

# PMD (UK) LTD PROCESS DATA

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CGN95-05/02

ISSUE 5

PREV 4

# PMD CIRGOLD N95

## GOLD PLATING PROCESS

### INTRODUCTION

PMD Cirgold N95 is an acid gold plating process specially formulated for barrel plating, to give fast plating rates and excellent deposit distribution. The deposits contain 0.2 - 0.3% nickel, have good wear characteristics, low contact resistance and are eminently suitable for electronic contacts.

### 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 N95 is supplied as a Base Concentrate to which potassium gold cyanide and deionised water are added:-

Cirgold N95 Base Concentrate	750 ml/L
Deionised Water	250 ml/L
Potassium gold cyanide	as required (See Operating Conditions)

CAUTION: Cirgold N95 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.

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### OPERATING CONDITIONS

	<b>BARREL</b>
<b>Gold concentration</b>	<b>1-4 g/l</b>
<b>Nickel concentration</b>	<b>0.8-1.2g/l</b>
<b>pH</b>	<b>4.2-4.8</b>
<b>Specific gravity</b>	<b>14-18° Be</b>
<b>Temperature</b>	<b>30-50°C</b>
<b>Cathode current density</b>	<b>0.1-1.0 A/sq.dm.</b>
<b>Anode current density</b>	<b>0.5-1.0 A/sq.dm.</b>
<b>Agitation</b>	<b>Work movement</b>

### 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.

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 Cirgold N95 Replenisher.

These materials are supplied in units of Cirgold N95 replenishment, each unit consisting of:

100 gm gold as PGC + a Cirgold N95 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.

## MAINTENANCE CONTINUED

Specific Gravity	Maintain the solution density at 14 deg Be. To raise the density Cirgold N95 Conductivity Salts should be added (15 g/l will increase the density at 20 deg C by 1 deg Be).
pH	Maintain the pH at 4.5 by additions of Cirgold N95 Acid Adjusting Solution to lower. If it is necessary to increase the pH add Cirgold N95 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.

## NOTES ON THE USE OF CIRGOLD N95

### 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	Deposition rate
Barrel plating	40	4.5	1	0.1	1μ in 30 minutes
"	40	4.5	3	0.5	1μ in 6 minutes

2. This solution may also be used for other applications, i.e. rack, selective. For operating conditions contact PMD.

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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 N95 System	
Cirgold N95 Base Solution	037044
Cirgold N95 250 ml "R" Unit	047049
Cirgold N95 Conductivity Salts	060017
Cirgold N95 Acid Adjuster	067025
Cirgold N95 Alkaline Adjuster	065014
Gold as PGC - 100 Gram Unit	029003

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