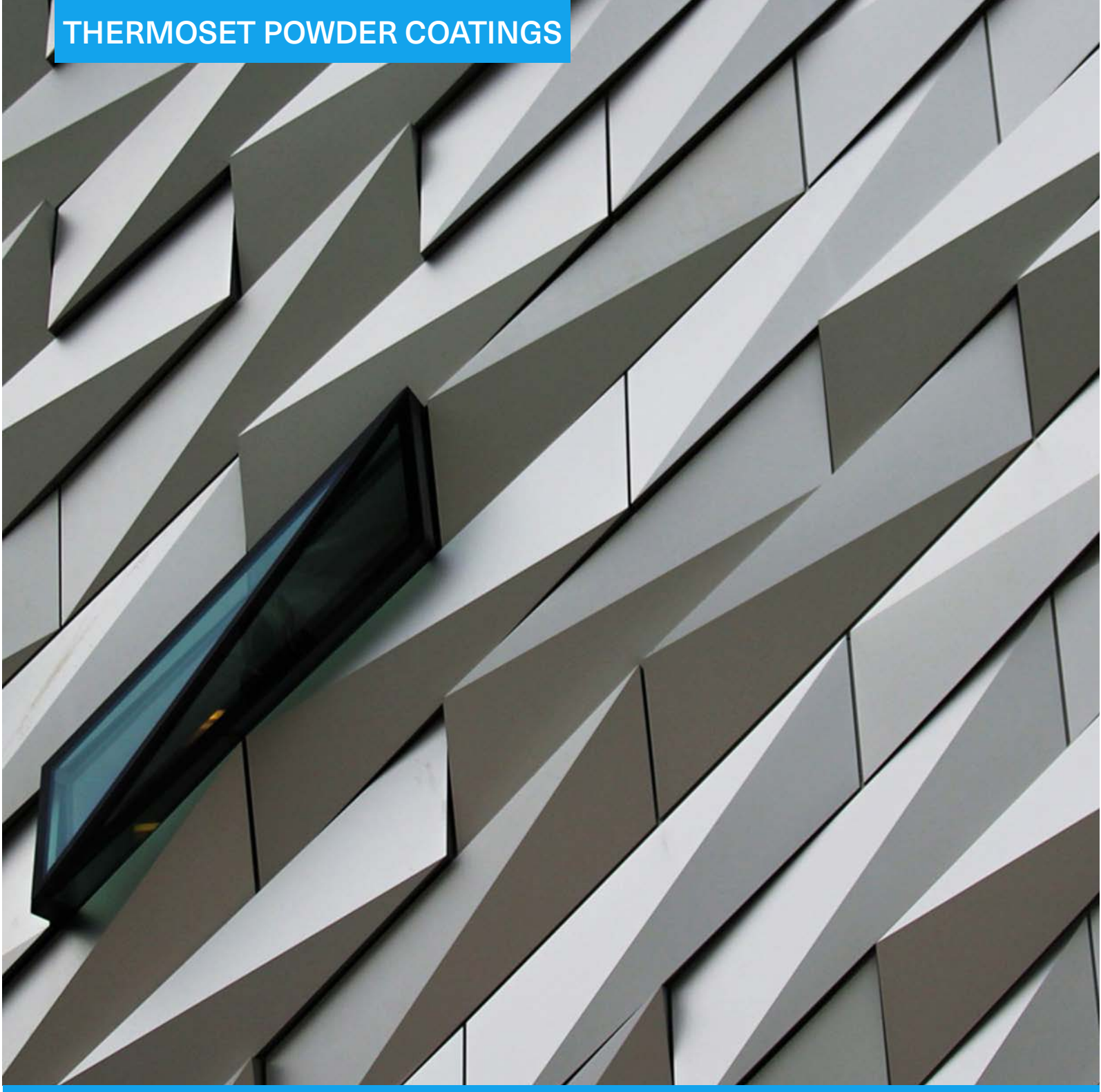


HI-LIFE PREMIUM PRIMERS

THERMOSET POWDER COATINGS



Intent

Protech-Oxyplast happily offers its expertise to assist you in finding the optimal coating system for your project(s). This brochure is about our various thermoset powder coating systems that protect metal substrates from corrosion. It was created because we understand you may have questions regarding the most appropriate powder coating system that suits your project or production process. The choice is ever so complex due to the multiple and various properties powder coatings have.

Powder coatings are extremely durable, exceptionally resistant to corrosion, and able to withstand exposure to harsh UV rays. For some projects, a two layer protection system is required to achieve optimal resistance and meet particular appearance requirements. The layers combine purposes: the primer (base coat) ensures optimal corrosion resistance, whilst the topcoat adds aesthetic appearance and/or brings additional functionality.

During the process of choosing the most appropriate powder coating solution; several criteria need to be considered, such as lifetime expectancy, corrosion class resistance (C1-CX), product protection, image loss, method of powder application, etc.

As the industry's needs are widely diverse and an all-in-one primer cannot claim its promises in every situation possible, Protech-Oxyplast has created a diverse selection of needs-based powder coating primer systems. The systems we offer are thanks to years of experience and customer-driven R&D.

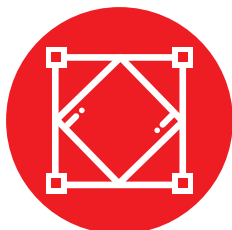
If you were to have any more questions after reading through this brochure, feel free to contact your regional representative or our customer service team.

Kind regards,

Oxyplast Belgium
Part of the Protech Group

Criteria for choice of primer

SUBSTRATE



Aluminium, steel, HOG steel, zinc-spray, etc.? Mechanical or chemical pretreatment? Do you need to cover sharp edges? The nature of the metal, its shape and its thickness will affect the choice of primer.

CORROSION CLASS



A thoroughly composed combination of (mechanical and/or chemical) pretreatment, a primer, and a topcoat will enable you to meet the requested corrosion class level and lifetime expectancy of the project.

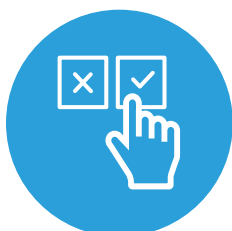
LIFETIME EXPECTANCY



Powder coatings maintain their finish and functionality throughout many years. The most durable systems are born from a precise combination of pretreatment and powder coating*.

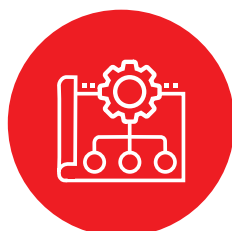
*Our corrosion matrix (on page 5) gives an overview of the corrosion classes and the coating systems.

FINAL APPLICATION



What kind of environment will the coated object be placed in (indoor or outdoor, chemical atmosphere, high humidity area, etc.)? Will the coating have a functional or aesthetic purpose? We base the primer system properties on your customer's specifications.

COATING PROCESS



The curing conditions (electrical, in- or direct fired gas oven, induction, etc.) must be matched with the reactivity and chemistry of the primer. Will the primer undergo a full or partial cure?

CERTIFICATION



The performance of a primer and/or coating system can be evaluated according standards and test methods, and certified by international quality associations.

TOPCOAT



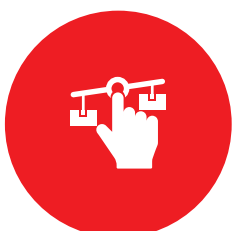
Most of our topcoats will match any of our primers. However, there are things to consider. We recommend combining a low-bake primer with a low-bake topcoat. We recommend a dark-toned primer for under dark topcoats and a light-toned primer for light-coloured topcoats.

