Add outsourcing to the plating process in KOA China Factory

Aug 28, 2015

KOA CORPORATION

Product Engineering

Thick Film Center

SHIMO-INA Business Field

≪ The purpose of change≫

- Product name：

  Thick film chip resistor

  RK73 B · H · Z series

  1E · 1J · 2A · 2B (1005 ～ 3216 size)

- Target factory: KOA China Factory

  KOA ELECTRONICS(TAICANG) CO.,LTD

  (Jiangsu Province, China Taicang)

≪ Target of products≫

To enhance the production capacity in KOA China factory of plating process, we will add the plating outsourcing.

≪ The contents details ≫

We add a outsourcing in the electrode plating process in KOA China factory (KOA electronics (Taicang) Co., Ltd.) to build a stable product supply system

【Current】 KOA China Factory only

【After】 KOA China Factory
+ Outsourcing（Japanese company）

Concurrent production

The subcontractor added in the electrode plating process

	Change point・Chift point
Machinery	It is the equipment and the same mechanism of proven equipment that is being used to KOA of plating process
Material	This is the same material as the plating process of KOA
method	This is the same method and management to KOA of plating process
Man	This is appointed as worker who was specified education and training (ISO 9001 registration factory)
Quality	Reliability test data was not a problem compared to the KOA China Factory
Location	It is located in the close location of the 40km-position to the KOA China Factory (Jiangsu Province Suzhou City)
Building	The building was built in June 2001, there is no problem in infrastructure, etc., even in the context of increased production (KOA China factory, founded in June 2000)
Logistics	We are regularly transported in dedicated facilities (car) between KOA China factory and Outsourcing

【4】Confirmation of the change point

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KOA

For electrode plating of outsourced factory it has been deployed in China factory on the basis of the cultivated plating technology in Japan, there is a processing performance of KOA same degree of '14. In addition, there is already delivery record of 5 years as outsourcing electrode plating to customers who have started the delivery have gotten approval.

Outsoucing Outline
(Comparison with China Factory)

Electrode plating process flow

Electrode plating process flow	Material	Machine	Method
Loading			
Acid Dipping	Same material as China factory	Barrel line of the same specifications for China Factory ↓ (Automated line) ※ Barrel of the same Specifications for China Factory	Similar control items as China factory ・Working method ・Process control item ・Equipment management ・Plating solution management
Rinse			
Ni Electric Plating	Same Ni plating solution as China factory		
Recovery			
Rinse			
Acid Dipping	Same material as China factory		
Sn Electric Plating	Same Sn plating solution as China factory		
Recovery			
Rinse			
Newtralization	Same material as China factory		
Rinse			
Unloading			
Dry		the same method	
Dummy sorting		the same method	
Plating Inspection		the same method	【Plating Inspection】 The same test items as China factory

【5】Confirmation of plating quality ①

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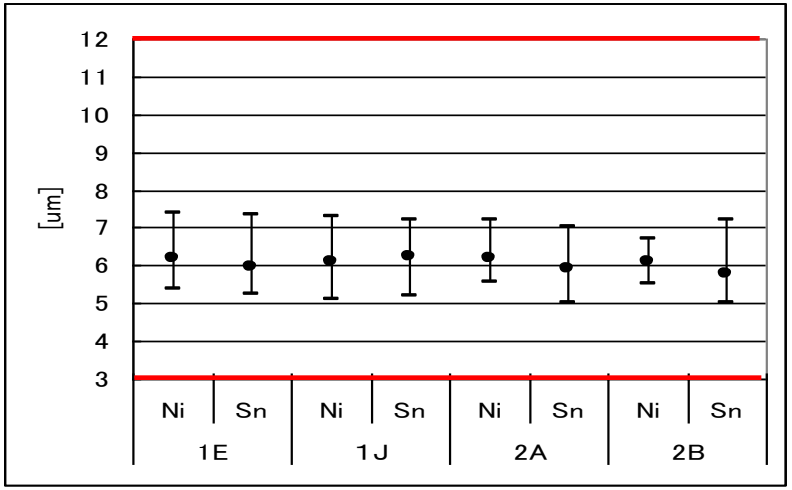
1. Plating thickness

