

Plascoat® PPA 571ES

Performance Polymer Alloy Coating

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General description

Plascoat PPA 571ES is a thermoplastic coating powder which has been specifically designed to provide a long lasting, tough coating for exterior applications to mild steel, galvanized steel and aluminium. It is based on an alloy of acid modified polyolefins. Therefore, it is Halogen free and the combustion fumes are low in smoke and have a low toxicity index.

Plascoat PPA 571ES is resistant to stress cracking, adverse weather conditions, detergents, salt spray and typical airborne pollutants. The coating maintains excellent adhesion to the metal substrate without the need for a separate primer. The material also provides good abrasion and impact resistance. If PPA 571ES over-sprayed powder is to be recycled, then blend a maximum of 25% of this over-sprayed powder with 75% of virgin powder.

Typical uses

Fencing, fan guards. Coating of pipes, fittings, valves & accessories including those for potable water

Typical properties of the powder

Coverage (100% efficiency)	5.2 m ² /kg at 200 microns
Particle Size	95% less than 150 microns
Bulk Density (at rest)*	0.40 g/cm ³
Packaging	20 kg cardboard boxes

*These values may vary from colour to colour

Handling and storage

Stored in a clean dry area at 10-25°C and out of sunlight, the material should not deteriorate. However, in the interest of good housekeeping, old stocks should be used first.

Common to all coating powders, there may be the likelihood of agglomerate formation during transportation and storage. The coating powder can be sieved to break up the agglomerates and therefore return the powder to its original condition; this does not affect the quality of the powder. The accumulation of powder particles is a physical phenomenon and may occur as a result of compaction or when cold powder, below 10°C, is brought into direct contact with warm humid air. In this latter situation the powder, still sealed, should be given time to warm up to the ambient temperature before use.

Health and safety

Plascoat PPA 571ES is supplied as a finely divided powder. While there are no known health hazards associated with PPA 571ES, normal handling precautions for dealing with fine organic powders should be taken - i.e. excessive dust generation and inhaling of the powder should be avoided. Facilities may be required for removing excess dust from the working area during the coating of certain difficult items.

As with all polymeric powders, the material can ignite if brought into contact with a high temperature source or ignition - particularly in the fluidised condition.

Reference should be made to the respective Plascoat GHS Safety Data Sheet, available on request.

Should the coating be required for contact with food or potable water, further details should be obtained from Plascoat.

Summary of essential coating requirements

1. *The metalwork must be either grit blasted or chemically pre-treated (zinc phosphating is recommended for outdoor applications rather than iron phosphating) prior to coating. **
2. *Set amps to 5 – 15 microamps and voltage to 100kV if both settings are available. For Corona guns with voltage setting only, set voltage at 30-50 kV. Failure to use the correct settings may result in coatings that are too thin or with poor coverage.*
3. *Heating schedule typically as polyester (See below). Ensure metal temperature exceeds 160°C.**
4. *Thickness must be a minimum of 170 microns. (See note 2 re voltage above). This may also require a longer spraying time or increased powder supply. This thickness should be periodically checked.*
5. *Galvanised substrates may need degassing. Preheat to 30°C higher than the post-heat temperature for at least as long as the post-heat time.*
6. *Do not use cured resin based passivating systems, e.g. acrylic based phosphates or chromates. If the metalwork has been pre-treated with these remove by grit blasting or strong alkaline rinse.*
7. *Adhesion checks should be carried out at regular intervals. **

* See 'A Guide to PPA 571 Processing'

Guide to typical coating conditions

Recommended Pre-treatment

The metal must be degreased, and all mill scale and corrosion products removed.

Mild steel should be solvent degreased then either grit blasted to Swedish Standard SA 2½ to 3 or phosphated. Galvanised steel should be either grit blasted at 0.3MPa (40 psi) using a fine grit (0.2 to 0.5mm) or treated with a phosphate system. To achieve maximum long-term adhesion, Plascoat recommend the use of zinc phosphate systems on both steel and galvanised steel. If chemical pre-treatment is used it is essential to remove any previously applied resin based pre-treatment systems. Discuss this with your pre-treatment supplier.

Aluminium should be degreased to remove lubricants and processing soaps. For most purposes, no further treatment is necessary. However, for maximum long-term corrosion resistance chromate treatment is recommended.

