



*Beratung - Schadensfallaufklärung - Qualitätssicherung - Forschung - Prüfung*

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## Test Report

### PB300/052/17\_1

Orderer: WEICON GmbH & Co. KG  
Königsberger Str. 255  
48157 Münster

Date of Order: 07.10.2016


Receipt of Samples: 23.11.2016

Test Period: 30.11.2016 to 31.01.2017

Order: Testing of the coating system WEICON Zinc Spray bright grade according to DIN EN ISO 9227 (NSS, neutral salt spray test)

Laboratory Order No: LA3/311/16/163346

Pages: 4

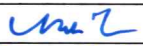


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Dresden, 26.04.2017

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Date: 26.04.2017	Date: 27.04.17	Date: 27.04.17

This test report replaces the test report PB300/052/17 of 04.04.2017 which becomes invalid herewith.

Note: This test report was created bilingual (German and English). In case of doubt the German text applies.

The publication of test reports in extracts, the reference to the tests for the purpose of promotion and the application of the content of the test report require a written consent of the Institut für Korrosionsschutz Dresden GmbH in every single case. In the case of no other agreement we reserve to dispose of the samples three month after delivery. The statements refer to the test object exclusively.

## 1 Subject

The Institut für Korrosionsschutz Dresden GmbH (IKS) was commissioned to examine the corrosion protection behavior of steel plates coated with WEICON Zinc Spray bright grade. As stress application, the neutral salt spray test according to DIN EN ISO 9227 (NSS) was to be carried out.

## 2 Sample preparation

WEICON Zinc Spray bright grade (spray can) was delivered by the customer. The samples were prepared by spraying on 30.11.2016 at the IKS by the customer's employees. The film thickness was set by the customer. To substrate and layer structure following information can be made.

Substrate:	Cold rolled steel DC01, (100 x 150 x 3) mm
Surface treatment:	Degreasing with WEICON Cleaner Spray S
Coating:	WEICON Zinc Spray bright grade

## 3 Stress application

### – Neutral salt spray test according to DIN EN ISO 9227 (NSS)

The exposure to salt spray was carried out at  $(35 \pm 2)^\circ\text{C}$  with a solution of 50 g/l NaCl. Prior to stress application, a scribe was introduced on the test plates down to the substrate, which ran parallel, with a distance of approximately 30 mm, to one of the length sides of the test plates. The scribe width was 0,5 mm. A scribe gouge with a profile based on Clemen was used.

Test equipment:	Weiss Umwelttechnik GmbH, PMK 300-5.5
Stress duration:	576 hours (24 days). Two test plates were used.

## 4 Testing

### – Film thickness

The film thickness was measured prior to stress application according to DIN EN ISO 2808.

Measuring device:	Fischer DELTASCOPE FMP 10 (PMK 300-11.4)
Method:	7C magnetic induction
Calibration:	on smooth steel calibration standard with foils of known thickness

### – Visual evaluation

The evaluation of visual changes has been carried out immediately after the end of the stress application with normal-corrected eye under artificial light according to DIN EN ISO 13076 taking into account the following standards:

Degree of blistering:	DIN EN ISO 4628-2
Degree of rusting:	DIN EN ISO 4628-3
Degree of cracking:	DIN EN ISO 4628-4
Degree of flaking:	DIN EN ISO 4628-5

– **Cross-cut test**

The cross-cut values were determined according to DIN EN ISO 2409

The cross-cut with a cutting distance of 1 mm was introduced with a cutter knife (identification 1c in accordance with DIN EN ISO 2409) prior to stress application as well as after stress application (24 hours after the stress application and storage under laboratory conditions).

For the removal of loose particles the tape TESA 4651 was used.

– **Corrosion at the scribe (mean values)**

The determination of the corrosion at the scribe (mean values) was carried out according to DIN EN ISO 4628-8. Immediately after end of stress application, the coating on the scribe was removed with a scalpel. The width of the corroded area at the scribe was measured at 9 locations and the arithmetic mean value was formed.

The degree of corrosion  $c$ , in millimeters, was calculated according to the following formula:

$$c = \frac{w_c - w}{2}$$

$w_c$ : width of the corroded area (arithmetic mean value)

$w$ : original scribe width

## 5 Test results

Table 1: Test results Zinc Spray bright grade

Assessment prior to stress application						
visual assessment of the surface			no visual defects			
Test before stress application			Sample A5			
DIN EN ISO 2808	Film thickness in $\mu\text{m}$	43 $\pm$ 3				
DIN EN ISO 2409	Cross-cut	0	1			
Assessment after stress application						
Test: DIN EN ISO 9227 (neutral salt spray test)						
Duration: 576 h (24 d)			Sample A3		Sample A4	
DIN EN ISO 2808	Film thickness in $\mu\text{m}$	36 $\pm$ 3		37 $\pm$ 1		
DIN EN ISO 2409	Cross-cut	4-5*	4*	3*	3*	
DIN EN ISO 4628-2	Degree of blistering	5(S2)		5(S2)		
DIN EN ISO 4628-3	Degree of rusting (white rust)	Ri 4		Ri 4		
	Degree of rusting (red rust)	Ri 0		Ri 0		
DIN EN ISO 4628-4	Degree of cracking	0(S0)		0(S0)		
DIN EN ISO 4628-5	Degree of flaking	0(S0)		0(S0)		
DIN EN ISO 4628-8	Corrosion scribe in mm (mean)	< 0,5		< 0,5		

