

Interpon Anticorrosion Systems



SELECTION GUIDE FOR STEEL





The long term corrosion protection of an item depends on many factors. The initial design, the choice of anticorrosion system, the production techniques, the ongoing maintenance scheme and the operating environment will all have an effect on the performance throughout the in-service life.

The correct selection and good application of the coating system play a vital role in providing the appropriate corrosion protection to give long term performance. AkzoNobel Powder Coatings offers a range of different high performance anticorrosion coating systems combined with detailed and rigorous application guidelines. Our expertise is at your disposal, so don't hesitate to take advice from our technical specialists.

THE CHOICE OF A SUITABLE ANTICORROSION SYSTEM

An anticorrosive powder coating system is defined by:

- the surface pre-treatment of the pieces to be coated
- the powder coating product or products
- the coating system specification ie number of coats, film thickness and application conditions

Selection of the most appropriate system can be made by following these steps.

1 Anticipate key factors

Type of substrate

For instance, a low viscosity primer could be useful to give a better surface to an irregular cast.

Type of environment

For instance in an environment with high humidity & condensation a system with a good barrier protection would be recommended.

Expected durability of anticorrosion protection

Shop fittings are periodically changed so a standard anticorrosion protection is sufficient. Whereas an item exposed to harsh weather and located in an inaccessible area requires high anticorrosion protection

Type of part - geometry, mass, quantity

Heavy parts cannot generally be pre-treated by chemical pre-treatment: a mechanical pre-treatment is then necessary. On the other hand the chemical pre-treatment is more adapted to parts showing crevices.

The chemical pre-treatment is also better adapted for large quantity treatments even if the automatic grit blasting allows large volume treatments.

Working constraints

If the coated parts could be subject to specific requirements such as contact with chemical products, silkscreen printing, exposure to specific temperatures, resistance to specific mechanical stresses, government controlled uses (contact with food), such uses must be the subject of specific recommendations.



Post-forming operations after coating

Any kind of parts which will be submitted to post-forming operations like folding, stamping, boring should have been pre-treated in a way to provide a very good adhesion of the powder coating.

However, to get the best anticorrosion protection it is highly recommended to reduce the post-forming operations to the minimum.

2 Select a protection technique

Barrier effect protection

This technology aims to isolate steel from its environment by covering it with a water and airtight cover such as enamel, paint, plastic coating, etc. It is called a barrier protection. The barrier protection works well as long as there is no defect in the protecting layer.

Cathodic protection

This technology consists of putting the steel in contact with a less noble metal which will oxidize preferentially to iron. Iron is less easily oxidized than zinc and can be protected by it. Zinc brings a cathodic protection to iron by an electrochemical effect.



Steel passivation protection

With paints or powder coatings, it is possible to delay the corrosion creep under the coating by the use of inhibiting pigments which can passivate the steel substrate.

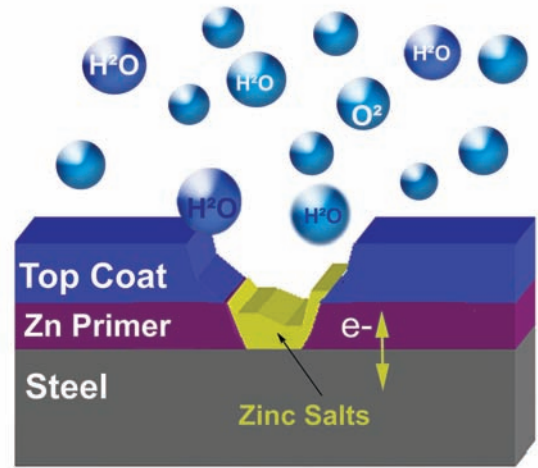
These pigments, depending on their nature, can build a passivating layer slowing down the reaction with the water-oxygen mixture or can neutralize the acid ions caused by humidity.

The effectiveness of these corrosion inhibiting pigments varies considerably depending on the coating chemistry and the formulating technique used.

Duplex system protection

When a zinc or zinc rich covering is overcoated with paint or powder coating, it is called a duplex system.

This two layer system combines cathodic protection provided by the zinc and an impermeable barrier protection provided by the coating.



^ Diagram of the Duplex System protection

3 Match it with our Interpon System

To aid selection the following tables present:

- The recommended Interpon anticorrosive systems depending on the category of the corrosive environment and on some generic pre-treatment types
- The additional characteristics of the different proposed systems.

This selection guide, based on the experience of AkzoNobel Powder Coatings, is given as information only. Please consult us for advice on your specific needs.

>> By Corrosivity category

The following tables are split by environment types exterior / interior. They are built using the corrosivity categories of ISO 12944-2. The anticorrosion systems presented are based on the different protection techniques.



