



**COT bv**  
Independent advice,  
research and  
management for  
construction and  
industry



## REPORT

Testing of system NEOGUARD PRIMER 313 (80 micron) /  
NEOGUARD 322 (120 micron) / NAVACOLOR PU HS 531 (80 micron)  
according to ISO 12944-6 C5-I High

Haarlem, July 9<sup>th</sup>, 2012

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ANNEX I: Paint Application Form

## 1 INTRODUCTION

### 1.1 Order

By order of Neokem in Attiki, Greece, the Centrum voor Onderzoek en Technisch advies (COT bv) in Haarlem, The Netherlands, has tested the system Neoguard Primer 313 / Neoguard 322 / Navacolor PU hs 531 according to ISO 12944-6 C5-I High.

The order has been given by signing and returning the COT order confirmation with reference LAB12-0092-OFF on February 6<sup>th</sup>, 2012.

### 1.2 Samples

COT sample number	Sample	Batch-number	Colour RAL	Received
28-02-12/0131 A-B	Neoguard Primer 313	Base: -- Cure: --	7135	27-02-2012
28-02-12/0132 A-B	Neoguard 322	Base: -- Cure: --	7001	
28-02-12/0133 A-B	Navacolor PU hs 531	Base: -- Cure: --	9016	
28-02-12/0134	Thinner S200 ( Navacolor PU hs 531)	21780	--	
28-02-12/0135	Thinner S130 (Neoguard Primer 313 and Neoguard 322)	21722	--	

## 2 PAINT APPLICATION

The coating system has been applied by COT on Sa3 blasted steel panels, surface roughness Medium (G).

Specified Dry Film Thickness: Neoguard Primer 313 : 80 µm  
Neoguard 322 : 120 µm  
Navacolor PU hs 531 : 80 µm

Application data has been added in Annex I.

The edges and the back of the test panels have been coated with an epoxy coating.

The coating system has been cured for 13 days at  $23 \pm 2$  °C and  $50 \pm 5$  % Relative Humidity.

Required durability: ISO 12944-6 C5-I High

Start Water Condensation test on April 19<sup>th</sup> 2012, end of test on May 18<sup>th</sup> 2012.

Start Neutral Salt Spray test on April 19<sup>th</sup> 2012, end of test on June 18<sup>th</sup> 2012.

Start Chemical Resistance tests on April 26<sup>th</sup> 2012, end of test on May 3<sup>rd</sup> 2012.

### 3 RESULTS

#### 3.1 Assessment before Artificial Aging tests

<b>Pull-off ISO 4624</b>	<b>Panel 12</b>	<b>Requirements</b>
Minimum – maximum DFT ( $\mu\text{m}$ )	286 - 337	
Average DFT ( $\mu\text{m}$ )	313 $\pm$ 19	280
Pull-off value (MPa)	>20 break in 2 <sup>nd</sup> layer and glue	No adhesion break to the substrate unless the values are $\geq$ 5 MPa

#### 3.2 Assessment after Water Condensation test

<b>720 hours ISO 6270</b>	<b>Panel 10</b>	<b>Panel 13</b>	<b>Panel 14</b>	<b>Requirements</b>
Min. – max. DFT ( $\mu\text{m}$ )	264 – 313	300 – 326	289 – 322	
Average DFT ( $\mu\text{m}$ )	289 $\pm$ 21	315 $\pm$ 13	306 $\pm$ 14	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
ISO 4628-3 (rusting)	Ri 0	Ri 0	Ri 0	Ri 0
ISO 4628-4 (cracking)	0(S0)	0(S0)	0(S0)	0(S0)
ISO 4628-5 (flaking)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	>20, break in 2 <sup>nd</sup> layer and glue	>20, break in 2 <sup>nd</sup> layer and glue	>20, break in 2 <sup>nd</sup> layer and glue	No adhesion break to the substrate unless the values are $\geq$ 5 MPa

#### 3.3 Assessment after Neutral Salt Spray test

<b>1440 hours ISO 9227 NSS</b>	<b>Panel 15</b>	<b>Panel 17</b>	<b>Panel 18</b>	<b>Requirements</b>
Min. – max. DFT ( $\mu\text{m}$ )	265 – 284	262 - 342	256 – 295	
Average DFT ( $\mu\text{m}$ )	276 $\pm$ 7	293 $\pm$ 33	280 $\pm$ 16	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
ISO 4628-3 (rusting)	Ri 0	Ri 0	Ri 0	Ri 0
ISO 4628-4 (cracking)	0(S0)	0(S0)	0(S0)	0(S0)
ISO 4628-5 (flaking)	0(S0)	0(S0)	0(S0)	0(S0)
Annex A (corrosion of the substrate from the scribe) (mm)	1	0	0	Not exceed 1 mm
Pull-off value (MPa)	>20 break in 2 <sup>nd</sup> layer and glue	>20 break in 2 <sup>nd</sup> layer and glue	>20 break in 2 <sup>nd</sup> layer and glue	No adhesion break to the substrate unless the values are $\geq$ 5 MPa

