

For large-scale plating without anode baskets, Special Metals Corporation offers INCOBAR® (“carbonized” or “carburized”) and DEPOLARIZED® (“decarburized”) wrought nickel anodes. They are made by melting nickel and adding elements which improve anode dissolution and reduce metallic residue. Compositions are listed in Table 1.

Produced in a range of shapes and lengths, they can be used as principal or auxiliary anodes. Principal anodes are usually placed close to the walls or down the center of the plating tank. They carry most of the electric current to the parts being plated and replenish the nickel ions removed as a result of the electroplating process. Auxiliary anodes are used to improve the uniformity of thickness of the nickel deposit. They carry a relatively small portion of the total current and are placed close to the parts being plated, often right on the plating rack, but electrically isolated from it.

Wrought INCOBAR and DEPOLARIZED nickel anodes dissolve with exceptional uniformity and at relatively low dissolution potentials. It is essential that chlorides are present in the electroplating solution for INCOBAR and DEPOLARIZED nickel anodes to dissolve efficiently.

**Table 1** - Limiting Chemical Compositions, wt %

	INCOBAR <sup>a</sup>	DEPOLARIZED
Nickel	Balance*	Balance*
Nickel oxide <sup>b</sup>	—	0.1-1.25
Carbon	0.2-0.5	—
Iron	0.30 max.	—
Sulfur	0.008-0.020	0.004-0.012
Copper	0.25 max.	0.02-0.25
Silicon	0.2-0.5	—
Lead	0.01 max.	0.01 max.
Zinc	0.01 max.	0.01 max.

\*Reference to the ‘balance’ of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

<sup>a</sup>Operational release limits obtained from BS 558 Specification.

<sup>b</sup>Oxygen content is a nominal 25% of the nickel oxide content.

## INCOBAR

On dissolution, the insoluble carbon in INCOBAR nickel anodes forms a tenacious sheath over the anode within which the silicon is oxidized to silica and hydrogen ions are formed. The resulting reduction of pH within the sheath allows the nickel to dissolve smoothly. INCOBAR anodes are especially intended for use in nickel plating solutions with a pH of 4 or below.

## DEPOLARIZED

When dissolved, DEPOLARIZED nickel anodes form a light green nickel oxide film mixed with metallic particles. They are used with high pH nickel baths (above pH 4) and will remain active where other anodes become wholly or intermittently passive.

## Available Products and Specifications

INCOBAR and DEPOLARIZED nickel anodes are available as rounds, flats and ovals.

BS 558: 1970

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