



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



## REPORT

Testing of ZINGA 2 x 90 µm  
dry film thickness  
according to ISO 12944-6

Haarlem, 6 September 2010

Civil projects  
Corrosionprotection  
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## **1 INTRODUCTION**

### **1.1 Order**

By order of Zingametall bvba in Eke, Belgium, the Centrum voor Onderzoek en Technisch advies (COT bv) in Haarlem has tested Zinga 2 x 90 µm dry film thickness according to ISO 12944-6.

The order has been given by signing the COT quotation LAB10-0234-OFF on 24 February 2010

### **1.2 Samples**

Samples : 44 coated steel test panels with 2 layers Zinga (2 x 90 µm DFT)

COT sample number : 22-02-10/0175 B

Received : 19 February 2010

## **2 PAINT APPLICATION**

The Zinga system has been applied at Zingametall bvba.

Specified Dry Film Thickness : 2 layers, 90 µm dry film thickness per layer

Required durability : ISO 12944-6 C5-I  
ISO 12944-6 C5-M  
ISO 12944-6 Im3

### **Test times:**

Water Condensation test	: Start 16-03-2010	End 15-04-2010
Neutral Salt Spray test	: Start 16-03-2010	End 14-05-2010
Chemical Resistance test	: Start 08-03-2010	End 20-04-2010
Water Immersion test	: Start 01-04-2010	End 24-06-2010



### 3 RESULTS

#### 3.1 Assessment before tests

<b>Cross-cut test ISO 2409</b>	<b>Panel 10</b>	<b>Panel 17</b>	<b>Requirement</b>
Minimum - maximum DFT ( $\mu\text{m}$ )	147 - 185	157 - 197	
Average DFT ( $\mu\text{m}$ )	169 $\pm$ 13	175 $\pm$ 13	
Classification	0	0	0 or 1

#### 3.2 Assessment after Water Condensation test

<b>720 hours ISO 6270</b>	<b>Panel 5</b>	<b>Panel 11</b>	<b>Panel 12</b>	<b>Requirements</b>
Minimum - maximum DFT ( $\mu\text{m}$ )	147 - 179	169 - 183	159 - 175	
Average DFT ( $\mu\text{m}$ )	163 $\pm$ 11	177 $\pm$ 4	167 $\pm$ 5	
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)
ISO 2409 Cross-cut test (Classification)	0	0	0	0 or 1

#### 3.3 Assessment after Neutral Salt Spray test

<b>1440 hours ISO 9227 NSS</b>	<b>Panel 9</b>	<b>Panel 15</b>	<b>Panel 16</b>	<b>Requirements</b>
Minimum - maximum DFT ( $\mu\text{m}$ )	135 - 173	159 - 181	183 - 211	
Average DFT ( $\mu\text{m}$ )	156 $\pm$ 11	172 $\pm$ 7	195 $\pm$ 8	
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)	<0.5	<0.5	<0.5	Not exceed 1 mm
ISO 2409 Cross-cut test (Classification)	0	0	0	0 or 1

### 3.4 Assessment after Chemical Resistance test

Instead of immersion, in accordance with ISO 2812-1, the system has been tested according to ISO 3231 with 0.2 L SO<sub>2</sub> during 30 cycles.

<b>30 cycles ISO 3231</b>	<b>Panel 1</b>	<b>Panel 2</b>	<b>Panel 3</b>	<b>Requirements</b>
Minimum – maximum DFT (µm)	165 – 195	175 – 215	139 – 177	
Average DFT (µm)	181 ± 10	196 ± 14	160 ± 13	
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)	0	0	0	Not exceed 1 mm
ISO 2409 Cross-cut test (Classification)	0	0	0	0 or 1

### 3.5 Assessment after Water Immersion test

<b>2000 hours ISO 2812-2 (5% m/m sodium chloride)</b>	<b>Panel 18</b>	<b>Panel 19</b>	<b>Panel 21</b>	<b>Requirements</b>
Minimum – maximum DFT (µm)	167 – 223	167 – 191	159 – 189	
Average DFT (µm)	199 ± 19	176 ± 8	177 ± 10	
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)
Cross-cut (Classification)	0	0	0	0 or 1



#### 4 CONCLUSION

The system 2 layers Zinga, dry film thickness 90  $\mu\text{m}$  per layer (COT sample number 22-02-10/0175 B), meets the requirements of the following corrosivity categories of ISO 12944-6:

C5-I-High and C5-M-High  
Im2-Medium and Im3-Medium

CENTRUM VOOR ONDERZOEK  
EN TECHNISCH ADVIES (COT bv)

A handwritten signature in blue ink, appearing to read 'B.P. Alblas', with a large circular flourish at the end.

Dr. B.P. Alblas  
Manager Laboratory

A handwritten signature in blue ink, appearing to read 'N. Blokker', with a large circular flourish at the end.

N. Blokker  
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