



Institut für
Oberflächentechnik
GmbH

Test Report Rev. 03

Referred to: Corrosion test of components with a wax coating

Client: Max Lehner AG
Stallikonerstrasse 71
CH-8903 Birmensdorf

Job number: 10717

Samples receipt: 07.04.2015

Start of testing: 24.04.2015

End of testing: 21.07.2015

Creation date: 14.06.2016

Number of pages: 17 pages



Accredited by DAkkS (Deutsche Akkreditierungsstelle GmbH)
according to German Industrial Standard DIN EN ISO/IEC 17025
accredited test laboratory.
The accredited test methods are marked with an **asterix ***.



1 Sample details

Label / No.:

Number:

Material / Surface:

Aluminium sample	1 piece	Wax coating: after drying of No. 41 Product: CorrProtect Application by spraying on the surface
Steel sample	1 piece	

2 Applied Testing Methods

Testing / Standard:

Testing device:

Duration:

Salt spray test NSS acc. to DIN EN ISO 9227:2012*	MSC 1000 (Co. Liebisch)	2000 h
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3 Requirements

- No requirements specified by the customer

4 Results

4.1 Salt spray test NSS

Sample:

Duration:

Results:

Aluminium sample	120 h	No sign of infiltration Degree of blistering: 0(S0) Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces
	240 h	No sign of infiltration Degree of blistering: 0(S0) Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces
	500 h	Maximum infiltration: 1.5 mm Degree of blistering: 0(S0) Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces



Sample: Duration: Results:

Aluminium sample	1000 h	Maximum infiltration: 1.5 mm Degree of blistering: 0(S0); 1 blister S4 at the beginning of the scratch Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces
Steel sample	120 h	No sign of infiltration Degree of blistering: 0(S0) Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces
	240 h	No sign of infiltration Degree of blistering: 0(S0) Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces
	500 h	Maximum infiltration: 3.3 mm Degree of blistering: 0(S0); 1 blister S4 at the beginning of the scratch Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri < 1 Slight corrosion signs on lateral surfaces
	1000 h	Coating section 324: Maximum infiltration: 3.8 mm Maximum corrosion at the scratch: 3.1 mm Coating section 77.4: Maximum infiltration: 2.0 mm Maximum corrosion at the scratch: 1.5 mm Coating section 5.3: Maximum infiltration: 10.7 mm (first layer) Maximum infiltration: 3.1 mm (up to the substrate) Maximum corrosion at the scratch: 3.0 mm Degree of rusting: Ri 3-4 Coating section 93.4: Maximum infiltration: 2.2 mm Maximum corrosion at the scratch: 1.5 mm



Sample: Duration: Results:

Steel sample	1000 h	Surface: Degree of blistering: 0(S0) Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 1 Slight corrosion signs on lateral surfaces
Aluminium sample	1240 h - 1740 h	Maximum infiltration: 1.5 mm Degree of blistering: 0(S0); 1 blister S4 at the beginning of the scratch Degree of cracking: 0(S0) Degree of flaking: 0(S0) Degree of rusting: Ri 0 No appearance of corrosion on lateral surfaces
	2000 h	Coating section 170: No sign of infiltration 1 blister S5 at the beginning of the scratch Coating section 75: Maximum infiltration: 1.0 mm Coating section 4: Maximum infiltration: 1.6 mm Coating section 86: No sign of infiltration

4.2 **Remarks**

The wax coating of the samples was partially damaged during transport. These spots were excluded from the evaluation.

5 **Conclusions and Evaluation**

The investigated aluminium sample exhibits a maximum infiltration of 1.5 mm after 500 h exposure to the neutral salt spray test. Furthermore, no corrosion signs are observed. After an exposure time of 1000 h a blister of size S4 has occurred at the beginning of the scratch. Apart from that, no further corrosion signs have been observed up to a test duration of 1740 h. After 2000 h of neutral salt spray testing, individual coating sections were assessed. The respective values for the maximum infiltration can be extracted from the table stated above.

The investigated steel sample does not show any form of infiltration and corrosion signs up to a neutral salt spray test duration of 240 h. After a test duration of 500 h, a maximum infiltration of 3.3 mm and slight corrosion signs (< Ri 1) were observed. After 1000 h of



neutral salt spray testing, individual coating sections were assessed. The respective values for the maximum infiltration and corrosion at the scratch are given in the table located above.

