



# Kesternich Test Coating Resistance to SO<sub>2</sub> Exposure EN ISO 3231



- Work Carried out by the PRA
- Samples tested for resistance to Sulphur Dioxide in accordance with EN ISO 3231 for 10 cycles using 0.2 litres of sulphur dioxide per cycle. This equates to a concentration of 0.066%, (0.2 litres in a 300 litre cabinet)

Zoom in (Ctrl+Plus)



Page 1 of 3

## Final Report

PRA Ref. Number 75221-407  
Date Received 07 April 2014  
Date Issued 07 May 2014  
Client FP Pigments OY  
Raisionkaari 55  
FI-21200 Raisio  
Finland  
FAO: Jorgen Lindholm

Work Requested Resistance to Sulphur Dioxide

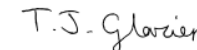
Samples Submitted 28 coated steel and aluminium panels

Work Carried out by



T. Glazier, J. Gadd

Approved by



A. Miller, T. Glazier

Authorised Signatory

*Note – Opinions or interpretations expressed herein are outside the scope of UKAS accreditation. Only tests marked with an asterisk are UKAS accredited. A copy of the PRA accreditation schedule can be found on the UKAS website under laboratory reference 0069.*

PRA  
Coatings Technology Centre  
14 Castle Mews, High Street, Hampton  
Middlesex TW12 2NP, United Kingdom

www.pra-world.com  
coatings@pra-world.com  
T: +44 (0)20 8487 0800  
F: +44 (0)20 8487 0801



# Formulation 1 – 2K PU DTM Coating

<b>Nuplex' 2K PU DTM</b>							
<b>W 5479</b>	<b>P 274-1</b>	<b>P 274-5</b>	<b>P 274-6</b>	<b>P 274-7</b>	<b>P 274-8</b>	<b>P 274-9</b>	<b>P 274-10</b>
<b>Component 1:</b>	<b>STD 1</b>	<b>4%</b>	<b>8%</b>	<b>12%</b>	<b>4%</b>	<b>8%</b>	<b>12%</b>
		<b>FP-470</b>	<b>FP-470</b>	<b>FP-470</b>	<b>FP-490</b>	<b>FP-490</b>	<b>FP-490</b>
Setalux 1906 BA-75	173.00	173.00	173.00	173.00	173.00	173.00	173.00
BYK 066	2.30	2.30	2.30	2.30	2.30	2.30	2.30
Disperbyk 110	3.60	3.60	3.60	3.60	3.60	3.60	3.60
Bentone 38, paste *)	13.30	13.30	13.30	13.30	13.30	13.30	13.30
Thixatrol MAX	5.80	5.80	5.80	5.80	5.80	5.80	5.80
M-P-A 60 X	5.10	5.10	5.10	5.10	5.10	5.10	5.10
FP-Opacity Pigment™							
FP-470		6.56	13.12	19.68			
FP-490					6.56	13.12	19.68
Kronos 2310	164.00	157.44	150.88	144.32	157.44	150.88	144.32
Siokal 20	129.00	129.00	129.00	129.00	129.00	129.00	129.00
<b>Subtotal</b>	<b>496.10</b>	<b>496.10</b>	<b>496.10</b>	<b>496.10</b>	<b>496.10</b>	<b>496.10</b>	<b>496.10</b>
<i>Grind (to &lt;5µm )</i>							
<b>Let down:</b>							
Setalux 1906 BA-75	184.30	184.30	184.30	184.30	184.30	184.30	184.30
BYK 320	2.20	2.20	2.20	2.20	2.20	2.20	2.20
BYK 358	9.90	9.90	9.90	9.90	9.90	9.90	9.90
TinStab BL 277 (1% in butyl acetate)	8.80	8.80	8.80	8.80	8.80	8.80	8.80
Dowanol PMA	28.70	28.70	28.70	28.70	28.70	28.70	28.70
Xylene	18.60	18.60	18.60	18.60	18.60	18.60	18.60
<b>Subtotal</b>	<b>748.60</b>	<b>748.60</b>	<b>748.60</b>	<b>748.60</b>	<b>748.60</b>	<b>748.60</b>	<b>748.60</b>
<b>Add before Use:</b>							
<b>Component 2:</b>							
Tolonate HDT-LV	117.40	117.40	117.40	117.40	117.40	117.40	117.40
Xylene	67.00	67.00	67.00	67.00	67.00	67.00	67.00
Dowanol PMA	67.00	67.00	67.00	67.00	67.00	67.00	67.00
<b>Total</b>	<b>1000.00</b>	<b>1000.00</b>	<b>1000.00</b>	<b>1000.00</b>	<b>1000.00</b>	<b>1000.00</b>	<b>1000.00</b>

Applied using 100 um Wound Wire Bar on Q-LAB Aluminum panel.

