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INTRODUCTION TO THE SYNTHATEC SYSTEM

Valspar Corporation

Valspar Corporation, with worldwide sales exceeding \$3 billion, is a major producer of powder coatings, supplying on a global basis from facilities in the UK, USA and China.

In the United Kingdom, Valspar Powder Coatings Ltd is the powder coating trading company, manufacturing an extensive range of powders for the architectural, automotive, appliance, and industrial markets.

Synthatec

Synthatec, a UK registered trademark of Valspar Corporation, is manufactured at the Birmingham factory and supplied throughout the UK and Ireland.

Since its inception in the 1970's Synthatec has been the market leading architectural powder coating and now, with a 35 plus year track record, it has added beauty, elegance and durability to thousands of buildings, large and small.

Technical Excellence

The Valspar philosophy is to extend the leading position of Synthatec, by technical development and the commitment of the Synthatec team to meeting the demands of the construction industry's professionals.

Some notable landmarks, introduced to the market by Synthatec, include superdurable technology and the bonding of metallic colours. A wide stock range of products and a 'bespoke' colour matching service complement these.



Quality & Resources

Valspar is a quality-committed company. The Aston Church Road factory is designed for flexibility and speed, whilst maintaining the high quality standards required by products destined for industries such as automotive, water supply, and domestic appliances in addition to architectural.

The Environment

Caring for the environment is now the responsibility of every manufacturer and individual. Powder coatings, unlike liquid paints, contain no VOC (volatile organic compounds) and therefore present no solvent pollution risk or solvent recovery/disposal costs.

Customer Service

Customer service is a key part of Valspar philosophy and it drives the Synthatec business. Producing what the customer needs, where and when he needs it, is the focus for technical, product range and service development.

Initiatives, such as the Synthatec sample supply service and major project specification policing, are designed to provide unequalled support and service to those individuals and organisations who use Synthatec branded products.

WHY USE THE SYNTHATEC SYSTEM

The specifier today has a large range of finishes to choose from and the suppliers of each will claim that his product is superior. It is true that different products have different benefits but some have more than others. The comparisons on the following pages have been designed to assist specifiers in their pursuit of the most effective specification.

The main choices are:

- The Synthatec System
 - Synthatec Matt
 - Synthatec Metallics
 - Synthatec Premium
 - Synthatec Gloss or Satin
- Other Polyester Powder Coatings
- Anodising
- PVDF Liquid Coating
- Mill Finish Aluminium
- Stainless Steel
- Others (Liquid coatings such as acrylic or polyurethanes)

The deciding factors when choosing are:

- Suitability (fitness for purpose)
- Cost
- Risk to the Environment
- Overall life expectancy
- Guarantee availability
- Whether a decorative or a decorative / durable surface finish is required

The use of the Synthatec System offers the choice of some 300 colour alternatives in varying gloss levels. It gives a consistent finish over many surfaces and substrates combining UV resistance with hardness and durability.

With galvanized steel, it is often found that the durable zinc coloured finish is not acceptable and, therefore, a further colour coating is required.

Some other substrates, e.g. stainless steel, may be considered to be 'self finishing'. However, when a colour change is required, limited success may be achievable with a coating. The limitations of adhesion, however, will make it unlikely that any performance warranty will be supplied with the chosen coating.

The following table shows how the SYNTHATEC System performs when compared to some of the other protective/decorative finishes available.

TEST	SYNTHATEC GLOSS & SATIN	SYNTHATEC MATT & SYNTHATEC METALLICS	SYNTHATEC PREMIUM	PVDF	ANODISING
Resistance to UV Light	Minimal colour change after 2 years Florida exposure	Minimal colour change after 5 years Florida exposure	Minimal colour change after 5 years Florida exposure	Minimal colour change after 5 years Florida exposure	Varies depending upon type of anodising
Resistance to Mechanical Damage	Good	Good	Good	Poor	Excellent
Location Areas	All	All	All	Not suitable for areas of public access where damage is possible & exposed sites where erosion is expected	All
Colour Availability	Wide choice of RAL & BS shades	Wide choice of House colours, RAL, BS shades & Synthatec Metallics.	Made to order in virtually any colour	Limited to those possible from available bases. Clean, bright colours not available	Very restricted range
Colour Uniformity	Excellent	Excellent	Excellent	Good	Very Poor
Gloss Level Availability	Gloss and Satin	Matt	Matt	Usually 30% Maximum 55% @ 60°	Restricted
No of Coats	One	One	One	Two, three or four	Electro-chemical process
Film Thickness	Minimum 40 microns	Minimum 40 microns	Minimum 60 microns	30 - 40 microns	Maximum 25 microns
Edge Coverage	Excellent	Excellent	Excellent	Fair	Excellent
Stoving Temperature Continued...	200°	200°	200°	Circa 240°	N/A



TEST	SYNTHATEC GLOSS & SATIN	SYNTHATEC MATT & SYNTHATEC METALLICS	SYNTHATEC PREMIUM	PVDF	ANODISING
Flexibility BS EN ISO1520:1999	>6mm	>6mm	ISO1519 >6mm	>6mm	N/A
Adhesion BS EN ISO 2409	Value 0 (100%)	Value 0 (100%)	BS3900 pt.E6 Class 0	Value 0 (100%)	N/A
Impact Resistance BS 6496 Part 4.7	Pass 20"/lbs	Pass 20"/lbs	AAMA 2604 Pt.7.5 Pass 2.5Nm	Good	Excellent
Scratch Resistance BS 3900 Part E2	Pass 4000 gms	Pass 4000 gms	Pass 4000 gms	Fair	Excellent
Resistance to Mortar	Excellent	Excellent	Excellent	Fair	Excellent
Full Independently Monitored System	Yes	Yes	Yes	No	No
Repair Characteristics	Excellent	Excellent	Excellent	Good	No system available
Guarantee	15 years	30 years*	40 years*	Variable <25 years (dependent on supplier)	Dependent upon supplier

*30 and 40 year guarantees only available for installations located in the European Union and north of 48° latitude. Other guarantee terms apply elsewhere - please contact Valspar for more information.

ENVIRONMENTAL ISSUES

Powder Coatings to Reduce Pollution

Concern about the environment and health consequences of many traditional processes is nowhere more evident than in the paint and surface coatings industry. Solvent based paint continues to come under increasing attack in consumer and industrial markets, with serious long term implications for the future of the coatings industry. Both the manufacture and use of coatings is likely to become subject to increasingly stringent regulations.

It is already clear, however, that recent developments in polymer science and powder processing will accelerate the developments of powders as highly practical alternatives to liquid solvent based paint systems in many industrial applications.

A principal cause of the environmental problem facing the industry is the formation of excess ozone near ground level. Ozone in the upper atmosphere is essential as a shield against UV radiation from the sun. However, excess ozone near the ground can be a health hazard and can damage crops and other vegetation. Ozone concentrations in the UK have often exceeded World Health Organisation guidelines for air quality.

Ozone and other photochemical oxidants such as smog and peroxides are formed by volatile organic compounds (VOC's) reacting in sunlight with other pollutants. There is a close link with the high level of solvent used by the UK coating industry. About half the VOC's in the air come from solvents and of those, two fifths - some 85,000 tonnes per annum - can be attributed to the paint industry.

VOC emissions from the manufacture and use of powder coatings are virtually zero and the material is entirely solvent free. Powder is already in widespread use in assembly line production in many industries and the expansion of its use is being urgently canvassed and investigated by leading environmental agencies worldwide.

Many experts see modern powder coatings, of which the Synthatec system is one, as a realistic long-term alternative to solvent-based wet paints for widespread industrial use. UK usage of powder coatings is currently running at an annual rate of around 25000 tonnes of material. If liquid solvent based paint had been used instead of this powder, **an additional 16500 tonnes of VOC emissions would have been generated.** In Europe as a whole, powder consumption is approximately 370000 tonnes per year. If liquid solvent based paint had been used instead, **an additional 245000 tonnes of VOC emissions would have been generated.**

Not only do powder coatings have environmental and health and safety attributes, performance characteristics are steadily improving also. Recent developments in powder formulations and application technology are bringing powder increasingly into contention as a high performance alternative to traditional wet paint in many industrial applications.

The continuing thrust of research and development will ensure that in the foreseeable future, powder coatings will meet the most stringent performance and aesthetic criteria which are currently the preserve of solvent based wet paint.

Research has already been produced to make powder formulations available for non-metal substrates, such as plastics and wood, widening dramatically the range of industries able to use powder systems.

In particular Valspar has developed the unique Synergy range of high performance architectural systems for co extrusion application to plastic substrates during the manufacturing process.

Overall, powder coatings offer the most environmentally sound solution to the industry's future requirements. The increasing pace of investment in research and development is a reflection of international concern to reduce VOC emissions and many national governments and the EC has already laid down directives to ensure substantial reductions in the future.

With the steady development of powder coating formulations designed to meet the most demanding criteria set by manufacturing industry, the powder industry can also be confidently expected to provide material and processes to match the performance of traditional liquid paints.

The international powder coatings industry is continuing to develop products for a wider range of end uses, thereby increasing the opportunities for further reductions in the environmental impact of coatings.

By specifying the Synthatec system rather than liquid paints, a further step towards a greener, cleaner environment is easily achieved.

THE SYNTHATEC PRODUCT RANGE

Synthatec offers the most comprehensive product range in the architectural coatings market, both in terms of product type and finish, ensuring quality products and innovative technologies are always available to meet the current and future needs of the specifier.

The Synthatec System is available in five generic grades:

- * Synthatec Matt, guaranteed for 30 years* and available ex stock in an extensive range of RAL, British Standard and bespoke, Colour Consultant designed SP architectural colours.
- * Synthatec Metallics, guaranteed for 30 years* and available ex-stock in a unique range of single coat exterior grade finishes, designed with the assistance of one of the UK's foremost colour consultancy teams.
- * Synthatec Premium, guaranteed for 40 years* and available, made-to-order, in virtually any colour, including RAL, BS and metallic colours
- * Synthatec Gloss, guaranteed for 15 years and available ex stock in a wide range of RAL and British Standard colours.
- * Synthatec Satin, guaranteed for 15 years and available in a limited stock range or to order in a wide range of RAL and British Standard shades.

All five types are formulated to comply as a minimum either with BS 6496, BS 6497 and BS EN 13438, the British and European Standards for architectural powder coating of aluminium and galvanized steel respectively, or, in the case of Synthatec Premium, to AAMA 2604 (American Architectural Manufacturers Association specification for High Performance Organic Coatings on Aluminium Extrusions and Panels). In addition, all these products hold approval certification from Qualicoat (Zurich) and GSB (Germany).

*30 and 40 year guarantees only available for installations located in the European Union and north of 48° latitude.
Other guarantee terms apply elsewhere - please contact Valspar for more information.



The Synthatec colour swatch is available from Valspar showing the colour range of our matt and metallic powders. In addition, the use of carefully controlled formulation techniques provides the facility to produce any other colour in either standard gloss, satin, Synthatec Matt or Synthatec Premium technology.

Due to potential colour performance differences between manufacturers we would recommend that only one source of powder is specified for any contract with no alternatives being allowed.



So that there is no doubt as to the chosen shade or gloss level, we offer sample panels of all standard Synthatec colours which can be used for reference purposes throughout the contract. (Where the use of metallic colours is required, please refer to page 18 for further advice). The Synthatec reference number should, therefore, be quoted on all drawings.

The unique combination of matt and metallic finishes coupled with a comprehensive 30 or 40-year guarantee and wide colour choice provides a risk free route to the highest quality of architectural metal finishing.

APPROVED APPLICATORS - APPROVAL AND REMOVAL

Only applicators approved by Valspar are eligible to use Synthatec products.

Approval to use Synthatec is only achieved after a rigorous technical approval process that is only initiated when any applicant company has satisfied certain financial criteria and achieved ISO 9000 registration.

The details of the process of approval are available from Valspar.

SYNTHATEC APPROVED APPLICATORS & IN HOUSE USERS

The Synthatec System can only be supplied to and applied by Approved Applicators and In-house users. These companies have been approved because of their experience and expertise in this demanding field. All companies listed conform to the requirements of the Synthatec System, have ISO 9000 and have operational procedures assessed and accredited by The British Board of Agrément under Certificate No. 94/3041.

A comprehensive list of Approved Applicators and In-House Users is available from Valspar, Tel 0121 322 6900, Fax 0121 322 6902, or from the Synthatec website www.synthatec.com.

THE SYNTHATEC SYSTEM - SUBSTRATE CHOICE

Design

The Synthatec System can be satisfactorily applied to a wide range of substrates. Different metals are often specified in order to meet certain needs, such as strength, visual appearance, corrosion resistance etc. Without doubt aluminium gives the best overall performance in most situations but other metals have been coated with the Synthatec System giving excellent results.

The following advice is intended to aid specifiers with the choice of substrate. The Synthatec Guarantee covers the substrates shown below.

ALUMINIUM (For internal/external use)

Conforming to:-

BS EN 485 (1-4)

BS EN 515 (1993)

BS EN 573 (1-4)

BS EN 754 (1,2,7,8) Specification for wrought aluminium alloys for general engineering purposes, bars, extruded round tube and sections.

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This substrate provides the best surface on which to apply the Synthatec System. The metal must be chemically pretreated in accordance with the Synthatec System in order to obtain a coating, which will be both decorative and give long lasting protection. Synthatec Approved Applicators follow these procedures rigorously and the resultant products carry a 30 or 40-year guarantee. A British Board of Agrément Certificate No. 94/3041 is available for all Synthatec products.

Zinc Over Steel Substrates

HOT DIP GALVANIZING TO BS EN ISO 1461:1999* (Previously BS729:1994)#

This process is widely used in the construction industry for a multitude of different components where long-term protection is required. Essentially, almost any iron or steel components can be hot dip galvanized. Following any necessary cleaning and pickling operations to remove any rust or surface contaminant, the components are preheated and immersed in a vat of molten zinc.

* For new equivalent CEN standards see Appendix E.

Now withdrawn

Due to the nature of the process both the film weight of zinc and its surface roughness can vary considerably. The minimum average coating weight of zinc for any individual test area varies depending on the nature of the component being treated.

The application of the Synthatec System to galvanized work produces a coating that will effectively protect and decorate. It is important to note that only 'unpassivated' grades of galvanizing are suitable for the application of Synthatec and it must be stressed also, that the smoothness and free flowing characteristics of any coating will be significantly affected by the surface texture of the underlying substrate. There can also be an additional factor, which will influence the overall appearance, which is defined as 'gassing'. The exact cause of this phenomenon is not known.

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Once the powder coating is applied to the substrate it is then stoved at around 200°C and it is at this stage that the gassing may occur manifesting itself as small pinholes or craters in the cured coating.

It should be noted that the presence of pinholes on galvanized substrates after powder coating is acknowledged in BS 6497 as being inevitable. The Applicator, however, will take all measures to keep this to a minimum.

Preheating of the substrate, known as 'degassing' prior to powder coating, and the application of the powder to the substrate whilst hot, goes a long way to improving this problem. Notwithstanding this, if small craters are apparent, they are not detrimental to the long term life of the coating when the full Synthatec process has been carried out.

The coating of this substrate when using Synthatec Gloss, Satin, Matt or Synthatec Metallic is covered by British Board of Agrément Certificate No. 94/3041.

GALVATITE BS EN 10142, 10143 & 10147 (Previously BS 2989:1992)

Specification for 'continuously Hot Dip Zinc coated and iron alloy coated steel, wide strip, sheet/plate and slit wide strip'. Consult your Applicator for the most suitable grade of Galvatite to be used.

Galvatite is manufactured by Corus (formerly British Steel). In this process the zinc is applied in the molten state to a coil of steel, followed by a rolling operation which produces a more uniform surface than is normally obtained with Hot Dip Galvanizing. Although the phenomenon of 'gassing' can occur on galvatite it is less frequent. The use of 'Smooth Galvatite' may improve the appearance of the coating. Further advice should be sought from the chosen Applicator.

Due to its production method, this substrate will have unprotected edges, and attempts should be made at the design stage to enclose these edges with the surrounding structure. Once installed any bare edges should be protected with an appropriate sealant or mastic (see TAS10).

The coating of this substrate when using Synthatec Gloss, Satin, Matt or Synthatec Metallic is covered by British Board of Agrément Certificate No. 94/3041.

When specifying powder coating onto galvatite the unpassivated grade should be requested.

Mild steel (or 'black steel') is a substrate which is occasionally used for architectural components and, though it can be satisfactorily coated with Synthatec, its unpredictable nature coupled with its readiness to corrode make it an unsuitable substrate where long term decorative coating performance is required. For this reason no Synthatec guarantees are available for this substrate.

In addition, guarantees are not normally available for the following substrates but more information may be obtained from Valspar technical department.

1. Cast Aluminium
2. Zintec/Electro galvanizing
3. Zinc Sprayed Steel
4. Stainless Steel

THE INFORMATION GIVEN IS BASED ON DATA OBTAINED FROM RELIABLE SOURCES AND IS BELIEVED TO BE CORRECT, HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED.

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DESIGN CONSIDERATIONS FOR SYNTHATEC COATED COMPONENTS

It is recommended that architects and specifiers take careful note of the following, especially when designing new components, which need to be powder coated.

Powder coatings are electrostatically spray applied and certain considerations have to be taken into account in order to ensure that a good quality finish is obtained. We, therefore, draw your attention to the following:

Surface Finish on Raw Materials

The Synthatec System, whilst having excellent flow properties, may only partially smooth out imperfections in a metal substrate. It is essential that all components must be supplied in the raw state, with a surface condition that reflects the ultimate surface required.

Aluminium is consistently supplied in good uniform quality and generally gives excellent results. It is, however, a soft substrate and should be carefully packed and protected during transportation to avoid surface scratches and blemishes which will inevitably show through the powder coating. Where uncoated aluminium is to be protected by an adhesive film, the suitability of its use should be confirmed by the adhesive film supplier e.g. lifespan after application - adhesive residues, etc.

Hot Dip Galvanized steel is notorious for having a pronounced textured finish. This can vary but should be noted. Pre-batch samples should be requested in order that the specifier can approve an acceptable standard. In certain instances this substrate can be substituted by using Galvatite which generally gives an improved surface appearance (See TAS1 - Substrate Choice).

