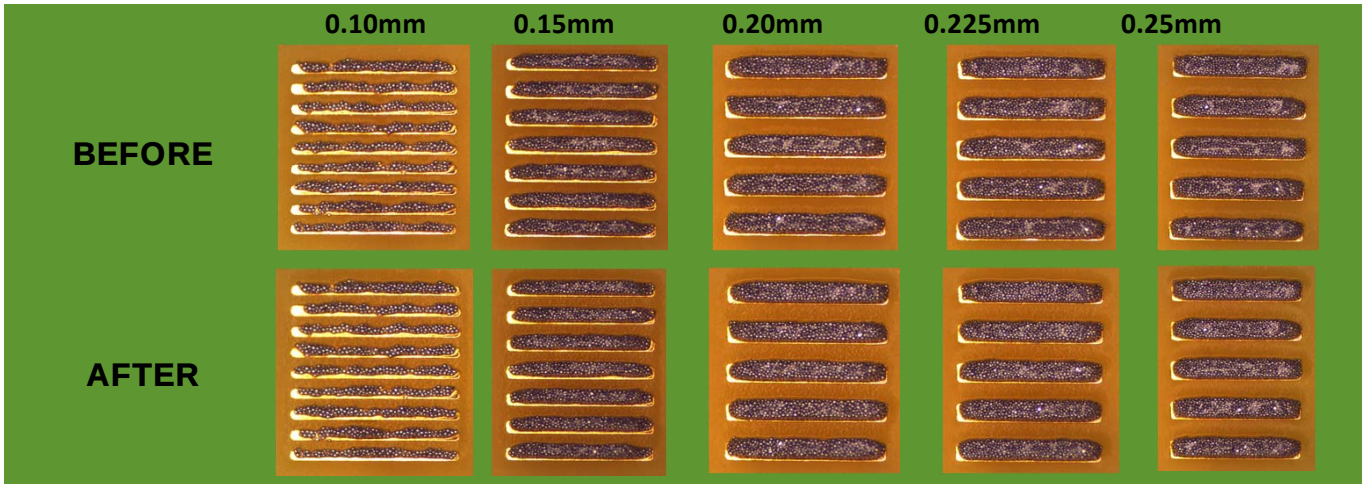
Cold Slump 0.06

Passing Result

25C slump fail limit (0.25mm)



Cold Slump Test Board



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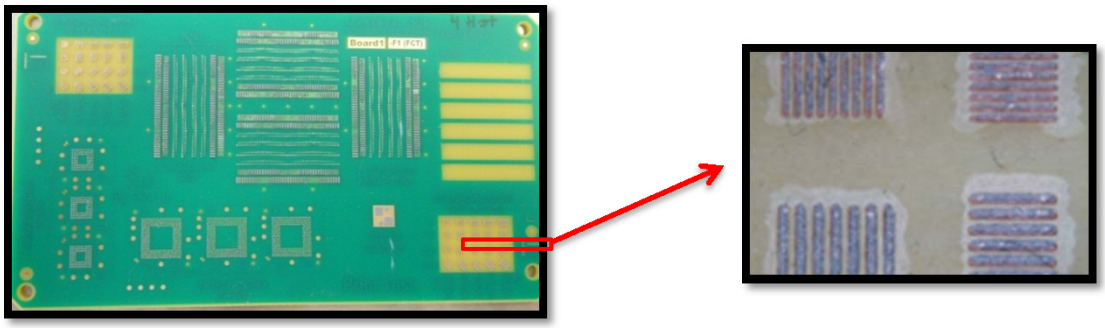
Solder Paste Test Program