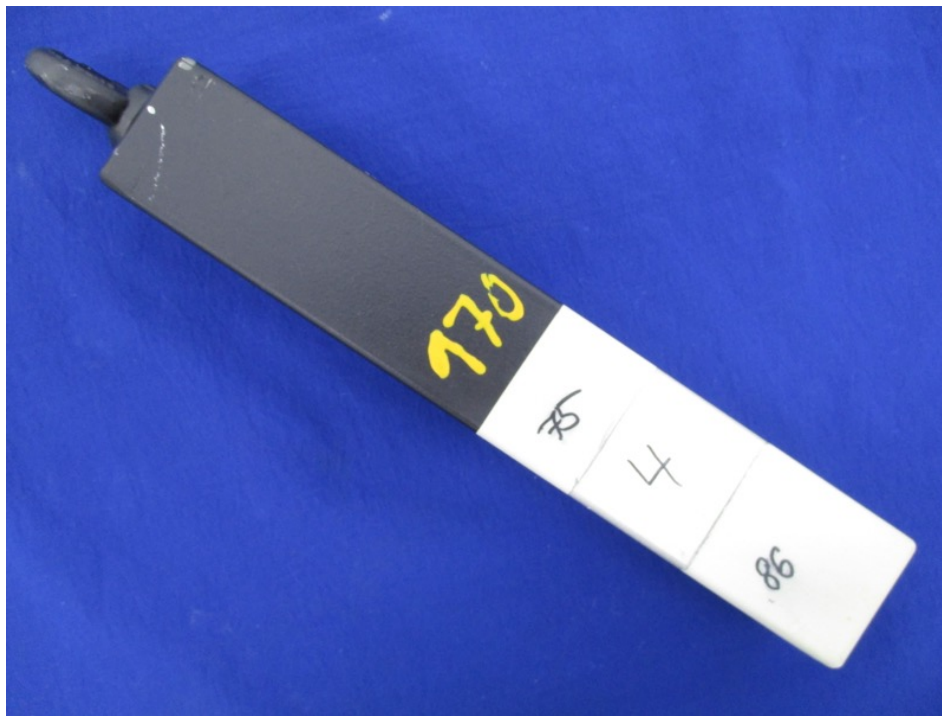
A classification into corrosion protection categories specified within EN ISO 9223 can be carried out in line with EN ISO 12944-6 by performing the above mentioned test methods. Based on the therein specified requirements for liquid coatings on steel and the results obtained from the conducted examination, the product CorrProtect is to be allocated into the category **C3 with a „medium“ term of protection** (corresponds to 5 to 15 years).

