COLIBER® POWDER COATINGS

TECHNICAL DATA SHEET

Type of coating	**PA - POLYESTER POWDER COATINGS**
Color	RAL 9007
Symbol	PA112/0/0630/06CFX
Surface	Smooth
Gloss	Semi-gloss

Characteristics

- Outdoor, industrial application
- Good weather resistance
- Good chalking resistance
- Very good covering power
- Decorative and metallic effect
- Very good mechanical resistance
- Improved good degassing properties

Applications

To cover porous, out gassing and galvanized elements, for example railings, traffic signs, machine casings, etc.

Powder properties

Particle size (Malvern)	Fine powder suitable for electrostatic spray (corona).	
Density (g/cm³) ISO 8130-2	1,625	
Theoretical coverage (m²/kg)	~9 by the film thickness 70 µm and 100 % use of powder coating.	
Storage stability	24 months from the date of production, in the orginal, unopened package, keep away from heat sources, in the temperature of 5 – 25°C, protect from moisture. No direct sun exposure. The product should be stay at ambient temperature (paint shop) 12h before use.	

Coating film

tested in lab conditions on: steel panel

Thickness ISO 2808	recommended 70-90µm - max. 120µm	
Gloss (60°) ISO 2813[1] VISUAL[2]	semi-gloss	
Cross cut ISO 2409	0	
Mandrel bending ISO 1519	<5 mm	
Erichsen cupping ISO 1520	>5 mm	
Impact resistance ISO 6272-1	front reverse	>50 kg/cm >50 kg/cm
Buchholz hardness ISO 2815[3]	n/d	
Pencil hardness ISO 15184[3]	3H	

(1) applies to smooth and no metallic coatings film
(2) applies to structural and metallic coatings film
(3) not applicable structural coatings film

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Surface pretreatment	- The overall quality of the coating film depends on the type and quality of the pretreatment. - Surfaces must be dry, degreased and free from rust and other contaminants. - In order to improve coating adhesion to the surface and improve resistance it is recommended: aluminium - chromating, chrome-free pretreatment or anodic pretreatment. steel and galvanized steel - individual choice of surface pretreatment (e.g. phosphating). - However, in order to achieve optimum results, you must follow the instructions and recommendations of the pretreatment material manufacturer.
Application	- Electrostatic gun - corona (recommended voltage - 60 kV). - Application parameters depend on the geometric shapes of the detail and the film thickness to be reached. - Responsibility for the correct application parameters lies on the coating applicators. - Despite careful production methods, slight deviation of color and effect between the different manufacturing batches may occur (typical for powder coatings). - Various application parameters may cause color/effect changes. - Proper grounding of application equipment and coated elements helps to keep repeatability of the obtained color/effect. - It is recommended to do the entire order on the same equipment, with the same application parameters and using powder coating from one production batch. - Not be mixed with other powder coatings. - Control the air speed during application of powder coatings. - Keep the appropriate distance: the gun - coated elements. - Keep a uniform thickness of coating.
Curing conditions	- Curing time recommendation in a convection oven: **200°C/10min.** **180°C/15min.** (object temperature) - Must be strictly observed parameters of stoving the coating film to ensure that the full mechanical and chemical properties. - Suitability of the product for stoving in gas ovens and radiant ovens should be verified - may be a significant difference in color - perform a comparative test with the standard color (please contact us for details).
Approvals	- The powder coatings are in compliance with 2011/65/EC and 2015/863/EC (so called ROHS). - Heavy metal and TGiC free.
Technical recommendations	- In the case of cleaning powder coated surfaces it is necessary strict compliance with the Technical recommendations 01: Cleaning of powder coated surfaces. - Detailed information of the usage of metallic powder coatings are in the Technical recommendation 04: The application of metallic powder coatings.
Comments	- To print, to glue, to label, to laminate with foil, over-coating or any other post-treatment, some preliminary testing is recommended. - Powder-coated details should be packaged after being completely cooled down to ambient temperature, into appropriate packaging materials previously tested by the user. - Packaged details should be stored under cover to avoid condensation, which may result in traces on the finished coating.
Safety Data Sheet	POLYESTER POWDER COATINGS PA/FX - TI
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EKO-COLOR