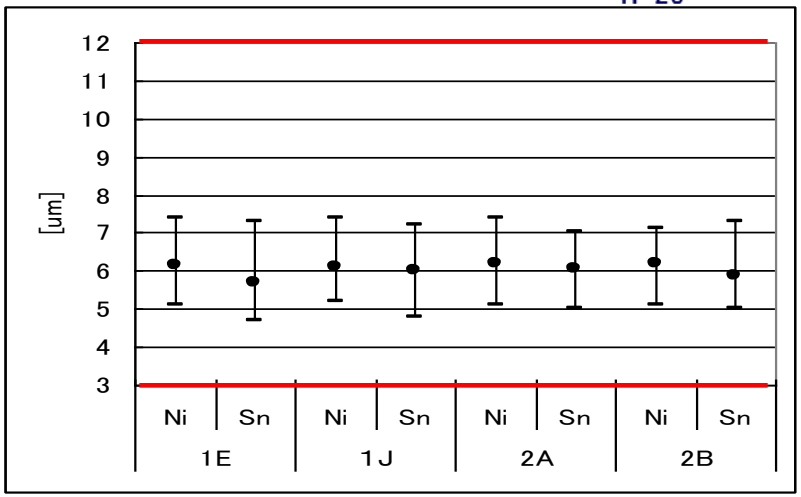
Standard:
3～12μm

In-house n=20



Standard

Outsoucing n=20



This is to determine that there is no problem no difference compared to the current

2.Solderability ①

Standard:
Solder-covered is that more than 95%

In-house n=20

	1E	1J	2A	2B
1	OK	OK	OK	OK
2	OK	OK	OK	OK
3	OK	OK	OK	OK
4	OK	OK	OK	OK
5	OK	OK	OK	OK
6	OK	OK	OK	OK
7	OK	OK	OK	OK
8	OK	OK	OK	OK
9	OK	OK	OK	OK
10	OK	OK	OK	OK
11	OK	OK	OK	OK
12	OK	OK	OK	OK
13	OK	OK	OK	OK
14	OK	OK	OK	OK
15	OK	OK	OK	OK
16	OK	OK	OK	OK
17	OK	OK	OK	OK
18	OK	OK	OK	OK
19	OK	OK	OK	OK
20	OK	OK	OK	OK

Outsoucing n=20

	1E	1J	2A	2B
1	OK	OK	OK	OK
2	OK	OK	OK	OK
3	OK	OK	OK	OK
4	OK	OK	OK	OK
5	OK	OK	OK	OK
6	OK	OK	OK	OK
7	OK	OK	OK	OK
8	OK	OK	OK	OK
9	OK	OK	OK	OK
10	OK	OK	OK	OK
11	OK	OK	OK	OK
12	OK	OK	OK	OK
13	OK	OK	OK	OK
14	OK	OK	OK	OK
15	OK	OK	OK	OK
16	OK	OK	OK	OK
17	OK	OK	OK	OK
18	OK	OK	OK	OK
19	OK	OK	OK	OK
20	OK	OK	OK	OK

This is to determine that there is no problem no difference compared to the current

2. Solderability② (Quick heating method-Judge by zerocross time)

Condition	Methods	quick heating method (Judge by zerocross time)		Judgment	Within 3 seconds
	Test temp.	245℃	Sn－3Ag－0．5Cu		

