

Cement alternative on inventors program

John Harrison, a geochemist, economist, inventor and managing director of cement products firm TecEco Pty Ltd appeared on the ABC's New Inventors television program last month. His invention and presentation was placed first out of three by the program's on-air judging panel and also won the people's choice (a phone, fax or email vote by interested viewers).

Harrison presented his eco-cement which is a blend of reactive magnesium oxide (reactive magnesia) with conventional hydraulic cements like Portland cement. He believes the invention is of global significance because eco-cements, for use as building blocks and other applications such as porous pavements, set by absorbing CO₂ out of the air, thus having a net positive affect on CO₂ levels in the atmosphere.

Harrison intends manufacturing magnesium oxide using a kiln he has also invented. Magnesite, a compound of magnesium that is abundantly available in nature, is heated in a kiln to about 650° C to produce reactive magnesium oxide. Because Harrison's kiln runs at low temperatures, energy from wind, solar cells or waste heat can be used. He said



John Harrison

this means less fossil fuels are burned and the CO₂ driven off from the magnesite in the kiln is captured for alternative use or safe disposal.

He said the reactive magnesia powder from the kiln is blended with a pre-determined, but flexible amount of Portland cement and aggregates to make an eco-cement which in porous materials absorbs CO₂ forming stronger fibrous

mineral carbonates that bond together aggregates many of which can be wastes.

"Eco-cement can handle more industrial waste than other hydraulic cements because it is less alkaline minimising the solubility of heavy metals and because it does not react with wastes jeopardising the strength of the concrete.

"On the other hand Portland cement concretes can't utilise huge amounts of waste because they are too alkaline and reactive leading to delayed and disruptive reactions," he said.

Harrison points out that eco-cements only carbonate in porous materials such as concrete blocks, mortars and porous pavement where it sets and hardens by absorbing the CO₂ directly out of the air. The more magnesium oxide, the more CO₂ is absorbed. The rate and amount of absorption depends on what stage of setting the concrete has reached. He said a typical concrete block would be fully carbonated within a year or so.

For more information visit www.tececo.com.

NEW MEMBERS

These companies and people recently became members of the Concrete Institute.

BRONZE PLUS

Baseline Pty Ltd (NSW)
BOSFA Pty Ltd (QLD, NSW, VIC, WA)
Connolly Key Joint Pty Ltd (NSW)
Cutler Hughes & Harris (NSW)

BRONZE

Alliance Design Group Pty Ltd (QLD)
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E B Mawsons & Son Pty Ltd (VIC)
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