\* Fracture image cannot be determined unequivocally

## 6 Conclusions from the test results<sup>1</sup>

After 576 hours stress application in the neutral salt spray test, samples showed blisters, white rust formation and a high cross-cut value. Red rust and corrosion at a scribe was not recognizable.

## 7 Standards and regulations

Table 2: Accredited standards and regulations

Standard	Edition
DIN EN ISO 2409	2013-06
DIN EN ISO 2808	2007-05
DIN EN ISO 4628-2	2016-07
DIN EN ISO 4628-3	2016-07
DIN EN ISO 4628-4	2016-07
DIN EN ISO 4628-5	2016-07
DIN EN ISO 4628-8	2013-03
DIN EN ISO 9227	2012-09

## 8 Photographic documentation

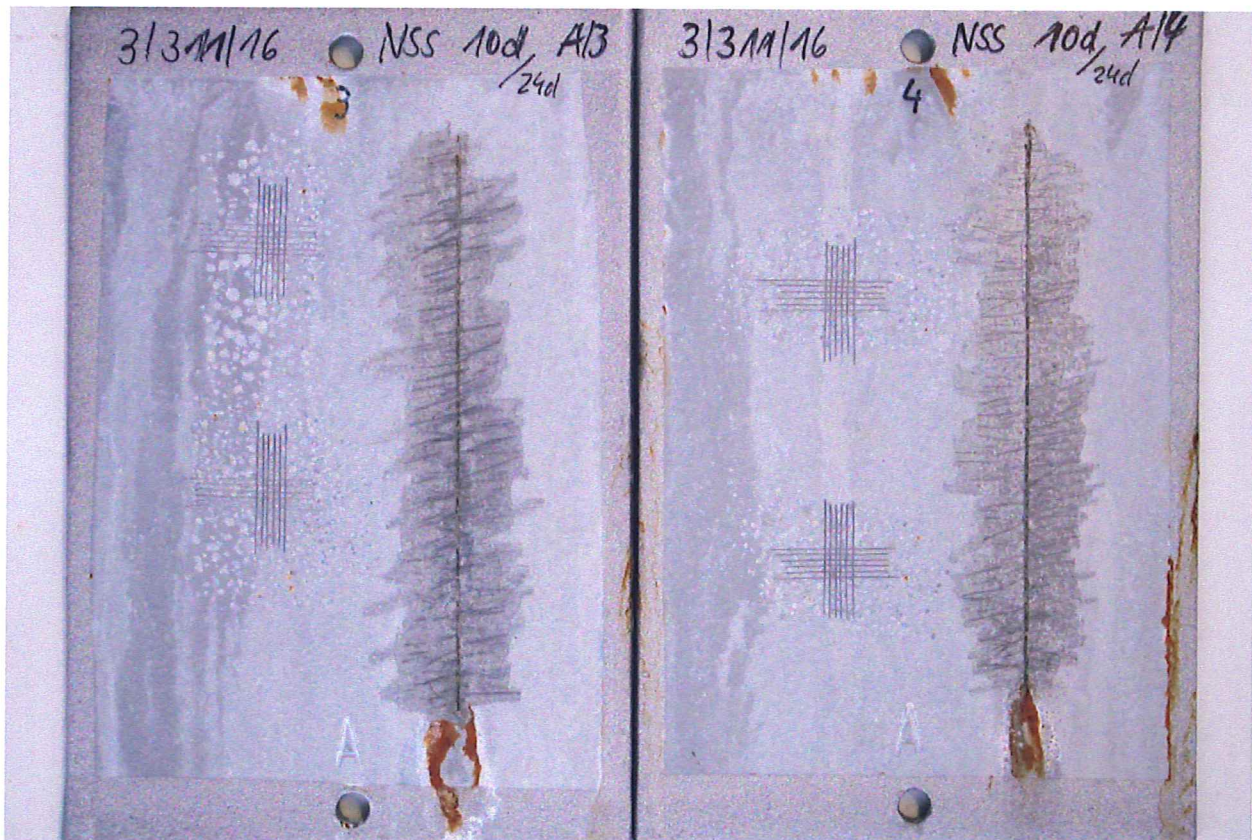


Figure 1: Test samples after 576 h stress application and determination of corrosion protection values

<sup>1</sup> Not within the accredited scope