

PMD (UK) LTD PROCESS DATA

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CG N92-05/02

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PREV 5

PMD CIRGOLD N92 GOLD PLATING PROCESS

INTRODUCTION

PMD Cirgold N92 is a high speed acid gold plating process specially formulated for use in reel-to-reel plating machines or automatic high speed plating of printed circuit board plating. The process can also be used for conventional rack or barrel plating. The deposits contain 0.2-0.3% nickel, have good wear characteristics, low contact resistance and are eminently suitable for electronic contracts.

BENEFITS

Wide current density range.

Excellent deposit distribution.

Capable of high current density operation at low gold concentrations.

Reduced inventory.

Reduced drag-out losses.

SOLUTION MAKE-UP

Cirgold N92 is supplied as a Base Concentrate to which potassium gold cyanide and deionised water are added:-

Cirgold N92 Base Concentrate	750 ml
Deionised Water	250 ml
Potassium gold cyanide	as required (See Operating Conditions)

CAUTION: Cirgold N92 Plating Solutions contain cyanide and therefore the correct precautions should be taken during make-up and operation.

Prior to using a new tank it should be leached with a 10 g/l solution of citric acid at 50 - 60 deg C overnight.

OPERATING CONDITIONS

	BARREL	RACK	HIGH SPEED
Gold concentration	1-3 g/l	3-6g/l	3-15g/l
Nickel concentration	0.5-1.0g/l	1.0-1.5g/l	1.0-1.5g/l
pH	4.0-5.0	4.0-5.0	4.0-5.0
Specific gravity	13-17° Be	13-17°Be	13-17°Be
Temperature	40-50°C	40-50°C	40-60°C
Cathode current density	0.1-1.0 A/sq.dm.	1.0-2.0 A/sq.dm	5.0-100 A/sq.dm
Anode current density	0.5-1.0 A/sq.dm.	0.5-1.0 A/ sq.dm	minimum possible
Agitation	Work movement	Moderate movement	solution Vigorous solution movement

EQUIPMENT

Tanks	Moulded polythene or welded PVC.
Anodes	Platinised titanium.
Agitation	Vigorous solution movement.
Filtration	Glandless all plastic construction capable of at least 3 - 4 turn-overs/hour through a 5 micron polypropylene cartridge guaranteed free of winding lubricant.
Rectification	Maximum 5% ripple.

MAINTENANCE

The solution should be regularly analysed for gold and nickel and maintained within 5% of the optimum concentrations.

MAINTENANCE CONTINUED

The gold and nickel concentrations will be approximately maintained by the following addition every ampere hour:

2.5 gm of gold as potassium gold cyanide (PGC or GPC).
6.25 ml Cirkgold N92 Replenisher.

These materials are supplied in units of Cirkgold N92 replenishment, each unit consisting of:

100 gm gold as PGC (029003) + a Cirkgold N92 250 ml "R" Unit.

This recommendation is only a guide and precise replenishment rate will vary depending on cathode efficiency which, in turn, will vary with gold concentration, current density, agitation and temperature.

Specific Gravity Maintain the solution density at 15 deg Be. To raise the density Cirkgold N95 Conductivity Salts should be added (15 g/l will increase the density at 40 deg C by 1 deg Be).

pH Maintain the pH at 4.75 by additions of Cirkgold N92 Acid Adjusting Solution to lower. If it is necessary to increase the pH add Cirkgold N92 Alkali Adjuster.

DEPOSIT PROPERTIES

Nickel in deposit	0.2 - 0.3%
Deposit density	16.5 - 17.0 gm/cc
Contact resistance (200 gm)	0.9 milliohm
Electrical resistivity	3.2 microhm - cm
Hardness	125 - 180 DPN
Stress (tensile)	30,000 p.s.i.

Conform to British Telecoms Specification M468A and USA MIL Specification G 452048 Type C.

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NOTES ON THE USE OF CIRGOLD N92

1. Deposition Rate

Cathode efficiency is affected by operating parameters as follows :-

Increasing current density reduces efficiency
Increasing gold concentration increases efficiency
Increasing pH increases efficiency
Increasing temperature increases efficiency
Increasing agitation increases efficiency.

As a general guide the following deposition rates can be expected:-

	Temp°C	pH	Gold g/l	CD A/sq.dm	Rate
Barrel plating	40	4.5	1	0.1	1μ in 30 minutes
"	40	4.5	3	0.5	1μ in 6 minutes
Rack plating	45	4.5	3	1.0	1μ in 4 minutes
"	45	4.5	6	1.5	1μ in 3 minutes
Tab plating	55	4.5	3	8.0	1μ in 60 seconds
"	55	4.5	6	15	1μ in 30 seconds
Reel to Reel	60	4.5	5	40	1μ in 12 seconds
"	60	4.5	10	100	1μ in 5 seconds

DISPOSAL

Dispose of in accordance with local authority requirements.

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PRODUCT FAMILIES

The following products or families of products are referred to in this data sheet:

<u>Product Name</u>	<u>Product Number</u>
The Cirgold N92 System	
Cirgold N92 Base Solution (Barrel)	037035
Cirgold N92 Base Solution (Rack)	037037
Cirgold N92 Base Solution (Reel/Reel)	037038
Cirgold N92 250 ml "R" Unit	047047
Cirgold N92 Conductivity Salts	063008
Cirgold N92 Acid Adjuster	067024
Cirgold N92 Alkaline Adjuster	065013
Gold as PGC - 100 Gram Unit	029003

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