TECHNICAL RECOMMENDATION 04:
THE APPLICATION OF METALLIC POWDER COATINGS

1. Description

Metallic powder coatings are thermal curing products which allow for obtaining coats with interesting visual effects. This results from the fact of using metallic pigments which, owing to their characteristic plate structure, enable obtaining coruscating surfaces. A varied quantity of pigments in powder coating and their specificity make powder coatings with a metallic effect very sensitive and the final outcome depends on many factors. This Technical Sheet is to facilitate painters' work consisting in applying dry blend metallic coatings and to attract attention to crucial painting stages.

2. Metallic powder coatings division

Depending on a manufacturing method, metallic powder coatings may be divided into

Dry blend – most popular on the market and produced by Eko-Color Ltd.
In this type of coatings, base coating is blended with a metallic pigment, thus obtaining a heterogeneous, non-uniform blend. Particles responsible for the effect are not bonded permanently to the base coating (basic coating) what brings in difficulties during application, the presence of single small clusters on a coat and lower repeatability of the final appearance of the coat.
Bonded – these coatings are created through "melting" a metallic pigment into a base coating particle what prevents pigment separation. This coating is more homogeneous and stable during application what results in obtaining higher repeatability of the metallic effect. The cost of such a powder coating, as compared to dry blend powder coatings, is significantly higher.

3. Colour stability/tolerance

Eko-Color Ltd. produces powder coatings with the use of high quality metallic pigments and the production process itself undergoes constant monitoring and control at each stage. The specific structure of metallic pigments and their varied settlement on the surface of the detail coated hinder keeping a uniform shade of metallic powder coating and is conducive to the presence of minor deviations within the coated material batches.

4. Application

- Metallic powder coatings must be applied by the electrostatic spray method (corona). Recommended voltage 60 kV. Current values should not be high because a metallic pigment, under the influence of high current, is distributed unevenly and it resembles a mosaic.
- It is recommended not to exceed 30 uA, depending on voltage, the higher voltage – the lower current. However, final set values are determined by the paint shop personnel.
  As far as tribokinetic (tribo) application is concerned, a different appearance of a final coat is obtained than with the corona application. Tribo application must always be checked before using the powder coating in order to accept a colour and final visual outcome.
- Loading change (from corona to tribo and from tribo to corona) is forbidden because it leads to significant differences in colour/final effect.
- Using metallic powder coatings is connected with the fact that the various types of applications, devices, parameters and detail shapes affect obtaining different results/coat effects. This is caused by a difference in polarity and changeable efficiency in the spray gun cascade connected with the correct detail grounding not exceeding 800 kiloohm.
- It is observed that in the event of application with the use of different manufacturers' devices, various final outcomes are obtained.
- The more complex shape of the detail being coated is, the more visible differences are in the visual effect.
- Jets must be dedicated to the shape of the coated detail. Flat details – slotted jets, rounded details (rods, pipes) – round jets.
- An optimal coating effect is obtained by coating on an automatic line, while keeping a proper applicator distance from the coated detail. In manual coating, it is difficult to keep constant and uniform coat thickness what in the event of metallic powder coatings means lighter and darker stripes.
- The application of metallic powder coatings must ensure the uniform supply of powder to the applicator. It is recommended to use fluidised feeders which enable the uniform mixture of metallic pigment and powder coating, with the simultaneous fragmentation of possible agglomerates. It is not recommended to use vibrating feeders, which are popular in paint shops, because vibration may lead to the separation of pigment and base powder coating.
- Powder coating fluidisation in the container should take place in a moderate manner. It is not allowed to aerate the container excessively because this will cause the formation of visible volcanoes on the aerated coating. Incorrect fluidisation will lead to heavy metallic pigment dropping to the container bottom, and then the suction system will collect excessive metallic pigment and, consequently, it will lead to the concentration of pigment on the surface of the detail being coated.
- An important parameter is the parameter of cleaning the gun electrode. Correct pressure value: from 0.15 to 0.20 bar.
- The whole application installation and the elements being coated must be grounded properly what, basically, contributes to the preservation of correct metallic shade and it does not lead to the binding of paint fraction in the container. It is necessary to pay special attention to the grounding of injector pumps (if application is carried out by means of such pumps).
- It is necessary to apply a coat with the uniform thickness. This is particularly important in the event of dark colours where significant thickness differences lead to the formation of a heterogeneous surface with visible smudges and shadows. The detailed data characterising the product are described in the product technical sheet.
- It is not allowed to mix it with other powder coatings.
- It is important to preserve purity in the entire coating installation before filling with powder coating, or in the event of changing to a different type of powder coating, in order to eliminate possible coat defects, e.g. impurities.
- Regardless of the careful cleaning of the coating installation, during daily work, it is necessary to conduct maintenance works recommended by the installation manufacturer (e.g. cleaning lines supplying powder, jets, electrodes) and replace consumables.
- It is particularly important to pay attention to the technical condition of powder hoses due to the fact that metallic powder coatings contains sharp fractions which cause faster wear and tear of powder lines. As a result of friction, notches are formed inside the powder line which hold powder coating fractions, causing powder coating agglomeration in points. Moreover, a very important role is played by an electro-conductive core which, when damaged, will not allow for the free transfer of excessive ions to the grounding installation.

