



Solder Paste Test Program (SPTP)



WS159 Solder Paste

Alloy: **63/37 Type 3** Metal Loading: **88.5%**
QC/Lot#: **23885** Mfg Date: **8/1/2012**

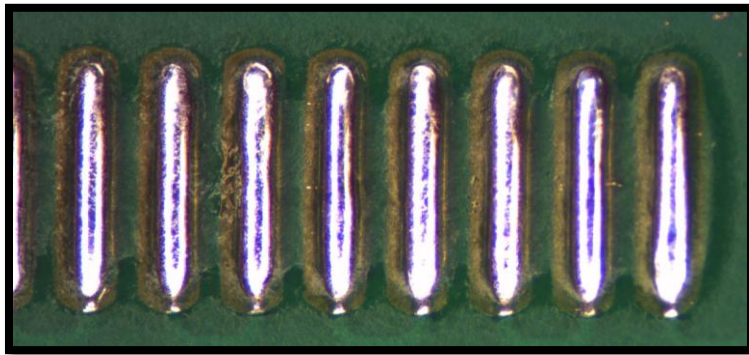
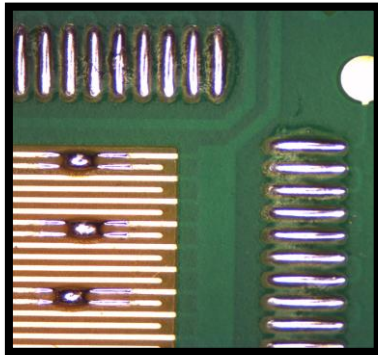
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Summary

WS159 is a water soluble paste that provides excellent wetting and low voiding.

Cosmetics



FCT Assembly

www.FCTAssembly.com

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Standards Tests

WS159 Solder Paste

Metal Loading

Metal 89.5%

Viscosity

Brookfield 677 Kcps
Malcom 185 Pa·s

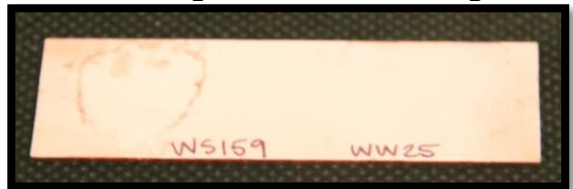
Silver Chromate

Shows Halides



Copper Mirror

Breakthrough around the edge

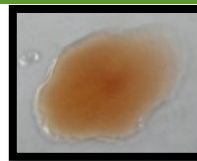


IPC Classification

ORH0

Flouride

Pass



Tack Testing

0 Hours	24 Hours	48 Hours	72 Hours	96 Hours
95.74	22.24	17.88	10.92	8.06

SIR

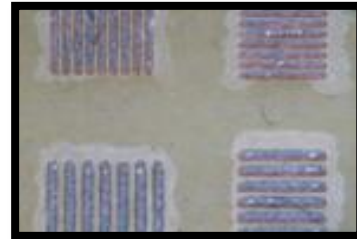
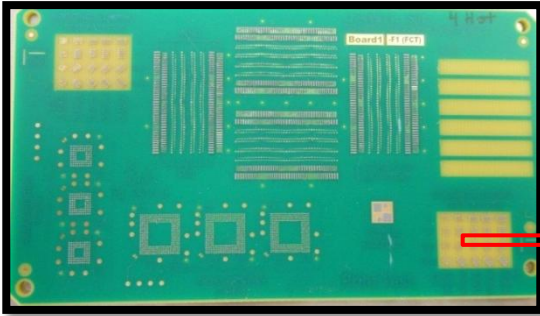
Pass

