

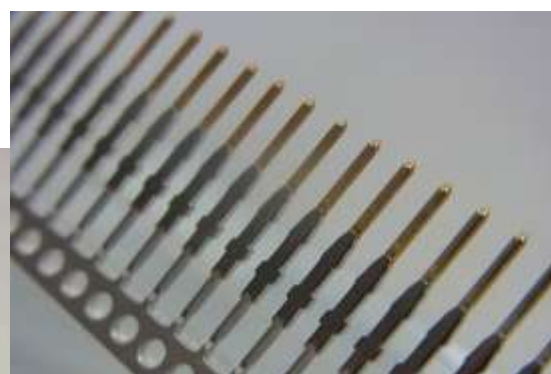
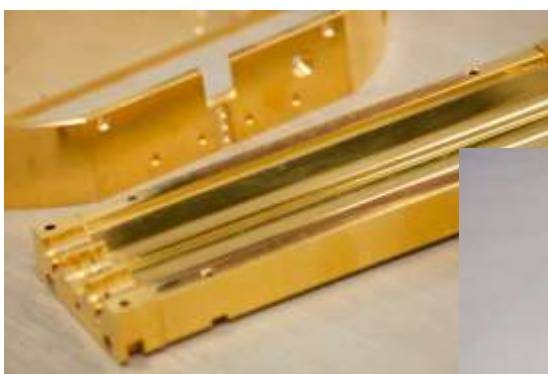
We are Your Surface Finishing Partner

Since 1931, We have provided surface finishing services for various industry field products.

These are used in electronics parts, automotive parts, aerospace parts, and medical applications.

We have provided Excellent plating services

- Gold-tin alloy plating with high reliability soldering bonding, high melting point
- Reel-to-Reel Process with High Level Partial Plating services.
- Plating for Bumps
- High Reflective Gold Plating film
- Nickel Plating for Wire Bonding
- Hard Silver Plating film
- Heat Resistant Silver plating film ...and more.



when request to the research and development stage,
we can offer a process to meet the customer requirements.

Please Feel Free to Contact Us !!

We are Your Surface Finishing Partner

Gotanda Factory



- Factory that is specialized
in noble metal plating
- Gold-plated accept with the purpose (10 types).
 - Various noble metal plating (gold, silver, etc.).

Hachioji Factory



- Factory that is specialized
in plating for package products
- Gold-tin alloy plating with high reliability soldering bonding, high melting point. (280°C)
 - Whisker-free tin alloy plating (non lead).

We have four Excellent factories

Yonezawa Factory



- Factory that is specialized
in professional Reel-to-Reel plating
- Stripe, partial high-variety low-volume manufacturing
 - Direct gold-plated on SUS material
 - Excellent hard silver plating (Not Reel-to-Reel)

Kofu Factory



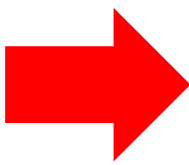
- Factory that is specialized
in RoHS compliance
- Trivalent chromate coatings.
 - Aluminum chemical conversion treatment using trivalent chromium.

Please Feel Free to Contact Us !!

New Hard Silver Plating Film

Hardness

Standard Silver
Hv 80~110



New Hard Silver
Hv 150~180

We have provided New Hard Silver Plating

Contact Resistance

Unit:(mΩ)

Standard Silver	New Hard Silver
0.60	0.76

Resistance Equivalent to Standard Silver

Measure by resistance Tester(type:CRS-113-AU)
Made by yamasaki-seiki Co., Ltd.
※Condition:100gf (n=3)

Resistance to Discoloration

Test of drop ammonium sulfide(JIS H 8621)

