

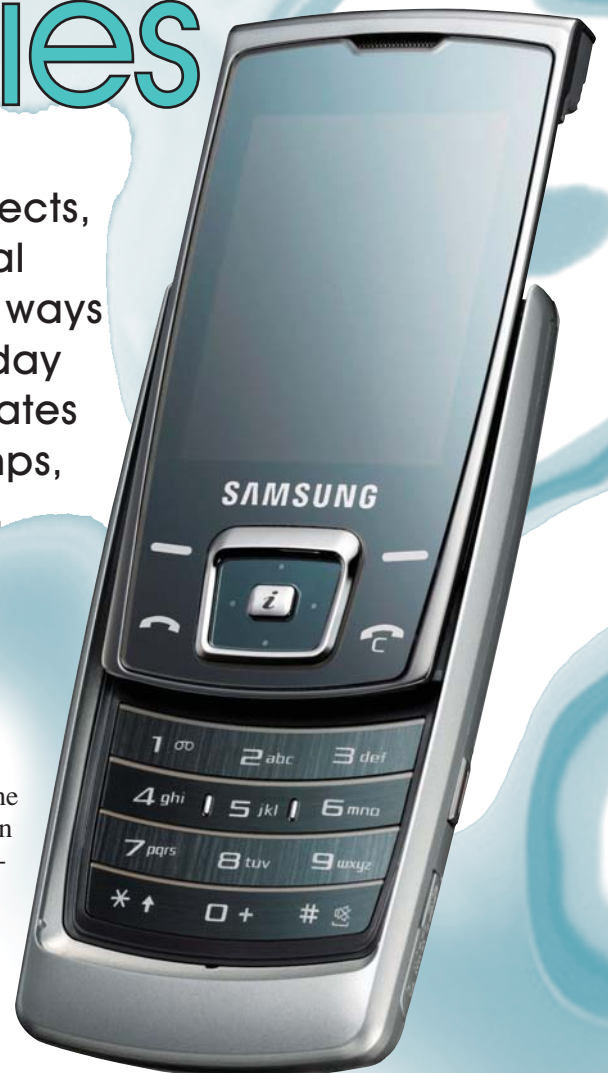
## Kolzer: sputtering in electrical, electronics and automotive industries

The present worldwide environmental aspects, rules and regulations are leading industrial companies to start looking for alternative ways of manufacturing products used in everyday life. From basic elements such as coverplates for electric switches, to reflectors and lamps, all can be “coated” using sputtering and, therefore, without the need for materials that are dangerous for our world and our health.

### THE CHOICE OF VACUUM

Companies can have the most diverse reasons to start using vacuum processes but, in most cases, and in particular with regards to those companies of the electrical and electronics sectors, the push to look for new surface treat-

ments comes directly from the European Directive (Restriction of Hazardous Substances Directive), which imposes restrictions on the use of certain dangerous substances (among which hexavalent chromium, which is used in the galvaniz-



ing industry) in the manufacture of different types of equipment.

Sputtering, which enables to deposit any kind of alloy or metal (and, therefore also chromium) on any kind of substrate, other than having zero discharge, also uses “zero-valent” metallic chromium, which is not dangerous for health and does not pollute.

## A “CASE STUDY” COMPANY

### *Electrical and electronics sectors*

As an example we can speak about BTicino, a leading company in the field of civil and industrial plants, which has, during the last year, bought two sputtering plants for the production of the coverplates that surround switches. Other than concentrating on quality and on the functionality of its products, BTicino also pays considerable attention to their planning and design, finding advantages and opportunities in the use of sputtering, which, other than guaranteeing the repeatability of the process and the uniformity of the deposited material, also enables to deposit alloys such as brass and copper, obtaining, in this way, numerous different shades, certainly attractive from the aesthetical and design point of view.

We can also use the case of BTicino as an example to observe how the company has been equipped as far as accessories for the sputtering plant are concerned.

### *Sputtering used for decorative finishings*

In particular with regards to decorative finishings, in which aesthetics are fundamental, the preparation of the item to be coated is essential. Preparation takes place by applying a base coat of transparent varnish able to carry out three fundamental procedures: levelling, hardening and brilliance of the surface. The only varnish able to carry out these three aspects, without affecting the characteristics of the plastic material during the drying phase is UV varnish. By



Different objects coated using sputtering



using special lamps that use ultra-violet, high intensity light, it is possible to dry in a few seconds paints to which a photoinitiator has been added which absorbs UV radiation, thus giving cause to reticulation.

There are different types of plants, with single station or in-line, manual or with robots. In each case it is essential to apply the varnish in a clean environment without the presence of dust, which would otherwise be captured by the thin layer of paint, with consequent marking of the surface.

If a base coat has been applied there will be no problems regarding adhesion, marking or brilliance, and the coating will be uniform.

The use of varnish not only regards the preparation of the item, but is also necessary after sputtering to protect the metals and alloys that tend to oxidize on exposure to air (such as silver, brass, copper...).

As with UV processes, vacuum processes do not damage plastic in



any way either, because they take place in an environmental temperature. This means that the items can be handled immediately after treatment, proceeding with packaging and shipping.

## VACUUM FOR THE AUTOMOTIVE SECTOR

A similar choice to that of BTicino is being taken by the larger companies of the automotive sector, pushed by the ELV (End of Life Vehicles) directive.

ELV regards the reduction of environmental impact of vehicles to be scrapped, and places particular atten-

# VACUUM APPLICATIONS

tion on the recycling and recovery of materials, which must be discussed in the early stages of design and planning of products.

More and more often, automotive components such as door handles and internal and external profiles are pressed in plastic and then chromium-plated using sputtering to give the illusion of metal, avoiding, in this way, galvanics.

The colours of the chromium used range from clear to dark grey, and include numerous shades, all perfectly repeatable over time and with uniform results.

With regards to reflectors and lamps of all kinds, the traditional process used is metallizing, depositing by means of evaporation of aluminium. It is therefore interesting to note that in

response to new functional (higher reflectance) and aesthetic (new trends and designer creativity) needs, the market is now moving towards sputtering for these applications too, choosing to deposit silver instead of aluminium. Sputtering, in fact, is also an advantageous process for the application of precious metals since production costs remain low because the

metal film that is deposited is not only pure but is also very thin.

The use of sputtering for plastic materials has reached the most diverse markets, and an even more widespread use is foreseen since it responds perfectly to the needs of industrial companies with its economical, productive, and zero environmental impact features.



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