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TDS
Water Soluble Solder Paste
NP303-WS6104-T6

株式会社ニホンゲンマ
NIHON GENMA MFG.CO.,LTD.

Void

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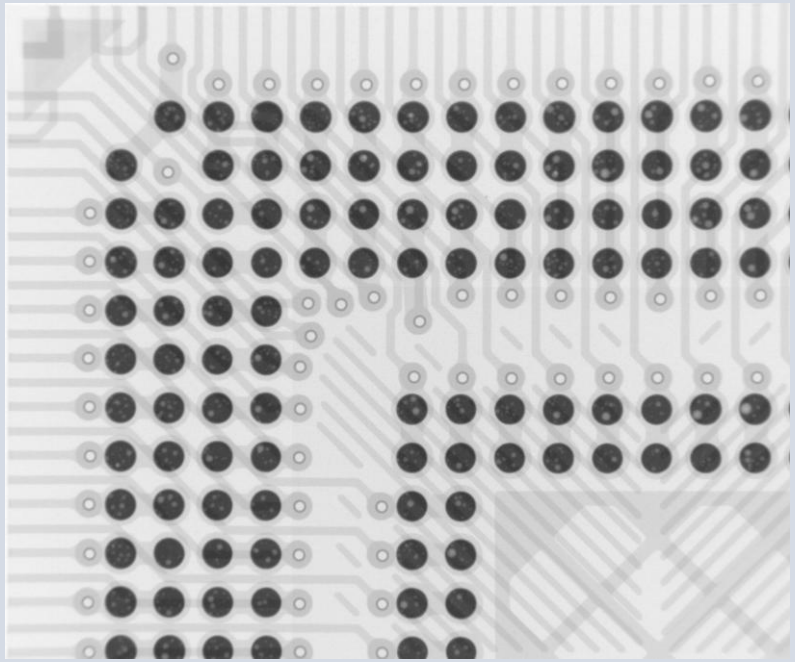
Test Conditions

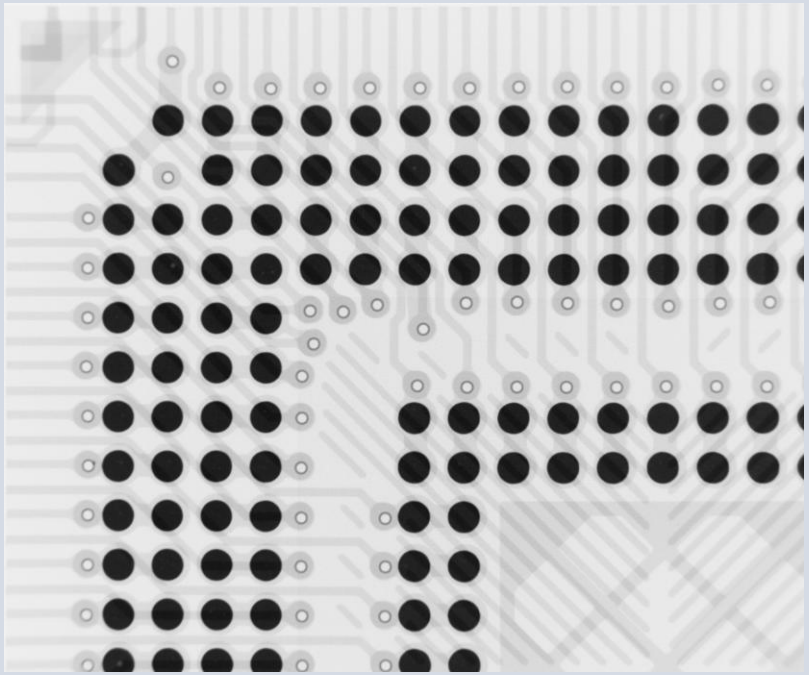
【Mask】Apertureφ180μm t30μm
【Substrate】 BGA φ180μm/Pitch300μm　ENIG　t1.0mm
【Printing】 Speed：50mm/s Pressure：50N
【Device】 Printing Machine (YAMAHA,YCP-10)、Heating Observation Device(CORES,core9046a-100)、X-ray Observation Device(MARS TOHKEN SOLUTION,MUX-3400)