New hard Silver



Standard Silver

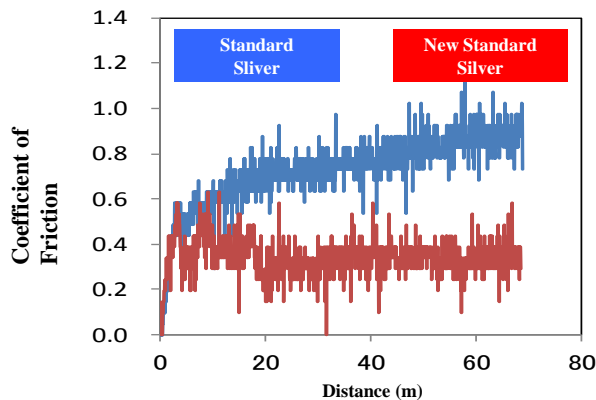


As Plating

24 hours

No Discoloration due to Sulfide

Coefficient of Friction



TRIBOMETER PIN-ON-DISK

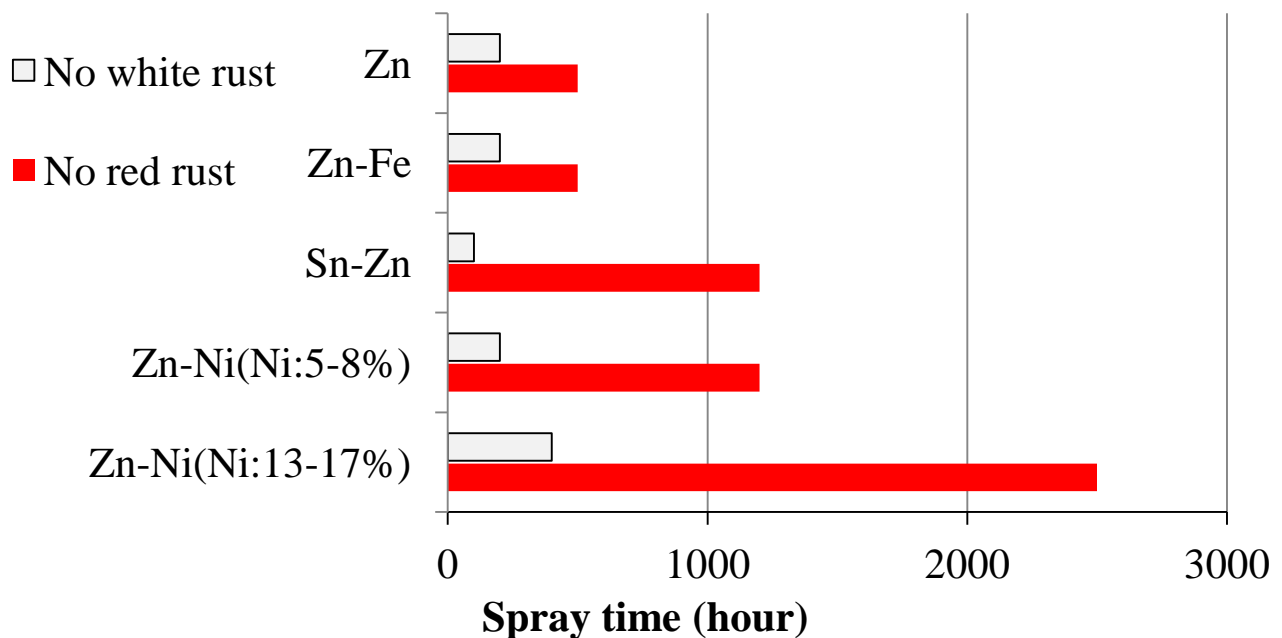
※Condition: Load 0.5N
Rotations(Speed/Total 100rpm/1000times)
φ6mm SUS304

Lower than Standard Silver

Zinc-Nickel Alloy Plating

Zn-Ni alloy that has high nickel content offers high corrosion resistance

Result of the salt spray test (ISO 9227)



•Substrate: Fe

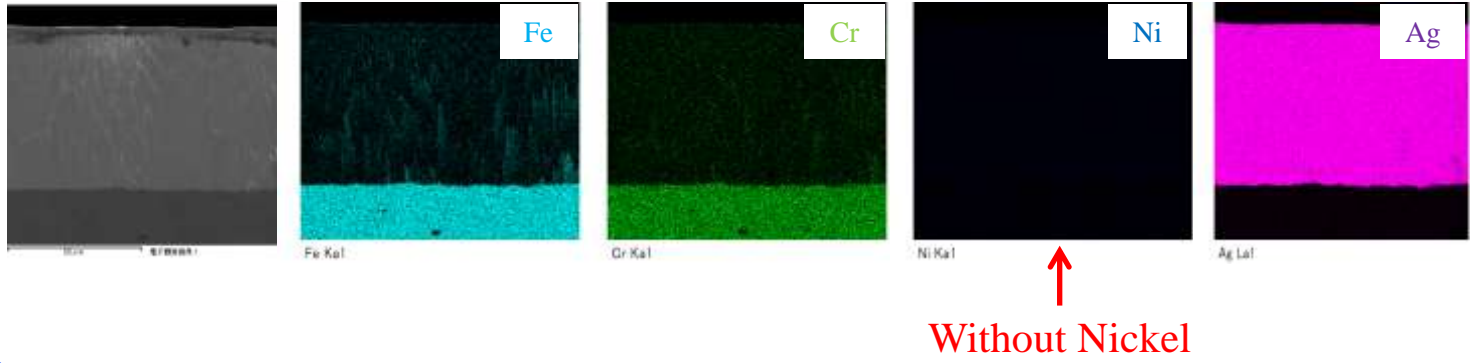
•Plating film thickness:8 μ m(After trivalent chromium conversion coating)

