

# NICKEL PLATING

**Scope:** Sharretts Plating Co., Inc. (SPC) provides nickel plating to the Electronics, Food Processing Equipment, Paper, Textiles, Chemical Soap and Caustic Processing, Glass Processing, Chemical & Nuclear, Automotive, Printing, Mining Equipment, Heavy Duty Machinery & Tools, and Molds & Dies manufacturing industries for hardness, strength, and ductility, load bearing characteristics, wear, corrosion, heat scaling, fretting, and fatigue resistance.



## SPC TEST METHODS

- **Deposit Purity by:** Atomic absorption spectrophotometry
- **Hardness:** (done at independent laboratories)
- **Appearance:** Use of 10X magnification
- **Thickness:** Seico 9000 X-Ray Fluorescence Spectrometry
- **Adhesion:** Bend Test, Heat Test, Cutting Test Solderability
- **Porosity:** Ferroxy Test, Boiling Water Test, Salt Spray Test
- **Microhardness:** Knoop, Vickers
- **Corrosion Resistance:** As specified by end user.
- **Thermal Shock:** Heat parts to 200° C (392° F) and quench in room temperature water. Review specimen for poor adhesion under 4x magnification.

## BEST IN PRACTICE PROCESS ADVICE

- *Defect-Free Basis Metal Surface*
- Scratch Free
- Minimal Roughness
- Lap Free
- Burr Free
- Pre-Treatment Stress Relief
- Minimal Porosity
- Pit Free
- Crack Free
- Cold Shut Free

High-Strength parts (1050+ MPa or 33+ Rockwell C) must be stress relieved prior to plating by baking for 2-23 hours at 190±10°C (375 ± 25°F).

Surface-Hardened parts must be baked for a minimum of 5 hours at 130-150° C (266-302° F).

Specified by end use application (Mostly Automotive): Waxes & Sealers

### **Peening**

Meant to induce compressive stress on high strength steel in order to create better plating adhesion and reduce loss of fatigue strength. Parts containing the following attributes should be peened unless otherwise specified:

- Notches
- Fillets
- Parts with abrupt changes of section size where stress will be concentrated

### **Racking or Tumbling**

Proper loading and positioning of parts must be examined in order to minimize trapping of hydrogen gas in cavities which will allow total and complete uniform plating of all parts.

Rack or wire marks are inherent with rack plating and must be agreed upon prior to first production run.

# NICKEL PLATING (CONT.)

## ***Hydrogen Embrittlement Relief***

Used for high strength alloy metals and surface hardened metals.

Bake for 1-6 hours at 120-320° C (248-608° F). Temperature and time vary depending on metal alloy and surface conditions.



## **SPECIAL REQUIREMENTS**

- *Quality systems*
  - Sampling plan
  - Thickness Testing / Cross Sectional Analysis (done at independent lab)
  - Thermal Cycling (Heat Testing)  
(done at independent lab)
- *Packaging and handling*

## **NICKEL PLATING APPLICATIONS**

- Underplate for precious metals of electronic connectors
- Optical mirrors (Telescopes)
- Corrosion Resistance for coils, pumps, and pipes
- Hydraulic components (wear resistance)
- Food Processing Equipment ex. extruders
- Fastener products
- Coatings on pistons
- Printing rollers