IGP POWDER COATINGS

Processing guideline

VR201.1 – IGP coating powder with pearl mica effect

Introduction

Effect powder coatings with a pearl mica effect place much higher demands on Processing compared to uni powder coatings. In principle, the darker the effect powder, the higher the effect content and the finer the effect pigment, the higher the processing requirements. When processing effect powder coatings, the design of the coating plants and the application parameters have a significant influence on the coating result. Errors lead to differences in shade and effect and produce inconsistent coating results. The processing guideline VR 201.1 was drawn up to assist users in the error-free processing of IGP effect powder coatings. There are essentially five processing categories for IGP effect powder coatings, ranging from 1-STAR* to 5-STAR*****. You can recognise the processing category of your product by the stars on the container label of your powder coating.

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. This minimises colour and effect differences when coating the entire application.

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

Electrostatic parameters such as the level of the set high voltage, the setting of the current limiter (µA), the use of ion-leakage rings and the processing of effect powder coatings with opposite polarity (tribo coating: positive polarity, corona coating: negative polarity) significantly influence the shade and effect formation.

The coating booth is another influencing factor. In contrast to steel booths, plastic and glass booths prevent the flow of electrostatic charge through insulating booth walls. This results in different coating results in terms of shade and effect formation.

Avoid processing the same job on different types of booths. 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 and parameter settings must also be adhered to when coating subsequent orders.

We strongly recommend the production of limit samples to check that they match the ordered shade (incoming inspection!) and to monitor the shade and effect 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).

If coatings on different systems cannot be avoided, or if the geometry places high demands on the application process, we strongly recommend the use of effect powder coatings from the IGP-Effectives® series.

Processing

Automatic coating is always preferable to manual coating. Any manual application required in semi-automatic mode should always be carried out as a pre-coating.

Color tones and effect fluctuations as well as cloud formation are to be expected with a purely manual coating due to uneven powder application.
The manual coating must therefore always be coordinated with the results of the automatic coating. For objects to be coated on both sides (e.g. profiles), the main visible side should be coated last.

Processing of coating powder with pearl mica effect should always be carried out using corona guns with electrostatic charge in negative polarity without ion-leakage rings.

Depending on the product, the spraying distances between the object and the gun vary between 300 and 400 mm.

Reclaiming

In powder systems with cyclone recycling systems, the finest powder grains and effect particles are not separated in the cyclone and are continuously removed from the powder. This removal results in a shift in the ratio of effect particles to the base colour. In order to completely rule out colour changes due to effect losses during coating, pearl mica products can only be processed in pure loss mode without reclaiming.

In the case of automatic coating with a corresponding batch size, a certain amount of reclaimed powder can be added depending on the categorisation of the shade. Please refer to the table at the end of the document. In this case, we recommend creating limit samples before the start of production and using them throughout production to check the shade and effect. If there is a deviation in shade and effect, the proportion of fresh powder should be increased accordingly.

It is recommended to feed part of the powder through the reclaiming process before coating begins in order to use a stable mixture of fresh and reclaimed powder during the coating of the first object.

If very high demands are placed on the stability of the effect image or if a high proportion of overspray is to be expected due to the geometry of the components, we recommend the use of IGP-Effectives®. The special production of this powder type enables the use of up to 90% reclaimed powder.

Maintenance and Cleaning of the system

In order to ensure the reproducibility of coating results on the coating system, the maintenance work recommended by the manufacturer to replace wearing parts must be carried out on the entire system at the intervals specified 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. It is also important to ensure that similar workpieces are always coated together.

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 must be adhered to.

Earthing

When processing coating powders with pearl mica effect, particular care must be taken to ensure sufficient earthing. This measure contributes significantly to a uniform consistency of the shade and effect formation.

Applicable documents

Technical data sheets

- TI106 Cleaning recommendations for IGP coating powders with pearl mica effect
- TI000 Categorisation of effect powder coatings

Recommendations for Processing IGP pearl mica effects

The values given here are recommendations. When processing pearl mica products, the processing parameters of the coating plants must be adapted to the product to be processed.

