

SERIES 29 ARCHITECTURAL APPLICATION

A POWDER COATING FOR METAL FACADES AND STEEL CONSTRUCTION
BASED ON POLYESTER

Typical application

- pre-finished architectural building components (e.g. window extrusions, sheetmetal claddings, etc.)
- steel construction
- automotive accessories
- metal cladding

Product details

Standard Packaging in 20 kg cartons, 2,5 kg minipack

Specific Gravity (ISO 8130-2) 1.2 - 1.7 g/cm³ depending on pigmentation

Theoretical Coverage at 60 µm film thickness: 9.8 - 13.8 m²/kg depending on specific gravity (please see also Information Sheet no. 1072 - latest edition)

Storage Stability 6 months from date of delivery under dry conditions at no more than 25 °C, avoid direct and extended heat exposure.

(The shelf life of custom made blanket orders or other stock agreements which by their nature are stored over longer periods is determined by the original production date.)

Features

- GSB* | Qualicoat approved* | AAMA 2603-02*
- good weather resistance
- very good mechanical properties
- very smooth flow
- good storage stability
- highly reactive
- batch consistency of RAL colors acc. to VdL guidance no. 10

* Subject to change without prior notice. Please contact our sales team.

Finish | Colors

- smooth flow - glossy surface, approx. 80-95*
- smooth flow - semi gloss surface, approx. 70±5*
- smooth flow - matte surface, approx. 25±5*
- fine texture

Available from stock in all RAL Colors in a smooth glossy surface. Any other color can be custom made with a minimum order of 60 kg.

* Gloss level acc. to ISO 2813/60° angle (doesn't apply to metallic effect powder coatings). The measured gloss level of effect powder coatings can diverge from the details given in this product datasheet. The creation of tolerance samples is urgently recommended)



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Pretreatment (alternatives)

The following table reflects the common methods of pretreatment with regards to various substrates and applications. In selecting the proper type of pretreatment please observe the suitability of the type of powder coating for a desired application according to the typical applications on page one of this Product Data Sheet.

	ALU-MINUM			GALVANIZED STEEL				STEEL		
Degreasing	○	○	○	○	○	○	○	○	○	○
¹⁾ Chromating	○	○	○	○	○	○	○	○	○	○
²⁾ Pre-Anodizing	○	○	○	○	○	○	○	○	○	○
²⁾ Chrome free	○	○	○	○	○	○	○	○	○	○
Iron Phosphating								○		
Zinc Phosphating				○	○	○	○	○	○	○
Blasting								○	○	○
³⁾ Sweeping				○	○	○	○	○	○	○
Application	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ
	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ
	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ
	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ	Ⓜ

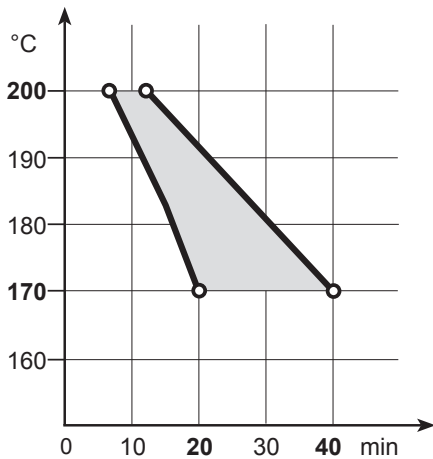
Application: Ⓜ interior, Ⓜ exterior, Ⓜ architectural, Ⓜ steel

1. acc. to DIN 50939
2. acc. to GSB quality and test regulations. The suitability of this type of pretreatment needs to be established through a boiling water test and subsequent cross-hatch adhesion and adhesive tape removal test.
3. only for zinc coated parts > 45 µm
4. for a two-coat process / TIGER Shield

Cure parameters

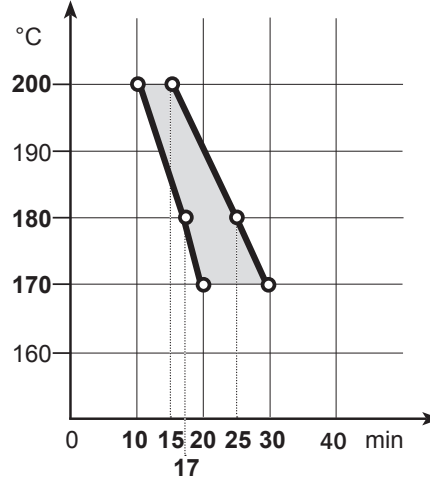
(substrate temperature)

TIGER Drylac® Series 29 cure window GSB smooth flow - glossy I semi gloss



Substrate temperature versus curing time

TIGER Drylac® Series 29 cure window GSB smooth flow - matte I fine texture



Substrate temperature versus curing time

Please observe cure parameters closely since mechanical properties will develop before full cross-linking! Metal temperatures shall not exceed 200° C. Please verify the suitability of direct gas-fired and IR oven equipment under actual production conditions for the intended application.

