

## IGP coating powder with metal interference pigments

Processing IGP effect powder coatings manufactured in the Premium-Bond process.

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### Introduction

IGP groups together effect powder coatings with metal interference pigments in a single processing group under the name Melted Metal. They are much more challenging to process than solid-color powder coatings.

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.

These Processing Instructions, VR 216, were prepared in order to provide users with assistance in fault-free processing of IGP effect powder coatings from the Melted Metal processing group. IGP effect coatings containing metal interference pigments are indicated by the letter M as the 5th digit in the product key. In terms of processing, they belong to the IGP 2-STAR\*\* effect category.

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 ( $\mu\text{A}$ ), 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 dissipation 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. Do not make any changes to the coating plant processing or application parameters when processing a single consignment. If you determine that plant data / application parameters are ideal, document and observe them without fail. 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).

### Processing

Automatic coating should always be preferred 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. profile sections), the side that will be primarily visible should be coated last.

When processing powder coating with pearl mica effect, we recommend using corona guns with a negative polarity electrostatic charge without ion-leakage rings.

The spraying distances between the object and the gun should be greater than 350 mm.

#### Special notes on purging air and gun distances

For reliable processing and to prevent powder deposits in the spray nozzle, we recommend increasing the total or dosing air by about 0.5-1.0 m<sup>3</sup>/h.

Additionally, you should increase the purging air or pistol air (different plant manufacturers use different terms for this) by about 0.1-0.2 m<sup>3</sup>/h. At the beginning of the coating process, after 1 or 2 minutes of spraying or 1 to 2 suspended parts, stop the process and check the spray nozzles for powder deposits.

If you find deposits in the spray nozzle, further increase the total or dosing air until no deposits are visible. If you only find deposits at a few spots on the electrodes, further increase the purging air or pistol air in small increments. However, do not exceed a value of approx. 0.4 m<sup>3</sup>/h.

You should always increase the total air first before adjusting the purging air. If necessary, repeat this step until no deposits are visible. Please note that increasing the air rates also accelerates the powder cloud. To prevent streaks, increase the spraying distance between the part and the coating pistol correspondingly.

Please contact our technical Sales if you'd like us to support you with your first coating process.

Especially when coating geometrical components, it is important to ensure an even coating thickness. We recommend approx. 70-80  $\mu\text{m}$ . Other coating thicknesses can alter the flow and the effect appearance. To prevent the picture-frame effect, first coat the less visible sides of the part, then the primarily visible side. Reducing the current limiter ( $\mu\text{A}$ ) can also help to minimize this effect.

It is recommended to let the guns spray for 30-60 seconds before coating the first workpieces.

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### Recycling

Powder facilities equipped with a cyclone recycling system 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 minimise shade changes caused by effect losses during coating, the processing of metal interference products can only be performed in pure loss mode without recycling.

In the case of automatic coating, it is possible with a corresponding batch size to add a certain quantity of recycled 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 recycling. This means you use a stable mix of fresh and recycled powder right from coating of the first object.

### 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.

To prevent coating flaws such as spitting, we recommend as far as possible using spray nozzles, electrode holders and nozzle wedges that are in as-new condition.

If there is increased wear on the components, this results in a greater tendency for powder to accumulate on and in the spray nozzle, which can cause spitting on the components.

From a certain level of wear, these powder deposits can no longer be removed with increased total or dosing air rates and the components must be replaced.

### Suspension of the parts

The suspension of the parts (horizontal or vertical) must be determined prior to coating. 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, ensure as far as possible that similar parts 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.

### Grounding

Special attention must be given to sufficient grounding 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 coating powder with metal interference pigments

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)	Setting (parameters) according to categorization	Possible effect (comment)
	**	
High-voltage setting (gun) kV	60 - 80 90-100 for colors with silver color	Setting range for processing
Current limit $\mu$ A (gun)	Approx. 10 $\mu$ A with sufficient charging, 10 - 30 $\mu$ A if charging is too low	Reduces possible edge greasing, prevents orange peel skin
Total air flow m <sup>3</sup> /h / conveying + dosing air (inner diameter of powder hose)	Increase by 0.5-1.0 m <sup>3</sup> /h compared to other IGP pearl mica powder coatings	Prevents deposits in the spray nozzle and spitting. During initial coating check the required values!
POE powder hose with integrated grounding (injector gun)	Earth the injector	Prevents electrostatic charging of the powder in the powder hose
Nozzle (gun) with flat spray nozzle	Recommendation: purging air 0.2-0.3 m <sup>3</sup> /h	Prevents deposits on the electrode and spitting
Nozzle (gun) with baffle plate	Suitable after testing	The coater must test this for every plant and article
Processing with / without ion-leakage ring (gun)	Processing without ion-leakage ring recommended	Spitting possible when processing with ion-leakage ring
Spraying distance of coating (gun to part)	> 350 mm	Even coat thickness distribution / prevents streaks
Coating with tribo guns (guns)	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 $\mu$ m	Better fluidization, more even application
Maximum share of recycled powder in circular operation without checking the shade	0 %	Prevents shade deviations during coating

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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)	Setting (parameters) according to categorization	Possible effect (comment)
	**	
Maximum share of Premium Bond recycled powder in circular operation with pre-checking the shade	≤ 20 %	Prevents shade deviations during coating
Document processing parameters (control unit program)	Strongly recommended	Prevents incorrect settings for new coating
Produce limiting sample first	Test coating strongly recommended	Parameters for fault-free coating must be determined in advance
Coating on various coating plants	Test coating strongly recommended	Different coating plants can create deviating effect characteristics
Manual pre-coating of the parts in semi-automatic operation	Strongly recommended	Lower tendency toward color deviations and streak or cloud formation
Manual follow-up coating of the parts in semi-automatic operation	Not recommended	Increased tendency toward color deviations and streak or cloud formation
Pure manual coating	Possible after feasibility check	If coating is uneven, strong tendency toward color deviations and cloud formation