



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



## REPORT

Testing of system NEOGUARD PRIMER 313 (120 micron) /  
NEOGUARD PRIMER 313 (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 General information

COT sample number	Sample	Batch number	Colour RAL	Received
28-02-12/0131 A-B	Neoguard Primer 313	Base: -- Cure: --	7135	27-02-2012
28-02-12/0133 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)	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 : 120 µm  
Neoguard Primer 313 : 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

Pull-off ISO 4624	Panel 5	Requirements
Minimum - maximum DFT ( $\mu\text{m}$ )	328 - 409	
Average DFT ( $\mu\text{m}$ )	$368 \pm 32$	320
Pull-off value (MPa)	$20 \pm 0.1$ , 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

720 hours ISO 6270	Panel 10	Panel 11	Panel 12	Requirements
Min. - max. DFT ( $\mu\text{m}$ )	270 - 303	323 - 367	300 - 340	
Average DFT ( $\mu\text{m}$ )	$287 \pm 15$	$348 \pm 17$	$313 \pm 16$	
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)
Pull-off value (MPa)	>20, break in 2 <sup>nd</sup> layer and glue	18, 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

1440 hours ISO 9227 NSS	Panel 13	Panel 14	Panel 15	Requirements
Min. - max. DFT ( $\mu\text{m}$ )	283 - 342	293 - 331	271 - 311	
Average DFT ( $\mu\text{m}$ )	$312 \pm 23$	$316 \pm 16$	$295 \pm 16$	
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)	2	1	1	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	>18, 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 6</b>	<b>Panel 7</b>	<b>Requirements</b>
Min. – max. DFT (µm)	262 – 337	322 – 376	310 – 437	
Average DFT (µm)	301 ± 29	346 ± 21	344 ± 53	
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)	321 – 344	315 – 354	270 – 291	
Average DFT (µm)	329 ± 10	334 ± 15	283 ± 8	
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	19, 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 8</b>	<b>Panel 9</b>	<b>Panel 17</b>	<b>Requirements</b>
Min. – max. DFT (µm)	319 – 348	281 – 339	278 – 320	
Average DFT (µm)	333 ± 13	307 ± 25	295 ± 19	
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 Primer 313 / Navacolor PU hs 531, dry film thickness 120 / 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 blue ink signature of R. Brakenhoff, written in a cursive style.

R. Brakenhoff  
Technical Manager Laboratory

A blue ink signature of Dr. B.P. Alblas, written in a cursive style.

Dr. B.P. Alblas  
Manager Laboratory



**ANNEX I**

<b>Paint Application Form</b>			
<b>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 Primer 313	Navacolor PU hs 531
Manufacturer: Neokem			
Date	04-04-2012	05-04-2012	06-04-2012
Time	10.00	11.30	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	150	150
Size nozzle	0.017"	0.017"	0.015"
Fan width	4	4	4
Mix.ratio by weight	100:9	100:9	100:12.5
Volume solid (%)	73	73	62
Wet film thickness (µm)	170	170	130
Dry film thickness (µm)	120	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)			