ZINC / ZINC FREE



Zinc gives an additional cathodic anti corrosion protection on steel and can be added to the primer. Certain projects require the application of a zinc primer, while others prefer a zinc-free solution.

COST



It is not always necessary to attain the highest level of corrosion resistance. In less demanding environments or project scopes, it makes sense to choose a more budget-friendly coating system. When the stakes are high, a more expensive but superior primer and coating solution proves the cheapest over time.

QUALITY

CERTIFICATES

Protech-Oxyplast strives for continuous optimisation. We regularly register products for external, objective qualifications and are pleased to be able to offer you a range of certified products. In our primer system range, the following certifications are available:

- EF36:

QSC HD2	PE-0043
QSC MS2	PE-0058
GSB	914b

- EF17: QSC ST2 PE-0153

These primers can be combined with certified topcoats such as PE40, PE50, etc.

ISO

Correct quality standards and procedures are key at Protech-Oxyplast. To maintain a good working process, we follow ISO regulations. Our ISO certificate is available upon request. We register as being compliant with ISO 9001:2015. This norm is a standard for quality management systems that is crucial for operational excellence. We ensure that established processes are followed to maintain high product quality.

In 2024, we are striving towards obtaining ISO certificate 14001. This regulation guides organisations in managing their environmental performance and implementing sustainable practices.

GREEN CURE

For many of Protech-Oxyplast suggested primers, an economical green cure is possible, meaning that a partial cure (50%) of the primer suffices. There is no negative influence on the corrosion resistance of the powder coating system as the crosslinking is further completed whilst curing the topcoat. We advise green curing as it enhances intercoat adhesion and reduces the risk of overcuring.

Please note that:

- in case the degassing properties of the primer and topcoat are primarily needed, green curing is discouraged.
- when choosing a green cure, the primed substrates must be finished with a topcoat immediately after having (partially) cured the primer.

REGULATIONS

ISO

Corrosion class	Examples of typical environments (informative only)	
	Interior	Exterior
C1	Heated buildings with clean atmospheres (e.g.: offices, shops, schools, hotels, etc.).	/
C2	Unheated buildings where condensation can occur (e.g.: depots, sports halls, etc.).	Atmospheres with low level of pollution: mostly rural areas.
C3	Production rooms with high humidity and some air pollution (e.g.: food processing plants, laundries, breweries, dairies, etc.).	Urban and industrial atmospheres, moderate sulfur dioxide pollution, coastal areas with low salinity.
C4	Chemical plants, swimming pools, coastal ship, and boatyards.	Industrial areas and coastal areas with moderate salinity.
C5	Buildings or areas with almost permanent condensation and with high pollution.	Industrial areas with high humidity and aggressive atmosphere and coastal areas with high salinity.
CX	Industrial areas with extreme humidity and aggressive atmosphere.	Offshore areas with high salinity and industrial areas with extreme humidity and aggressive atmosphere and subtropical and tropical atmospheres.

ISO 12944-2:2018

Qualisteelcoat: approval for powder coating systems

Base material	Pre-treatment	Coating system	Corrosivity class				
			C1	C2	C3	C4	C5
Steel	Mechanical and/or chemical	ST1	V	V	X	X	X
		ST2	V	V	V	V	X
		ST3	V	V	V	V	X
Hot-dip galvanized steel (batch galvaizing)	Mechanical and/or chemical	HD1	V	V	V	V	X
		HD2	V	V	V	V	V
		HD3	V	V	V	V	V
Steel coated by thermal spraying	n.a.	MS1	V	V	V	V	X
		MS2	V	V	V	V	V
		MS3	V	V	V	V	V

QUALISTEELCOAT technical specification - Version 4.3, pages 8 - 9

V: possible for approval
X : not possible for approval

LIFETIME EXPECTANCY MATRIX

This corrosion table is according to Qualicoat and Qualisteelcoat standards. The foreseen corrosion class can only be obtained if the pretreatment of the substrate and the cleaning & maintenance of the coated object are according to Qual(steel)coat regulations.

Substrate	Base material	Pretreatment	Primer	Thickness primer	Topcoat	Total layer thickness	CORROSION CLASS							
							C1	C2	C3	C4	C5	CX		
ALU	/	Chemical*	Primer needed to improve edge coverage	/		80				C4H	C5M			
		Pre-ano*										CX		
STEEL	Steel (ST)	Chemical or mechanical**	-	-		80		C2H	C3M					
	Steel (ST)	Mechanical**	EF-SERIES	> 60		140				C4H	C5M			
	Thermal spraying (MS)	/	MULTIPRIM	2x > 60	Outdoor durable topcoat	200					C5H	CX***		
	Continuously galvanized (CZ)	Chemical	-	-		80				C3H	C4M			
	Hot-dip galvanized (HD)		Chemical and/or mechanical**	EF-SERIES	> 60		140					C4H	C5M	
														C4H

According to ISO 9001:2015, a score of 'high' equals a score of 'medium' in a class higher.
 For example: C4H equals C5M.
 A score of 'high' also equals a score of 'very high' in all classes below.
 For example: C4H equals C3VH.

*Etching 2 g/m² advised
 **Grit blasting Sa 2,5 according to ISO 8501
 ***Based on internal data

Very high: + 25 years
 High: 15 - 25 years
 Medium: 7 - 15 years

TESTED PRIMER SYSTEMS

EF33

OXYPRIM

STANDARD PRIMER

p. 8

EF36

GREENPRIM LB

LOW-BAKE PRIMER

p. 10

EF17

ULTRAPRIM

HIGH-PERFORMANCE PRIMER

p. 12

EF26

DRYPRIM

DRY-ON-DRY PRIMER

p. 14

ZINC

ZINCOPRIM

ZINC-RICH PRIMER

p. 16

3III

MULTIPRIM

MULTI-LAYER PRIMER (INCL. TOPCOAT)

p. 18

TESTS PERFORMED

The following tests were conducted to assess the validity of the primer coating systems.



ADHESION - CROSS-HATCH TEST (ISO 2409)

The cross-hatch test evaluates the adhesion of the powder coating to the metal substrate. A cross-hatched grid pattern is cut through the coating down to the substrate. Then, a piece of tape is applied to the cross-hatched area and removed quickly. Afterwards, the test panel is inspected to see if the coating is lifted away from the substrate.



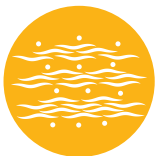
WET ADHESION - BOILING WATER TEST (QUALICOAT SPEC.)

This practice establishes the standard procedure for evaluating the resistance of the coating system to accelerated ageing by boiling water. If the permeability of the coating is too high, bubbles or blisters will form.



SALTSPRAY TEST (2000 hrs) (ISO 9227 / ASTM B-117)

The salt spray test is an accelerated corrosion resistance test to evaluate the performance of a coated object in a high salinity environment and its durability as a protective finish. The test is performed by scribing a line or "X" onto the surface of a finished powdercoated panel, after which the panel is placed into a simulation chamber where a corrosive mist is applied (sodium chloride). The panel is taken out of the chamber at set time intervals to measure and describe the "creep" performance of the coating around the scribe.



HUMIDITY TEST (ISO 6270-2)

The humidity test is an accelerated corrosion test used to evaluate the performance of a coated object to continuous condensation.



CYCLIC CORROSION TEST (ISO 12944-6 / ISO 20340)

Cyclic Corrosion Testing is a way of accelerating actual corrosion failures under laboratory-controlled conditions. The test comprises different automatically cycled climates. The tested samples undergo the same changing environment as in the natural world.