Schwaebisch Gmuend,
14.06.2016

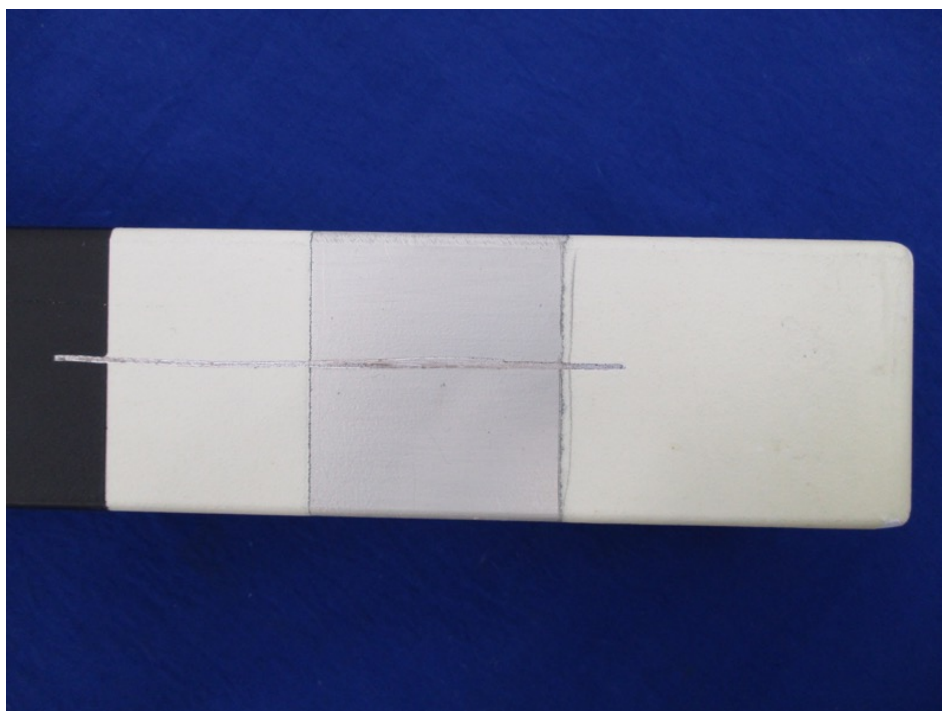
W. Noack
Laboratory manager

A. Eva
Processor

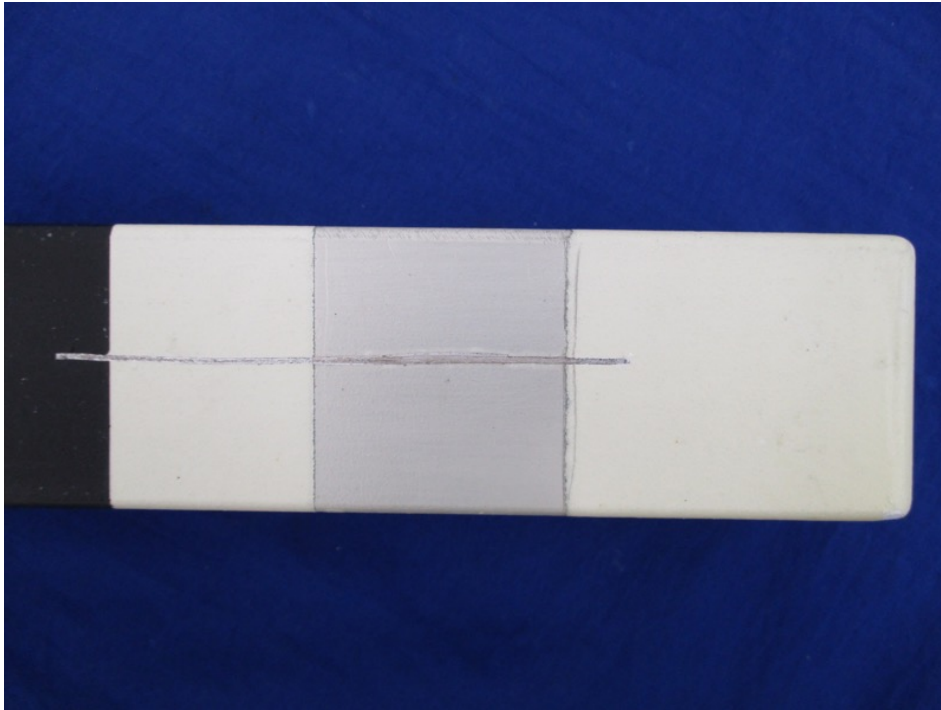
6 Image documentation



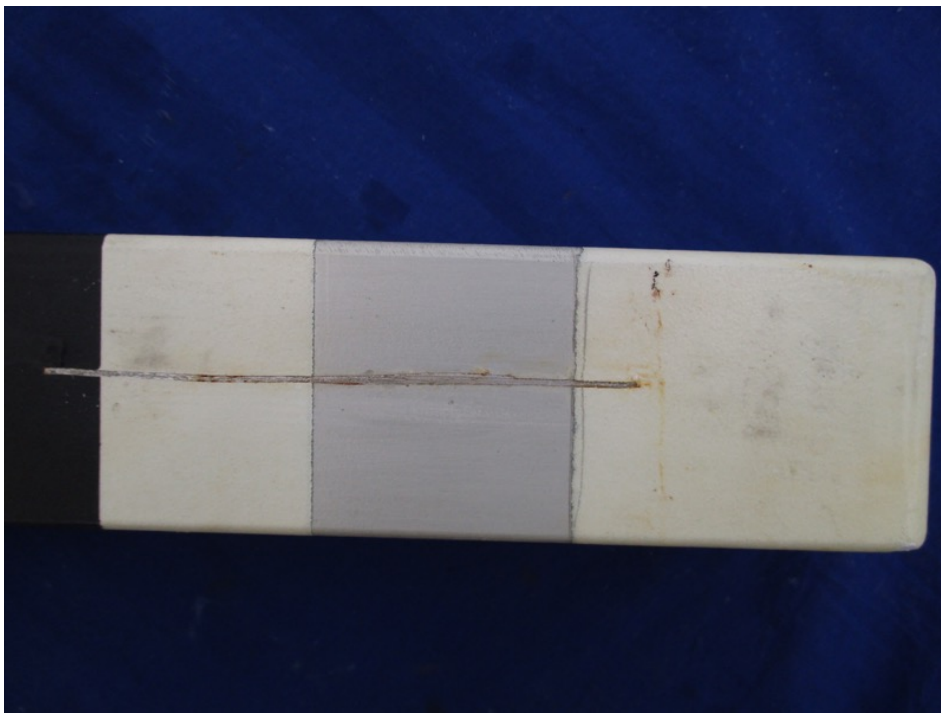
Picture 1 – Aluminium sample after 120 h NSS exposure