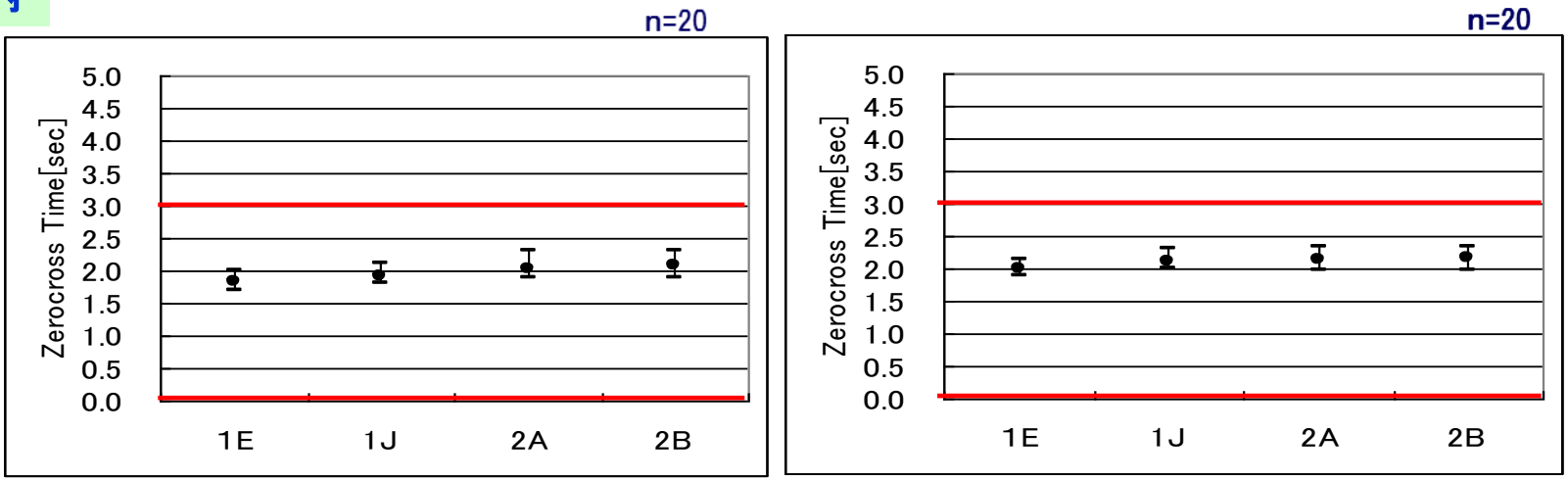
1.Non Pre-treatment

Standard：
3sec以内

In-house

Standard

Outsoucing



This is to determine that there is no problem no difference compared to the current

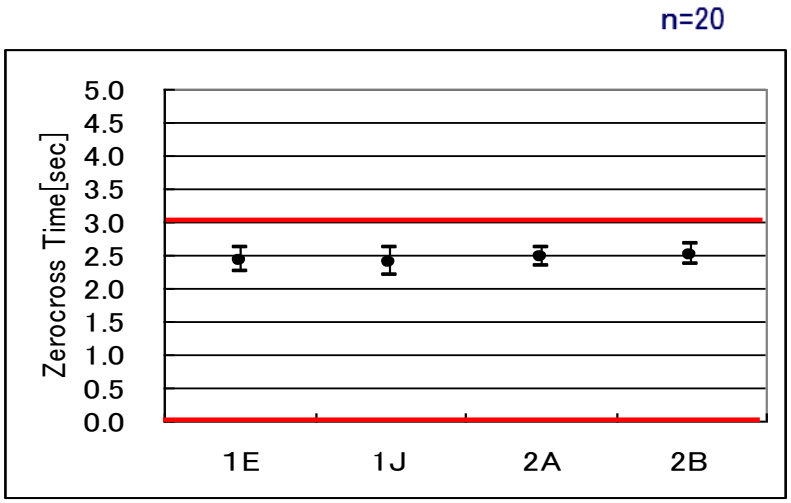
2. Solderability② (Quick heating method-Judge by zerocross time)

2. Pre-treatment
PCT 121℃ 2atm

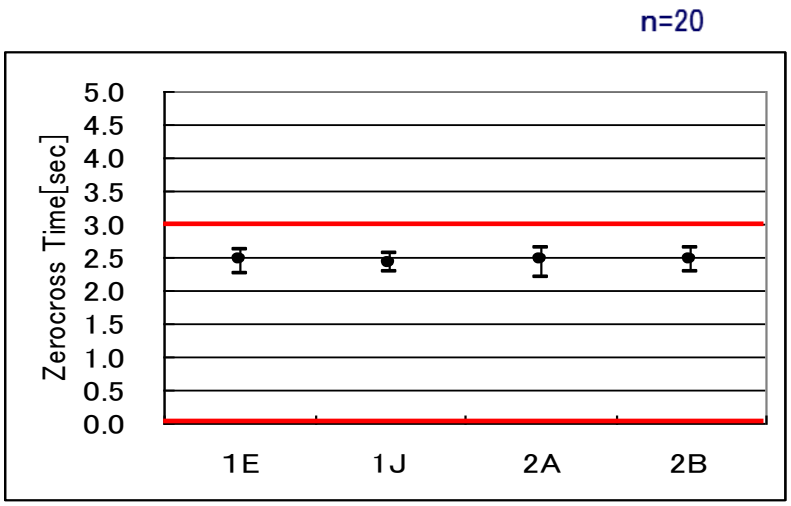
Standard:
within 3sec

Standard

In-house



Outsoucing



This is to determine that there is no problem no difference compared to the current

