



TECHNOPARK
VTP KRALUPY

CORROSION RESISTANCE TESTING OF CLIMBING HANGERS ACCORDING TO EN 795 STANDARD REQUIREMENTS

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1. Scope

Specimens of a climbing hanger made by Lappas were delivered for testing on the corrosion resistance according to the requirements of the standard EN 795. In point 5.8, it defines that representative samples of the metal parts of the anchor device shall be exposed to the neutral salt spray test (NSST) in accordance with EN ISO 9227 for a period of 24 ± 0.5 hours and then dried for 60 ± 5 minutes at 20 ± 2 °C. This procedure shall be repeated twice. Finally, the anchor device shall be examined for corrosion of the base material, which is not acceptable. The presence of tarnishing and white scaling is acceptable.

2. Specimens

Three pieces of Lappas hangers made of zinc coated steel were cleaned with ethanol and marked with numbers 1–3. The hangers are shown in **Figure 1** and **Figure 2**.



Figure 1. Lappas hangers before testing, back side



Figure 2. Lappas hangers before testing, front side (1 to 3 from left to right)

3. Experimental

3.1. Test conditions

The test consisted of two cycles. Each cycle consisted of the following steps:

- exposure in neutral salt spray mist for 24 hours,
- drying at 20 ± 2 °C for 1 hour.

The corrosion test using the neutral salt spray method (NSST) was performed according to the EN ISO 9227 standard. The calibration protocol is in **Appendix 1**. Sodium chloride solution was prepared by mixing NaCl and demineralized water with conductivity $4.5 \mu\text{S}/\text{cm}$ and with salt concentration $50 \pm 5 \text{ g}/\text{l}$. The pH was adjusted by sodium hydroxide to 6.90. Prepared solution was mixed with humid air in a nozzle, forming a salt mist.

Placement of the samples in the NSST chamber VLM CCT 400-FL VDA-I is seen in **Figure 3**.

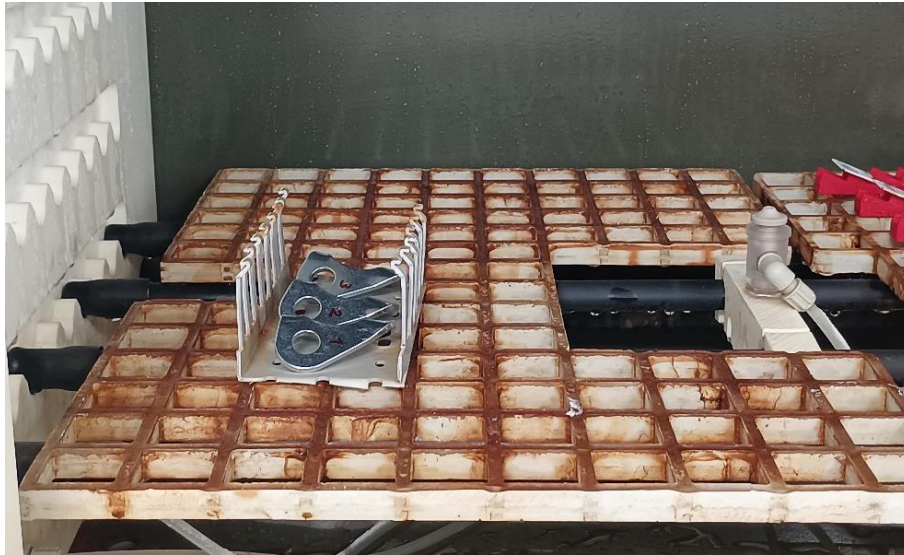


Figure 3. Specimens on a holder in the NSST chamber

3.2. Evaluation

After the test, the specimens were washed gently in clean running water to remove salt deposits from their surface, and dried immediately. They have been photographed and verified to meet the requirements of 4.2.1 of EN 795, i.e., no corrosion of the base material.

4. Results

Photographs of all specimens are shown in **Figure 4** and **Figure 5**. Only white corrosion products of the zinc coating was formed on all specimens. They were completely free of red corrosion products from steel. The base material was thus not damaged.



Figure 4. Hangers after the test, front side (1 to 3 from left to right)



Figure 5. Hangers after the test, back side (1 to 3 from left to right)

5. Conclusions

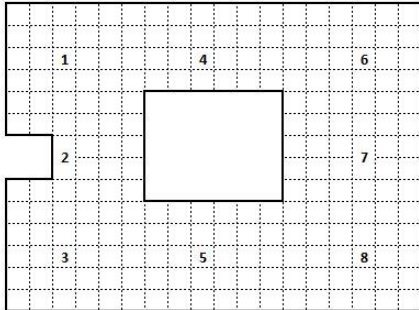
The tested anchors meet the requirements of EN 795 for the corrosion resistance of anchor devices. There was no corrosion of the base material.

Appendix 1: Salt mist deposition – calibration protocol

Chamber	Standard	Date and time	Operator
VLM CCT 400-FL VDA-I	EN ISO 9227	03/04/2024, 11:50	Jakub Padevěť

Solution	Concentration [g/l]	pH	Pressure [bar]
NaCl in water	53	6.90	1.1

Required deposition rate [ml/h na 80 cm ²]	Duration [hours]
1.5 ± 0.5	24

Collection vessel	Deposition rate	Deviation	Position of the collection vessel in the chamber
1	34		
2	32		
3	24		
4	28		
5	31		
6	31		
7	30		
8	25		

Výsledek
Composition of the salt solution and the deposition rate were in the range given by the standard.