TECHNICAL TOOLS

Ideas and applications for GiColor products

MRK-012-0114

POWDER-COATING OF GLASS OBJECTS

Technique for the powder-coating
of non-conductive materials

Information:

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Technique for the powder-coating of non-conductive materials

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1. Versatility of powder-coatings

Powder-coatings are designed for the application on conductive materials, but with a specific technique it is possible to use them also on non-conductive materials, such as glass, thus expanding the versatility of these products and the results that we can obtain.

Some of the steps for the powder-coating of a glass bottle

2. Technique for the powder-coating of glass

a) Preparation

After preparation and careful cleaning (Picture 2 and 3), the sample is hung with a hook or firmly placed on a metal rod, so that we can move it and put it into the oven <u>without touching it directly</u> (Picture 4).

If possible, when using hooks or similar kinds of supports, we recommend to avoid an oblique positioning of the sample: once it is in the oven, this may cause the asymmetric flowing of the melt powder-coating on the surface of the sample.

We also recommend, if possible, to avoid an asymmetric contact of the metal hook (or rod) on the sample: this may cause, first a higher electrostatic attraction of the powder particles on some spots of the glass object, secondly a faster and easier melting of the powder due to the thermal conductivity of the metal support.
This can be prevented by using supports made of non-conductive materials, and that can *resist at temperatures higher than the curing temperature.*

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Technique for the powder-coating of non-conductive materials

Picture 1: glass sample

Picture 2: protection of the parts to left uncoated

Picture 3: cleaning

Picture 4: preparation on the support for the powder-coating

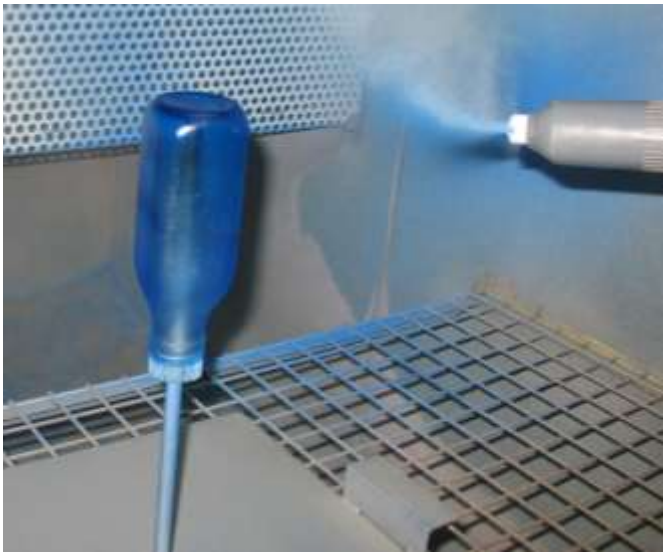
b) Pre-heating

the sample is put into the oven at 248°F - 120°C (melting temperature): in this way, the powder will stick to the object as it touches the hot glass surface, due to instantaneous melting.
The whole glass sample must be hot: for this reason, the longer the object will remain in the oven, the easier and the better will result the subsequent application of the powder.
Approximately, this time should be at least 5 minutes, but it can vary depending on shape and dimensions of the specific object (large glass bottles may require 20 minutes or more).

c) Application

We take the sample out of the oven and we immediately spray the powder on it.
The application is carried out just as for normal (conductive) objects, but it will result easy and homogeneous as long as the sample is hot; for this reason it has to be done rapidly.
The voltage can be set at 0 V, since the powder does not stick to the sample for electrostatic attraction.

While spraying the powder, we'll observe its instant melting on the sample: it is normal, but for powder-coatings with special surface effects (Saltlake, Icetouch...) we'll see the characteristic textured finish only at the end of the curing cycle.



Picture 5 and 6: application of the powder-coating on the hot sample

Attention: in case of defects (due for example to dust fallen on the sample, or contact with other objects that spoil the layer of the melt powder) it is not possible to remove the sprayed powder as in the case of "normal" application (on cold conductive objects). Every contact with the melt powder will compromise the perfection of the result.

d) Curing

We put the sample into the oven for the time and temperatures reported on the *TDS* of the product used.

