



Specialty Gold N (F.A.O.)

High Purity, Inorganic Gold Dye

1. Description

Specialty Gold N (Ferric Ammonium Oxalate) is a water soluble, inorganic dye, used to color anodized aluminum various shades of brassy gold.

- Excellent light fastness
- RoHS compliant

2. Application instructions

Concentration:	10-20 g/l
pH:	4.5 ±0.5
Buffering:	Not required
Temperature:	140°F ±5°F / 60°C
Oxide film thickness:	0.20-0.80 mils.
Dye time:	Depending on the shade desired, dye times could range from 2-20 minutes, but can only be determined by sampling in plant production.
Preferred sealing:	Specialty Sealant MTL Specialty Sealant

3. Conditions for using Specialty Gold N

Tank:	Stainless steel or other acid resistant materials such as neoprene, polyethylene and polypropylene that can withstand a constant operating temperature of 140°F.
Water quality:	Deionized
pH adjustments:	Raise with sodium hydroxide. Lower with oxalic acid or acetic acid. The pH should be checked once per shift with a calibrated meter and maintained within recommended range.
Bath agitation:	Moderate agitation before and during the dyeing step via circulation pump or mechanical stirring device will produce a more uniform color. Air agitation can be used, but it shortens the service life.
Idle solutions:	F.A.O. solutions are chemically broken down by light. Keep tank covered when not in use. Continue to check the pH daily and adjust if necessary.
Bath turbidity:	A fresh solution will be greenish-yellow. As the solution is used and ages, insolubles will form, causing the solution to look rusty orange. THIS IS NORMAL. As long as your colored worked is uniform in color, keep using the bath. At the first sign of splotchy or uneven colored work, and all operating conditions are within spec, the solution should then be replaced.

Rinsing: It is important to remove all acid residues clinging to the work and acid retention in the oxide pore itself. Rinse work load thoroughly after anodizing. A minimum of two rinses is recommended, with the second rinse at over-flow.

To increase rinsing effectiveness, add vigorous air agitation in all rinse tanks. This also improves your rinsing of surfaces on complicated shaped parts.

4. Light fastness

Rating: 8 (1=poor, 8=excellent)

5. Storage

Shelf life is virtually unlimited.

Store in original container in a cool dry location.

Close package tightly after removal of dye.

In humid environments, F.A.O. crystal/powder may harden.

6. Preparation of a new dyebath

1. A cleaned tank is filled with deionized water to about 75% of final volume and raised to dyeing temperature.
2. With moderate agitation, slowly add the required amount of F.A.O. to the water.
3. Top off the tank to final working solution volume with more hot deionized water.
4. Using a calibrated pH meter, check the pH and adjust if necessary.
5. The dyebath is brought to dyeing temperature, 140°F ±5°F.

7. Titration procedure

Reagents: 50% sulfuric acid
Ammonium molybdate solution
Potassium iodide crystals
1% starch indicator
0.1N sodium thiosulfate

- Procedure:
1. Take a sample from the production dyebath and clarify by filtration.
Discard any cloudy first running.
 2. Pipette 25-ml of this clarified working solution into 250 ml flask.
 3. Add 20-ml of 50% sulfuric acid.
 4. Add 50-ml hot water.
 5. Add 10 drops of ammonium molybdate solution.
 6. Add 2 grams of potassium iodide crystals.
Mix solution thoroughly until the potassium iodide crystals are dissolved.
 7. Titrate with 0.1N sodium thiosulfate until a light straw color is obtained.
 8. Add 2-ml starch indicator.
 9. Continue titrating very slowly, drop by drop, until the deep color disappears and a light blue to green color is obtained.

Calculation: **g/l of Gold N(F.A.O.)** = ml of 0.1 N sodium thiosulfate x 1.496

8. Conversion factor

Converting grams per liter (g/l) to ounces per gallon (oz/gal)

$$\text{g/l} \times 0.134 = \text{oz/gal}$$

9. Product safety

We recommend that the company/operator read and review the **Material Safety Data Sheet** for the appropriate health and safety warnings before use.

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