Latrobe Magnesium

ABN 52 009 173 611

SUCCESSFUL FULL CEMENT TEST RESULTS FOR CHINA SAMPLE

11 May 2015, Sydney Australia: Latrobe Magnesium Limited (ASX:LMG) has received very positive test results on its supplementary cementitious material (SCM) from its recently processed China sample. The testing concentrated on the wet and hardened properties of the SCM with ordinary portland cement and black coal fly ash mixes.

The SCM is a by-product of LMG's process of extracting magnesium from large volumes of spent fly ash in Victoria's Latrobe Valley. LMG is endeavouring to commercialise SCM as a company income generator.

The tests involved the preparation and setting of three shotcrete mixes – a pure GP mix, a 70% GP and 30% black coal fly ash mix and a 70% GP with 30% LMG SCM material mix.

The LMG SCM mix appears to behave like a conventional pozzolan, lagging the pure GP cement mix over the first 7 days; but by 14, 28 and 56 days has caught up in compressive strength. The difference between the LMG SCM mix and the GP mix at 14, 28 and 56 days is not statistically significant.

Unconfined Compressive Strength Results:

Age (days)	Pure GP cement mix	Black Coal Fly Ash mix	LMG SCM Mix
7	43.5 MPa	34.5 MPa	35.0 MPa
14	48.2 MPa	43.2 MPa	47.0 MPa
28	52.5 MPa	50.7 MPa	52.7 MPa
56	59.7 MPa	55.3 MPa	57.7MPa

Test results indicated that the shrinkage characteristics of the SCM were similar to the fly ash. The setting time for the SCM material was slower than the fly ash. However, there was only one hour difference between the three mixes. The durability test results were different depending upon the test method. This will need further investigation. The water penetration test results indicated similar characteristics in all three mixes.

Workability and consistency was assessed using slump standards and the tetxture was manually assessed. The mixes containing the SCM and fly ash were found to be superior to the cement mix primarily because the creaminess characteristics makes the concrete more pumpable and sprayable and thus more suitable for shotcrete.

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LMG will produce over 8 tonnes of SCM for every tonne of magnesium produced. LMG's price for its SCM will be set somewhere between the cost of black coal fly ash and the cost of cement delivered in Melbourne. These costs are between $130-180 per tonne.

The revenue generated by this product combined with magnesium revenue ensures that LMG's magnesium product is cost competitive with China.

LMG's SCM is produced without emitting any CO^2. Cement traditionally produces up to 0.9 tonnes of CO^2 per tonne of cement. LMG or its customers should therefore earn carbon credits of some 7 tonnes per tonne of magnesium produced.

There are major cost benefits and environmental benefits when LMG's SCM is mixed with normal portland cement.

LMG is also investigating whether the lower strength in the first 7 day period is due to the properties of the SCM material itself or whether it is the result of a process issue in China. Previously the SCM performed the same as the pure GP in the 7 day test.

LMG is therefore remaking a small amount of its SCM from the same material that was sent to China to prove this lower strength resulted from a China process issue. These test results will be known within the next month.

LMG is also carrying out cement characterisation tests at a respected cement laboratory.

David Paterson
Managing Director

About Latrobe Magnesium

Latrobe Magnesium is developing a magnesium production plant in Victoria's Latrobe Valley using its world-first patented extraction process. LMG intends to extract and sell magnesium metal and cementitious material from industrial fly ash, which is currently a waste stream from brown coal power generation.

LMG has completed a pre-feasibility and an adjustment study validating its combined hydromet / thermal reduction process that extracts the metal. Production from its initial 5,000 tonne per annum magnesium plant is due to start at the end of 2016. The plant will be in the heart of Victoria's coal power generation precinct, providing immediate access to feedstock.

LMG plans to sell the refined magnesium under long-term contracts to Australian and American users. Currently, Australia imports 100% of the 10,000 tonnes annually consumed.

Magnesium has the best strength-to-weight ratio of all common structural metals and is increasingly used in the manufacture of car parts, laptop computers, mobile phones and power tools.

The LMG project is at the forefront of environmental benefit – by recycling power plant waste, avoiding landfill and is a low CO^2 emitter.