Electromigration

Pass

Cold Slump

WS159 Solder Paste



Cold Slump

IPC Slump Results

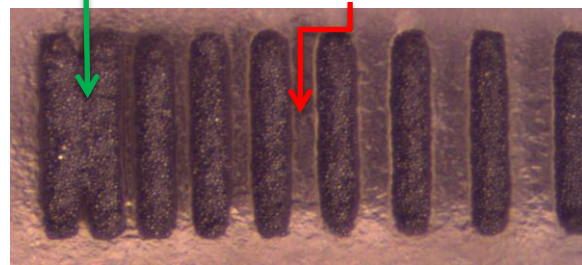
Bridging Quantity

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

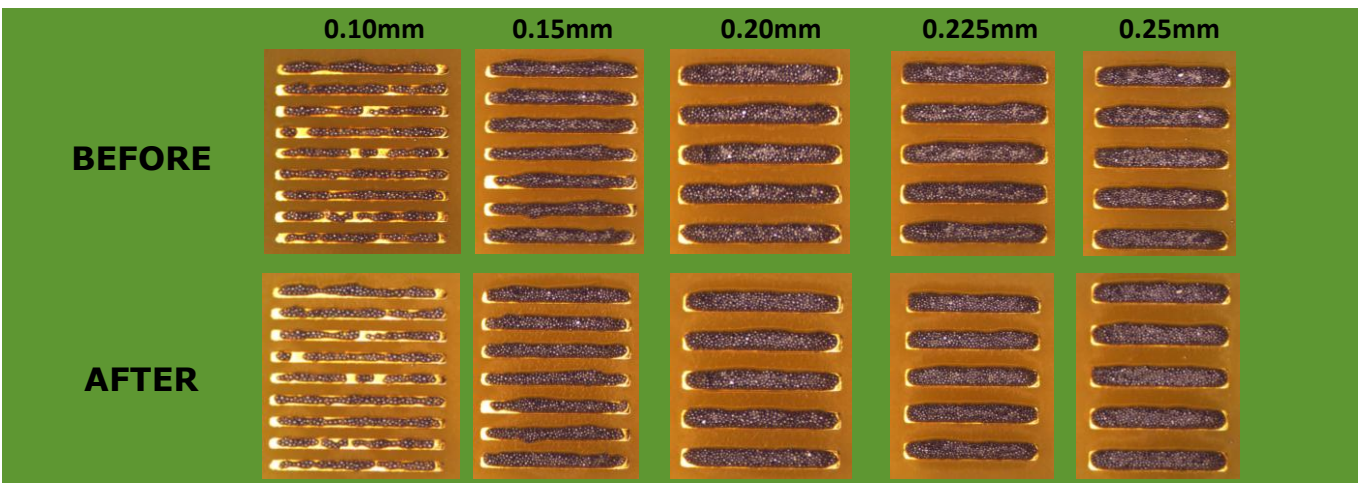
Cold Slump 0.06

Passing Result

25C slump fail limit (0.25mm)

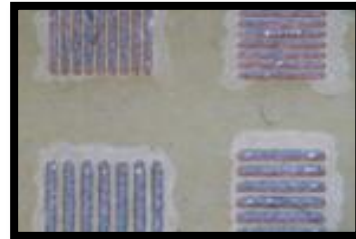
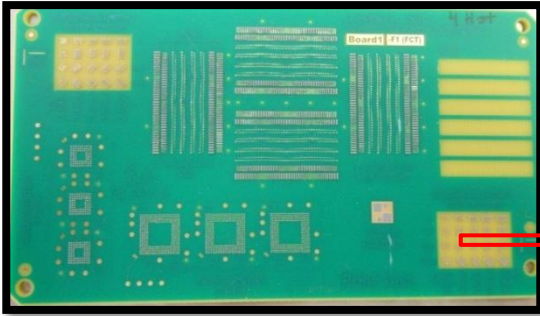


Cold Slump Test Board



Hot Slump

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Hot Slump

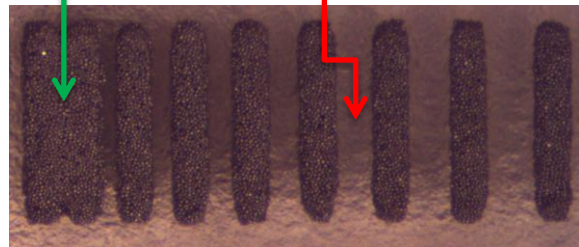
IPC Slump Results

Bridging Quantity

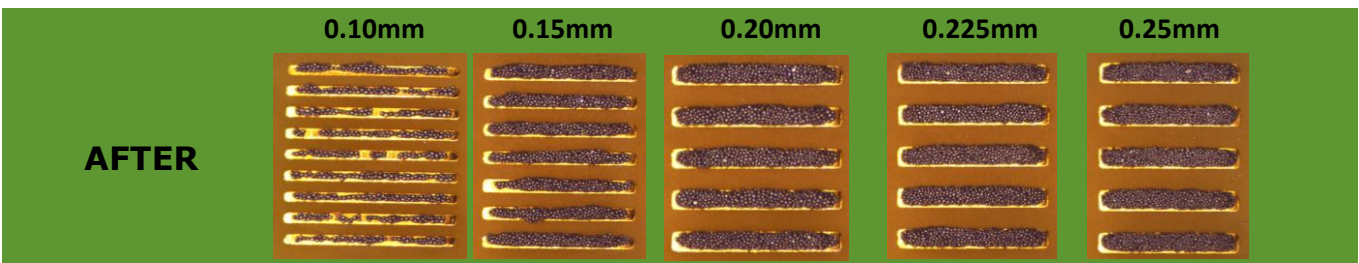
Pad	Defect Count
0.10mm	0
0.15mm	0
0.20mm	0
0.225mm	0
0.25mm	0

