

## Researchers develop building coating that uses bacteria to protect and self-repair against erosion

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Credit: University of Hertfordshire

An innovation for a pioneering new limewash for building surfaces, which uses bacteria to form a barrier against erosion damage, has been developed by University of Hertfordshire researchers.

The limewash contains non-pathogenic bacteria, which increase the amount of  $CO_2$  that a building surface can absorb through



photosynthesis. This, in turn, generates additional calcium carbonate that forms a more robust barrier against erosion, as well as encouraging selfrepairing mechanisms.

Believed to be the first of its kind, a pre-production prototype is now being developed by the team, based on research by the University's Zero Carbon Lab and the manufacturing expertise of UK Hempcrete Ltd.

Both organizations are partnering with whisky makers Whyte & Mackay Ltd, who have agreed to trial the prototype at their distillery on the Isle of Jura off the west coast of Scotland. Currently, wind-driven rain on the island damages the building surfaces of the distillery, resulting in the need for annual re-coating. This not only disrupts production and tourism but increases the company's <u>carbon</u> emissions, as they transport materials to the island and carry out maintenance works.

The new, more robust self-repairing surface is expected to lower the frequency of maintenance, reduce disruption to the distillery and to tourism, and lower carbon emissions caused by frequent maintenance, while also actively absorbing carbon, thus supporting Whyte & Mackay's zero-carbon commitments. Over time it will improve the carbon absorption of the building surface, strengthening the outer layer and reducing maintenance requirements.

Professor Ljubomir Jankovic, professor of advanced building design and founder of the University of Hertfordshire's Zero Carbon Lab, said, "We are excited to see the potential impact that our research will have on the resilience and maintenance of the distillery. Following the planned field trials, there is scope for this method to be used on a much wider scale. As well as supporting Whyte & Mackay's zero-carbon aims, we also intend to give local community, trade and homeowners the opportunity to use the product. This will help them to lower traditional maintenance costs, supporting environmental goals and the local tourism economy."



Jamie Muir, Jura distillery manager for Whyte & Mackay, said, "The Isle of Jura is a beautiful place to make Scotch Whisky, but it is not necessarily the easiest place be a whisky maker. When we created our sustainability plan The Green Print, we laid out our commitment to make a positive impact to the local community where we make our whisky. This partnership with our friends at UK Hempcrete and the University of Hertfordshire will deliver a pilot, which we believe could make a significant impact across the Scotch Whisky industry and beyond."

Alex Sparrow, UK Hempcrete's managing director, added: "This collaboration with the University of Hertfordshire and White & Mackay is a perfect fit for UK Hempcrete. This is an opportunity to develop an innovative new low-carbon product in tandem with the development of primary research at the University, and simultaneously see its application in a real-world context. This fits exactly with our ethos of improving the technical performance of buildings in the real world, while lowering their carbon footprint."

The team are aiming to have the prototype in place by July for a 3–6 month testing period.

Provided by University of Hertfordshire

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