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Jigging Points

To apply the Synthatec System, it is necessary to hang each item on to a conveyor and so one or two jigging points are required. These are best in the form of drilled holes, or suitable jigging edges, where the contact point does not affect the appearance of the finished product.

When positioning hanging holes on wide assemblies, it is necessary to allow for pretreatment runoff by tilting the component. On extrusions, allowance should be made for hanging points (seek advice from the Synthatec applicator).

Pretreatment drainage is of extreme importance and as with the previous information, care should be taken during the design stage in order to avoid adhesion failure of the coating.

All of the approved pretreatments require immersion in, or spraying with aqueous solutions. It is, therefore, necessary that components do not float or retain trapped solutions after treatment. Although hollow components may appear to be watertight, pressure and temperature variations may cause ingress of solutions, which can then boil out during the powder curing cycle, thus spoiling the coating.

Likewise porous welds can suck in liquid but difficulty occurs when trying to drain these areas. Rivets are another area where pretreatment solutions can become trapped and if sited on 'seen' faces can cause surface marking.

Flat butting surfaces can trap solutions by capillary actions and should be avoided. Most components can be suitably ventilated by 6mm diameter holes permitting total drainage of the components.

Sound deadening or porous filling material such as heat or fire insulation can absorb pretreatment chemicals. Material likely to melt below 250°C cannot be processed due to stoving requirements. Therefore, if any of these processes are required it should be noted at the design stage so that they can be assembled after the powder coating has taken place.

It is important to consider the above recommendations and seek advice from Valspar or one of the Approved Applicators. (List of applicators is available from Valspar).

Powder Penetration

Powder initially adheres during coating by electrostatic forces. However, a phenomenon known as the 'Faraday Cage' effect can counter the attraction on components with narrow recesses, slots or sharp enclosed corners. Advice should be sought where they cannot be avoided. As a general rule, the width between the two edges should be greater than the depth.

Size & Gauge of Components

Maximum plant dimensions at Synthatec Applicators are available from Valspar and component weights are generally restricted to around 70 kg. Advice should be sought from an applicator if you wish to exceed this. The minimum gauge of aluminium for flat panels and pressings is 1.2 mm. Deformation may occur during stoving if thinner gauges are used and it is advisable, therefore, to seek advice from the Approved Applicator when thin gauge material is to be coated.

Dissimilar Metals

Assemblies consisting of different metals, or plated surfaces, must be avoided. The differing material may require non-compatible pretreatments and electrolytic corrosion may also occur.

Heavy Masses

Heavy components require a longer heating cycle due to the metal temperature being the important criterion. These are therefore more expensive to coat. The surface appearance (but not colour) of the finished item may be slightly different between substrates of differing mass and wall thicknesses greater than 5mm due to variations in the 'heat-up' times. Advice should be sought from an Approved Applicator if heavy and light masses of the same metal need to be mixed on one component.

Significant Surfaces

All drawings should indicate the surfaces where the coating is required on individual components or sections.

Steel components

When steel is used for an external component, it is recommended that it be galvanized. However, the surface texture of galvanized steel should be taken into consideration at the time of specification (See TAS1 - Substrate Choice). The steel must be galvanized for the Synthatec Guarantee to be applicable.

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Where zinc coated steel components are required to have a smoother surface finish, it is possible to finish i.e. dress back the zinc layer and/or welded joints. This procedure should be carried out with care as these areas would be excluded from the guarantee if the zinc layer film thickness is reduced below that required by BS729 EN1043.

Slides & Fits

The coating thickness could, in extreme cases, be in excess of 200 microns. Where sliding or clipping fits are required, allowance should be made for this. In cases of special difficulty, an Applicator should be consulted.

Structural Silicone Glazing

If the coating is applied to components for use in SSG then the specifier must clearly mark all drawings and relevant documents, stating that all surfaces are to be fully coated, not just the seen significant surfaces. Failure to do so could result in the structural silicone being partially applied to mill finish aluminium. If structural silicones are applied to Synthatec by the component manufacturer, then full testing should be carried out in advance of the project commencing, in order to ensure good adhesion.

Synthatec systems have been tested for suitability with structural silicone glazing sealants and satisfactory results have been achieved. Both Dow Corning (Report No. DC01B83) and Tremco (Report No.1267) have approved Synthatec for use in structural silicone glazing systems.

'Orange Peel'

'Orange Peel' is the term sometimes used to describe the surface finish of a coating. This effect usually occurs as a result of high film thickness or inappropriate plant settings.

Synthatec has been formulated to provide excellent weathering properties and the ability to give good edge cover and protection whilst, at the same time, produce a minimum of orange peel.

During design, it is helpful to avoid recesses, as in attempting to penetrate these, it is inevitable that a heavier coating will be deposited on the adjacent faces thus causing greater orange peel.

Finishing of Aluminium

Where it is necessary to finish welds on aluminium pressings, it is recommended that 320 grit is used as the final flattening material.

The SYNTHATEC System

To ensure that the appropriate care and attention of the Synthatec System is received, all drawings should specify Synthatec.

SYNTHATEC METALLICS **RECOMMENDATIONS FOR SPECIFICATION AND USE**

In response to the growing demand from specifiers for metallic architectural finishes and extended performance warranties, Synthatec Metallics are marketed alongside the established Synthatec Matt and Synthatec Gloss & Satin ranges.

Synthatec Metallics are produced by the Valspar metallic bonding process. Each is manufactured and applied according to the same strict criteria, which have made Synthatec almost a generic term for product quality, expert application and exemplary customer service.

As an endorsement of the product's suitability as a high performance decorative coating for the building industry, Synthatec Metallics have been accredited by the British Board of Agrément (certificate number 94/3041), which independently states an anticipated life expectancy of up to 30 years.

The metallics range, including RAL 9006 and RAL 9007 equivalents*, is displayed in the 'Synthatec Product Range' colour swatch available from Valspar. Due to the limitations of printing processes the colours shown give only an indication of shade and gloss.

* RAL9006 and 9007 cannot be reproduced to precise tolerances and are only a representation of RAL9006 and 9007. The shades were not intended by RAL to be used for decorative purposes and consequently, exact colour matches for the standard are virtually impossible. However, all Synthatec Metallics will be reproduced consistently.

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Many contracts have been satisfactorily completed in Synthatec Metallics, and many more exist where metallics have been specified. A list of these projects is available from Valspar.

N.B. As with all metallic finishes, the apparent colour will vary dependent on the angle of incident light, a feature known commonly as geometric metamerism, where a different colour is seen as the viewing angle changes. Whilst this phenomenon is often the very reason for specifying metallics, care must be taken during the design, application and installation processes. It is important to recognise that metallic polyester powder products produce a variable visual effect and, unlike solid non-metallic colours, individual components may exhibit some shade variation from other components which have been coated at the same time.

For assistance with specifications the Synthatec Specification Guide is freely available in printed form, as well as from the Synthatec website, and Valspar provides an architectural specification and advisory service.

When specifying Synthatec Metallic finishes the following points should be noted for inclusion in specification documents: -

1. Only Synthatec Approved Applicators with approval to apply Synthatec Metallics should be used.

NB. Synthatec Metallics, like all metallic polyester powder coatings, are more difficult to apply than solid colours. Extra controls are exercised by the applicator when applying metallic colours and Valspar supply detailed guidelines of application requirements to all Synthatec Approved Applicators.

2. Reference samples of each component should be produced initially by the component supplier / sub contractor, each sample having been coated on the processing plant of the chosen applicator and representing the colour which will be achieved in practice. These samples should receive approval from the contract administrator before proceeding further.

FILM THICKNESS SPECIFICATION (ALUMINIUM)

With any organic coating it is necessary to specify a minimum film thickness in order to ensure that the coating gives the necessary degree of protection, colour uniformity, and overall appearance. It is a well known fact that, as with every coating, higher film thicknesses do not necessarily equate with better performance, and that colour uniformity is achieved by consistency of film thickness rather than by a certain film thickness itself.

The Synthatec System has been extensively tested at differing film thicknesses. In terms of the guaranteed properties of adhesion, gloss retention, colour stability and general weatherability, it has been shown that a minimum film thickness of 40 microns (60 microns for Synthatec Premium) offers the best specification for applicator, fabricator and specifier alike.

As far as application is concerned, laboratory tests and actual experience over the last 20 years show quite clearly that a minimum film thickness of 40 microns on prime surfaces gives an adequate thickness in the key area of edge coverage. In addition, it is also known that the minimum thickness of 40 microns gives a continuous film without pinholes or voids.

So far as the fabricator is concerned, a minimum film thickness of 40 microns enables the optimum mechanical properties to be obtained from the coating. If higher minimum film thicknesses are used, the Applicator is forced to apply maximum film thicknesses (due to the nature of the process) in excess of 120 microns in most cases. This means that the impact resistance of the coating can be affected along with its flexibility, in addition to the obvious problems of higher costs.

Also, such maximum film thicknesses may cause problems with fit between components. It is interesting to note that the British Standard actually recommends a maximum film thickness of 120 microns, when required, as well as stipulating a minimum of 40 microns.

Finally, the specifier benefits from a minimum film thickness of 40 microns, not only for the above reasons but also due to its simplicity as a standard. Valspar has always attempted to have standards that are easily measurable. A minimum film thickness of 40 microns is just that. Many other standards, such as that of the GSB RAL-R6631 recommend 60 microns as the 'minimum' but allows local measurements to go down as low as 48 microns. The interpretation of this standard is in itself difficult and open to differing opinion. This is obviously not the case when an absolute minimum is stipulated.

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From the above it is clear, therefore, that in order to comply with the terms of the Synthatec System Guarantee, BS6496 and the Agrément Certificate for the Synthatec System, the minimum film thickness should be 40 microns on aluminium substrates. No other specification is necessary in these circumstances, nor, indeed will any other specification improve the performance of the product.

Those specifications which require a 60 micron minimum film thickness produce no benefit (other than in a marine or swimming pool environment, or a Synthatec Premium application) and, at the same time, consume more powder product (with pro rata cost increase). The Synthatec specification requires 40 microns minimum film thickness and this specification carries the Synthatec 30 year guarantee (15 years for Synthatec Gloss & Satin).

In the case of galvanized steel the minimum film thickness should be 60 microns. In addition, harsh environments such as coastal (marine) locations also require a minimum film thickness of 60 microns to protect against the increased risk of erosion, which is often present.

A film thickness of 60 microns is required for the Synthatec Premium product where the increased weatherability of the coating combined with the extended guarantee period requires a higher film build to ensure the long-term durability of the coating.

CERTIFICATION AND INDEPENDENT ASSESSMENT OF THE SYNTHATEC SYSTEM

The Synthatec System was the first process of its type to win the coveted British Board of Agrément approval. This independent assessment of the process states:

'Synthatec coated on galvanized steel or aluminium cladding, curtain walling, roofing or window frames will perform effectively with a life expectancy exceeding 30 years.'

In addition to this, the Synthatec System is certified to conform to BS 6496:1984 Section 2 - 'Powder Organic Coatings for Aluminium' and BS 6497:1984 Section 2 - 'Powder Organic Coatings of Hot Dip Galvanized Steel', in all respects. Synthatec Premium conforms to AAMA 2604-98, 'High performance Organic Coatings on Aluminum'

Further certification of the Synthatec System includes classification under various parts of BS 476 Fire Resistance Testing as listed in Technical Advisory Sheet TAS6.

The product has also been independently assessed and approved to Qualicoat Class 1 and GSB RAL-RG6631.

In addition, when submitted to EMMAQUA ® accelerated weathering testing in Florida, Synthatec Matt and Synthatec Metallics have produced results equivalent to three years South Florida natural weathering testing, while Synthatec Premium has achieved full compliance with AAMA 2604 5 year Florida performance.

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FIRE RESISTANCE OF THE SYNTHATEC SYSTEM

In order to be able to specify the Synthatec System with complete confidence, it is necessary that the specifier is assured of the following:

1. The coating is fit for purpose.
2. The coating presents no fire hazard in the environment to which it is to be used.
3. The coating will not assist the propagation of fire.

The Synthatec System has been subjected to stringent independent testing by the Warrington Fire Research Centre and has been verified as suitable for use in accordance with various national Building Regulations.

All Synthatec products meet BS 476 as listed below and copies of reports are available on request from Valspar.

BS 476:1989 Part 6	Fire Propagation Class 0.
BS 476:1987 Part 7	Surface Spread of Flame Class 1.
BS 476:1958 Part 3	Fire tests on building materials and structures - External fire exposure roof test Class A.

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THE SYNTHATEC SYSTEM IN CONTACT WITH COPPER AND LEAD

There may be occasions where Synthatec coated components will come into contact with either copper or lead. This could happen where windows or cladding are adjacent to roofs for instance. The problem of bimetallic corrosion may then arise. In order for this to occur there must be effective electrical contact between the Synthatec coated substrate and the metal in question.

In such circumstances, however, the properties of both the Synthatec coating and substrate conversion coating will combine to provide an effective physical insulating barrier to the electrochemical process or corrosion.

In order to determine the risk of degrade, Synthatec coated aluminium panels were tested in contact with copper and lead under an accelerated weathering regime. Control panels of uncoated aluminium were also tested in contact with copper and lead.

The tests were carried out as follows:

TEST 1 (Humidity Test to ISO 6270: 2001) The test panels were subjected to a temperature that cycled between 42°C and 48°C at 100% relative humidity. The test lasted 300 hours..

TEST 2 Test 1 was repeated with the addition of a solution of acetic acid, common salt and hydrogen peroxide to help accelerate any attack.

RESULTS

TEST 1 Exposed copper, lead and aluminium showed signs of attack but the Synthatec coated panel was unaffected.

TEST 2 Aluminium & Lead and Aluminium & Copper.
The copper, lead and aluminium were all attacked with severe results on the aluminium.

Synthatec coated Aluminium in contact with Lead and Copper

Both the copper and lead showed severe signs of attack. In the case where lead was in contact with the Synthatec component there was no effect on the coating except a slight staining of the Synthatec adjacent to the lead. This staining was removed by washing with 5% detergent solution. There was no effect on the Synthatec coated component adjacent to the copper.

THE INFORMATION GIVEN IS BASED ON DATA OBTAINED FROM RELIABLE SOURCES. IT IS BELIEVED TO BE CORRECT, HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED.

EDGE COVERING PROPERTIES OF THE SYNTHATEC SYSTEM

The thickness of coatings on sharp edges will normally be lower than the mean coating thickness. As such, the barrier to corrosive influences is reduced. It is for this reason that the Synthatec System has been formulated to optimise its edge covering properties. However, the edge coverage depends also on other factors such as extrusion design. Extrusions with radiused rather than sharp edges will facilitate improved coverage at the edges.

At present there is no non-destructive method to measure coating thickness at sharp edges. The only effective method involves sectioning the extrusion and microscopic examination.

If there is any uncertainty about the suitability of a particular profile for coating, please contact Valspar.

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PROTECTION & PACKAGING OF THE SYNTHATEC SYSTEM

The Synthatec System is an extremely tough and resilient coating. However, mechanical abuse can cause unsightly scratches and blemishes. The best way to minimise these is by adopting good working practices both during fabrication and installation. Notwithstanding this, the use of protective packaging can further help to minimise this problem and remove the need for remedial action post installation.

Protective Packaging By the Approved Applicator

Approved Applicators recognise the need to protect coated components during transit and will, as a rule, wrap components in packaging materials that are normally of a relatively neutral pH value in order to eliminate chemical attack should the packaging become damp. Any marks should be easily removable with a damp cloth. More elaborate packaging by the Approved Applicator is available on request.

Packaging for coated components must be suitable to prevent scratching, scuffing or other mechanical damage to the coating. All packaging materials should be non-abrasive so as to avoid damage occurring from movement of the components during transit.

Protection of Synthatec Coated Components Post Fabrication

Protective tapes are used extensively for the protection of architectural products, and are normally applied by the fabricator or window manufacturer. The Synthatec surface to which they are applied must be free from dirt, oil or other surface contaminants. If necessary, the surface may be cleaned using a soft cloth dampened with white spirit or Isopropyl Alcohol. The surface must be dry before tape application.

Care of Taped Coatings

Tapes should be removed after a period not exceeding six months. If further protection is required new tapes should be applied.

In general, exposure of taped components to direct sunlight, UV light or elevated temperatures should be avoided. When removing protective tape, care must be taken to avoid the possibility of any damage to the coating. Where necessary, any residual adhesive left on the Synthatec coating following the removal of the protective tapes, should be removed by wiping with a white spirit dampened cloth. Solvents or cleaning solutions containing esters, ketones or chlorinated hydrocarbons must not be used, as these may be detrimental to the coating.

The following tape manufacturers have a range of products, which are commonly used on Synthatec coated components. Valspar is unable to recommend specific products. For advice on suitability, the individual tape manufacturer should be consulted.

Ambassador Packaging Limited
Unit 45-47 Enterprise Trading Est
Pedmore Road
BRIERLEY HILL
DY5 1TX

Tel: 01384 70202

Bandfix Tape Limited
Unit 9 George Street
HUNTINGDON
PE18 6BD

Tel: 01480 413277

Concorde Packaging Specialists
Concorde House
Stewart Close
Eccleshill
BRADFORD
BD2 2EE

Tel: 01274 633315

John Gosheron & Co Limited
PO Box 21
Grove House
551 London Road
ISLEWORTH
TW7 4DT

Tel: 01724 841860

BDF Tesa Limited
Yeomans Drive
Blakelands
MILTON KEYNES
MK14 5LS

Tel: 01908 211333

Boston Tapes
46 Bickford Road
Witton
BIRMINGHAM
B6 7EE

Tel: 0121 328 2166

Flowstrip Limited
Flowstrip House
Atkinsons Way
Foxhills Ind Park
SCUNTHORPE
DN15 8QJ

Tel: 01724 841860

Hadleigh Enterprises Limited
Unit 11 Buckingham Square
Hurricane Way
Wickford
BASILDON
SS11 8YQ

Tel: 01268 572255

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John Kilby & Son
192 Alcester Road
Hollywood
BIRMINGHAM
B47 5HH

Tel: 01564 823175

Poli-Film Adhesive Products
Stephenson Close
Drayton Fields Ind Est
DAVENTRY
NN11 5RF

Tel: 01327 76071

Rotunda Plc
Holland Street
Denton
MANCHESTER
M34 3GH

Tel: 0161 3364433

Novacel (UK) Limited
Unit 6 Dencora Way
Sundon Business Park
LUTON
LU3 3HP

Tel: 01582 583294

Protective Tapes (UK) Limited
Unit 8 Joiners Square Ind Est
Hampton Street
Hanley
STOKE-ON-TRENT
ST1 3EX

Tel: 01782 279224

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SEALANTS AND MASTICS FOR USE WITH THE SYNTHATEC SYSTEM

The following companies have all tested several of their products for adhesion to, and compatibility with, Synthatec products.