Processing

Corona, Tribostatic*

* Suitability of metallic effects for tribo processing must be verified prior to application. Please consult with the relevant Information Sheets, latest edition.

Please note

A top-coat with a clear exterior grade powder coating over an interior grade powder coating does not produce a weather resistant coating. Please mind the effect differences of fine texture and fine texture metallic effects between a production under lab conditions versus an actual production. Top and re-coating ("rework") in general may impair the adhesion to the substrate and between the different film layers (pay especially attention to structural glazing components) and the effect of effect finishes.

To help users exploit the benefits of the new generation of metallics to the full, we have divided our metallic effect powder coatings into the application categories A, B, C and D. For more detailed information on this subject, please refer to the Application Guidelines for Powder Coatings with Metallic-Effects, ofi data sheet no. 44.

Thanks to their different chemistry do not mix different product lines (Series) with each other. Clean the line thoroughly when changing from one product line or manufacturer to another.



Certificates

Quality labels for the piecework coating of building components to extend and as indicated on the carton:

- glossy:** GSB material license 107m
Qualicoat P-0909 (Cat. 3 Class 1)
- semi gloss:** GSB material license 107q
Qualicoat P-0266 (Cat. 2 Class 1)
for architectural applications please also see TIGER Drylac® Series 14
AAMA 2603-02
- matte:** GSB material license 107i
Qualicoat P-0267 (Cat. 1 Class 1)
AAMA 2603-02
- fine texture:** GSB material license 174b
Qualicoat P-0630 (Cat. 1 Class 1)

Test results

Checked under laboratory conditions on a chromated aluminum test panel which is 0.7 mm thick. Actual product performance may vary due to product specific properties such as gloss, color, effect and finish as well as application related and environmental influences.

test results	test method	Series 29 smooth glossy GSB license no. 107m	Series 29 smooth semi gloss GSB license no. 107q	Series 29 smooth matte GSB license no. 107i	Series 29 fine texture GSB license no. 174b
film thickness	ISO 2360	60-80 µm	60-80 µm	60-80 µm	70-90 µm
gloss - 60°	ISO 2813	80-95	70+5	25+5	8+5
cross cut test 1 mm	ISO 2409	0	0	0	0
impression hardness	ISO 2815	> 87	> 87	> 87	n.a.
mandrel bending test	ISO 1519	< 3 mm	< 4 mm	< 5 mm	< 5 mm
cupping test	ISO 1520	> 5 mm	> 5 mm	> 5 mm	> 5 mm
impact test 20 inch/pound	ASTM D 2794	no appearance of cracks down to the substrate	no appearance of cracks down to the substrate	no appearance of cracks down to the substrate	no appearance of cracks down to the substrate
mortar resistance	ASTM D 3260	ok	ok	ok	ok
drill mill test		ok	ok	ok	ok
Kesternich-test 30 cycles	ISO 3231	0,2 SO2 - ok	0,2 SO2 - ok	0,2 SO2 - ok	0,2 SO2 - ok
grey scale for assessing change in color	EN 20105 - A02	> 4	> 4	> 4	> 4
determination of resistance to humidity 1000 h	ISO 6270-1	max. blistering < 1 mm	max. blistering < 1 mm	max. blistering < 1 mm	max. blistering < 1 mm
salt spray test 1000 h	ISO 9227	max. undercutting < 1 mm	max. undercutting < 1 mm	max. undercutting < 1 mm	max. undercutting < 1 mm



Guidelines for application - solid colors & metallic effects

General notes

To achieve a minimum thickness of 80 µm on edges and corners, a two-coat application is required for buildings at coastal and offshore areas with an extensive exposure to salt and industrial areas with high humidity and an aggressive atmosphere. The first coat in this case is cured at 200°C for 4 minutes or at 170°C for 10 minutes, the second coat at 200°C for 12 minutes or 180°C for 22 minutes. The appearance of filiform corrosion excludes any guarantee.

Film thickness

To achieve adequate opacity and smoothness, a film thickness of at least 60 µm to 80 µm, and not more than 110 µm is required. Bright colors and fine texture as well as sparkling metallic effects based on bigger effect particle pigments may require a higher film thickness.

