



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



REPORT

Testing of system NEOGUARD PRIMER 313 (80 micron) /
NEOGUARD 322 (160 micron) / NAVACOLOR PU HS 531 (80 micron)
according to ISO 12944-6 C5-I High

Haarlem, July 9th, 2012

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CONTENTS

1	INTRODUCTION	3
1.1	Order.....	3
1.2	Samples.....	3
2	PAINT APPLICATION	3
3	RESULTS	4
3.1	Assessment before Artificial Aging tests	4
3.2	Assessment after Water Condensation test	4
3.3	Assessment after Neutral Salt Spray test.....	4
3.4	Assessment after Chemical Resistance test.....	5
4	CONCLUSION.....	6

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 6th, 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 : 160 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 ± 2 °C and 50 ± 5 % Relative Humidity.

Required durability: ISO 12944-6 C5-I High

Start Water Condensation test on April 19th 2012, end of test on May 18th 2012.

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

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

3 RESULTS

3.1 Assessment before Artificial Aging tests

Pull-off ISO 4624	Panel 1	Requirements
Minimum - maximum DFT (μm)	348 - 370	
Average DFT (μm)	359 ± 10	320
Pull-off value (MPa)	>20 break in 2 nd layer and glue	No adhesion break to the substrate unless the values are ≥ 5 MPa

3.2 Assessment after Water Condensation test

720 hours ISO 6270	Panel 11	Panel 12	Panel 13	Requirements
Min. - max. DFT (μm)	308 - 360	326 - 352	358 - 426	
Average DFT (μm)	333 ± 21	336 ± 11	393 ± 28	
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 nd layer and glue	>20, break in 2 nd layer and glue	>20, break in 2 nd layer and glue	No adhesion break to the substrate unless the values are ≥ 5 MPa

3.3 Assessment after Neutral Salt Spray test

1440 hours ISO 9227 NSS	Panel 14	Panel 15	Panel 16	Requirements
Min. - max. DFT (μm)	335 - 400	334 - 378	357 - 406	
Average DFT (μm)	374 ± 30	348 ± 17	377 ± 18	
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	1	0	Not exceed 1 mm
Pull-off value (MPa)	20 break in 2 nd layer and glue	>20 break in 2 nd layer and glue	>20 break in 2 nd layer and glue	No adhesion break to the substrate unless the values are ≥ 5 MPa

3.4 Assessment after Chemical Resistance test

168 hours in 10 % H₂SO₄ ISO 2812-1	Panel 2	Panel 3	Panel 4	Requirements
Min. – max. DFT (µm)	337 – 373	379 – 406	375 – 402	
Average DFT (µm)	354 ± 13	390 ± 11	391 ± 10	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	>20, break in 2 nd layer and glue	18, break in 2 nd layer and glue	11, break in 2 nd layer and glue	No adhesion break to the substrate unless the values are ≥5 MPa

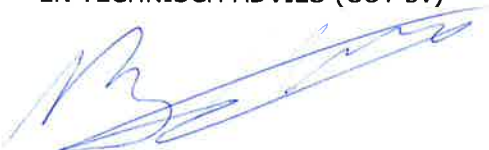
168 hours in 10 % NaOH ISO 2812-1	Panel 5	Panel 6	Panel 7	Requirements
Min. – max. DFT (µm)	353 – 394	327 – 356	342 – 360	
Average DFT (µm)	377 ± 17	342 ± 13	351 ± 7	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	>20, break in 2 nd layer and glue	19.5 break in 2 nd layer and glue	>20 break in 2 nd layer and glue	No adhesion break to the substrate unless the values are ≥5 MPa

168 hours in Mineral Spirit ISO 2812-1	Panel 8	Panel 9	Panel 10	Requirements
Min. – max. DFT (µm)	372 – 397	300 – 352	357 – 401	
Average DFT (µm)	385 ± 11	326 ± 20	375 ± 18	
ISO 4628-2 (blistering)	0(S0)	0(S0)	0(S0)	0(S0)
Pull-off value (MPa)	>20 break in 2 nd layer and glue	18 break in 2 nd layer and glue	20 break in 2 nd 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 / 160 / 80 μm , (COT sample numbers 28-02-12/0131 till 135) 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 be 'R. Brakenhoff', written over a horizontal line.

R. Brakenhoff
Technical Manager Laboratory

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

Dr. B.P. Alblas
Manager Laboratory



ANNEX I

Paint Application Form			
Application data	1st coat	2nd coat	3rd coat
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	230	115
Dry film thickness (µm)	80	160	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)			