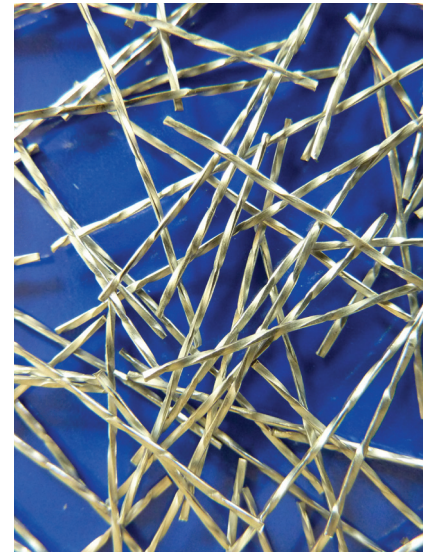


reinforcing revolution

Alternative solutions in concrete reinforcing are set to be a real game-changer in the housing industry, writes Amelia Dale.

Micro-rebar was first developed more than 15 years ago as a result of University of Michigan research into blast- and earthquake-resistant concrete for the US military. Its application in all concrete projects, including commercial and residential building, was recognised soon after, and it is now in use in 36 countries across the world. The product is an engineered, discontinuous steel reinforcing system, which has a number of benefits over traditional reinforcing methods.

Helix Steel Australasia brought the product downunder in 2009, and, following a fast take-up in the commercial construction and mining industries, it is now generating considerable interest in the residential construction sector.



Helix Steel Australasia CEO Kevin Fuller explains that the company's micro-rebar product has been used in a number of residential projects across Australia, with excellent results.

'Once [engineers] understand the Helix product, and have undertaken their own due diligence review of its suitability...they are happy to both specify and certify Helix Micro-Rebar in residential projects,' he says.

'The high tensile strength and patented twist give the product an ability to engage cracking at the micro level'

Helix Micro-Rebar is suitable for use in all footings, and can replace all or the majority of the main concrete reinforcement. It is also suitable for cast in-situ slabs; walls and permanent formwork walls; suspended slabs and slabs on ground; insulated concrete form (ICF) walls; and stairs.

Below: Helix Micro-Rebar has been used in a number of residential projects across Australia.



The product can also be used in a hybrid capacity in combination with rebar or mesh, in order to address the unique reinforcement needs of each job.

Helix Micro-Rebar is not a steel fibre; rather, it is classified as twisted steel micro rebar (TSMR). According to Helix, TSMR is capable of superior temperature and shrinkage control compared to those offered by traditional concrete reinforcement methods, and replacing rebar or mesh with TSMR results in improved crack resistance, increased durability and improved shear strength.

‘Helix does not allow for a complete failure of the reinforcement system due to corrosion; unlike traditional mesh and rebar which is continuous and electrically connected,’ Kevin explains.

‘Furthermore, the fact that Helix is discontinuous means there is no likelihood of any oxidation of one [piece] being followed throughout the concrete.’

‘The high tensile strength and patented twist give the product an ability to engage cracking at the micro level before it becomes visible.’

The nature of the product also allows engineers to include considerably less steel reinforcement in their designs.

‘Helix often replaces rebar/mesh at about a quarter of the total weight, so actual steel consumption [on a job] is reduced up to 75 per cent,’ Kevin says.

Using a smaller volume of steel has a number of benefits for a project, both from an economic and


environmental perspective. There is the obvious reduction in freight costs when getting materials from source to site, and according to Helix the cost of concrete pumps for on-ground slabs and cranes for lifting steel and prefabricated cages can also be reduced or eliminated entirely when using Helix Micro-Rebar.

Kevin adds that Helix Micro-Rebar is also a ‘greener’ product in many ways. ‘Helix is made from 56 per cent recycled steel, and since less overall weight of steel is used, the emissions of [associated] trucks, forklifts and cranes are greatly reduced.’

Using a smaller volume of steel has a number of benefits for a project, both from an economic and environmental perspective

Kevin says that the product also reduces construction time by eliminating laying and tying, and in many cases can eliminate the need for pumping and void development in highly congested steel locations. ‘Contractors don’t get excited by placing and tying steel,’ he says. ‘Concreters have found Helix concrete pours are easy to handle, the concrete easy to work, and the finishing of the surface can be completed, without any Helix visible, using standard tools and equipment.’

Helix provides free design software to engineers, and local agents are available to provide onsite support to concreters who are using TSMR for the first time.

‘[Engineers] find our design software useful in determining how mesh and rebar can be replaced with Helix Micro-Rebar,’ Kevin says. ‘Builders [are impressed] that we can take existing designs and convert them to Helix alternative designs within a very short time-frame and with the minimum of fuss, at no charge... We can have the Helix alternative designs independently certified by a chartered Australian structural or civil engineer from the state or territory they operate in.’ 



BCA: How Helix complies

Helix Micro-Rebar is classified as a twisted steel micro rebar (TSMR). TSMR is not specifically named in any building code or standard, but it can be deemed compliant via an ‘alternative solution’ or ‘deemed-to-comply’ clause, such as those found in the Building Code of Australia (BCA). A designer simply needs to demonstrate that the solution in question will meet or exceed the performance requirements of the code. Helix engineers can provide data to support this.

Clause A0.5 of the BCA recognises flexibility in performance-based building, and states how a product such as Helix Micro-Rebar can achieve compliance as long as adequate proof, such as testing documentation, is supplied.

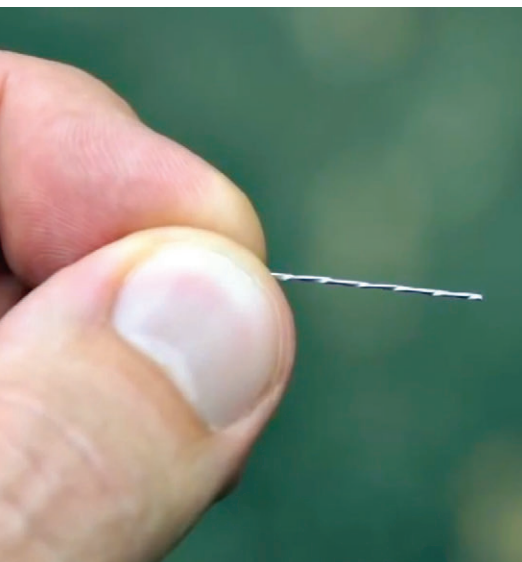
Helix Micro-Rebar has undergone extensive testing to prove that it provides a tensile response equal to rebar, and comes with documented results that see it fulfil these BCA provisions.

An ISO-accredited assessment has been completed on Helix (UES ER 0279), and provides strict guidance on its use for:

- shrinkage and temperature control in concrete
- structural tension and shear resistance in concrete
- fire resistance.

The Helix design software also enables engineers and certifiers to make a side-by-side comparison that provides clear confirmation that the Helix alternative is equal to or greater than a conventional rebar or mesh design.

For more information visit www.helixsteel.com.au



Left: A piece of Helix Micro-Rebar.