【5】Confirmation of plating quality ③

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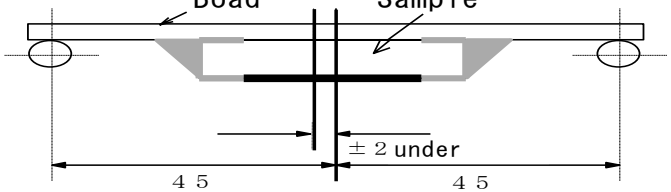
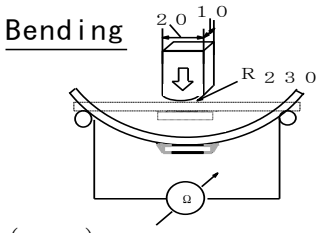
3.Bending strength

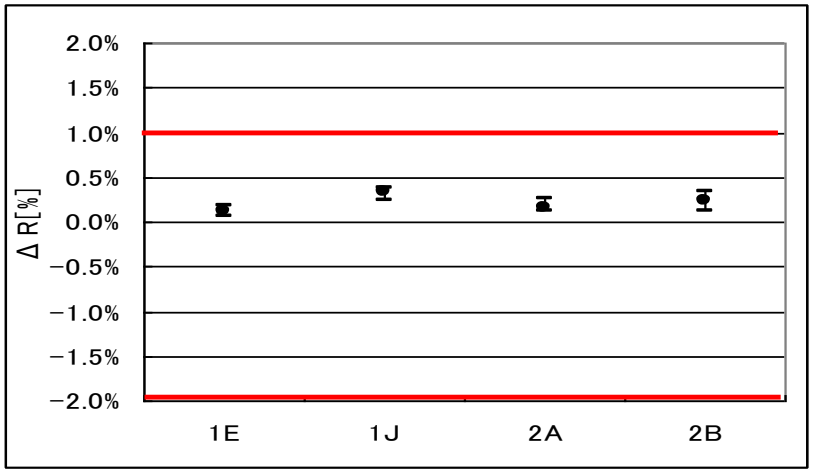
Bending test	Condition				
		Bending length	RK73	1E	1J・2A・2B
				3mm	5mm
		Keeping time		5sec	

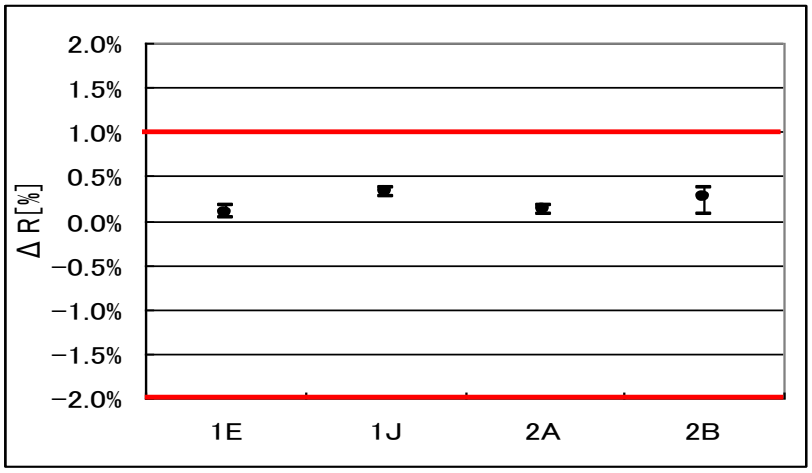




Standard: within ±1%

In-house n=20 — Standard — Outsoucing n=20





This is to determine that there is no problem no difference compared to the current