NOTE ON PRETREATMENT

A well-considered and well-performed pretreatment is of utmost importance as it is the substrate's primary protective barrier and requires full adhesion to the primer. The pretreatment layer is a major contributor to optimal anti-corrosion protection and must always be considered in the coating process, either applied mechanically or chemically.

Depending on the quality and type of the metal, there are different cleaning and pretreatment products and procedures possible. The total procedure (cleaning, pretreating, and coating) must be mutually coordinated and needs to comply with the final desired properties of the coating system. Please involve your chemical supplier and powder coating producer timely into your project.

SPECIFICS

Oxyprim is our standard, modified epoxy primer that is easily applied and gets its full properties based on a regular curing schedule.

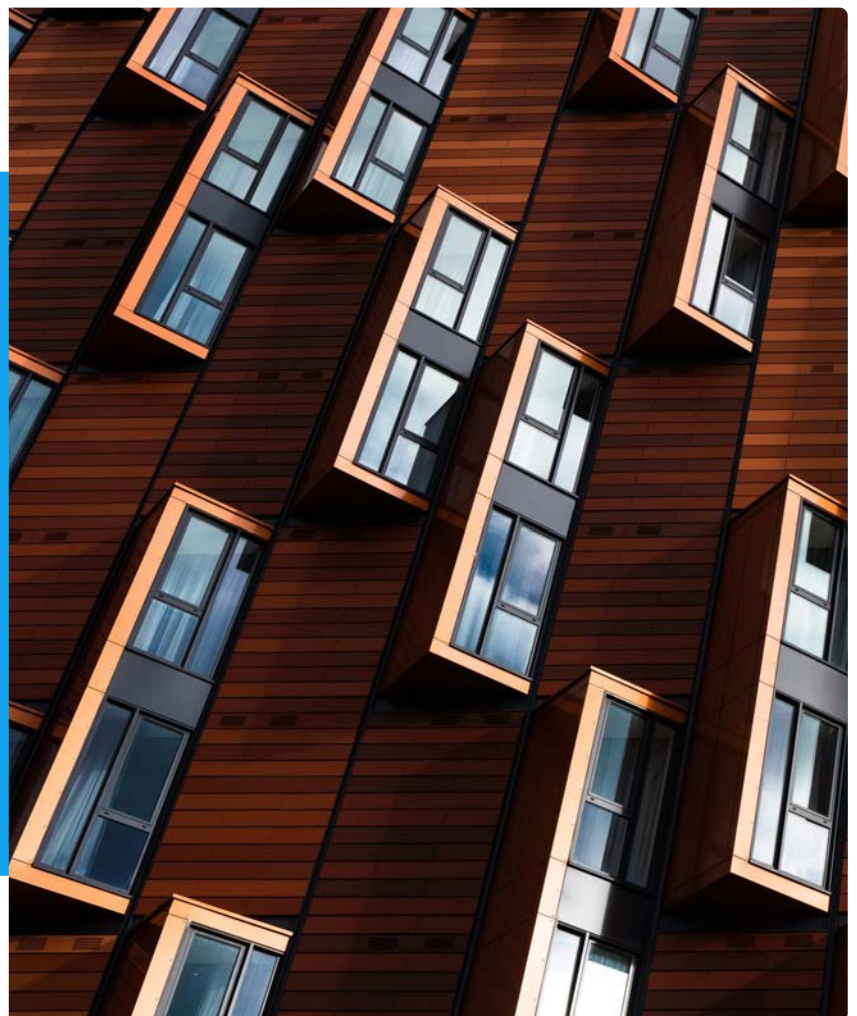
This primer promises smooth aesthetics (excellent flow-out), optimal wetting, low film build, and strong adhesion with its topcoat. The two-layer system principle offers ultimate corrosion protection for architectural applications and industrial environments.

Thanks to its degassing properties, it is also particularly recommended for application onto porous substrates like cast iron, hot-dip galvanized steel, or zinc metallisation. Besides those, we also recommend using Oxyprim on aluminium substrates. Furthermore, Oxyprim is a budget-friendly product.

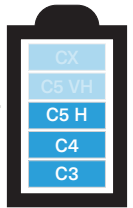
EF33-S is especially advised for OEM automotive wheel applications where a high level of smoothness is required.

FEATURES

- Standard primer
- Easy application
- Top aesthetics
- Excellent corrosion protection
- Degassing properties
- Cost-efficient
- For aluminium, steel or porous substrates



OXYPRIM - STANDARD PRIMER - EF33



PRODUCT CODE

EF33 LIGHT GREY PRIMER (for light coloured topcoats)
ES312A8004

EF33 DARK GREY PRIMER (for dark coloured topcoats)
ES312A8001

TESTIMONIAL

THE BENEFITS OF A "SLOWER" CURING SYSTEM.

For some production cycles, we consistently choose EF33 {Oxyprim} based on its process performance and curing speed. A very responsive oven with high airflow can sometimes heat substrate parts too quickly. In these cases, Oxyprim is a perfect powder system to use as it is a "slower" system, making it possible for gas formation to escape from the substrate before the coating seals the part.

- anonymous customer coating heavy parts -

CURING CONDITIONS

Substrate	Aluminium or steel
Curing schedule EF33	10' at 180°C (object temperature)
Layer thickness EF33	60 µm
Curing schedule topcoat	See TDS of desired topcoat
Layer thickness topcoat	80 µm