### 3.4 Assessment after Chemical Resistance test

<b>168 hours in 10 % H<sub>2</sub>SO<sub>4</sub> ISO 2812-1</b>	<b>Panel 4</b>	<b>Panel 5</b>	<b>Panel 6</b>	<b>Requirements</b>
Min. – max. DFT (µm)	260 – 341	298 – 339	278 – 300	
Average DFT (µm)	313 ± 32	319 ± 17	288 ± 10	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	>20, break in 2 <sup>nd</sup> layer and glue	17, break in 2 <sup>nd</sup> layer and glue	20, break in 2 <sup>nd</sup> layer and glue	No adhesion break to the substrate unless the values are ≥5 MPa

<b>168 hours in 10 % NaOH ISO 2812-1</b>	<b>Panel 1</b>	<b>Panel 2</b>	<b>Panel 3</b>	<b>Requirements</b>
Min. – max. DFT (µm)	300 – 343	314 – 352	316 – 343	
Average DFT (µm)	322 ± 19	330 ± 15	335 ± 11	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	18, break in 2 <sup>nd</sup> layer and glue	>20, break in 2 <sup>nd</sup> layer and glue	>20, break in 2 <sup>nd</sup> layer and glue	No adhesion break to the substrate unless the values are ≥5 MPa

<b>168 hours in Mineral Spirit ISO 2812-1</b>	<b>Panel 7</b>	<b>Panel 9</b>	<b>Panel 11</b>	<b>Requirements</b>
Min. – max. DFT (µm)	267 – 315	304 – 342	283 – 327	
Average DFT (µm)	290 ± 19	325 ± 18	304 ± 16	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	>20, break in 2 <sup>nd</sup> layer and glue	20, break in 2 <sup>nd</sup> layer and glue	19, break in 2 <sup>nd</sup> layer and glue	No adhesion break to the substrate unless the values are ≥5 MPa

#### 4 CONCLUSION

The system Neoguard Primer 313 / Neoguard 322 / Navacolor PU hs 531, dry film thickness 80 / 120 / 80  $\mu\text{m}$ , (COT sample numbers 28-02-12/0131 - 0135) meets the requirements of ISO 12944-6 C5-I High.

CENTRUM VOOR ONDERZOEK  
EN TECHNISCH ADVIES (COT bv)

A handwritten signature in blue ink, appearing to read 'R. Brakenhoff', written over a horizontal blue line.

R. Brakenhoff  
Technical Manager Laboratory

A handwritten signature in blue ink, appearing to read 'Dr. B.P. Alblas', written over a horizontal blue line.

Dr. B.P. Alblas  
Manager Laboratory



**ANNEX I**

<b>Paint Application Form</b>			
<b>{PRIVATE }Application data</b>	<b>1<sup>st</sup> coat</b>	<b>2<sup>nd</sup> coat</b>	<b>3<sup>rd</sup> coat</b>
Paint system	Neoguard Primer 313	Neoguard 322	Navacolor PU hs 531
Manufacturer: Neokem			
Date	04-04-2012	05-04-2012	06-04-2012
Time	10.00	10.00	10.00
Surface prep.	Gritblasting	-	-
Blasting standard	Sa	-	-
Abrasive used	A2	-	-
Roughness	Medium	-	-
Batch No. Comp. A	--	--	--
Batch No. Comp. B	--	--	--
Equipment used	WIWA 66:1	WIWA 66:1	WIWA 66:1
Pressure on nozzle (At.)	150	170	150
Size nozzle	0.017"	0.021"	0.015"
Fan width	4	4	4
Mix.ratio by weight	100:9	100:12	100:12.5
Volume solid (%)	73	73	62
Wet film thickness (µm)	115	170	130
Dry film thickness (µm)	80	120	80
% Thinner	5 (S130)	5 (S130)	--
Air temperature (°C)	19.9	19.9	21.9
% RH	44.1	34.5	44.7
Steel temp. (°C)	20.1	22	22.1
Dew point (°C)	7.4	4.1	9.4
Present at application: R. Brakenhoff (COT)			