THE EMESH STORY – INTERVIEW WITH FIBERCON FOUNDER MARK COMBE

BACKGROUND

Fibercon - an engineering firm established in 1996 specialising in concrete solutions – envisioned, developed, and marketed a product which is changing the face of infrastructure concrete works in Australia.

They developed Emesh – a product which uses 100% recycled propylene plastic to reinforce concrete infrastructure. As at end November 2019 -through using their Emesh product instead of traditional concrete reinforcement methods - environmental savings of the following have been achieved:

- Recycled 102 tons of plastic—equivalent to the plastic waste of 1,125 Australians for 1 year
- Reduction of 2,850 CO2 emissions—equivalent to taking 609 cars off the roads for 1 year
- Saved 47600 m3 water
- Saved 550 tons of fossil fuel
- Generated 4,624 hours of employment for NDIS workers

HOW DID YOU COME UP WITH THE IDEA OF EMESH?

My professional background and expertise has been concrete. Concrete is a very brittle material that cracks easily. It needs reinforcement. Steel mesh had traditionally been used, with *virgin* plastic fibres also being used for the past 15 years.

At that stage, as with everyone else in the field, we were using virgin plastic fibre – that is, plastic fibre manufactured *specifically* from scratch for use in concrete reinforcement. Long term staff member Tony Collister – now our R&D Manager —suggested we should look at using recycled plastics.

5 years later, we had a product ready for market.

YOU ENGAGED IN SOME EXTENSIVE RESEARCH PRIOR TO DEVELOPMENT. HOW DID YOU COME ACROSS THE POTENTIAL WITH JAMES COOK UNIVERSITY?

We had been sponsoring research on concrete at James Cook University (JCU) for more than a decade. I had always worked with Universities and loved both the academic approach to testing, and the inquisitiveness. Undertaking a PhD is a major commitment – we believed we had something new, which could be validated with research.

A three-year PhD research project overseen by JCU's College of Science Technology and Engineering validated the use of the 100% Recycled Propylene Plastic, with both environmental and technical use benefits. It was also an internationally recognised work and awarded the Springer Thesis Prize.

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The environmental performance has gone through rigorous examination of all aspects of the production process, including the transportation to site and the amount of plastic waste Emesh prevents becoming landfill by using 100% recycled plastic fibres.

Emesh is the only concrete fibre product that can categorically state its environmental performance through a registered EPD, (Environmental Product Declaration), which is also independently audited.

Technical performance was also rigorously tested, in acidic and alkaline environments for impact absorption and cracking post-performance. The research proved that Emesh was:

- Cheaper
- Faster and Simpler
- Safer
- Sustainable

We wanted Emesh to be a real and valid solution, with proven environmental credentials, and not associated with the "Green Washing" and quasi environmental claims we have seen by others in the building industry. I believe we have achieved this.

WHAT WORK DID YOU NEED TO DO ON THE BUSINESS TO HELP FACILITATE ITS SUCCESS?

One of the biggest potential uses for our product, is in footpaths and other infrastructure – maintained by Councils. Councils are traditionally very cautious in taking on new products and innovations. With our efforts over the past 10 years, we are finally getting there but it involved a completely different approach.

We changed our focus to both finding the right distributors who were used to dealing with Councils, and to strengthening our credentials through collaboration with research and industry groups and Membership and Certifications.

We also had to find a manufacturer whose ideals and capabilities were suited to our needs. Registered NDIS Provider MacCallum Industries in Ballarat, was ideal. In addition to providing an extensive range of Disability Support Services including purpose-built accommodation, McCallum employs 90 people on the NDIS, all of whom have worked on our Fibercon products. McCallum have packed our product for over 10 years. As McCallum's say, a lot of people talk about developing infrastructure products to help protect the environment, but Fibercon and Emesh have made it happen.

WHAT ARE YOUR PLANS FOR THE FUTURE?

Our priority is to find our way through the maze in Australia first. Councils and Infrastructure are not easy markets to enter, and they are not allowed generally to say anything which could be taken as an endorsement of a product – even though some products are obvious success stories!

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WHAT DID IT MEAN TO YOU TO BE RECOGNISED AS A FELLOW OF THE AUSTRALIAN ENGINEERS?

It was amazing recognition for me – it recognised my contribution to the industry as a whole, and the fact that I had done the hard yards over 20 years – it's not an accolade given lightly.

WHAT HAVE BEEN YOUR KEY CHALLENGES?

Even though Emesh has proven itself in the field time after time; was validated by the JCU PhD study; and has impeccable environmental credentials; the hard work just begins. Relevant bodies and many different specifications mean we have to prove we are better or equivalent to the old mesh and conform to the limited number of specifications that allow virgin macro poly fibres.

What we have found is that when we work with those who are prepared to consider alternatives and take time to understand the facts, we can achieve great innovation.

Innovation is the key to Australia's building future. Particularly with the challenges the world faces with climate change, we need a more common-sense approach to using products which are sustainable, and "simply make sense".

Fibercon CEP Mark Combe with Emesh 100% recycled plastic fibres

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FOR FURTHER INFORMATION, PLEASE CONTACT:

Mark Combe, Fibercon CEO
Email: markc@fibercon.com.au
Mobile: 0414-647077
Website: www.fibercon.com.au; www.emesh.com.au
LinkedIn: https://www.linkedin.com/in/markcombe/
For Photo see: http://emesh.com.au/media.php

Tony Collister, Fibercon R&D Manager
Email: tonyc@fibercon.com.au
Mobile: 0414-911349

FIBERCON COMPANY INFORMATION

Mark Combe (BE Civil '87 UNSW, MIE, MIPENZ, RPEQ,) established Fibercon in 1996, and specialises in Macro Poly and Steel Fibre Reinforcing of Concrete in infrastructure, footpaths, cycleways, small precast units, roundabouts, and mining applications.

In 2015 Fibercon were recognised with a prestigious Shell and Australian Department of Industry, Innovation & Science Innovation Challenge Award for their development of a recycled macro-plastic fibre reinforcing made entirely from industrial plastic wastes.

Mark was also awarded the Top 50 Most Innovative Engineers in 2017. Fibercon was the industry sponsor of a three-year PhD program at James Cook University to develop *Emesh* - whose fibres can reinforce concrete in footpaths, cycleways, shotcrete and small precast elements. The company also tested its Macro Poly and Steel fibres with researchers at UNSW.