

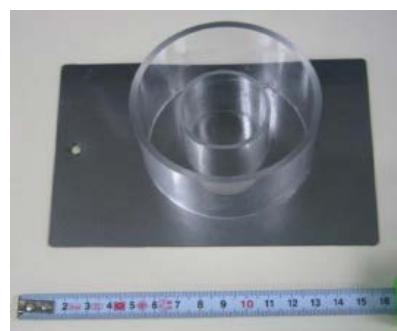
New non-destructive method for “in situ” monitoring of anticorrosive protection of organic coatings

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Description

Paint coating is one of the most used methods to delay corrosion process in metallic structures. Metal corrosion is the main reason of metallic infrastructure deterioration (bridges, boats, planes...) causing failures in numerous industrial areas. The economic loss due to corrosion is estimated at about 4% of the Gross Domestic Product (GDP) in industrialized countries. Due to the serious consequences of this phenomenon, it is essential to develop effective methods for early detection of coatings failures and establishment of deterioration mechanisms. However nowadays, most of the inspection methods are indirect, destructive and based on deterministic or probabilistic models, which limits the coatings performance assessment on the in real operating conditions.

The Corrosion Engineering and Materials Research Group (ENCOMAT) proposes a solution to this problem with a new device and a direct and non-destructive test based on electrochemical impedance spectroscopy (EIS). The main novelty of the device and procedure is the new portable sensor adaptable to any surface. The device, fixable by vacuum to the surface under study, makes possible the measurement of the electrochemical interfacial impedance. That is the main parameter of interest for adherence quality and anti-corrosion performance. The procedure reduces testing time and allows in situ assays to be performed.



Innovative aspects and advantages

In comparison with current procedures the present innovation provides:

- A portable device and a direct and non-destructive method capable for in "in situ" assays.
- Excellent analytical performance: short testing time (10 times shorter than current methods) giving complete and preventive information about barrier properties and level of adhesion of the coating.
- Capability to be used on any kind of organic anticorrosion coating on any metal substrate. It is effective even with low porosity coatings.

Commercial applications and potential users

The method can be used for defect identification, condition assessment, corrective maintenance, and new coating systems development. It can be Interesting to producers or users of organic coatings (Chemical and alimentary industries, naval, construction, aeronautics...). Industrial providers of devices and consultants of quality control of materials can also benefit of the innovation.

Patent status

A prototype is available, which has been protected by Spanish patent P201200870.

Type of collaboration

We look for a company to complete commercial development of portable device under collaboration agreement and the licence of the patent.