



## OXYPLAST BELGIUM N.V./S.A.

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## OXYPLAST POLYESTER POWDER COATING PE54

### A TGIC-free polyester powder coating

#### DESCRIPTION

Polyester binders, the basic components of outdoor thermosetting powders, have been used since 1975 for the decorative protection of outdoor material and particularly architectural aluminium.

The long experience accumulated with polyester powders in this application field, particularly with OXYPLAST PR29, based on carboxylic polyesters and the high-performance hardener triglycidyl isocyanurate, has ensured reliable results for what weather and corrosion resistance is concerned. These polyester powders have a very good reputation in the world of architectural aluminium.

Since 1992, OXYPLAST BELGIUM has developed a Qualicoat-certified TGIC-free alternative for OXYPLAST PR29, viz. OXYPLAST PE50.

As part of its continuous technology development, OXYPLAST BELGIUM has aimed to introduce a TGIC-free alternative for the industrial polyester powders OXYPLAST PR40. This has resulted in the **OXYPLAST PE54** powders, based on the same technology as OXYPLAST PE50.

#### PROPERTIES OF THE POWDER

Melting range (Kofler)	: 90 – 95 °C
Specific gravity (DIN 55990/3)	: 1.65 ± 0.05 (white powder)
Particle size distribution for a standard smooth coating (Laser diffraction)	
Diameter (micron)	% undersize
32	46 ± 14
63	77 ± 11
80	87 ± 9
100	95 ± 5
The <u>structured</u> types give a coarser particle size distribution.	
Gel time 180 °C (DIN 55990/8)	: 80 - 260 seconds (depending on the degree of gloss)

## POWDER APPLICATION

**OXYPLAST PE54** powder coatings can be applied by electrostatic spraying using classic, high performance devices, that can produce a high negative tension, preferably above 80 kilovolts.

**OXYPLAST PE54/TR** powder coatings can also be applied by means of tribo guns.

The curing will take place in a suitable convection oven.

Curing schedule : 10 minutes at 180 °C  
18 minutes at 180 °C or 10minutes at 200 °C for the M (matt) types  
(always metal temperature)

## WARNING

One should take care of the following parameters during application and curing of **OXYPLAST PE54**.

1. **OXYPLAST PE54** must be cured, for preference, at a temperature not exceeding 200 °C (metal temperature).
2. **OXYPLAST PE54** will be applied at the prescribed film thickness i.e. between 60 and 120 micron. For the structured types, a minimal film thickness of 90 micron is recommended.
3. **OXYPLAST PE54** is only partly compatible with OXYPLAST PR40.  
For example, a dry-blend of 50% PE54 and 50% PR40 will give a gloss drop of 10% compared to pure PE54.  
Before switching over from PR40 to PE54, one should thoroughly clean the powder application plant as well as the reclaim devices like cyclones, filters, sieves etc.

## PROPERTIES OF THE COATING

The general properties hereafter are determined on chromated aluminium, according to the Qualicoat and GSB specifications. However **OXYPLAST PE54** also ensures the protection of other metal substrates like steel or galvanized steel, provided adequate surface treatment is applied in order to guaranteeing an optimal adhesion as well as good corrosion protection.

Steel (indoor)	:	iron phosphate amorphous
Steel (outdoor)	:	zinc phosphate crystalline or better: tricationic phosphatation
Galvanized steel (zinc)	:	chromatation or tricationic phosphatation
Metallized steel (flame-sprayed)	:	-
Aluminium	:	chromate treatment (DIN 50939)

<b>OXYPLAST PE54</b>	<b>PROPERTIES OF THE COATING</b>	
Substrate	: aluminium, chromated	
Curing cycle (metal temperature)	: 10 min/180 °C	
Curing cycle M (matt) types (metal temperature)	: 18 min/180 °C or 10 min/200 °C	
Film thickness	: minimum 60 micron	
Gloss (ISO 2813: 1994 - 60°)	: 5 - 90%	
Flow-out	: very good	
Buchholz hardness (ISO 2815: 1973)	: > 80	
Persoz hardness (NF-T-30016)	: > 250 seconds	
Pencil hardness (Wolff & Wilborn)	: HB - F	
Clemen hardness	: > 3 kg	
Erichsen cupping (ISO 1520: 1973)	: > 5 mm	(ST: > 3 mm)
Impact (ASTM D-2794)		
Direct	: > 25 kg.cm	(ST: > 20 kg.cm)
Reverse	: > 25 kg.cm	(ST: > 10 kg.cm)
Conical bending (ISO 6860: 1984))	: maximum 20 mm	(ST: max. 40 mm)
Adhesion (ISO 2409: 1992)	: Gt = 0	
Taber abrasion (ASTM D 4060-95) , wheel CS10, 10 N, 1000 revs. - Loss of weight	: < 30 mg	

## CHEMICAL RESISTANCE

**OXYPLAST PE54** is resistant for a brief contact to various chemicals. The reagent is maintained in contact with the coating during 48 hours at room temperature.

