



Copper Surface Treatment LBN Technology

Performance Data

November 2019

Copper Etch Rate, Dry Film and Tin Adhesion Data

Panasonic Megtron 6 R-5775K Laminate

IPC-TM-650 #2.4.1.6

Classification	Surface of cross-cut area from which flaking has occurred. (Example for all paralleled cuts)
5	None
4	
3	
2	
1	
0	Greater than 65%

	Etch Rate (micron/min)	Riston LDI-7330 Dry Film Tape Test	Tin (1 min) Adhesion Tape Test
CuP-600™	0.05	5	Pass
CuP-100™	0.04	5	Pass
Persulfate/ Sulfuric Acid	1.50	5	Fail
Peroxide/ Sulfuric Acid	1.50	5	Pass

Solder Reflow Adhesion Data

Panasonic Megtron 6 R-5775K Laminate

	Adhesion Tape Test ICP-TM-650		
	Initial	3X Reflow	6X Reflow
CuP-600™	Pass	Pass	Pass
Persulfate Sulfuric Acid	Pass	Pass	Pass
Peroxide Sulfuric Acid	Pass	Pass	Pass

CuP-600™ passed adhesion testing after 6X solder reflow simulation providing high bond strength while offering a simple and sludge-free process.

Dry Film Adhesion Data Rogers Laminates

Riston Dry Film LDI-7330 - Adhesion Tape Test

	RO3003™ HH/HH		RO4835T™ 5E/5E		CLTE-MW™ SH/SH	
	Initial	3 hr. Stress	Initial	3 hr. Stress	Initial	3 hr. Stress
CuP-600™	5	4	5	3	5	4
CuP-100™	5	4	5	3	5	3
Persulfate/ Sulfuric Acid	4	4	4	3	5	3

Classification	Surface of cross-cut area from which flaking has occurred. (Example for six paralleled cuts)
5	None
4	
3	
2	
1	
0	Greater than 65%

2.4.1.6-02

IPC-TM-650 #2.4.1.6

Tin Adhesion Tape Test Results

Rogers RO3003TM Laminate

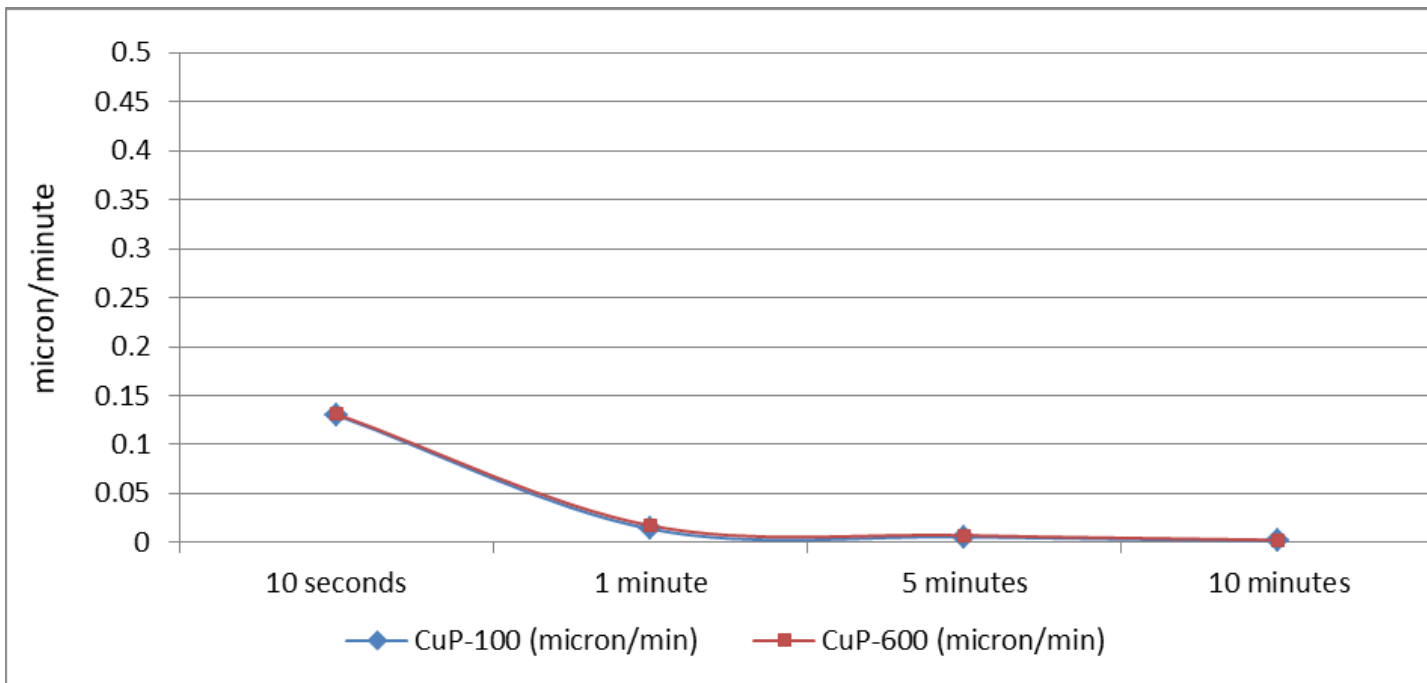
IPC-TM-650 # 2.4.28.1

	Tin Immersion Tape Test Time (min)		
	3	4	5
CuP-600 TM	pass	pass	pass
CuP-100 TM	pass	pass	pass
Persulfate/Sulfuric Acid Solution	fail	fail	pass