Picture 2 – Aluminium sample after 120 h NSS exposure



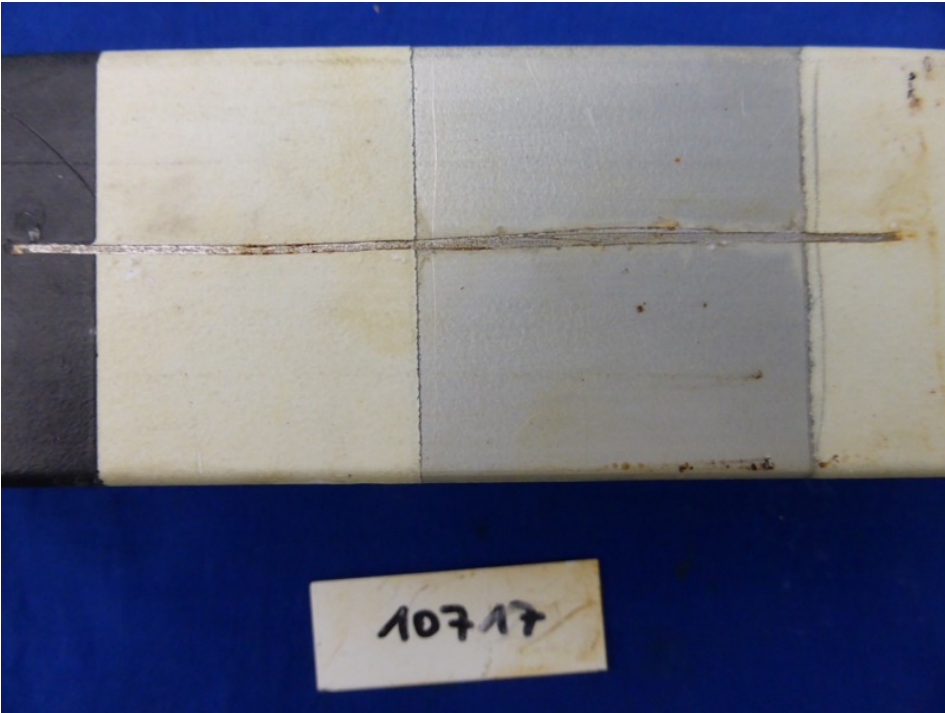
Picture 3 – Aluminium sample after 240 h NSS exposure



Picture 4 – Aluminium sample after 500 h NSS exposure



Picture 5 – Aluminium sample after 1000 h NSS exposure



Picture 6 – Aluminium sample after 1000 h NSS exposure



Picture 7 – Aluminium sample after 1240 h NSS exposure



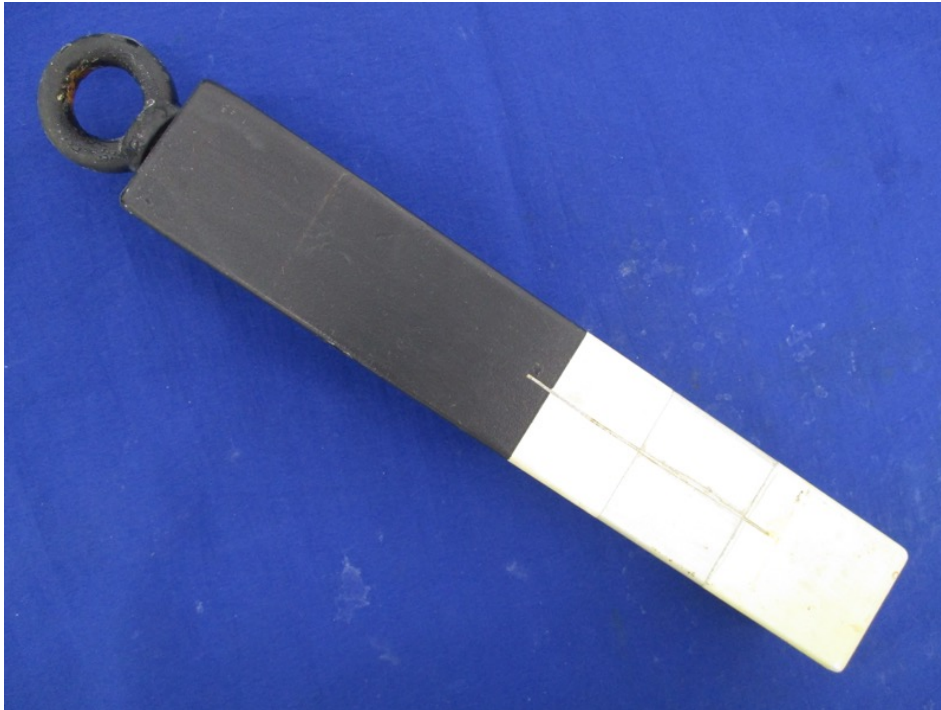
Picture 8 – Aluminium sample after 1240 h NSS exposure