<Properties of the high nickel content Zn-Ni alloy>

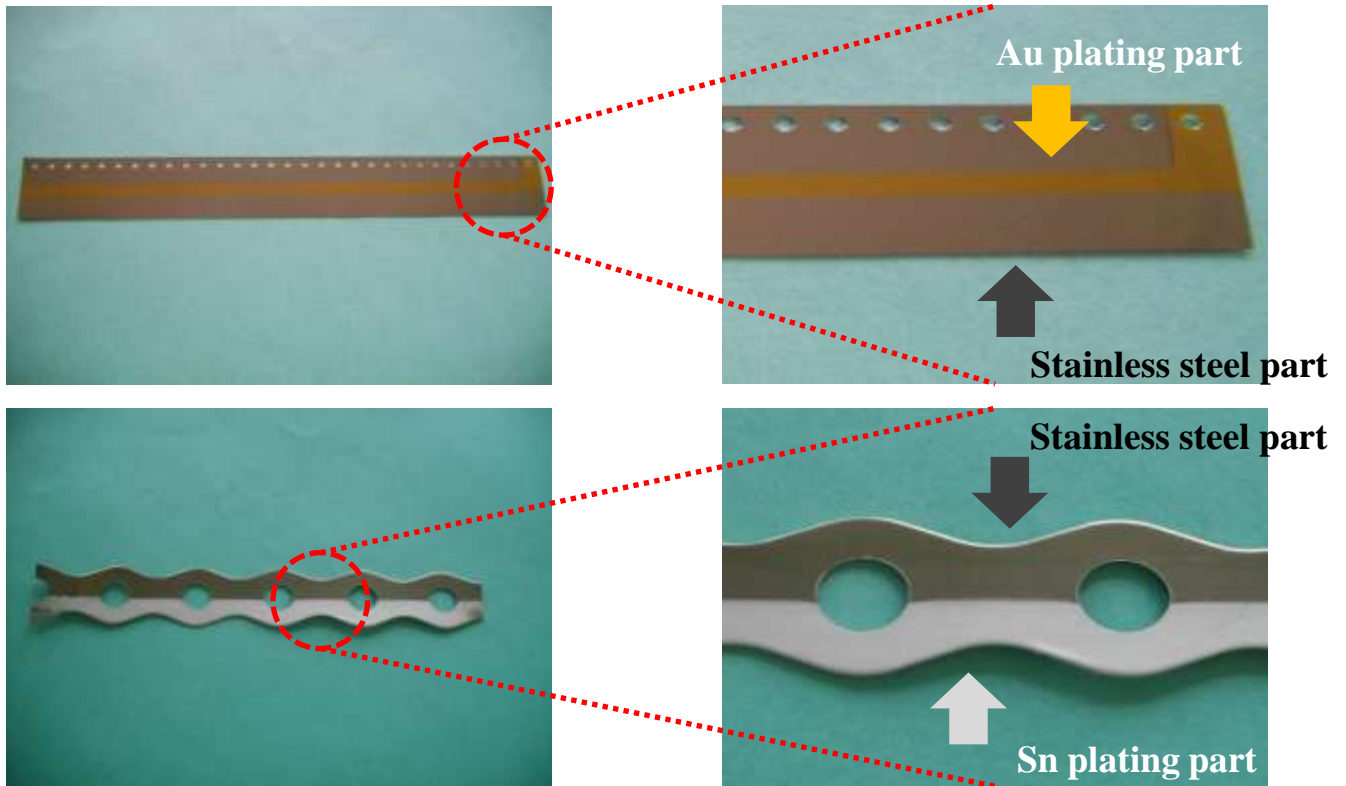
- **High-corrosion resistance:** The Zn-Ni alloy(high nickel content) has the most high-corrosion resistance in zinc alloys.
- It shows five times or more corrosion resistance than Zn.
- It shows more than twice corrosion resistance than Zn-low Ni alloys.
- **High heat resistance:** It shows excellent corrosion resistance and adhesion under high temperature.
- **Compliance with environmental regulations:** Our processes and equipments are designed to ensure compliance with all applicable environmental regulations and permits.
- **Plating processes:** We can offer the high nickel content Zn-Ni alloy coating with barrel and a lack plating.

