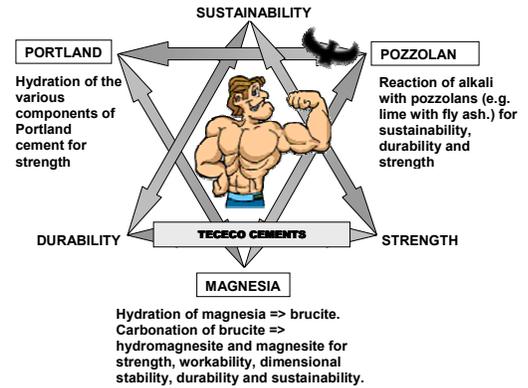




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**TecEco cements as featured in New Scientist Magazine, (July 13, 2002)  
 Discovery Channel etc.**



TecEco cements comprise a range of binders within a system whereby reactive magnesia is blended with Portland cement and usually a pozzolan to remove lime (Portlandite).

➔ **Tec- cements concretes.**

- Contain more Portland cement than reactive magnesia.  
 Reactive magnesia hydrates in the same rate order as Portland cement forming brucite which densifies, maintains pH and protects due to it's low solubility.  
 Other benefits include lower water cement ratio, improvements in strength, rheology, less shrinkage and carbonation.

➔ **Eco-cements**

- Contain more reactive magnesia than Portland cement.
- Brucite in **porous** materials eventually carbonates, forming stronger more acid resistant fibrous minerals.  
 Resulting in huge opportunities for sequestration and abatement.

➔ **Enviro-cements**

A new benchmark in toxic and hazardous waste treatment

➔ **Ramifications include:**

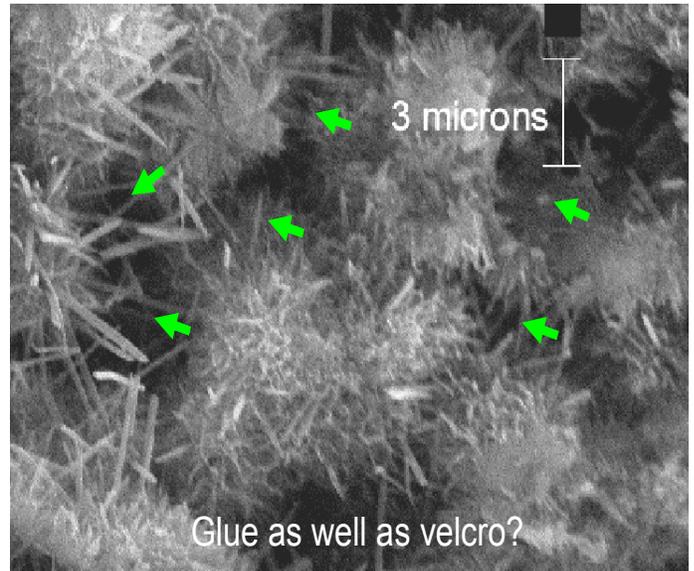
These properties make TecEco cements ideal for many uses including waste fixation, masonry products, pavement and ultimately readymix

- **Greater Durability.**  
 TecEco cement concretes are not attacked by salts and do not carbonate as readily.
- **A Lower More Stable pH for much Longer? – Less Corrosion**  
 As Portlandite is removed the pH becomes governed by the solubility of brucite and is much lower at around 10.5 -11 reducing problems such as AAR and etching, but still high enough to keep Fe and Fe<sub>3</sub>O<sub>4</sub> stable.
- **Increased Density**  
 Brucite also densifies the matrix by filling in pore spaces taking up mix and bleed water as it hydrates reducing shrinkage. (Bleed water is taken up by brucite which is 69 mass% water!)
- **Improved Rheology**  
 Reactive magnesia being much finer acts as a lubricant for Portland cement:  
 Improving the rheology, reducing the water/cement ratio, improving strength and reducing shrinkage.
- **Greater Sustainability**  
 TecEco modified Portland cements are more durable, last longer and there use less resources requiring less energy over time, whereas TecEco eco-cements can re-absorb considerable carbon dioxide making them suitable for large scale abatement.

# TecEco Research Activities

Current research activities include a scoping study at the BRE in the UK, a study into hydration at UTS in Australia and major research initiatives on sustainable brownfield remediation, regeneration, waste minimisation and re-use at Cambridge University (UK).

The new TecEco cements have many advantageous properties for many applications opening up considerable avenues for research. They can utilise and bind a wide range of wastes considered toxic or hazardous wastes as brucite can accommodate many substances because of its layered structure. A lower pH introduces stability and minimizes the solubility of toxic heavy metals.



Hydrated Portland cement paste (after Soroos, 1999)



**Eco-cements** are revolutionary new materials that create “structures that soak up carbon dioxide - the main greenhouse gas behind global warming.”

Many people believe that the recent extreme weather patterns are a foreboding warning of the future. Scientists therefore have a responsibility of finding ways of maintaining earth eco-systems.

With capture of CO<sub>2</sub> during the manufacture of eco-cements the potential for abatement is in the order of two billion tonnes or more and therefore should be considered very seriously.

TecEco are looking for research partners as well as funding to continue research in to what could be a major breakthrough in our efforts to find suitable systems to manage our impact on earth.

**SCIENCE PAPERS AND BUSINESS DOCUMENTS ARE DOWNLOADABLE FROM THE WEB SITE AT [www.tececo.com](http://www.tececo.com) IF REQUIRED ASK FOR A PASSWORD.**

## MAJOR RESEARCH (As at 15/08/03)

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