

## A&I Coatings FAQ Sheet No. 28

### Fluoropolymer Coating Application on Bridges

#### Facts on Coating Applications.

Everyone connected with the coating industry knows that there are numerous pitfalls for the unwary applicator. We summarize some of the main ones when coating steel bridges as follows...

#### 1. Surface cleanliness

Whether abrasive blast cleaning to ISO 8501-1 SA2½ (AS1627.4 Class 2.5) is specified, or alternatively preparation to ISO 8501-1 ST3 (AS1627.4 Class 2, where a surface tolerant coating is generally specified), one very important thing is that the surface is free from salt contamination *prior* to the preparation. This prevents the salt contamination from becoming embedded into the surface. Soluble Surface Salts should be tested in accordance with ISO 8502-6 (Part 6: Extraction of soluble contaminants for analysis – The Bresle Method) and analyzed in accordance with ISO 8502-9:2020 (Part 9: Field method for the conductometric determination of water-soluble salts). Remove contamination by water cleaning in accordance with ISO 12944-4 6.1.1

#### 2. Dewpoint condensation

When painting steel surfaces during periods of cold nights and warm days, it is important to know the dew point temperature and the temperature of the steel. As the temperature and humidity climb during the day, it is possible for the steel to sweat from condensation, much the same as a cold drink taken out of the refrigerator. To guard against painting over condensation, the steel must not be painted if it is within 3°C (5°F) of the dew point. To establish the dewpoint, a sling psychrometer is required.

#### 3. Intercoat adhesion.

Intercoat adhesion is dependent on either a chemical bond or a mechanical bond. A chemical bond is most easily formed when the first coat is still drying or curing so has molecules free to attach to fresh ones in the topcoat. A mechanical bond is formed normally by surface roughening or abrasion so the topcoat can get a 'hold' on the first coat.

Contamination of any sort of course will interfere with intercoat adhesion.

#### **4. Colour Variation...**

Always check colour before mixing. On special tinted colours check the spray out and notify A&I Coatings of any discrepancy. Other possibilities...

- a. Pack A pigment not fully incorporated, requiring more stirring.
- b. Metallic colours especially are influenced by a number of things such as weather conditions, amount of thinners added, and if spraying, air pressure, nozzle size etc. Furthermore, a brushed metallic finish can vary considerably from a sprayed one.

#### **5 Areas of soft paint or poor adhesion.**

Paint doesn't have a personality of its own. If a two-pack coating from one batch has gone off in some areas but not in others, it is not that that portion of the paint has decided not to go hard, but almost always comes down to inadequate mixing. If there is a problem with a batch, it will characterize the whole batch.

#### **6 Surface Roughness/bubbles**

Appearance of a coating is dependent on careful application. This involves method and tools used for application, and if required, the amount of thinners added. Thinners are only needed for application purposes, that is they contribute nothing to the final film, but as an example a thick coating applied in warm weather may have severe bubbling without the addition of thinners to the coating. The thinners holds the film 'open' longer and allow the bubbles to escape.

#### **7 Inadequate Coverage**

Data Sheets will give theoretical paint coverage rates, based on the volume solids of the paint and the recommended film thicknesses per coat. This is recorded as a M2/Litre figure. This however, doesn't take into account losses in application. These can vary from quite low when rolling a flat surface but can be very great when spray applying to a tubular installation. Furthermore, there are variations in Specifications for different applications and environments.

Therefore, if there is a doubt, it is best to ask for technical help. Reds, oranges and yellows are based on organic pigments. A&I puts the maximum recommended pigment amount in the base when tinting, but this can still result in poor coverage, and at least three coats may need to be allowed for.

### Example Vitreflon 790 TDS

- Theoretical Coverage** : 8.2m<sup>2</sup>/litre theoretical @ 75µm DFT (approx. 116µm WFT).  
**Volume Solids** : 62% by Volume.  
**Recommended DFT** : Depends on application. Typically, 40-60µm DFT per coat.  
**Usual no. of coats** : 2 coats.

### Paint application Information

Formula: Theoretical Spreading Rate (SR).

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

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.

## 8 A&I Coatings Warranty...

What does it cover?

A&I Coatings Warranties cover supply of replacement material only. In the event of a problem, the customer should notify A&I Coatings who will send a QA form to be filled out with Batch Numbers etc.. If it is proven that it is a product failure, A&I Coatings will supply replacement material.

## 9 Helpdesk

A&I Coatings Technical Staff are very willing to advise to the best of their ability over the phone 1800 819 585, by email [helpdesk@aicoatings.com](mailto:helpdesk@aicoatings.com); or on a site visit where possible.