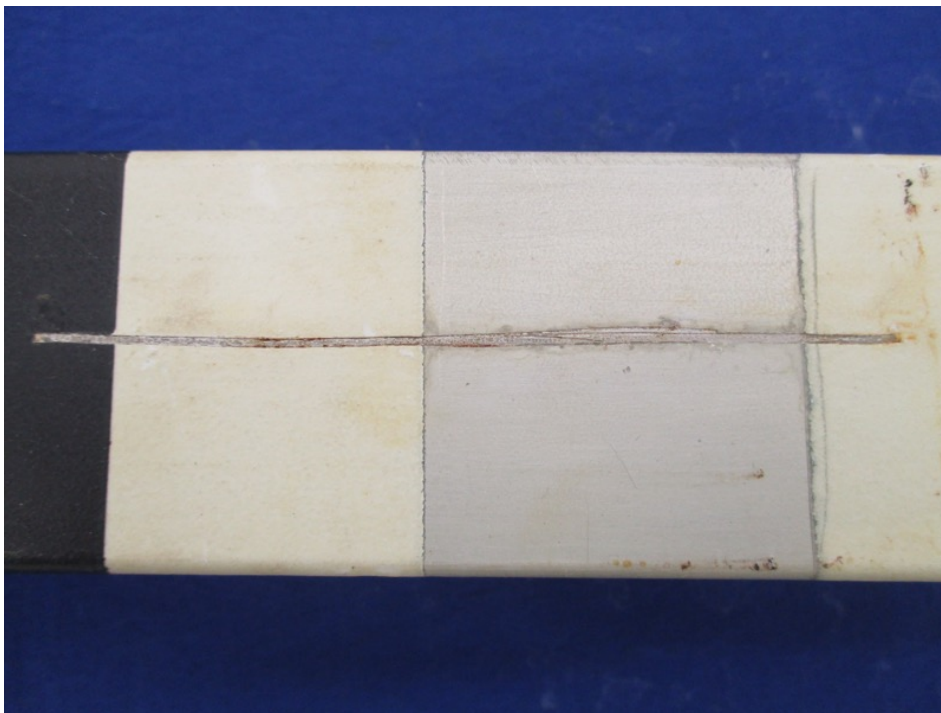
Picture 9 – Aluminium sample after 1500 h NSS exposure



Picture 10 – Aluminium sample after 1500 h NSS exposure



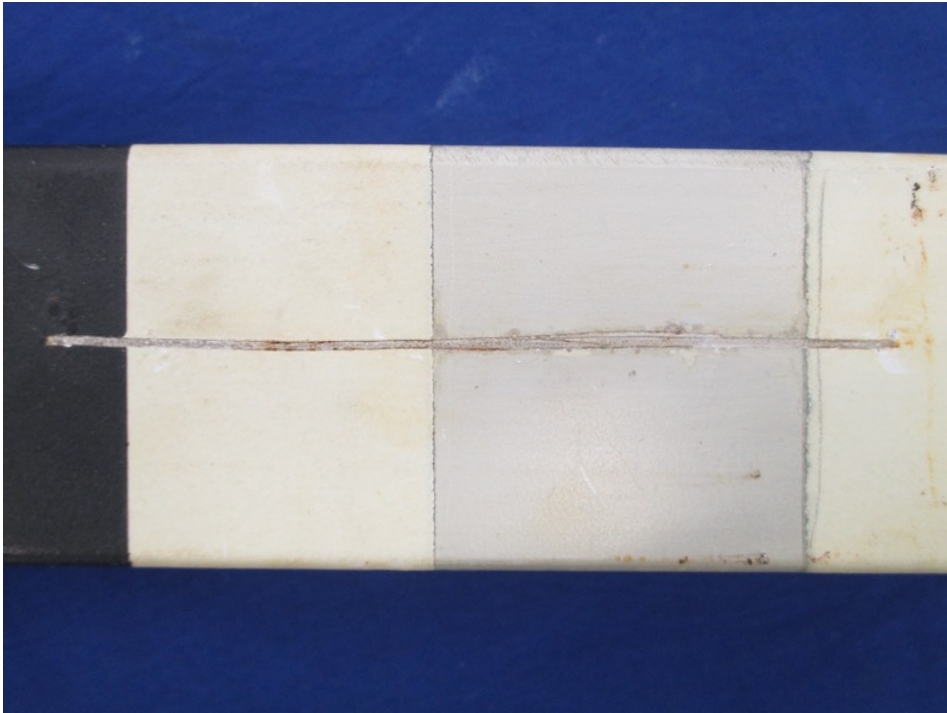
Picture 11 – Aluminium sample after 1740 h NSS exposure



