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## Chromium VI handling and dosing at Castle Cement UK cement plants

**UK/WORLD** Over the last 12 months Fairport Engineering has been working on a nationwide basis for Castle Cement undertaking work to reduce the level of chromium VI in its cement and other plant improvement projects. Chromium VI is produced during the clinker manufacturing process. Chromium VI, is soluble in water, and in wet cement becomes a sensitising agent for allergic dermatitis if there is direct and prolonged contact with the skin. The most effective way of decreasing chromium VI is to add reducing agents, among them ferrous sulphate. With this addition, chromium VI is converted to chromium III, which is not soluble and so does not cause allergic reactions. This being the case, as most readers will be well aware, all cement suppliers needed to conform to the EU directive regarding the 2ppm maximum level of chromium VI in their cements by January 2005.

In light of this situation Castle instructed Fairport, in mid-September 2004, to proceed with the design and build of four ferrous sulphate reception, storage and addition systems. Two of these were to be at Ketton works, and one each at Padeswood and Ribblesdale. The total

contract value was some UK£1.5m (Euro2.5m) and the plants were all to be operational in 18 weeks.

Broadly speaking, all four plants are identical in that they include facilities to pneumatically unload ferrous sulphate from road vehicles into storage silos ranging from 100 to 150t capacity. Screw feeders then extract the stored ferrous sulphate and a pneumatic conveying system transports the material to day bins prior to addition, via loss-in-weight feeders, to the mill discharge bins.

In view of the hygroscopic nature of ferrous sulphate, chiller and dehumidifier units were supplied for both the tanker unloading and pneumatic conveying packages.

The projects were full turnkey assignments - designed and engineered closely in co-operation with Castle's engineers - and the projects included the civil and electrical and control works. The design and build of all four projects was brought in on-time, thus allowing Castle to continue to supply its clients with a high quality and user acceptable product.

Currently, Fairport is working with Castle Cement and ATEC (Advanced Process Technologies GmbH) at Ketton to design, construct and install a chlorine by-pass system. This system, to be complete early in 2006, is intended to reduce the amount of chlorine re-circulating through the clinker-making process and so minimise the deposition of volatile substances in the cooler areas of the kiln and pre-heater, which lead to poor performance and potentially leaving coating and deposits that ultimately may shut the cement making process.

## ScotAsh named for award

**EUROPE** ScotAsh has been named as an entrant to the prestigious European Business Awards for the Environment (EBAE). Organised by the European Commission, the EBAE recognise innovation and excellence in industry across Europe. ScotAsh has been chosen for its overall approach to business, through its policies, practices and products. ScotAsh creates quality construction products, including cements, grouts and waste stabilisation materials, manufactured using recycled pulverised fuel ash (PFA). During the last three years the company - a joint venture between ScottishPower and Lafarge Cement UK - has displaced the need for more than 1Mt of primary aggregates, saved 100,000 tonnes of carbon dioxide from the manufacture of OPC, and has avoided the need to dispose of over 1Mt of ash to landfill or lagoons. ScotAsh aims eventually to recycle Scottish Power's entire ash output - over 0.6Mt/year - as value-added construction products. The company achieved nearly 80% in 2003/4 and is on track to achieve over 0.5Mt in the current year.

**Silo and (inset) loss-in-weight feeder for ferrous sulphate, for Castle Cement by Fairport Engineering.**