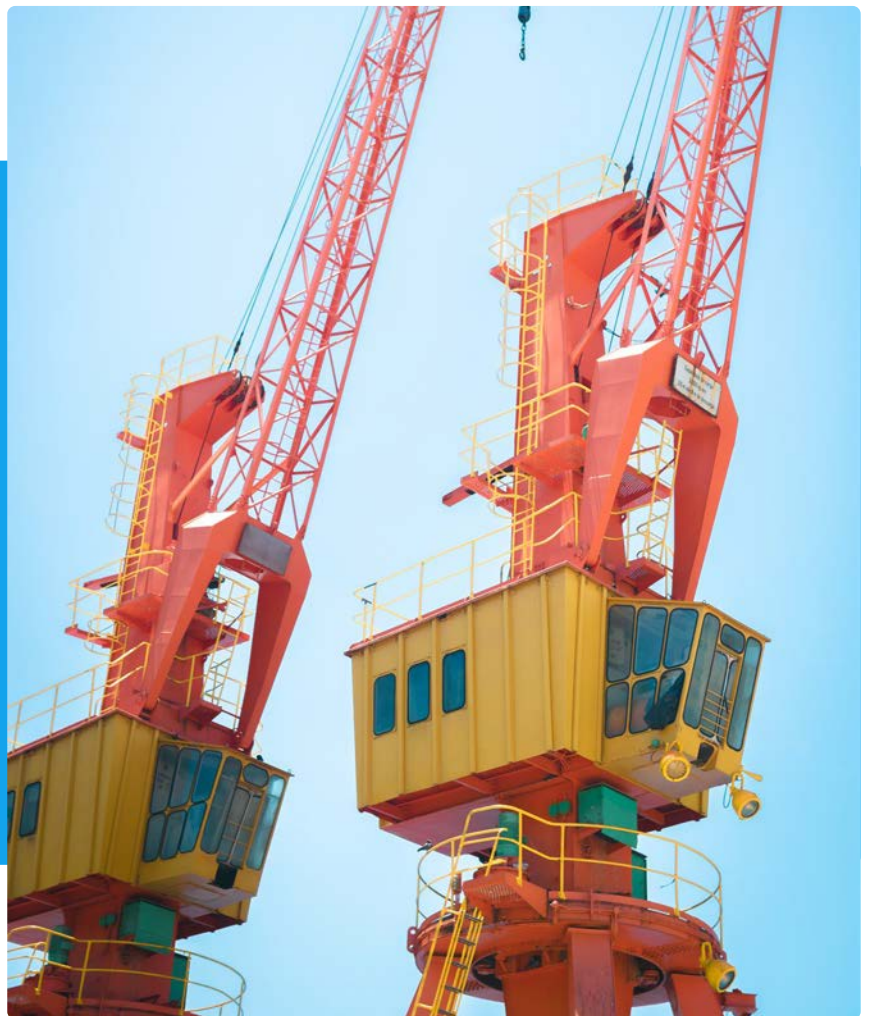
SPECIFICS

Greenprim LB is a degassing modified epoxy primer that is very energy efficient. Greenprim LB was developed as a basis for a two-layer low-bake system. The primer itself can be either fast-cured or low-cured. Greenprim LB delivers strong overcure robustness (up to 30 min. at 180° C) and does not suffer from intercoat delamination. Higher film build and curing conditions are possible without loss of its properties.

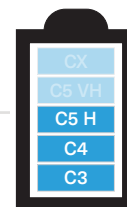
Greenprim LB's formulation focuses on industrial applications, steel and porous substrates. The primer is exceptionally competent with regard to edge protection.

FEATURES

- Degassing primer, for low-bake coating systems
- Energy efficient
- Strong overcure robustness and intercoat adhesion
- Excellent edge protection
- Cost-efficient
- Qualisteelcoat label
- For porous substrates, steel and industrial applications



GREENPRIM LB - LOW-BAKE PRIMER - EF36



PRODUCT CODE

EF36 LIGHT GREY PRIMER (for light coloured topcoats)

ES322A8201

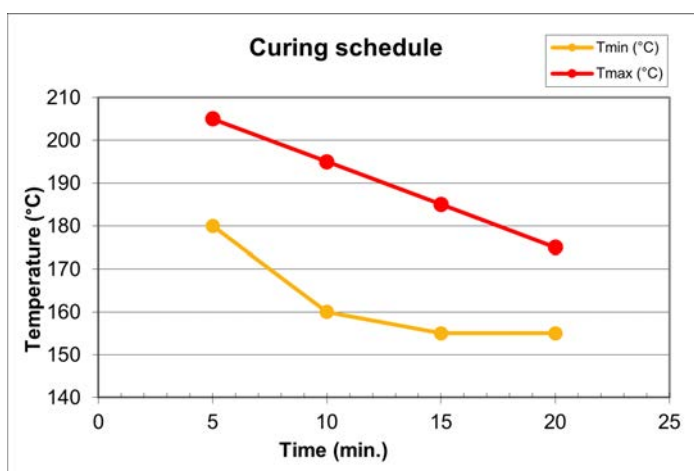
EF36 DARK GREY PRIMER (for dark coloured topcoats)

ES322A8006

CURING CONDITIONS

Substrate	Aluminium or steel (not advised for architectural purposes)
Curing schedule EF36	10' at 160°C (object temperature)
Layer thickness EF36	60 µm
Curing schedule topcoat	See TDS of desired topcoat
Layer thickness topcoat	80 µm

Greenprim's properties secure overbake robustness, but also allow shorter curing cycles (possible curing cycles: 10 min. at 160°C or 5 min. at 180°C).



CERTIFICATES

According to Qualisteelcoat testings, EF36 is labeled in category C5 and has received two Qualisteelcoat certificates:

- PE-0043 (HD2)
- PE-0058 (MS2)



ULTRAPRIM - HIGH PERFORMANCE PRIMER -EF17

2-LAYER
SYSTEM

SPECIFICS

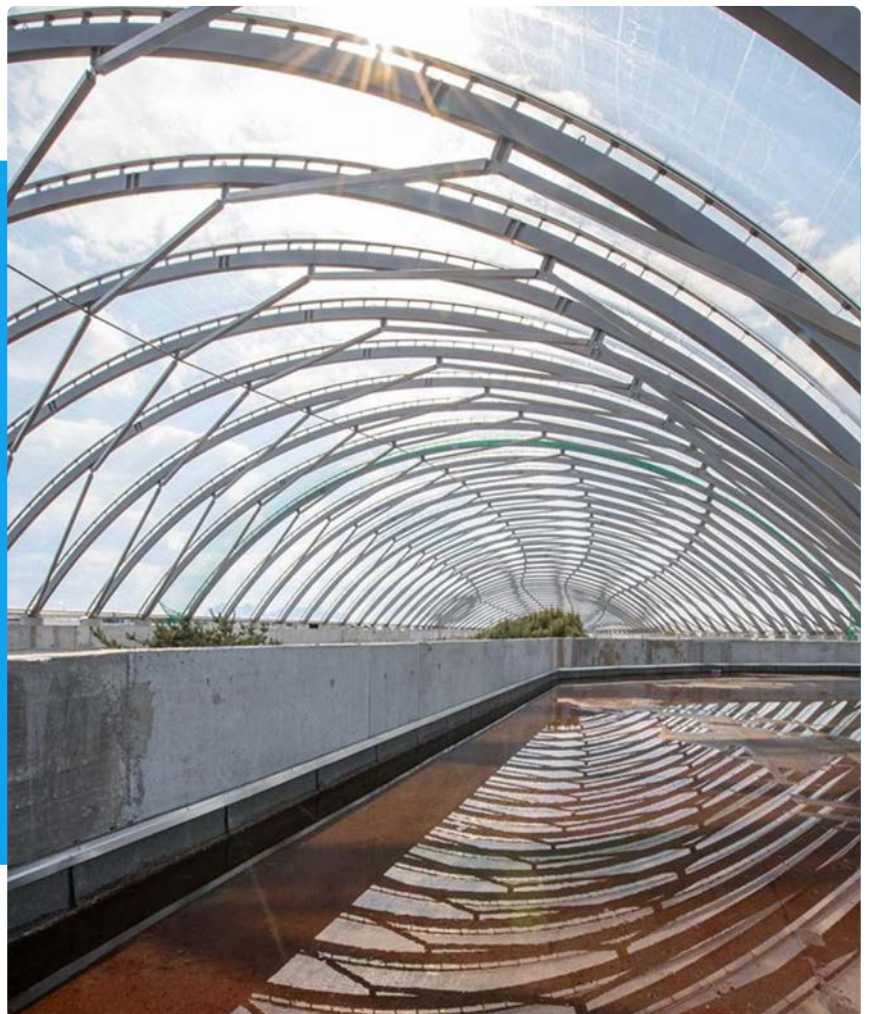
Ultraprim is our ultimate primer product, hence the name. It is a zinc-free, pure epoxy coating that delivers superior corrosion protection. Therefore, it is a superb product for applying on all types of metal substrates, even in the most demanding environments.

Moreover, ultraprim is also the champion in edge protection and is extremely useful when coating parts with perforations, laser cuts, sharp edges, etc. It proves to have a robust curing window, allowing excellent overbake stability and intercoat adhesion in all oven types.

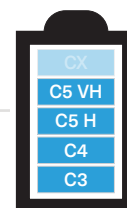
Ultraprim is Qualisteelcoat certified and attains the requirements in category C5 (ST2), certificate number P-0153.

