

About - Vacuum Metallizing



What is it?

Vacuum Metallising is the evaporation of aluminium (or other metals) under a vacuum. These coatings are generally decorative in application and can be dyed to produce a great variety of metallic colours such as gold, bronze, copper, silver and gunmetal. Special paint-type coatings are used both under and over the evaporated film to give a suitable base to deposit the metal on to and to protect the thin metal film. Decorative Vacuum Metallised coatings as applied by Finished Products are only metallic in appearance; basically they are paint coatings that look metallic.

What material can be Metallised?

Nearly all materials can be Metallised but some are more suitable than others. Generally plastics and metals are the best substrates for Metallising. Material that is porous and contains air or moisture is unsuitable unless special procedures are followed; for example wood and foam plastics are unsatisfactory. All materials must be able to withstand heat of approximately 70°C.

How is it done?

All components must be held on special **racks** for processing. Generally these will consist of spring type wires or clips. Racking points are required on all products which will result in a racking mark somewhere on the component. **Base-coating** is where a special paint-type coating is applied to the product by spraying, dipping or flood coating. This coating gives a gloss base and provides a base for the evaporated metal. Basecoats are normally baked at a minimum of 70°C to cure the coating.

The base-coated components are placed in a vacuum chamber and all the air is pumped out. Aluminium is then heated on tungsten filaments until it boils and evaporates. This aluminium vapour then condenses and **Metallises** all surfaces in the chamber giving a silver mirror effect. The evaporated coatings are extremely thin and need to be protected from abrasion, so a special clear **topcoat** is applied over the evaporated film in a similar fashion to the basecoat. To produce metallic **coloured coatings** such as copper and gold, dyes are incorporated into the top coat.

What are the recommended uses for Vacuum Metallised coatings?

Decorative Metallised coatings are generally used in low wear applications. Typical examples include cosmetic closures, lighting reflectors, point of sale displays, nameplates, automotive interior fittings, badges, logos, and low cost jewelry. Metallising should not be used in exterior applications or where heat, moisture or wear are present.

How colour fast are the coatings?

Coloured Metallised coatings are dyed and not suitable for exterior exposure. Natural silver coatings will not change colour but may be effected by temperatures over 100°C.

What thickness is Metallising?

The actual evaporated aluminium films are extremely thin and near see-through, but the finished coating with basecoat and topcoat is about 20 microns thick.

Can the gloss level be changed?

By the use of matte or textured base coats and topcoats a wide variety of finishes can be obtained. This can range from a bright finish to a frosted or sandblasted effect.

How flexible are Metallised coatings?

Generally Metallised coatings should be avoided on flexible substrates as they will tend to lose gloss or adhesion on flexing.

Does Metallising conduct electricity?

Decorative metallising is 99.99% paint and is an extremely poor conductor of electricity, however we would not advise the use of Metallised coatings where high voltages are present.

What are the design considerations for trouble-free Metallising?

Avoid designs that will trap air or coating chemicals during metallising. Generally, the best results are obtained by Metallising injection molded ABS plastics. Consideration should also be given to racking the item for processing. Internal metallising on deep recesses should also be avoided. Any form of injection molding release agents on the surface of the component will cause problems with the coating process and must be avoided.

Can metallised coatings be used in contact with food?

These coatings are not food grade and the finish should not be used in contact with food.

What is the maximum size Finished Products can Metallise?

This depends on the shape and size of the vacuum chamber.

For more information on Vacuum Metallising or to find out how Finished Products can help you achieve outstanding results for your surface finishing requirements, please feel free to contact us.