Direct Noble Metal Plating on Stainless Steel

Ex) Silver plating sample viewed by SEM



We have developed a process for noble metal (Au,Ag,Sn) plating directly on stainless steel.



We will provide high quality products.
Don't Worry about Nickel allergy.

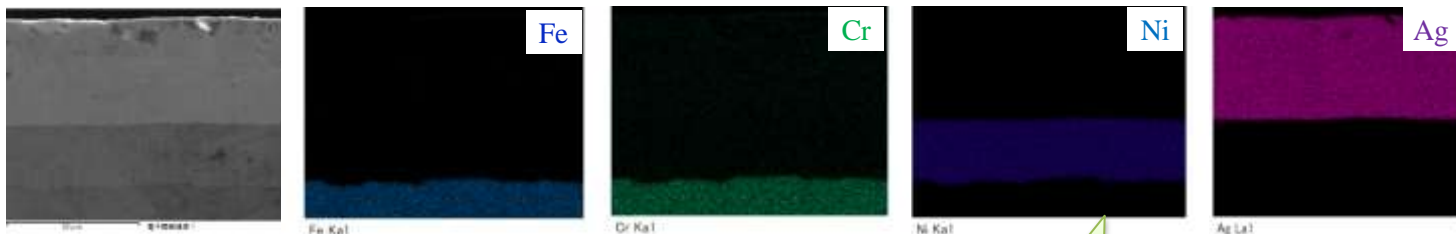
Please Feel Free to Contact Us !!

Direct heat resistive Silver plating process on the stainless steel

- We can directly to the silver plating stainless steel.
- This does not involve peeling or discoloration caused by a high-temperature environment.

To conventional Silver plating on SUS

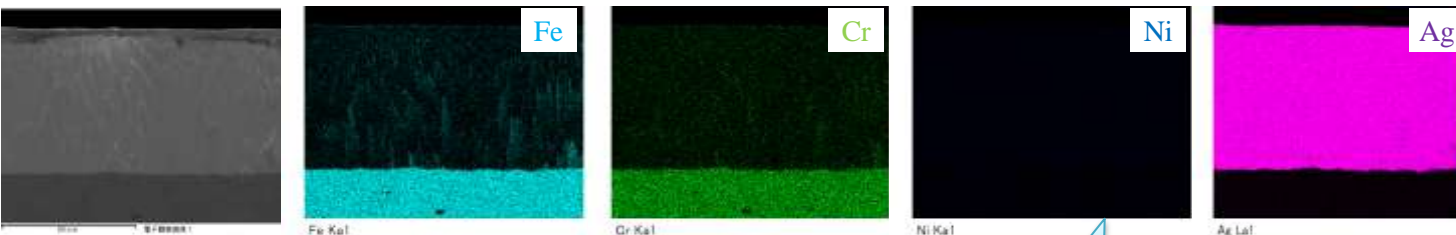
Ex.) Nickel and Silver plating on SUS430



There is nickel under-layer plating on stainless steel .

Direct Silver Plating on SUS

Ex.) Direct Silver plating on SUS430

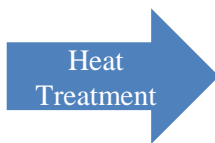


It is definite that Tin plate on stainless steel directly.

Heat-resistance



Before heat treatment



After heat treatment

It keeps adhesion without discoloration of heat treatment at 750 °C.

- We provide it at the same price as the regular silver plating.
- From prototype to mass production, we deliver high-quality products.

Pease do not hesitate to consult.

Porous Nickel Plating

Do you need these materials ?

