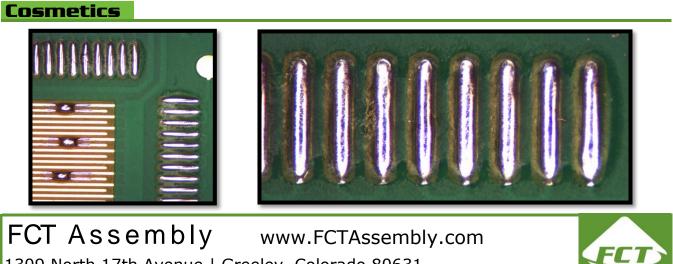
FCTASS LEADERS IN TECH	embly	Solder Paste Test Program (SPTP)
RETASSEMBLY PASTE TYPE-WS159 ALLOY:63/37 MESH:-325/+500	Alloy: 63	5159 Solder Paste /37 Type 3 Metal Loading: 88.5% 4: 23885 Mfg Date: 8/1/2012
VISCOSITY (Kcps):760 METAL CONTENT:85.55 Use only with adequate version	Contents	
For additional information role to	Section 1:	Summary
	Section 2:	Standard Tests
	Section 3: Section 4:	Slump Data Reflow Data
Summaru		

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



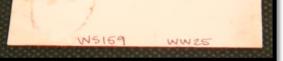
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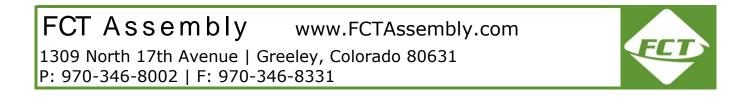
Standards Tests WS159 Solder Paste

Metal Load	ding	Viscosity	
Metal	89.5%	Brookfield Malcom	677 Kcps 185 Pa∙s
Silver Chro	omate	Copper Mirr	Dr
Shows Halides	5	Breakthrough ar	ound the edge



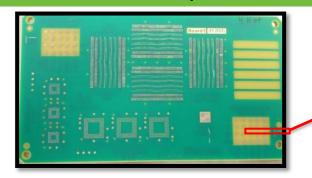


IPC Class	sification		Flouride	
ORH0			Pass	
Tack Tes	iting			
0 Hours	24 Hours	48 Hours	72 Hours	96 Hours
95.74	22.24	17.88	10.92	8.06
SIR			Electromigratio	n
Pass		-	Pass	



Cold Slump

WS159 Solder Paste



NS159 Solder Paste

Test Program



Cold Slump

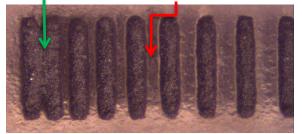
Bridging Quantity

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

IPC Slump Results

Solder Paste

Cold Slump 0.06 Passing Result 25C slump fail limit (0.25mm)

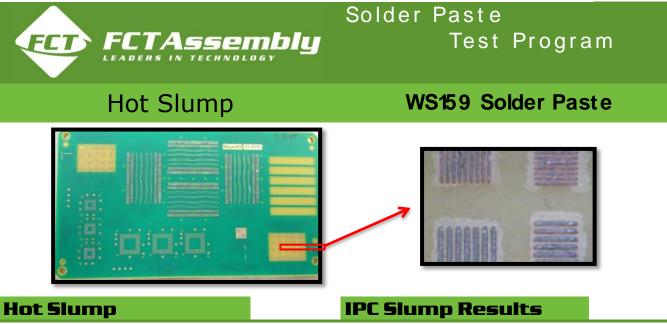


Cold Slump Test Board

	0.10mm	0.15mm	0.20mm	0.225mm	0.25mm
		Contraction of the second s	(Constitution)		(
			Consider Installing		
BEFORE		(and a second se		(Manufacture)	
			(CONSIDERING)	(CLASSES)	(CONCERN)
					(CONTRACTOR)
AFTED	de antennenne antennen)				
AFTER					
			C.		
	Commission of the second secon				

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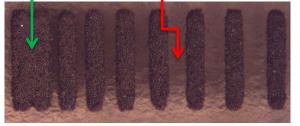


Bridging Quantity

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)