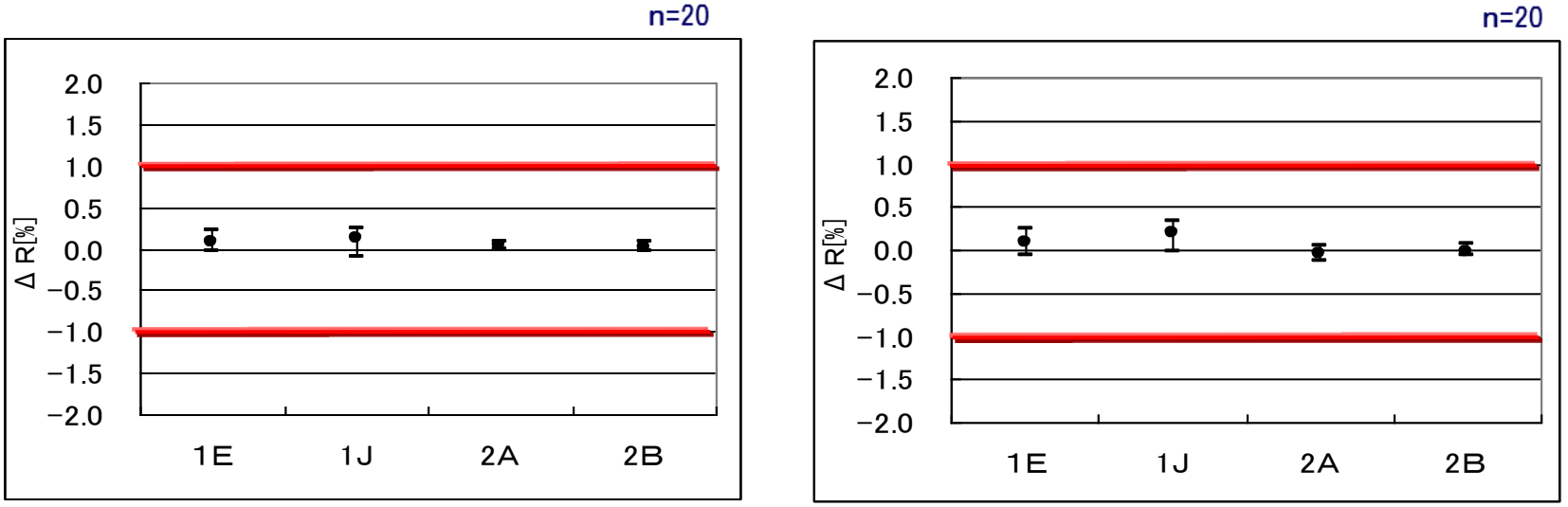
4.Solder heat

Condition	260℃	10sec
Judgment	ΔR≦±1% （10R≦⊿R≦1M）	

In-house

Standard

Outsoucing



This is to determine that there is no problem no difference compared to the current

