

Bright Nickel

Common Names: Nickel Plating, Nickel Electroplating, Nickel Plate

Applicable Specifications: SAE-AMS QQ-N-290, Federal Specification QQ-N-290

Description: Nickel plating is the electrolytic deposition of a layer of nickel upon a substrate material. The process involves the dissolution of one electrode (the anode) and the deposition of metallic nickel on the other electrode (the cathode). Conductivity between the electrodes is provided by an acidic aqueous solution of nickel salts. Nickel can be used as part of a multi-plate system (such as copper-nickel-chromium or nickel-chromium) or be used as the final finish. Nickel plating is one of the oldest and most widely accepted electroplates.

Function & Physical Finish: Bright nickel deposits are used primarily to provide decorative finishes on metals that, without suitable protection, will corrode or tarnish. These deposits contain various amounts of sulfur and brighteners and are frequently used as an undercoating for chromium, brass, or a precious metal plating.

Nickel is relatively hard and pore-free. It provides corrosion protection by encapsulation rather than electro-chemical properties. When used as the final finish, nickel will tarnish, taking on a yellow color during long exposure to mildly corrosive atmospheres or turning green on severe exposure.

The deposit is a tan-gray color. Deposits greater than 0.0005" are non-porous.

Examples of Use: Automotive trim; food, pharmaceutical, and medical equipment; house wares; hardware; toys.

Considerations & Limitations:

- Base Material: Steel, Tool Steel, Brass, Copper, Aluminum, Cast Iron.
- Shape of parts: Unlimited except that blind cavities or holes may require supplemental electrodes to ensure adequate coverage. Special fixturing may be required to control gas pocketing or burning.
- Size: Parts up to 7 feet by 2 feet. Maximum weight 500 lbs.
- Quantity: Although quantity affects price, quantity is not a limiting factor. Price is determined by how many parts can be process in an hour.
- Thickness of Finish: Varies from 0.0002" to 0.002".
- Masking: Can be used to protect critical machined dimensions.
- Heat Treatment: Generally has no effect but does tend to sometimes effect adhesion.
- Method of Processing: Parts must be racked or barrel plated.
- Pre-Treatment: Parts must be clean and free from oil, grease and tape residue. Parts must be "chemically" clean prior to plating and may require specific activation, chemical etch or activation prior to plating. Normal processing includes caustic soak, electroclean, and acid pickle. Sometimes abrasive blasting or mechanical finishing is required for better adhesion or to achieve a required surface finish.
- Post Treatment: None – a protective clear coat (by others) may be required to prevent tarnishing.
- Packaging: **Parts are repacked as received.** It is often necessary to wrap parts with paper to prevent scratching. This will be done at the customer's request.

Quality Control Process solutions are checked and analyzed following an established schedule and monitored using SPC techniques. Thickness testing can be done at the customer's request. Salt Spray testing can be done by submitting samples to an outside laboratory. This is done for an extra charge at the customer's request.