syntha pulvin
a brand of The Sherwin-Williams Company

Technical Data Sheet: QM
Date: Nov-20

Qualicoat Approved Architectural Range

Certificate Nos: P-0656, P-0676, P-1084, P-1097
Product tested and approved for the quality mark

Introduction

Valspar Powder Coatings' Class 1 'Qualicoat' approved range of Architectural Polyesters are recommended for use on aluminium exterior situations where the 'Qualicoat' specification applies. Metallic effects are also available which may require changes to the normal non-metallic settings of the application line. This is discussed in pages 3 & 4 of this document. Valspar Powder Coatings' attention to formulation and particle size control ensures optimum transfer efficiency, enabling applied costs to be better controlled.

Colour

Wide range of RAL colours available and specials manufactured to order

Gloss

Three levels available (all measured at an incident angle of 60°)

Category 1:	< 30 +/-5 units
Category 2:	31 – 70 +/- 7 units including "BR" Metallics
Category 3:	71 – 100 +/- 10 units

(Permissible variation from the nominal value)

Film Properties

Meets the following criteria:

Adhesion	ISO2409:1992 (2mm)	Gt 0
Indentation	ISO2815:1973	Min 80
Mandrel bend	ISO1519:1995 (5mm)	No cracking or detachment
Impact	ASTM D2794: 1969 (2.5Nm)	No cracking or detachment
Kesternich	ISO3231:1993 (0.21.S02-24 cycles)	Max 1mm corrosion creep from scribes
Acetic Acid Salt Spray	ISO9227:1990 (1000hrs)	Max 16mm2 over 10cm length of scribe
Machu	Qualicoat method B1 (j)	Max corrosion creep 0.5mm
Accelerated Weathering	ISO1 1341-1994 Luminous intensity 550 W/m2 (290-800Nm)	Loss of gloss max 50% of original value. Colour change as defined in Qualicoat table 2
Weathering	Florida 5° south facing 1 year (ISO2810:1974)	Residual gloss 50% of original (min)
Resistance to Mortar	ASTM B3260 (24hrs)	No residue after removal
Resistance to boiling water	2 hrs deionised water or 1 hr pressure cooker	No defects or detachment
Condensed water	DIN50017:1982 (1000 hrs) Max 1mm under film creep	No blistering
Solvent (xylene)	30 secs	Rating 3-4
Sawing, Milling, Drilling		No cracking or chipping
Cupping Test	ISO1 520: 1995 5 mm min	(typically 7-9 min)

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Substrate used for these tests was aluminium alloy AA5005-H24 with a thickness of 0.8mm pre-treated according to DIN 50939: 1988

Specific Gravity

1.4 – 1.8 depending on colour, gloss etc

Coverage

9 – 12 sq. m/kg @ 50 microns (100% utilisation assumed) depending on colour and gloss

Film Thickness

Minimum 60 microns

Minimum Curing Conditions (Minutes at object temperature)

	Full Gloss Cat 3 & Semi Gloss Cat 2	Matt Cat 1
210°C	5 mins	8 mins
200°C	6 mins	10 mins
190°C	8 mins	13 mins
180°C	10 mins	Not recommended
170°C	13 mins	Not recommended

Maximum Cure Conditions

	Full Gloss Cat 3 & Semi Gloss Cat 2	Matt Cat 1
210°C	5-15 mins	8-15 mins
200°C	6-16 mins	10-20 mins
190°C	8-18 mins	13-23 mins
180°C	10-20 mins	Not recommended
170°C	13-23 mins	Not recommended

Storage

Store in dry, cool conditions, preferably below 30°C. Shelf life under these conditions will be approx 24 months.

Pre- treatment

Conversion coating is essential in all cases. A chromate or chromate-free pretreatment approved by Qualicoat or GSB should be used prior to powder coating.

Application Guidelines

Valspar Powder Coatings 'Qualicoat' approved powder coatings are suitable for use with all known electrostatic powder spraying equipment designed for thermosetting powder application.

Individual Product Information

Reference Number	QD906345SM
Description	RAL 7048 PEARL MOUSE GREY POLYESTER SM
Gloss Level (60°)	Visual Only
Specific Gravity	1.43 +/-0.10
Stoving Schedule	10 MINS @ 200C Metal Temperature
Film Thickness	60-80 microns

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Technical Data Sheet: QM Date: Sep-12

SDS No:	

Application Guidelines for Metallic Powder Coatings

Introduction

Demand for metallic coating powders has increased significantly to the point where many users consider them to be the same as conventional coating powders. The user requires them to be readily available in their preferred colour or effect and they are expected to apply in exactly the same way as any other non-metallic coating powders. With the current range of available colours and effects increasing, a wide variety of products have evolved all with differing types and levels of special effect pigments and as a result all can have different application properties. The result is that many metallic coating powders can be difficult to apply, showing poor quality of finish and inconsistent appearance if application conditions are not monitored and controlled.

To help get the result we can offer the advice below on how to select and apply our metallic coating powders.

Which product do I use?

Valspar Powder Coatings has three types of metallics available, Blended, Bonded and Hammer Finish. This document deals only with Blended and Bonded coating powders. The Hammer Finish is manufactured using different technology to the other two types of products and does not have the same application issues.

Blended metallics are simply dry-blends of a powder base with a special effect pigment. They are not recommended for reclaim systems and are best sprayed to waste! The special effect pigment can be easily separated from the powder during application and recovery. This can result in reduced metallic effect second time round the system. Blended coating powders are recommended only when a small quantity is required and if application equipment can apply metallic powder without difficulty.