【5】Confirmation of plating quality ⑤

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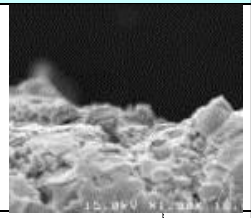
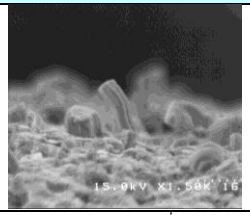
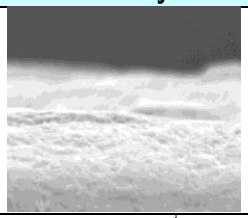
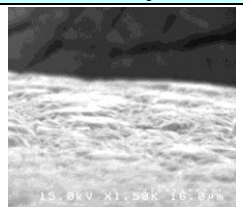
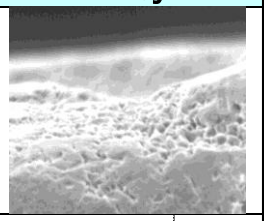
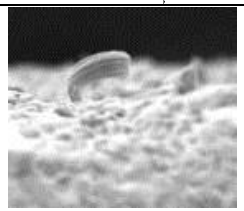
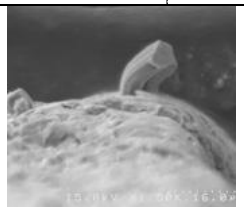
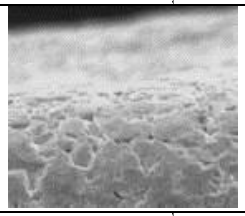
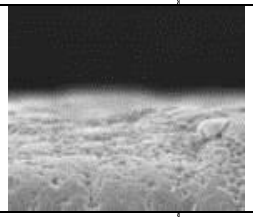
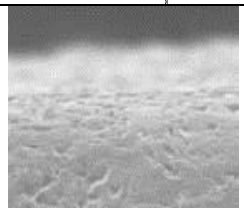
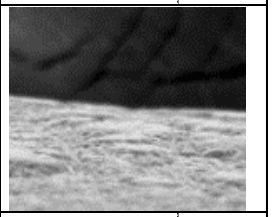
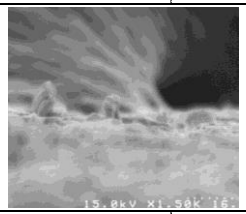
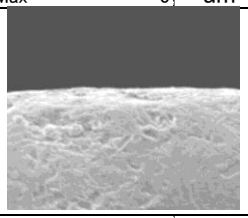
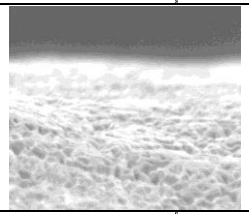
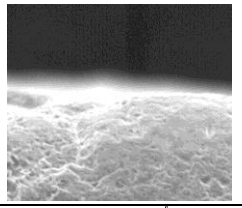
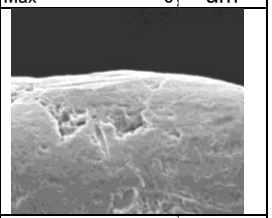
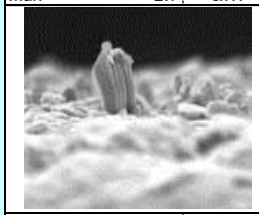
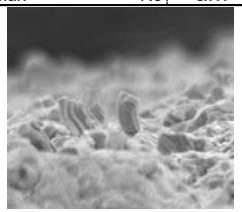
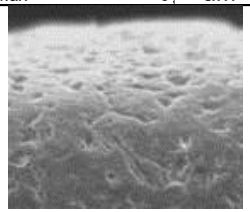
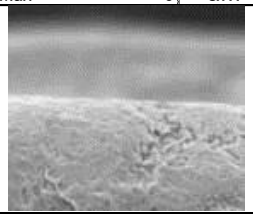
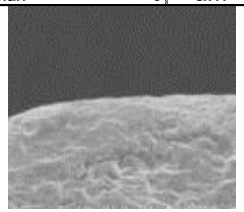
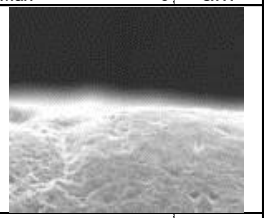
5.Whisker

ITEM	Temperature cycle		High Temperature High Humidity Exposure		Ambient storage	
Conditions	Temperature	-40/85℃	Temperature	60℃	Temperature	20～25℃
	Time	20min/20min	Time	87%RH	Time	30～80%RH

	Type	500h	1000h	2000cys	4000cys	2000cys	4000cys
In-house	1E 1005	 Max 5.5 um	 Max 11.8 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um
Outsourcing		 Max 13.9 um	 Max 14.4 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um
In-house	1J 1608	 Max 2.7 um	 Max 7.8 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um
Outsourcing		 Max 13.6 um	 Max 13.2 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um