Picture 12 – Aluminium sample after 1740 h NSS exposure



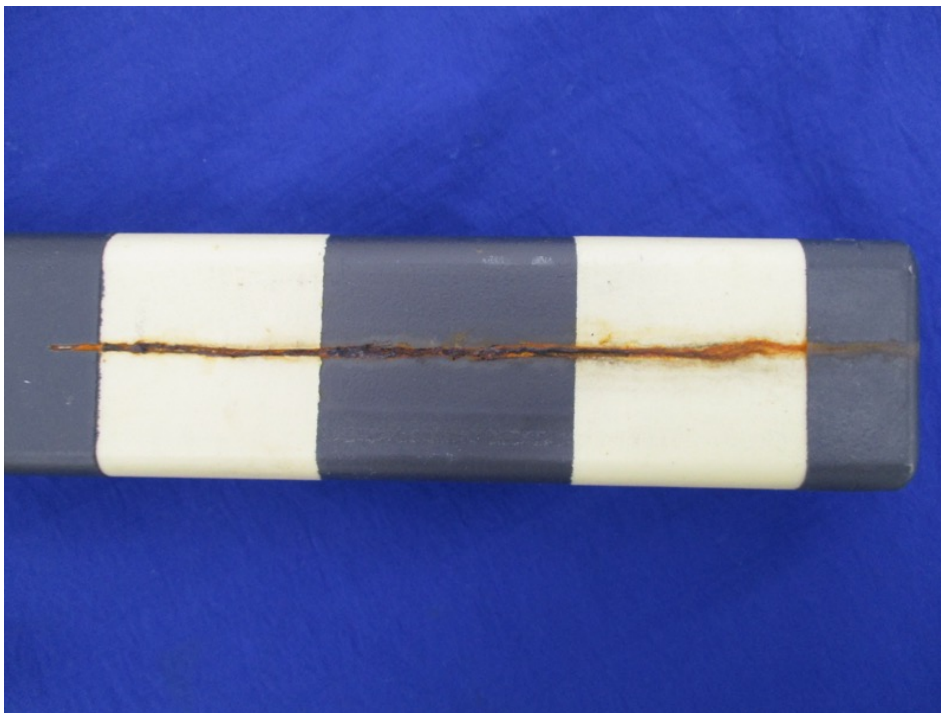
Picture 13 – Aluminium sample after 2000 h NSS exposure



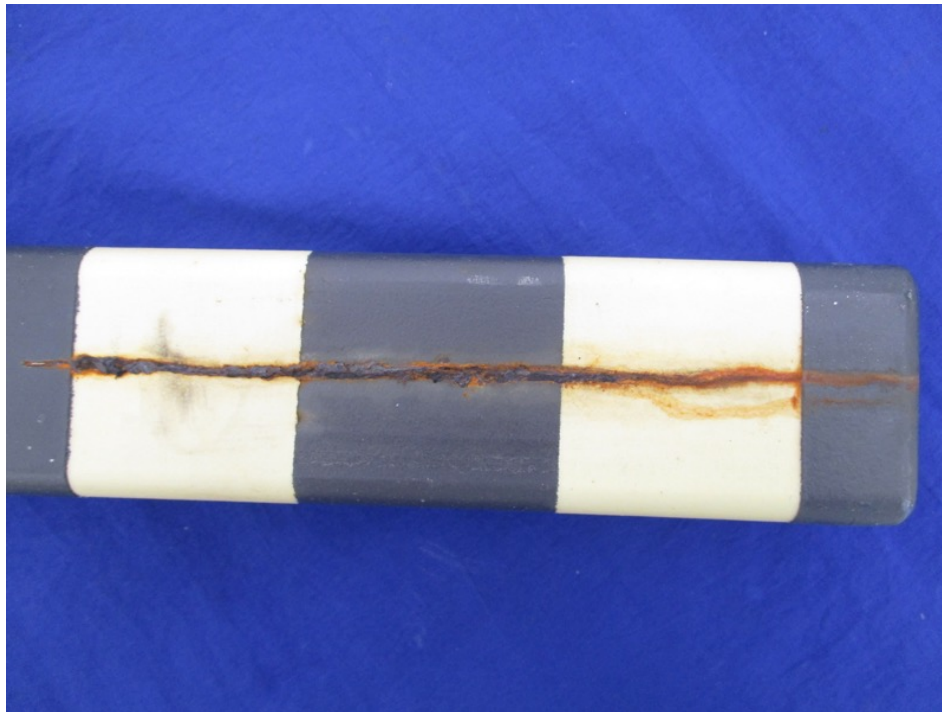
Picture 14 – Aluminium sample after 2000 h NSS exposure



