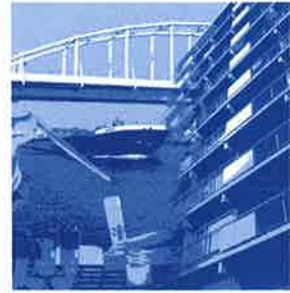




COT bv  
Independent advice,  
research and  
management for  
construction and  
industry



## REPORT

Testing of Zingametall system  
Zinga 2x 60 micrometer  
according to ISO 12944-9 Im4

Haarlem, 8 May 2018

## Consultancy Laboratory

Jan Tademaweg 40  
2031 CV Haarlem  
P.O. Box 2113  
2002 CC Haarlem  
The Netherlands  
T +31 23-5319544  
F +31 23-5277229  
E [info@cot-nl.com](mailto:info@cot-nl.com)  
I [www.cot-nl.com](http://www.cot-nl.com)

**Client** : Zingametall bvba  
Industriepark Rozenstraat 4  
9810 EKE Belgium  
Contact person: Mr. J. Serck

**Project number** : 20060103

**Report number** : LAB18-0184-REP

Copy Right This report contains 5 numbered pages and is property of COT BV (Netherlands). No part of this report may be copied, distributed, inserted in any text document, or reproduced in any other way or published, without written permission of COT BV (Netherlands). This report is not transferable to any person or body, serves only to take cognisable and gives in no way the rights on this report, neither can lay a claim to any in this report discussed product or method. Use of information from this report is not permitted without written permission of COT BV. When not agreed in the by COT BV provided order confirmation, our Rules of Service are applicable.



## CONTENTS

|     |                                   |   |
|-----|-----------------------------------|---|
| 1.  | INTRODUCTION .....                | 3 |
| 2.  | GENERAL DATA .....                | 3 |
| 3.  | PAINT APPLICATION AND CURING..... | 3 |
| 4.  | PERFORMANCE TESTS .....           | 4 |
| 4.1 | Seawater immersion .....          | 4 |
| 4.2 | Cathodic disbonding .....         | 4 |
| 4.3 | Adhesion test .....               | 4 |
| 5.  | REQUIREMENTS.....                 | 4 |
| 5.1 | Immersion test.....               | 4 |
| 5.2 | Cathodic disbonding .....         | 4 |
| 6.  | RESULTS .....                     | 5 |
| 6.1 | Original adhesion value .....     | 5 |
| 6.2 | Seawater immersion .....          | 5 |
| 6.3 | Cathodic Disbonding Test.....     | 5 |
| 7.  | CONCLUSION .....                  | 5 |



## 1. INTRODUCTION

By order of Zingametall bvba in Eke, Belgium, The Centrum voor Onderzoek en Technisch Advies (COT BV) has tested the system Zinga 2 X 60  $\mu\text{m}$  according to ISO 12944-9 Im4.

The order has been given in the letter dated 18-08-2006 with reference Testen/Algemeen/COT/2/1-SD.

## 2. GENERAL DATA

|                                                     |   |                  |                     |                          |
|-----------------------------------------------------|---|------------------|---------------------|--------------------------|
| Samples                                             | : |                  | <b>Batch number</b> | <b>COT sample number</b> |
| <b>Test panels,</b>                                 |   |                  |                     |                          |
| applied with the system: Zinga, 2x 60 $\mu\text{m}$ |   |                  | --                  | 22-08-06/667             |
| test panels, size                                   | : | 150 x 75 x 5 mm  |                     |                          |
|                                                     |   | 150 x 300 x 5 mm |                     |                          |

COT project number : 20060103

## 3. PAINT APPLICATION AND CURING

The coating system was applied on the test panels by Zingametall bvba.

Dry film thickness: Zinga: 2x 60  $\mu\text{m}$

After curing the dry film thickness of the paint system has been measured on each panel, after which the tests have been started.



## 4. PERFORMANCE TESTS

### 4.1 Seawater immersion

The fully cured coating system has been mechanically scribed horizontal down to bare metal. The scratch line is 2 mm wide and 50 mm long. The system has been immersed in synthetic seawater (according to ISO 15711) at 40°C during 4200 hours according to ISO 2812-2.

### 4.2 Cathodic disbonding

Cathodic disbonding has been determined according to ISO 20340 (ISO 15711). After 6 months exposure time the maximum disbonding is measured.

### 4.3 Adhesion test

The adhesion before and after the seawater immersion test has been determined by a pneumatic adhesion tester in accordance with ISO 4624. The coating surface and the dolly have been sanded lightly and a epoxy adhesive has been applied. After curing of the adhesive and prior to testing, the coating has been scratched around the dolly down to the bare metal. Three trials have been done and the average value has been reported.

## 5. REQUIREMENTS

### 5.1 Immersion test

After exposure to the specified time, the test panels shall comply with the following requirements:

| Method     |                              | Requirements                                            |
|------------|------------------------------|---------------------------------------------------------|
| --         | Corrosion creep from scribe* | < 3.0 millimetres                                       |
| ISO 4628-2 | Blistering                   | 0                                                       |
| ISO 4628-3 | Rusting                      | 0                                                       |
| ISO 4628-4 | Cracking                     | 0                                                       |
| ISO 4628-5 | Flaking                      | 0                                                       |
| ISO 4624   | Adhesion                     | min. 5.0 MPa, max 50 %<br>reduction from original value |

\* The corrosion creep is calculated from the equation:  $M=(C-W)/2$ , where  
M = corrosion creep  
C = average of the nine measurements  
W = the original width of the scribe.

### 5.2 Cathodic disbonding

After exposure to the specified time, the test panels shall show no disbonding around the holiday with an equivalent diameter >20 mm.

## 6. RESULTS

### 6.1 Original adhesion value

The original Adhesion value is  $4.7 \pm 0.1$  MPa

### 6.2 Seawater immersion

**Exposure Time: 4200 hours**

*Table 1. Results Immersion test*

|                                      | <b>Panel 1</b> | <b>Panel 2</b> | <b>Panel 3</b> |
|--------------------------------------|----------------|----------------|----------------|
| Dry film thickness ( $\mu\text{m}$ ) | 146 $\pm$ 9    | 174 $\pm$ 8    | 149 $\pm$ 14   |
| Corrosion creep from scribe (mm)     | 0              | 0              | 0              |
| ISO 4628-2 Blistering                | 0              | 0              | 0              |
| ISO 4628-3 Rusting                   | 0              | 0              | 0              |
| ISO 4628-4 Cracking                  | 0              | 0              | 0              |
| ISO 4628-5 Flaking                   | 0              | 0              | 0              |
| ISO 4624 Adhesion (MPa)              | 4.7 $\pm$ 0.1  | 5.1 $\pm$ 0.1  | 5.0 $\pm$ 0.0  |

### 6.3 Cathodic Disbonding Test (6 months)

Maximum disbonding ECD panel 1: 0 mm

Maximum disbonding ECD panel 2: 0 mm

Maximum disbonding ECD panel 3: 0 mm

## 7. CONCLUSION

The system Zinga, dry film thickness 60/60  $\mu\text{m}$ , meets the evaluated requirements of ISO 12944-9 Im4.

CENTRUM VOOR ONDERZOEK  
EN TECHNISCH ADVIES (COT)



Dr. B.P. Alblas  
Manager Laboratory



J.R.S. Brakenhoff  
Technical Manager Laboratory