

Hard Chromium Plating

Common Names: Hard Chrome, Flash Chrome, Industrial Chrome

Applicable Specifications: QQ-C-320, Class 2; SAE-AMS QQ-C-320

Description: Hard chromium or industrial chromium plating refers to relatively thick chromium deposits applied to a base material because of the hardness, wear resistance, and/or corrosion resistance of the chromium. Hard chromium may be applied to almost any metal. However, each base metal requires specific pre-plating processes. We have limited our process to plating on steel, brass and copper. For these materials, the chromium is deposited directly on the base material. It is common practice to salvage miss-machined parts or parts worn undersize by pre-plate grinding, followed by oversize plating and then grinding to the finished size. Hard chromium is used on original equipment to increase wear resistance.

Function & Physical Finish: Chromium is extremely hard. Among naturally occurring substances, hard chromium is equal in hardness to aluminum oxide and is second in hardness only to a diamond,.

As deposited, chromium has a dull luster but is easily polished and buffed to a brilliant highly reflective finish. For thinner deposits, a pre-plate mechanical polish is required if a bright finish is required. For other applications, a pre-plate grit blast may be required. Chromium is extremely corrosion resistant but should never be used in the presence of chlorides. Peeling is seldom a problem with hard chromium. For some special applications where hydrogen embrittlement is a concern, a post plate bake may be required.

Thickness of hard chromium may vary from 0.0001" to 0.025". The true hardness of chromium is achieved from deposits of 0.002" and greater. Hard chromium has excellent lubricity and anti-galling properties.

Examples of Use: Machine tools, textile machinery parts, packaging machinery parts, salvaging of miss-machined and/or worn parts, medical, pharmaceutical, and food applications.

Considerations & Limitations:

- Base Material: Steel, Stainless Steel, Tool Steel, Brass, Copper
- Shape of parts: Unlimited except that Chromium has extremely poor covering ability (throw). Coverage in internal holes and cavities requires supplemental (auxiliary) cathodes. Special fixturing may be required for complex shapes.
- Size: Parts up to 12 feet by 4 feet. Maximum weight is 1000 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 0.0001" to 0.025". The nominal plating rate is 0.001" per hour.
- Masking: Can be used to protect critical machined dimensions.
- Heat Treatment: Parts which are Rockwell 40c or above must be stress relieved before and after hard chromium plating.
- Method of Processing: Parts must be racked or fixtured for electrical contact.
- 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 or chemical etch prior to plating. Parts may require Stress Relief before and after plating. Sometimes abrasive blasting or mechanical finishing is required for better adhesion or to achieve a required surface finish.
- **Post-Treatment: Light oil may be applied to prevent rusting in deep recesses.**
- 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.

