

Nottingham Platers

Chrome Plating Specialists Since 1982

DESIGNERS HELPBOOK

Things you wanted to know
and things you should know

A few answers to questions we are often asked

What is decorative chrome plate?

Decorative Chromium Plating consists of an electrolytically applied coating of sometimes copper followed by nickel followed by chromium plate.

Is it Molten Metal Dipped on?

No. An aqueous solution of the particular metal has electricity applied making the work (cathodes) negative and the metal (anodes) positive.

How is the Metal in Solution? (*I don't understand Chemistry*)

Imagine an iron nail dropped into a glass of acid (Hydrochloric, Sulphuric, Nitric etc). After much effervescence the nail has disappeared and the solution takes on a greenish colour we know it is not magic, yet the nail has gone.

It actually exists as a positive part called an ion, in this case Fe^{++} .

In much the same, from a simplistic point of view, nickel is held in a solution of Nickel Sulphate i.e. a piece of Nickel metal dissolved in Sulphuric acid.

What are Anodes?

These are the positive side of the electric circuit. In most cases the metal to be deposited is the anode, as in nickel plating. In the case of the chromium plate the anodes in conventional Hexavalent chrome solutions are lead, **and trivalent chrome are carbon.**

Why does chrome have problems reaching parts?

Nickel plating is 95% efficient most chrome is only 12-15% efficient.

What this means, is that of all the electricity applied, in the case of Nickel most of it goes to produce Nickel Plate whereas, the case of decorative chromium plate only 12% produces plate the rest produces hydrogen gas and heat.

The lack of efficiency in chromium plate produces poor throw. All contacts be they wired or jiggged must be very positive we cannot afford to lose any more efficiency from poor contacts. **Throw is not a problem with Trivalent Chrome.**

What is Chrome Burning?

To get over the poor efficiency and lack of throw (i.e. the ability to get into the recesses and around Holes) we can strike the work in the chrome vat.

This means that chrome plate is applied at a higher voltage than is normally required for a short time. The result is that points and tips get too much power to allow a recess to receive enough.

If too much power is applied a phenomena called burning occurs. The deposit instead of being bright and lustrous is, for want of a better description, battleship grey.

This can be removed by CHROME FINISHING.

Trivalent chrome produces no burning.

What is Chrome Finishing?

By using a rotating cloth polishing mop and special polish we can burnish the dull chrome up to a finish matching the remainder of the item. ***This is unnecessary in Trivalent Chrome.***

What are Hexavalent/Trivalent Chromes?

HEXAVALENT CHROME - *a dark reddish brown plating solution*

Normal chrome as experienced over the last century was produced from a solution containing Hexavalent chromium. The solution is very toxic as are the gases escaping during processing. Hexavalent chrome has been labelled a carcinogen and is to be avoided at all costs. If controls are in place when using Hexavalent the dangers can be minimised.

However new controls being imposed could result in barriers being put in place to stop or lessen the use of Hexavalent chrome solutions for decorative chromium plating. Under imminent European Legislation **TRIVALENT CHROME** from 2016 will be the only available chrome for decorative purposes.

The occurrence of nickel blows and chrome burning on work are from Hexavalent chrome vats, this we have mentioned earlier.

TRIVALENT CHROME - *a blue green solution*

This has been commercially available for a long time. It is the "Heineken" of chromes reaching parts that other chromes (Hexavalent) cannot reach. It *does not* chrome burn. Its one main draw back is that it was a different colour, this no longer applies.

Trivalent chrome as used at Nottingham Platers is

1. Not carcinogenic
2. Environmentally friendly
3. Hexavalent chrome coloured
4. Throws unbelievably
5. Doesn't burn

We do not use Hexavalent chrome anymore.

CHOICE OF BASE MATERIAL

What base materials can Nottingham Platers plate?

Steel, Copper, Brass.

How good does the raw materials have to be?

Assume that all decorative chrome does, is change the surface colour.

To polish or not to?

1. Only you the Customer know what you are looking for
2. Polishing is done prior to plating NOT AFTER except in the case of Satin Nickel/Chrome
3. Polishing is no replacement for good raw material. The small extra charge for the best raw material per tonne can eliminate expensive polishing altogether
4. Some products may require PRE POLISHING before assembly. This is particularly important in NISHEEN and NILINE.
5. Talk to us before you make the product. Occasionally it is not possible to polish the assembled product.