FEATURES

- Superb edge protection
- Excellent overcure stability and intercoat adhesion
- Ultimate corrosion protection
- Matt appearance
- Qualisteelcoat label
- For all sorts of metal substrates



ULTRAPRIM - HIGH PERFORMANCE PRIMER - EF17



PRODUCT CODE

EF17 LIGHT GREY MATT PRIMER (for light coloured topcoats)

ES512A8530

EF17 DARK GREY MATT PRIMER (for dark coloured topcoats)

ES512A8029

CURING CONDITIONS

Substrate	Aluminium or steel
Curing schedule EF17	10' at 180°C (object temperature)
Layer thickness EF17	60 µm
Curing schedule topcoat	See TDS of desired topcoat
Layer thickness topcoat	80 µm

TEST REPORTS

Ultraprim EF17 meets the requirements for C5 Very High (>25 years).

Edge protection: Ultraprim was tested by the independent laboratory MetaLogic and establishes excellent edge protection at sharp corners, laser cuts, perforations, etc.

Cyclic corrosion testing: Results after 16 cycles (2688h) of cyclic corrosion testing according to ISO 12944-6.

SUBSTRATE	GRITBLASTED STEEL	ZINC PHOSPATED STEEL
BLISTERING	0 (S) 0	0 (S) 0
RUSTING	Ri 0	Ri 0
SCRIBE CORROSION	<3 mm	< 1 mm

DRYPRIM - DRY-ON-DRY PRIMER - EF26

2-LAYER
1 CURE
SYSTEM

SPECIFICS

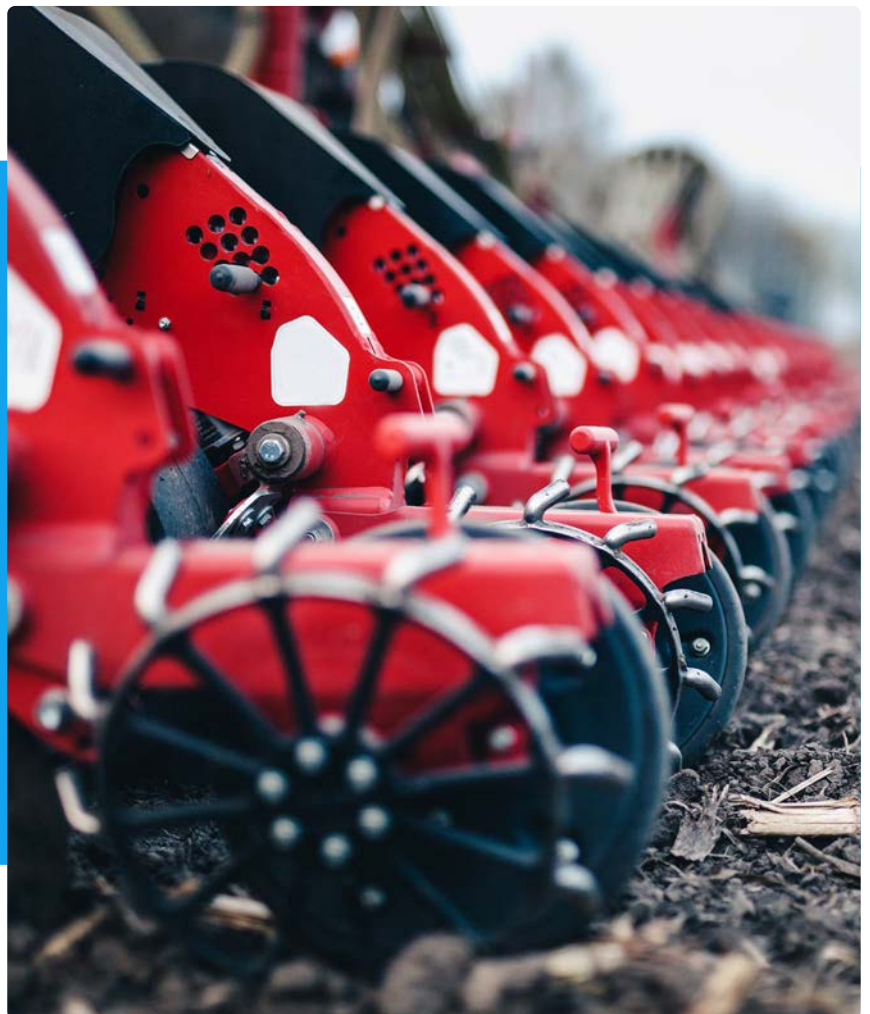
Dryprim is a primer that excels in simplicity. Thanks to its "powder-in-powder" technology, it provides the advantages of a two-layer powder coating system but needs only one cure cycle to achieve its full potential. After applying the two dry powder layers one after the other, both layers are cured in the same time span, eliminating the step of intermediate curing. Moreover, standard equipment suffices to apply this two-in-one primer system.

Dryprim promises excellent intercoat adhesion, high corrosion and edge protection. Our green label recognises Dryprim's energy efficiency. The system performs best with a PE40 low-bake topcoat. Nevertheless, other desired topcoats can be endorsed by us for system validity upon request.

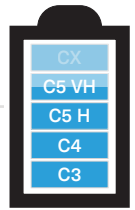
Note: The Dryprim process is easy, but a correct process start-up is vital for the product's success. It is necessary to allow Protech-Oxyplast to help you set the parameters of your process correctly from the start.

FEATURES

- Dry-on-dry principle: 2 layers, only 1 cure
- Energy efficient
- Accelerated production process
- Excellent intercoat adhesion
- Excels in simplicity



DRYPRIM - DRY-ON-DRY PRIMER - EF26



PRODUCT CODE

EF26 LIGHT GREY PRIMER (for light coloured topcoats)
ES222A8030

EF26 DARK GREY PRIMER (for dark coloured topcoats)
ES222A8025

CURING CONDITIONS

Substrate	Aluminium or steel
Layer thickness EF26	<50 µm
Curing schedule	Together with topcoat
Layer thickness topcoat	80 µm
Curing schedule	See TDS of desired topcoat

CASE STUDY

Our R&D department conducted 3 neutral salt spray tests according to ASTM B117-07 on bare steel, pretreated with iron phosphate and then passivated.

1. Primer EF26 and topcoat PE40-FE with a total layer thickness of 70 – 90 µ.
2. Primer EF26 and topcoat PE40-FE with a total layer thickness of 90 – 110 µ.
3. Only topcoat PE40-FE with a layer thickness of 80 µm.

The dry-on-dry technique can contribute significantly to preventing problems and improving the adhesion of the coating to the substrate. Our research shows that the overall coating thickness also plays an important role in protecting the substrate from corrosion and blistering. Moreover, using a primer has a beneficial effect on edge protection, especially for sharp edges.

Read the full case study on our website:
www.theprotechgroup.com/dry-on-dry-technique/



ZINCOPRIM - ZINC RICH PRIMER

2-LAYER
SYSTEM

SPECIFICS

Zincoprim is a zinc-rich epoxy-based primer that is ideally suited for shot-blasted steel. Zincoprim can be produced both as a normal cure and an accelerated, low-cure version.

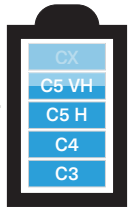
The zinc concentration processed in the coating allows the substrate to benefit from extra protection against corrosion. Apart from the cathodic protection zinc offers, it also has the inherent ability to form a very dense film that serves as a protective barrier on metal surfaces. The highly impermeable layer helps keep out moisture that can significantly speed up the corrosion process. Therefore, an extra zinc protection layer is not only useful in outdoor settings but also in many aggressive and indoor industrial environments.

