

Colour gold bath FG 200

Instructions for use

Edition 01/2020

Product description

Colour gold bath FG 200 is used for deposition of thin, decorative gold layers (approx. 0.1 µm thin). The deposited layers are shine-conserving and there is a large selection of colour shades available. In addition to standard gold colours (N), colour shades of yellow, green (pale yellow) and red gold as well as mixtures thereof can be deposited.

Colour code system explanation

The basic gold colour which *Colour gold bath FG 200* deposits is fine gold. By addition of special colour solutions to the basic *Colour gold bath FG 200* the colour of its gold deposition can be adjusted in a controlled manner. For this purpose mainly 3 special colour solutions are available:

1. Colour solution FG 200, **green**
2. Colour solution FG 200, **yellow**
3. Colour solution FG 200, **rose**

For easy distinction and identification of a specific FG 200 gold colour shade a 4-digit colour code has proven to be suitable. This code shows which one and how much of a certain FG 200 colour solution has been added to the basic *Colour gold bath FG 200* and which type of colour shade the gold deposition of a specific bath provides. The basic make-up of *Colour gold bath FG 200* has the colour code 0000. Here, no FG 200 colour solutions have been added to it. Each of the 4 single digits in the FG 200 colour code stands for the amount of ml of a certain FG 200 colour solution added to 1 l ready-to-use *Colour gold bath FG 200*. The first digit stands for added *Colour solution FG 200, green*, the second one for *Colour solution FG 200, yellow* and the third one for added *Colour solution FG 200, rose*.

Typical gold colour shades, respectively colour codes of *Colour gold bath FG 200* are the following ones:

- 0000 (= no colour solution added whatsoever/
= fine gold deposition/ = fine gold colour)
- 6000 (= 6 ml/l *Colour solution FG 200, green* added/
= green gold deposition/ = standard gold colour 1N)
- 10000 (= 10 ml/l *Colour solution FG 200, green* added/
= brighter green gold deposition / = standard gold colour 0N)
- 4010 (= 4 ml/l *Colour solution FG 200, green* and 1 ml/l *Colour solution FG 200, rose* added/
= bright gold deposition / = 14 carat gold colour)
- 7020 (= 7 ml/l *Colour solution FG 200, green* and 2 ml/l *Colour solution FG 200, rose* added/
= brighter gold deposition / = 14 carat gold colour)
- 0400 (= 4 ml/l *Colour solution FG 200, yellow* added/
= yellow gold deposition / = 18 carat gold colour/ = standard gold colour 2N)
- 0420 (= 4 ml/l *Colour solution FG 200, yellow* and 2 ml/l *Colour solution FG 200, rose* added/
= Hamilton gold colour)
- 0030 (= 3 ml/l *Colour solution FG 200, rose* added/
= light rose gold deposition/ = standard gold colour 4N)
- 0080 (= 8 ml/l *Colour solution FG 200, rose* added/
= rose gold deposition / = standard gold colour 5N)
- 0080/120 (= 16 ml/l *Colour solution FG 200, 0080/120* added/
= deep rose gold deposition / = Russian red gold)

For exact determination of a desired colour shade, we require a freshly electroplated, respectively degreased sample.

Table of articles

| | | |
|----------------------------------------|-----------------|--------------------------|
| Colour gold bath FG 200 | (1 g Au/l) | Art. No. 86902100 |
| Colour gold bath FG 200, 1 l | (1 g Au/l) | Art. No. 81020414 |
| Colour gold concentrate FG 200 | (10 g Au/l) | Art. No. 81009475 |
| Colour gold concentrate FG 200, 100 ml | (1 g Au/100 ml) | Art. No. 86902000 |
| Make-up salt FG 200 A | (31.8 g Au/kg) | Art. No. 86902160 |
| Colour solution FG 200, green | | Art. No. 86938320 |
| Colour solution FG 200, yellow | | Art. No. 86938330 |
| Colour solution FG 200, rose | | Art. No. 86938340 |
| Colour solution FG 200, 0080/120 | | Art. No. 81012154 |
| Conducting salt SICCUM | | Art. No. 86938360 |
| Potassium gold cyanide 68.2 % Au | (682 g Au/kg) | Art. No. 81009262 |