Hot Slump

NC676 Solder Paste



Hot Slump

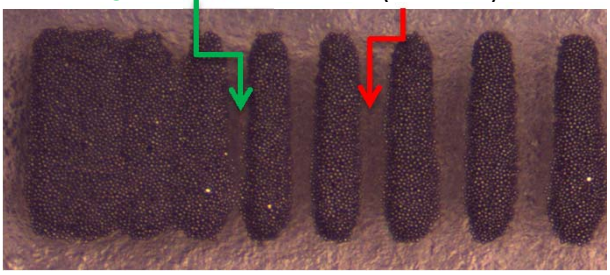
Bridging Quantity

Pad	Defect Count
0.10mm	0
0.15mm	0
0.20mm	0
0.225mm	0
0.25mm	0

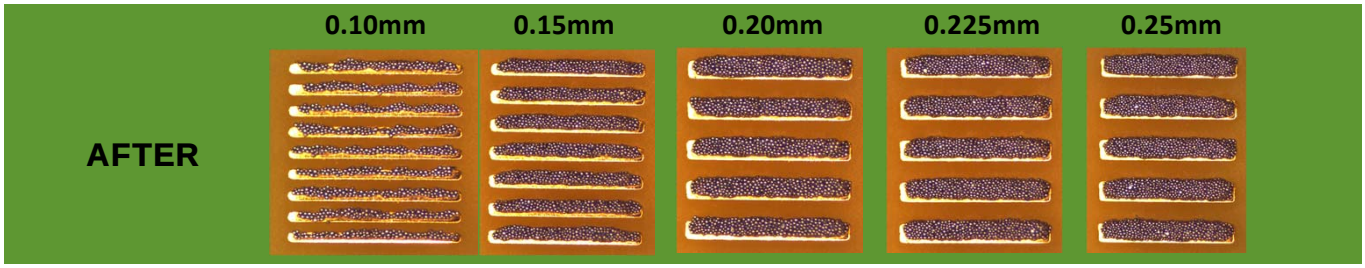
IPC Slump Results

Hot Slump 0.20
Passing Result

150C slump fail limit (0.30mm)



Hot Slump Test Board



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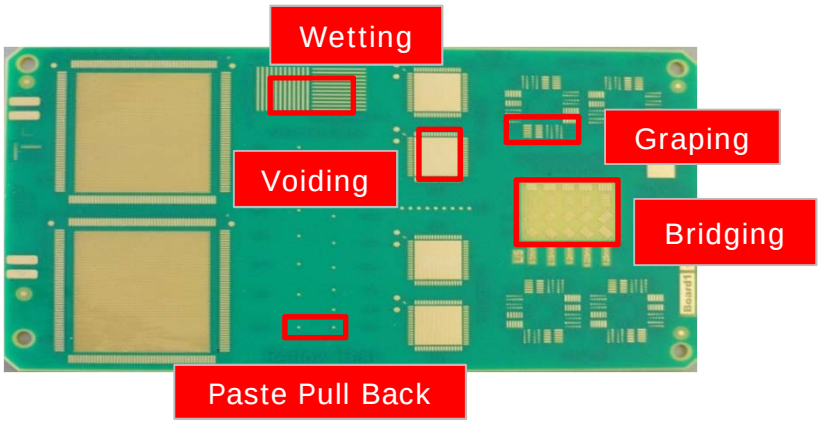
Solder Paste Test Program

Reflow Data

NC676 Solder Paste

Inspection Area Overview

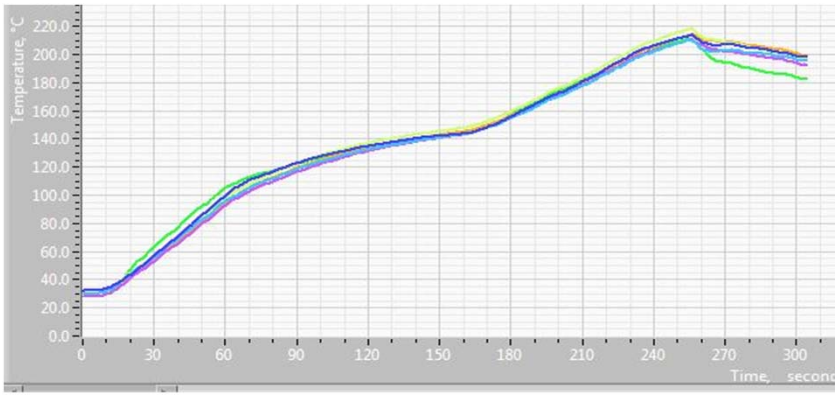


High Curve

Low Curve

N/A for Leaded Paste

Optimal Curve



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Solder Paste Test Program

Reflow Data (Graping)

NC676 Solder Paste

Graping Inspection

Measure the performance of graping on 96 pads with ½ being mask defined. Pad size varies from 7X7 mil to 12X12 mil . When counting the pads we identified the largest feature pad that showed the graping effect then counted all pads at this size and smaller. These are recorded in the tables below. Pads were on four different locations of the board.

High

CRD	Brd 1	Brd 2	Brd 3	Brd 4	Total
G1					
G7					
G10	N/A for Leaded Paste				
G15					

Graping Comparison

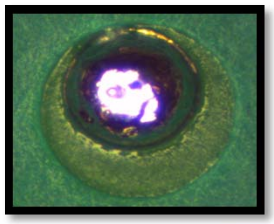
Product	Total Grapes
NC676	32
Competitor A	24
Competitor B	61

Low

CRD	Brd 1	Brd 2	Brd 3	Brd 4	Total
G1					
G7					
G10	N/A for Leaded Paste				
G15					

Optimal

CRD	Brd 1	Brd 2	Brd 3	Brd 4	Total
G1	4	2	1	1	8
G7	5	3	2	0	10
G10	4	2	0	2	8
G15	3	3	0	0	6



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Solder Paste Test Program

Reflow Data (Wetting)

NC676 Solder Paste

Wetting/Spread Inspection Test

In each of the wetting/spread ares we identified the number of lines that had one or more bridge of the solder bricks. The maximum number of lines is 24.We then measure the most bricks that were bridged in one line. These results are shown below.

