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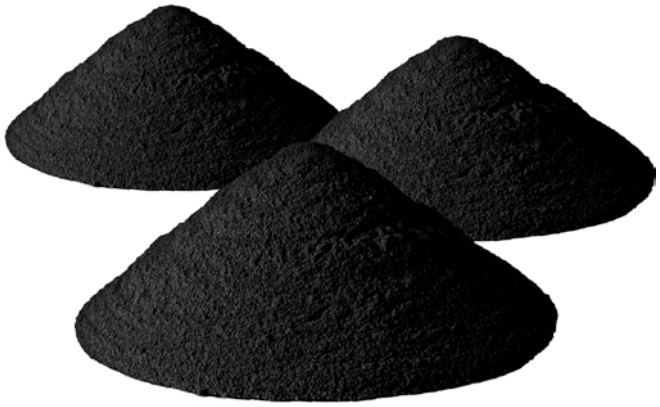
TRIALS FOR PERTH COMPANY'S POTENTIAL REVOLUTION OF WORLD'S MOST WIDELY USED MAN-MADE PRODUCT

Trials are to be undertaken in the United States and Australia over the next two years to test the potential of an Australian company's technology to enrich the capabilities of building concrete.

At the heart of the tests will be the use in concrete of the breakthrough carbon ingredient called nanotubes, super-strength micro-sized particles.



Eden's Carbon Nanotubes

The commercial application of carbon nanotubes (CNT) in concrete is being pioneered by Perth-based and ASX-listed technologist and energy company, Eden Energy Limited.

Eden says the gains in concrete performance – if proven commercially – will positively impact the global building industry where concrete is a key construction ingredient for domestic, industrial and commercial projects.

Concrete is the most widely used man-made product in the world with approximately one ton of concrete produced every year for each person on the planet. The United States is a big consumer, soaking up in excess of 700 million tonnes annually.

Eden has worked successfully in its United States laboratories over the past three years to bring the Company's nanotube production capability up to a commercial scale and to develop applications for the CNT including as an additive into concrete and plastics

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Now the Company is looking to take the next steps towards potential commercialisation of its CNT by bringing an "off the shelf" product to market. At this stage, concrete looks like being the first such product.

"Our forward strategy announced today is now to test our CNT-enriched concrete over the next 12-24 months in both the US and Australia, and prove up the markets before possibly licencing suitable admixture manufacturers to produce Eden's admixture made with Eden's CNT," Eden's Executive Chairman, Mr Greg Solomon, said today.

"Eden's CNT enriched admixtures will be sold to concrete manufacturers or selected joint venture partners as the case may be and added into the concrete during production in the same manner that other admixtures are presently introduced to produce stronger concrete," Mr Solomon said.

"We will be aiming initially at high abrasion resistant applications and following with high strength uses in high rise applications. Road and bridges in areas that are subject to heavy snowfall and where snow ploughs are used to clear the roads for example, suffer severe abrasion and damage to the road surfaces, requiring frequent repairs and are the initial target market.
"In the United States alone, there are some 89,000kms of concrete paved roads and bridges, with an annual US$40 billion maintenance bill so nano-enriched concrete has a real value-add market opportunity to reduce these impacts while delivering a lighter, stronger material."

Mr Solomon said the primary unresolved technical issue for the CNT-concrete application was complete tests and satisfy the required standards and also to extend the shelf life of Eden's Admixture from 3 months to 6-12 months.

"For most applications, long-term testing of the CNT-enriched concrete against international standards will also be necessary and this will be part of our trial work over the next year or so.

"Our work to date gives us confidence that our CNT-enriched concrete will meet the various required standards for commercial application."

"Whilst the current shelf life is not considered to be a project stopping issue, it will require far tighter management of the distribution chain but we are confident that a suitable solution will be found," Mr Solomon said.

The initial commercial trials of the CNT enriched concrete will be undertaken on hardened surfaces such as roads which do not carry the same risks as concrete used in high rise construction.

The super-strong carbon nanotubes are also highly conductive (thermal and electrical) and have a flexural strength 200-300 times stronger than steel.

Hythane Company, Eden's wholly-owned US subsidiary, has commercialised a process, jointly developed by Eden with the University of Queensland, to produce low cost CNT from natural gas with the only products being hydrogen and CNT, and no CO_2.

Eden's existing low cost reactors used to produce the experimental nanotube batches can produce about 40 tonnes per year of the carbon-wonder material but Mr Solomon says larger reactors will eventually be needed if the technology becomes established as a building "norm".