Color deviation

Powder coatings are formulated and manufactured to meet color standards: e.g. the RAL standard. Despite careful working methods, the color or effect difference of various batches cannot be avoided. The achievable coating result, which is to be checked in a pre-trial in comparison with the reference sample of the powder coating manufacturer, is also dependent on the application equipment. Before processing, therefore, a suitability trial is to be carried out on the spraying equipment. The color and effect differences caused by the system - especially in respect of the share of reclaim powder - are to be defined through the establishment of tolerance samples.

To keep system-dependent color and effect differences to a minimum, the entire coating of a specific commission (also and especially when the coating comprises part commissions) is to be carried out on the same system, if possible without any interruption with constant system parameters (e.g. high-voltage, conveying air, dosage, distance from the gun to the work piece, etc.) and if possible with one batch and a constant reclaim share. Due to irregular powder application, color and effect deviations are to be reckoned with any manual spraying. A uniform film thickness is to be ensured: greater differences cause a degree of color, effect and gloss difference. The evaluation of color and effect tolerances, according to existing norms for automobile coating, is not suitable for powder coatings.

Durability - one coat versus two coat

Products marked as two-coat metallic effect are to be top-coated with clear for architectural applications. Durability is fundamentally defined by the method, either a

one or two-coat process. The durability of metallic powder coatings depends on the product and is to be clarified with the manufacturer, whereby special requirements, such as abrasion and scratch-resistance, cleaning method, color stability and chemical durability is to be indicated. Effective consultation with the manufacturer requires exact knowledge of all pollutions and substances to which the powder coating is subjected in use and assembly, this includes joint sealants and other auxiliary products such as glazing aids, gliding waxes, drilling and cutting lubricants, etc., which come into contact with coated surfaces and which must be pH-neutral and free of paint-damaging substances. They must be first subjected to a suitability check by the coater. As required, a transparent top-coat could therefore be necessary to prevent influences to the paint surface (metallic particles) that could lead to a discrepancy in color or effect. The valid curing conditions are to be observed for the implementation of two-coat systems.

Two-coat systems: first coat: apply only half of the curing time acc. to the corresponding Product Data Sheet (provided that no other information is given therein). Second coat: requires then full cure acc. to the relevant Product Data Sheet. Please note, the exact cure conditions (curing time and cure temperature) need to be established individually based on the application and the coating line. Check continuously for intercoat-adhesion!

Post bending

When post bending of work pieces takes place, the suitability of the coating must be checked on original pieces before undertaking series production because the alloying, pre-treatment, bending radius, bending (environmental) conditions, temperature, wall thickness, film thickness, curing conditions, color, storage time and other factors influence flexural behavior. Microscopic cracks in the surface of the powder coating can lead to corrosive damage.

Adhesion of sealants, adhesives and foam

Before the application of a sealant or adhesive, and before foaming, the surface is to be appropriately cleaned, for example with IPA alcohol. Pre-trials are absolutely necessary. Processing guidelines and product recommendations are to be acquired from the relative suppliers. Even the short-term use of organic solutions, such as nitrocellulose thinner or acetone, as well as alkaline abrasives or other paint-damaging cleansing agents, results in irreversible damage to the coated surface that is not visible to the naked eye!

Packing and storing coated components

Assurance must be given that sufficient and suitable non-plasticizing packing materials, as well as foils and labels, auxiliary agents and transport means, the suitability of which is to be checked in pre-trials, is used properly and can be easily removed at the given time (e.g. labels, adhesive tapes, etc.). In unfavorable storage conditions, especially outside, the interaction of water accumulation (e.g. beneath



packaging foils) and heat may lead to milky-white stains. This possible and occasional physical process is often reversible through thermal influence (e.g. re-tempering in the oven, industrial blower), respectively, can be reduced or hindered through the use of perforated foils.

Storage: if stored at site on the ground, place package in a tilted position lengthwise on blocks of wood and protect against the influences of sunlight, rain and contamination. Allow for adequate ventilation to avoid condensation water; for proper ventilation of foil wrapped packages remove foil at each end. Open packages are to be protected against the weather.

Cleaning

The prerequisite for the proper care of a coated building is regular cleaning at consecutive intervals at least once yearly, and more often with excessive environmental pollution, according to the guidelines of the Gütegemeinschaft für die Reinigung von Metallfassaden e.V., GRM, (Quality Association for the Cleaning of Metal Facades) performed by a member of GRM using only GRM accepted and approved cleaning agents and cleaning aids suited for powder coated surfaces acc. to RAL-GZ 632-1996 - prior to the initial cleaning and prior to a change of the cleaning agents and cleanings aids throughout the regular cleaning cycles suitability of the cleaning agents and cleaning aids has to be established and checked on a southward oriented area, a minimum of 2 m² in size with low visibility.