Test Results

Conventional Product



NP303-WS6104-T6



- **NP303-WS6104-T6 achieves low void with BGA.**

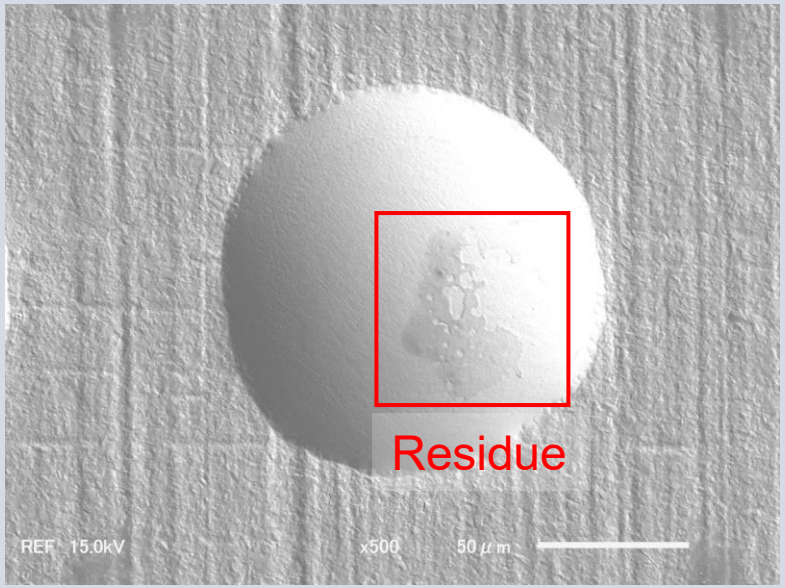
Washability

Test Conditions

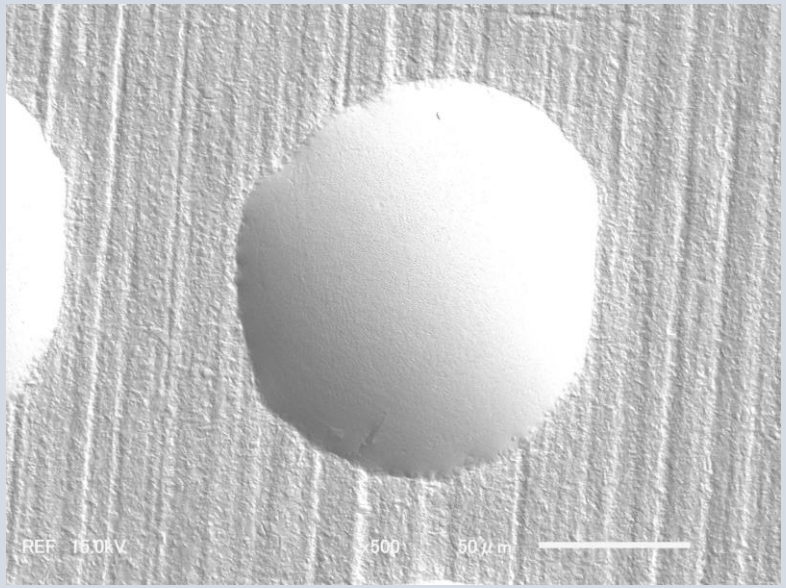
【Mask】Apertureφ100μm t35μm
【Substrate】 CuOSP t1.0mm
【Printing】 Speed：30mm/s Pressure：30N
【Washing】 DIwater 40℃　Spray 150PSI
【Device】 Printing Machine (YAMAHA,YCP-10)、Heating Observation Device(CORES,core9046a-100)、SEM(JEOL,JSM-IT100)

Test Results

Conventional Product



NP303-WS6104-T6



- **NP303-WS6104-T6 is compatible with DI water cleaning, with no residue observed.**