As a result of these tests each company has a range of products that it believes are suitable, in various situations, for use in conjunction with the Synthatec System. For specific details about individual products and their use the company should be contacted.

In all cases the Synthatec surface to which such products are applied must be free from dirt, oil and other contaminants. The surface should be cleaned with a dry cloth or if necessary a cloth moistened with white spirit or Isopropyl Alcohol. The surface must be dry before and during application.

Valspar is unable to recommend specific products. For advice on suitability the individual sealant / mastic manufacturer should be consulted.

Adshead Ratcliffe Limited
Derby Road
BELPER
DE5 1WJ

Tel: 01773 826661

Cellotape GB Limited
The Woodside Est
DUNSTABLE
LU5 4TP

Tel: 01582 696666

Dow Corning Hansil
19 Wintersells Road
BYFLEET
KT14 7LH

Tel: 01932 351911

Seal Strip Limited
Scotlands Ind Est
London Road
COALVILLE
LE67 3JJ

Tel: 01530 813121

Sika Limited
Watchmead
WELWYN GARDEN CITY
AL7 1BQ

Tel: 01707 329241

Stag Polymers & Sealants
Tavistock Road
WEST DRAYTON
UB7 7RA

Tel: 01895 445511

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Evode Group Plc
Common Road
STAFFORD
ST16 3EH

Tel: 01785 57755

Tremco Limited
Coupland Road
Hindley Green
WIGAN
WN2 4HT

Tel: 01942 58011

Trade Sealants Limited
Unit 16 Arnside Road
WATERLOOVILLE
PO7 7UJ

Tel: 01705 251321

Removal of Excess Mastic and Sealant

Care should be taken to remove the excess before it is fully cured. Removal of the excess after curing may prove difficult without causing damage to the Synthatec coating.

Where it is necessary to use a solvent or cleaning solution either white spirit or mild detergent in water is recommended. Solvents or cleaning solutions containing esters, ketones, or chlorinated hydrocarbons must not be used since these may be detrimental to the coating.

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CLEANING OF THE SYNTHATEC SYSTEM

As with any organic coating, in order to retain the aesthetic qualities and the expected long-term durability of the Synthatec System, it is important that the coating is cleaned regularly.

The frequency of cleaning depends upon the environment in which the Synthatec coating is in service.

For areas of 'normal' urban environment we recommend a maximum period of 18 months between cleaning operations, unless any undue soiling is apparent on the coating, in which case cleaning should be more frequent. In areas of high pollution, marine and swimming pool environments cleaning should be carried out every 3 months.

It should be noted that one of the conditions of the Synthatec Guarantee is that the coating is cleaned at the specified frequency and that the building occupier retains proof of cleaning. These cleaning records would be needed should a claim arise against the guarantee.

Cleaning of the Synthatec coating is an important part of the routine maintenance of any building. It is for this reason that we advise that only companies who specialise in this type of work are used for large cleaning operations.

Cleaning of Small Areas

The Synthatec coating can be cleaned by using a solution of mild detergent in warm water. All surfaces should be cleaned using a soft cloth, sponge or a natural bristle brush. Abrasive materials should be avoided, as they will damage the coating. If the Synthatec coating has become heavily soiled it may be difficult to remove this soiling using only a mild detergent.

In order to overcome this problem any mild, non-abrasive household cleaner may be used (after applying to a small test area first). Cleaners containing esters, ketones or chlorinated hydrocarbons must not be used.

Should oil or grease deposits exist, strong solvents must not be used to remove them. White spirit has been tested and approved for this purpose.

Whilst tests show that products of this type may be used successfully in the removal of heavy surface deposits, particular care must be exercised in their use to avoid any scuffing of the powder coating.

It is recommended that in all cases, such products are reserved for heavy soiling only and should be tested on small areas of the soiled powder coating first to assess their efficiency. After application, all detergents and cleaners must be thoroughly rinsed away with clean water.

For further advice please contact your Approved Applicator or Valspar.

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REMOVAL OF ALKALINE DEPOSITS

The Synthatec coated component is more often than not installed in close proximity to concrete based construction materials. Rainfall can cause alkaline substances to leach from those materials and deposit themselves on the surface of the Synthatec coating (this usually occurs when the concrete is new). By using the correct process, it should be possible to remove the alkaline deposits without causing damage to the Synthatec coating.

Visual effect of alkaline deposit: Hard glaze/powder deposit.

Method of Removal

The use of specialist cleaning contractors is recommended.

The following acids and alkalis have been tested, in conjunction with Synthatec, and have shown no detrimental effect.

Sulphuric acid - 30%

Phosphoric acid - 30%

Acetic acid - 20%

Nitric acid - 30%

Hydrochloric acid - 30%

Lactic acid - 10%

Citric acid - 10%

Ammonia - 10%

Hydrogen peroxide - 30%

(All chemicals should be applied to a small test area before commencing any cleaning procedure and, following application, all chemicals should be rinsed away with clean water.)

WARNING

Extreme caution should be taken when using strong brick/glass cleaners. When it is necessary to use these materials, which are available in varying concentrations, all adjacent areas coated with the Synthatec System must be fully protected. Please contact Valspar for further advice.

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SITE APPLIED REMEDIAL SYSTEMS (FOR SCRATCHES OR SMALL AREAS OF DAMAGE)

Wherever possible, SYNTHATEC coated items that have been damaged should be reprocessed by a SYNTHATEC Applicator i.e. stripped, pre-treated and re-coated.

However, if the SYNTHATEC coating suffers on site damage and the coated item cannot be removed it should be repaired using a suitable colour matched remedial liquid paint system from Breakwells Paints, 1 Harden Road, Leamore, Walsall WS3 1EL (tel. 01922 400444, <http://www.breakwellspaints.co.uk/>) or any other reputable paint supply company.

The particular method of repair, and repair system to be adopted, will be dictated by the nature of the required repair. Comprehensive product data and method statements are available from Breakwells Paints. Other reputable paint supply companies should be in a position to supply similar information. The method statement will describe:-

1. Surface preparation
2. Practice to be adopted if bare substrate is showing
3. Practice to be adopted if impact damage has resulted in indentations that need to be filled.

It is important to recognise that liquid repair systems are unlikely to have durability equivalent to the original Synthatec coating and, accordingly, repaired areas may weather differently. No warranty is expressed or implied by Valspar Powder Coatings Ltd. relative to the use of repair and remedial paint systems and it remains the responsibility of the user / specifier to ensure that any repair system is suitable for the purpose intended.

Remedial systems are general-purpose air-drying paints for the repair of the factory applied SYNTHATEC coating. They should be used only to repair small scratches or minor areas of damage. They are not designed to overcoat defective factory applied powder coatings. If there is any query concerning the quality of the SYNTHATEC coating then the Approved Applicator who coated the work should be consulted immediately.

All remedial systems and the areas of metalwork coated in these materials are expressly excluded from the SYNTHATEC guarantee. The SYNTHATEC guarantee will continue to apply to any 'unrepaired' area of SYNTHATEC coating, on any component, where the SYNTHATEC coating has been unaffected by the repair.

POLYAMIDE THERMAL BREAK

Introduction

Where an aluminium window or curtain wall structure is required to have improved thermal insulation properties, the components may be constructed from two separate extrusions which are joined together with an insulating 'thermal break' extrusion.

The original system for thermally breaking windows, curtain walls, etc was the system commonly referred to as 'pour and cut', where a channel in the aluminium extrusion is filled with an insulating resin. Once the resin is cured, the base of the channel is removed with a 'debridging saw' to leave two aluminium sections joined only by the resin thermal break.

The increased insulation value required by Building Regulations has led to a growth in the popularity of polyamide thermal break, where a polyamide extrusion is inserted and crimped between two individual aluminium extrusions designed with channels specifically for this purpose.

The adoption of this type of thermal break practice has led to some issues with the application of powder coatings which hitherto had not been seen with 'pour and cut' systems where the thermal break is carried out after the application of the powder coating.

Adhesion

The material which is used in the manufacture of polyamide thermal break extrusions is a nylon based plastic. Not only is it a very poor conductor of heat, but it is also a very poor conductor of electricity. Since the application of a powder coating is by electrostatic spray and requires the target material to be earthed, the polyamide extrusion will not attract the powder coating in the way that the aluminium extrusion will. In addition to its non-conductive properties, polyamide strip has hygroscopic properties and will therefore absorb moisture from the atmosphere or any other source of water to which it is exposed. The liberation of this water during the Synthatec curing process is very likely to disrupt the coating. Furthermore, Synthatec, like all architectural powder coatings, is designed for optimum adhesion to pretreated aluminium and galvanized steel substrates, not to plastics.

For these reasons, expectations of the quality of finish on the polyamide strip should not be too high when polyamide thermally broken components are coated after the strip has been rolled into place. Synthatec guarantees only apply to the aluminium or galvanized steel sections of the component – not to the polyamide strip.

Effect of Stoving

Most manufacturers of polyamide thermal break extrusion produce material which is tolerant of temperatures in excess of 200°C and hence is capable of tolerating the temperatures at which Synthatec is cured. Applicators must, however, recognise that temperatures in excess of 220°C can soften the polyamide strip and lead to distortion of the component. Careful attention should be paid to oven temperature control and jiggling of the components wherever Synthatec is applied to any rolled or polyamide-broken aluminium component if distortion is to be avoided. Increasing oven temperatures to speed up the application process is not recommended.

In addition to the distortion issues, the effect of pre-treatment chemicals and curing temperatures can reduce the shear value of the pre-rolled thermally broken section. In service, shear values of the knurled joint will reduce by up to 50%, and this change is accelerated in the curing process. Because the reduction in strength may be seen immediately after curing it is often assumed that the coating application has damaged the joint when it is, in fact, a normal process that has simply been accelerated. It is essential to ensure that, during the rolling process, shear values are achieved that take into account the relaxation of the joint in service.

The shear strength of a polyamide thermal break is achieved by a combination of knurling the aluminium and the pressure applied when rolling the strip into the knurled groove. It is important that the manufacturer's recommendations are followed if optimum shear strength is to be obtained. However, shear strength is likely to reduce after powder coating and it is essential to take this into account at the time the joint is formed.

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Recommendations

For purposes of simplification, the production of a 'broken' component which is subsequently coated shall be referred to as 'Roll & Coat'. Where the polyamide strip is applied after coating this shall be referred to as 'Coat & Roll'.

'Roll & Coat' carries with it the risk of distortion of the thermally broken component, disruption of the coating film on the polyamide strip and reduced shear strength. Though careful control of oven temperatures and jiggling will help to eliminate distortion, poor adhesion and disruption of coating on the strip is still likely, as is the reduction in shear strength.

The disruption and reduced adhesion of the cured coating will be significantly improved if a 'coating grade' of polyamide is chosen. Some polyamide suppliers are now producing modified strip which exhibits very significant improvements in coatability, adhesion and final appearance. Specifiers and fabricators should seek advice from their polyamide supplier when 'Roll & Coat' is to be used.

'Coat & Roll' carries with it none of the problems of 'Roll & Coat' as described above and, since skilled operators will make allowances for the effects of the coating already applied, shear strength values can be maintained at acceptable levels. In addition, since the polyamide strip is not coated its natural appearance is unaffected. If this, usually black, appearance is acceptable then 'Coat & Roll' must be the preferred option. Where a two colour component is required (eg external window frame a different colour to the internal frame) then 'Coat & Roll' is the only practical option available.

Only one other 'Coat & Roll' issue has been identified: obstruction of the thermal break channel or rebate with deposits of cured coating. This is another issue where the skill of the applicator will dictate the quality of the result. By careful setting up of the powder application equipment and careful jiggling, and where necessary, masking, penetration of these channels can be kept to a minimum and subsequently no interference from the cured powder will be experienced.

THE SYNTHATEC SYSTEM GUARANTEE

Valspar offers a performance guarantee to cover the main criteria required from any protective/decorative coating used in the architectural market. The Synthatec System Guarantee relates to the gloss retention, colourfastness and weathering properties of the product and, due to the unique nature of the Synthatec System, the adhesion of the coating when applied to the substrate by Approved Applicators is also guaranteed.

The guarantee, which is universally applicable to the Synthatec System when applied to aluminium substrates as specified in BS EN 485 (1-4), BS EN 515 (1983), BS EN 573 (1-4) and BS EN 754 (1,2,7,8)* stands out amongst other guarantees by carrying clear, tangible statements defining failures.

The Synthatec Guarantees are as follows:

Synthatec Matt & Synthatec Metallics on Aluminium & Galvanized Steel is for 30 YEARS.

Synthatec Premium on Aluminium and Galvanized Steel is for 40 YEARS

Synthatec Gloss & Satin on Aluminium & Galvanized Steel is for 15 YEARS.

These 'standard' guarantees are available without prior request. 'High hazard' guarantees for such locations as coastal (marine), industrial or swimming pools are available, on a project basis, by prior request.

As well as these advantages, the specifier has the security of knowing that the components have been coated by experts in the field of metal preparation and finishing - companies which have operational procedures assessed and accredited by The British Board of Agrément under Certificate No. 94/3041 and all of which are approved to ISO 9000.

Many companies offer 'guarantees' but Valspar is proud to be able to offer major advantages to the specifier in this important area. Specialist advice is available comparing the Synthatec System Guarantee with those offered by companies marketing similar products for architectural purposes.

NB: Guarantees stated here are applicable to installations in the United Kingdom and Eire only. Other countries will have different guarantee periods or may have no guarantee. For details on the guarantee availability for specific countries please contact Valspar.

* For new equivalent CEN standards see Appendix E.

THE SYNTHATEC SYSTEM IN MARINE & INDUSTRIAL LOCATIONS

There are three overriding factors that affect all organic coatings and their ability to decorate and protect in hazardous locations.

1. **Colour Stability and Resistance to Chalking**

In marine locations, the effect of ultraviolet radiation on the coating (which is the principle cause of colour fading and chalking) is more intense than it is in industrial cities and towns. In towns, a significant proportion of the radiation is absorbed by atmospheric contaminants. However, The degradation process by ultraviolet light and moisture is more pronounced in shoreline installations.

2. **Corrosive Salts**

Sea salts are very corrosive and affect both ferrous and non-ferrous metals. Again, shoreline installations are particularly at risk as they are frequently exposed to sea salt solutions followed by dry periods. This wet / dry cycle produces a very corrosive environment.

3. **Physical Erosion of the Coating**

The combination of wind and seashore debris i.e. sand and shingle, produces a very abrasive force that can physically erode coatings. This can result in corrosive attack of the base metal substrate and eventual structural weakness.

Over the years, numerous different coatings have been developed for harsh coastal environment and the most successful historically have been those where the emphasis is on protection using multicoat systems. These have, however, left a lot to be desired in decorative terms. Many of the designers of these finishes have also failed to recognise that coatings can be damaged leading to the substrate being exposed to the aggressive nature of the environment. This type of degrade has meant that such systems have required repainting every two to three years. The alternative is Synthatec.

We would recommend that in such locations only galvanized steel or aluminium substrates be used, and if possible extrusion edges be radiused to facilitate maximum edge protection. With Synthatec, these substrates are chromate or phosphate pre-treated which offers the best protection against the corrosive nature of the environment. The applied powder coating is extremely tough and will resist accidental damage and scratches. This we consider to be an essential requirement.

The influence of erosion, in a marine location, has proved to be difficult to replicate in a laboratory. However, research shows that the rate of erosion is dependent upon a variety of factors such as foreshore type, prevailing winds, geographical location and protection from other buildings or landscaping. Synthatec marine project guarantees take account of these (and other) factors to ensure that the guarantee is relevant and specific.

Quality Procedure

For a Marine/Industrial Environment Guarantee to apply, the Approved Applicator will use a higher level of inspection, quality control and sampling. This inspection procedure shall be at least in accordance with BS 6001:1991 Part 1 Inspection Level III (using appropriate AQL) using Normal, Reduced and Tightened Inspection as required.

Marine/Industrial Guarantee Availability

The Synthatec Guarantee for coatings on aluminium and galvanized steel will be available for certain locations providing that in Valspar's opinion, the proposed position of the site does not constitute any risk to the coating. A guarantee for these locations is given on a contract basis when all of the facts have been evaluated including: distance of the buildings from the shoreline, the nature of the shoreline, prevailing winds, the geographical location, lie of the land etc. or, in the case of an industrial environment, factors such as known pollutants e.g. aircraft exhaust emissions, railway vehicle brake dust, chemical plant effluent etc.

In order to simplify this procedure the marine / industrial guarantee request form must be completed in every case so that a full assessment can be made. The result of this will be made known in writing to the originator with a copy to the Approved Applicator. In order to comply with requirements of the Synthatec Matt product guarantee certain extra stipulations will apply.

They are:

1. The minimum film thickness is increased to 60 microns.
2. All joints or water traps must be sealed with an approved mastic.
3. There shall be no exposed bare metal edges. NB: This excludes mitre joints where the joint is crimped and sealed with an approved 2 pack adhesive or small joint sealer.
4. Fully corroborative documented records showing cleaning periods not exceeding 3 months must be kept.



For full details of these requirements, please contact your applicator or Valspar.

Any guarantee offered will be for a period of up to 25 years*. It will only be considered with the prior knowledge of the proposed Approved Applicator, who will be party to the guarantee and who will have, jointly, assessed the risk.