The cleaning of metallic effect coatings must be executed regularly and immediately after becoming soiled. Dried, old soiling is abrasive, which means it can only be removed by damaging (scratching) the surface. Please observe our Technical Information Sheet No. 1090 (latest edition).

For façade components coated with fine-texture-effect powder coatings, there are further especially targeted recommendations, additional to those given above, for rough surfaces, which due to their nature make cleaning difficult: use only clean water, or as required with a slight addition of a neutral or weak alkaline washing liquid. Do not use a scratching or abrasive agent. Use only nonfibering cloths for cleaning. Excessive rubbing is to be avoided. Do not use steam-jet devices. Rinse with clean cold water immediately after every cleaning process. Even the short-term use of organic solutions, such as nitrocellulose thinner or acetone, alkaline and acidic as well as abrasives or other paint-damaging cleansing agents, results in irreversible damage to the coated surface that is not visible to the naked eye!

Chemical resistance

The required chemical resistance of a powder coating is, among other things, product-dependent and according to the situation and awareness of all pollutions must therefore be brought to agreement between the contract partners as soon as possible, at best during the projecting phase. Agreement is especially necessary in respect of the requirements profile and the monitoring method, which can take place according to EN ISO 2812-1 "Paint and Paint Materials. Definition of Durability Against Fluids." Moreover, the duration of monitoring and effectiveness and concentration of the

pollution mediums is to be established.

General notes - metallic effects

Pieces that are difficult to coat should be given an undercoat. A subsequent top coat can lead to clouding. On pieces to be coated on both sides, the main visible side should be coated last. The positioning of façade sheet metal and profiles is to be determined before coating - vertical or horizontal - and must not be changed during coating and subsequent installation! Differing heat-up curves are to be avoided: thin and thick-walled pieces should be brought to the coating process separately. To avoid color, gloss and effect differences, colors from differing batches should not be used or combined with those from different manufacturers for the same object. It is recommended that during the entire coating of a production series to constantly maintain the application parameters and to carry out an initial and an ongoing test during the process, which includes at least the color, gloss, effect and curing conditions. In large projects completed by several coaters, due to differing processing and system parameters, and even with the same manufacturer and batch product types, color and effect differences are possible. Appropriate tolerance samples are therefore to be mutually agreed upon before coating commences. Differing material stress between the substrate and coating can lead to stress cracks in the powder coating in non-pigmented coatings (e.g. transparent).

Coating systems - metallic effects

Differing gun types, processing and system parameters are often responsible for a varied result. It is therefore to be ensured that only gun nozzles are used that are recommended for metallic powder coating. According to the type of object to be coated, a flat-spray nozzle, respectively, flat-spray impact disk is to be used in an even cloud of powder pattern. The grounding and charging of the powder cloud is to be regularly monitored. A part of regular process controls includes the monitoring of the intermediate cleaning of powder hoses and the removal of powder-gun deposits, and booths. The metallic coatings should take place exclusively from fluidized containers.

Because metallic coatings react more sensitively to differing reclaim shares, the coating should take place from the start with reclaim powder to an extent of not more than around 30% (initial coating without pieces).

To avoid the "formation of stripes", powder guns should never be positioned too close to the pieces during the en-tire application period. These "stripe formations", which occur in automatic systems, among others, through the reciprocator movement in a sinus curve, are generally not immediately recognizable and often appear only under appropriate lighting conditions, respectively, when viewed from various angles.



Reclaim - metallic effects

To achieve uniform color and effect, the dosing of fresh powder is to be defined by the coater and maintained throughout the entire process, but should not be less than 70%. At the same time the reclaim powder should only be continuously reintroduced and sieved into the powder circulation. The multiple or exclusive use of reclaim powder is not permitted. Because not all metallic powder coatings are uniformly stable in reclaiming, the fresh-powder percentage is to be defined via the color/effect tolerance samples. The initial monitoring of color stability is nevertheless absolutely necessary. It is recommended to spray fine texture metallic effects without the use of reclaim powder!

Charging - metallic effects

Manually or automatically; electrostatic (metallic powder coatings), respectively, tribostatic (solid colors). Fundamentally only a few metallic powder coatings can be sprayed tribostatically. Appropriate suitability must be checked prior to application. Due to the differing charging capacities of powder coatings and metallic particles, not all metallic particles are transported to the object to be coated, which can also result in a discrepancy of the color/effect. A change from electrostatic to tribostatic charging is not permitted. Special system cleanliness is to be observed for the use of metallic powder coatings to avoid sintering, thus causing a short circuit in the gun sphere.

Grounding - metallic effects

When using metallic powder coatings, the powder-spray system and the object to be coated must sufficiently be grounded. This measure contributes significantly to the consistency of the color and effect.



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EN ISO 9001 / 14001



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