



Ministry of Housing, Utilities
& Urban Communities



Housing & Building National Research Center
International Conference

Future Vision & Challenges for Urban Development

Green Smart Sustainable Building between Present & Future

Cairo – Egypt, December 2024



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Template No. (1)

Workshop Title: Waste -Based Coatings as Sustainable innovative solutions for Coastal Corrosion

Abstract

Coastal corrosion poses a significant threat to infrastructure, requiring sustainable and cost-effective solutions. This research explores the potential of waste-based coatings as an innovative approach to combating this issue. By leveraging bacterial processes and waste materials, we aim to develop eco-friendly coatings that offer superior corrosion resistance and contribute to circular economy principles. The focus is on developing coatings for diverse applications, including steel, concrete, and even tiles. This investigation explores the feasibility of using bacterial coatings for reinforced concrete structures, offshore pipelines, and the incorporation of waste materials into dry cement paint and self-healing concrete.

Objectives

The objectives of this work are:

- 1. Investigate the potential of using waste materials in bacterial coatings for steel and concrete structures.** This includes evaluating the effectiveness of different waste materials in terms of corrosion resistance and adhesion properties.
- 2. Develop bacterial coatings specifically for reinforced concrete and offshore pipelines.** This involves optimizing the formulation and application process to achieve high performance in harsh marine environments.
- 3. Explore the feasibility of using waste materials in dry cement paints.** This entails researching suitable waste materials for enhancing paint durability and performance.
- 4. Examine the application of bacterial self-healing concrete.** This involves studying the mechanisms behind bacterial-induced self-healing and exploring potential waste material integration.
- 5. Investigate the potential of using waste materials in the production of corrosion-resistant tiles.** This research will explore the viability of incorporating waste materials for enhanced tile performance.
- 6. Develop a comprehensive understanding of the mechanisms of corrosion inhibition by bacterial coatings.** This objective includes



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analyzing the interaction between bacterial activity, waste materials, and the corrosive environment.

By achieving these objectives, this research aims to contribute towards the development of sustainable and environmentally-friendly coatings that mitigate coastal corrosion, promote resource conservation, and advance circular economy principles.

Main outlines

- **Waste-based coatings as a potential solution: Introduce the concept of utilizing waste materials to create sustainable, high-performance coatings.**
- **Preparation of bacterial coatings: Describe the method of incorporating the selected waste materials and bacteria into coating formulations.**
- **Testing and evaluation: Explain the testing procedures used to evaluate the corrosion resistance, adhesion, durability, and environmental impact of the waste-based coatings.**
- **Comparative analysis: Compare the performance of waste-based coatings with traditional coatings.**
- **Sustainability considerations: Analyze the environmental impact of using waste materials**
- **Steel structures: Discuss the applicability of the developed coatings for protecting steel structures (bridges, buildings, etc.).**
- **Concrete infrastructure: Highlight the potential for use on reinforced concrete structures and offshore pipelines.**

Other applications: Explore possibilities in the field of paints, tiles, and self-healing concrete. Suggested Speakers with related presentation:

1. Prof/ Ahmed Elshami
2. Prof/ Medhat elmahllawy
3. prof /tarek elsokary
4. Prof. / Basil Ahmed El -Sabbagh

Expected Attendees:

- Armed forces engineering authority.



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- The public and private sector companies based on these projects Tourism ministry.
 - Housing utilities and urban communities ministry (Housing and Construction Sector).
 - Colorama coating company