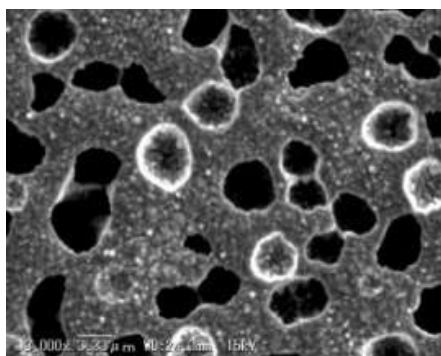
Materials with large specific surface?

Materials with micro asperity surface?

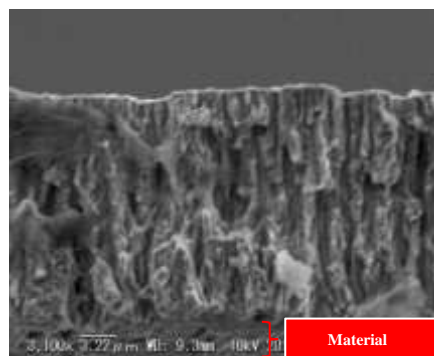
Then ...

We can provide porous nickel plating

Porous Nickel Surface



Porous Nickel Section



In this process ...

- The porosity is about 40 million/cm².
- The pore size is changeable depending on plating conditions .

Applications

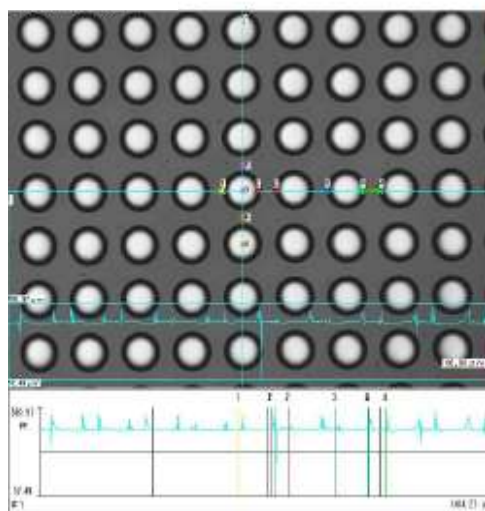
- Before surface for painting ▪ Surface modification
- Fuel Cell Parts ▪ Substrate for packing materials , ETC.

Bump plating technology to a wafer

Please order bump plating to the various wafers used for semiconductor parts.

The diameter of bump : 100 μ m

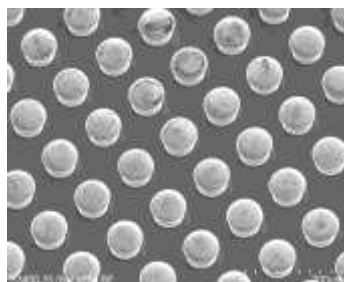
Enlargement



•Magnification *10

•Distance
 1 : 100.90 μ m
 2 : 53.92 μ m
 3 : 100.92 μ m
 4 : 52.53 μ m

•Difference in height
 5 : 3.00 μ m
 6 : 3.01 μ m



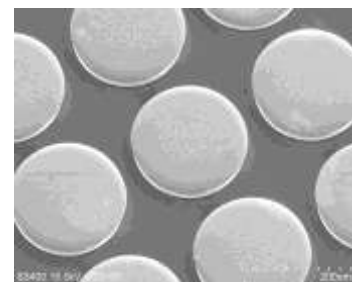
ϕ 50 μ m



ϕ 100 μ m



ϕ 150 μ m



ϕ 200 μ m

【The track record of our company】

- In the specification of electroplating and electroless plating, the surface-mounted component for smart phones has a track record.
- Similarly , we have a track record in the silicon wafer etc.
- Various materials and various sizes should trial-production-give an order (The correspondences of 4 inches wafer).
- Please do not hesitate to consult with the demand from a research-and-development stage.
- Moreover, we'll propose the process of suiting a visitor's demand.

Pease do not hesitate to consult.

Gold-Tin Alloys

Outline

We have provided Gold-Tin alloy plating technologies. Gold-Tin alloys have used in high temperature and high strength joint soldering field.

Plating films of Gold-Tin alloy are thinner than sheet or ribbon solder materials and deposited only on demanded area.

Our plating films are uniform in composition and thickness.

We can gain eutectic composition as well as some types of compositions.