CHEMICALS		RESULTS
Hydrochloric acid	10 %	film unchanged
Nitric acid	30 %	film matt but washable
Sulfurous acid	(saturated)	film unchanged
Hydrogen peroxide	40 vol	film unchanged
Ammonium hydroxide	10 %	film unchanged
Ammonium hydroxide	33 %	film unchanged
Sodium hydroxide	5 %	film unchanged
Tartaric acid	5 %	film unchanged
Citric acid	5 %	film unchanged
Lactic acid	5 %	film unchanged
Ethanol		film unchanged
n-Butanol		film unchanged
Petroleum ether		slight softening

## **CORROSION RESISTANCE**

**OXYPLAST PE54**, applied on different substrates (test-panel quality) has been tested in the saltspray cabinet according to ASTM B 117-73, on different substrates.

### STEEL :

IRON PHOSPHATE	1000 h	: < 5 mm undercutting
TRICATIONIC PHOSPHATE	1000 h	: < 2 mm undercutting

### GALVANISED STEEL :

CHROMATED	1000 h	: < 4 mm undercutting
TRICATIONIC PHOSPHATE	1000 h	: < 4 mm undercutting

### ALUMINIUM :

CHROMATED (DIN 50939)	2000 h	: no undercutting
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These results are only obtained when the metal pretreatment has been performed in an optimal way. In no way it's a guarantee.

## **STORAGE STABILITY**

**OXYPLAST PE54** can be stored at 25 °C in a dry room in its original packaging for at least one year.

All the information given in this Data Sheet is the result of our research work and experience. It is given in good faith and with every belief in its accuracy but cannot be considered as a formal warranty. In accordance with OXYPLAST BELGIUM policy of product development, this specification is subject to change without notice.

# OXYPLAST POLYESTER PE54//WR

## ADDENDUM TO TECHNICAL DATA SHEET PE54

OXYPLAST BELGIUM also offers the Polyester powder coating qualities in special decorative effects like WRINKLE type "WR". For the standard WR types (coarser structure) a minimum layer thickness of 100 µm is recommended. For the fine WR types a minimum layer thickness of 80 µm can be maintained.

At this higher layer thickness, and moreover by the use of structure additives, the mechanical properties will be somewhat lower than these of the flat coatings.

### **Important remark:**

- ◆ As the WR types are not compatible with the flat coatings of the same group, the complete spraying installation has to be cleaned after the application of WR powders.
- ◆ Due to their irregular surface, wrinkle coatings don't have an overall sufficient coating thickness to completely protect the substrate. Therefore an adequate pretreatment is indispensable: at least tricationic phosphatation for steel, chromatisation for galvanised steel and chromatisation for aluminium.

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# OXYPLAST PE54/(TR)B and PE54/(TR)X POWDER COATING

## ADDENDUM TO THE TECHNICAL DATA SHEET PE54

### DESCRIPTION

**OXYPLAST PE54/(TR)B and PE54/(TR)X** powders are thermosetting polyester powder coatings in smooth, structure or “antique” finish, that show a metallic effect.

### APPLICATION

To avoid colour differences, these coatings have to be applied in a film thickness of at least 90 µm.

### REMARK

- ◆ Due to their irregular surface, antique/hammerfinish coatings don't have an overall sufficient coating thickness to completely protect the substrate. Therefore an adequate pretreatment is indispensable: at least tricationic phosphatation for steel, chromatisation for galvanised steel and chromatisation for aluminium.
- ◆ In contradistinction to the normal RAL-colours, finger marks on these metal-look coatings cannot be removed by simply rubbing with a cloth. They can nevertheless be easily removed with a soft household detergent. A transparent topcoat is indispensable for substrates that are frequently touched by hands (e.g. chairs, handrails), in order to prevent discoloration of the coating surface.
- ◆ The metallic pigments in the powders coded with /(TR)B, have a limited humidity resistance. For all applications where a good humidity resistance is requested, a transparent topcoat is recommended.  
In highly corrosive environments, as coastal and industrial area, even the powder based on humidity-resistant pigments (code /(TR)X) can suffer from matting and surface oxidation.  
In these circumstances, we strongly advise to apply also a transparent polyester topcoat.
- ◆ As specified in the product code, the PE54/TRB and PE54/TRX powders can be applied perfectly with a tribo-electric spray gun. The obtained metallic effect may however differ from that obtained with corona spray guns. Therefore we advise to do a test first.

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