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Low Carbon, Low Cost Cement Mix For Additive Manufacturing (3D Concrete Printing)

Researchers at Purdue University have developed a low-cost, low-carbon cement mix for additive manufacturing. This cement mixture significantly increases static yield, improves cure kinetics, and reduces costs. Most conventional cement additive producers use Viscosity Modifying Admixture (VMA), which can have a prolonged setting time and reduced compressive strength. Moreover, the majority of 3D concrete printing (3DCP) mixes are proprietary and very expensive. The mixture developed at Purdue instead enables greater build heights and improves hardened properties, offering a sustainable solution for construction by lowering both environmental impact and manufacturing expenses.

Technology Validation:

Rheology tests were performed on the cement mixture. Results demonstrated that the static yield stress of the cement paste increased by ~800%.

Advantages:

-Reduces costs and carbon footprint

-Lowers manufacturing expenses

-Improving cure kinetics

-Improves yield at 1/20 the dosing of commercial VMA

Applications:

-Construction materials

-Cementitious systems

-Additive manufacturing

Technology ID

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Category

Buildings, Infrastructure, & Construction/Construction Robotics & 3D Printing

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Intellectual Property:

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