

GtM Action and C&O Concrete Collaborate on Graphene-enhanced Concrete

2022-02-17

New Zealand-based graphene technology provider GtM Action is working with pre-fab concrete manufacturer C&O Concrete Limited to bring graphene-enhanced concrete to market.

[GtM Action](#) has distribution rights for graphene materials manufactured by [Australia](#)-based [First Graphene](#), which was reportedly found (in studies carried out by First Graphene, industry and a range of global research institutions) to provide up to 59% improvement in compressive strength and 33% improvement in tensile strength of concrete.

GtM Managing Director Mike Ogle said the challenge was to take those results from the laboratory bench to an industrial scale. “One of the major hurdles was to determine how to achieve consistent dispersion throughout a concrete mix,” Ogle said. “But having overcome that challenge, we’ve been able to achieve an average 31% improvement in compressive strength compared to a standard control mix.”

Ogle said being able to successfully scale up production of the graphene-enhanced cement to an industrial scale is a significant achievement, paving the way for industry to dramatically reduce its CO2 footprint.

“The increased strength means less materials needs to be used to achieve structural integrity,” he said. “With cement and concrete manufacturing being such a big contributor to global CO2 emissions, estimated between 6%-8%, and concrete being one of the most widely used materials on earth, being able to reduce material usage by even 25% will be hugely beneficial. For the [New Zealand](#) concrete industry alone, this would be equivalent to 23 million trees sequestering carbon over 10 years.”

There are other benefits graphene brings to the concrete industry. With good mix design these could include faster cure rates, reduced water permeation (and therefore

consumption), less rebound for sprayed mortars and reduced micro-cracking and fractures.

According to Ogle, working with [C&O Concrete](#) had enabled GtM to quickly test graphene on a larger scale with batch sizes up to 1.3 cubic meters. This enabled quick turnaround of testing in a variety of products including small floor slabs, landscape products and explosive goods sheds.

“The C&O Concrete team also reported that an unexpected benefit discovered when using graphene-enhanced concrete was its notably improved workability,” Ogle said.

Research being undertaken by First Graphene in conjunction with the [University of Wollongong](#) in New South Wales is showing graphene-enhanced concrete and repair mortars provide substantial benefits in harsh environments such as wastewater treatment facilities and salt water applications.

Ogle also said that phase two of testing for GtM involved identifying projects that could take advantage of the new and exciting benefits graphene had to offer [New Zealand](#)'s concrete and wider construction industries.

Read the [original article](#) on Graphene Info.