

# PRESS RELEASE

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## HANDY CORROSION SENSORS PROTECT CULTURAL AND HISTORICAL OBJECTS

Fraunhofer Institute for Electron Beam and Plasma Technology FEP

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**A safe companion: the AirCorr logger detects the corrosion risk of ambient air in real-time**

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Paris - Japan, a historical tapestry on its journey from the Louvre to an exhibition in Osaka: the AirCorr corrosion logger monitors the air quality surrounding the tapestry. The air humidity fluctuates minimally; the temperature is also fine. However, upon opening the transport box and exhibiting the tapestry in Osaka, the corrosivity increases tremendously.

The AirCorr corrosion logger registers the changes in real time. The data can be read via a wireless interface and transport procedures or the exhibition surroundings can be adjusted. Conventional sensor devices often measure only air humidity and temperature, and, therefore, would not have detected the increased air corrosivity, risking irrevocable damage to the cultural object.

A team of European researchers, museum experts and industry representatives developed the transportable and user-friendly real-time measuring device AirCorr in order to control the impact of corrosive atmospheres, especially on objects of importance to cultural heritage. The plug-in sensor units can be exchanged easily and, hence, can be used to monitor and protect various metallic objects. Important conclusions about the corrosiveness of the ambient air can also be drawn for non-metallic objects.

The loggers can be mounted almost everywhere since they are battery-driven and consume little power. Currently, the devices are being tested in several European museums and exhibitions. Furthermore, the user-friendliness of the logger software is being improved by including existing standards and recommendations, which allow the user to draw straightforward conclusions from the measured data.

The concept of the measuring device is simple and yet highly effective: the sensor is comprised of a thin metal layer (copper, silver, lead, iron, zinc, tin, bronze, or brass), which is deposited on an insulating substrate (made of ceramic or polymer). Corrosion of the metal layer causes an increase in its electrical resistance, which is recorded and can be used to calculate the degree of corrosion. A part of the sensor is protected against corrosion by an organic coating and serves as a reference to compensate for the temperature-dependence of the electrical resistance.

The loggers and sensors have been developed and brought to commercial viability within the framework of the European research project »MUSECORR - Protection of cultural heritage by real-time corrosion monitoring« (FP7/2007-2013, project number 226539). Researchers from the Fraunhofer Institute for Electron Beam and Plasma Technology FEP in Dresden used their vacuum-based precision coating technologies to develop a process for depositing thin metal layers in a precise and reproducible manner on the plug-in sensors for indoor use. Thicker metal layers for outdoor sensors were manufactured by the Institute of Chemical Technology in Prague. The cost-efficient AirCorr loggers are available with different resolutions designed for indoor or outdoor use can be purchased from the French Corrosion Institute, which is coordinating the project.

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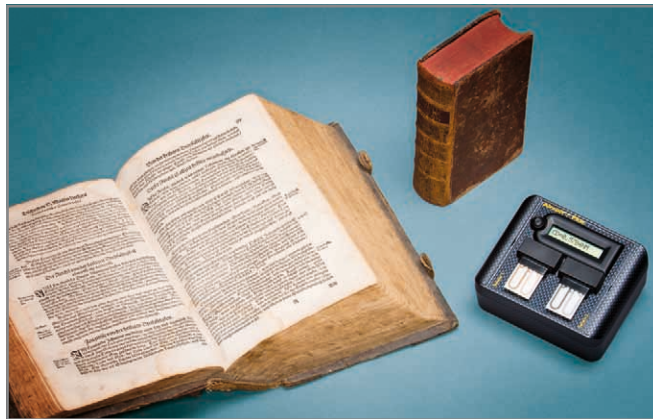
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## About the EU project »MUSECORR«

The European research project »MUSECORR - Protection of cultural heritage by real-time corrosion monitoring« (FP7/2007-2013, project number 226539) aims to develop handy corrosion sensors and loggers to monitor and protect historical and cultural heritage objects within a period of 3 years. The project coordinator is the French Corrosion Institute (»Institut de la Corrosion«) in Brest. Project partners include: the research institutes: Institute of Chemical Technology in Prague, Czech Republic, and the Fraunhofer Institute for Electron Beam and Plasma Technology FEP in Dresden, Germany; the developer of the measuring technology: nke SA in Hennebont, France; and museum experts from the »Centre de Recherche et de Restauration des Musées de France« in Paris, the Swiss National Museum, and the National Museum of Denmark. The project ends in June 2012. Subsequent marketing of the product is planned by the French Corrosion Institute.

More information can be found under:

 [www.musecorr.eu](http://www.musecorr.eu)



*AirCorr logger measures the corrosion risk for cultural and historical objects. | © Fraunhofer FEP*

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 MUSECORR



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