Thinner Alloy Film

The alloy film thickness is controlled by plating conditions and therefore the film is able to thinner than that of sheet or ribbon materials.

Wide range of contents

The films have various contents by various plating conditions.

Fine deposition

The films can be formed on fine patterns.

High reliability joint

We can offer the plating film as high reliability solder joint materials

Because Gold of excellent oxidation resistance and mechanical properties.

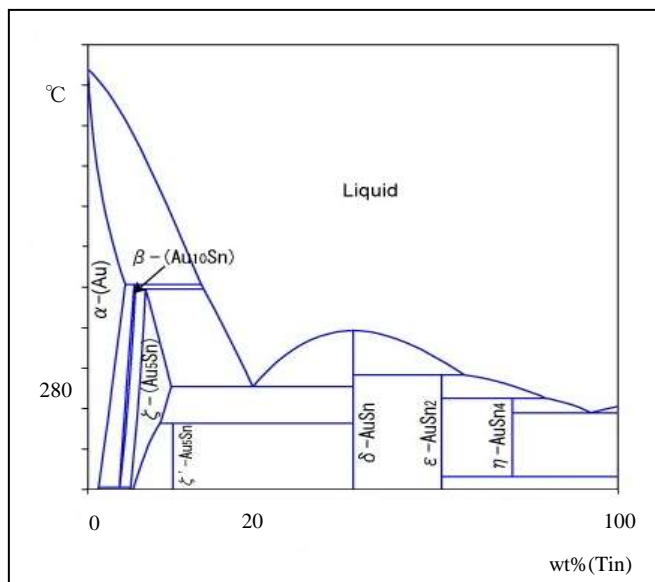


Figure1. Eutectic phase diagram

High-temperature Solder

We can offer the plating film as lead-free solder of 280°C of melting point.

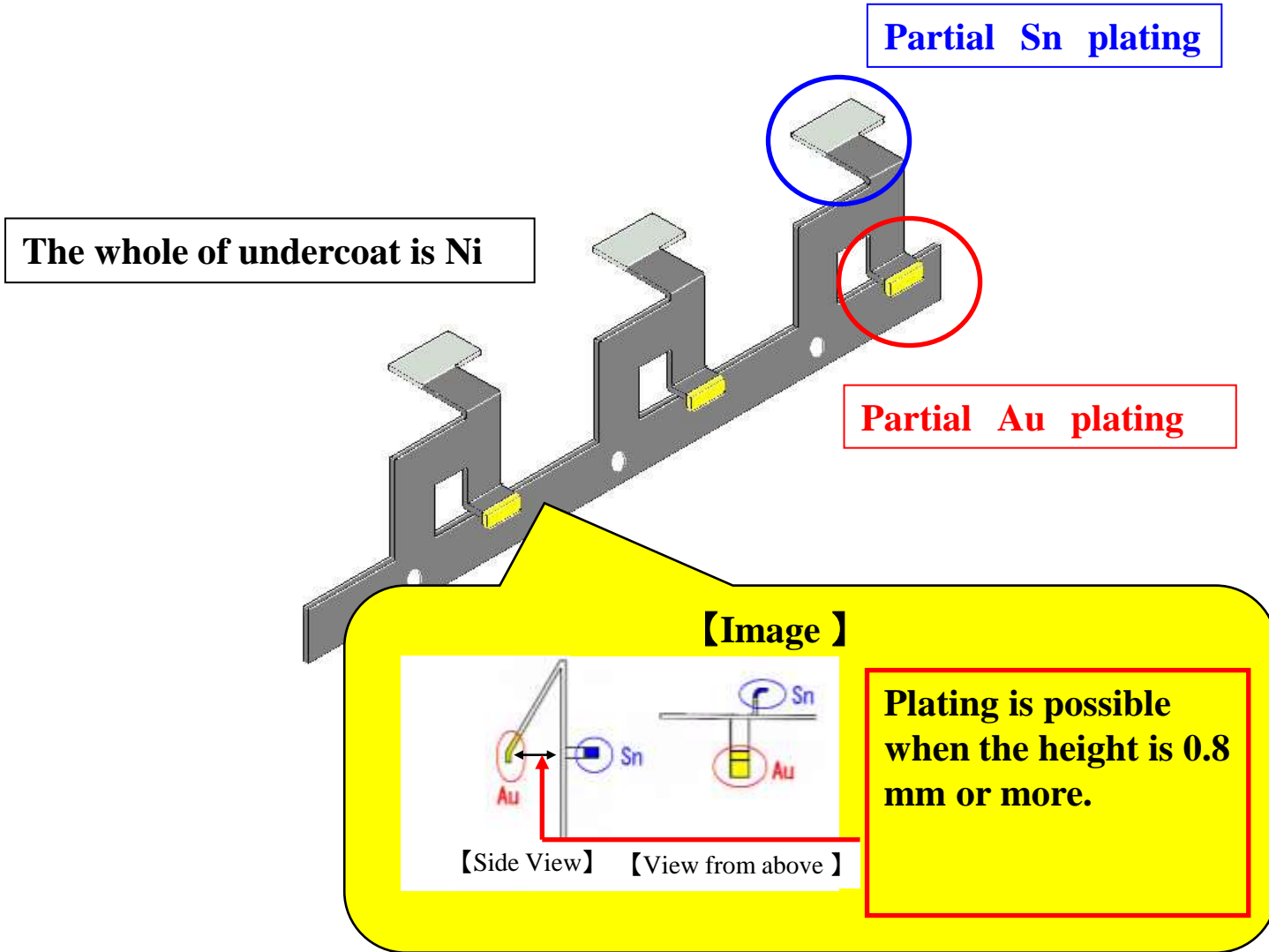
As Gold-Tin alloys have relatively high melting point in solder, they have used in a process which demands two or three of soldering.