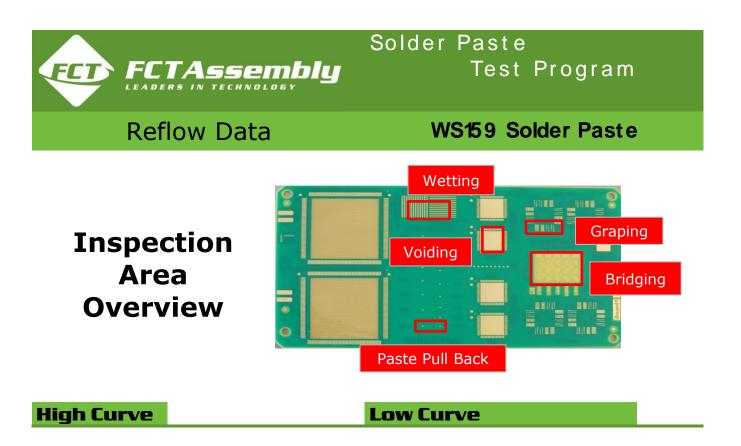


Hot Slump Test Board

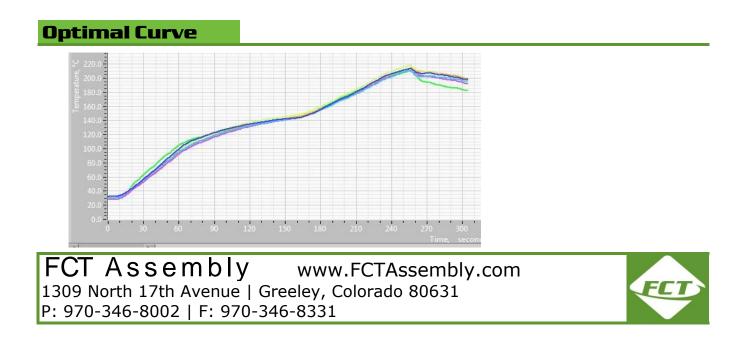
	0.10mm	0.15mm	0.20mm	0.225mm	0.25mm
	antin - militar anno dian -			C	
			CONTRACTOR 100		
AFTER			C C C C C C C C C C C C C C C C C C C	C C C C C C C C C C C C C C C C C C C	GREENE
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N/A for Leaded Paste





Solder Paste Test Program

Reflow Data (Graping)

WS159 Solder Paste

Graping Inspection

Measure the performance of graping on 96 pads with $\frac{1}{2}$ 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 G1	Brd 1	Brd 2	Brd 3	Brd 4	Total	
G7 G10 G15	N/	A for	Lead	ed Pa	ste	Graping Comparison
						Product Total Grapes
Low						NC676 32
CRD G1	Brd 1	Brd 2	Brd 3	Brd 4	Total	Competitor A 24
G7						Competitor B 61
G10	N/	A for	Leade	ed Pa	ste	
G15						
Optin	nal					
				- • -		a state to
CRD	Brd 1	Brd 2	Brd 3 4	Brd 4	Total	
G1 G7	12 11	6 8	4 10	6 8	28 37	
G10	12	5	8	8	33	A Contraction
G15	13	3	2	8	26	and the second
1309 N	orth 17tl	embly n Avenue 2 F: 970	Greeley,	Colorado		.com



Solder Paste Test Program

Reflow Data (Wetting)

WS159 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.

	_	
_		

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

Low		Wettin	g Comp	arison	
Board	Total Lines Most on 1	Product	<u>Total</u>	<u>Most</u>	
1 2		NC676	24	15	
3 4	N/A for Leaded Paste	Competitor	A 24	15	
Average		Competitor	В 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

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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		
2		
3	N/A for Leaded Paste	
4	NATOR Leaded Faste	
Average		
·		
Low		Pastepull Back
Board	Pad Size	Comparison
1		Product <u>Average</u>
2		NOC76 44500/
3	N/A for Leaded Paste	NC676 1150%
4	IN A IUI LEAUEU FASIE	Composition A OF 09/

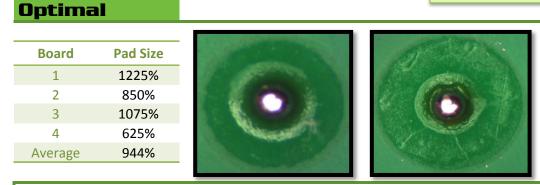
Competitor A

Competitor B

950%

1225%

Average



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Solder Paste Test Program

Reflow Data (Bridging)

WS159 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

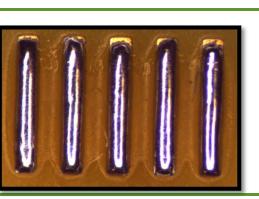
Board	Defect Count	
1		
2		
3	N/A for Loaded Desta	
4	N/A for Leaded Paste	
Total		

Low

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

Optimal

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





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