Copper Etch Rate Rogers Laminates

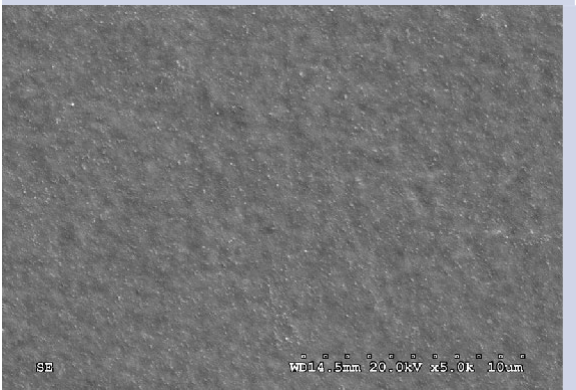
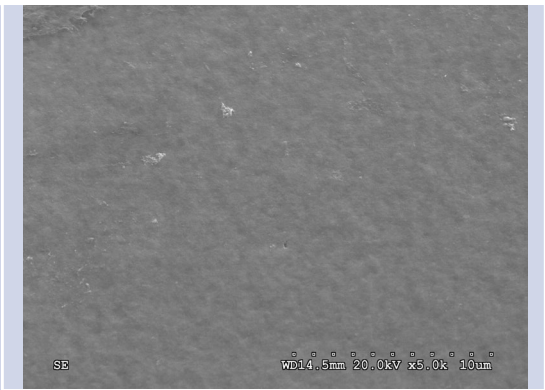
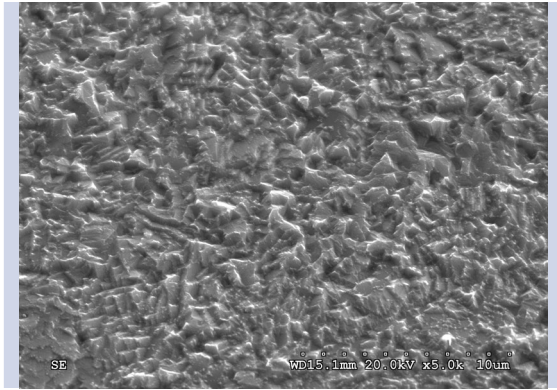
	Etch Rate (micron/min)			
	CuP-600™	CuP-100™	Persulfate/Sulfuric Acid Solution	Peroxide/Sulfuric Acid Solution
RO3003™ HH/HH	0.00	0.01	0.42	0.40
RO4835T™ 5E/5E	0.01	0.01	1.57	7.90
CLTE-MW™ SH/SH	0.01	0.01	1.85	5.17

CuP-600™ and CuP-100™ Copper Etch Rate Over Time



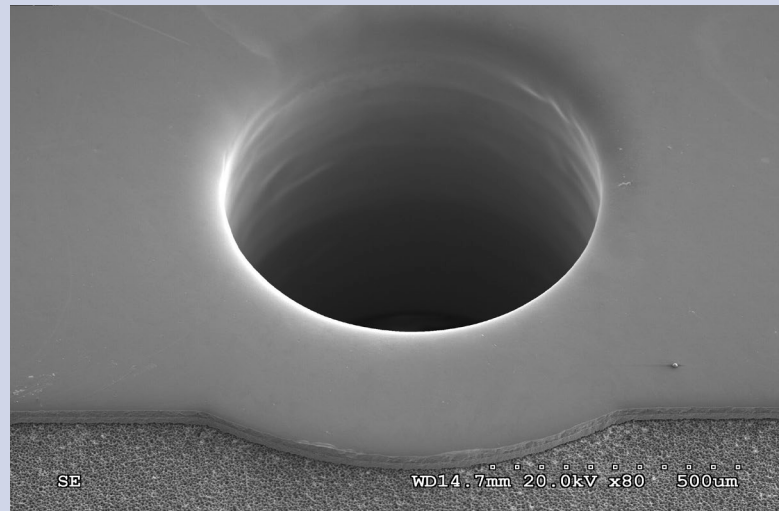
CuP products remove copper oxides , copper hydroxide as well as surface contamination (oils and greases) without etching copper.

Copper Surface SEM Analysis Results:

Untreated	CuP-100™	Persulfate/Sulfuric Acid Solution
 SE WD14.5mm 20.0kV x5.0k 10um	 SE WD14.5mm 20.0kV x5.0k 10um	 SE WD15.1mm 20.0kV x5.0k 10um
	<i>Copper Etch Rate ≈ 0.006 micron/min</i>	<i>Copper Etch Rate ≈ 0.674 micron/min</i>

Copper Surface SEM Analysis Results:

CuP-100™



*Copper Etch Rate
≈ 0.006 micron/min*