COLIBER® POWDER COATINGS

TECHNICAL DATA SHEET

Type of coating	**PA - POLYESTER POWDER COATINGS**
Color	RAL 8029
Symbol	PA114/0/5278/40FX
Surface	Smooth
Gloss level	Matt

Characteristics	- Outdoor, industrial application - Good weather resistance - Good chalking resistance - Very good covering power - Decorative and metallic effect - Very good mechanical resistance
Applications	Agricultural machinery, furniture and garden tools, machine casings, mailboxes, etc.

Powder properties	**Particle size (Malvern)**	Fine powder suitable for electrostatic spray (corona).
	Density (g/cmł) ISO 8130-2	1,421
	Theoretical coverage (m¸/kg)	~10 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]	matt	
	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]	>80	
	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 - 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: **180°C/10min.** **170°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
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The above values may vary depending on the type of surface pretreament, color, gloss, texture, etc.
All informations included in this card are based on our experience and actual knowlegde and do not release the user from carrying out their own tests. If in doubt please contact us for details.
Having no influence on the use and application conditions, we can take responsibility only for the quality of any the product and ensure that it fits to our standards.
This Technical Data Sheet is revised periodically. EKO-COLOR reserves the right to change specifications without notice.
If necessary, our sales department will confirm the validity of this document.

EKO-COLOR

TECHNICAL RECOMMENDATION 04:
USE OF METALLIC (FX) AND PEARLESCENT (FP) POWDER COATINGS

1. Description

Metallic and pearlescent powder coatings are thermosetting products, which allow to obtain coatings with interesting visual effects thanks to the use of special pigments. The pigments used in powder coatings, due to their characteristic structure, make it possible to obtain surface finishes with sparkling, shimmering or pearlescent effects. Their variety and specific nature make powder coatings with the aforementioned effects much more demanding in terms of application compared to ordinary coatings, while the end result depends on a number of factors.
Eko-Color metallic powder coatings are marked as FX.
Eko-Color pearlescent powder coatings are marked as FP.
This product data sheet is intended to assist powder coaters with the challenges of applying metallic and pearlescent powder

2. Metallic and pearlescent powder coatings

Depending on the production method, metallic and pearlescent powder coatings can be divided into:

- dry blend coatings – the most common type of coatings on the market and in the offer of Eko-Color.
  In this type of coatings, the base powder is mixed with a metallic or pearlescent pigment, until the mixture is heterogeneous. The molecules responsible for the effect are not permanently bound to the base powder, which can make application more difficult, cause the appearance of individual, small clusters (agglomerates) on the coating and a less reproducible final appearance of the coating.
- bonded coatings – these coatings are created by 'fusing' a metallic or pearlescent pigment into the base powder, which prevents pigment separation. The coating is more homogeneous and stable during application, resulting in a more reproducible metallic or pearlescent effect. The cost of this type of coatings compared to dry blend products is significantly higher.

3. Colour stability/tolerance

Eko-Color uses high quality pigments for the production of its metallic and pearlescent powder coatings, ensuring continuous monitoring of the conditions during the production process.
The specific structure of the pigments and their different layering on the surface of the coated element make it extremely difficult to maintain the metallic and pearlescent effect of the coating in an even shade, and slight deviations within the coated batches are

4. Application

- Metallic and pearlescent powder coatings should be applied by electrostatic spraying (with a corona gun). The recommended voltage is 60 kV. The amperage values should not be high, as the pigment is distributed unevenly under high current, often resulting in a mosaic effect. It is recommended not to exceed the value of 30 uA. When it comes to the voltage, the higher the voltage, the lower the amperage. However, the final settings are decided by the paint shop staff.
- When applied with a tribo gun, the final appearance of the coating differs from that applied with a corona gun. The possibility of using a tribo gun must always be verified beforehand to validate the colour and final visual effect.
- Changing the gun (from corona to tribo and from tribo to corona) is prohibited as it leads to significant deviations in colour and finish effect.
- When applying powder coatings with special effects, it is important to bear in mind that different types of application, application parameters, equipment, as well as the shape and weight of the coated elements will result in different results
  and effects.
- It has been observed that when using equipment by different manufacturers for application, different final effects are achieved.
- The more complex the shape of the coated element, the greater the differences in the visual perception of the effect.
- It is recommended to work with nozzles dedicated to the specific shape of the coated objects. Flat objects: flat spray nozzles, round objects (bars, pipes): round spray nozzles.
- The optimum effect is achieved by applying the product on the automatic line while maintaining the appropriate distance of the gun from the coated element. With a manual application, it is difficult to maintain a consistent and even coating thickness, which in the case of coatings with special effect may create alternating stripes with lighter and darker shades.
- The feeding system of powder coatings with special effect must ensure an even supply of powder to the gun. It is recommended to use fluidisation feeders/tanks that allow even mixing of the metallic/pearlescent pigment and the base powder, while at the same time breaking up any clumps. Vibrating tables, which are quite commonly used in paint shops, are not recommended, as they can cause separation of the metallic/pearlescent pigment and the base powder.
- Fluidisation of the powder in the tank should be carried out in a gentle manner. Excessive aeration of the tank, resulting in visible bulges in the aerated mixture, should be avoided. Incorrect fluidisation process can lead to the separation of the pigment from the powder base, which may result in the concentration of the pigment on the surface of the coated element (which may ultimately result in a unique appearance of the final coating).
- An important parameter is related to the cleaning of the gun electrode tip. It is important to avoid the accumulation of metallic/pearlescent pigments or the coating itself on the electrode tip.
- The entire application system and the coated elements should be properly earthed, which will help to ensure the correct metallic and pearlescent effect shade and will prevent the binding of individual coating fractions in the tank. Particular attention should be paid to the correct earthing of injector pumps (if they are used for application).
- The coating applied should have a uniform thickness. This is particularly important in the case of dark colours, where significant variations in thickness lead to a non-uniform coating with visible streaks and shadows. Detailed product characteristics are provided in the Technical Data Sheet.
  The product should not be mixed with other powder coatings