*15 years for Synthatec Gloss & Satin

GUARANTEES ARE ONLY OFFERED IN CONJUNCTION WITH THE GUARANTEE OF APPLICATION FROM THE SYNTHATEC APPROVED APPLICATOR AND WILL NOT BECOME OPERATIVE UNTIL CONFIRMATION IS RECEIVED BY VALSPAR IN WRITING THAT THE COATING HAS BEEN APPLIED BY AN APPROVED APPLICATOR.

THIS CONFIRMATION WOULD NORMALLY COME VIA THE ORIGINATOR OF THE GUARANTEE REQUEST.

REQUEST FOR MARINE/INDUSTRIAL GUARANTEE

Please complete the following so that an accurate assessment can be made:

NAME OF SYNTHATEC APPLICATOR	
PROJECT NAME AND ANY REF. NO.	
LOCATION INCLUDING FULL ADDRESS	
FABRICATOR(S)	
ARCHITECT	
SUBSTRATE (ALUMINIUM OR GALV.STEEL)	
COMPONENTS TO BE COATED	
PROUCT AND COLOUR REFERENCE (eg GLOSS, MATT OR METALLIC, SYNTHATEC PREMIUM)	
DISTANCE IN METRES FROM NEAREST SHORE- LINE/CREEK/HARBOUR ETC	
TYPE OF FORESHORE (EG. SAND, SHINGLE, ROCK)	
NUMBER OF FLOOR LEVELS	
DIRECTION BUILDING FACES	
IF INDUSTRIAL ENVIRONMENT GIVE DISTANCE FROM SOURCE OF POLLUTANT	
TYPE OF INDUSTRIAL POLLUTANT	
HAS PROPOSED BUILDING ANY OTHER BUILDINGS OR LANDSCAPE GIVING PROTECTION OR IS THE LAND FULLY EXPOSED	
ARE THERE ANY OTHER ENVIRONMENTAL CONDITIONS TO TAKE INTO CONSIDERATION	
RESULT OF THIS ENQUIRY (To be completed by Valspar.)	
NORMAL GUARANTEE	MARINE GUARANTEE
	NO GUARANTEE

THIS FORM MUST BE ACCOMPANIED BY A SCALED PLAN AND/OR ORDINANCE SURVEY MAP MARKING THE PROPOSED PROJECT.
ONCE COMPLETED, THIS FORM WILL BE MARKED WITH OUR DECISION AND RETURNED TO ITS ORIGINATOR WITH A LETTER OF RECOMMENDATION AND A COPY TO THE APPROVED APPLICATOR

THE SYNTHATEC SYSTEM IN SWIMMING POOL ENVIRONMENTS

Since the early seventies the Synthatec System has been used successfully in chlorinated atmospheres as found in swimming pool areas. Two of many such examples are the Vale of Glamorgan Leisure Centre, and the Spennymoor Leisure Pool, for Sedgfield District Council. On these projects the Synthatec System was specified for aluminium window and doorframes, screens, balustrades, exterior cladding, guttering and brackets.

Inspections of the above buildings have shown no signs of coating failure and support the suitability of the Synthatec System in such environments.

In addition to the practical experience gained from these and other similar contracts, laboratory tests have been carried out whereby Synthatec coated panels were immersed in chlorinated water, as used in the potentially more hazardous swimming pools, for a period of 650 hours, with the water at a constant temperature of 60°C. The test was terminated with no discernible effect on the coating.

In addition, recent methods of disinfection have led to reductions in the levels of chlorination used in swimming pools and the introduction of ozone and ultra violet light as alternative means of ensuring water quality. The Synthatec System is equally resistant to these methods of pool hygiene.

Valspar is prepared to consider guarantees for projects in swimming pool environments on an individual basis, but the following minimum additional requirements should be noted.

1. **Film Thickness**

The **minimum** film thickness of the Synthatec coating on all significant surfaces, must be increased to **60 microns** (applies to all substrates).

2. **Water Traps**

There shall be no water traps in the design of the windows, curtain walling or any other Synthatec coated components.

3. **Pool Contents**

Information is required on water composition and operating conditions prior to any Guarantee being given (see attached form).

4. **Jig Points**

These should be avoided wherever possible and in any case only allowed on secondary or unseen surfaces. It is recommended where jig marks occur these should be given remedial treatment after assembly and prior to installation (See Repair Procedure for Synthatec TAS13).

5. **Mechanical Processes**

Whilst every endeavour should be made to avoid any crimping, punching, drilling and sawing etc. after coating, it is recognised a limited amount of work may occur. Where this is the case remedial treatment (See Repair Procedure for Synthatec TAS13) should take place immediately and suitable inserts must be used to isolate the untreated aluminium from the atmosphere, i.e. drainage slots, etc. Where possible, cut edges should be coated using a suitable coating system prior to assembly and installation. The chosen product manufacturer should confirm suitability for this system. Bare metal edges should be avoided.

6. **Damage**

Where damage to the coating occurs, it must be repaired immediately. Should damage occur during fabrication or on site, it is necessary to apply a repair procedure (See Repair Procedure for Synthatec) immediately. It is suggested that this is carried out by the fabricator/installer.

7. **Cleaning**

Cleaning should take place at intervals not exceeding 3 months, with fully documented records being maintained throughout any Guarantee period.

It should be noted that the initial cleaning cycle shall commence at a maximum of 3 months after the first component is installed (See Synthatec TAS11).

8. **Low Tack Tapes**

Where it is necessary to use tapes as a form of protection, these must be of a low tack quality and must not be left in contact with the surface longer than six months (See 'Use of Low Tack Self Adhesive Tapes' on Synthatec TAS9).

9. **Sealants & Mastics**

Where it is necessary to use sealants and mastics on surfaces coated with the Synthatec System, reference should be made to TAS9.

10. **Electrolytic Cells in Fixing**

Every effort should be made to avoid the use of dissimilar metals, thereby setting up electrolytic cells. Where this is unavoidable suitable sealants/ mastics must be used to isolate the various components from each other.

11. **Quality Procedures**

For a Swimming Pool Guarantee to apply, the Approved Applicator will use a higher level of inspection, quality control and sampling. This inspection procedure shall be at least in accordance with BS6001 Part 1:1999 Inspection Level III (using appropriate AQL) using Normal, Reduced and Tightened Inspection as required.

12. **Galvanized Substrates**

The pretreatment used for galvanized substrates should be as recommended by the respective pretreatment supplier.

13. **Plant Rooms**

Any coated components, within swimming pool plant rooms, are expressly excluded from any guarantee offered.

14. **Additional Requirements**

It may be necessary, for particular projects, that following evaluation of the specific circumstances related to the project, further technical requirements are specified.

The final guarantee offer of up to 25 years will not be granted without the completion of the attached 'Swimming Pool Environment' request form and full consultation with the proposed Synthatec Applicator.

Further copies can be obtained from Valspar.

REQUEST FOR SWIMMING POOL ENVIRONMENT GUARANTEE

Please complete the following so that an accurate assessment can be made:

NAME OF SYNTHATEC APPLICATOR	
PROJECT NAME AND ANY REF. NO.	
LOCATION INCLUDING FULL ADDRESS	
CLIENT'S NAME	
FABRICATOR'S NAME & ADDRESS	
ARCHITECT'S NAME & ADDRESS	
TYPE OF SUBSTRATE AND DETAILS OF COMPONENTS TO BE GUARANTEED, (EG. ALUMINIUM OR GALVANIZED STEEL -DOORS, WINDOWS OR HANDRAILS)	
POOL WATER TEMPERATURES - MAIN POOL	
POOL WATER TEMPERATURES - SPA POOLS	
AIR TEMPERATURE INSIDE BUILDING	
HUMIDITY LEVEL	
TYPES & CONCENTRATION OF CHEMICALS USED IN WATER.	
PRODUCT AND COLOUR REF. OF POWDER COATING AND GLOSS LEVEL, IE; GLOSS, MATT METALLIC, SYNTHATEC PREMIUM	
DISTANCE OF COATED COMPONENTS FROM POOLSIDES	
IS THE WATER TREATED WITH CHLORINE, BY UV OR OZONE ETC. STATE WHICH	

RESULT OF THIS ENQUIRY (To be completed by Valspar)

Swimming Pool Environment Guarantee delete where applicable	* Granted	* Not Granted
--	-----------	---------------

Once completed, this form will be marked and dated with our decision and returned to its originator with a letter of recommendation and a copy to the Approved Applicator



SYNTHATEC

PRODUCT PERFORMANCE
&
APPLICATOR REQUIREMENTS

Valspar Powder Coatings Ltd.

June 2007

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1. Performance of the Applied Synthatec Coating

1.1a **Test Panels (Aluminium)**

Test panels prepared in accordance with Appendix A1 shall be used for the testing of the performance of the coating both at Valspar and the Approved Applicators. Extrusion offcuts will also form part of this test programme.

1.1b **Test Panels (Galvanized Steel)**

Test panels and/or sections in accordance with Appendix A2 shall be used for the testing of the performance of the coating at both Valspar and the Approved Applicators.

1.2 **Test for Adhesion Cross Hatch**

Test method in accordance with BS EN ISO2409 2007 - no detachment of film from substrate other than debris from the cutting operation. Co-efficient zero.

*1.3 **Test for Flexibility**

Test method in accordance with BS EN ISO6860 2006. No cracking, flaking or film deformation above 6mm.

*1.4 **Erichsen Cupping Test**

Test method in accordance with BS EN ISO 1520 1999 using an indentation of 6mm. No cracking of the coating or detachment from the substrate.

1.5 **Scratch Resistance**

Indentation test method in accordance with BS EN ISO 1518 2001 using a 4000g weight and a 1mm diameter tungsten ball. No penetration to the substrate.

*1.6 **Impact Resistance**

Test method in accordance with BS6496:1984 Clause 16. No cracking or detachment of coating @ 0.23m kg - 20"/lbs impact.

*Aluminium substrates only.

1.7 **Drill, Mill and Saw**

Test panels or sections to withstand drill, mill and sawing action similar to the rigours of fabrication after coating.

1.8 **Mortar Resistance**

Test method in accordance with BS6496:1984 Clause 14 and BS6497:1984 Clause 14.

1.9 **Acetic Acid/Salt Spray Resistance**

Test method in accordance with BS6496:1984 Clause 15 and BS6497:1984 Clause 15 for a period of 1000 hours for aluminium substrates and 500 hours for galvanized steel. Corrosion creep will be less than 2.0mm from score lines. There shall be no blistering, softening or detachment of the coating.

1.10. **Artificial Environmental Tests**

Light Resistance - EN ISO 11341:1994/7

Wool Scale 6 (BS1006) after 2000 hours. A colour change may occur in the shade of the coating without affecting the uniform appearance.

Degree of Gloss - ISO 11341:1994/7

The gloss level shall be 30 ± 7 units when measured using an incidence angle of 60° . Any gloss reduction occurs evenly over the surface without adversely affecting the uniform appearance of the coating.

Weather Resistance - EN ISO 11341:1994/7

Colour change shall correspond with 'Grey Scale' 4 or greater after 2000 hours.

1.10.1 **Natural Weathering Resistance**

Synthatec Matt and Synthatec Metallics are designed to decorate and protect architectural metalwork exposed to extreme weather and ultraviolet conditions. Rigorously tried and tested including five years of the most arduous weathering tests in South Florida and with no cracking, crazing or flaking of the coating. When the coating of the exposed test panel is examined for signs of chalking in accordance with EN ISO 11341, the surface of the velvet shows no chalking in excess of the minimum illustrated in the photographic standards of ASTM D659:1980.

In addition, when subjected to accelerated EMMAQUA ® weathering tests Synthatec Matt and Synthatec Metallics give weatherability performance equivalent to a three year South Florida natural exposure test.

1.11 Humidity Resistance

Reference EN ISO 6270:2001 / BS 3900 F9. Synthatec shows no effect after 3000 hours.

1.12 Sulphur Dioxide Resistance

Reference EN ISO 3231:1998. Synthatec shows no colour change, softening, blistering or loss of adhesion after 576 hours. This test demonstrates the excellent properties of the coating when exposed to an industrial atmosphere.

1.13 Colour Consistency

Colour consistency shall be assured not only within one batch but from batch to batch within the delivery for one complete project. Consistency will be judged in general under the conditions described by BS950 Part 1 'Artificial Daylight' for the assessment of colour - Illuminant for colour matching and colour appraisal, ie: inspection under the light of 750 lux to 3200 lux at a colour temp of 6500°K @ 45° angle unless otherwise stated.

In case of disagreement between the Specifying Officer and the supplier, a calibrated reflectometer shall be used.

1.14 Permeability

Meets the performance requirements of BS6496:1984 Clause 17 and BS6497:1984 Clause 16. "There shall be no blistering of the coating except within 3mm of any edge of the panel".

1.15 Salt Spray

Reference ISO 9227: no effect after 3000 hours - demonstrates the excellent corrosion resistance.

2. Requirements of the Approved Applicator

2.1 Pretreatment of Aluminium

All aluminium components shall be pretreated in accordance with Appendix B.

2.2 Pretreatment of Galvanized Steel

All components shall be pretreated in accordance with Appendix C.

2.3 Surface Classification

The minimum coating thickness permitted on a significant surface is 40 microns for aluminium substrates and 60 microns for galvanized steel. However, the Specifying Officer and/or fabricator can specify a minimum in excess of 40 microns if necessary*.

2.3.1 The significant surface is defined as that surface on any component that is exposed to the external environments or faces the interior of the building in its final installed position. The minimum coating thickness permitted is as stated in Section 2.3. This surface is the most likely surface on which a higher minimum is required. When specifying a higher minimum, consideration must be given to the question of fit or possible problems with sliding components.

2.3.2 All non-significant surfaces shall be defined as those which do not affect the performance of the component when in its final installed position. On those areas the minimum film thicknesses as stated in Section 2.3 are not mandatory unless specified by the Contract Administrator / Specifying Officer / Fabricator and agreed by the Applicator. It should be noted that if components are to be coated for use in a structural silicone glazing situation, all surfaces are classed as significant. See TAS2.

* This relates to marine or other hazardous environments and Valspar should be contacted for further information. See Page 39 of the technical manual.

2.4 Quality Control Testing

2.4.1 Monitoring of the Process Using Test Panels

The minimum number of samples taken for testing shall be as per the Synthatec Guarantee. If further samples are required they can be supplied by agreement with the Specifying Officer and Valspar. The sampling requirement will depend on the type of test. Coating thickness determination will require the greatest frequency of testing. Coating thickness determination should take place on the actual work, not test panels.

Sample panels shall be prepared as directed by Appendix A1 and A2, ie: in accordance with the process and at the same time as each production run.

A sufficient number of panels shall be prepared to carry out the required tests to comply with the Guarantee.

Test panels are to be used as follows:

- for testing the physical properties of the powder used.
- for pressure cooker pretreatment testing - (Permeability).
- for retaining as a reference sample for a period of the Guarantee plus one year from the date of processing.
- for submission to Valspar. These will be retained for a period of three years from the date of receipt.

(The assessment of the process can also be carried out using additional test sections. The use of test panels is, however, mandatory).

Note 1

Test panels pretreated in bulk are not acceptable under any circumstances. All test panels must be pretreated and coated concurrently with the job they represent.

Note 2

Because the test panels must be produced concurrently with the production job they represent, it is appreciated that the film thickness on the panels may be excessive by nature of the process. Film thickness on the test panels above 80 microns may result in reduced flexibility values being obtained, for which consideration must be given in final assessment.

2.4.2 Assessment of the Physical Properties of the Powder Using Test Panels

All test panels produced must satisfy the tests detailed under 1.2, 1.3, 1.6, 1.7 and 1.14 for aluminium substrates and 1.2, 1.7 and 1.14 for galvanized steel substrates. Compliance with the remaining tests on the appropriate substrate correctly pretreated is certified by Valspar.

Procedure in the event of failure

If any of the test panels produced do not conform to the requirements detailed above then the actual components coated in production represented by the test panels shall be tested in accordance with 1.2.

The number of components to be tested is as follows:

Quantity in Batch*	No. to be tested	Acceptance No.	Rejection No.
1 - 19	All	0	1
20 - 150	20	0	1
151 - 500	80	1	2
501 - 1000	125	2	3
1001 - 3000	200	3	4

Note: Testing of the actual production where possible should be done on a hidden surface to avoid reprocessing should the components pass the test. However, the lack of a suitable hidden face or surface must not prevent compliance with this requirement.

* In the case of test panel failures, the term 'batch' refers to the number of components processed which relate to the failed test panels (usually 4 hours of production).

Action upon Rejection of Batch

If, after inspection has taken place in accordance with the table shown above, the batch is rejected, all of the coated components represented by the test panels must be reprocessed. Rejected components must be chemically stripped back to bare aluminium before reprocessing takes place. 'Double coating' of rejects is not permitted. Full details on reprocessing can be found in Appendix F of this document.

2.5 Assessment of the Finished Product

The number of components tested from each batch of work shall be based on the guidelines in BS 6001:1999 Part 1 / ISO 2859-1:1999. The Acceptable Quality Level (AQL) shall be 1.0 for normal, reduced and tightened inspection.

The attributes inspected will be coating thickness, surface appearance, gloss level and colour.

2.5.1 Determination of coating thickness on significant surfaces

The thickness of the coating shall be determined by the method given in BS EN ISO 2808:2007

The frequency of thickness readings shall be governed by the shape and size of the component being inspected. As a guide, readings should be taken at one metre intervals along stock length extrusions. For other components e.g. panels, the frequency of readings will be determined by the quality inspector who carried out the testing. The inspector must be satisfied that the number of readings taken gives a representative sample of the film thickness on each component.

If any reading is below the minimum value specified, the component shall be rejected.

If any single reading is less than 10% above the minimum value specified, three further readings shall be taken, each within 5cm of the initial reading.

If any of the 3 further readings are below the minimum value specified, the component shall be rejected.

2.5.2 **Surface Appearance**

Visual inspection under identical and repeatable conditions shall be conducted at a distance of 1.0m under the light of 750 to 3200 lux with a colour temperature of 6500°K (artificial daylight) all in accordance with BS950 Part 1. In case of dispute, instrumental inspection shall be carried out in accordance with BS1134 Part 1 & 2 Assessment of surface appearance either by 'Centre Line Average' height (CLA) or any other instrument available for the purpose.