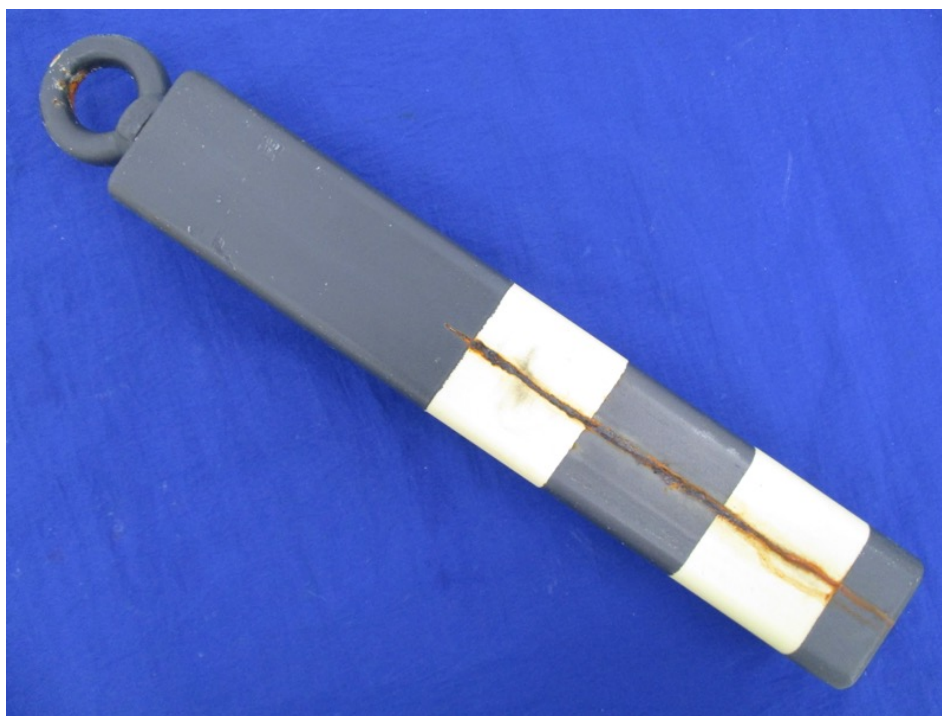
Picture 15 – Steel sample after 120 h NSS exposure



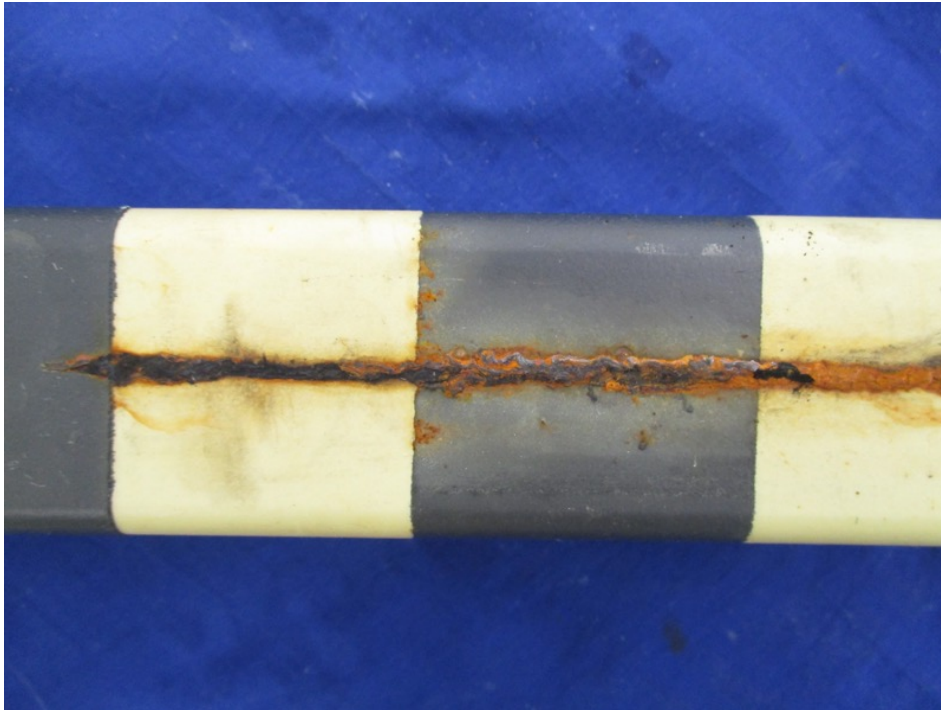
Picture 16 – Steel sample after 120 h NSS exposure