Slump-in-Printing & Heating

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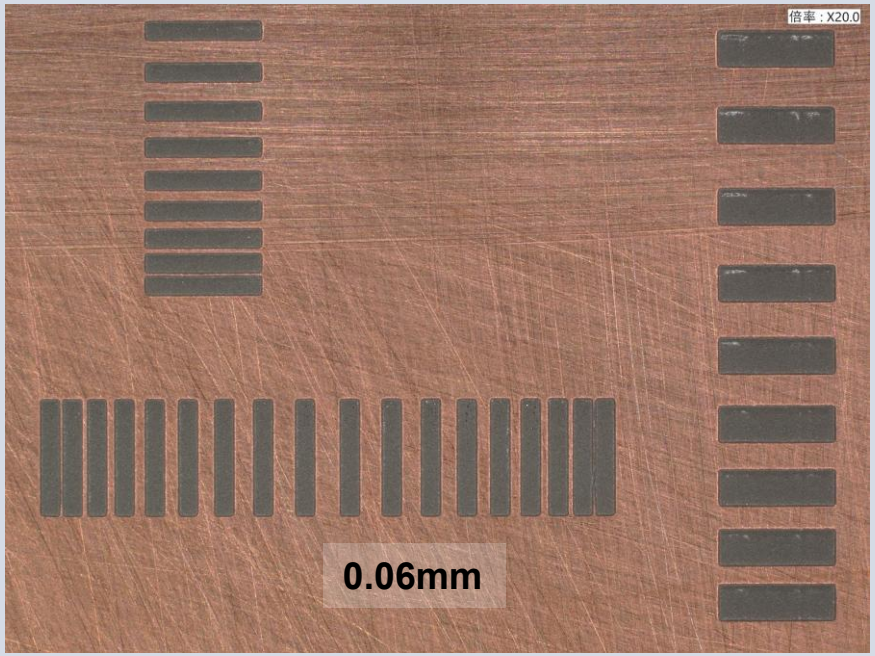
Test Conditions

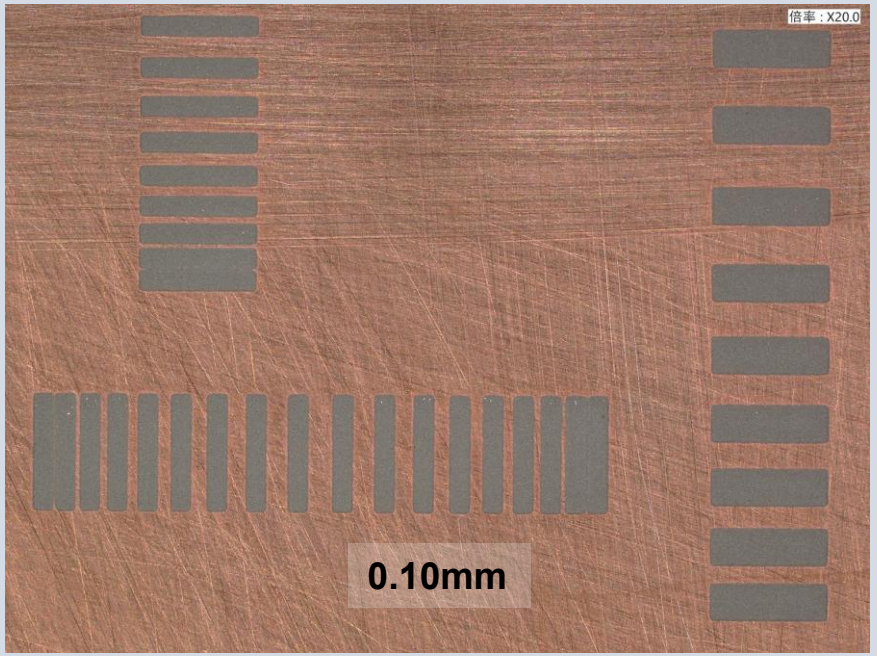
【Mask】 IPC-TM-650 2.4.35　Stencil: IPC-A-20(t=40um)
【Substrate】 CuOSP t1.0mm
【Heating】150℃ 1min
【Device】 Oven (ESPEC,PH-102)