Note: Should it prove impossible to simulate the detailed inspection conditions, an alternative agreed method acceptable to the Specifying Officer should be used. Depending on the colour used and/or the shape of the profile/component to be coated, a degree of 'orange peel' may be exhibited. The degree of 'orange peel' shall be shown, if necessary, by the provision of samples.

- 2.5.3 On galvanized components the degassing operation (as detailed in Appendix C) will normally minimise the effect of pinholing. The assessment of the visual appearance of cured coating should be from a distance of 1 metre.

Note: A degree of pinholing is inevitable with this substrate, but generally it is not detrimental to the performance of the coating.

2.5.4 **Gloss Level**

The gloss level of Synthatec Matt, Synthatec Metallics* and Synthatec Premium shall be 30 ± 7 units. The measurement should be determined according to EN ISO 2813 using an incidence angle of 60°.

*Metallic colours produce a 'light scattering' effect and, for this reason, are best assessed visually in comparison with an approved sample. Though the base (before the addition of metallic) is manufactured to 30% gloss, instrumental measurement of the applied coating may not give accurate results.

2.5.5 **Colour**

The colour and gloss of Synthatec on the significant surface when examined in accordance with BS3900:1978 Part D1 shall closely match that of a previously agreed sample.

2.6 **Curing of Synthatec**

Unless otherwise stated, the coating must be cured at 200°C for 10 minutes metal temperature. The applicator shall, therefore, ensure that the oven(s) is (are) checked within 90 minutes of the start of the production and then every eight hours thereafter using a Grant recorder or similar monitoring equipment. Any shift in temperature must be fully evaluated and the necessary action taken. Full written evidence/log relating to the curing must be retained for inspection by Valspar.

2.7 **Pretreatment Control**

The Applicator must keep a daily pretreatment log and use the pretreatment chemicals in strict accordance with the manufacturer's instructions. This log should be retained by the Applicator for inspection by Valspar. In addition regular chromate weight determinations should be carried out.

The quality of pretreatment should be tested in accordance with Section 1.14.

2.8 **Statement of Compliance**

Where requested, the Applicator will provide a written test certificate/report stating that the Synthatec coating has been applied in accordance with the manufacturer's instructions confirming that it conforms fully to Section 3, for any production job not less than £1,000 in value to the Applicator.

A specimen copy of the Synthatec Quality Control Report Form/Certificate can be found in Appendix D of this document.

INDEPENDENT INSPECTION OF THE SYNTHATEC SYSTEM

Whilst high quality is a prerequisite for the architectural market, it is a standard for Synthatec, the only architectural powder coating system that can demonstrate a proven track record dating back to the early 1970's.

All manufacturers will claim high quality and, in today's contractual climate, quality claims can prove both expensive and sometimes damaging. Delays on site as a result of poor quality coating, inaccurate colour and gloss matches, and surface contamination, can result in accumulated costs and even penalty clauses.

Synthatec is manufactured in a modern and highly efficient powder production facility, the first factory of its type to gain the prestigious ISO 9001:2000 certification, and where in-depth quality control processes ensure exacting standards are maintained.

Raw materials are comprehensively tested, resins, pigments and other ingredients are mixed together, extruded, and ground to a fine powder. At every stage, comprehensive quality control procedures ensure that the product is of the highest quality. During production, each batch is tested for colour, gloss and mechanical properties, and test panels are retained.

Only applicators approved to ISO 9001:2000 standards are considered for Synthatec Approved Applicator status. Prior to approval, applicators are subjected to a thorough approval process and test panels and extrusions processed by their plants are thoroughly tested for compliance with the Synthatec performance standards.

The real measure of quality is track record. Since the 1970's, the Synthatec system has protected and decorated major buildings and projects around the world. To date, no claim has been received against the Synthatec guarantee. In today's market, the cost of sub standard quality is the difference between profit and loss. Right first time ensures no penalty claims, no expensive litigation and no delayed payments.

By specifying Synthatec you will be guaranteed that your project will be protected and decorated by the highest quality architectural powder coating system. Synthatec is:

- Manufactured and processed by ISO 9001:2000 approved companies
- Independently assessed and certified by the British Board of Agrément
- Processed to meet the requirements of BS6496, BS6497, BS EN 12202-1 or AAMA 2604
- Supported by more than 35 years 'track record' throughout UK and Europe

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Preparation of Coated Aluminium Test Panels and /or Test Sections used by Valspar and the Approved Applicators.

A 1.1 Panel Material

Panels, 150mm x 100mm x 1.0mm shall be prepared from aluminium alloy conforming to EN573-3, AA 5005 –H14 (or suitable equivalent)* unless otherwise agreed with Valspar.

In addition to these test panels, each applicator is required to supply, for test, sample offcuts of extrusion & etc. which will, more accurately, represent the standards being achieved on actual work pieces.

A 1.2 Pretreatment

The aluminium panels shall be thoroughly cleaned by treatment with suitable alkaline or acidic solutions and rinsed as detailed in Appendix B. A conversion coating shall be applied by pretreatment with a solution containing essentially chromate or chromate/phosphate ions as the active ingredients.**

The coating weight deposited will depend on the type of conversion coating used and will be as recommended by the conversion coating chemical supplier.

The conversion coating shall be thoroughly rinsed in deionised water of conductivity not greater than 80 microsiemens and dried at the temperature and time specified by the chemical supplier. When dry, the surface must not be contaminated and application of the powder coating should be carried out as soon as possible.

A 1.3 Coating

Coat the panels with the powder coating by the appropriate method to give a cured film thickness of between 40-70 microns, when determined by the method described in BS EN ISO 2808:2007. Condition the panels by allowing to cool to a temperature of 20-25°C for a period of at least one hour before carrying out the tests.

* For new equivalent CEN standards see Appendix E

* Or an approved Chrome-free system

Preparation of Galvanized Test Panels and/or Sections.

A 2.1 Test Panels

Panels 100mm x 150mm x 1.6mm nominal size shall be prepared from steel sheet galvanized to BS EN 10142, 3 & 7 or BS EN ISO 1461:1999 (formerly BS2989:1992 (unpassivated)).

Test Sections

Window section F4 or similar, of a nominal 150mm length shall be hot-dip galvanized to BS EN ISO 1461:1999 (unpassivated).

A 2.2 Pretreatment

The test panels or sections shall be pretreated in accordance with Appendix C.

A 2.3 Galvanizing Thickness Determination

Due to the nature of the process the galvanizing thickness will vary over relatively small areas. It is, therefore, necessary to determine both the galvanizing thickness and the powder coating thickness in exactly the same place. Location of the position on the test section can be achieved by the use of a suitable template.

Along an imaginary centre line on the uncoated panel and/or the widest face of the test section, determine the galvanizing thickness at 50mm intervals using the eddy current method described in EN ISO 2808:2007 or ISO 2360:1982. The imaginary centre line on the specified six test panels and/or sections will be 150mm in length giving the two determinations. These should be recorded together with the locations from which the readings were taken.

A 2.4 Powder Coating Thickness

Coat the panels or sections with the powder coating by the appropriate method to give a cured film of a minimum thickness of 60 microns.

The powder coating thickness should be determined using the same instrumentation and data obtained from Section A 2.3. Condition the panels by allowing to cool to a temperature of 20-25°C for at least 1 hour before carrying out the tests.

Specification for the Chromate¹ Pretreatment of Aluminium
(Aluminium in accordance with BS1470*, BS1471* & BS1474*)

1. Immersion Pretreatment Process

- a) **Degreasing**
With acidic or alkaline aqueous solutions, organic solvents or aqueous emulsions.
- b) **Rinsing#**
With cold water (omitted after degreasing with organic solvents).
- c) **Etching**
Alkaline or acidic.
- d) **Rinsing#**
Omitted if no etching.
- e) **Desmutting**
As required, e.g. nitric acid.
- f) **Rinsing#**
- g) **Chromating# #¹**
- h) **Rinsing#**
With cold water.
- i) **Rinsing#**
With demineralised water. The conductivity reading of the initial drain-off water of the final rinse must not exceed 80 microsiemens at 20°C.
- j) **Drying**
Maximum 100°C metal temperature.

Rinsing must be performed carefully in order to avoid carry-over of chemicals and corrosion damage.

Chromated components should not be handled or exposed for more than 16 hours before subsequent coating. ALL CHEMICALS USED IN THE PROCESS MUST BE USED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND KNOWLEDGE.

* For new equivalent CEN standards see Appendix E

¹ Or approved 'Chrome Free' system

Specification for the Chromate¹ Pretreatment of Aluminium
(Aluminium in accordance with BS1470*, BS1471* & BS1474*)

2. Spray Pretreatment Process

a) Degreasing/Etching

Combined alkali cleaner/etch, may be used.

b) Rinse#

Cold water.

c) Rinse#

Cold water.

d) Chromating# #¹

e) Rinse#

Cold water.

f) Final Rinse#

With demineralised water. The conductivity reading of the initial drain-off water of the final rinse must not exceed 80 microsiemens at 20°C.

g) Drying

Maximum 100°C metal temperature.

Rinsing must be performed carefully in order to avoid carry-over of chemicals and corrosion damage.

Chromated components should not be handled or exposed for more than 16 hours before subsequent coating.

ALL CHEMICALS USED IN THE PROCESS MUST BE USED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND KNOWLEDGE.

* For new equivalent CEN standards see Appendix E

¹ Or approved 'Chrome Free' system

Recommended Specification for the Pretreatment of Hot-Dip Galvanized Hot Rolled Steel, Complying with ISO1461 & Hot-Dip Galvanized Preformed Steel Sheet, Complying with BS EN 10142, 3 & 7

1. **Degassing#**
At a metal temperature of not less than 220°C for a minimum of 7 minutes. This operation may be carried out either before or after the application of the conversion coating as recommended by the conversion chemical supplier.
2. **Degreasing/Cleaning**
With acidic or alkaline aqueous solutions.
3. **Rinsing# #**
With cold water.
4. **Etch Clean # # #**
With acidic or alkaline aqueous solutions. This process can be omitted at the discretion of the Applicator.
5. **Rinsing # #**
With cold water.
6. **De-Smut (as required)**
With acidic aqueous solution.
7. **Rinsing# #**
With cold water.
8. **Conversion Coating# # # #**
Chromating or Zinc Phosphating.
9. **Rinsing# #**
With cold water.
10. **Rinsing# #**
With demineralised water (conductivity of the initial drain-off water must not exceed 80 microsiemens at 20°C).
11. **Drying**
Up to a maximum metal temperature of 100°C.

Degassing is an essential procedure as it normally minimises the incidence of pinholing in the subsequent cured powder film.

Rinsing must be performed carefully in order to avoid carry-over of chemicals and corrosion damage.

Materials complying with BS EN 150 1461:1999 may need to be etch cleaned to remove any passivation. Etch cleaning should be carried out with great care so as not to remove all of the zinc layer. This stage can be omitted if the galvanizing has not been passivated.

We would advise that material complying with BS EN 10142,3 & 7 (formerly BS2989:1992) should not be etch cleaned due to the relatively thin layer of zinc which may be totally removed by the etch cleaner.

If 'white rust' is likely to be present on the zinc layer then the Applicator should be consulted as it may be impossible to remove the 'white rust' without also removing the zinc layer.

Pretreated components must not be handled or exposed for more than 12 hours before subsequent coating.

Note: It is recommended that all batches of work are noted to show that they have been supplied as conforming to BS 3100:1967 or BS EN 10142, 3 & 7 for future reference.

ALL THE CHEMICALS USED IN THE PROCESS MUST BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND KNOWLEDGE.

Synthatec
Quality Control Report Form

DECLARATION OF CONFORMITY (EN 45014:1998)

All details to be recorded by The Synthatec Approved Applicator during production.

Synthatec We: _____ Report No. _____
Approved Applicator: _____
(Name & Address) _____

Customer: _____ Order No. _____

Main Contractor: _____

Project Name: _____

Process Date/Time: _____ Despatch Date: _____

Substrate: _____ Item: _____

Pretreatment: _____

Powder Code: _____ Batch No. _____ Box No. _____

Recommended Curing Schedule: _____

Oven Recording: _____

Line No. _____

Completed by: _____ Position: _____
(Authorised Person)

Signed: _____

Date: _____ 19 _____

Place of Issue: _____

The coating applied to the materials on the above Order No. conforms to the requirements of sections 10.2 - 10.8 inclusive of BS6496:1984, (or 10.2 - 10.7 inclusive of BS6497:1984), to the Synthatec Product Performance & Applicator Requirements (September 1994) and to all respects of the contract or order as specified by the customer.

Assessment of Finished Material

Appendix D
(Page 2 of 2)

Visual Appearance : (BS6496:1984 Part 10.2) _____
(BS6497:1984 Part 10.2)

Colour: (BS6496:1984 Part 10.3) _____
(BS6497:1984 Part 10.3)

Specified Gloss: _____ Actual Gloss: _____ (BS6496:1984 Part 10.4)
(BS6497:1984 Part 10.4)

Specified Film Thickness : _____

Actual Film Thickness: _____ (BS6496:1984 Part 10.5)
(BS6497:1984 Part 10.5)

Assessment of Test Panels

Test panels to be prepared in accordance with Synthatec Product Performance & Applicator Requirements (October 2003).

<u>Test</u>	<u>Specification</u>	<u>Result</u>
Visual Appearance	BS6496/BS6497:1984 Part 10.2	_____
Colour BS3900 Part D1:1978	BS6496/BS6497:1984	_____
Gloss BS EN ISO2813:2000	BS6496/BS6497:1984 Part 10.4	_____
Film Thickness BS EN ISO 2808:2007	BS6496/BS6497:1984 Part 10.5	_____
Adhesion BS EN ISO2409:2007	Classification 0	_____
Impact BS6496:1984 Clause 16*	No cracking/detachment	_____
Conical Mandrel BS EN ISO6860: 2006*	No cracking at 6mm	_____
Drilling	No Flaking	_____
Milling	No Flaking	_____
Sawing	No Flaking	_____
Permeability BS6496:1984 Part 4.13 BS6497:1984 Part 4.11	No Blisters - except within 3mm of edges	_____

* These tests are not applicable to galvanized substrates

Packages of European Standards to Replace Existing British Standards Concerning Aluminium & Aluminium Alloys for General Engineering Applications.

BS1470:1987 Wrought aluminium & aluminium alloys for general engineering purposes - plate, sheet & strip.

- EN 515** Aluminium & aluminium alloys - Wrought products - Temper designations
- EN 573-3** Aluminium & aluminium alloys - Chemical composition & form of wrought products. Part 3: Chemical composition
- EN 573 - 4** Aluminium & aluminium alloys - Chemical composition & form of wrought products. Part 4: Forms of Products
- EN 485 - 1** Aluminium & aluminium alloys - Sheet, strip & plate
Part 1: Technical conditions for Inspection & Delivery
- EN 485 - 2** Aluminium & aluminium alloys - Sheet, strip & plate
Part 2: Mechanical Properties
- EN 485 - 3** Aluminium & aluminium alloy - Sheet, strip & plate
Part 3: Tolerances on shape and dimensions for hot rolled products
- EN 485 - 4** Aluminium & aluminium alloys - Sheet, strip & plate
Part 4: Tolerances on shape and dimensions for cold rolled products

BS1471:1972 Specification for wrought aluminium & aluminium alloys - Drawn tube

- EN 515** Aluminium & aluminium alloys - Wrought iron products - Temper designations
- EN 573 - 3** Aluminium & aluminium alloys - Chemical composition & form of wrought products. Part 3: Chemical composition
- EN 573 - 4** Aluminium & aluminium alloys - Chemical composition and form of wrought products. Part 4: Forms of products
- EN 754 - 1** Aluminium & aluminium alloys - Cold drawn rod/bar & tube
Part 1: Technical conditions for Inspection & Delivery
- EN 754 - 2** Aluminium & aluminium alloys - Cold drawn rod/bar & tube
Part 2: Mechanical Properties
- EN 754 - 7** Aluminium & aluminium alloys - Cold drawn rod/bar & tube
Part 7: Seamless tubes, tolerances on dimensions & form
- EN 754 - 8** Aluminium & aluminium alloys - Cold drawn rod/bar & tube
Part 8: Porthole tubes, tolerances on dimensions & form

BS1474:1987 Specification for wrought aluminium & aluminium alloys for general engineering purposes: bars, extruded round tubes & sections

- EN 515** Aluminium & aluminium alloys - Wrought iron products - Temper designations
- EN 573 - 3** Aluminium & aluminium alloys - Chemical composition & form of wrought products
Part 3: Chemical composition
- EN 573 - 4** Aluminium & aluminium alloys - Chemical composition and form of wrought products
Part 4: Forms of products
- EN 755 - 1** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 1: Technical conditions for Inspection & Delivery
- EN 755 - 2** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 2: Mechanical Properties
- EN 755 - 3** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 3: Round bars, tolerances on dimensions & form
- EN 755 - 4** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 4: Square bars, tolerances on dimensions & form
- EN 755 - 5** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 5: Rectangular bars, tolerances on dimensions & form
- EN 755 - 6** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 6: Hexagonal bars, tolerances on dimensions & form
- EN 755 - 7** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 7: Seamless tubes, tolerances on dimensions & form
- EN 755 - 8** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 8: Porthole tubes, tolerances on dimensions & form
- EN 755 - 9** Aluminium & aluminium alloys - Extruded rod/bar, tube & profiles
Part 9: Profile, tolerances on dimensions & form
- EN aaa - 1** Aluminium & aluminium alloys - Extruded precision profiles in alloys
EN AW6060/EN AW 6063 - Part 1: Technical conditions for Inspection & Delivery
- EN aaa - 2** Aluminium & aluminium alloys - Extruded precision profiles in alloys
EN AW 6060/EN AW 6063 - Part 2: Tolerances on dimensions & form

The Re-Processing of Non-Conforming Synthatec Coated Components

As with all processes, the application of Synthatec powders to the chosen substrate will sometimes produce components that will be rejected because the applied Synthatec powder does not meet all the requirements of the Synthatec Product Performance & Applicator Requirements e.g. low film thickness, inclusions, etc.

