

# Steel Coatings Guide

Envirothane  
Vitrethane and  
Vitreflon



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### ACKNOWLEDGEMENTS

We acknowledge all images in this publication taken from non A & I Coatings resources

### DISCLAIMER

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about us

**Welcome to A & I Coatings – a company that recognises the requirements of its valued clients and services those requirements by producing products in line with the latest technological developments.**

Now a fully certified ISO 9001-2008 company and committed to environmental responsibility, A & I Coatings confidently responds to the most daunting challenges and fulfils the most complex requirements. A & I Coatings steel coatings combine durability with environmental responsibility. What is released are products that are fit for purpose, user friendly, economic and will provide a long lasting finish.

We at A&I Coatings look on steel protection as both a challenge and a privilege. We believe we have the challenge sorted, and now we hope you'll give us the privilege of protecting your property.

Research and development at A & I Coatings involves extensive practical testing in a multitude of applications to validate products according to the most stringent standards. A & I Coatings is a family business with more than 30 years of experience in the development and manufacture of special purpose coatings.

The friendly team at A&I Coatings are eager to help with specifications, samples, low VOC certificates for GreenStar projects and advice regarding the best systems for meeting specific requirements.

We invite you to put our products to the test.





about coating steel

## About coating steel...

There are two factors involved in steel coating... protection of the steel from rust by the primer and possibly build coat, and the decorative and protective role of the topcoat.

### Some heavy points...

- The degradation of any object needs mechanical, electrical or chemical energy. The main source for changing the nature of a substance is the energy from solar radiation.
- 5 – 6 % of radiation is UV radiation and it is this that destroys all organic products.
- The “micro” climate includes dew, which is more aggressive to paint than rain, as it is often saturated with pollutants.

- It is a law of nature that all unstable products will revert to the stable metal oxide, hence iron to rust, zinc to zinc oxide etc.
- The three major factors which cause rusting are humidity and dew formation, the presence of oxygen, and the stimulating effects of acid pollutants in the atmosphere.
- Zinc is used as a protection for steel because it corrodes at a much slower rate.
- Zinc coatings form a barrier against oxygen, humidity, and acid pollutants. Zinc forms a salt on the surface which is very tough.

### There are five different climates..

- Dry (cold polar or hot desert). These areas are characterized by very low corrosion.
- Normal (town and rural). This will be characterized by higher humidity than dry climate and so faster corrosion but still slow.
- Coastal (with chloride contamination). Much faster corrosion.
- Industrial. Characterized by acid pollution and faster corrosion.
- Tropical. An increase of temperature of 10C will double the speed of a chemical reaction such as corrosion.

### Painting Iron and Steel Surfaces Preparation

- Hot rolled steel always comes out with a layer of iron oxide or mill scale. Mill Scale must be removed to get a long lasting paint system in exterior applications.
- Removal is normally by abrasive blast cleaning. This is to Class 1, Class 2 thorough blast cleaning, or Class 2.5 Very thorough blast cleaning, or Class 3 to white metal.
- Hand tool cleaning, wire brushing etc won't remove all mill scale but this may not be an issue in an internal application.
- As soon as possible after preparation steel should be painted to prevent rerusting and contamination by salts etc.

### Atmospheric Corrosion of Metals

- Metals are made by processing from a stable metal oxide to a less stable pure metal.

## about coating steel

- The coating should have a ...
  - a. Barrier effect to keep out moisture, oxygen and other pollutants.
  - b. Electrical insulating effect so that galvanic cells are not formed.
  - c. Passivating effect so that acidic ions etc are neutralized.
- Zinc phosphate epoxies provide a good passivating effect, but need a clean surface to be really effective.
- Micaceous iron oxide pigmented coatings provide excellent barrier coatings over the zinc phosphate.
- Polyurethanes provide very good weathering durability, and Fluoropolymers much better again. Therefore a typical heavy duty Spec might be...
  - a. Blast cleaning to Class 2.5
  - b. Epoxy zinc phosphate primer (V580)...80µm
  - c. Micaceous iron oxide epoxy (E100 MIOX).....100µm
  - d. Two Pack Fluoropolymer (IA10).....40µm

Water based protective coatings are being used more now for environmental reasons and A&I Coatings have achieved very comparable results to solvent based coatings..