Equipment

| | |
|--------------------------|----------------------------------------------|
| Anode material: | stainless steel (V2A) |
| Anode/cathode ratio: | 1:1 (anode/cathode surface size) |
| Heating: | heating element made of quartz glass or PTFE |
| Tank material: | PPH |
| Bath filtration: | not required |
| Movement of cathode rod: | none |
| Exhauster: | recommended |

Bath make-up

Make-up of ready-to-use *Colour gold bath FG 200* with a certain colour shade can be conducted with make-up salts and adding the required colour solutions by oneself or with make-up concentrates which have already been added the required colour solutions. Alternatively, the completely pre-mixed and ready-to-use *Colour gold bath FG 200* with the desired pre-adjusted colour code is available.

Make-up chemicals

Bath chemicals for 1 l *Colour gold bath FG 200* (0000):

- 100 ml *Colour gold concentrate FG 200*
- 900 ml Deionised water (< 10 µS, 60 °C)

or

- 31,47 g *Make-up salt FG 200 A*
- 1 l Deionised water (< 10 µS, 60 °C)

or

- 30 g *Conducting salt SICCUM*
- 1,47 g *Potassium gold cyanide 68.2 % Au*
- 1 l Deionised water (< 10 µS, 60 °C)

Procedure

Into a thoroughly cleaned tank the quantity of deionised water which is required for the desired bath volume is filled and heated to 60 °C. While stirring constantly, the make-up chemicals are slowly added to the water. The solution must be stirred until all make-up chemicals have been dissolved and fully mingled with the water.

Process overview

Prerequisite for a strongly adhesive colour gold plating is an intensive pre-treatment of the surface. This should be carried out using an ultrasonic cleaning bath made-up with *Ultrasonic cleaning concentrate ULTRA 3000*, *Electrolytic degreasing bath Type A* and finally an acid dip treatment in *Acid dip bath S* or 10% sulphuric acid solution.

Constant monitoring of voltage, temperature and exposition time is required. **Moving the goods during the electroplating process changes the colour.** After the respective process baths, the parts need to be rinsed several times in water. The last rinsing prior to colour gold plating should be carried out in deionised water.

Process parameters

| | |
|---------------------------------|---------------------|
| Bath temperature: | 60 °C |
| Exposition time for ca. 0.1 µm: | 20 s |
| Voltage: | 6 V |
| Current density: | 5 A/dm ² |
| Max. layer thickness: | 0.1 µm |

The last rinsing after galvanic coating with *Colour gold bath FG 200* should be carried out in 60–80 °C hot deionised water for 10–20 s. This intensifies the colour of the deposition.

Bath control and regeneration

Evaporation losses can be compensated by adding deionised water (< 10 µS).

Bath parameters

| | |
|---------------|----------|
| Gold content: | 1 g/l |
| pH-value: | alkaline |

Regeneration of a *Colour gold bath FG 200* with a volume of less than 10 l not economic in any case. Such a bath should be depleted and replaced afterwards.

In case of a larger bath volume we conduct regular analyses in our application technology laboratory and issue individual regeneration advices. For a standard analysis we require 100 ml of the electrolyte. In case of malfunctions or problems we require 1 l as probe.

Hazard information, storage, disposal

The plating bath contains cyanides and must **not** come into contact with acids or acidic solutions.

The occupational safety measures and regulations specified in the material safety data sheet must be observed.

The bath chemicals must be stored sealed and separately from food in suitable and labelled containers.

Spent plating bath solutions and drag-out rinse waters must **not** be discharged into the waste water without first being treated. The spent solutions or drag-out rinse waters contain precious metals that we would be happy to recycle for you. Recovering such solutions can be profitable from 20 l.

The information on our product and the method are based on intensive research and technical experience of this application.

We provide these results to the best of our knowledge and reserve the right to make technical changes in the course of product development.

However, this does not relieve the user of their responsibility to check our specifications for their own use before application.

If you have any questions or would like a consultation, please contact our application technology service department at any time.

We would also be happy to discuss our further electroplating product range.