5. Recovery

- Metallic powder coatings, on account of their structure, are not recovered to the same degree as powder coatings without the metallic effect.
- Basically, metallic powder coatings should not be processed in order to eliminate changes in colour caused by the loss of a metallic effect.
- In the event of filter recovery, a metallic pigment may concentrate, and in the event of cyclone recovery, it may be reduced.
- As far as cyclone recovery is concerned, a darker colour shade is obtained. This is because the finest particles of powder coating and metallic pigment are not separated and they are treated as impurities which are eliminated on a continuous basis. Such a separation results in the change of the proportion of effect – basic colour.
- If recovery is necessary, it is required to take care of the proper dosing of a recovery powder in relation to a fresh powder. It is possible to dose approx. 15% of recovery powder coating, provided that optimal mixing with the fresh powder coating is ensured. However, in such a case, the responsibility for obtaining the acceptable and repeatable effect is borne by the paint shop.
- When working with a powder coating from recovery, it is necessary to conduct frequent checks aimed at verifying the appearance of the obtained coat.
- The use of the recovery powder coating alone or repeated powder recovery is forbidden.
- A good practice before starting the production process is preparing limit templates and using them during production in order to check the colour and the effect.

6. Curing conditions

- It is obligatory to follow curing parameters. **Curing time runs from obtaining the set temperature by the detail in the curing process.**
- A condition to obtain a uniform coat is even temperature distribution in an oven and maintaining polymerisation as part of a curing window. For this purpose, it is necessary to conduct the thermographic test of the oven.
- Insufficient curing time or curing in excessively low temperature results in the formation of coats with a lighter shade (more metallic), excessive gloss and insufficient mechanical properties.
- Excessive curing time or curing in excessive temperature may result in colour change, yellowing and the formation of more mat coats.
- Thick-walled details require more time to cure as compared to thin-walled details, what is reflected directly in obtaining a different final visual effect.
- If a detail is not cured to the required temperature, the coat does not obtain mechanical strength and chemical resistance. As a rule, a shade obtained is lighter (more metallic colour) than the required one and there is no effect of structure built-up (in the event of metallic structural powder coatings).

7. In a few words

- The application of metallic powder coatings requires constant control during the coating process, as well as the ongoing control of the obtained effect as compared to the template.
- It is necessary to ground properly all the elements affecting the coating process – details, cabin, conveyor, applicators.
- It is recommended to check the powder painting installation grounding once a year.
- It is necessary to remember about powder painting tag cleanliness (proper grounding to max. 800 kiloohm).
- When changing a powder coating, all the powder painting installation elements responsible for coating feeding and/or recovering must be cleaned carefully.
- The recovery of dry blend metallic powder coatings is not recommended.

8. Storage conditions

Store in accordance with data provided on the label and in the Technical Data Sheet for the product, in original unopened packaging, away from heat sources, in the temperature of 5 – 25°C, free from any moisture. The product should be kept in the ambient temperature (of the paint shop) for 12 hours before use.

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