MISSOURI S&T

**Opportunity**

Seeking a licensing and development partner to scale this carbon-capturing concrete reinforcement technology toward commercial manufacturing.

**Development Stage**

Laboratory validation in progress.

**Intellectual Property**

Provisional Patent Application Status: Filed

**Publication**

Coming Soon

**IDF#**

25-MST-031

# $CO_2$-Infused Steel Fiber Technology For Concrete

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## PROBLEM STATEMENT

Cement production accounts for roughly 8% of global anthropogenic $CO_2$ emissions, making concrete one of the largest industrial contributors to climate change. Current methods to reduce concrete's carbon footprint each carry serious drawbacks. External $CO_2$ injection requires specialized gas delivery systems and high-pressure curing chambers, both costly and impractical at scale. Passive carbonation relies on slow atmospheric absorption that takes years to meaningfully sequester carbon. Conventional steel fiber reinforcement improves strength but does nothing to address emissions. The construction industry needs a reinforcement material that improves concrete performance while actively capturing and utilizing $CO_2$ during the mixing and curing process itself.

## SOLUTION

Researchers at Missouri University of Science and Technology have developed $CO_2$-Infused Steel Fiber Technology. Steel fibers coated with Metal-Organic Framework (MOF) material absorb $CO_2$ from the atmosphere before mixing. During curing, ultraviolet light triggers a controlled release of the stored $CO_2$, timed precisely with cement hydration to strengthen the concrete's microstructure.

## VALUE PROPOSITION

$CO_2$-Infused Steel Fiber Technology delivers reinforcement and carbon sequestration in a single product, with no gas injection equipment, pressure chambers, or external $CO_2$ supply required. The fibers drop into existing ready-mix workflows and improve crack resistance, shrinkage, and curing performance while locking captured $CO_2$ into the concrete itself. Well suited for EV charging stations, wind and solar foundations, and carbon-neutral construction, where verifiable low-carbon materials command a premium.