

POWDER-COATING AND HEAT-TRANSFER DECORATION OF CERAMIC MATERIALS

Technique for the powder coating of non-conductive materials, and heat-transfer decoration



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POWDER-COATING AND DECORATION OF CERAMIC MATERIALS

Technique for the powder-coating of non-conductive materials

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 ceramic and pottery, thus expanding the versatility of these products and the results that we can obtain.



Pottery, suitable for the decoration with powder coating

2. Technique for the powder coating of pottery

a) Preparation

After preparation and careful cleaning, 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 without touching it directly (Picture 1).

If possible, we recommend 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 ceramic 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: preparation of the sample on a hook, in order to move it without touching it

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 surface, due to instantaneous melting.

The whole ceramic 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. Pre-heating also allows the expulsion of possible volatile compounds inside the material, that could generate defects after the application and during the curing of the powder.

Approximately, pre-heating should take at least 15 minutes, but it can vary depending on shape and dimensions of the specific object.

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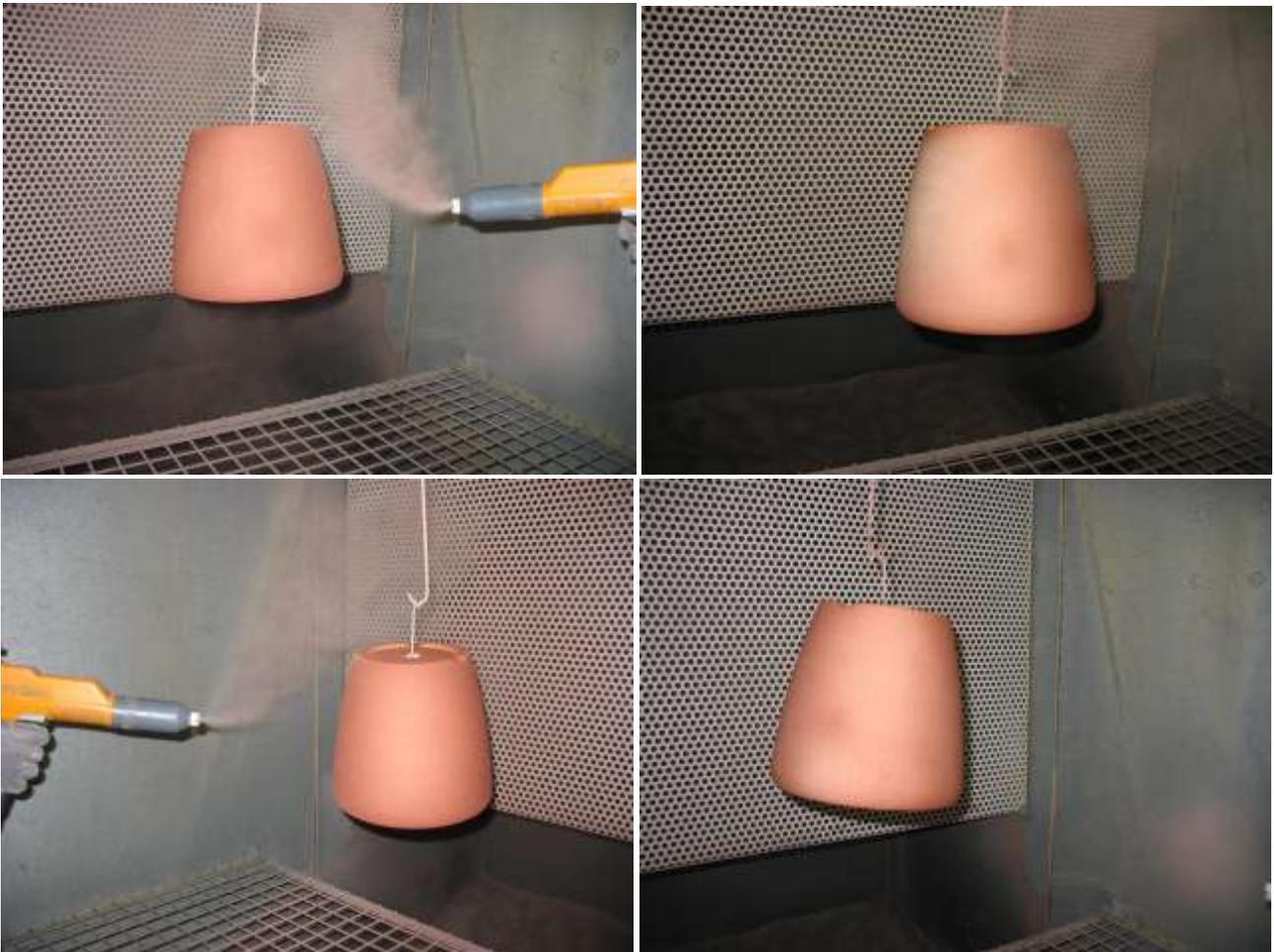
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c) Application

