Acid Gold Baths Composition

Component	Matte Finish g/l	Bright Finish g/l
Gold metal	2-10	4-12
Phosphates	0-100	—
Chelates	10-200	10-150
Brightener	—	0.1-20
Grain refiner	0-10	0.1-10

SLIDE 27

The composition of acid gold baths will vary depending upon the finish desired.

As previously mentioned all bath make up components (except the gold salts and the brighteners) are purified through carbon treatment before the gold salts and brighteners are added. The bright acid gold baths facilitate codeposition of a great many base metals with the gold to any practical thickness, with a wide variety of colors, ranging from very pale yellow to deep orange to light violet.

These acid baths will not attack delicate substrates such as ceramics or plastics. The pure gold bath described as matte finish can produce the purest gold electrodeposits commercially available. Gold from these systems has been measured 99.999%+ pure with a density of 19.3.

Phosphates—ortho or pyrophosphates—are used in some bath formulations as a buffer. These include appropriate mixtures, sometimes with organic complexing agents such as citric acid/citrates. Either phosphoric acid (or superphosphoric acid) or citric acid is used to lower the pH of these mixed baths.

Citric acid/citrate salt baths without phosphates are also used to produce pure gold deposits.

These salts are usually referred to as conducting salts. They increase bath conductivity and improve throwing power. Organic phosphates or phosphonates have replaced inorganic phosphates in more recent formulations.

Complexing agents also prevent co-deposition or metallic impurities. Organic chelates such as EDTA (or other amine compounds) are also used.

Bright acid gold baths contain small amounts of nickel or cobalt which are usually complexed. Since these brighteners are not compatible with phosphates, the latter are not present.

Acid alloy gold baths are generally based on nickel as citrate or cobalt as citrate or EDTA complexes. Since cobalt is not deposited from EDTA complexes, the uncomplexed/complexed salt relative concentrations must be controlled.