During the inspection process at the Approved Applicator, any such components will be classed as non-conforming and will be subjected to the relevant procedures as stated in the Approved Applicators Quality Manual.

In the majority of cases this will involve re-processing. There are two methods of re-processing rejected powder-coated materials as follows:

1. Double Coating

This involves the rejected material being sent through the coating booth and curing oven for a second time. The intercoat adhesion between the first layer of powder and the second layer of powder will be very poor as powder coatings are formulated to give good adhesion to metallic substrates and not to other powders. This poor intercoat adhesion may lead to delamination of the top layer after a short period of time.

Components treated in this way do not meet the requirements of the Synthatec Product Performance & Applicator Requirements, and are not covered by the Synthatec Guarantee.

2. Chemical Stripping

This involves the rejected material being immersed in a chemical solution, which attacks the Synthatec coating and consequently removes it from the substrate. The components are then withdrawn from the solution and all traces of the original powder coating, and pretreatment chemicals, are removed using a high-pressure water jet. Any traces of Chromate pretreatment remaining on the metal surface will reduce the effectiveness of the subsequent pretreatment processing.

This chemical stripping can be carried out either in-house at the Approved Applicators (if the facilities are available) or by a specialist sub-contractor. In either case it is vitally important that the chemicals are used in strict compliance with the manufacturers instructions. It is also important that the stripped components are handled carefully and are completely free from the original coating as any residual deposits may cause problems during further stages of re-processing.

When the component has been reduced back to bare metal it is processed in the same way as virgin material i.e. pretreatment, powder coating, curing. This method of reprocessing is the only method that is approved by Valspar. Work that has been processed in this way will carry the Synthatec Guarantee at the discretion of the Approved Applicator concerned.

There are some instances where chemical stripping may not be possible. These include when materials have been thermally broken, and when steel is used which has a very thin layer of zinc. i.e. zintec or galvatite. In these cases the stripping solution may attack the materials and render them unfit for use.

Any queries on reprocessing should be addressed to an Approved Applicator or Valspar.

Synthatec Anti-Graffiti Coatings

Over recent years the Synthatec product range has been regularly tested for use in underground railway and railway vehicle applications.

The major hazards, in underground stations and railway vehicles, tend to be of smoke emission from fire, spread of flame, toxic fumes and general wear and tear from the millions of passengers who use railway services each year. The complete product range from Synthatec has been tested, extensively, against these hazards and has achieved high performance and certification for use in these locations.

Unfortunately, areas of public access now often suffer from another problem, that of GRAFFITI. Several coating products are currently available, and these offer some protection. However, the harsh cleaners and chemicals used to remove felt tip marker pen and aerosol spraypaint (& etc.), often damage the surface of the affected component.

Late in 1995, Valspar submitted to London Underground Limited, a revolutionary new coating called Synthatec A.G. (Anti-Graffiti). Not only did it pass all of the safety testing, but it also achieved exemplary results in the demanding graffiti removal tests (The full cycle of testing is rarely completed without failure). Following this test programme, L.U.L. described Synthatec A.G. as the most graffiti resistant powder coating that the authority had ever tested.

Synthatec A.G, now readily available through any one of the Synthatec Approved Applicators on the list of applicators available from Valspar, has already been used extensively on railway vehicles for Scotrail, Gatwick Express, Virgin (West Coast) and Southwest Trains.

It is suitable for all the usual substrates situated internally, and is available to order in RAL, NCS and BS 4800 satin (60% gloss) shades as well as some metallics.

Synthatec A.G. fully meets the L.U.L. Code of Practice for Fire Safety on the Underground when used on aluminium.

A technical data sheet is available from Valspar on request. Sample panels showing colour and finish can be obtained by contacting our dedicated sales fax number: 0121 322 6902.



Synthatec in Use

Further information relating to completed contracts and the use of Synthatec is available on the Synthatec website:

www.synthatec.com

Further product information can be found in

'RIBA PRODUCT SELECTOR'
(RIBA Information Services)

Synthatec specifications are contained within NBS PLUS format and subscribers to 'Specification Manager' and 'Specification Writer' can locate the information within NBS Sections H10, H11, H13, L10, L20, L30, R10 & Z31

CI/SfB |
CAWS
DATE:

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Z31

DRAFT

Specification Guide

Specification for **Synthatec®**

30 year* guaranteed matt and metallic Superdurable Polyester Powder Coating for aluminium alloy and galvanized steel

Synthatec

GUIDANCE NOTES

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GENERAL GUIDANCE NOTES

It is important that the details given in any specification ensure that the components installed on site meet the stated requirements of the specifier and the clients; equally important is the need to comply with the recommendations of the manufacturer and advisory bodies and with the restrictions or limitations set by certifying, assessment or testing bodies and issuers of guarantees.

For finishing with **Synthatec**, it is not merely the colour, gloss level and generic type of treatment which must be specified, but also a range of conditions, set out in the guidance notes, which enable us to provide our guarantee of up to 30 years, for a product with a life expectancy in excess of 30 years

INTRODUCTION

VALSPAR CORPORATION

The Valspar Corporation is one of the largest global coatings manufacturers in the world, providing coatings and coating intermediates to a wide variety of customers. Since 1806, Valspar has been dedicated to bringing customers the latest innovations, the finest quality, and the best customer service in the coatings industry.

With more than 7,000 employees in over 80 locations around the world, Valspar is in a truly unique position to supply customers with the coating solutions they need.

Valspar is a major world-wide producer of thermosetting powder coatings, marketing on a world-wide basis from manufacturing plants in the USA, UK and China

In the United Kingdom, Valspar Powder Coatings Ltd is the powder coating trading company, manufacturing an extensive range of powders for automotive, appliance, industrial and architectural markets.

SYNTHATEC

SYNTHATEC is a registered trademark of Valspar Powder Coatings Ltd, manufactured at the Birmingham factory and marketed throughout the British Isles by Valspar.

SYNTHATEC, since its inception in the 1970's, has been the pacesetter in terms of innovation, quality and colour. It has over 30-years track record and has added beauty, elegance and interest to thousands of prestigious buildings.

SYNTHATEC product development also works in unison with designers, ensuring innovative technologies and finishes are always available to meet the future needs of the specifier.

SYNTHATEC dominates the architectural market place for polyester powders and can justifiably claim to have changed the face of British architecture.

TECHNICAL EXCELLENCE

The Valspar philosophy is to extend its market leading position by ensuring that a competitive technical edge is maintained. New technology and new applications demand a constant re-appraisal of products and services and a policy of innovation in every department. The company is committed to meeting the challenge of technical development and changing customer requirements.

The focus on technical excellence is reflected in the wide range of products and services provided. Valspar offer a technically advanced bonding process for metallic finishes and an advanced range of superdurable polyester designed to decorate and protect architectural metalwork, in addition to our comprehensive range of stock products

QUALITY & RESOURCES

Valspar has a wide range of manufacturing equipment and the Aston Church Road site is a modern and highly efficient powder production facility

The factory is designed for maximum flexibility and speed producing powders that not only satisfy the needs of a wide range of customers but also profit making rapid batch turnaround and manufacturing efficiency.

Valspar has accreditation for BS EN ISO 9001 Quality Assurance standards, a comprehensive evaluation concerned not just with the quality, but with every aspect of company operations. This is a key factor in the constant effort to maintain exceptional standards of quality and service.

The **SYNTHATEC** system, the leading architectural polyester powder coating, has British Board of Agrément certification, a further confirmation of product quality and manufacturing systems. It is a matter of pride that the **SYNTHATEC** system has so far had no claims on its guarantee during the 35 years of its existence.

THE ENVIRONMENT

Caring for the Environment is now a responsibility for governments, industry and the individual. Powder coatings have major environmental benefits over traditional paints and often a parallel cost benefit. Liquid paints generally contain up to 50% solvents to enable dispersion of the resins and pigments and facilitate application. These solvents evaporate completely into the atmosphere resulting in major environmental concerns. The **SYNTHATEC** system has zero VOC (Volatile organic content), therefore solvent emissions become a thing of the past thereby creating a cleaner and safer environment

SYNTHATEC® Specification Guide

SYNTHATEC “INNOVATION WITHOUT COMPROMISE”

SYNTHATEC MATT, with its impressive technical superiority, surpasses any similar product available today.

- Superdurable formulation - 30 year Guarantee period when installed in northern Europe*.
- Complies fully with the requirements of the British Standards BS 6496 and BS 6497
- Tried and tested in Florida including EMMAQUA® accelerated outdoor weathering test results equivalent to 3 years South Florida testing
- Manufactured to BS EN ISO 9001
- Available only via 'Approved Applicators' and 'In-House Users' with ISO 9001 accreditation
- Awarded BBA Agrément Certificate No. 94/3041
- Wide range of colours ex-stock, including an exclusive range of Colour Consultant designed 'house' shades, SYNTHATEC metallic finishes, plus RAL and BS colours

SYNTHATEC is only applied by selected 'Approved Applicators' and 'In-House Users' each of whom carries out strict quality control procedures, as detailed in the **SYNTHATEC** "Product Performance and Applicator Requirements" Section 2 – "Requirements of the Approved Applicators", and is monitored by Valspar. This ensures total control over the preparation and application procedures.

Not only has each applicator been independently assessed and accredited with ISO 9001 certification but their operations and procedures form part of the assessment in the granting of the current British Board of Agrément Certificate No. 94/3041.

It is not possible to obtain **SYNTHATEC** coated products from any applicator other than those 'Approved Applicators' or 'In-House Users' whose names are available from Valspar.

*Northern Europe is defined here as those parts of the European Union north of 48° latitude.

SPECIFYING SYNTHATEC

In view of the foregoing points, it is vitally important to include all relevant issues in your contract specification, in order to ensure that you have **SYNTHATEC** applied to your building.

NO OTHER SPECIFICATION SHOULD BE USED FOR THE SYNTHATEC SYSTEM.

The 30 year **SYNTHATEC** Guarantee* will only automatically apply to work coated to the **SYNTHATEC** specification as issued by Valspar.

This Specification includes the points that must be made clear to all parties in the contract specification in order to ensure that **SYNTHATEC** from Valspar is used.

*30 year guarantee applies to Synthatec Matt and Synthatec Metallics.

THIS SPECIFICATION

Specification for **SYNTHATEC** Superdurable Polyester Powder Coating for Aluminium and Galvanised Steel.

It is based on the Valspar specification text to suit current specification and Polyester powder coating practice.

It has been prepared for use on CPI (Co-ordinated Project information) organised projects using CAWS (Common Arrangement of Work Sections) SMM7 (Standard Method of Measurement edition 7) arranged specification texts.

It is intended as a stand-alone specification, however, with the introduction of work section Z31 Powder Coating in the NBS (National Building Specification) Clause Library, this Specification has been numbered to enable integration with the NBS Specification.

If integration with the NBS work section is adopted, care must be taken to ensure that the clauses selected do not contradict or undermine each other.

It will be seen that some clauses are intended as substitutes for existing NBS Clauses and others can compliment the NBS clauses.

WORD PROCESSING TEXT AVAILABLE

To enable rapid production of project specific text within designer's, specifier's or purchaser's offices, the specification text is available on the internet for download at www.synthatec.com

PROJECT SPECIFIC TEXT WRITING SERVICE

In cases where designers, specifiers or purchasers feel unable to prepare project specific text for **SYNTHATEC** using this specification guide, an alternative service is available from Valspar Powder Coatings Ltd, 95 Aston Church Road, Birmingham B7 5RQ. Tel: 0121 322 6900, Fax: 0121 322 6902.

DEFINITIONS OF ABBREVIATIONS:

Abbreviations used in the guidance notes, reference documents and specification clauses.

AMD	Amendment (usually of a BS or CP)	CP	Code of Practice (from BSI)
EU	European Union	EN	European Standard (from CEN)
BBA	British Board of Agrément	ISO	International Standards Organisation
BS	British Standards	OS	Ordnance Survey
BSI	British Standards Institution	UK	United Kingdom
CA	Contract Administrator		

REFERENCE DOCUMENTS

The BSI/CEN/ISO documents referred to in work section Z31 are:

ISO 1464.1994 Hot dip galvanised coatings on steel articles (ISO 1459, 1460, 1461)

BS 1470:1987 Wrought Aluminium & Aluminium Alloys for General Engineering Purposes – Plate, Sheet & Strip.

EN 515	Aluminium & aluminium alloys – Wrought products – Temper designations.
EN 573-3	Aluminium & aluminium alloys – Chemical composition & form of wrought products. Part 3: Chemical composition.
EN 573-4	Aluminium & aluminium alloys – Chemical composition & form of wrought products. Part 4: Forms of Products
EN 485-1	Aluminium & aluminium alloys – Sheet, strip & plate. Part 1: Technical conditions for Inspection & Delivery.
EN 485-2	Aluminium & aluminium alloys – Sheet, strip & plate. Part 2: Mechanical Properties.
EN 485-3	Aluminium & aluminium alloys – Sheet, strip & plate. Part 3: Tolerances on shape and dimensions for hot rolled products.
EN 485-4	Aluminium & aluminium alloys – Sheet, strip & plate. Part 4: Tolerances on shape and dimensions for cold rolled products.

BS 1471: 1972 Specification for Wrought Aluminium & Aluminium Alloys – Drawn Tube.

EN 515	Aluminium & aluminium alloys – Wrought products – Temper designations
EN 573-3	Aluminium & aluminium alloys – Chemical composition & form of wrought products. Part 3: Chemical composition
EN 573-4	Aluminium & aluminium alloys – Chemical composition & form of wrought products. Part 4: Forms of products
EN 754-1	Aluminium & aluminium alloys – Cold drawn rod/bar & tube. Part 1: Technical conditions for Inspection & Delivery
EN 754-2	Aluminium & aluminium alloys – Cold drawn rod/bar & tube. Part 2: Mechanical Properties
EN 754-7	Aluminium & aluminium alloys – Cold drawn rod/bar & tube. Part 7: Seamless tubes, tolerances on dimensions & form
EN 754-8	Aluminium & aluminium alloys – Cold drawn rod/bar & tube. Part 8: Porthole tubes, tolerances on dimensions & form

BS 1474:1987 Specification for Wrought Aluminium & Aluminium Alloys for General Engineering Purposes: Bars, Extruded Round Tubes and Sections.

EN 515	Aluminium & aluminium alloys – Wrought products – Temper designations
EN 573-3	Aluminium & aluminium alloys – Chemical composition & form of wrought products. Part 3: Chemical composition
EN 573-4	Aluminium & aluminium alloys – Chemical composition & form of wrought products. Part 4: Forms of products
EN 755-1	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 1: Technical conditions for Inspection & Delivery
EN 755-2	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 2: Mechanical Properties
EN 755-3	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 3: Round bars, tolerances on dimensions & form
EN 755-4	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 4: Square bars, tolerances on dimensions & form
EN 755-5	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 5: Rectangular bars, tolerances on dimensions & form
EN 755-6	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 6: Hexagonal bars, tolerances on dimensions & form.
EN 755-7	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 7: Seamless tubes, tolerances on dimensions & form.
EN 755-8	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 8: Porthole tubes, tolerances on dimensions & form.
EN 755-9	Aluminium & aluminium alloys – Extruded rod/bar, tube & profiles. Part 9: Profile, tolerances on dimensions & form
EN aaa-1	Aluminium & aluminium alloys – Extruded precision profiles in alloys. EN AW6060/EN AW 6063. Part 1: Technical conditions for Inspection & Delivery
EN aaa-2	Aluminium & aluminium alloys – Extruded precision profiles in alloys. EN AW6060/EN AW 6063. Part 2: Tolerances on dimensions & form.

BS 3900 Method of Tests for Paints

:1989	Part O	General Introduction
	Group C	Test associated with paint film formation
:1997	Part C5	Determination of film thickness = ISO 2808
	Group D	Optical tests on paint films
:1997	Part D5	Measurement of specular gloss of non metallic paint films @ 20°, 60° and 85° = DIN 67530 = ISO 2813:2000
	Group E	Mechanical tests on paint films
:1995	Part F6	Cross-cut test = SIO 2409:1995

SYNTHATEC® Specification Guide

BS 4800:1989	Schedule of paint colours for building purposes
BS EN ISO 9001:2000	Quality Management Systems – Requirements
BS 6496:1984	Powder organic coatings for application and stoving to aluminium alloy extrusions, sheet and preformed sections for external architectural purposes and for the finish on aluminium alloys extrusions, sheet and preformed sections coated with powder organic coatings.
BS 6497:1984	Powder organic coatings for application and stoving to hot-dip galvanized hot rolled steel sections and preformed steel sheet for windows and for the finish on galvanized steel sections and preformed sheet coated with powder organic coatings.
BS 7514:1989	General criteria for suppliers' declaration of conformity = EN 45014
BS EN 10143:1993	Continuously hot-dip metal coated steel sheet and strip. Tolerances on dimensions and shape.

The BRITISH BOARD OF AGRÉMENT DOCUMENTS referred to in work section Z31 are:

CERTIFICATES:

94/3041:1994	The SYNTHATEC System
	Detail Sheet 1
	Detail Sheet 2
	Detail Sheet 4
	Detail Sheet 5

OTHER DOCUMENTS referred to in work section Z31 are:

British Coatings Federation:

Code of Safe Practice – Application of powder coatings by electrostatic spraying

MANUFACTURER'S TECHNICAL INFORMATION referred to in work section Z31 is:

2007 "The **SYNTHATEC** system" Technical Manual.

The SYNTHATEC Specification

Work Section A10 PRELIMINARIES: PROJECT PARTICULARS

GUIDANCE NOTES

- 111 THE PROJECT TITLE AND LOCATION
Complete the clause to describe the nature of the project and its location. If known, give the ordnance survey reference. See guidance notes to clause Z31/212

- 141 CONTRACT ADMINISTRATOR (CA):
This may be the Architect, Project Manager or other party. Insert contact name, company, address, phone and fax number

- 200 MAIN CONTRACTOR
Complete if and when known. Insert contact name, company, address, phone and fax number.