Hot Slump 0.06
Passing Result

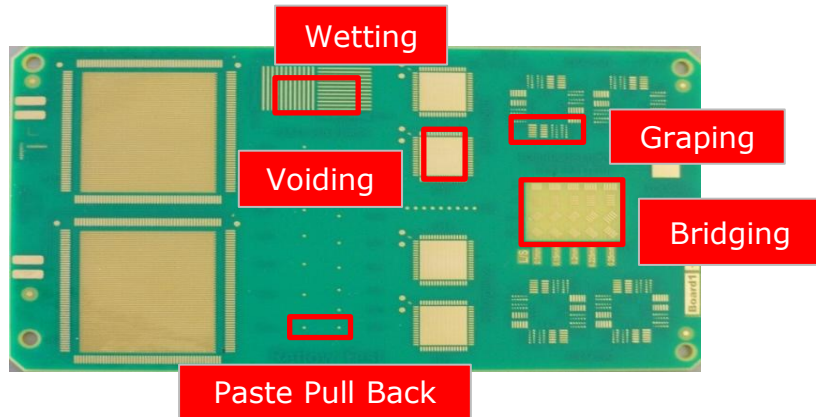
150C slump fail
limit (0.30mm)



Hot Slump Test Board



Inspection Area Overview

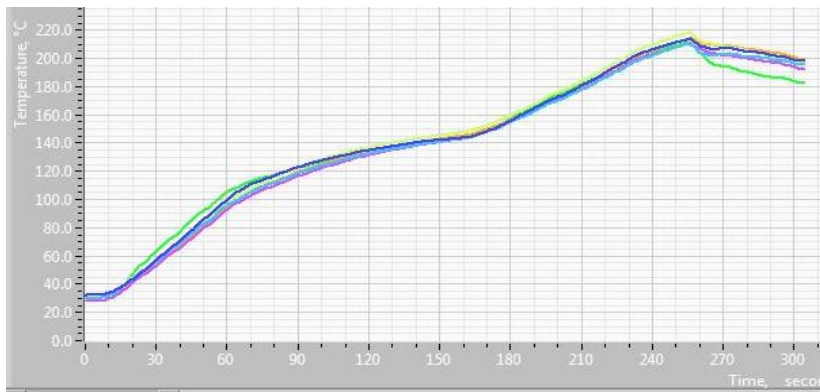


High Curve

Low Curve

N/A for Leaded Paste

Optimal Curve



Reflow Data (Graping)

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Graping Inspection

Measure the performance of graping on 96 pads with 1/2 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	<h1>N/A for Leaded Paste</h1>				
G7					
G10					
G15					

Graping Comparison

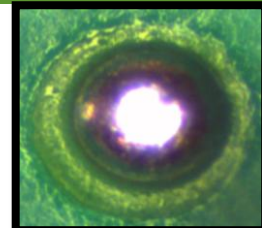
<u>Product</u>	<u>Total Grapes</u>
NC676	32
Competitor A	24
Competitor B	61

Low

CRD	Brd 1	Brd 2	Brd 3	Brd 4	Total
G1	<h1>N/A for Leaded Paste</h1>				
G7					
G10					
G15					

Optimal

CRD	Brd 1	Brd 2	Brd 3	Brd 4	Total
G1	12	6	4	6	28
G7	11	8	10	8	37
G10	12	5	8	8	33
G15	13	3	2	8	26



Reflow Data (Wetting)

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Wetting/Spread Inspection Test

In each of the wetting/spread areas 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	N/A for Leaded Paste	
2		
3		
4		
Average		

Low

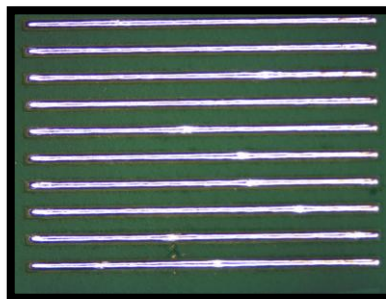
Board	Total Lines	Most on 1
1	N/A for Leaded Paste	
2		
3		
4		
Average		

Wetting Comparison

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

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
Average	96 out of 96	60 out of 60



Reflow Data (Solder Ball)

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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	N/A for Leaded Paste
2	
3	
4	
Average	

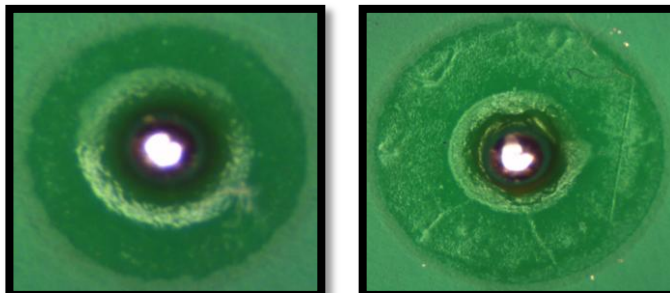
Low

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

Pastepull Back Comparison	
Product	Average
NC676	1150%
Competitor A	950%
Competitor B	1225%

Optimal

Board	Pad Size
1	1225%
2	850%
3	1075%
4	625%
Average	944%



Reflow Data (Bridging)
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Bridging Inspection

We measured the number of bridge occurrences 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	N/A for Leaded Paste
2	
3	
4	
Total	

Low

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

Optimal

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