Test Results

Before Heating



After Heating



- **Good performance at slump-in-printing and heating.**

Tackiness

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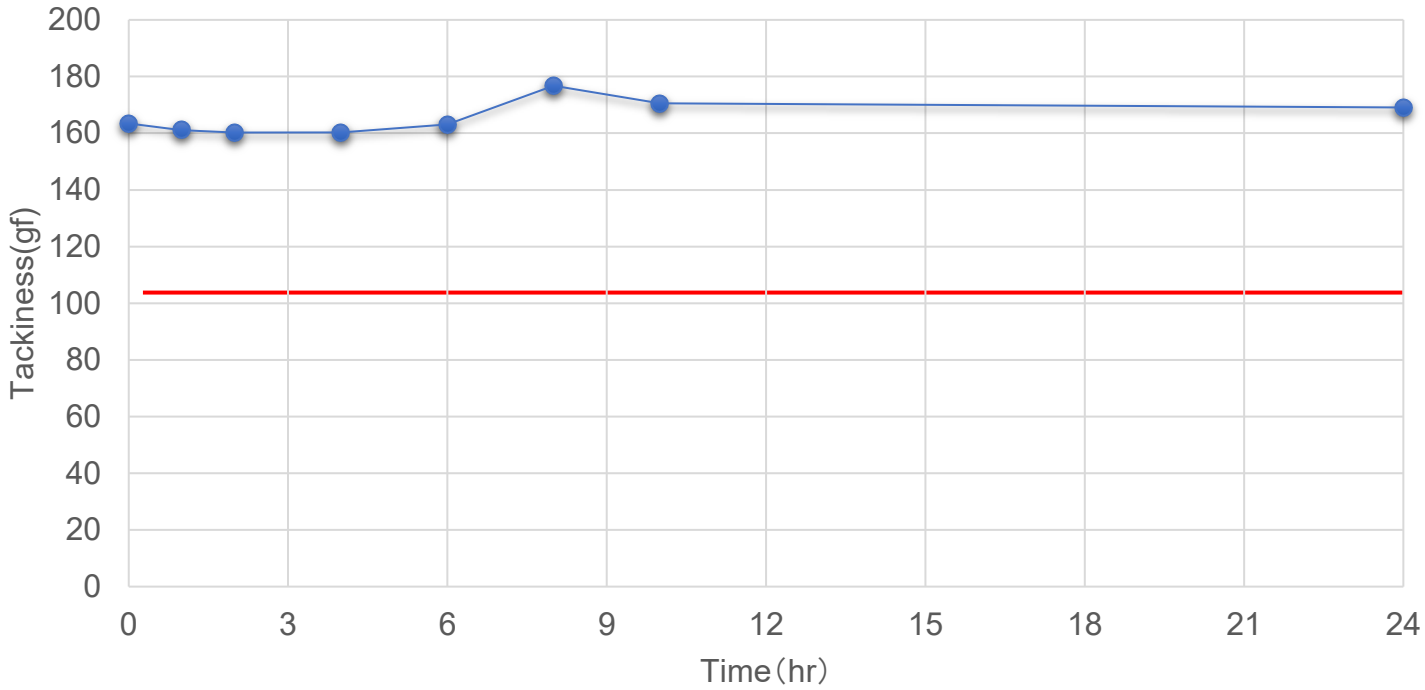
Test Conditions

【 Mask Thickness 】 200μm　　【 Aperture 】 φ6.5mm

【 Probe Diameter 】 φ5.1mm　　【 Maintaining Pressure 】 50gf

【 Pressure Time 】 0.2s　　【 Permeation Rate 】 2.0mm/sec　　【 Retraction Speed 】 10mm/sec

【 Device 】 Tacking Tester (Malcom, TK-1S)



100gf above (JIS Z 3284 3 4.5)

・There is no observed deterioration in tackiness over time.

Continuous Printing Evaluation——Viscosity & TI

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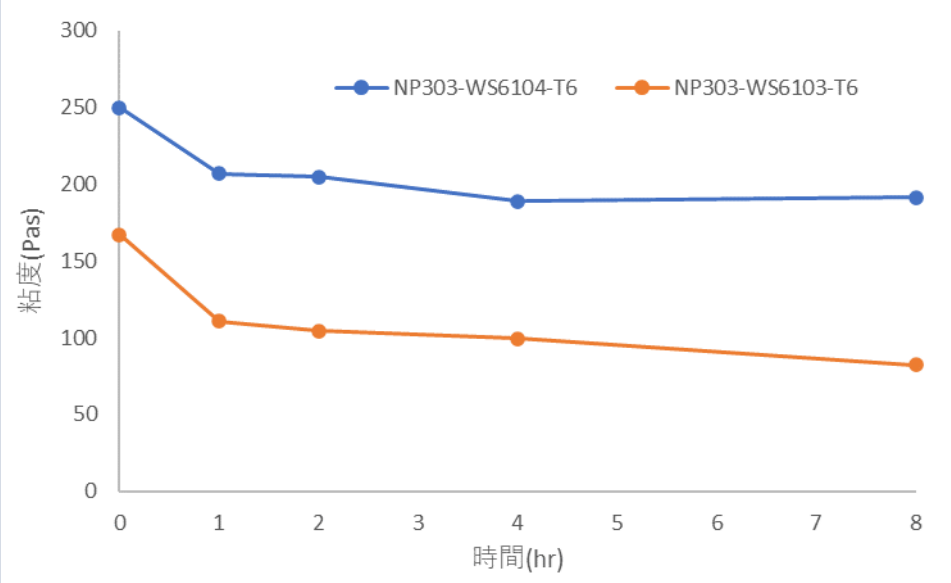
Test Conditions

