Monash researchers, led by Dr Wenhui Duan, have discovered a novel method for reinforcing construction materials.

They have developed a cementitious matrix containing graphene oxide to enhance the strength and durability of concrete. Ordinary Portland cement (OPC) is widely used in building and construction. Due to its poor tensile stress and strain capacity it must be reinforced with steel bars. In addition, fibres of various types may be added to delay the development of micro-cracks and improve resistance to tensile stress.

**Applications**
- Conventional buildings and infrastructure utilising precast or cast-in-place products
- Offshore and other structures in marine environments
- Well cementing
- Smart materials for structural health monitoring

**Advantages**
- Significant enhancement of the compressive and tensile strengths of cement and concrete
- Improved durability due to a finer pore structure of the composites
- Corrosion resistance

**Technology**
The newly formulated cement composite contains graphene oxide which is commercially available and can also be manufactured in-house. This matrix formulation does not require a dispersing agent, a surfactant, or a stabilizing agent and can be prepared in different weight aspect ratios using water as a dispersing medium.

The mechanical properties have been tested in the laboratory and measurements show that only 0.05% of graphene oxide (GO) is needed to improve flexural strength of an ordinary Portland cement matrix by from 41% to 59% and compressive strength by from 15% to 33%.

**Opportunity**
We are seeking partners for further development of this technology, with a view to licensing and commercialisation.

**Patent status**
Monash University has filed a United States Provisional Application (61/580,484). This patent covers composition of structural materials, methods of preparation and the nature of materials comprising cementitious matrix with improved technical performance.

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**Contact us**

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