

IGP-DURA[®]xa/ Type L

Deep matt powder coating system for the architecture and industrial sector

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A DOLD GROUP Company

Introduction

IGP-DURA[®]xa is a deep matt decorative powder coating system. It is available in highly weather-resistant façade quality as the 4201 series (Qualicoat certification class 2) and in weather-proof industrial quality as the 4601 series. Both types come in single color or pearl mica effect.

IGP-DURA[®]xa effect powder coatings generally undergo an additional manufacturing process to ensure optimal processing stability: the IGP bonding process. Here, unusually fine effect pigments are bonded to the powder grain.

IGP coating powders with effect agents are agglomerate-free and ensure problem-free, reproducible processing.

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.

The shade

If the requirements regarding shade and effect uniformity are very high, and if the components are installed directly adjacent to each other, we recommend determining the required powder amount for the entire order, plus a certain reserve so that you can coat the entire application with a single batch. This guarantees absolute color and effect consistency of the entire coat.

Pre-treatment

Depending on the pre-treatment method, when you apply IGP-DURA[®]xa/ you must continually check the required process parameters and observe them without fail.

The coating system layout determines the throughput rate through the pre-treatment line. This rate must not be reduced, especially with regard to the rinsing process.

Only then can you be sure the deep matt surface character of the powder coating is not impaired by contaminants from the pre-treatment or by insufficient rinsing.

Processing (general information)

IGP-DURA[®]xa can be applied with all corona pistols with electrostatic charge in negative polarity at a high-voltage setting of 50 to 80 kV. IGP-DURA[®]xa is ideal for electrostatic application. However, depending on the shade and formula, this method may cause spray-back at coating thicknesses of >90 µm.

You can avoid this by restricting the pistol current to <10 µA or by using ion-leakage rings (low-ion charging). For efficient application of IGP-DURA[®]xa, we recommend flat spray nozzles.

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 spacing (harmonized gun turning points) when coating using the short stroke

method. The manual application that is necessary in semi-automatic operation should always be performed as a preliminary coat. When dealing with objects to be coated on both sides (e.g. profiles), the side that will be primarily visible should be coated last. We do not recommend applying IGP-DURA[®]xa with tribo coating pistols. Experience has shown that they achieve an insufficient tribo-electric charge for efficient application.

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 coating. This removal offsets the effect to shade ratio. This usually results in the shade becoming darker.

In manual coating, IGP-DURA[®]xa effect powder coating should only be processed in pure loss mode without recovery in order to avoid shade changes caused by effect losses. 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.

If you process IGP-DURA[®]xa/ without effect agent, we recommend continuously adding fresh powder.

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Earthing

Special attention must be paid to sufficient earthing when processing IGP-DURA[®]xa. This measure significantly contributes to a uniform appearance of the surface.

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.

Curing

Due to the deep matt surface and unique surface character of IGP-DURA[®]xa, even slight differences in the gloss level are clearly visible.

A correct curing process is important because it has a significant influence on the gloss level.

An even temperature distribution in the oven is the basic requirement for achieving an evenly deep matt surface on all the parts on the hangers. The temperature in the oven determines the gloss level. A reduction in the target object temperature increases the gloss level, exceeding the object temperature reduces the gloss level.

To ensure optimal cross-linking and the correct gloss level of IGP-DURA[®]xa, we recommend drawing up a temperature profile of the stoving oven before the start of production. To do this, use an oven measurement device and measure under production conditions. Determine the optimal time combination of object temperature and retention time depending on the thickness of the substrate to be coated.

If irregularities in temperature distribution in the stoving oven occur, correct them via the air flow or other measures in consultation with the oven manufacturer. In all events, ensure that the coated objects are cured on the basis of the time combination of object temperature and retention time, taking into account the recommended curing conditions.

We recommend the following temperature and time combinations for achievement of the deep gloss level required:

Object temperature	Retention time at object temperature	
	Minimum	Maximum
180 °C	20 min.	25 min.
190 °C	10 min.	15 min.
200 °C	6 min.	10 min.

If objects of a single order are cured in different stoving ovens, we recommend drawing up a temperature profile for each stoving oven using an oven measurement device and matching the curing temperatures of the various ovens.

Resistances and technical data

This information can be found in the the respective technical data sheets.

Cleaning

The coated parts must be cleaned according to the directives RAL-GZ 632 or SZFF 61.01.

The technical Information IGP-TI 106 must also be observed when dealing with effect powder coatings.

Other applicable documents

Safety data sheet SD 110

Technical data sheets IGP-DURA[®]xa/ 4201 and IGP-DURA[®]xa/ 4601.
TI 000 classification of effect powder coatings

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Recommendations for processing IGP-DURA[®]xa/ 4201 and 4601

The values stated here are recommended values. When processing IGP-DURA[®]xa/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 (including single-color powder coatings)						Possible effect (comment)
	Single-color	*****	****	***	**	*	
High-voltage setting kV (pistol)	50 – 80	50 – 80	60 – 80	60 – 80	60 – 80	60 – 80	setting range for processing IGP-DURA [®] xa/
Current limit µA (pistol)	80 µA → ≤ 10 µA →						→ For normal operation → Reduces spray-back effects
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 or without-baffle plate	suitable						reduced depth effect
Processing with ion-leakage ring (pistol)	with or without suitable	with or without suitable	processing with or without	processing with or without	processing with or without	suitable only without	reduces spray-back effects, improves flow properties at coating thicknesses of > 90 µm.
Spraying distance of coating (pistol to part)	≤ 200 mm	≤ 200 mm	≤ 250 mm	≤ 250 mm	≤ 300 mm	≤ 300 – 350 mm	even coating, reduces streak and cloud formation
Coating with tribo pistols (pistols)	not suitable						IGP recommendation: do not process IGP-DURA [®] xa/ with tribo.
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. Risk of cloud formation.
Screening with US screen (screening machine)	suitable for mesh size ≤ 140 µm						better fluidization, more even application

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Plants and/or processing parameters (devices / accessories)	Adjustment (parameters) according to classification (including single-color powder coatings)						Possible effect (comment)
	Single-color	*****	****	***	**	*	
Maximum share of recovered powder in circular operation without checking the shade	≤ 90%	≤ 90%	≤ 10%	≤ 0%	≤ 0%	≤ 0%	prevents shade deviations during coating
Maximum share of Premium Bond recovered powder in circular operation with pre-checking the shade	not applicable	not applicable	≤ 30%	≤ 25%	≤ 20%	≤ 10%	prevents shade deviations during coating
Document processing parameters (control unit program)	possible	possible	recommended	recommended	strongly recommended	strongly recommended	facilitates reproducibility of the coating results
Produce limiting sample first	input inspection sufficient	input inspection sufficient	recommended	strongly recommended	necessary	necessary	prevents the possibility of subsequent complaints due to high shade deviations
Coating on various coating plants	possible	possible	possible after comparison	possible after comparison	only possible under certain conditions	not recommended	different coating plants can create deviating effect characteristics
Manual pre-coating of the parts in semi-automatic operation	possible	possible	recommended	recommended	strongly recommended	strongly recommended	low tendency toward color deviations and streak or cloud formation
Manual follow-up coating of the parts in semi-automatic operation	possible	possible	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	possible	possible after feasibility check	possible after feasibility check	not recommended	if coating is uneven, strong tendency toward color deviations and cloud formation