Picture 7: the sample inside the oven on its support, to complete the curing

e) Cooling down and completion

The sample is pulled out of the oven; the high temperature can temporarily increase the fragility of the glass, so it has to be moved carefully. We let it cool down to room temperature.

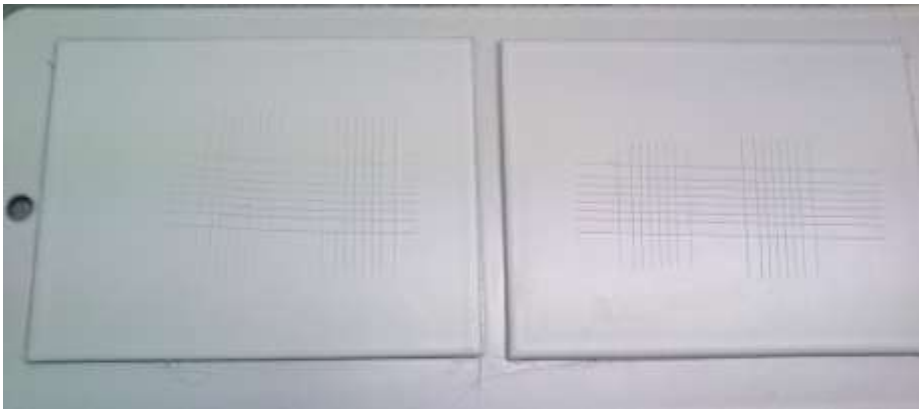
Picture 8 and 9: the sample powder-coated with *Glass-003*

3. Test

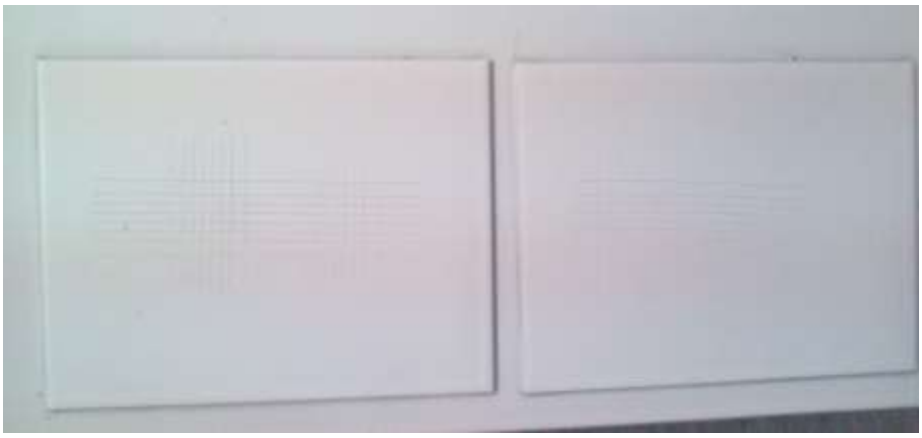
A cross-cut test (*EN ISO 2409*) was carried out on standard powder-coating products applied on glass:

- Smooth glossy finish (*8.447.1704-AJT*): gt = 0; no loss of adhesion.
- Smooth matt finish (*8.647.1700-AJT*): gt = 0; no loss of adhesion.
- Textured finish (*8.666.1700-AJT*): gt = 0; no loss of adhesion.

The adhesion of the powder-coatings is regular and compliant to the standards also on this kind of material.



Cross-cut test carried out on a glass slide, coated with 8.647.1700-AJT (smooth matt)



Cross-cut test carried out on a glass slide coated with 8.447.1704-AJT (smooth glossy)

4. Possible applications

Every glass object can be decorated with the technique here illustrated.
Amazing results can be achieved with bottles and round shapes, that may valorize the metallization and the reflection of light of many powder-coatings.

Glass bottles, coated with (left to right) Goldlook-001, Titanlook-001, Silverlook-001 and Steelook-001.

A perfect solution can be obtained by matching the transparency of the glass with products characterized by low hiding power, thus conferring to the glass object a special color or a special reflection of the light but keeping at the same time the translucency that is typical of this material.

Glass jars coated with Glass-001 and Glass-003.

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