

Processing guideline

VR219 – Processing of semi-transparent IGP coating powders "Thermofer"

Introduction

In contrast to fully transparent or opaque powder coatings, semi-transparent coating powders place significantly higher demands on the coating.

These powder coatings are mainly used as primers for thermal transfer printing.

This processing guideline has been created to provide users with instructions on how to achieve optimum coating results.

Pretreatment

In contrast to pigmented coatings that cover the substrate, the coatings in this product group are translucent. This means that the surface of the substrate remains visible even through the baked paint film. This places increased demands on the substrate and the pretreatment.

The substrate must be pretreated so that it has the same appearance on all components. Even fine scratches, scuff marks or discolouration caused by the pretreatment will affect the subsequent shade of the coating and also the thermal transfer print.

If it is not possible to ensure an absolutely uniform substrate, an opaque coating should be applied before coating the transparent powder coating. As this coating also has an influence on the top coat, this decision must be made before limit samples are created and cannot be changed.

Order organisation

One batch - one application equipment

If the components are installed directly next to each other, we recommend determining the amount of powder required for coating the entire job, allowing for a certain reserve and coating the entire job with one finished batch of paint. This ensures that the colour of the coating is the same for the entire application.

Experience has shown that Application with equipment from different manufacturers (due to different characteristic curves of the high-voltage generators) produces different results in terms of shade.

Processing the entire application on different booths should also be avoided. When processing a specific commission, no changes may be made to the processing or application parameters on the coating plants. Once system data or application parameters have been determined to be optimal, they must be documented and strictly adhered to. This procedure must also be adhered to at of the coating of follow-up orders.

We strongly recommend the production of limit samples to check for conformity with the ordered shade (incoming inspection!) and to monitor the shade throughout production. A check for any deviation from the tolerance limits must be carried out under suitable lighting conditions before delivery of coated parts (outgoing inspection).

As the coating thickness and substrate have a significant influence on the visual appearance of the coating, limit and approval samples may only be made on the same substrate with the same pretreatment as the subsequent coating material.

The samples must also have the identical, desired layer thickness of the later coating.

For this reason, only parts of the same material and the same pretreatment may be used for the entire coating application. Otherwise, unavoidable colour deviations are to be expected.

If it is not possible to avoid different substrates / pretreatments, it is strongly recommended to coat in a two-coat system. For this purpose, a neutral substrate is coated first and then the semi-transparent powder coating is applied.

Processing

Processing of semi-transparent powder coatings should ideally be carried out in automated coating operations.

During coating, care must be taken to ensure that the layer thickness distribution on and between the individual workpieces is as uniform as possible. Even slight deviations from approx. $\pm 5\mu\text{m}$ can lead to noticeably lighter or darker colour tones with darker glaze-like shades.

These deviations are still visible later in thermal transfer printing due to the different colour embossing.

To prevent this, an increased amount of manual pre- or follow-up coating may be necessary on the inside edges.

It is recommended to pay particular attention to uniform fluidisation of the powder and a uniform "soft" powder cloud. This measure in conjunction with adapted electrostatics (use a current limiter) helps to ensure that the colour is as consistent as possible on and between the individual workpieces.

For finely textured surfaces, the processing guideline [VR214](#) must also be observed.

The reclaiming process

In powder systems with cyclone recycling systems, the finest powder grains are not separated in the cyclone and are continuously removed from the powder. This removal results in a shift in the particle distribution.

In order to guarantee optimum particle distribution and thus the best possible powder feed, a maximum proportion of 90% reclaimed powder should not be exceeded for the coating.

Maintenance and Cleaning of the system

To ensure reducible coating results on the coating plants, the maintenance work recommended by the manufacturer to replace wearing parts must be carried out on the entire system at the intervals provided for this purpose. Various functional checks, such as checking the high voltage, must be carried out at regular intervals.

Mounting the parts

The mounting of the workpieces must be determined before coating (horizontal or vertical). The distances between the coating objects within the hanger as well as the distances between the hangers should be as small and even as possible. If the distances between the hangers are large, it is advisable to switch the guns on and off automatically via a parts detection system.

Earthing

When processing semi-transparent coating powders, particular care must be taken to ensure sufficient earthing.

This measure contributes significantly to an even layer thickness distribution and a consistent shade.

Curing

Different curing temperatures and heating speeds of the parts must be avoided, just as thick and thin-walled parts must not be coated at the same time. The recommended curing window according to the technical data sheet must be adhered to.

Applicable documents

Technical data sheets

Recommendations for Processing semi-transparent powder coatings

The values given here are "recommendations". When processing pigmented semi-transparent powder coatings, we recommend adapting the processing parameters of the coating plants to the "product" to be processed.

Equipment and processing parameters (equipment / accessories)	Setting (parameter)	Possible effect (remark)
High voltage setting (gun)	60-90kV	Setting range for Processing
Current limiter μ A (gun)	<10-20 μ A	Reduces possible edge greasing
Total airm ³ /h/ conveying + dosing air (inner diameter of powder hose)	12 mm = 5m ³ /h 11 mm = 4m ³ /h 10 mm = 3m ³ /h	Prevents pulsation of the powder cloud, ensures optimum atomisation.
POE powder hose with integrated earthing (injector gun)	Injector grounding	Prevents electrostatic charge of the powder in the powder hose.
Nozzle (gun) with flat spray nozzles	Suitable	Good depth, even atomisation.
Nozzle (gun) with baffle plate	suitable	Reduced depth of atomisation
Processing with ion-leakage ring (gun)	Suitable with or without	Reduces tendency to edge greasing

Coating spraying distance (gun-workpiece)	> 200mm	Uniform coating thickness distribution
Coating with tribo guns (guns)	Suitable depending on powder type	Observe the information in the respective technical data sheets
Powder feed from fluidised container	Well suited, fluidising air as required	Uniform powder delivery and powder cloud
Powder delivery from the delivery container / carton	Unsuitable	Sometimes slightly irregular conveying and therefore irregular layer thicknesses.
Screening with US screen (screening machine)	Suitable with mesh size >140µm	Better fluidisation, more even application
Maximum proportion of reclaimed powder in recirculation mode without testing the shade	<90%	With a higher proportion, fluidisation deteriorates in some cases, irregular conveying
Document processing parameters (control unit programme)	Recommended	