

IGP coating powder with metal interference pigments

Processing IGP effect powder coatings manufactured in the IGP bonding 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 results achieved with effect powder coatings. Faults will result in shade and effect differences, creating an inconsistent coating result.

This processing guideline, VR 216, was created 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 category of your product.

Project organization

One batch, one set of application equipment

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 booth. Unlike steel booths, booths 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's 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 strongly recommend producing limit samples to check the results match the ordered shade (input inspection), and 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 delivery of coated parts (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.

Pure manual coating is likely to result in shade and effect fluctuations, as well as cloud formation, due to the 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 coating powder containing metal interference pigments, 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^3/h .

You should always increase the total air first before adjusting the purging air. If necessary, repeat this step until no deposits are visible.

Additionally, you should increase the purging air or gun air (different plant manufacturers use different terms for this) by about 0.1 – 0.2 m^3/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 gun air in small increments. However, do not exceed a value of approx. 0.4 m^3/h .

If the deposits remain on the electrode, it may cause significant deviations in surface appearance and effects.

We recommend allowing the guns to spray for approx. 30 – 60 seconds before coating the first workpieces.

Special notes on high voltage and coating thickness

Especially when coating geometrical components, it is important to ensure an even coating thickness. To achieve a smooth flow, a coating thickness of approximately 95 μm is recommended.

For articles in the silver color range, higher voltages (80 – 100 kV) are recommended to ensure a consistent finish.

Depending on the shade, it may also be necessary to increase the lead and follow-up times (pre- and post-spraying) of the guns.

If possible, coat all components in one go rather than splitting them into various stages.

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Reclaiming

Powder facilities equipped with a cyclone reclaim system do not separate the finest powder grains and effect particles in the cyclone. Instead, these particles are continuously removed from the powder. This removal alters the ratio of the effect particles to the basic shade. In order to minimize shade changes caused by effect losses during coating, the processing of metal interference products can only be performed without reclaiming any of the surplus powder at all.

In the case of automatic coating, it is possible – with a corresponding batch size – to add a certain quantity of reclaimed powder, depending on the shade category. For details, please see the table at the end of this document. In this case, we recommend that you prepare limit samples prior to the start of production and use them throughout the entire production run 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 reclaimed powder. This means you use a stable mix of fresh and reclaimed powder right from the start, i.e., when coating 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.

Increased wear on the components will result in a greater tendency for powder to accumulate on and in the spray nozzle, which can cause spitting on the components.

Mounting of the parts

The mounting method for 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 have the guns switched on and off automatically 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 curing window 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