## Paint application Information

**Formula:** Theoretical Spreading Rate (SR).

$$\text{SR} = \frac{\text{Corrected Volume Solids (CVS)} \times 10}{\text{Dry Film Thickness (DFT)}}$$

Spreading Rate (in m<sup>2</sup>/Litre)\* Achieving required DFT for various solids coatings

Dry Film Thickness (microns)	VOLUME SOLIDS %																	
		20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
	20	10.0	12.5	15.0	17.5	20.0	22.5	25.0	27.5	30.0	32.5	35.0	37.5	40.0	42.5	45.0	47.5	50.0
	25	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	38.0	40.0
	30	6.7	8.3	10.0	11.7	13.3	15.0	16.7	18.3	20.0	21.7	23.3	25.0	26.7	28.3	30.0	31.7	33.3
	50	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
	75	2.7	3.3	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0	12.7	13.3
	100	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
	125	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0
	150	1.3	1.7	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	6.3	6.7
	175	1.1	1.4	1.7	2.0	2.3	2.6	2.9	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.1	5.4	5.7
	200	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	5.0
	250	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0
	300	0.7	0.8	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3
	400	0.5	0.6	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.1	2.3	2.4	2.5
	500	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0

\*Theoretically calculated figures may vary from practical spreading rates by as much as 50% or more.

Mining  
machinery,  
agricultural  
machinery etc



## Water based Typical Specifications

Environment	Preparation	Primer	DFT (um)	TSR m <sup>2</sup> /L	Intermediate Coat	DFT (um)	TSR m <sup>2</sup> /L	Topcoat	DFT (um)	TSR m <sup>2</sup> /L	Total DFT
Mild	Whip blast, wire brush	E8300	40	9.0				E8075	40	6.0	80
Medium	Class 2.5 blast	E2300	50	8.0	E2300	50	8.0	E8476	50	10.0	150
Marine Fluoropolymer topcoat	Class 2.5 blast	E2300	75	5.5	E2100MIOX	150	3.0	E8480	50	8.0	275

### ENVIROTHANE 8300

A & I Coatings ENVIROTHANE 8300 is a single pack water based anti-corrosive primer. Envirothane 8300 has excellent adhesion and film properties on a variety of substrates in both general industrial and marine uses. E8300 can be recoated with a wide range of topcoats to give an environmentally friendly and versatile paint.

### ENVIROTHANE 2300

ENVIROTHANE 2300 is a water based, environmentally friendly two pack zinc phosphate primer for mild steel, hot dipped gal and zinc plated steel. This product

exhibits excellent anti-corrosive properties, is fast drying and has very good resistance to abrasion and impact damage. E2300 commonly forms the primer or intermediate coat in medium to heavy duty coating specifications, in conjunction with an Envirothane topcoat.

### ENVIROTHANE 2100 MIOX

ENVIROTHANE 2100 MIOX is a two component high performance epoxy micaceous iron oxide coating. When used as an intermediate coat it provides an excellent corrosion barrier. Fast dry characteristics are especially beneficial for early handling when applied as a same day multicoat system, even under low temperature

conditions. The high solids and low VOC nature is ideal for both industrial and marine environments. Envirothane 2100 MIOX has been formulated to suit both spray or brush applications.

### ENVIROTHANE 8476

ENVIROTHANE 8476 is a water borne two pack polyurethane coating which gives excellent adhesion, barrier and film properties on a variety of substrates. It is easy to use and environmentally friendly, with the added benefit of durability, good yellowing and UV resistance on exterior exposure. It has good abrasion and chemical resistance.





Mining  
machinery,  
agricultural  
machinery etc

### Solvent based Typical Specifications

Environment	Preparation	Primer	DFT (um)	TSR m²/L	Intermediate Coat	DFT (um)	TSR m²/L	Topcoat	DFT (um)	TSR m²/L	Total DFT
Mild	Whip blast, wire brush	V440	20	5				V630	50	8	70
Medium	Class 2.5 blast	V580	50	10	V580	50	10	V630	50	8	125
Marine	Class 2.5 blast	V580	75	6.8	V580	100	5	V630	50	8	225

### VITRETHANE 440

VITRETHANE 440 is a single pack self etching primer/pretreatment for adhesion to both ferrous and non ferrous substrates, various plastics and laminated surfaces. V440 is suitable for applications where combination of fast drying, adhesion, abrasion resistance and overcoatability is required. V450 or V580 are recommended where

increased corrosion resistance is required. CASA Approved for aeroplanes.

### VITRETHANE 580

VITRETHANE 450 is a two pack polyurethane high build zinc phosphate based primer with excellent rust-inhibiting properties for application to steel, aluminium or galvanised surfaces. Vitrethane 450 also has excellent filling properties.

