

Warehouses -

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COLORING STAINLESS STEEL

HOW IS IT DONE –

To Colour stainless steel one must manipulate the thickness of the passive layer that is formed on the surface.

(What is a passive layer – it is a very thin layer that is formed on the surface of the metal when the Chrome or Nickel reacts with Oxygen. This layer gives stainless steel its stainless look and also protects the metal)

So the higher the Chrome, Nickel or Moly, the better the passive layer formation and the easier it is to colour.

This passive layer then reflects the light at certain wave lengths to give the illusion of different light colours.

No dyes, inks, paints or pigments are used.

PROCESS – (summary)

First the stainless steel is degreased in heated Caustic Soda.

Then it is submerged in an aqueous solution at around 70 deg. C containing Chromatic Acid and Sulphuric Acid.

The stainless steel is then left in the tank for between 10 and 50 minutes allowing the stainless steel's passive layer to form to the required thickness.

The longer the time, the thicker the passive layer.

The thinner passive layers give a Bronze colour, through Blue, Black, Charcoal, Gold, Violet and onto Green.

The passive layer forms from 0.02 micron to 0.36 micron thick. (Passive layers are normally around 3 Nanometres thick so this colouring process increases the passive layer a hundred-fold)

The surface polish of the stainless steel also affects the colours and patterns.

ADVANTAGES –

- No flaking, peeling or cracking as there is no dyes and inks.
- The thicker passive layers are more resilient to scratching.
- No fading.
- Improved pitting resistance.
- More repellent to water and dirt.
- Surface film can be mechanically removed by polishing or even chemically removed by etching.

DISADVANTAGES –

- Challenging to fabricate a handrail and only the most experienced installers can do this.

PS - Surface blackening using Sodium Dichromate as well as PVD coating (ceramic coatings) are also sometimes used in colouring the surfaces of stainless steels.