Systems and processing parameters (equipment / accessories)	**Settings (parameters) according to categorisation**					**Possible effect (remark)**
	*****	****	***	**	*	
High voltage setting (gun) kV	See VR 201.2 IGP-Effectives®	50 - 90	50 - 90	70 - 80	70 - 80	Setting range for Processing
Current limiter µA (gun)	See VR 201.2 IGP-Effectives®	<80 µA -> normal operation <10 µA -> reduced edge greasing				Reduces possible edge greasing
Total air m³/h conveying + dosing air (inner diameter of powder hose)	See VR 201.2 IGP-Effectives®	12 mm = 5 m³/h 11 mm = 4 m³/h 10 mm = 3 m³/h				Prevents pulsation of the powder cloud, ensures optimum atomisation
POE powder hose with integrated earthing (injector gun)	See VR 201.2 IGP-Effectives®	Grounding the injector				Prevents electrostatic charging of the powder in the powder hose
Nozzle (gun) with flat spray nozzles	See VR 201.2 IGP-Effectives®	suitable				good depth, even atomisation.
Nozzle (gun) with buffle plate	See VR 201.2 IGP-Effectives®	suitable				Reduced depth of atomisation
Processing with / without ion-leakage ring (gun)	See VR 201.2 IGP-Effectives®.	Processing without ion-leakage ring recommended.				Prevents spitting

Coating spraying distance (gun-workpiece)	See VR 201.2 IGP-Effectives®	> 250	> 300	> 350	> 350	Prevents streaks and cloud formation
Coating with tribo guns (guns)	See VR 201.2 IGP-Effectives®	Not suitable				Significant colour deviations possible
Powder delivery from fluidised container	See VR 201.2 IGP Effectives®	well suited, fluidising air as required				Uniform powder feed and powder cloud
Powder delivery from the box	See VR 201.2 IGP-Effectives®	Limited suitability				Sometimes slightly irregular conveying and therefore irregular layer thickness/ effects
Screening with US screen (screening machine)	See VR 201.2 IGP-Effectives®	suitable with mesh size > 140µm				Better fluidisation, more even Application
Maximum proportion of reclaimed powder in circulation mode without testing the shade	See VR 201.2 IGP-Effectives®	≤ 10 %	≤ 5 %	0 %	0 %	Prevents colour deviations during coating operation
Maximum proportion of Mica Bond reclaiming in circulation mode with pre-testing of the colour	See VR 201.2 IGP-Effectives®	Not applicable	≤ 10 %	≤ 10 %	0 %	Prevents colour deviations during coating operation
Maximum proportion of premium bond reclaimed powder in circulation mode with pre-testing of the shade	See VR 201.2 IGP-Effectives®	≤ 30 %	≤ 25 %	≤ 20 %	≤ 10 %	Prevents colour deviations during coating operation
Document processing parameters (control unit programme)	See VR 201.2 IGP-Effectives®	recommended	recommended	strongly recommended	strongly recommended	Facilitates reproducibility of the coating results
Create limit samples in advance	See VR 201.2 IGP-Effectives®	recommended	strongly recommended	strongly recommended	strongly recommended	Prevents excessive colour deviations, which can be subsequently objected to.
Coating on various coating plants	See VR 201.2 IGP-Effectives®	after adjustment possible	after adjustment possible	only conditionally possible	is not recommended	Different coating plants sometimes produce different effect characteristics

Manual pre-coating of the workpieces in semi-automatic operation	See VR 201.2 IGP-Effectives®	recommended	recommended	strongly recommended	strongly recommended	Lower tendency to colour deviations and streak or cloud formation
Manual follow-up coating of workpieces in semi-automatic operation	See VR 201.2 IGP-Effectives®	possible after feasibility check	not recommended	not recommended	not recommended	Increased tendency to colour deviations and streak or cloud formation
Pure manual coating	See VR 201.2 IGP-Effectives®	Possible	after feasibility check possible	after Feasibility test possible	not recommended	Strong tendency to colour deviations and cloud formation with uneven coating