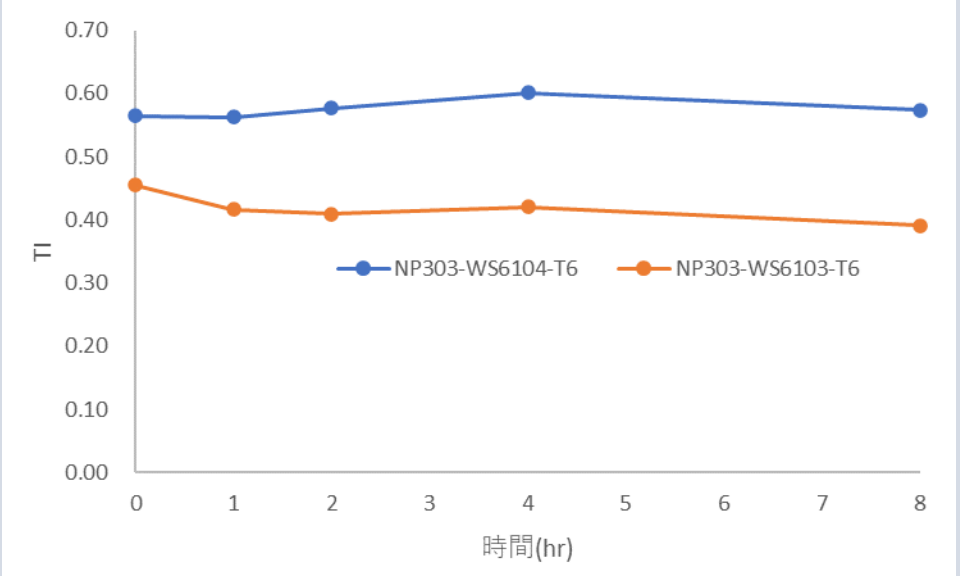
【Printing】 Speed：30mm/s　Printing Distance：300mm　Interval：180s
【Environment】 Temperature 24℃ Humidity 35%
【Device】 Desktop Printer、Viscometer (MALCOM, PCU-200 series)

Test Results

Viscosity



TI



- **Although a decrease in viscosity of NP303-WS6104-T6 is observed with continuous printing, , but the reduction rate is mitigated compared to conventional products.**
- **Stable TI.**

Void——Stand on the stencil for 8 hours

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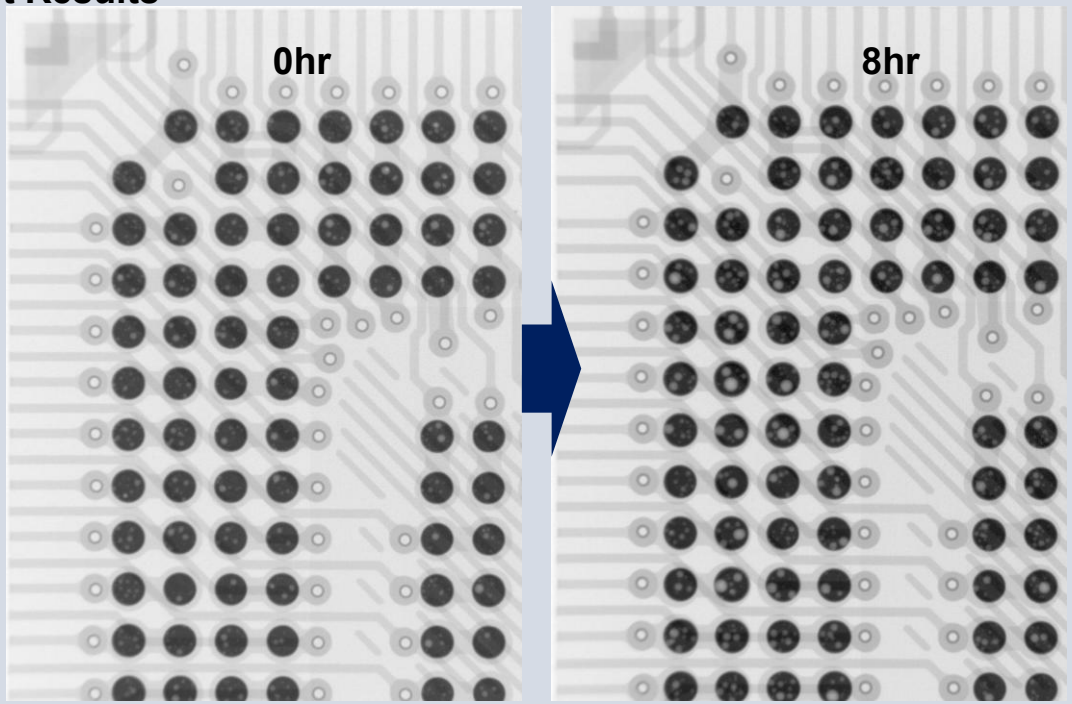
Test conditions