### VITRETHANE 630

VITRETHANE 630 is a solvent based two pack acrylic urethane with very good exterior durability and excellent application properties. It is quick drying and well suited to onsite application.

## Locomotives and Rolling Stock



### Water based system Typical Specifications

Environment	Preparation	Primer	DFT (um)	TSR m <sup>2</sup> /L	Intermediate Coat	DFT (um)	TSR m <sup>2</sup> /L	Topcoat	DFT (um)	TSR m <sup>2</sup> /L	Total DFT
Mild	Whip blast, wire brush	E8300	40	9.0				E8476	40	6.0	80
Medium	Class 2.5 blast	E2300	50	8.0	E2300	50	8.0	E8476	50	10.0	150
Heavy Duty	Class 2.5 blast	E2300	75	5.5	E2100MIOX	150	3	E8476	50	10.0	275





## Locomotives and Rolling Stock

### Solvent based Typical Specifications

Environment	Preparation	Primer	DFT (um)	TSR m <sup>2</sup> /L	Intermediate Coat	DFT (um)	TSR m <sup>2</sup> /L	Topcoat	DFT (um)	TSR m <sup>2</sup> /L	Total DFT
Low cost	Whip blast, wire brush	V440	20	5				V630	50	8	70
Medium	Class 2.5 blast	V580	50	10.0	V580	50	10.0	V640	50	9	150
Heavy duty	Class 2.5 blast	V580	75	6.8	V580	100	5	V640	50	9	225

### VITRETHANE 580

VITRETHANE 580 combines a high loading of zinc phosphate in an air impermeable matrix of hard epoxy resin. Its excellent adhesion and its corrosion inhibiting “throw” renders VITRETHANE 580 very effective in the control of rust on mild steel substrates. It usually forms the primer or intermediate coat of a heavy duty paint system in combination with a durable VITRETHANE Polyurethane topcoat finish.

### VITRETHANE 640

VITRETHANE 640 is a two pack high performance reactive acrylic crosslinked with aliphatic isocyanates at room temperature or under low bake conditions.

## Architectural and Structural Steel

### Water based steel system Typical Specifications

Environment	Preparation	Primer	DFT (um)	TSR m <sup>2</sup> /L	Intermediate Coat	DFT (um)	TSR m <sup>2</sup> /L	Topcoat	DFT (um)	TSR m <sup>2</sup> /L	Total DFT
Mild	Whip blast, wire brush	E8300	40	9				E8075	40	6.0	80
Medium	Class 2.5 blast	E2300	50	8	E2300	50	8	E8476	50	10	150
Marine	Class 2.5 blast	E2300	75	5.5m <sup>2</sup> /L	E2100MIOX	150	3	E8476	50	10.0	275
Fluoro polymer topcoat	Class 2.5 blast	E2300	75	5.5m <sup>2</sup> /L	E2100MIOX	150	3	E8480	50	8	275

## ENVIROFLON 8480

ENVIROFLON 8480 is a unique, environmentally friendly two pack water borne fluoro modified two pack acrylic polyurethane with excellent graffiti and chemical resistance. It has superior UV resistance. It has good application properties and is very low in VOC's.



## Architectural and Structural Steel

### Solvent based steel system Typical Specifications

Environment	Preparation	Primer	DFT (um)	TSR m²/L	Intermediate Coat	DFT (um)	TSR m²/L	Topcoat	DFT (um)	TSR m²/L	Total DFT
Mild	Whip blast, wire brush	V440	20	5				V630	50	8	70
Medium	Class 2.5 blast	V580	50	10	V580	50	10	V630	50	8	125
Marine	Class 2.5 blast	V580	75	6.8	V580	100	5	V630	50	8	225
Fluoro polymer topcoat	Class 2.5 blast	V580	75	6.8	V580	100	5	IA20	50	6	225

### INFLONITO A20

INFLONITO A20 is a high performance two pack fluoropolymer resin based top coat that can cure at room temperature or under low bake conditions. This gives excellent UV resistance and weathering performance. It has good application properties and chemical resistance. The ‘State of Art’ technology lowers the lifetime maintenance cost of coating in a variety of environments

**What solution can we bring to help solve your problem?**

If we haven’t got it we have the technical expertise to invent it.

