

Corrosion test report:
Determination of corrosion
Virocid (0,5% v/v) on copper coils

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1 General information

Test method: Corrosion test based on UN no. ST/SG/AC.10/11/Rev.4 guidelines

Test Item: Virocid, Batch 2211616082

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2 Information concerning the Sponsor and the Test Facility

Sponsor: CID LINES NV
Waterpoortstraat 2
8900 Ieper
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Test Facility: CIRLAM Laboratory
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3 Dates of experiments

Effective experimental date: 20/12/2017

Effective completion date: 27/12/2017

4 Description of the method

4.1 Reagents

- Demineralized water
- Acetone
- Ethanol

4.2 Type of surface to be analysed

- Copper coils (provided by client)

4.3 Dilution of test item

- Tested at 0,5% v/v; diluted in tap water.

4.4 Protocol

The test is performed at $54 \pm 1^\circ\text{C}$. A beaker, containing enough test substance to cover the copper coils is heated to a temperature of $54 \pm 1^\circ\text{C}$. The copper coils are put in ethanol in an ultrasonic bath for 5 minutes, degreased with acetone and dried. The coils are weighed and are placed inside the reaction container standing in diagonal (to have greater contact surface between test solution and plates). The specimen is completely inserted into the test solution (the distance between the upper edge of the plate and the surface of liquid is at least 10mm). The coils are exposed to the test conditions for one week (168 ± 1 hour). After finishing the test, if necessary, the coils are dipped into a pickling solution (i.e. 30% sulphuric acid/ 70% water) for 5 minutes, then carefully cleaned with ethanol in an ultrasonic bath for 5 minutes and degreased with acetone. Once dried, the copper coils are reweighed.

5 Results

5.1 Uniform corrosion

Sample	Weight before (g)	Weight after (g)	% loss
Virocid 0,5% v/v	11,600	11,600	0 %

As described in the UN no. ST/SG/AC.10/11/Rev.4 guidelines, "In case of uniform corrosion attack the mass loss of the most corroded sample shall be used. The test is considered positive if for any specimen the mass loss on the metal specimen is more than the amount stated in the following table:

Table: Minimum mass loss of specimens after different exposure times

exposure time	mass loss
7 days	13.5 %
14 days	26.5 %
21 days	39.2 %
28 days	51.5 %

NOTE: These values are calculated based on a 6.25 mm/year corrosion rate."

5.2 Visual assessment

The copper coil submerged in Virocid 0,5% v/v showed a slight darkening of the color, the same happened with the coil submerged in tap water.

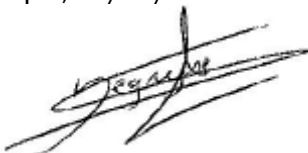


Left: untreated coil / middle: stored in 0,5% v/v Virocid / right: control stored in tap water

6 Conclusion

According to tests performed in CIRLAM Laboratory based on UN no. ST/SG/AC.10/11/Rev.4 guidelines, Virocid is considered not corrosive towards the copper when used in the given conditions.

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