High

Board	Total Lines	Most on 1
1		
2		
3	N/A for Leaded Paste	
4		
Total		

Wetting Comparison

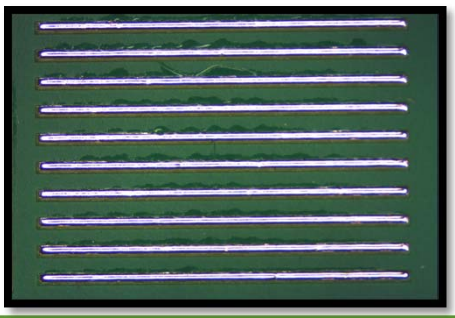
Product	Total	Most
NC676	24	15
Competitor A	24	15
Competetor B	24	15

Low

Board	Total Lines	Most on 1
1		
2		
3	N/A for Leaded Paste	
4		
Total		

Optimal

Board	Total Lines	Most on 1
1	24 out of 24	15 out of 15
2	24 out of 24	15 out of 15
3	24 out of 24	15 out of 15
4	24 out of 24	15 out of 15
Total	96 out of 96	60 out of 60



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Solder Paste Test Program

Reflow Data (Solder Ball)

NC676 Solder Paste

Paste Pullback (Solder Ball)

Measure the performance by volume of the solder paste to pullback on a pad. The start of the volume was at 500% with the maximum being 1250%. Any solder ball that was found not coalescing with the rest of the solder was failed.

High

Board	Pad Size
1	
2	
3	N/A for Leaded Paste
4	
Average	

Low

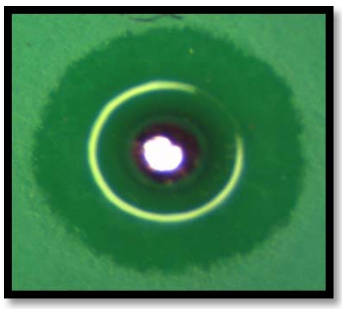
Board	Pad Size
1	
2	
3	N/A for Leaded Paste
4	
Average	

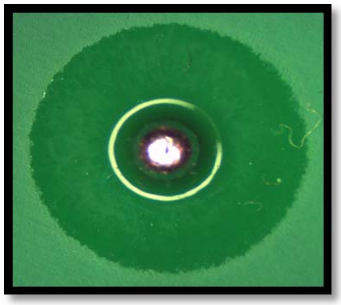
Paste Pullback Comparison

Product	Average
NC676	1150%
Competitor A	950%
Competitor B	1225%

Optimal

Board	Pad Size
1	1225%
2	1225%
3	1225%
4	925%
Average	1150%





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Solder Paste
Test Program

Reflow Data (Bridging)

NC676 Solder Paste

Bridging Inspection

We measured the number of bridge occurences and recorded in the tables below. We should note that the .1m m pads had minimal paste release which led to 0 bridges. Thus this pad offered no value in this study.

High

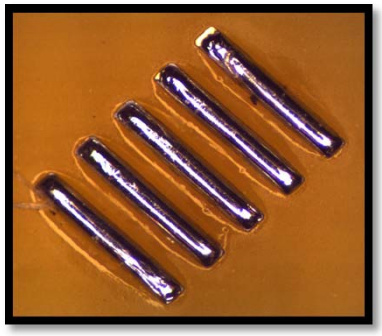
Board	Defect Count
1	
2	
3	N/A for Leaded Paste
5	
Total	

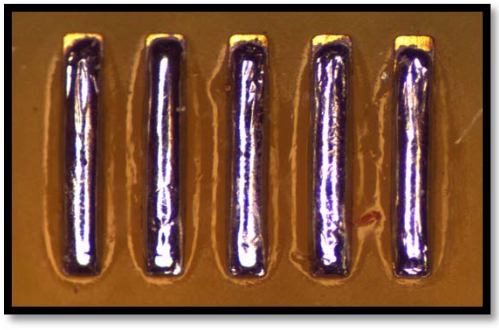
Low

Board	Defect Count
1	
2	
3	N/A for Leaded Paste
4	
Total	

Optimal

Board	Defect Count
1	0
2	4
3	0
4	5
Total	9





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