

Corrosion protection for metal artifacts

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The Mediterranean region is home to numerous museums and historical sites housing metal objects that provide an invaluable window into the past. EU funding enabled development of state-of-the-art corrosion protection and monitoring.

Metal objects from Phoenician, Hellenistic, Roman and Islamic periods define an entire cultural heritage. Unfortunately, they are subject to corrosion from the high humidity and sea salt in the air.

When left unprotected, they can become completely mineralised. Traditional protection systems used in northern countries are generally not suitable to such climates.

The extent of metal collections combined with the limited economies of the countries that manage them make it impossible to house the objects

in environmentally protected areas. Cost considerations also limit the potential of curators and conservation scientists to develop new and appropriate protection technology.

Conservation scientists aimed to develop a coherent restoration and preservation policy with innovative corrosion-protection systems combined with state-of-the-art portable technologies for assessing corrosion.

EU funding of the Promet project enabled the consortium to develop and test corrosion inhibitors and coatings as well as physical vapour deposition (PVD) and plasma-enhanced [chemical vapour deposition](#) (CVD) barrier films.

In addition, they developed new strategies for monitoring corrosion based on laser-induced breakdown spectroscopy (LIBS) and micro-X-ray fluorescence (micro-XRF), two state-of-the-art techniques for non-destructive elemental analysis of the [chemical composition](#) of a sample.

Corrosion tests in climatic chambers combined with assessment of natural ageing enabled scientists to compare the efficiency of different protection systems under study. Collections evaluated included archaeological museums and excavation sites as well as collections of coins and knights' armour.

Continued experimentation by Promet partners should solidify project concepts and results with long-term assessments, enabling the conservation community to support adoption without reservation.

Promet concepts have the potential to enable widespread use of protective coatings and implementation of low-cost on-site assessments of corrosion of archaeological and historical collections.

Together, they may ensure protection of an amazing cultural heritage of metallic objects in the Mediterranean region subject to [high humidity](#) and salt-water–induced [corrosion](#).

Provided by CORDIS

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