Please contact [helpdesk@aicoatings.com](mailto:helpdesk@aicoatings.com) or phone 1800 819 585



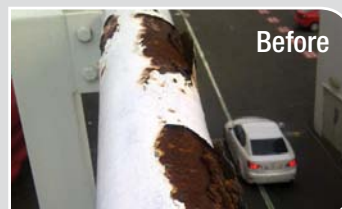
## Typical Projects



Many buses and coaches are coated the the Vitrethane System

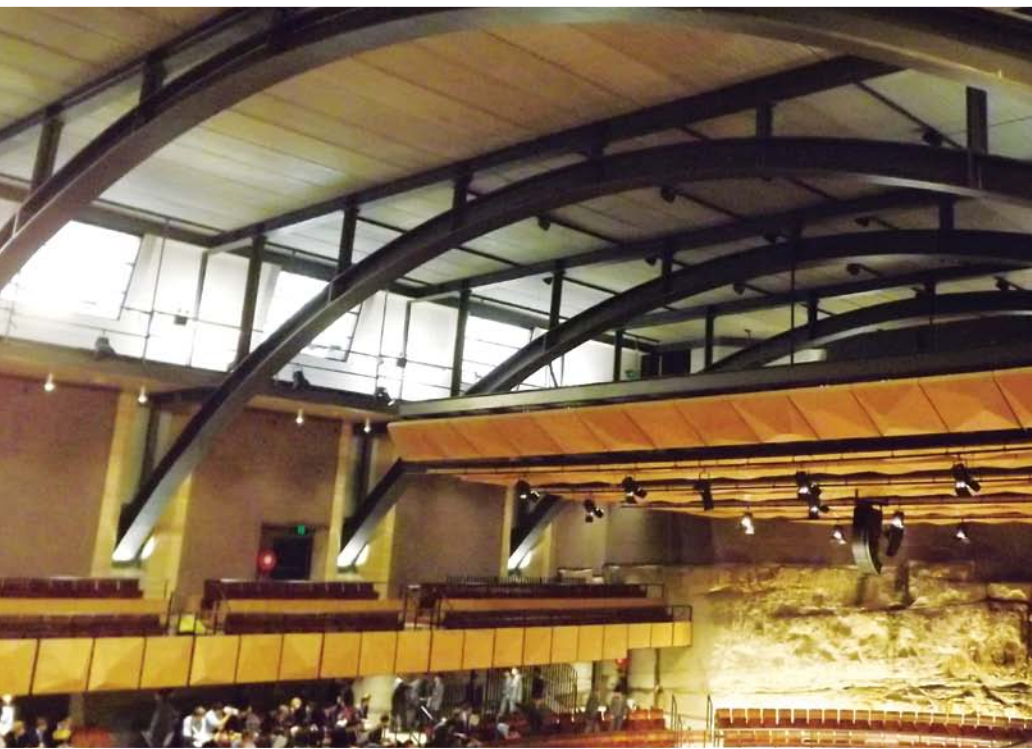


BlueScope Steel Façade Panels finished in the Inflonito System



Trial of E1980 Rust Converter at Sydney Airport.





## Typical Projects



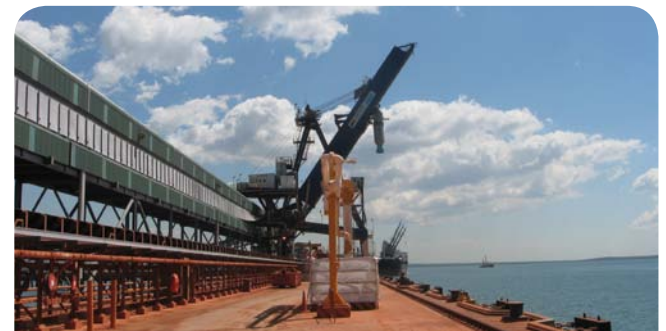
**Concrete Batching Plant  
finished in Vitrethane System**



**111 Eagle St Brisbane Steelwork  
finished in Envirothane System**



**National Musuem Sculpture  
finished in Enviroflon System**



**Rio Tinto shiploader at Gladstone  
repaired with Envirothane System**

## Quality Control

### A & I Coatings are now fully certified to ISO 9001:2008.

This means that coatings from the Envirochoice, Vitrethane, and Vitreflon ranges can now be specified with complete confidence.

The certified system was built on procedures that we installed to guarantee consistency on broad area projects such as noise walls and tunnel linings.

Customer references verifying our past performance on such projects is available on request.



These Specifications are given as a guide only.  
For detailed Technical Support and Specification please  
contact [helpdesk@aicoatings.com](mailto:helpdesk@aicoatings.com) or phone 1800 918 585



This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



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