Valspar Powder Coatings Bonded metallics are put through a further specialised process that physically “bonds” the special effect pigment to the surface of the powder particle. This reduces separation of the special effect pigment from the powder allowing powder to be reclaimed more successfully, although this must be controlled and we would not recommend exceeding 25% reclaim in virgin powder. Bonding also reduces the amount of “free” special effect pigment in the powder that can cause loss of electrostatic charge and spitting of metallic pigment.

The final use of the coated article should also be taken into account when selecting a metallic powder. Not all metallic effects are suitable for exterior use and some may require a clear lacquer topcoat to protect the metallic pigment from the weathering effects of the environment. Some metallic coatings may also finger mark more than others.

We recommend that once you have selected the product, that you carry out application trials on your own equipment and substrates prior to full scale production. It is not recommended that the colour is accepted on our submitted panels as these are for guidance only. Some metallic coating powders can give rise to colour differences on varying substrates due to the base powder not being fully opaque and therefore may not always hide blemishes on the substrate such as weld lines etc. Other electrostatic powder application equipment may also give differing effects when compared to laboratory applied panels.

Application Plant

Automatic application equipment will give greater consistency of finish than manual hand operated guns. It is advised that all plant parameters are fully recorded for future repeatability. It is important to note all settings for KV, uA, air pressures, gun distance to object, conveyor speeds etc. It is recommended that manual touch in should be carried out prior to automatic application

A fluidised hopper will supply powder more consistently than a box feeder type system. The vibration of a box feeder may cause separation so that the heavier metallic particles may sink to the bottom of the box resulting in inconsistent effect.

Gun nozzles should be monitored and cleaned at regular intervals to prevent build up of metallic pigment. These may require cleaning every 15

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minutes for some products! Slotted nozzles may reduce the possibility of striping effects on large flat surfaces but they should be monitored carefully for pigment build up inside the nozzle that will intermittently spit out and spoil the surface of the coated work piece.

Some experimentation may be required to find the ideal gun parameters. Our recommended starting points would be 50-70KV, with a medium of 50-60uA, and a gun to part distance of 200-250mm. If automatic current limiters are being used it may be necessary to increase gun to part distance to allow higher current for improved charging. Some metallics may give a dry texture effect if the emitted gun voltage is less than 60KV. If this texture occurs anywhere on the coated object, increase the KV to maximum setting and if possible check the gun for charging faults.

Powder feed rates should be kept to a minimum to give maximum opportunity for the powder to pick up the charge. Reduced atomizing air will also help prevent separation of the metallic pigment particles. It may also be necessary to reduce conveyor speeds to obtain sufficient film thickness of coating at lower powder outputs.

Always try to coat the main face of the component last to prevent any visible differences that may occur due to wrap on edges.

If manual spraying is the only available option then it is recommended that the gun to part distance is kept constant at all times. Varying the gun to part distance will result in variation in the metallic effect. Powder with a higher metallic pigment content may cause a dry spray texture effect when applied with a manual gun. This is caused by pigment separation in the gun and feed hose when the gun trigger is released or by low KV. When the gun is triggered an initial flow of air will blow the separated pigment out of the gun causing a concentrated spray of metallic pigment on an area of the component giving rise to a texture effect. To overcome this problem try to coat the entire article without releasing the gun trigger or when the gun is initially triggered point the gun away from the article until the powder comes out in a steady flow. The powder feed air should also be reduced which helps prevent the initial air surge from blowing any separated pigment out of the feed hose before the main powder pickup has begun. Also set KV and uA to maximum possible setting.

Colour and Effect

Film thickness needs to be controlled to maintain a consistent colour and effect. Thicker films will tend to have more metallic effect. This is because the metallic particles in the powder will migrate to the surface of the coating during stoving. Therefore the more powder applied, the more metallic pigment there is to come to the surface.

Care should also be taken when comparing finished articles or on final assembly of components. Metallic pigments can have different orientation levels during the powder curing stage. This may cause certain types of products, like coarse sparkles, to look lighter or darker when rotated through various angles! Therefore it is important to ensure that items are placed on jigs in the same orientation prior to coating and especially important if some components require subsequent remedial overcoating.

The level of metallic effect will be affected by gun to part distance gun voltage and current. Generally the further the gun is away from the part, the less metallic will attract to it. Too low KV and uA settings can also result in poor charge retention for the powder and may require these settings to be set to maximum.Too low KV and uA can also give rise to a very high concentration of effect pigment being deposited on the workpiece resulting in much higher than expected metallic effect.

Whenever possible the job should be completed with the same batch of powder. Metallic powder coatings may show a slight variation between batches of the same product.

Troubleshooting

If changing the gun settings does not help overcome an application problem then it may help to discuss the problem with the gun manufacturer. Sometimes changing the powder feed hose to a different material or internal diameter may help prevent separation. Some gun manufacturers have specific attachments for metallic powder coatings which help prevent charge backtracking.

Generally the initial problem occurs when changing from a non-metallic to a metallic because powder flow rates need to be reduced and gun voltages and uA need to be increased. Patience is the key to successful application.

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Health & Safety

We recommend all users of powder coatings to refer to the Code of Safe Practice: Application of Powder Coatings by Electrostatic Spraying (published by the British Coatings Federation of Great Britain Ltd) and our appropriate Health & Safety Data Sheet.

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