



Sprayable concrete

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NEW EARTHQUAKE-RESISTANT CONCRETE COULD HELP SAVE LIVES

 SUSTAINABILITY

A sprayable concrete could significantly enhance the resistance of vulnerable structures to earthquakes.

Engineers at the [University of British Columbia](#) will see the first real-life application of its new seismic-resistant, fibre-reinforced concrete at the seismic retrofit of a Vancouver elementary school. The material is engineered at the molecular scale to be strong, malleable, and ductile, similar to steel, so it is capable of dramatically enhancing the earthquake resistance of a seismically vulnerable structure when applied as a thin coating on the surfaces.

Researchers subjected the material, called eco-friendly ductile cementitious composite (EDCC), to earthquake simulation tests using intensities as high as the magnitude 9.0–9.1 earthquake that struck Tohoku, Japan, in 2011. A 10mm-thick layer was sprayed on to walls as part of the test, and the movements did not break the seal. EDCC combines cement with polymer-based fibres, fly ash and other industrial additives, making it highly sustainable. By replacing nearly 70 percent of cement with fly ash, an industrial byproduct, the amount of cement used can be reduced. This is an urgent requirement in terms of sustainability, as one tonne of cement production releases almost a tonne of carbon dioxide into the atmosphere, and the cement industry produces close to 7 percent of global greenhouse gas emissions. Other EDCC applications include resilient homes for First Nations communities, pipelines, pavements, offshore platforms, blast-resistant structures, and industrial floors.

The way in which concrete can be manipulated in the modern day takes its uses far beyond once it once was. Researchers have created an [even stronger form of concrete](#) by integrating recycled tyres, and electromagnetic radiation can be [used to detect corrosion](#) within the building material. How could taking a new approach to an age-old product or system change your business perspective?

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