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Gold Contact Plating Repair Kit

IPS CRK-01

Procedural Instructions

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Outline

This method is used to replate gold contact areas or fingers by selective plating. Contacts may require replating if they have become contaminated with solder, or scratched during handling. Other applications may arise when the existing plating does not meet the required specification, or if the specification changes.

The electroplating process uses a DC power supply. One lead, the cathode, is connected to the contact area to be plated. A second lead, the anode, is connected to the Mini Plating Pen. When the Pen is swabbed across the contact area the metal contained in the solution contained in the Pen is plated wherever electrical contact is made.

If the repair is required because of solder contamination, it is important to remove all the solder contamination prior to replating.

Caution

The method can be used to replate any metal surface, but it is essential that the surface is free from deep scratches, nicks, pin holes or other defects. If gold contacts or fingers are too damaged to be replated by this procedure, please contact INTERTRONICS for advice and other methods.

Safety

A thorough review of this method should be made before repairs are attempted. Operators should become familiar with the tools included and should practice on scrap printed circuit boards (PCBs).

To achieve the best results, a clean work environment is essential. A smooth work surface and good lighting are recommended.

We recommend that safety glasses and gloves should be worn during the procedure, and that the work area should be adequately ventilated or extraction should be used. The Health & Safety Data Sheets which are included in the IPS CRK-01 Gold Contact Plating Repair Kit should be read and appropriate precautions taken in compliance with them, legal requirements and good industrial practice.

Tools & Materials

The following will or may be required during this procedure:

Part No	Description	Supplied in kit
IPS ER-02	Eraser Refill	Y
IPS GL-01	Antistatic Gloves	Y
TEC 1821-5F	Desoldering Braid	Y
TEC 1822-5F	Desoldering Braid	Y
ADH 1610-PK	IPA Cleaning Wipe	Y
ADH 1616-100	Adhere Drywipe	Y
TEC 2032	Cleaning Brush	Y
RAR-WB-8-ESD	ESD Safe Water Bottle	Y
INT 701-012	Kapton Masking Tape	Y
IPS SG-01	Safety Glasses	Y
HUN PL-1001	Connector Cables	Y
HUN PL-1002	Absorbent Pen	Y
HUN PL-1003	24k Gold Pen	Y
HUN PL-1016	24k Gold Pen – Heavy	N
HUN PL-1006	Nickel Pen	Y
HUN PL-1020	Nickel Pen – Heavy	N
	Power Supply 0-12V DC, 100mA	
	Soldering Iron	
	DI Water	

Preparation

Remove Solder Contamination

- Clean the rework area with ADH 1610 IPA Cleaning Wipe or similar.
- Apply INT 701-012 Kapton Masking Tape to the PCB surface surrounding the area to be reworked. The masking tape will protect adjacent components and PCB surface from unwanted exposure to cleaning and plating solutions.
- Remove the bulk of the solder contamination using desoldering braid. In order to provide a more even surface for replating, solder may be reflowed over the entire contact area prior to desoldering.
- Clean the area.
- Using the Eraser, remove the remaining thin layer of solder until the underlying nickel surface is exposed.
- Thoroughly rinse the area with DI water (the RAR-WB-8-ESD ESD Safe Water Bottle is supplied for this). Use an ADH 1616 Adhere Drywipe to remove any residue.

Remove Poor Plating

- Clean the rework area with ADH 1610 IPA Cleaning Wipe or similar.
- Apply INT 701-012 Kapton Masking Tape to the PCB surface surrounding the area to be reworked. The masking tape will protect adjacent components and PCB surface from unwanted exposure to cleaning and plating solutions.
- Buff the contacts using the Eraser until all defective or poor plating is removed.
- Thoroughly rinse the area with DI water (the RAR-WB-8-ESD ESD Safe Water Bottle is supplied for this). Use an ADH 1616 Adhere Drywipe to remove any residue.

Plating Process

- Place the PCB on an ADH 1616 Adhere Drywipe. This will help to protect the work surface.
- Masking & Bussing

  Masking of surrounding areas which will not be plated will protect adjacent components, PCB surface and other contacts from unwanted exposure to cleaning and plating solutions. Also, precautions must be taken to prevent the plating voltage from being applied through other parts of the PCB, which might cause electrical damage.

