

Gloss of aluminium pigmented coatings

Scope

This guideline describes the characteristics of an aluminium pigmented topcoat and outlines the basic principles for applying such a product to achieve the optimal metallic finish. The guideline does not describe the mechanism of aluminium in corrosion protection.

The guideline provides general recommendations only, hence the information should be supplemented with more details regarding the actual product as outlined in the Product Data Sheet and/or in the Hempel specification.

Safety

Use adequate personal safety equipment and follow sound procedures. Apply only in well ventilated areas. Observe safety labels on packaging and paint containers and consult Hempel's Safety Data Sheets for the products to be applied.

Introduction

Typically, leafing pigments are used in topcoats to create a metallic look and non-leafing pigments are used in primers to enhance corrosion protection.

In order to produce a shiny aluminium finish, it is necessary to use the so-called leafing aluminium pigments.

Whereas non-leafing aluminium pigments are homogeneously distributed in the coating film, leafing aluminium pigments consist of fine aluminium flakes, surface treated in such a way, that they flow to the substrate's surface during application of the paint and align themselves. This will create the shiny aluminium finish.

Both leafing and non-leafing products tend to vary in colour and finish depending on application method, film thickness, thinning, etc.

When appearance is of secondary importance, ordinary airless spray application can be used. Some degree of variation in finish should be anticipated in this case. This will normally be acceptable for primers and intermediates where the aluminium pigment is added to enhance corrosion protection and not to serve a cosmetic purpose.

The most common aluminium pigmented shades in Hempel's assortment are listed in the table below

Hempel shade	RAL code	Pigment type
19000	9006	Leafing
19001	-	Non-leafing
19002	-	Non-leafing
19360	9022	Non-leafing
19530	-	Leafing
19690	-	Leafing
19870	9007	Leafing
19871	-	Non-leafing

Topcoats

Finish

The appearance of the aluminium pigmented topcoatings depends on how the pigments are distributed and aligned in the dry film. This is particularly pronounced with the leafing pigments where two phenomenons may be observed in the finish:

- **Staining:** The pigments are concentrated at the coating surface and in case of physical contact, some of the pigment may rub off, resulting in stains.
- **Banding (or non-uniform finish):** When the leafing aluminium is used in thixotropic (or high build) paints, the leafing effect will be hindered by the thixotropy of the coating and different finish will be obtained depending on application method, film thickness, etc. This will often result in a non-uniform appearance as the overlapping areas may get a slightly different shade as compared to the rest of the surface. Such colour differences can be pronounced, in particular when larger surfaces are coated.

To avoid staining or banding, the products must be specified and applied with special attention. The following is an instruction on how to achieve the best metallic finish.

Specification

To obtain a uniform finish with thixotropic, aluminium pigmented coatings, it is recommended to use heavy thinning and thin coats applied by an experienced painter (car painting technique).

Technical guideline

The thixotropy of the paint is eliminated by thinning, but thinning will significantly limit the thickness that can be applied without sagging. Therefore, the relevant topcoat should be specified in a much lower thickness than normally used. A typical range is 20-30 microns.

The lower topcoat thickness should be compensated by a higher thickness of the primer/intermediate system and/or by the application of a final clear coat.

Gloss

Due to the heavy thinning and application in lower thickness, the gloss of the finally applied product will be lower than normal for the non-aluminium shades of the product. If a higher gloss is needed, this can be achieved by the application of an additional clear coat.

Application of a clear coat will increase thickness, raise the gloss and prevent staining in case of physical contact with the coating. The clear coat must be compatible with the topcoat and also have good adhesion to the topcoat. The clear coat should be selected so as not to reduce the expected gloss retention of the topcoat.

Application

Hempel's aluminium pigmented topcoatings should be applied by air mix or air spray equipment. Only for special cases, airless spray should be used, see table below. Brush and roller application is generally not recommended, except for smaller repairs in areas where a slightly deviating finish is acceptable.

Heavy thinning is required. Add 25-50% of the thinner recommended for the actual topcoat to the *mixed* paint - not to the individual components. The amount of thinner should be adjusted in order to obtain a closed film for the thickness where hiding is only just obtained. Viscosity should be adjusted by thinning to approx. 25-40 seconds at 20°C [68°F].

Air mix, air spray or HVLP

Flow cup/ISO 2431 - DIN 4, FORD 4, AFNOR 4

Fluid tip: 1.2-1.4 mm

Air pressure: 0.7 bar at nozzle, 2 bar at handle

Spray data is indicative and subject to adjustment.

Airless (secondary alternative only)

Nozzle orifice: 0.013"-0.015"

Nozzle pressure: 75-100 bar (1100-1450 psi)

Adjust pressure to a level where tails are only just avoided.

The topcoat should be applied in the lowest possible thickness so that opacity and film formation is only just achieved. More passes may be necessary. Be careful to avoid sagging.

If application takes place outdoor, it is necessary to apply the coatings on a non-windy day or under cover due to the low pressure and sensitivity of the application.

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