

IGP coating powder with pearl mica effect

Processing IGP effect powder coatings manufactured in the mica-bond or premium-bond process.

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A DOLD GROUP Company

Introduction

Effect powder coatings with pearl mica effect are much more challenging to process than single-color powder coatings.

The rule of thumb is: the darker an effect powder, the higher the effect proportion and the finer the effect pigment, the more challenging the processing. The design of the coating plant and the application parameters have a significant impact on the coating result of effect powder coatings. Faults cause shade and effect differences, creating an inconsistent coating result. This Processing Instruction, VR 201.1, was prepared in order to provide users with assistance in fault-free processing of IGP effect powder coatings.

IGP effect powder coatings come in five main processing categories, from 1-STAR * to 5-STAR****.

The stars on the label of your powder coating container indicate the processing class of your product.

Project organization

One batch, one application facility

If the components are installed directly adjacent to each other, we recommend determining the required powder amount for the entire order and planning a certain reserve in order to coat the entire application with a single production batch. This minimizes color and effect differences when coating the entire order.

Experience has shown that varying results in terms of shade and effect formation can occur when the product is applied using devices from different manufacturers (due to the different characteristic curves generated by the high-voltage generators).

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

Another influencing factor is the coating cabin. Unlike steel cabins, cabins made of synthetic material and glass prevent the flow off of electrostatic charge because of the insulating cabin walls. This produces different coating results with regard to shade and effect formation.

Processing one order in different cabin types should be avoided. No changes to the coating plant processing or application parameters may be made when processing a certain consignment. If it is determined that plant data / application parameters are ideal, they must be documented and observed. This procedure and the parameter settings must also be observed for follow-up orders. We urgently recommend producing limiting samples to check the match with the shade ordered (input inspection) as well as to monitor the shade and effect appearance throughout production. An inspection to determine any deviation from the tolerance limits on coated parts must be carried out under suitable lighting before supply (output inspection).

If it is not possible to avoid coating on different plants or if the part

geometry makes high requirements of the application process, we recommend using effect powder coatings from the IGP-Effectives® series.

Processing

Automatic coating should always take precedence over manual coating. Any manual application that is necessary in semi-automatic operation should always be performed as a preliminary coat. Shade and effect fluctuations as well as cloud formation can be expected from pure manual coating due to an uneven application of powder. Therefore, manual coating must always be aligned with the results of automatic coating. When dealing with objects to be coated on both sides (e.g. profiles), the side that will be primarily visible should be coated last.

When processing powder coating with pearl mica effect, we recommend using corona with a negative polarity electrostatic charge without ion-leakage rings. The speed of the stroke devices must be adapted to the transport speed (harmonized sinusoid guns) when coating using a long stroke method.

The stroke height must be adapted to the gun distance (harmonized gun turning points) when coating using the short stroke method. Depending on the product, the spraying distances between the object and the pistol vary between 300 and 400 mm.

Recovery operation

Powder facilities equipped with a cyclone recovery mode do not separate the finest powder particles and effect particles in the cyclone. Instead, these particles are continuously removed from the powder. This removal offsets the ratio of the effect particles to the basic shade.

In order to completely avoid shade changes caused by effect losses during coating, the processing of pearl mica products can only be performed in pure loss mode without recovery.

In the case of automatic coating, it is possible with a corresponding batch size to add a certain quantity of recovered powder, depending on the shade classification. For details, please see the table at the end of this document. In this case, we recommend that you prepare limiting samples prior to the start of production and use them throughout the entire production in order to check the shade and effect. If the shade and effect deviate, increase the ratio of fresh powder as required.

We recommend that, before the start of coating, you feed in a portion of the powder from recovery. This means you use a stable mix of fresh and recovery powder right from coating of the first object.

If very high standards of stability of the effect appearance are required, or if the parts geometry makes a high share of overspray likely, we recommend using IGP-Effectives®.

The special production of this powder type enables the use of up to 90% recovery powder.

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Plant maintenance and cleaning

To ensure the coating plant achieves reproducible coating results, the maintenance work for replacing parts subject to wear in the entire plant must be performed at the specified intervals, as recommended by the manufacturer. Various functional tests, e.g. checking the high voltage, must be carried out at regular intervals.