We take the sample out of the oven and we immediately spray the powder on it (Picturese 2a, 2b, 2c, 2d). 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 powders with special surface effects (Saltlake, Icetouch...) we'll observe the characteristic textured finish only at the end of the curing cycle.



Pictures 2a, 2b, 2c, 2d: application of the powder on the hot pre-heated pottery

Attention: in case of defects (due for example to dust fallen on the sample, or contact with other objects that spoil the layer of 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.

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d) Curing

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

Due to the low thermal conductivity of ceramic materials, complete curing could take longer than analogous metal samples (up to 10-15 minutes more): curing conditions, indeed, always refer to the sample temperature.



Picture 3: the sample inside the oven with its support, to complete the curing

e) Cooling down

The sample is carefully pulled out of the oven and let cool down to room temperature.



Picture 4: the sample, coated with 9G-036-A004

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Technique for the heat-transfer decoration

3. Heat-transfer decoration

Heat-transfer technology allows to decorate powder-coated objects to obtain wood effect finishes, fancy effects, or different decorative motifs.

Here is shown the procedure for the decoration of pottery.

a) Preparation

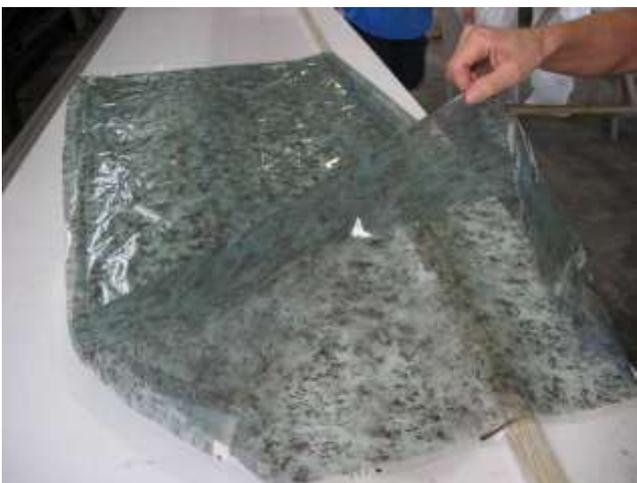
With the heat-transfer film that we have chosen for the decoration, we make a bag large enough to contain the object to decorate: we cut a square portion of the film and join two opposite sides of it (Picture 5); then we close in the same way one remaining side (Picture 6), thus leaving one side open to insert the sample (Pictures 7 and 8).



Picture 5: two sides of the portion of film are joined together



Picture 6: one remaining side is closed, forming a bag



Picture 7: the bag, open on one side



Picture 8: the sample inside the bag

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Technique for the heat-transfer decoration

b) Bagging and suction

The bag containing the object is closed on “suction heads” (Picture 9); these heads will make the vacuum inside the bag, so the film will strictly adhere on the whole surface of the sample (if necessary, the film will be handled to eliminate wrinkles): this will allow the correct transfer of the inks all over the surface of the object.



Picture 9: the bag containing the object is closed on the suction head (on the left), then vacuum is made

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Technique for the heat-transfer decoration

c) Oven and heat-transfer process

The sample prepared is put into the oven for 12 minutes at 446°F – 230°C (air temperature). After this time, the exhausted film can be removed and the decoration is complete.



Pottery coated with 9G-036-A004 and decorated with heat-transfer film 6052/01



Close view of the sample

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Technique for the heat-transfer decoration

4. Possible applications

Every ceramic object can be decorated with this technique. Striking results can be obtained with pottery vases and round shapes that can valorize the metallization and the opalescence of the powder coating products.

Amazing solutions can also be obtained by choosing powders with special textured effects, like *Ice touch* or *Saltlake*, that valorize the color and the light on the decorated object.



Pottery coated with Saltlake-025 then decorated with heat-transfer film 76048/07



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