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PMD CIRGOLD C93

GOLD PLATING PROCESS

INTRODUCTION

PMD Cirgold C93 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 edge contacts. The process can also be used for conventional rack or barrel plating. The deposits contain 0.15 - 0.3% cobalt, 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 C93 is supplied as a Base Concentrate to which potassium gold cyanide and deionised water are added:-

Cirgold C93 Base Concentrate	750 ml
Deionised Water	250 ml
Potassium gold cyanide	as required (See Operating Conditions)

CAUTION: Cirgold C93 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- 6 g/l**	**3-15 g/l**
Cobalt Concentration	**0.3- 0.5 g/l**	**0.5- 0.8 g/l**	**0.75-1.0 g/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	**35-45°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 solution movement.**	**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 cobalt and maintained within 5% of the optimum concentrations.

The gold and cobalt 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 C93 Replenisher.

These materials are supplied in units of Cirgold C93 replenishment, each unit consisting of:

100 gm gold as PGC (029003) + a Cirgold C93 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 15 deg Be. To raise the density Cirgold C93 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 Cirgold C93 Acid Adjusting Solution to lower. If it is necessary to increase the pH add Cirgold C93 Alkali Adjuster.

DEPOSIT PROPERTIES

Cobalt in deposit	0.15 - 0.3%
Deposit density	16.5 - 17.0 gm/cc
Contact resistance (200 gm)	0.8 milliohm
Electrical resistivity	3.0 microhm - cm
Hardness	115 - 170 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 C93

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.

PRODUCT FAMILIES

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

Product Name	Product Number
The Cirgold C93 System	
Cirgold C93 Base Concentrate (Barrel)	037029
Cirgold C93 Base Concentrate (Rack)	037039
Cirgold C93 Base Concentrate (Reel/Reel)	037040
Cirgold C93 250 ml "R" Unit	047043
Cirgold C93 Conductivity Salts	067021
Cirgold C93 Acid Adjuster	067022
Cirgold C93 Alkaline Adjuster	065012
Gold as PGC - 100 Gram Unit	029003

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