Always handle raw material or polished material with utmost care. Remember Chromium Plating exaggerates marks caused by damage, saw cuts and grinding/tooling. In effect the best way to consider chromium Plating is that it only changes the colour of the substrate. Don't do a good polish and then manhandle the goods in assembly or carriage. You could possibly negate all the good work you have done.

What do we ask for when ordering raw material?

Always tell your supplier that you are considering chrome plating direct or after a polish. Brass suppliers need to supply lead free and also have knowledge of what is best for plating.

Do you have to polish wire work?

Wire work and rods should be always of the best quality. Polishing may not be possible it is dangerous to do and produces flats on the surface.

Hot Rolled, Cold Rolled Steels, what is best?

Normally Cold Rolled. Cold reduced is the best. CR4 Quality flat material should be requested but please ensure it is the best CR4 and not rubbish.

(All sliced loaves are the same but price and quality makes them different).

Occasionally some Hot Rolled Pickled & Oiled Steel has been excellent.
If in doubt let us sample for you

WORK SIZE

PLATING:

Work Size 12 Foot x 27" High x 21 ½" Wide
3660mm x 685mm High x 550mm Wide

POLISHING:

For Centreless Minimum diameter 12mm
Maximum Diameter 150mm
Maximum Length 3700mm

For Flat Bed Maximum Width 600mm
Maximum Length 3600mm

What are the new finishes we hear about?

NISHEEN - A brushed stainless steel "look-a-like"

NILINE - A lined stainless steel "look-a-like"

NIPEARL - A pearl nickel appearance "look-a-like" without the faults of pearl Nickel

The above finishes are produced using a solution that mirrors the surface the plate is applied to. The cost can be similar to full polished decorative chrome but looks far more expensive.

All the above finishes are exclusive to Nottingham Platers Limited.

SATIN NICKEL - A nickel finish that has scratch lines applied to the nickel after plating

THINGS YOU SHOULD KNOW

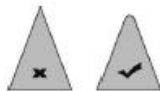
Some Handy Tips in Designing Work for Plating

1. In plating we have to suspend by wire or jig a component. Due consideration must be given to:

- I. Where wire marks are acceptable
- II. The drilling of a wiring hole
- III. An acceptable position for a jig mark
- IV. A place for us to solder a contact should jigging or hole drilling be unacceptable

2. Avoid points

Rounded ends are better

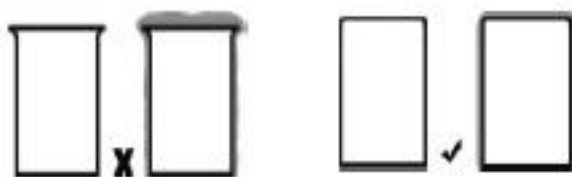


3. Leave tubes open if possible by using knock in inserts after plating.

4. Allow sufficient drainage,

- I. Solution and air have to quickly enter and exit the product
- II. Where visible drain holes are not acceptable use secret ones, i.e. drain hole in Vertical before horizontal welded over
- III. Holes must be as large as possible
- IV. Position holes at the end of blocked tubes. Holes 1" up the tube will lock in solution
- V. One hole for solution. One hole for air.
- VI. Don't try to seal up the weld or braze. It won't work. As air expands in a hot vat it will squirt out under pressure through the smallest hole. On entering a cold solution contraction causes solution to be sucked into the product. The solutions contaminated in this are messy/toxic and could cause problems later.

5. Avoid sharp edges. A slight burr, when plated, causes build up, so chamfer edges to avoid this.



6. When making ranges of work try to get common positions for brackets holes etc, so that jigs can be used on more than one size.
7. Avoid recesses or right angles. 8. Pre polish work before assembly even saddles and slatwall backs for peg arms.
9. TIG weld where possible.
10. Degrease and clean before brazing. Scarring can occur where the oil and carbon get burnt into the surface on brazing.
11. Heavy brazing usually produces a lumpy porous deposit.
12. Chamfer edges of components to be brazed or welded together to allow the filler to fill the gap and not bridge it.
13. If you dress out weld or braze, only dress the area needed and not all of the surrounds.

When in doubt ask. It is sometimes cheaper and better for us to do the work for you.

If there are any further questions you need to ask or other areas to clarify please
contact us directly either by

email info@chrome-platers.com with your enquiry.

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