

# CIRGOLD N(HT) HIGH THROWING POWER HARD GOLD PROCESS

## INTRODUCTION

PMD Cirgold N(HT) is an acid gold process specially developed for rack plating of printed circuit board edge contacts or barrel plating of electronic connectors. The unique formulation enhances throwing power with resultant savings in gold usage.

The deposit contains 0.2 - 0.3% nickel which gives good wear characteristics, low contact resistance and makes Cirgold N(HT) eminently suitable for electronic contacts.

## EQUIPMENT

Tanks	Moulded polythene or welded PVC.
Anodes	Platinised titanium.
Agitation	Solution movement and/or work movement.
Filtration	Glandless all plastic construction capable of at least 3 - 4 turnovers/hour through a 5 micron polypropylene cartridge guaranteed free of winding lubricant.

## SOLUTION MAKE-UP

Cirgold N(HT) - Base Solution is supplied ready for use at the gold concentration recommended for the application - see Notes, Page 3.

**CAUTION: Cirgold N(HT) Plating Solutions contain cyanide and therefore the correct precautions should be taken during make-up and operation.**

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

## **OPERATING CONDITIONS**

Temperature		30 - 45 deg C
pH		4.2 - 4.6
Cathode Current Density		
	Rack	1.0 - 2.0 A/dm <sup>2</sup>
	Barrel	0.1 - 0.5 A/dm <sup>2</sup>
Anode Current Density		2.0 A/dm <sup>2</sup> max
Specific Gravity		1.140 minimum
Agitation		Solution and/or work movement.

## **PERFORMANCE**

<u>Rack Plating</u>	At 1.5 A/dm <sup>2</sup> will deposit 1 micron in 3 minutes at optimum operating conditions.
<u>Barrel Plating</u>	At 0.2 A/dm <sup>2</sup> will deposit 1 micron in 20 minutes. (This is only a general guide as actual deposition rate will depend on the type of load, barrel speed etc.)

## **MAINTENANCE**

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

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	<u>RACK</u>	<u>BARREL</u>
GOLD	6.0 g/l	3.0 g/l
NICKEL	2.0 g/l	2.0 g/l

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The gold and nickel concentration will be approximately maintained by the following addition every 1 ampere hour:

4 gm of gold as potassium gold cyanide (PGC or GPC).  
4 ml of Cirgold N(HT) Replenisher.

These materials are supplied in units of Cirgold N(HT) replenishment each unit consisting of:-

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100 gm gold as PGC + a Cirgold N(HT) 100 ml "R" Unit.

Also available on request is a smaller unit as follows: 50 gm gold as PGC + a Cirgold N(HT) 50 ml "R" Unit.

## **MAINTENANCE**

The specific gravity should be maintained at 1.140 minimum by the following addition for every 0.01 S.G. low:

8 g/l Cirgold N(HT) Buffer Salts or 24 ml/l Cirgold N(HT) Buffer Salt Solution.

2 g/l Cirgold N(HT) Conductivity Salts

Solution pH will rise gradually with use and should be reduced by adding 5 ml/l of Cirgold N(HT) Acid Adjuster for every 0.1 pH unit reduction required.

If it is necessary to increase the pH, an addition of 35 ml/l Cirgold N(HT) Alkaline Adjuster will give a 0.1 pH unit increase.

## **NOTES**

### Gold Concentration

The process can be operated at gold concentrations lower than the recommended optima but it should be noted that cathode efficiency, hence plating rate, will be reduced. Also, at reduced gold concentrations the process will be less tolerant to metallic contamination.

### Effect of Operating Variables

The effects of the main operating parameters can be summarised as follows:-

Gold Content	As this increases the cathode efficiency increases slightly.
pH	Increasing pH will give increased cathode efficiency. Too high a pH (above 4.7) will cause dull porous deposits. The lower end of the pH range is recommended where maximum pore closure at minimum thickness is desired.
Temperature	Cathode efficiency increases with temperature. Too low temperatures (below 25 deg C) may give stress cracking in high current density areas.

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Current Density	Cathode efficiency decreases with increasing current density thereby giving good throwing power. The maximum operating current density which can be achieved without deposits burning
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will depend on gold concentration and the degree of agitation.

Agitation

Air agitation is not recommended because of the risk of splashing gold-containing electrolyte outside the tank. For rack plating the solution is best agitated by using the outflow from the filter pump positioned to flow through a sparge pipe underneath the work.

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**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 N(HT) System:	
Cirgold N(HT) Base Solution	037006
Cirgold N(HT) 100 ml "R" Unit	047023
Cirgold N(HT) 50 ml "R" Unit	047022
Cirgold N(HT) Buffer Salts	060004
Cirgold N(HT) Buffer Salt Solution	067015
Cirgold N(HT) Conductivity Salts	063003
Cirgold N(HT) Acid Adjuster	067003
Cirgold N(HT) Alkaline Adjuster	065002
Gold as PGC - 100 Gram Unit	029003
Gold as PGC - 50 Gram Unit	029004

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