Steel passivation **Active Protective Primer Interpon APP 120 + topcoat**

Barrier effect **Barrier Protective Primer Interpon BPP 330 + topcoat**

Duplex system **Zinc rich primer Interpon PZ + topcoat**
(cathodic protection + barrier effect)

Reinforced Duplex System **3 layer system Interpon PZ + Interpon BPP 330 + topcoat**
(cathodic protection + high barrier protection)

Selection guide of Interpon steel anticorrosion

Pieces exposure		Corrosivity categories of the environment ISO 12944				
		Exterior atmosphere				
		C2	C3	C4	C5-I	C5-M
		Corrosivity Low	Corrosivity Middle	Corrosivity High	Corrosivity Very High Industrial	Corrosivity Very High Marine
		Rural zones Low level of pollution	Urban, Industrial / coastal area moderated pollution / low salinity	Industrial/coastal area moderate salinity	Industrial high humidity /aggressive	Coastal/offshores area high salinity
Surface treatments	Chemical treatments	Amorphous Phosphating or Amorphous Phosphating with Passivation or Cristalline Zn-Ni Phosphating with Passivation	Amorphous Phosphating with Passivation or Cristalline Zn-Ni Phosphating with Passivation	Cristalline Zn-Ni Phosphating with Passivation	Specific study, consult us	Cristalline Zn-Ni Phosphating with Passivation
	Or	Or				Or
Note 1	Mechanical treatments	Grit blasting Ra 6 - 12 μ SA \geq 2,5	Grit blasting Ra 6 - 12 μ SA \geq 2,5	Grit blasting Ra 6 - 12 μ SA \geq 2,5		Grit blasting Ra 6 - 12 μ SA 3
Coatings	On chemical treatments	Interpon 610, TC or Interpon D1036 or Interpon D1094 (mini 60 μ) Note 3	<u>2 layer system</u> : Interpon APP120 or Interpon BPP330 (mini 60 μ) + Interpon 610, TC or Interpon D1036 or D1094 (min. 70 μ) Note 3	Depending on the environment : <u>2 layer system</u> : Interpon APP120 or Interpon BPP330 (mini 60 μ) + Interpon 610, TC or Interpon D1036 or D1094 (mini 70 μ) Note 4 Or <u>3 layer system</u> : Interpon PZ 770 (min. 60 μ) + Interpon BPP330 (min. 60 μ) + Interpon D1036 or D1094 (min. 70 μ) Note 3		Specific study, consult us
	On mechanical treatments	<u>2 layer system</u> : Interpon PZ 660 or 770 (min. 60 μ) + Interpon 610, TC or Interpon D1036 or D1094 (min. 70 μ) Note 3	<u>2 layer system</u> : Interpon PZ 660 or 770 (min. 60 μ) + Interpon 610, TC or Interpon D1036 or D1094 (min. 70 μ) Note 3	Depending on the environment : <u>2 layer system</u> : Interpon PZ 770 (min. 60 μ) + Interpon D1036 or D1094 (min. 70 μ) Note 4 Or <u>3 layer system</u> : Interpon PZ 770 (min. 60 μ) + Interpon BPP330 (min. 60 μ) + Interpon D1036 or D1094 (min. 70 μ) Note 3	Specific study, consult us	With a durability depending on the elements design, use and maintenance : <u>3 layer system</u> : Interpon PZ 770 (min. 60 μ) + Interpon BPP330 (min. 60 μ) + Interpon D1036 or D1094 (min. 70 μ) Note 3

Note 1 : for cast iron, in some cases, a degassing operation and a surfacer primer application could be recommended
 Note 2 : some Interpon 310 or Interpon 700 finishes containing metal pigments can not be used in humid environments
 Note 3 : high durability powder coatings are also available, Interpon 810 for industrial uses and Interpon D2525 for
 Note 4 : only for pieces located over 500 meters from a coast or an aggressive atmosphere