【5】Confirmation of plating quality ⑤

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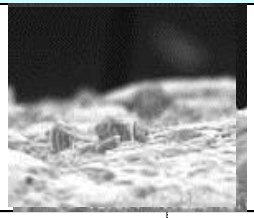
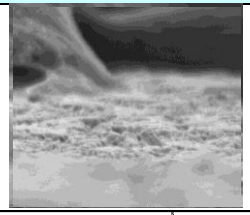
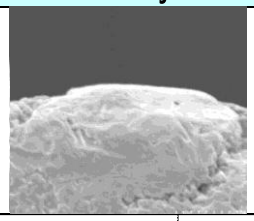
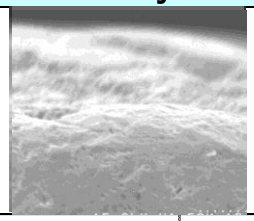
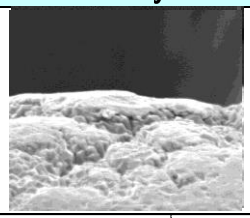
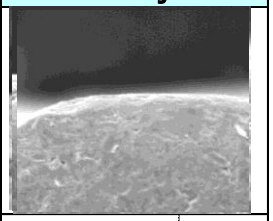
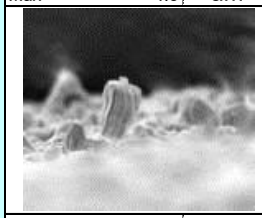
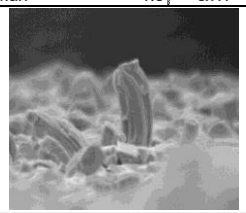
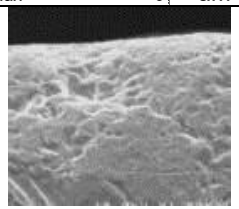
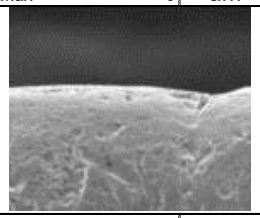
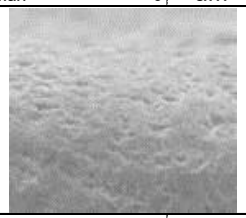
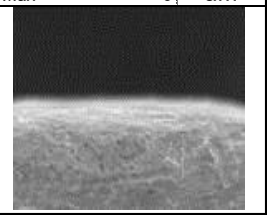
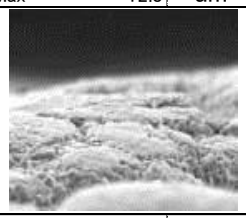
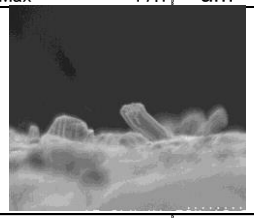
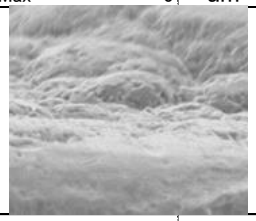
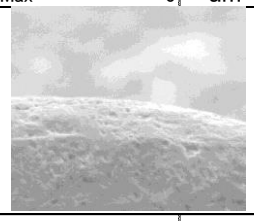
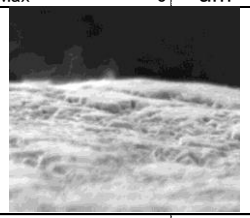
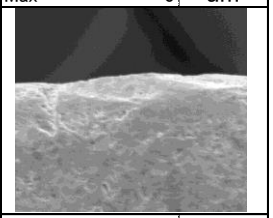
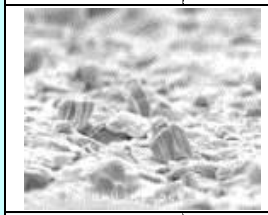
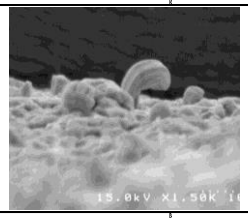
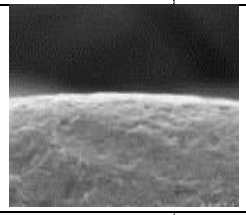
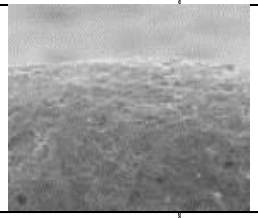
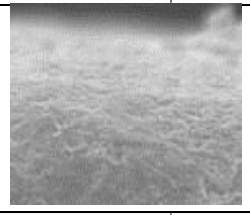
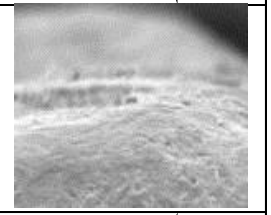
ITEM	Temperature cycle		High Temperature High Humidity Exposure		Ambient storage	
Conditions	Temperature	-40/85℃	Temperature	60℃	Temperature	20～25℃
	Time	20min/20min	Time	87%RH	Time	30～80%RH

	Type	500h	1000h	2000cys	4000cys	2000cys	4000cys
In-house	2A 2125	 Max 4.3 um	 Max 4.8 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um
Outsourcing		 Max 12.8 um	 Max 17.1 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um
In-house	2B 3216	 Max 0 um	 Max 10.5 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um
Outsourcing		 Max 9.3 um	 Max 12.4 um	 Max 0 um	 Max 0 um	 Max 0 um	 Max 0 um

This is to determine that there is no problem no difference compared to the current