FEATURES

- Zinc rich primer
- Excellent corrosion protection
- For shot-blasted steel



ZINCOPRIM - ZINC RICH PRIMER



PRODUCT CODE

ZINCOPRIM NEW (high zinc content)

ES112A8203

ZINCOPRIM (medium zinc content)

ES312A162

ZINCOPRIM LOWBAKE (accelerated formulation)

ES212A8503

CURING CONDITIONS

Substrate	Steel
Curing schedule Zincoprim	10 min. at 180°C (160°C LB)
Layer thickness Zincoprim	60 - 80 µm
Curing schedule topcoat	See TDS of desired topcoat
Layer thickness topcoat	80 µm

TEST REPORTS

Salt spray (ASTM B-117)

Results after 1440h of NSS
according to ASTM B-117/ISO 9227

Humidity cabinet (DIN 50017)

Shot-blasted steel
After 500h: no blistering
Peel off at scratch: 0 mm

SUBSTRATE	GRITBLASTED STEEL
BLISTERING	0 (S) 0
RUSTING	Ri 0
SCRIBE CORROSION	<3 mm

These results are directly related to a correct pretreatment and cannot strictly be guaranteed.

MULTIPRIM - MULTI-LAYER PRIMER

3-LAYER
SYSTEM

SPECIFICS

Multiprim is a multi-layer system that combines Protech-Oxyplast's zinc-rich primer with Ultraprim, a perfect marriage that ensures the best corrosion protection on shot-blasted steel.

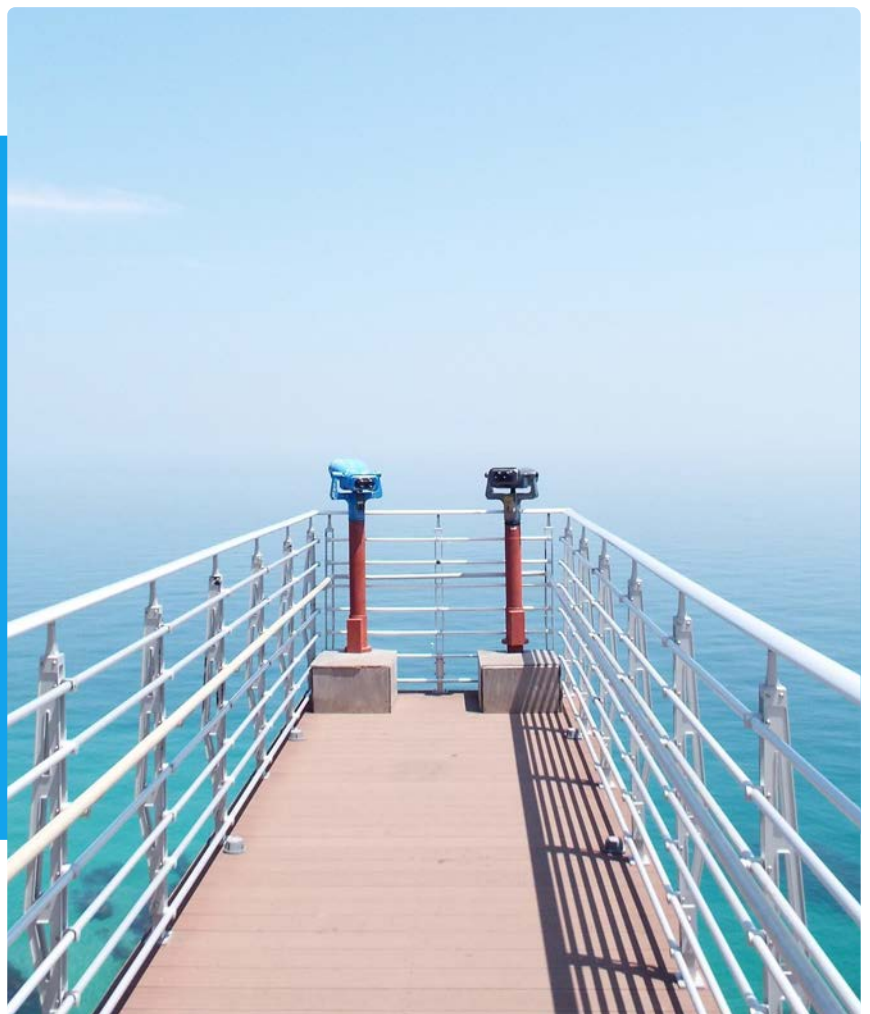
The system's high anti-corrosion performance is built on combining features such as impermeability, cathodic protection, excellent adhesion of the primer layers and high layer thickness. In cases where very strong protection is required, the substrate will benefit from additional chemical pretreatment.

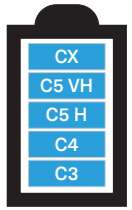
When using Multiprim, Protech-Oxyplast strongly advises using a green cure process and shortening the curing cycles per layer (more information can be found on page 23). The substrate will undergo three curing cycles, meaning that cross-linking of the first layers will proceed when curing the layers on top*.

*Protech-Oxyplast advises using Z-SERIES super durable topcoats.

FEATURES

- High layer thickness (3-layer system)
- Recommended for coastal and offshore projects
- Excellent corrosion resistance
- Very good edge protection
- For shot-blasted steel





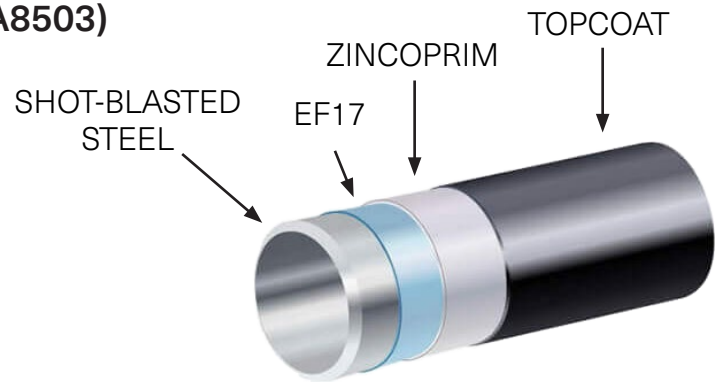
MULTIPRIM - MULTI-LAYER PRIMER

PRODUCT CODE

EF17 ULTRAPRIM (ES512A8530 or ES512A8029)

ZINCOPRIM (ES112A8203 or ES212A8503)

TOPCOAT OF CHOICE
(Z-SERIES advised)



CURING CONDITIONS

Substrate	Steel
Curing schedule EF17	Green cure* is necessary!
Layer thickness EF17	60 µm
Curing schedule Zincoprim	Green cure* is necessary!
Layer thickness Zincoprim	60 µm
Curing schedule topcoat	See TDS of desired topcoat
Layer thickness topcoat	80 µm

*Information about green cure can be found on page 23.

TEST REPORTS CYCLIC CORROSION

Multiprim meets the requirements for at least C5 Very High category*.

Results after 16 cycles (2688h) of cyclic corrosion testing according to ISO 12944-6:

SUBSTRATE	GRITBLASTED STEEL
BLISTERING	0 (S) 0
RUSTING	Ri 0
SCRIBE CORROSION	<3 mm

*Further tests in CX simulated environments (25 cycles, ISO 12944-9) prove to be very promising. Contact Protech-Oxyplast for the test results.