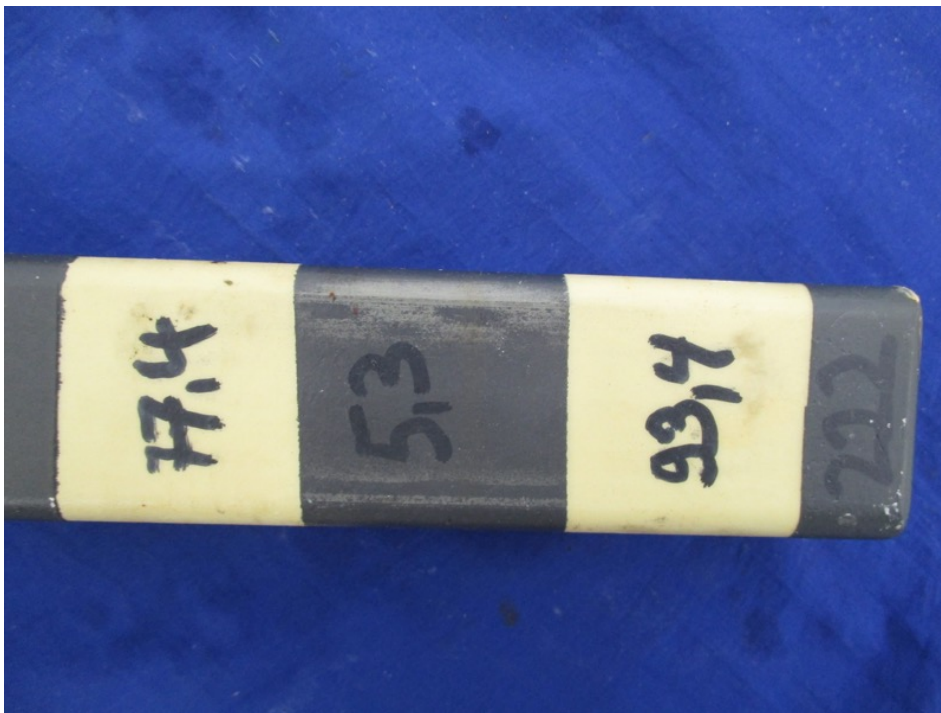
Picture 17 – Steel sample after 240 h NSS exposure



Picture 18 – Steel sample after 240 h NSS exposure



Picture 19 – Steel sample after 500 h NSS exposure



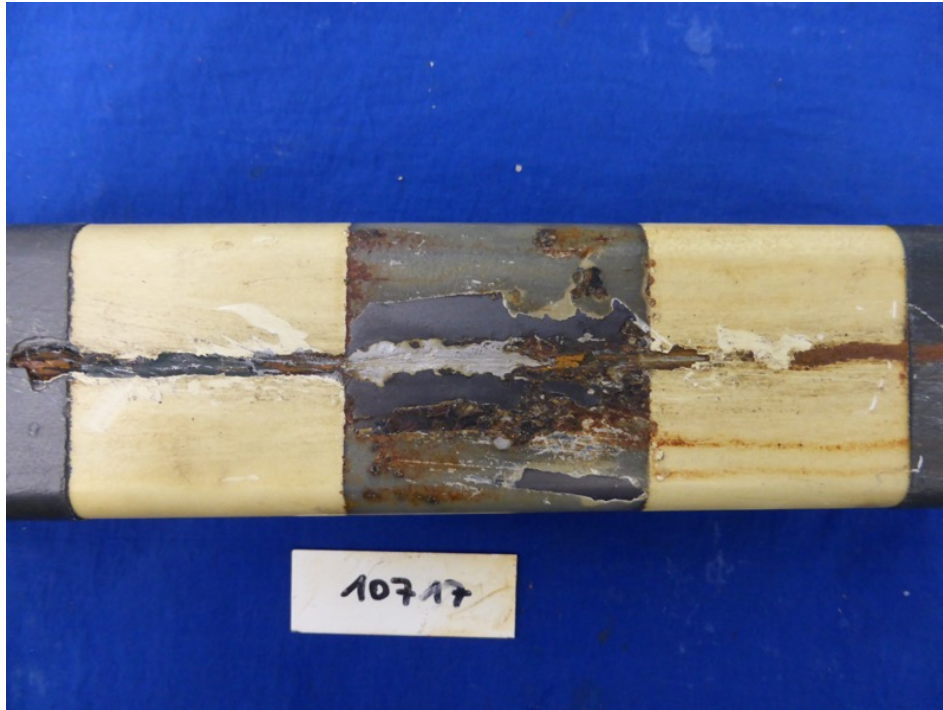
Picture 20 – Steel sample after 500 h NSS exposure



Picture 21 – Steel sample after 1000 h NSS exposure



Picture 22 – Steel sample after 1000 h NSS exposure



Picture 23 – Steel sample after 1000 h NSS exposure