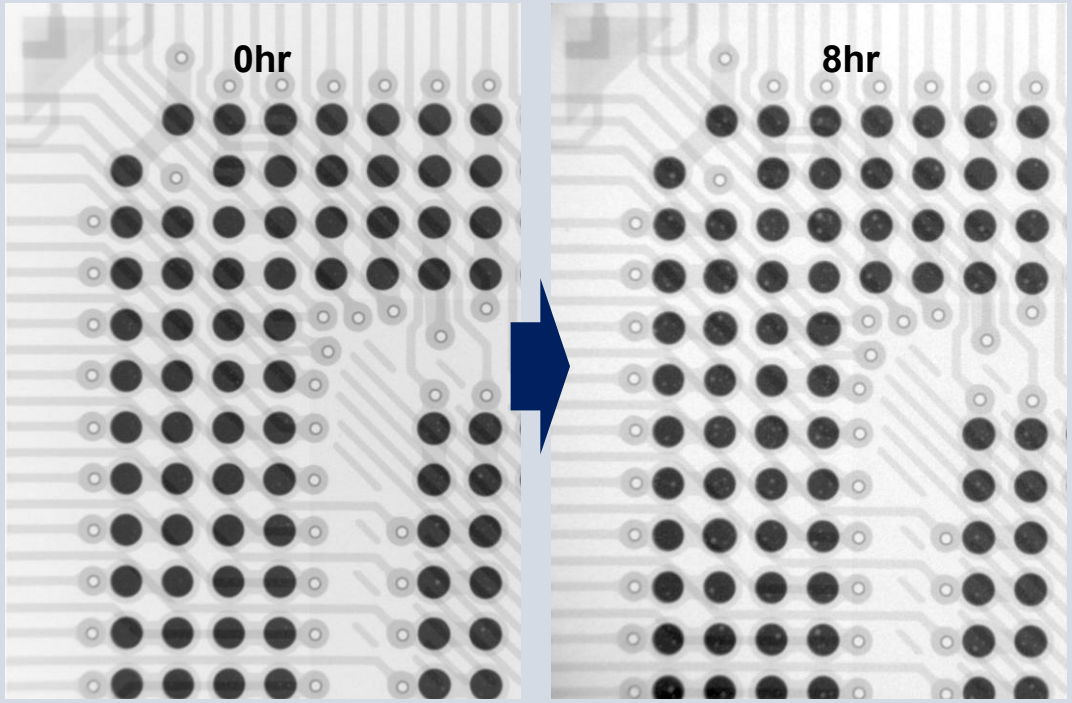
【Mask】Apertureφ180μm t30μm
【Substrate】 BGA φ180μm/Pitch300μm　ENIG　t1.0mm
【Printing】 Printing：50mm/s Pressure：50N
【Standing】 After one print, let it stand for 8 hours (24℃35%), then print again.
【Device】 Printing Machine (YAMAHA,YCP-10)、Heating Observation Device(CORES,core9046a-100)、X-ray Observation Device(MARS TOHKEN SOLUTION,MUX-3400)

Test Results

Conventional Product



NP303-WS6104-T6



・Although NP303-WS6104-T6 shows a slight increase in voids after an 8-hour standing period, there is a significant improvement compared to conventional products.

Characteristics

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Solder Composition

Sn3.0Ag0.5Cu

Melting Point

217～219℃

Test method:
DSC

Halide Content

≦0.05wt%(F＋Cl＋Br)

Test method:
JIS Z 3197 8.1.4.2.1

Powder Size

Type6

15～5μm

Viscosity

190Pas

(reference value)
Test method:
Malcom PCU-2, 5, 205

TI

0.55

(reference value)
Test method:
Malcom PCU-2, 5, 205

Insulation Resistance* (Ω)

40℃90%　　**85℃85%**

1.0×10^{11} min.　　1.0×10^{8} min.