Pieces exposure		Corrosivity categories of the environment ISO 12944				
		Interior ambience				
		C1	C2	C3	C4	C5
		Corrosivity Very low	Corrosivity Low	Corrosivity Middle	Corrosivity High	Corrosivity Very High
		Heated building, clean atmosphere office, stores, school	Not heated building, possible condensation Warehouse, Sporthall	Production room, high humidity and air pollution Food ind., laundries, dairies	Chemical Plants, Swimming pool costal ship, boatyard	Building/area Condensation, high pollution
Surface treatments	Chemical treatments	Amorphous Phosphating or Amorphous Phosphating with Passivation or Cristalline Zn-Ni Phosphating with Passivation	Amorphous Phosphating or Amorphous Phosphating with Passivation or Cristalline Zn-Ni Phosphating with Passivation	Amorphous Phosphating with Passivation or Cristalline Zn-Ni Phosphating with Passivation	Cristalline Zn-Ni Phosphating with Passivation	Specific study, consult us
	Note 1	Or	Or			
	Mechanical treatments	Grit blasting Ra 6 - 12 μ SA \geq 2,5	Grit blasting Ra 6 - 12 μ SA \geq 2,5	Grit blasting Ra 6 - 12 μ SA \geq 2,5	Grit blasting Ra 6 - 12 μ SA \geq 2,5	
Coatings	On chemical treatments	Interpon 700 or Interpon 310 or Interpon 610 or Interpon D1036 or Interpon D1094 (mini 60 μ)	Interpon 700 or Interpon 310 or Interpon 610 or Interpon D1036 or Interpon D1094 (mini 60 μ) Note 2	<u>2 layer system</u> : Interpon APP120 or Interpon BPP330 (mini 60 μ) + Interpon 700 or Interpon 610, TC or Interpon D1036 or D1094 (mini 60 μ) Note 2	<u>3 layer system</u> : Interpon PZ 770 (mini 60 μ) + Interpon BPP330 (mini 60 μ) + Interpon 700 or Interpon 610, TC or Interpon D1036 or D1094 (mini 60 μ) Note 2	Specific study, consult us
	On mechanical treatments	Interpon 700 or Interpon 310 or Interpon 610 or Interpon D1036 or Interpon D1094 (mini 60 μ)	Interpon 700 or Interpon 310 or Interpon 610 or Interpon D1036 or Interpon D1094 (mini 60 μ) Note 2	<u>2 layer system</u> : Interpon PZ 660 or 770 (mini 60 μ) + Interpon 700 or Interpon 610, TC or Interpon D1036 or D1094 (mini 60 μ) Note 2	<u>3 layer system</u> : Interpon PZ 770 (mini 60 μ) + Interpon BPP330 (mini 60 μ) + Interpon 700 or Interpon 610, TC or Interpon D1036 or D1094 (mini 60 μ) Note 2	

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<< Chemical pretreatment



Mechanical pretreatment >>

>> By additional characteristics

Regarding the primer choice some additional characteristics of the primer should be taken in account such as its application conditions, its overcoatability with a liquid paint etc.

The following table provides some of this information which should be completed by consulting the primer technical documentation.

Additional characteristics of the systems

Primer	Type	Hollow bodies penetration	Edge coverage power	Primers - colours availability	Powder spraying easiness	Powder recycling easiness	Topcoat flow quality	Overcoatability with liquid paints	Use as holding primer	Safety Label
Interpon APP 120	Powder Epoxy-polyester	●●	●●●●●	Yes	●●●●●	●●●●●	●●●●●	Yes : PU 1K or 2K	Yes, with a maximum waiting delay of 6 weeks	Free
Interpon BPP 330	Powder Pure Epoxy	●●	●●●●	Grey	●●●●●	●●●●●	●●●●●	Yes : PU 1K or 2K	Yes, with a maximum waiting delay of 1 week	Free
Interpon PZ 660	Powder Zinc rich Epoxy	●	●●●●	Zinc grey	●●●●	●●●●	●●●●	Yes : PU 1K or 2K	No	Xi Irritant N-Dangerous for the environment
Interpon PZ 770	Powder Zinc rich Epoxy	●	●●●●	Zinc grey	●●●	●●●	●●●	Yes : PU 1K or 2K	No	Xi Irritant N-Dangerous for the environment

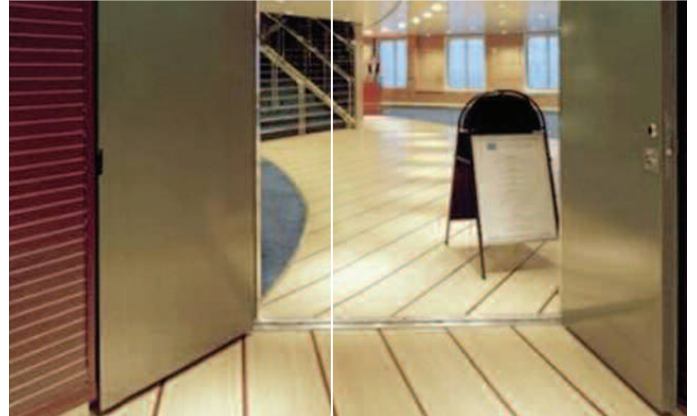


OUR ANTICORROSION SYSTEMS IN DETAIL

>> Interpon APP 120 system

This two layer system consists of an active protective primer Interpon APP 120 overcoated with a polyester topcoat or a hybrid topcoat for interior exposure. It is dedicated to steel protection with a surface pre-treatment obtained by grit blasting or phosphating with passivation. Interpon APP 120 is an epoxy polyester primer including active anticorrosive pigments which provide a passivating effect to protect the substrate. This primer has also been formulated to provide the best adhesion of the topcoat, powder or liquid. Interpon APP 120 can be formulated in different colours to correspond with the topcoat colour. This hybrid primer can also be used as a holding primer but never as a durable single coat.