Coating Conditions:

The heating schedule should be 160°C to 220°C for 5-40 mins depending on metal thickness. To ensure optimum adhesion, the metal temperature during processing must exceed 150°C. Since Plascoat PPA 571ES is a thermoplastic there is no crosslinking to take place. Therefore, when the powder has melted to form a smooth coating no further heating is required.

Overheating can cause craters to form in the coating, or the coating to reduce in gloss. It may also cause the coating to discolour in storage or in service. Thicknesses outside the recommended range may be detrimental to the properties of the coating.

Do not cure thermosetting powder paints with PPA 571ES. The fumes from such systems can affect the surface of the PPA 571ES coatings.

For more detailed information on the coating processes please refer to 'A Guide to PPA 571 Processing', available from your Plascoat contact or the Plascoat website.

Typical properties of the material

Specific Gravity*		0.93-1.06 g/cm ³
Tensile Strength	ISO 527	14 MPa
Elongation at Break	ISO 527	800%
Brittleness Temperature	ASTM D-746	-78°C
Hardness	Shore A	95
	Shore D	44
Vicat Softening Point	ISO 306	70°C
Melting Point		105°C
Tear Strength	ASTM D1938	22 N.mm
Environmental Stress Cracking	ASTM D1693	Greater than 1000 hrs
Toxicity Index	NES 713	1.8
Flammability	UL94 3.2mm moulding	Unrated (See also Properties of Coating)
Dielectric Strength	IEC 243 VDE 0303	47.8 kV/mm at 370 microns
Volume Resistivity	IEC 93	3 x 10 ¹⁷ Ohm.cm
Surface Resistivity	IEC 93	8 x 10 ¹⁷ Ohm at 200 microns
Water Absorption	ASTM D570-81	<0.03%

*These values may vary from colour to colour

Typical properties of the coating

The following data applies to a 200 microns coating applied under standard conditions onto 3mm thick steel or aluminium. The pre-treatment consisted of degreasing and grit blasting unless otherwise stated.

Recommended Coating Thickness		170-300 microns
Appearance		Smooth/Glossy
Gloss	ISO 2813	70
Impact Strength	Gardner (drop weight) ISO 6272	
	Direct 23°C (0.7mm plate)	Greater than 27 Joules
	Reverse 0°C (0.7mm plate)	Greater than 27 Joules
	Reverse 0°C (3mm plate)	18.0 Joules
Abrasion	Direct 23°C (3mm plate)	2.7 Joules
	Taber ASTM D4060/84	
	H18, 500g load, 1000 cycles	60 mg weight loss
Salt Spray	CS17, 500g load, 1000 cycles	25 mg weight loss
	ISO 9227 and NF 41-002	Results after 1000 hours
	Steel - Scribed	Loss of adhesion less than 10mm from scribe. Under film corrosion 1mm
	- Unscribed	No blistering or corrosion after 10,000 hours
	Aluminium - Scribed	No loss of adhesion
	- Unscribed	No loss of adhesion
	Hot Dip Galv** (Zinc Phosphated) - Scribed	Loss of adhesion <10 mm from scribe Under film corrosion 1 mm
-Unscribed	No blistering or corrosion after 10,000 hours	
Chemical Resistance*	- Dilute Acids 60°C	Good
	- Dilute Alkali 60°C	Good



	- Salts (except peroxides) 60°C - Solvents 23°C	Good Poor
Adhesion	PSL, TM 19	A-1
Weathering	QUV ASTM G53-77 Florida 45° facing South	2000 hrs - No significant change in colour or loss of gloss. 3 years - No significant change in colour or loss of gloss.
Burning Characteristics		
Ignitability	BS476: Pt5: 1979 500 microns coating	P - not easily ignitable
Surface spread of flame	BS476: Pt7: 1979 500 microns coating	Class 1
Fire Propagation	BS476: Pt6: 1989 500 microns coating	I = 0.2
Flammability	UL94	Vo (see also Properties of Material)
Safe Working Temperature	(Continuous in air)	60°C max

*The results given are for full immersion in the chemicals for a prolonged period of time. The coating is resistant to splashes and short-term contact of most chemicals. Further technical advice may be obtained from Plascoat concerning the effects of particular chemicals or mixtures.

** Dependent on the quality of the hot dip galvanised zinc layer and content.

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