Test method:
JIS Z 3284 3

Migration*

No Migration

Test method:
JIS Z 3284 14

*After Cleaning

Recommended Reflow Profile

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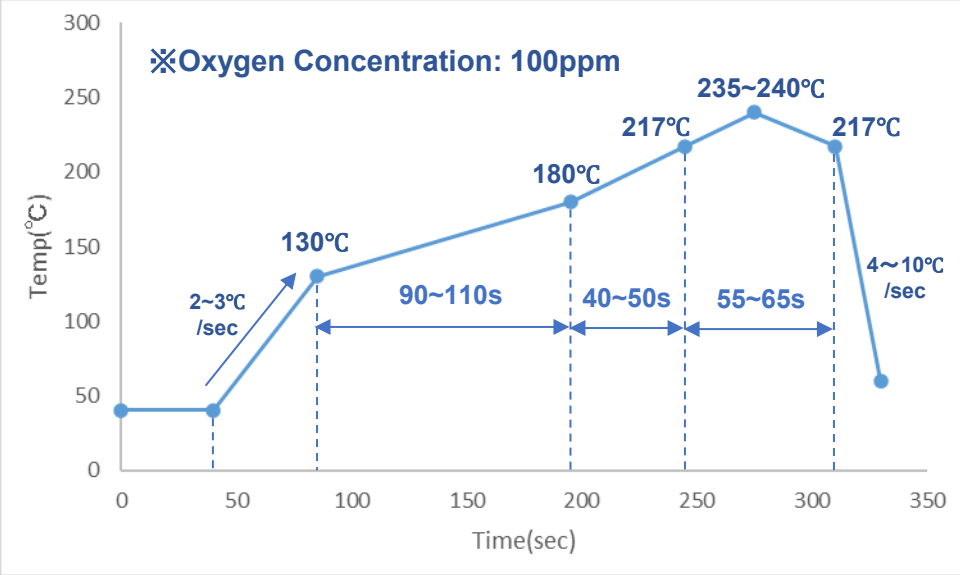

・Pre-heat

Please make sure the rising rate as 2-3℃/sec until pre-heat temperature. Rapid rising may cause slump of solder paste. To reduce temperature dispersion (⊿t) on substrate, use pre-heat temperature at 130-180℃ and pre-heat time for 90-110sec. In case of lower temperature and shorter time, the temperature dispersion (⊿t) on substrate will be large and may cause non-melting. Moreover, in case of higher temperature and longer time, activity of flux will be lost and may cause non-melting.

・Reflow peak

Please keep long time at low temperature (235-240℃) as peak temperature because of heat-resistance of component. When such condition can't be set because of reflow furnace performance, heat-resistance of the component at higher temperature (250℃) than normal temperature should be confirmed first. In case of over 220℃, melting time should be set for 20-50sec.

・Please set Oxygen concentration under 100ppm. In case of oxygen concentration is higher than 100ppm, it may cause non-melting.

・Cooling

Slow cooling may cause component to shift, stand or lower the joint strength. On the other hand, rapid cooling may damage the component by thermal shock. Cooling down rate should be set at 4- 10℃/sec.

＊Since the reflow profile shall be changeable depending on the condition of component, substrate, and specification of reflow furnace, sufficient examination in advance is recommended.

Caution in Use

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1. Do not use this product for other purposes except soldering.
2. Do not touch this product directly. In case of skin contact, wipe with tissue or cloth with alcohol or appropriate solvent then wash by soap water.
3. Do not inhale fume generated from this product. Adequate ventilation is required.
4. Recommended store condition and quality guarantee period are as follows: Keep refrigerated (10℃ or less) : 3 months from manufacturing date.
5. When it backs to room temperature, avoid to heat too rapidly. Keep it at room temperature and wait(1-2 hours). Do not open sealing when it is cold.
6. After thawing, mix this product at 500 rpm for 2 minute using the solder paste mixer(SR-500).
7. Optimum tack time after printing to mounting of components is about 8 hours.
8. Contamination by chlorinated or fluorinated solvents or other type of solvents will cause degrading of printability and solder ball. Please be careful in cleaning of stencil.
9. Please keep it away from any fire source in working place or store room.