CHARACTERISTICS & COMPARISON

		CODE (COLOR)	SUPPORT	GLOSS	THEORETICAL CURING CONDITIONS <small>* object temperature</small> <small>** deviations might be necessary, according to your production process</small>
OXYPRIM - STANDARD PRIMER	EF33	ES312A8004 (± RAL 7035) ES312A8001 (± RAL7016)	Fe / Alu	Satin	10 min. - 180°C
GREENPRIM - LOW-BAKE PRIMER	EF36	ES322A8201 (± RAL 7035) ES322A8006 (± RAL7016)	Fe / Alu	Satin	10 min. - 160°C
ULTRAPRIM - HIGH PPERFORMANCE PRIMER	EF17	ES512A8530 (± RAL 7035 matt)	Fe / Alu	Matt	10 min. - 180°C
DRYPRIM - DRY-ON-DRY PRIMER	EF26	ES222A8030 (± RAL 7035) ES222A8025 (± RAL 7016)	Fe / Alu	Satin	N.A.: only one cure, after dry applying both primer and topcoat
ZINCOPRIM - ZINC-RICH PRIMER	ZINCOPRIM NEW ZINCOPRIM ZINCOPRIM LB	ES112A8203 ES312A162 ES212A8503	Fe Sa 2,5*	Satin	10 min. - 180°C 10 min. - 180°C 10 min. - 160°C
MULTIPRIM - MULTI-LAYER PRIMER	EF17 + ZINCOPRIM NEW + TOPCOAT	ES512A8530 (± RAL 7035 matt) + ES112A8203 (middle grey) + TOPCOAT	Fe Sa 2,5*	Satin	10 min. - 180°C 10 min. - 180°C according to TDS of chosen topcoat

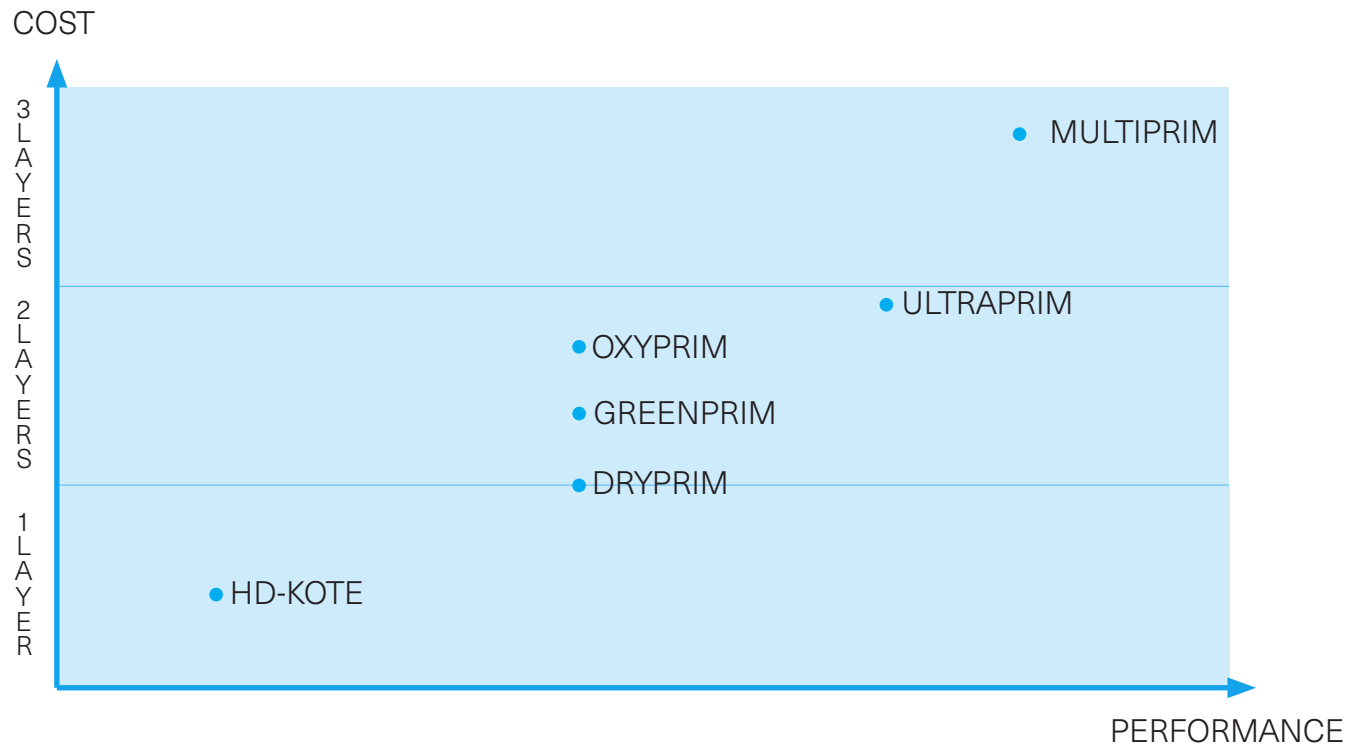
* gritblasted Fe
min. Ra: 6 - 7 µm

	DEGASSING	LOW-BAKE	OVERBAKE RESISTANCE	EDGE PROTECTION	CORROSION CLASS
OXYPRIM Standard primer					C5M
GREENPRIM LB Low-cure primer					C5M
ULTRAPRIM High performance primer					C5VH - CX
DRYPRIM Dry-on-dry primer					C5VH
ZINCOPRIM Zinc-rich primer					C5H
MULTIPRIM Multi-layer primer					C5VH - CX

*Zincoprim is available in different varieties with specific characteristics, such as low-bake properties, overbake robustness, etc.