- 201 SUB-CONTRACTOR
The SYNTHATEC powder coating applicator may not necessarily be a sub-contractor; this is largely dependent on whether he is also the metalwork fabricator, a number of companies have fully integrated extrusion/finishing/fabrication operations with SYNTHATEC 'In-House User' status. The specifier may choose the SYNTHATEC Applicator, or influence the choice, by the conditions set out in the Contract Preliminaries on Warranties and Quality Assurance. He may leave the choice to the Tenderer to allow competitive sub-tendering. The choice may be down to the size of objects to be galvanized, pre-treated and/or coated and sizes of plant available at 'Approved Applicators' works. Complete if and when known. Insert contact name, company, address, phone and fax number.

- 220 FABRICATOR
Complete if and when known. Insert contact name, company, address, phone and fax number.

- 230 APPROVED APPLICATOR
See also Guidance notes to A10/210 and Z31/214 & 221. Special equipment and expertise is required for the application of SYNTHATEC powder coatings. It must be carried out by a specialist 'Approved Applicator' in factory conditions under a quality control system. See Guidance notes to clause A10/210. Complete if and when known. Insert contact name, company, address, phone and fax number. A list of SYNTHATEC 'Approved Applicators' is available on request from Valspar and may also be found on the 'SYNTHATEC' website: www.synthatec.com

SPECIFICATION CLAUSES

- 111 THE PROJECT TITLE AND LOCATION: _____
 A Project title:
 B Type of project:
 C Site Location:

- 141 CONTRACT ADMINISTRATOR (CA): _____
 A Contact Name:
 B Company:
 C Address:
 D Phone No:
 E Fax No:

- 200 MAIN CONTRACTOR: _____
 A Contact Name:
 B Company:
 C Address:
 D Phone No:
 E Fax No:

- 201 SUB CONTRACTOR
 A Contact Name:
 B Company:
 C Address:
 D Phone No:
 E Fax No:

- 220 FABRICATOR: _____
 A Contact Name:
 B Company:
 C Address:
 D Phone No:
 E Fax No:

- 230 APPROVED APPLICATOR: _____
 A Contact Name:
 B Company:
 C Address:
 D Phone No:
 E Fax No:

The SYNTHATEC Specification

Work Section Z31 SUPERDURABLE POLYESTER POWDER COATING

GUIDANCE NOTES

121 POWDER COATING TO:

Repeat the clause as often as is necessary to cover each coating type, background or colour used, to indicate all variations. In each case add a revision letter or increase the number so each version of the clause has a unique number to help identify it when cross referencing e.g. 121A, 121B or 122, 123 etc. Describe the application in the title e.g. CURTAIN WALLING, DOORS etc.,

- A Select the relevant background and delete other. If both are used repeat the clause to describe each application.
- H Reference number defines type of finish, gloss level and colour.
- I Use to allow double checking of the reference number by all parties
- K Insert 40 for aluminium backgrounds, 60 for galvanized steel.
- L Select the relevant product and delete the other.

GENERAL WORKMANSHIP REQUIREMENTS

211 CONFORMITY REQUIREMENTS:

- A It is important to check if alternative coatings offered by the contractor meet all of the requirements of BS6496. See clause 245. Obtain a certificate of conformity or declaration of conformity. See clauses 216, 475 or 476.

212 GUARANTEE:

A 30 year guarantee will be given for all SYNTHATEC MATT and SYNTHATEC METALLICS finishes in normal environments when requested (15 years for SYNTHATEC GLOSS & SATIN).

Please refer to the Guarantee Section of the SYNTHATEC Technical Manual.

Projects in marine or heavy industrial environments will be assessed separately for guarantee purposes.

Submit a pre-printed questionnaire with OS Map and site plans to Valspar for evaluation of terms of the Guarantee in marine and heavy industrial environments.

A copy of the pre-printed questionnaire can be found in the SYNTHATEC Technical Manual or can be obtained separately from Valspar at the address given at the beginning of this specification. See Guide Notes to clause 242 & 531.

213 AGRÉMENT CERTIFICATE:

The application of the 'SYNTHATEC System' by Approved Applicators is accredited with Agrément Certificate No: 94/3041. A copy of this certificate should be requested by the specifier. Copies are available from Valspar.

SPECIFICATION CLAUSES

Z31 SUPERDURABLE POLYESTER POWDER COATING

Clauses in work Z31 to be read with the Preliminaries A10-A55 and the Contract general conditions.

SUPERDURABLE POLYESTER POWDER COATING SYSTEMS

111 CLAUSES IN Z31: cover items general to all specification work sections dealing with galvanized mild steel or aluminium commodities to be polyester powder coated. They are to be read as part of those work sections.

121 SUPERDURABLE POWDER COATING TO: _____

- A Type: Polyester powder to BS6496 (Aluminium)
Polyester Powder to BS6497 (Galvanized steel)
- B Manufactured by an ISO 9001 (9002) certified company
- C Agrément Certificate No: 94/3041
- D Conformity requirement: See clause 211
- E Processing Conditions. See clause 320 & 321
- F Certificate of compliance. See clause 216 & 475
- G Guarantee requirements. See clause 212
- H Coating reference number: _____
- I Colour: _____
- J Gloss Level: 30%±7 units. See clause 248
- K Coating thickness: _____ microns. See clause 443
- L Reference: **SYNTHATEC Matt** or **SYNTHATEC Metallics**
- M Manufacturer: Valspar Powder Coatings Ltd.

GENERAL WORKMANSHIP REQUIREMENTS

211 CONFORMITY REQUIREMENTS:

Ensure the product and its application conforms to all relevant requirements, restrictions and recommendations of:

- A BS 6496 (Aluminium)
- B BS 6497 (Galvanized Steel)
- C Agrément Certificate No. 94/3041
- D 'The SYNTHATEC System' technical manual
- E The SYNTHATEC Guarantee
- F British Coating Federation: Code of Safe Practice

212 GUARANTEE

Provide a guarantee for a period of 30 years to the CA for approval (15 years for SYNTHATEC GLOSS & SATIN).

Ensure the coating work is carried out by the SYNTHATEC 'Approved Applicator' in accordance with the requirements of the SYNTHATEC Guarantee

213 AGRÉMENT CERTIFICATE:

Ensure the product and its application conforms to all relevant restrictions and recommendations of:

- Agrément Certificate No. 94/3041
- Provide a copy of the Agrément Certificate to the CA for approval.

216 **QUALITY CONTROL REPORT:**
A copy of the report can be found in the 'SYNTHATEC system' Manual Appendix D. This report should be completed and attached to each declaration of conformity and sent with each delivery of coated materials. See clause 476.

221 **SYNTHATEC APPROVED APPLICATOR:**
See SYNTHATEC 'Approved Applicators' published by Valspar. See guidance notes to clause 214.

240A **TESTING & COMPARISONS WITH CONTROL SAMPLES:**
Where disputes arise as to whether the coating meets this specification, Valspar will carry out tests which will form the basis of a final decision.

241 **TESTING OF COATED COMPONENTS:**
B4 See clause 243.

214 **TENDER AND CONTRACT INFORMATION:**
Ensure the name of Valspar and the colour reference number(s) specified are on all documents, together with the name of the SYNTHATEC 'Approved Applicator' when known.

215 **DOCUMENTATION**
Ensure all documents submitted to the 'Approved Applicator' clearly state the name of the Project / Development.

216 **QUALITY CONTROL REPORT:**
Supply to the CA when requested a copy of the quality control report from the 'Approved Applicator' verifying that the finish complies with the SYNTHATEC process as defined in:
A BS6496 (Aluminium)
B BS6497 (Galvanized Steel)
C 'The SYNTHATEC system' Technical Manual
D The British Board of Agrément Certificate No.94/3041
Attach to Declaration of Conformity. See clause 476.

221 **SYNTHATEC APPROVED APPLICATOR:**
Ensure that the applicator:
A is a SYNTHATEC 'Approved Applicator'
B complies fully with the SYNTHATEC 'Product Performance and Applicator Requirements'

231 **SAMPLES:** submit representative samples of the following with the tender, obtain CA's approval prior to ordering any materials required for the works:
A Coated samples of components to be used in the works showing various grades and forms of:
1 Aluminium
2 Galvanized mild steel
B Colour(s) including attached information on:
1 Colour name(s)
2 Reference number(s)
3 Gloss level(s)
4 Product reference(s)
5 Manufacturer's name
Retain sample panels until Contract Completion.
Ensure that delivered materials and coatings match samples. See also clause 325 & 441

SAMPLES AND TESTING

240A **TESTING AND COMPARISONS WITH CONTROL SAMPLES:**
In the event of any dispute contact Valspar to arbitrate.

241 **TESTING OF COATED COMPONENTS**
A Whenever possible carry out testing on the actual components or suitable test pieces, in accordance with:
1 The SYNTHATEC 'Product Performance and Applicator Requirements' Section 2.4 "Quality Control Testing"
2 BS6496 Parts 10.2-10.8 (Aluminium)
3 BS6497 Parts 10.2-10.7 (Galvanized steel)
B Where test pieces are not available, or are unsuitable for physical testing, use test panels as follows:
1 Alloy designation as in BS6496 Part 13.1
2 Galvanized steel to BS EN 10143 (formerly BS2989) as in BS6497 Part 13.1, 275 g/m2
3 Sheet to be:
(a) 1 mm thick in aluminium
(b) 1.6 mm in galvanised steel
4 Each to be coated to:
(a) 40 microns minimum (aluminium)
(b) 60 microns minimum (Galvanized steel)
C Retain test pieces or panels. See clause 325

242 FILM THICKNESS:

Every effort must be made to achieve the recommended film thickness on significant surfaces. See clause 431. Any item of work processed where the film thickness is out of specification is reject and must be stripped and reprocessed. This assessment is confined to significant surfaces and specified surfaces only i.e. those requiring coating to the full specification requirements. See clause 431.B

The agreed significant surfaces must be known to the tester and the relevant information be available to Valspar if required.

D2 & E3 Those surfaces with coating in excess of 120 microns will still be covered by the SYNTHATEC Guarantee.

243 VISUAL APPEARANCE:

Inspection of the visual appearance is essential. The visual appearance may vary slightly according to the colour in use, therefore, the tester/inspector must have available a standard panel or extrusion of each colour coated to the specified film thickness for comparative appraisal.

Metallic colours shall be visually assessed for gloss and colour. Due to the 'light scattering' effect of these products, instrumental measurement may not give accurate results.

245 IMPACT TEST:

It is important to check this is achieved by any alternative product offered by the sub-contractor if different to that specified.

246 PRE-TREATMENT QUALITY:

Where disputes arise as to whether the coating meets this specification, Valspar will carry out tests which will form the basis of a final decision.

248 GLOSS LEVEL.

SYNTHATEC METALLICS colours produce a 'light scattering' effect and, for this reason, are best assessed visually in comparison with an approved sample. Though the 'base' (before addition of metallic) is manufactured to 30% gloss, instrumental measurement of the applied coating may not give accurate results.

BACKGROUNDS, COATINGS & MATERIAL COMPATIBILITY

251 MATERIAL TO BE COATED:

Aluminium:

BS1470: alloy 1200 or 3103

BS1471: alloy 6063

BS1474: alloy 6063 TE or TF

European alloys:

BS EN 485: Parts 1, 3 & 4: alloys EN AW 1200 or EN AW 3103

BS EN 754: Parts 1,2,7 & 8: alloy EN AW 6063

BS EN 755: Parts 2-9: alloy EN AW 6063

Each with:

BS EN515

BS EN573: parts 1 & 4 (draft),

Galvanized steel to:

BS729

BS2989 (replaced by BS EN10143)

BS EN10143 (formerly BS2989).

Suitably protect materials prior to coating as to avoid scratches and blemishes which would be visible through the coating.

242 FILM THICKNESS:

Test the coated test pieces or panels in accordance with:

A ISO 2508:1997

B BS6496 Part 10.5 (Aluminium)

C BS6497 Part 10.5 (Galvanized steel)

D Requirement on test panels: see BS6496 and 6497

243 VISUAL APPEARANCE:

Test the coated test piece or panel(s) in accordance with:

A BS6496 Parts 10.2, 10.3 & 10.4 (Aluminium)

B BS6497 Parts 10.2, 10.3 & 10.4 (Galvanized steel)

C Compare the work with an approved sample standard panel or extrusion of each colour coated to the specified film thickness for comparative appraisal. See clause 441.

244 ADHESION:

Test the coated test piece of panel(s) in accordance with the procedure described in:

A BS3900:Part E6 Cross hatch test, using 2mm parallel cuts,

B BS6496 Part 10.6 (Aluminium only)

C BS6497 Part 10.6 (Galvanized steel)

D Value required: Co-efficient zero, 100% adhesion

245 IMPACT TEST:

Test the coated test piece or panel(s) in accordance with:

A BS6496: Part 16.1, Test to 20"/lb or 23 cm/kg

B BS6496 Part 10.7 (Aluminium only)

C Cracking of the finish or any detachment of film from the substrate at this test level will constitute failure.

246 PRE-TREATMENT QUALITY:

Test the coated test piece or panel(s) in accordance with:

A BS6496 Part 10.8 (Aluminium)

B BS6497 Part 10.7 (Galvanized steel)

C Test by pressure cooker described in BS6496 Clause 17

D Any blistering except within 3 mm of any edge will constitute failure.

248 GLOSS LEVEL:

Test the coated test piece or panel(s) in accordance with:

A ISO 2813:1993

B BS6496: Part 10.4 (Aluminium)

C BS6497: Part 10.4 (Galvanized steel)

D Required gloss level: 30% ± 7 units at 60 degrees

E See clause 240A

BACKGROUNDS, COATINGS & MATERIAL COMPATIBILITY

251 MATERIAL TO BE COATED

A Ensure the substrates to be coated with the SYNTHATEC system are made from materials to the appropriate British Standard(s)

B Ensure the materials and alloys are all in a suitable condition for the application of the SYNTHATEC System and are able to withstand curing temperatures of approx 200 degrees Centigrade.

SYNTHATEC® Specification Guide

260 SEALANT COMPATIBILITY

Where sealants are used these are to be of a colour agreed with the CA.

PREPARATION OF SURFACES

320 PROCESSING CONDITIONS: PRE TREATMENT:

See clause 246 for test method.

325 RETENTION OF RECORDS:

The correct pre-treatment procedure will automatically be carried out when work is processed by SYNTHATEC 'Approved Applicator' Details of the chemical process can be found in the 'SYNTHATEC System': 'Product Performance and Applicator Requirements'.

PREPARATION OF SURFACES

APPLICATION OF POWDER COATINGS

431 SIGNIFICANT SURFACES

Any item of work processed where the minimum film thickness is out of specification is reject and must be stripped and reprocessed.

This assessment is confined to significant surfaces and specified surfaces only i.e. those requiring coating to the full specification requirements.

The agreed significant surface must be known to the tester and the relevant information be available to Valspar if required

C The SYNTHATEC colour reference must be clearly marked on the drawings.

260 SEALANT COMPATIBILITY

Obtain written confirmation from the sealant manufacturer as to their suitability for use in conjunction with the 'SYNTHATEC System'

Use the products from the manufacturers list in SYNTHATEC Technical Advisory Sheet No.10: 'Sealants & Mastics for use with the SYNTHATEC System'.

320 PROCESSING CONDITIONS: PRE TREATMENT:

Ensure all material is pre-treated in full accordance with the requirements of the SYNTHATEC process.

321 PROCESSING CONDITIONS: COATING:

A Ensure the finish meets the criteria laid down by Valspar

1 The 'SYNTHATEC System' Technical Manual:

'Product Performance and Applicator Requirements'

B Ensure the finish conforms in all respects with BS6496 (Aluminium) or BS6497 (Galvanized steel)

C The SYNTHATEC 'Approved Applicator' must ensure that the curing schedule is achieved when processing the component(s), as laid down by Valspar

D Ensure the cured finish is equivalent to the colour control samples

E Ensure the colour control samples are available when requested by the CA

325 RETENTION OF RECORDS:

Retain test panels, report forms and process control records for the period for the guarantee and make them available for inspection by the CA or any nominated persons prior to fixing of the fabricated products and throughout the guarantee period.

APPLICATION OF POWDER COATINGS

431 SIGNIFICANT SURFACES

A Supply drawings with the components to be coated with SYNTHATEC

B Clearly mark which surfaces are the 'significant surfaces'

1 All visible surfaces

2 Other surfaces that require a 'full coating'

C Indicate SYNTHATEC MATT, SYNTHATEC METALLICS or SYNTHATEC GLOSS & SATIN colour reference and thickness

D Sliding fittings or other areas where a high coating thickness which may cause tolerance problems must be clearly indicated

E Obtain approval from the CA before commencing coating

432 JIGGING POINTS, VENTING AND DRAINAGE HOLES:

A No areas of uncoated metal will be accepted on 'significant surfaces' under any circumstances.

B In any area where coating is carried out after machining, satisfactory jiggling points must be agreed in advance between the fabricator and applicator

C Provide pre-treatment and galvanizing venting and drain holes where necessary

D Obtain agreement of all parties for the location of all jiggling, vent and drain holes.

E Wherever possible ensure drainage holes are in unseen areas, but in positions to give the most satisfactory result

F Ensure holes are in areas that will not weaken joints, sections or assemblies.

Submit representative sample(s) of component(s) and section(s) with the tender for CA's approval.

Samples must show design characteristics in relation to pre-treatment and galvanizing drainage and jiggling points.

SYNTHATEC® Specification Guide

441 APPEARANCE:

- A Inspection of the visual appearance is essential.**
The visual appearance may vary slightly according to the colour in use, therefore, the tester/inspector must have available a standard panel or extrusion of each colour coated to the specified film thickness for comparative appraisal.
- B This practice ensures all parties are fully aware before the work starts of what is acceptable and what can be consistently achieved during normal production.**

442 COLOUR AND GLOSS LEVEL:

See clauses 243 & 248 for test methods and guidance on metallic products.

443 COATING THICKNESS:

A Insert the clause number of the last of the clauses based on clause 121 describing the applications.

Every effort must be made to achieve the recommended film thickness on significant surfaces.

This assessment is confined to significant surfaces and specified surfaces only i.e. those requiring coating to the full specification requirements.

The agreed significant surface must be known to the tester and the relevant information be available to Valspar if required.

The SYNTHATEC Guarantee will not cover any area of coated metal that is over-coated.