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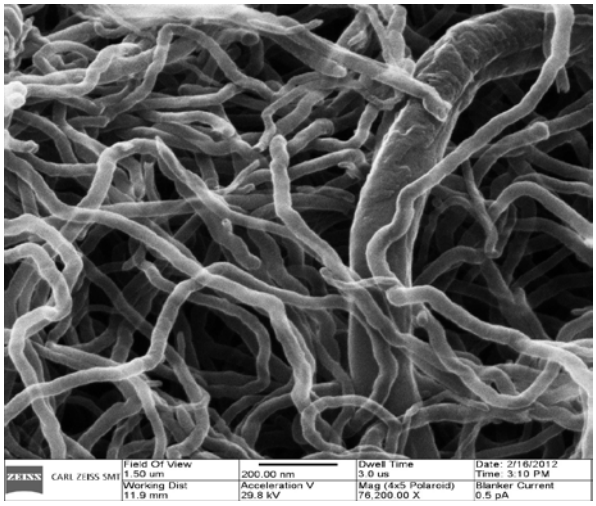
Eden's Denver-based CNT Production Clean Room and Reactors

This proprietary technology is a modular system able to be installed at gas fired power stations or fertiliser plants and used to produce the CNT from the natural gas feedstock, whilst using the hydrogen by-product to produce cheaper electricity or the fertiliser and again, with a greatly reduced Greenhouse Gas Emissions (GHG) footprint.

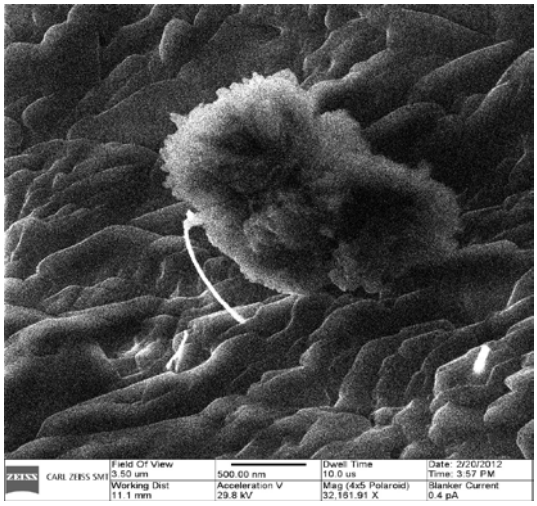
Cement production currently accounts for 5% of annual global anthropogenic GHG.

Eden on its own behalf and also in conjunction with Monash University has developed a process to mix its CNTs into cement paste, achieving an increased compressive strength of up to 30%. This significant increase in strength was achieved using only half of one percent (0.5%) (by weight) of CNT and 99.5% (by weight) of cement, equivalent to only 600g- 900g of CNT per tonne of concrete mixtures

Helium ion microscope analysis by Monash University showed Eden's CNT in cement paste acted as nucleation points for cement hydration, rather than acting solely as nano-scale fibre reinforcement (like larger-scale fibres), resulting in a denser, stronger and potentially more durable composite.



Helium Ion Microscope Image of Eden's Carbon Nanotubes in Fresh Cement Paste (showing build-up of dense hydrated cement on the surface of the CNT (top right) due to CNT acting as nucleating points for cement hydration)



Helium Ion Microscope Image of Eden's Carbon Nanotubes in Hardened Cement Paste after Fracturing (showing that the ends of the CNT are well-bonded within the cement gel and provide anchorage)

"CNT-enriched concrete should significantly reduce the quantity of concrete required for structures and reduce or even perhaps eliminate the need for re-enforcing steel, resulting in cheaper, lighter, stronger structures, far more flexible designs and far lower Greenhouse Gas footprints," Mr Solomon said.

"10,000 tonnes p.a. of CNT would be sufficient nanotubes for 17 million tonnes of concrete, or nearly 70% of the annual Australian concrete supply," he said, "so that gives you an idea of its future potential."

Mr Solomon said current competitive concrete additives, such as high performance fibre reinforced concrete, fly-ash and blast furnace slag, increase the flexural strength of concrete but required significantly greater quantities of additives and finer crushed aggregates and generally did not increase compressive strength – a factor necessary for abrasion resistance.

"After completion of the trials in the US and Australia, Eden will review the alternative methods of building up our manufacturing and marketing base so we can progressively expand sales into the huge global concrete market," Mr Solomon said.

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