CHARACTERISTICS & COMPARISON

EF-SERIES



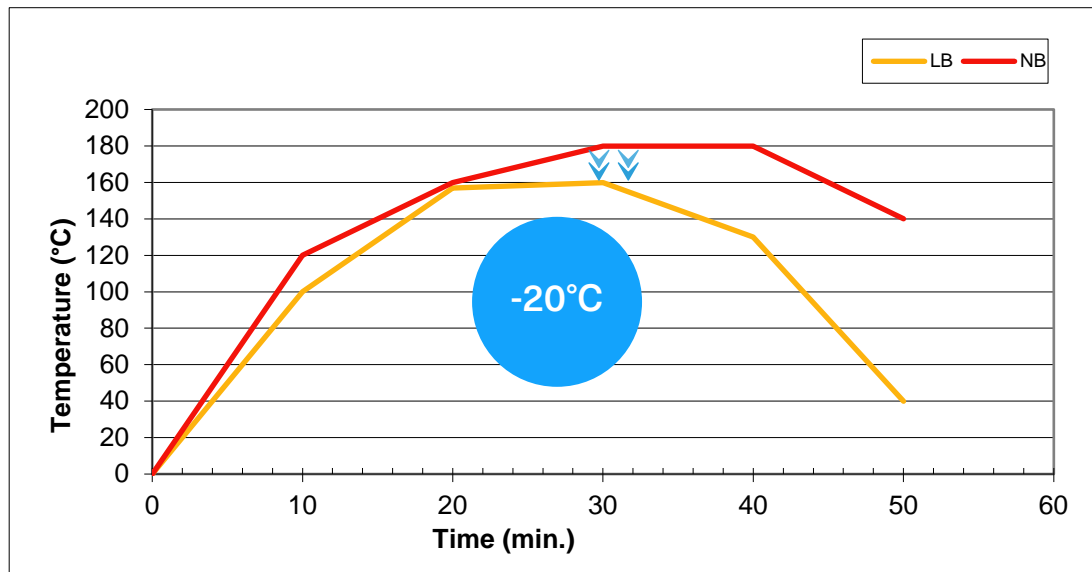
De Steltloper, the Netherlands

GUARANTEED EFFECTIVENESS

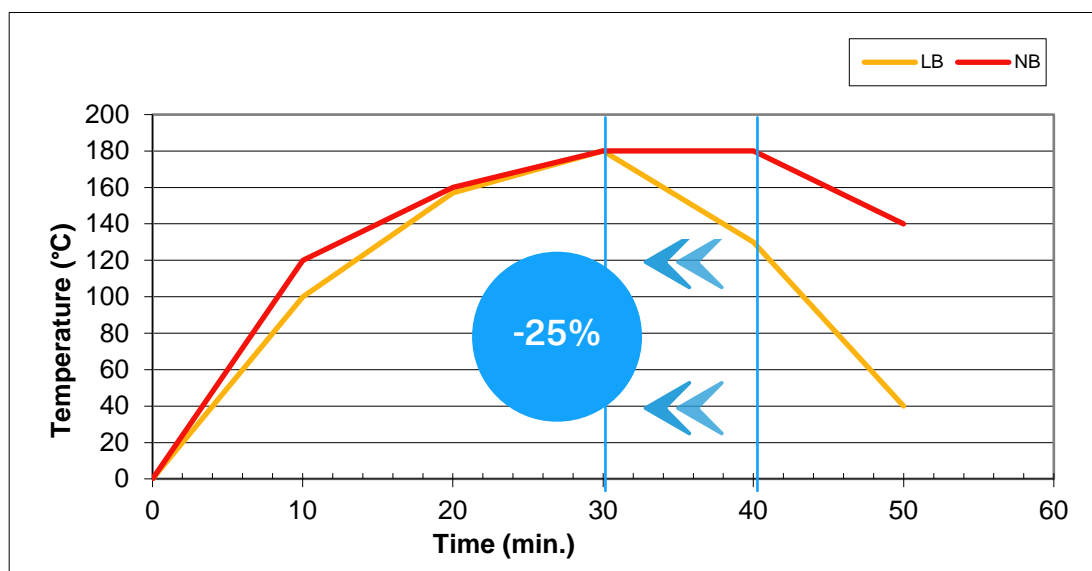
"Why use low-bake powder systems?"

Our low-bake products ensure improved coating efficiency, production and energy savings, and a reduced carbon footprint. Hereunder, you may find the results of tests performed with low-bake (LB) and normal-bake (NB) products. Your production process will benefit from reduced curing time (accelerated formulation) and/or reduced energy input (lower curing temperatures). The lowered energy input will also result in shorter heat-up times and increased productivity.

Lower gas consumption



Higher productivity



FREQUENTLY ASKED QUESTIONS

How could your primer be useful?

Topcoat layers, mainly polyester-based, are more or less permeable. Rain, humid environments or water presence will affect the coating and oxidize the metal. "Red" rust will be formed on steel, whereas it will be "white" rust on zinc substrates. This oxidation process will attack the metal, causing adhesion loss of the coating on the metal and shortening the lifetime expectancy of your object. A powder coating primer with a high content of epoxy is not permeable. It will function as a barrier and block water penetration, preventing it from touching the metal.

Another vital surplus of using a primer layer is edge protection. Especially the specially designed edge primers are utterly useful for covering sharp edges. Thanks to its specific rheology, the additional primer layer will not only build up a thicker layer on the edge than most topcoats would, but it will also allow the second layer to settle better on the edge. The rule of thumb defines that the edges require 30% of the nominal layer thickness.

Do I need a chemical or mechanical cleaning before primer application?

For many industries, lengthening the lifespan of essential parts is a critical concern. Logically, powder coating is a time and cost-effective way of doing so. Of course, this process has to be done right to be worthwhile, which is why mechanical and/or chemical cleaning is a key element of any preservation policy. Powder coating is one of the most certain ways of preserving substrates, but can only adhere on a clean surface. Apart from appropriate precleaning, a conversion layer should increase the lifetime expectation. The kind of pretreatment will depend on the type of metal and the required level of corrosion resistance.

Can salt spray test results of powder coating primers be provided?

Yes and No. The corrosion resistance (of which a salt spray test can give a good idea) is determined by the primer and by the whole coating system. Therefore, every step in the coating process will influence the test result and the corrosion resistance. In other words, if you would like to determine and compare the corrosion resistance of a primer, you need to test it on a comparable combination of substrate, cleaning, pretreatment, primer, and topcoat. The primer layer is just one aspect to consider, though a very important one.

Is layer thickness of the primer important?

Absolutely! The higher the layer thickness, the better the part will be protected against corrosion. However, when the primer layer is too thick, applying a second layer will become more difficult, and the mechanical strength might drop. Generally, we advise approx. 60µm of primer and 60 - 80µm of topcoat. In multiple-layer systems, do not overcure the first layer, as it will pass the oven several times during the coating process. In those cases, we strongly advise following the "green cure" curing time and temperature.

Are the primers available in any color?

All colours can be tailor-made. However, Protech-Oxyplast already offers two standard colours that are immediately available: a neutral light grey primer which works best under most light colours, and a RAL 7016 primer for darker colour purposes. Slight colour differences with the topcoat can allow you to determine if the topcoat (second layer) is applied sufficiently.

How to prevent intercoat adhesion loss?

A significant amount of complaints and claims are due to adhesion loss between the topcoat and the primer. Overcure and the deposition of substances in direct gas ovens are often why the top layer does not adhere to the primer. In the past, primers were mainly 100% based on epoxy resins. These pure epoxy powders became very hard when cured too high or too long, in combination with gas release in the oven. Continuous development and optimisation led to the modification of these epoxy primers. Thanks to our research, Protech-Oxyplast has developed a very high-end pure epoxy primer, which is safe to use in all circumstances and offers ultimate corrosion protection.

FREQUENTLY ASKED QUESTIONS

Can powder coating be used for CX-/ offshore projects?

The CX environment class refers to extreme circumstances, one of which is the offshore environment covered by ISO 12944-9.

Generally acknowledged, there are six atmospheric-corrosivity categories:

- C1 very low
- C2 low
- C3 medium
- C4 high
- C5 very high
- CX extreme

Moreover, these time ranges express durability:

- Low (L) < 7 years
- Medium (M) 7 - 15 years
- High (H) 15 - 25 years
- Very High (VH) > 25 years

Our R&D department is doing research to determine the best system for CX environments. Please feel free to contact Oxyplast to assist you further.

How to choose the most appropriate system for a specific purpose and production process?

Protech-Oxyplast recommends making a list of all the requirements the powder coating system needs to meet, such as performance requirements (adhesion, appearance, and mechanical and resistance properties), conditions under which the coating must perform, and lifetime expectancy*, coating equipment in use and cure time in the process, image loss, gloss level, etc. Let this brochure and its overviews assist you, or contact us. Your regional salesperson, as well as our entire team, are available to support you.

*Please consult our corrosion matrix on page 5.

Does primer/ powder coating in general fill imperfections?

No. Powder coating can only cover minor scratches and little imperfections. Smooth glossy powders are the most demanding, whereas matt or textured powders are the most forgiving for surface preparation. However, as with any coating, the final result is only as good as the surface. Paintable fillers to smoothen or camouflage imperfections are available.

What kind of properties powder coating can add to the coated substrate?

There are specific properties you can choose from when deciding to use powder coatings: static and dynamic mechanical properties, flexibility, toughness, adhesion, hardness, abrasion resistance, chemical resistance, aesthetic appearance, etc.



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