- ✓ Good performance with phosphating with passivation
- ✓ Zinc free anticorrosive primer
- ✓ High finish quality due to good flow of primer
- ✓ Good protection of the part's edges
- ✓ Holding primer for a powder / liquid topcoat (maximum overcoating time of 6 weeks and a preliminary cleaning)
- ✓ Easy and flexible application with precise guidelines
- ✓ Possibility to have a similar colour to the topcoat colour



^
^ Hellbergs' boat doors protected by Interpon APP 120

>> Interpon BPP 330 system

This two layer system is made of a barrier protective primer Interpon BPP 330 overcoated with a polyester topcoat or a hybrid topcoat for interior exposure. It is dedicated to steel protection with a surface pre-treatment obtained by grit blasting or phosphating. Interpon BPP 330 is a pure epoxy primer providing excellent barrier protection. This is made possible by formulating techniques to achieve a high level of cross-linking in the polymer matrix together with the incorporation of barrier effect agents. This combination significantly enhances the performance when compared with other systems such as normal epoxy primers. It is available in grey and satin.

- ✓ Very good anticorrosion in particular with a phosphating with passivation
- ✓ Very good flow
- ✓ Zinc free anticorrosive primer
- ✓ High finish quality system due to good flow of primer
- ✓ Easy spraying
- ✓ Possibility to use it also as a barrier primer on hot dip galvanised steel.



<< Veles e Ventes - Valencia Spain
Protected by a 3 layer system: Interpon PZ 770 / Interpon BPP 300 / Top coat.



>> Interpon PZ system

This duplex technology system combines cathodic protection and barrier effect. It consists of a two layer system with a zinc rich primer - Interpon PZ 660 or Interpon PZ 770 - overcoated with a polyester topcoat or a hybrid topcoat for interior exposure.

Dedicated to steel protection with a surface pre-treatment obtained by grit blasting or phosphating with passivation, the Interpon PZ formulation is patented by AkzoNobel. It is made of an epoxy resin, including 50% of zinc; dust and in particular lamellate to improve conductivity. Interpon PZ 770 includes a specific anticorrosive function which improves the protection in case of scratch.

Both Interpon PZ products have a grey zinc colour.

- ✓ High anticorrosion protection especially with grit blasting
- ✓ Interpon PZ 770 is certified by ACQPA - (N° C4A NV 572) and approved by SNCF (French railways) according to the NF F 19-478 specification
- ✓ Good finish quality (no irregular and porous surface)
- ✓ Economical zinc powder primer /m² (density 2,0)
- ✓ Strict application specification
- ✓ Approved applicators network
- ✓ Possibility to apply a PU 2K liquid topcoat on the Interpon PZ primer (maximum application delay of 12 hours) and if required a third antigraffiti powder layer.



^ Various Industrial parts protected by Interpon PZ system.

>> 3 layer system

The Interpon PZ + Interpon BPP 330 system is used in highly corrosive environments. This 3 layer system consists of a zinc rich primer Interpon PZ 770, a barrier protective primer Interpon BPP 330 and a polyester topcoat / hybrid topcoat for interior

It is mainly intended for steel protection with a surface pre-treatment obtained by grit blasting or crystalline Zn-Ni phosphating with passivation.

The system combines the benefits of cathodic protection (Interpon PZ) and the high barrier effect (Interpon BPP 330)



<< Protected by a 3 layer system



THE CHOICE OF PERFORMANCE AND AESTHETIC

Interpon anticorrosive primers have many years anticorrosion track record performance, throughout Europe.

Interpon primers are used in a wide range of applications:

- Architectural metalwork
- Balustrades
- Fencing
- Structural steelwork
- Truck trailers and chassis
- Gas-tanks and bottles

Through the wide range of finishes – Collection Futura, Elements, Fiji and Ral “Metallic”, AkzoNobel Powder Coatings also bring a high aesthetic appearance to the coated pieces. This is further preserved with the Interpon anticorrosion systems.

When used with one of the wide range of AkzoNobel finishes – Collection Futura, Elements, Fiji and RAL “Metallic” – coated pieces can have a combined highly protective and aesthetic finish.



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