Table1. Melting point of Tin and Tin Alloys

Plating types	Melting point	Characteristic
Tin	230°C	Typical lead-free solder plating
Tin-Antimony	235°C	Excellent mechanical properties
Gold-Tin alloy	280°C	High-temperature Solder

Three kinds of high level partial plating.

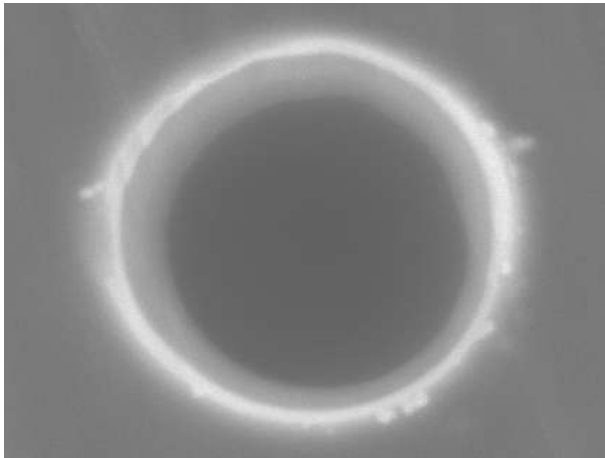
- Since Ni-Au-Sn can process at one hoop line, it can respond at short time for delivery.
- Partial Au plating cuts cost!
- It is possible to plate on the demanded parts with simple jigs.



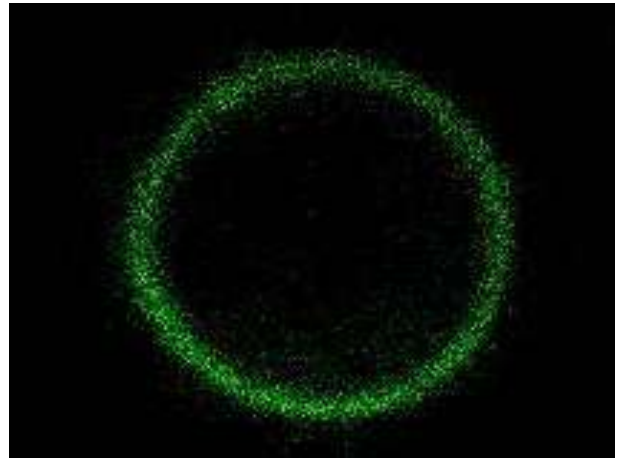
We are at your service.

We can Plate Powder Plating

Cross-sectional observation of plated Sic powder



SEM photograph



Ni K α

× 6000

Advantages

**Reducing metal usage metal by only surface metalizing.
Improvement corrosion resistance by Plating**

Materials: Various diameters of particle and kind of materials are available.

Achievement: We have succeeded several types of plating(Nickel, Copper, etc).

Security Protection: We keep your confidential matter by non-disclosure agreement(NDA).