- It is important to maintain cleanliness on the entire application system before filling with powder coating or when changing to a different type of powder coating in order to eliminate potential coating defects, such as contamination.
- In addition to thorough cleaning of the application system during daily operation, maintenance work recommended by the system manufacturer (e.g. cleaning of powder feed lines, nozzles, electrodes) and replacement of wear parts should be carried out at appropriate
- intervals.
  Particular attention should be paid to the condition of the powder hoses due to the fact that powder coatings with special effect contain sharp fractions, which can cause premature wear of these components. As a result of friction, small notches are created inside the hoses, which trap the coating fractions, causing agglomeration at points. The conductive core also plays a very important role, as, if damaged, it

5. Recovery

- Metallic and pearlescent powder coatings are not as suitable for recovery as ordinary powder coatings.
- In principle, metallic and pearlescent powder coatings should not be recycled, which will eliminate possible changes in colour due to loss of effect.
- In the case of filter recovery, an accumulation of the special effect pigment can occur, while in the case of cyclone recovery, the amount of the pigment in question can be reduced, as the finest base powder and special effect pigment particles are not returned and are instead treated as impurities and permanently removed. In both cases, this leads to a change in the special effect pigment-base powder ratio and thus a visual difference in the colour of the coating.
- If recovery is required, care must be taken to ensure that the recovered powder is dosed appropriately in relation to the fresh powder. Up to 15% of recovered powder coating can be used, as long as optimal mixing with fresh powder coating is ensured. However, in this case, the responsibility for achieving an acceptable and reproducible result lies with the paint shop.
- When working with recovered products, frequent inspections are necessary to check the appearance of the resulting coating.
- The use of the recovered products alone, as well as repeated recovery of the powder coating is prohibited.
- It is good practice before starting the work to prepare reference models and use them from time to time to verify colour and effect.

6. Curing conditions

- The recommended curing parameters must be strictly adhered to. The curing time is calculated from the moment the coated element is heated to the set temperature.
- In order to achieve uniform coating, uniform temperature distribution in the oven and maintenance of polymerisation within the curing window are required. For this purpose, a thermographic test of the oven should be carried out.
- An excessively short curing time or curing at an excessively low temperature can result in coatings with a lighter shade (more metallic, pearlescent), incorrect gloss and insufficient physical and chemical properties.
- An excessively long curing time or curing at an excessively high temperature in turn can result in colour changes, yellowing and creating a more matt finish.
- Thick-walled objects require a longer time to heat up compared to thin-walled objects, which directly results in a visually different end result.
- If the object is not heated to the required temperature, the coating will not achieve its optimal mechanical and chemical resistance, resulting in a generally lighter colour shade (more metallic, pearlescent) than required and no structural effect (in the case of metallic and pearlescent structured powder coatings).

7. In a few words

- The application of metallic and pearlescent powder coatings requires constant control during the application process, as well as the ongoing control of the obtained effect as compared to the template.
- It is necessary to properly ground all components that have an impact on the application process, including coated objects, booth, conveyor and guns.
- Once a year it is recommended to check the earthing of the installation to earth.
- It is necessary to check the cleanliness of the hooks (required for correct earthing to max. 800 kilo-ohm).
- When changing powder coatings, all parts of the application system responsible for feeding or recovering powder coatings should be thoroughly cleaned.
- Recovery of dry blend metallic and pearlescent powder coatings is not recommended.

8. Storage conditions

Store in accordance with the information on the label and Technical Data Sheet, in the original unopened packaging, away from sources of heat at 5 - 25°C, protect from moisture. The product should be kept at ambient (paint shop) temperature for 12 h before use.

The information presented here is based on our current state of knowledge and does not relieve the user of performing their own tests. The document is updated periodically. Eko-Color reserves the right to change technical data without notice. If necessary, the sales department will confirm the validity of the document.
When cleaning elements covered by certificates or approvals, the guidelines of the relevant associations must also be observed.
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