Where the SYNTHATEC film thickness on a significant surface of any item of processed work does not meet the minimum film thickness, it will be rejected and must be stripped and reprocessed.

Stripping, reprocessing and recoating of rejects is an acceptable alternative to disposal of components and will be eligible for the SYNTHATEC Guarantee. See clause 531.

DELIVERY CERTIFICATION:

476 DECLARATION OF CONFORMITY:

B See Clause 216.

A standard form is included in the 'SYNTHATEC' Manual, Appendix D. It can be completed and attached to the Declaration of Conformity.

441 APPEARANCE:

- A** Ensure all visible finished surfaces are free from blisters, craters, pinholes or scratches when viewed with normal or corrected vision from a distance of 1 metre.
- B** Submit samples complying in all respects to the 'SYNTHATEC System' illustrating the surface appearance when required, for signed approval of the CA before any coating work commences.

442 COLOUR AND GLOSS LEVEL:

- A** Ensure the finish of the SYNTHATEC coated products match the samples supplied by Valspar and held by the CA
- B** See clause 243 for testing colour values & clause 248 on testing gloss levels
- C** In the event of any dispute contact Valspar to arbitrate

443 COATING THICKNESS:

A Ensure the SYNTHATEC coating has a minimum continuous film thickness on all specified surfaces of:

- 1 40 microns on Aluminium
- 2 60 microns on Galvanized steel, unless specified otherwise, see clause(s) 121 _____

B No double coating of processed work will be accepted as this invalidates the SYNTHATEC Guarantee.

455 FABRICATION REQUIREMENTS:

- A** Fabrications may be from:
- 1 pre coated stock lengths of metal cut after coating
 - 2 pre cut lengths coated after cutting, at the recommendation of the fabricator to suit the environmental conditions.
- B** State in the tender which method is to be adopted, for CA approval

DELIVERY CERTIFICATION

475 CERTIFICATE OF COMPLIANCE:

Supply to the CA when requested a Certificate of compliance to:

- A** BS6496: Part 11 (Aluminium)
- B** BS6497: part 11 (Galvanized steel)
- C** The 'SYNTHATEC System' Technical Manual
- D** British Board of Agrément Certificate No.94/3041
- E** The SYNTHATEC Specification

See also clauses 216 & 476.

476 DECLARATION OF CONFORMITY:

- A** Ensure that all relevant specifications are submitted to manufacturers or suppliers and/or standards to be achieved are stated in purchase orders.
- B** Indicate that a declaration of conformity to BS EN 45014:1998 will be required with the deliveries, with any test results attached,
- C** Obtain evidence of currency of certificates from the issuing agency for commodities carrying product or system quality marks e.g. BBA Certificate(s)
- D** Collect together (and/or obtain) and provide all declaration of conformity or other evidence supplied with each delivery, for inclusion in Operating and Maintenance manuals, to the CA to forward to the Employer.

SYNTHATEC® Specification Guide

INSTALLATION

481 PROTECTION AFTER COATING:

Powder coated surfaces may be damaged during handling, fixing or by other building operations and therefore should be fully protected until completion of all other work in the area of the installation.

A list of tape suppliers who have a range of products which are commonly used on the SYNTHATEC coated components is available on request from Valspar and is contained in the 'SYNTHATEC System' Technical Manual – Technical Advisory Sheet No.9

PROTECTION AND MAINTENANCE

512 PROTECTION DURING AND AFTER FIXING:

It is possible that damage may occur to the SYNTHATEC coated surface during handling, fixing or by other building processes carried out nearby. To reduce the risk of damage to SYNTHATEC, coated surfaces should be fully protected until completion of all other work in the area of the installation.

A list of tape suppliers who have a range of products which are commonly used on the SYNTHATEC coated components is available on request from Valspar and is contained in the 'SYNTHATEC system' Technical Manual – Technical Advisory Sheet No. 9

513 REMOVAL OF PROTECTIVE TAPES:

See the 'SYNTHATEC System' Technical Manual, Technical Advisory Sheet 9.

531 RECTIFICATION OF DAMAGE:

Over coating with repair system is unacceptable as it invalidates the SYNTHATEC Guarantee. See clause 212 & 242. Stripping, reprocessing and recoating of rejects is an acceptable alternative to disposal of components and will be eligible for the guarantee.

Site rectification is not covered by the SYNTHATEC Guarantee.

541 CLEANING DOWN:

The SYNTHATEC Customer Care Manual is available upon request from Valspar or the Approved Applicator.

This clause may need to be modified to reflect the parties involved in the contract and the procurement method adopted on the Project.

Take care to ensure this clause does not contradict any clause in the preliminaries or contract.

550 MAINTENANCE OF THE SYNTHATEC SYSTEM:

The SYNTHATEC Customer Care Manual is available upon request from the Approved Applicator or direct from Valspar.

INSTALLATION

481 PROTECTION AFTER COATING:

Ensure the **SYNTHATEC** coated surfaces are taped or otherwise protected and the following recommendations shall be adopted:

- A Ensure protective tapes are applied by the fabricator or manufacturer.
- B Ensure the **SYNTHATEC** coated surfaces to which they are applied are free from dirt, oil, cement or other surface contaminants.
- C If necessary clean the surfaces using a soft cloth dampened with white spirit.
- D The surface must be dry before tape application
- E Fully protect the **SYNTHATEC** coated surfaces which are likely to be damaged during handling or fixing. See also clause 512.

PROTECTION AND MAINTENANCE

512 PROTECTING DURING AND AFTER FIXING:

Ensure the **SYNTHATEC** coated surfaces are taped or otherwise protected and the following recommendations shall be adopted:

- A Fully protect the **SYNTHATEC** coated surfaces which are likely to be damaged during handling, fixing or by other building processes being carried out nearby until completion of all other work in the area of the installation.
- B If during fixing any tape is removed from the components, renew it afterwards and leave in position.
 - 1 for up to a further 6 months
 - 2 until final removal when instructed by the Main Contractor. Ensure tapes are removed at the end of a period not exceeding 6 months.
- C Apply new tapes if further protection is required after the 6 months. See clause 481 Items B-D.

513 REMOVAL OF PROTECTIVE TAPES:

- A Do not allow tapes to remain on the **SYNTHATEC** coated surface for longer than 6 months.
- B Where necessary, remove any residual adhesive left on the **SYNTHATEC** coating following removal of the protective tapes by wiping with a white spirit dampened cloth.
- C Solvents or cleaning solutions containing esters, ketones, chlorinated hydrocarbons or alcohols must not be used, as these will be detrimental to the coating.

531 RECTIFICATION OF DAMAGE:

- A During fixing, glazing or sealant work, rectify any damage that occurs immediately, do not leave until the end of the installation.
- B Only carry out site rectification of damage with the CA's prior approval and in accordance with the recommendations in **SYNTHATEC** Technical Advisory Sheet No: 13: **SYNTHATEC** Remedial Systems.
- C Remove and replace damaged panels or remove, strip and recoat damaged coating.

541 CLEANING DOWN:

- A Ensure the sub-contractor maintains the **SYNTHATEC** coated components until practical completion, after which protection will be the Main Contractor's responsibility until hand-over.
- B Liaise with the Main Contractor to ensure that other sub-contractors cannot damage the work prior to practical completion and thereafter until handover.
- C Ensure cleaning down is carried out in accordance with the **SYNTHATEC** System Customer Care Manual and the **SYNTHATEC** Guarantee.

550 MAINTENANCE OF THE SYNTHATEC SYSTEM

Ensure the appointed sub-contractor supplies copies of the **SYNTHATEC** System Customer Care Manual to the Main Contractor covering cleaning and maintenance of the coated surfaces.

END OF WORK SECTION Z31

SYNTHATEC® Specification Guide

VALSPAR POWDER COATINGS LTD DISCLAIMER

The information given in this document is not intended to be exhaustive and any person using the product for any purpose other than that specifically recommended in this document and without prior arrangement with Valspar does so at his own risk. Please contact Valspar for further information about the product.

Whilst we endeavour to ensure that all information and advice we give about the product (whether in this document or otherwise) is correct, it is liable to modification from time to time in the light of our experience and our policy of continuous product development. We specifically draw your attention to the fact that we have no control over the quality or condition of the substrate or many factors affecting the use and application of the product, and accordingly we cannot accept liability for any loss or damage by them.

We provide a guarantee for the product, as set out in this letter, and we acknowledge our liability for death or personal injury caused by our negligence, and any liability under the Consumer Protection Act 1987. We do not however accept any other liability, whether for negligence, failure of the product to be of merchantable quality or fit for any particular purpose, misrepresentation, or otherwise, howsoever, and subject to the foregoing we shall under no circumstances be liable for any consequential or indirect loss or damage, including loss of business or profits.

VALIDITY DATE: It is a company policy to update this product documentation when necessary.

SYNTHATEC IS A UK REGISTERED TRADEMARK OF VALSPAR CORPORATION.

30 yr Guarantee



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GUARANTEE FOR THE COATING OF ALUMINIUM ALLOYS* AND GALVANIZED STEEL*

We, Valspar Powder Coatings Ltd of 95 Aston Church Road, BIRMINGHAM, B7 5RQ, manufacturers and suppliers of SYNTHATEC MATT / SYNTHATEC METALLICS powder coatings (hereinafter referred to as SYNTHATEC or referred to as the product), for heat treated application to aluminium pressings, sheeting and extrusions and galvanized steel* hereby guarantee that our SYNTHATEC MATT / SYNTHATEC METALLICS coating will, subject to the provisions of this guarantee, have the following properties for a period of 31 years from the date of application of the coating or for a period of 30 years from the date of installation of the coated article.

1. ADHESION

Adhesion of the product as delivered to the Applicator when measured by reference to BS3900 Part E6:1992 will have cross-cut coefficient zero on a panel prepared and coated in strict accordance with the specified process and coated to a maximum of 100 micrometres.

2. DEGREE OF GLOSS

At the time of delivery of the product to the Applicator the degree of gloss will be within five units of the standard for the product. The measurement will be taken using the procedure described in BS3900 Part D5:1980 using an incidence angle of 60° and will be measured after the film has been cured at the recommended stoving schedule. Any gloss reduction occurs evenly over the surface without adversely affecting the uniform appearance.

3. LIGHT RESISTANCE

Light resistance measured by reference to BS3900 Part F5:1972 and evaluated by reference to BS3900 Part D1:1978 shall be to wool scale pattern No.5 or greater complying with BS1006. A change may occur in the shade of the coating on the surface of the product but this will not affect the uniform appearance of the finish.

4. WEATHER RESISTANCE

Weather resistance is measured by reference to BS3900 to Part F3:1971, and shall correspond with "Grey Scale" 2 or greater.

* See Appendix Part 1

Our Guarantee is only applicable where the product has been applied to the aluminium alloys and galvanized steel specified in the distinguishing appellation of this document and providing that the coating is applied by a Valspar Powder Coatings Ltd Approved Applicator.

THE PROCESS AND PROCEDURE

(a) PRETREATMENT

The aluminium alloys and galvanized steel to be coated must be fully pretreated using a Valspar Powder Coatings Ltd approved method prior to the application of the product. The approved method is based on:-

- i) degreasing
- ii) rinsing
- iii) etching (optional for galvanized steel)
- iv) rinsing
- v) de-smutting
- vi) rinsing
- vii) chromating (aluminium)
- viii) chromating or zinc phosphating (galvanized steel)
- ix) rinsing
- x) demineralised water rinse (the conductivity reading of the initial drain-off water of the final rinse must not exceed 80 microSiemens)
- xi) drying (maximum 100° Celsius metal temperature)

(Degassing should be carried out for galvanized steel in accordance with Appendix Part 4)

- (b) The cured continuous film must be a minimum of 40 micrometres in thickness. To maintain the inherent design capabilities of the product it may be necessary to apply a thicker film in some instances.
- (c) All extrusion and other components to be coated as individual items (i.e. no cut edges) where practical. The use of a 2 pack adhesive and/or small joint sealer, as recommended by the system supplier when applied to bare aluminium mitre joints together with crimping is the normal and acceptable practice when marine conditions apply.
- (d) All joints to be sealed with an approved mastic.
- (e) The Applicator shall prepare four test panels of an approved grade, size and thickness for testing and reference purposes. These panels shall be prepared and coated from 40 micrometres up to a maximum film thickness of 80 micrometres (60 –80 micromtres galvanized steel) in accordance with the process and at the same time as the production they represent. A minimum of one set per production line must be prepared every four hours. Two panels shall be submitted to Valspar Powder Coatings Ltd for testing, one panel shall be fully tested by the Applicator and one shall be retained by the Applicator for reference.
- (f) The Applicator, every four hours, on one of the panels prepared in (e) must carry out the following tests to ensure the specified test values have been obtained and the results recorded.
 - 1. Adhesion to BS3900 Part E6:1992 cross hatch test.
Value required - coefficient zero 100% adhesion.
 - 2. Mandrel bend test to BS3900 Part E11:1985. (Aluminium only)
Value required - 6mm no cracking of film.



3. Falling weight impact of an approved type (Aluminium only)
Value required - 20"/lbs or 23 cm/kgs. No film detachment.
 4. Drilling, milling and saw test
Value required - no loss of adhesion.
- (g) The Applicator shall ensure that the curing oven(s) is (are) checked once daily in order to ensure that any shift in the curing temperature is recognised. If any shift occurs the work involved must be fully evaluated and the necessary action taken by the Applicator. The details of curing parameters must be retained by the Applicator for inspection by Valspar Powder Coatings Ltd.
- (h) The Applicator must keep an accurate pretreatment log and use the pretreatment chemicals in strict compliance with the manufacturer's instructions and knowledge. Also details must be kept indicating colour, batch number of powder used and date of despatch of each individual job processed. This information must be available for inspection by Valspar Powder Coatings Ltd.
- (i) Where damage to the coating occurs, it must be repaired immediately. Should damage occur during fabrication or on site, it is necessary to apply a repair procedure (See Repair Procedure for SYNTHATEC) immediately. It is suggested that this is carried out by the fabricator/installer.
- (j) A production control report must be produced with every set of 4 test panels (see above). Copies of this report will be made available as follows:-
1. Customer of the Applicator if requested.
 2. Valspar Powder Coatings Ltd
 3. Retained by the Applicator

PROVISIONS OF THE GUARANTEE

Valspar Powder Coatings Ltd shall incur no liability hereunder whatsoever in the event that any one or more of the following circumstances shall apply:-

- i) the process and approved procedure as detailed has not been adhered to and the necessary documentation and test panels have not been received by Valspar Powder Coatings Ltd.
- ii) on the date of application the gloss level is more than 7 units from the standard for the product when measured at an incidence angle of 60° as specified BS3900 Part D5:1980 when the film is cured at the recommended stoving schedule.
- iii) where two coats of the product have been applied.
- iv) the product is stored at temperatures exceeding 25° Celsius.
- v) the product is not stored in dry conditions.
- vi) the product coating is not cleaned and maintained in accordance with Appendix Part 2.
- vii) touch-up systems have been used as detailed in Appendix Part 3.



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- viii) the product to which our coating is applied is exposed to continuous heat in excess of 70° Celsius or is in the direct influence zones of the sea, acid, industrial or other aggressive emission sources which are known or believed to be damaging or corrosive to thermosetting powder coatings.
- ix) notification in writing is not received within 60 days of any defect becoming apparent to the building owner.
- x) the product coating is subjected to mechanical damage.
- xi) delamination of the galvanizing layer for whatever reason. (This includes the cropped edges of hot rolled section and sheet to BS EN 10142, BS EN 10143, BS EN 10147 unless protected by a water tight seal or gasket or sealed under an approved mastic).

Save where we are shown to have failed to exercise reasonable care in the manufacture and supply of the product we shall not be liable in any circumstances in respect of death or personal injury and under no circumstances whatsoever shall we be liable for consequential and indirect loss of loss of profits.

Our liability whether in respect of one claim or the aggregate of various claims other than claims for death or personal injury due to negligence on our part shall not extend to the first £1000 of any loss or damage suffered by reason of any failure. The maximum liability of our company in respect of any one claim or series of claims for any such failure in respect of any one occurrence or series of occurrences consequent upon or attributable to one source or original cause during any one calendar year shall not exceed £250,000.

This guarantee shall only apply where the product to which the coating is applied is installed on premises within the European Union and in a location north of 48° latitude. Locations outside of this zone will be subject to different guarantee terms – please contact Valspar for more information.

This guarantee shall be construed and interpreted in accordance with English Law and shall be subject to the jurisdiction of the English courts only. Where by virtue of any United Kingdom Act of Parliament, statutory rights are conferred for the benefit of the customer, such rights shall not be affected in any way by this guarantee.

Our Terms and Conditions of Sale shall apply to all SYNTHATEC supplied by us save that the provisions of this guarantee shall override the portions of Condition 10 (liability) with which they are in conflict such that the provisions of the guarantee shall prevail so as to give full effect to the terms of this guarantee. This guarantee expressly excludes the adhesion of the coating applied by the Applicator.



APPENDIX

PART 1

Aluminium alloys to be coated shall be to BS1470, BS1471 and BS1474 (or their updated BS EN and other European standards).

Galvanized steel to be coated shall be hot-dip galvanized hot rolled steel sections to BS729 or hot-dip galvanized preformed steel sheet to BS EN 10142, BS EN 10143 or BS EN 10147.

PART 2

Components to which the product is applied must be cleaned when they become soiled. The cleaning interval should be determined by the amount of soiling and further details concerning required intervals should be obtained from SYNTHATEC Technical Advisory Sheet 11.

Cleaning should commence with the date of installation at the premises of the building owner, using a mild detergent and warm water on all surfaces and a soft cloth or sponge but nothing harder than a natural bristle brush.

Fully documented and corroborative cleaning records must be kept for the period of the guarantee, by the client of the building to which the guarantee relates.

PART 3

If touch-up materials are used the areas coated in these materials are expressly excluded from the guarantee.

PART 4

De-gassing of zinc based substrates shall be carried out as and when required at the discretion of the Applicator in order to achieve the optimum visual and environmental performance. De-gassing will invariably reduce pinholing of the coating on zinc based substrates but in some instances even when processed perfectly pinholing will be evident in the cured film.