Taking inspiration from the human body, the team added an enzyme that is found in red blood cells to dry concrete powder | Photo source Worcester Polytechnic Institute

SELF-REPAIRING CONCRETE SEQUESTERS CARBON TO HEAL CRACKS

SCIENCE

The new material could extend the life of a structure from 20 to 80 years

Spotted: Concrete is used in almost every kind of structure or construction project. Although strong, it is also a very brittle material, making it prone to crack under any kind of stress, from weather and design flaws to reactions to other substances such as road salt and water. Researchers at the Worcester Polytechnic Institute in Massachusetts have created a new version of concrete that captures airborne carbon dioxide in order to repair cracks both small and large.

Taking inspiration from the human body, the team added an enzyme that is found in red blood cells to dry concrete powder. Called carbonic anhydrase (CA), the enzyme remains dormant until it interacts with carbon dioxide. A crack of any size sets off the chemical reaction that forms calcium carbonate crystals, a substance very similar to that of traditional concrete.

The process takes only 24 hours, which is significantly faster than other self-healing concretes. The speed is important because the faster a new crack is repaired, the longer a structure can operate at high quality. The scientists think that this composite material could extend the life of a typical construction project from 20 years to close to 80.

Finding ways to heal environmental disasters without creating any further damage is a huge goal that many entrepreneurs and creatives are approaching with tenacity and hope. From AI mapping tools that help predict the burn risk of different areas of forest, to drone delivery of essential medical and food supplies, Springwise continues to spot inspiring projects making a difference in local communities.

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Takeaway:

As well as extending the life of structures, self-healing concrete and other similarly repairing materials could help increase the general resilience of communities facing the effects of climate change. Building modularly and with new mediums that have been engineered specifically to be natural disaster resistant are two methods that could help communities live in greater equanimity with their local climate. For those on shorelines, finding ways to work with the power of the sea, including for farming, homes and energy, is a further example of the necessity of finding ways to live with, rather than in resistance to, weather and other location-specific challenges. Otherwise, moving and making a home elsewhere often becomes the only remaining option.