

Real Time Corrosion Monitoring with Automated Corrosion Loggers – End-user Testing in the New Collections Centre of the Swiss National Museums



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The Collections Centre of the Swiss National Museums, constructed in 2007 in the township of Affoltern-am-Albis, is a state-of-the-art facility which contains both the newly designed conservation treatment laboratories, the laboratory for conservation research as well as the museum's storage facility. Housed are nearly one million objects of a wide variety of materials (wood, textiles, leather, metals, glass, stone, ceramics and plastics among them) in a three-storied building (3 x 2970 m²) which is equipped with carefully chosen building materials.



The façade of the three-storied storage building



4 different storage areas.

Use of

- Archival quality packing materials
- Equipment with state-of-the-art facilities
- Air conditioning: Strict temperature and humidity control
- Filters for incoming air

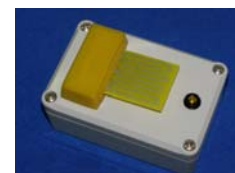
Possible hazards for the objects:

- Pollutants deriving from objects themselves (pesticides etc.)
- Climate variation by visiting groups



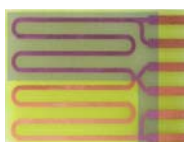
A monitoring method is needed!

This makes the Collections Centre an ideal end-user for testing a new type of automated corrosion loggers. A logger of this sort was developed during a research project entitled 'Automated Corrosion Sensors as On-Line Real Time Process Control Tools' **CORRLOG**, and was under the support of the European Commission within the Sixth Framework Program [1]. The goal of the project was to develop a logger enabling a continuous measurement of the corrosion rate of selected metals in air [2]. The logger is manufactured by nke, rue Gutenberg, ZI Kerandr , F 56700 Hennebont, France.



Corrlog corrosion monitoring system.

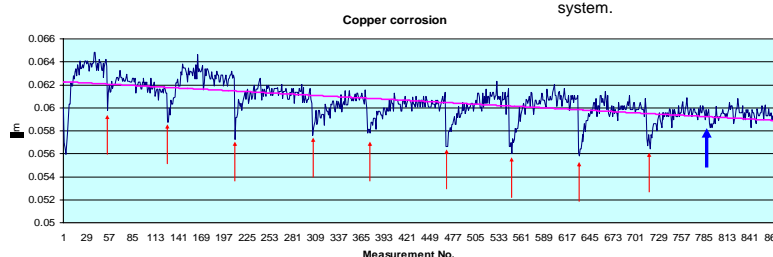
Results of the testing phase:



The copper sensor at the beginning ...



and after 141 days of testing. A slight corrosion is visible at the left lower part of the copper layer.



The diagram shows the decrease of the initial thickness of the copper layer. The overall tendency is a loss of appr. 0.003 μm in 146 days. The „spikes“ (red arrows) obviously have been induced by handling two sensors (Cu and Fe) with only one datalogger by changing the sensors manually. This could be approved by avoiding the change of the sensors, causing no „spike“ as indicated by the blue arrow.

Moreover, the Collections Centre will start a research project „Chemical interactions between selected cultural metallic artefacts and indoor environment in the new Collection Centre of the Musée Suisse Group“ in 2008. This project is supported by the COST Action D42 (Chemical Interactions between Cultural Artefacts and Indoor Environment (ENVIART) [3]).

References:

[1] www.corrlog.com

[2] Metal 07 (Amsterdam Sept. 2007): M. Kouril et al., Automated corrosion sensors for on-line real time monitoring of corrosion rate in indoor and outdoor atmosphere

[3] <http://www.echn.net/enviart>

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