



Plating Chips

Properties and Characteristics of Inco Plating Chips

Inco Plating Chips are a disc-shaped, high-purity nickel anode material. The newly developed anode material is formed from pieces of nickel produced from Inco's unique carbonyl refining process, which is recognized as producing the purest form of nickel available in the market today.

This anode material is 4-6mm thick with a diameter range of 17-22mm.

It is suitable for plating from titanium anode baskets and has been designed to used with common basket mesh sizes.

Inco Plating Chips have dissolution characteristics similar to other non-activated anode materials and will dissolve at 100% anode efficiency in common electro plating solutions that contain chlorides.

Comparing Inco Plating Chips to Electrolytic 25mm Squares

The most common non-activated materials used by platers around the globe today are cut squares (25mm X 25mm) and proprietary shapes such as Inco R Rounds.

The testing in our Inco laboratories has shown that Inco Plating Chips are comparable and in some cases an improvement over other materials.

Handling

Inco Plating Chips are individual pieces that are uniform in size. The edges are smooth and free from sharp edges, enabling easy and safe handling. In comparison, 25mm squares have sharp edges making them difficult to "scoop up" when filling the anode baskets. The square product also has poor flowability properties and is prone to catching on the basket mesh. Plating Chips are adaptable for use with automatic and semi-automatic loading systems because of the superior flow properties.

Packing Density and Settling Characteristics

Inco Plating Chips have a packing density that is the similar to 25mm squares. This means that costs of inventory in the baskets are the same.

Typical Packing Densities* (g/cm³)

25mm squares	Inco Plating Chips
4.30	4.70

**tested in a 9" X 6" X 6" basket. Results will vary depending on basket dimensions.*

The unique shapes of the Inco Plating Chips offers several advantages when compared to squares:

1. Fewer Voids in the Anode Loads

Square pieces of nickel anode material have a tendency to form "bridges" in the baskets creating voids in the anode load. This can result in:

- i) Poorer current distribution and deposits that are non-uniform in thickness. This can be critical when plating complex shapes.
- ii) Rise in potential on the titanium baskets in the areas where voids occur can result in breakdown of the protective oxide layer on the titanium and cause premature failure of the baskets.

2. Better Settling Properties

The nature of the Square anode materials to form "bridges" in the anode load creates a need for the operators to use a "ramming" action to enable the anode materials to settle in the baskets. The ramming action can result in mechanical damage to the costly titanium basket and also cause tears in the anode bags allowing residues to escape into the plating solution.

The plating chips are self-settling in the baskets, eliminating the need for any ramming action.

Inter-changeability

As both anode materials are non-activated, they can be mixed together in the same anode basket and plating cell. Plating Chips can be added to existing anode materials as part of the basket top-up practice.

Residues

Initial testing in our laboratories has indicated that residues produced from the dissolution of both Plating Chips and electrolytic squares generated similar residue compositions. In both cases, the nickel content was greater than 90% and the carbon level was approximately 2%. Work is continuing in this area.