	<b>P274-1</b>	<b>P274-5</b>	<b>P274-6</b>	<b>P274-7</b>	<b>P274-8</b>	<b>P274-9</b>	<b>P274-10</b>
<b>Film thickness: µm</b>	<b>46</b>	<b>48</b>	<b>46</b>	<b>46</b>	<b>48</b>	<b>48</b>	<b>45</b>

# Formulation 2 – Bayer 1K PU Top Coat



<b>Bayer's Coil Coating, Solvent-borne 1K-PUR top coat, white, glossy</b>							
<b>W 5533</b>	<b>P 280-1</b>	<b>P 280-5</b>	<b>P 280-6</b>	<b>P 280-7</b>	<b>P 280-8</b>	<b>P 280-9</b>	<b>P 280-10</b>
	<b>STD</b>	<b>4%</b>	<b>8%</b>	<b>12%</b>	<b>4%</b>	<b>8%</b>	<b>12%</b>
		FP-470	FP-470	FP-470	FP-490	FP-490	FP-490
Desmophen T 1665	47.50	47.50	47.50	47.50	47.50	47.50	47.50
FP-Opacity Pigment™							
FP-470		5.73	11.46	17.20			
FP-490					5.73	11.46	17.20
Kronos 2160	143.30	137.57	131.84	126.10	137.57	131.84	126.10
Solvesso 200ND	40.50	40.50	40.50	40.50	40.50	40.50	40.50
<b>Subtotal</b>	<b>231.30</b>	<b>231.30</b>	<b>231.30</b>	<b>231.30</b>	<b>231.30</b>	<b>231.30</b>	<b>231.30</b>
<b>Let down:</b>							
Desmophen T 1665	106.00	106.00	106.00	106.00	106.00	106.00	106.00
Desmodur BL 3175	58.00	58.00	58.00	58.00	58.00	58.00	58.00
<b>CAB 531-1 10% in Solvesso 200 ND / BDG (2:1)</b>	<b>34.40</b>	<b>34.40</b>	<b>34.40</b>	<b>34.40</b>	<b>34.40</b>	<b>34.40</b>	<b>34.40</b>
<b>Acronal 4 F 50% in Solvesso 200 ND</b>	<b>6.90</b>	<b>6.90</b>	<b>6.90</b>	<b>6.90</b>	<b>6.90</b>	<b>6.90</b>	<b>6.90</b>
<b>Addocat 201, 10% in Solvesso 200 ND</b>	<b>4.30</b>	<b>4.30</b>	<b>4.30</b>	<b>4.30</b>	<b>4.30</b>	<b>4.30</b>	<b>4.30</b>
Solvesso 200ND	59.10	59.10	59.10	59.10	59.10	59.10	59.10
<b>Total</b>	<b>500.00</b>	<b>500.00</b>	<b>500.00</b>	<b>500.00</b>	<b>500.00</b>	<b>500.00</b>	<b>500.00</b>
<b>Applied using 100 um Wound Wire Bar on epoxy primed CRS panel.</b>							
	<b>P280-1</b>	<b>P280-5</b>	<b>P280-6</b>	<b>P280-7</b>	<b>P280-8</b>	<b>P280-9</b>	<b>P280-10</b>
<b>Film thickness: μm</b>	<b>36</b>	<b>35</b>	<b>34</b>	<b>31</b>	<b>34</b>	<b>32</b>	<b>34</b>

- After 10 cycles there were no visible differences between any of the panels tested and the control.
- P274 = 2K PU DTM Coating
- P280 = Bayer 1K PU Top Coat

## Conclusion

Additions of up to 12% FP-470 and FP-490 in exterior industrial maintenance coats has no discernible negative effect on the coatings resistance to sulphur dioxide exposure.

### 3 Results and Observations

Sample	Condition After 10 Cycles SO <sub>2</sub> to EN ISO 3231	Sample	Condition After 10 Cycles SO <sub>2</sub> to EN ISO 3231
P274-1-1	No visible change	P280-1-1	No visible change
P274-1-2	No visible change	P280-1-2	No visible change
P274-5 - 1	No visible change	P280-5-1	No visible change
P274-5-2	No visible change	P280-5-2	No visible change
P274-6-1	No visible change	P280-6-1	No visible change
P274-6-2	No visible change	P280-6-2	No visible change
P274-7 - 1	No visible change	P280-7-1	No visible change
P274-7-2	No visible change	P280-7-2	No visible change
P274-8-1	No visible change	P280-8-1	No visible change
P274-8-2	No visible change	P280-8-2	No visible change
P274-9 - 1	No visible change	P280-9-1	No visible change
P274-9-2	No visible change	P280-9-2	No visible change
P274-10-1	No visible change	P280-10-1	No visible change
P274-10-2	No visible change	P280-10-2	No visible change