Suspension of the parts

The suspension of the parts must be determined prior to coating (horizontal or vertical). The intermediate spacing between the coating objects within the hangers as well as the spaces between the hangers must be kept as small and regular as possible. If there are large distances between the hangers, it is advisable to automatically switch the guns on and off via a parts detection system.

Furthermore, it must be ensured as far as possible that similar components are always coated together.

Curing

Different curing temperatures and heating speeds of the parts must be avoided. Furthermore, thick and thin-walled parts must be coated separately. Observe the recommended range of curing conditions without fail.

Earthing

Special attention must be given to sufficient earthing when processing coating powders with a pearl mica effect.

This measure significantly contributes to a uniform shade and effect formation consistency.

Other applicable documents

Technical data sheets;
TI 106, cleaning recommendation for IGP coating powder with pearl mica effect.
TI 000 classification of effect powder coatings

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Recommendations for processing IGP pearl mica effect products

The values stated here are recommended values. When processing pearl mica products, you must adjust the processing parameters of the coating plant to the product to be processed.

Plants and/or processing parameters (devices / accessories)	Adjustment (Parameters) according to classification					Possible effect (comment)
	*****	****	***	**	*	
High-voltage setting (pistol) kV		50 - 90	50 - 90	70 - 80	70 - 80	Setting range for processing
Current limit μ A (pistol)		<80 μ A				reduces possible edge greasing
Total air flow m ³ /h / conveying + dosing air (inner diameter of powder hose)		12 mm = 5 m ³ /h 11 mm = 4 m ³ /h 10 mm = 3 m ³ /h				prevents pulsing of the powder cloud, ensures optimal atomization
POE powder hose with integrated earthing (injector pistol)		Injector earthing				prevents electrostatic charging of the powder in the powder hose
Nozzle (pistol) with flat spray nozzle		suitable				good depth effect, even atomization.
Nozzle (pistol) with baffle plate		suitable				reduced depth effect
processing with / without ion-leakage ring (pistol)		suitable with or without	processing only with or only without	processing only with or only without	processing only with or only without	reduces spray-back effects, improves flow properties at coating thicknesses of > 120 μ m
Spraying distance of coating (pistol to workpiece)		> 250	> 300	> 350	> 350	even coat thickness distribution
Coating with tribo pistols (pistols)		not suitable				significant color deviations possible
Powder feeding with injector so that the powder flows inside the container		highly suitable, fluidizing air as required				even powder feeding and powder cloud
Powder feeding with injector from the supply container		suitable under certain conditions				partly slightly irregular feed and therefore irregular coat thicknesses.
Screening with US screen (screening machine)		suitable for mesh size >140 μ m				better fluidization, more even application
Maximum share of recovery powder in circular operation without checking the shade		\leq 10 %	\leq 5 %	0 %	0 %	prevents shade deviations during coating

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Plants and/or processing parameters (devices / accessories)	Adjustment (Parameters) according to classification					Possible effect (comment)
	*****	****	***	**	*	
Maximum share of Mica Bond recycling in circular operation with pre-checking the shade		not applicable	≤ 10 %	≤ 10 %	0 %	prevents shade deviations during coating
Maximum share of Premium Bond recovery powder in circular operation with pre-checking the shade		≤ 30 %	≤ 25 %	≤ 20 %	≤ 10 %	prevents shade deviations during coating
Document processing parameters (control unit program)		recommended	recommended	strongly recommended	strongly recommended	facilitates reproducibility of the coating results
Produce limiting sample first		recommended	strongly recommended	strongly recommended	strongly recommended	prevents the possibility of subsequent complaints due to high shade deviations.
Coating on various coating plants		possible after comparison	possible after comparison	only possible under certain	not recommended	different coating plants can create deviating effect characteristics
Manual pre-coating of the parts in semi-automatic operation		recommended	recommended	strongly recommended	strongly recommended	lower tendency toward color deviations and streak or cloud formation
Manual follow-up coating of the parts in semi-automatic operation		possible after feasibility check	not recommended	not recommended	not recommended	increased tendency toward color deviations and streak or cloud formation
Pure manual coating		possible	possible after feasibility check	possible after feasibility check	not recommended	if coating is uneven, strong tendency toward color deviations and cloud formation

See VR 201.2 IGP Effectives