  - If only one gold contact requires plating, mask off the area where plating is not required and the adjacent contacts with INT 701-012 Kapton Masking Tape.
  - If more than one contact requires plating, either
    (a) plate the contacts individually, masking off each one in turn, or
    (b) Use a bussbar of conductive ink or copper wire across all the contacts to be plated. This will ensure that plating voltage is confined to that area.
- Set the current limit on the power supply to 100mA and the voltage to 0 volts.
- Connect the HUN PL-1001 Connector Cables to the power supply, red cable to positive (+ve) and black cable to negative (-ve).
- Connect the –ve lead to a convenient point in the rework area and lightly rub the Absorbent Pen across the area to be plated. Small bubbles will form to remove oil and grease.
- Set the power supply voltage to 0 volts.
- Remove the Absorbent Pen and store (vertically, with the tip point upwards).
- Thoroughly rinse the area with DI water using an ADH 1616 Adhere Drywipe to remove any residue.
- Connect the PL-1006 Nickel Pen to the +ve lead and adjust the voltage to 6 volts.
- Contact the –ve lead to a convenient point in the rework area and lightly rub the Pen across the area to be plated. In moving the Pen lightly back and forth, nickel will be deposited on the contact area.
- Set the power supply voltage to 0 volts.
- Remove the Nickel Pen and store.
- Thoroughly rinse the area with DI water using an ADH 1616 Adhere Drywipe to remove any residue.
- Connect the PL-1003 Gold Pen to the +ve lead and adjust the voltage to 6 volts.
- Contact the –ve lead to a convenient point in the rework area and lightly rub the Pen across the area to be plated. In moving the Pen lightly back and forth, gold will be deposited on the contact area.
- Set the power supply voltage to 0 volts.
- Remove the Gold Pen and store.
- Remove masking tape.
- Thoroughly rinse the area with DI water using an ADH 1616 Adhere Drywipe to remove any residue.

Evaluation

- Visually examine the rework area for colour and lustre.

Additional Information

CAUTION – Store the Mini Plating Pens vertically, with the tips pointing upward.

If the temperature is very low, the plating adhesion may be poor. In this case, warm the plating area and Pen to not more than 40°C.

Wait until the plating solution seeps out of the end of the Mini Plating Pen. Do not shake the Pen to force the solution out.

Rinsing must be thorough. Rinse the area with DI water after each stage of the plating process, including degreasing. Leave the area damp to prevent oxidation between stages.

The working voltage is indicated on each Pen. Using too high a voltage will result in burning and excessive use of solution.

Keep the work surface clean. If it is stained with plating solution, ensure this is wiped off.

Replace the Mini Plating Pen cap immediately after use. Use the same cap for the same pen. If caps become mixed, wash thoroughly and dry.

Plating zinc die-casting: first plate with copper and then with the desired plating following the sequence indicated: degrease – rinse – copper plate – rinse – desired plating – rinse.

Troubleshooting

When plating does not adhere well, check the following points:

1) Room temperature – if low, warm part and pen as previously described.
2) Pre-polishing – perhaps the object has not been polished sufficiently. Utilize the metal polish until all visible oxidation and corrosion are removed.
3) Degreasing – grease may not have been removed completely. Use absorbent pen until the object does not repel water when rinsed, and turns light gold in colour.
4) Voltage – check whether the voltage is adjusted to the level designated on the pen. Also check all connections.
5) Wipe a few drops of plating solution from the service end of the pen with a clean cloth or soft paper.

Plating Coverage

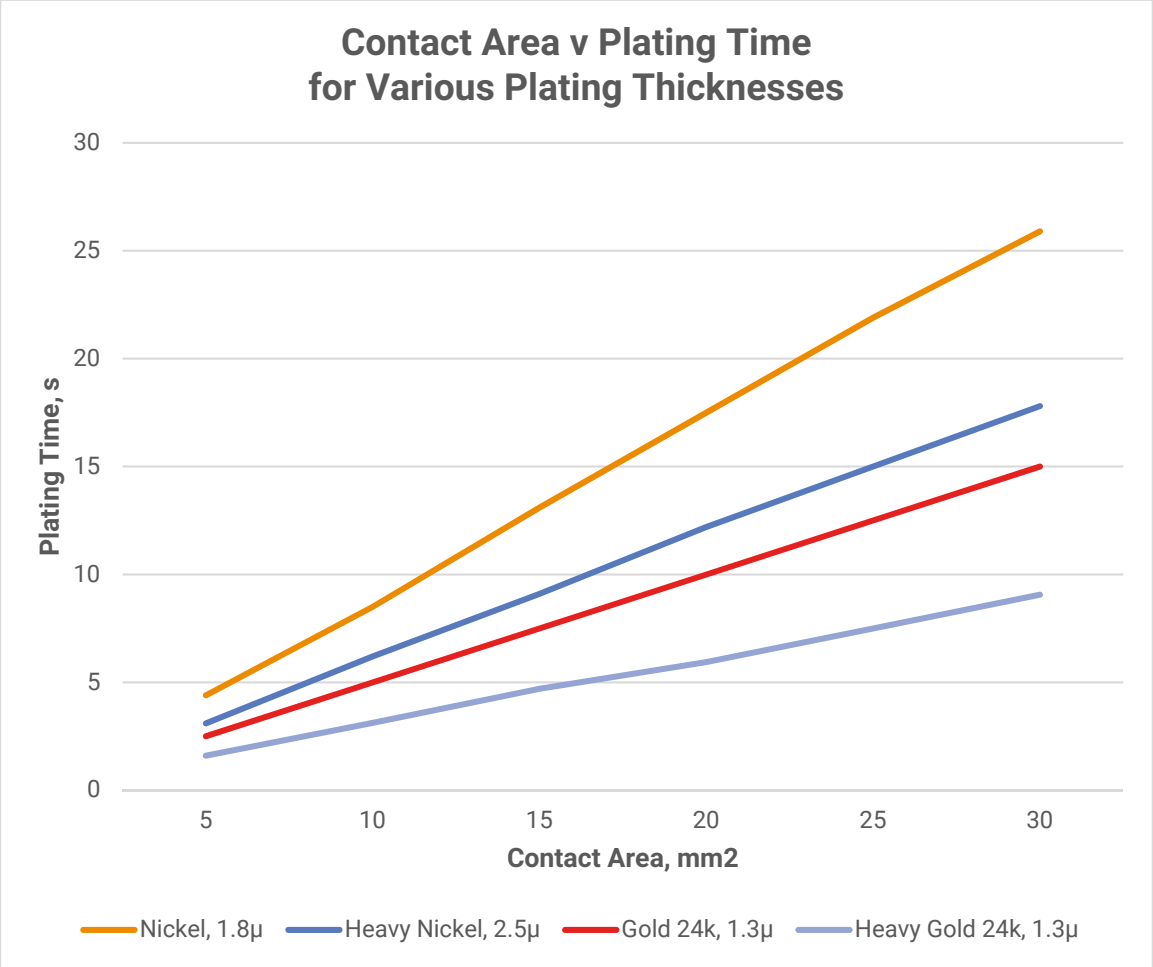
The following specifications are meant as a guide only, and the user should establish the correct plating times to meet their requirements.

