

Hard Chrome and Nickel Plating



GSD ENGINEERING

GSD Engineering (Pty) Ltd

Services

Our workshop:

Hard chrome plating to client specifications.
Hard chrome pump sleeve manufacturing.
Cylindrical grinding.
Hard chrome mono pump rotor repairs.

Wear protection on pump impellers, back plates, volutes etc.
Electroless nickel plating.

Hard Chrome (Abrasive Wear-Resistance)

Why Hard Chrome?

Hard Chrome Surface engineering is a hot topic these days, with applications throughout a wide range of industrial sectors. Engineering surface treatments and coatings can bring specialist properties of corrosion and wear resistance, without compromising the characteristics of the substrate or base metal. Many new processes are emerging, their innovations and developments sometimes outpacing any proven industrial demand or performance demonstration. There is vapor deposition, implantation, an expansive array of thermal spray coatings, and many others, all attempting to attain the ultimate hard, tough, wear resistant, low friction and anti-corrosion surface.

And yet, for many applications, such a coating already exists, with qualities too long taken for granted or even overlooked, and its development too long neglected. Hard Chrome Plating brings a wide variety of desirable properties and characteristics, properties that many Engineers require of their components and products.

What are the Benefits of Hard Chrome?

It is ultra-Hard:

850-1000Hv (68-70Rc), harder than most industrial abrasives and steel counter faces.

Unusually, it combines this hardness with a degree of toughness, so the deposit can stand up to high stress contact.

It can be applied to a wide variety of substrates:

Covering a wide range of engineering and high alloyed steels: stainless steel, cast iron, mild steel.

It provides superb abrasion resistance:

Even under high contact stress, it gives a very low wear rate (at least 100 times better than hardened steels or electroless nickel) with abrasive products like textiles, paper and food stuff.

With thick deposits, it gives excellent wear resistance under high stress contact against sand, coal, cement, limestone, glass fibres, etc.

With abrasion being the most common and destructive wear process found in industry, hard chrome has the potential to solve many problems in pumps, valves, bearings, etc. throughout a wide range of industries; including pharmaceutical, chemical, oil and gas, textiles, printing, food, mining, and countless others.

It gives ultra-high metal-to-metal sliding wear resistance;

Up to 100 times less wear, than given by through-hardened, induction hardened, carburized or nitride steels in dry sliding situations, and greatly superior to Electroless Nickel.

It produces very low friction;

And is suitable for most organic acids and gasses (not chlorine), excellent in hot oxidizing or reducing air, in commodities like beer, sugar, brine, coal gas, cyanides, fruit acids, molten glass, glue, milk, oils and fuels.

Coating thicknesses subject to application:

For a slurry application a coating thickness of 0.25mm to 0.4mm is applied to substrate (sleeve, impellers, casings etc).

For less abrasive conditions a coating thickness of less than 0.25mm is applied to substrate (Hydraulic cylinder shafts).

For impact resistance coating thickness from 0.5 – 1.0mm can be applied.

Electroless Nickel (Corrosion Resistance)

Superior Corrosion Resistance

Plating Services

Raw metals other than precious metals can easily oxidize and corrode over time when exposed to various environmental conditions and corrosive applications. The proper design of any component must begin with a surface engineering evaluation to ensure that the product will function reliable over the intended service life span. Even in relatively mild service applications, corrosion can result in functional issues and shortfalls.

Electroless nickel plating can provide a robust solution to corrosive attack across a range of corrosive mechanisms including galvanic corrosion, chemical attack and erosion. Electroless nickel plating can be applied to a wide range of basis metals including stainless steel, mild steel, copper, brass and aluminium alloys. Electroless nickel plating is currently utilized to promote corrosion performance across a diverse range of industries including heavy equipment, oil & gas, mining, power transmission & distribution, automotive, marine and railway to name a few.

Strong, Chip Free Coating

With electroless nickel plating, there is no need to worry about the strength of the coating. Electroless nickel plated coatings do not chip, peel or crack. It can also be applied on its own without any other pre-surface treatments.

Areas of Application

Mining: Valve components, such as ball, gate, plug etc. and other components such as pumps, pipe fittings, packers, barrels etc.

Chemical processing: Heat exchangers, filter units, pump housing and impellers, mixing blades etc.

Plastics: Moulds and dies for injection and blow moulding of plastics components, extruders, machine parts, rollers etc.

We are proud to have a dedicated workshop in Rustenburg that specializes in:

Hard chrome pump sleeves manufacturing.

Hard chrome repairs on worn parts.

Acid and environmental corrosion resistant Electroless nickel plating on fasteners, pump parts, valves etc.



Left: SRH pump sleeve LCC 300 Hard chrome pump sleeves.

Right: Hard chrome SRH pump sleeve

Both sleeves worked under the same conditions and it clearly shows the superior resistance of the hard chrome sleeves.

Electroless nickel plated induction motor.



Electroless nickel plating for a sulphuric and hydrochloric acid application.





Electroless nickel plated KSB pump volute casing for acidic conditions.



Electroless nickel plated fasteners for extreme corrosion conditions.



Inspection of this pump after running for 2880 hours, shows very little wear on the Hard chrome impeller.



Electroless nickel plated mechanical seal sleeves 4/3 D.



12x10 Hard chrome sleeve with neck ring insert.



6x4E pump backplate manufactured and electroless nickel plated.



Grooved flange before and after refurbishment and electroless nickel plating.



Mono pump rotors before and after refurbishment.



High tensile and mild steel bolts, nuts and washers. Electroless nickel plated for extreme corrosion conditions e.g. environmental, sulphuric, hydrochloric and numerous acid other acids.



Electroless nickel plated reduction gearbox.



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