Plating times given are typical to achieve a 1 micron thickness on 25mm x 25mm copper surface.

PL-1006 Nickel	300 seconds
PL-1020 Nickel – Heavy	150 seconds
PL-1003 Gold 24k	240 seconds
PL-1016 Gold 24k – Heavy	150 seconds

Therefore, for a typical edge connector pad 7mm x 1.5mm, the approximate plating times would be:

PL-1006 Nickel	1.8 microns	9 seconds
PL-1020 Nickel – Heavy	2.5 microns	6 seconds
PL-1003 Gold 24k	1.3 microns	5 seconds
PL-1016 Gold 24k – Heavy	1.3 microns	3 seconds



References

IPC-7721 Repair and Modification of Printed Boards and Electronic Assemblies

ANSI/IPC-A-610 Acceptability of Electronic Assemblies

ANSI/IPC-A-600 Acceptability of Printed Boards

Plating Requirements

Pen	Product Number	DC Voltage	Comments
Absorbent	HUN PL-1002	10v-12v	For cleaning all metals prior to plating, except stainless steel
Gold – 24k	HUN PL-1003	6v-8v	Plates over gold, nickel and silver
Gold – 18k	HUN PL-1004	6v-8v	Plates over gold, nickel and silver
Gold – 14k	HUN PL-1005	6v-8v	Plates over gold, nickel and silver
Nickel	HUN PL-1006	6v-8v	Plates over copper. Apply copper flash using copper pen to non-copper surfaces
Black Nickel	HUN PL-1007	8v-10v	Same as nickel
Silver	HUN PL-1008	5v-6v	Plates over any metallic surface except aluminium or chromium
Chrome-Colour	HUN PL-1009	6v-8v	Plates over copper. Apply copper flash using copper pen to non-copper surfaces.
Copper	HUN PL-1010	6v-8v	Plates over any metallic surface except aluminium or chromium
Rhodium	HUN PL-1011	8v-10v	Plates over nickel. Non nickel surfaces should be first flashed with copper, and then with nickel
Tin	HUN PL-1012	6v-8v	Plates over any metallic surface except aluminium or chromium
Zinc	HUN PL-1013	6v-8v	Plates over any metallic surface except aluminium or chromium
Absorbent for Stainless Steel	HUN PL-1014	10v-12v	For cleaning and activating stainless steel
Palladium	HUN PL-1015	6v-8v	Plates over nickel. Non nickel surfaces should be first flashed with copper, and then with nickel
Gold – 24k heavy	HUN PL-1016	6v-8v	Plates over gold, nickel and silver
Gold – 18k heavy	HUN PL-1017	6v-8v	Plates over gold, nickel and silver
Silver – heavy	HUN PL-1018	5v-6v	Plates over gold, nickel and silver
Copper – heavy	HUN PL-1019	6v-8v	Plates over any metallic surface except aluminium or chromium
Nickel – heavy	HUN PL-1020	5v-6v	Plates over copper. Apply copper flash using copper pen to non-copper surfaces.
Connector Cables	HUN PL-1001		For use with power supply
Power Supply (optional)	HUN PL-1000-220V	220v 50hz	
Deluxe Kit	HUN PL-1000-220V-K	220v	Complete with power supply, connector cables, and one each of the following pens: Absorbent, Silver, Gold (24k), Nickel, Chrome-Colour and Copper
Contact Repair Kit	HUN PL-1000-220V-C	220v	Complete with power supply, connector cables, and one each of the following pens: Absorbent, Gold (24k) and Nickel

NOTE: In the case of zinc die-castings or steel, it is recommended that a copper flash be applied prior to the application of any other plating.