# Firebolt blocks made to last

**by Höganäs Bjuf Middle East Ltd, Cyprus**

*The bullnose area of a kiln can now be protected with specially-designed Firebolt™ refractory blocks from Höganäs. This refractory comes in a range of specifications depending on customer needs to protect against corrosion, alkali attack from alternative fuels and for grate cooler protection on the hot zone.*

Höganäs Firebolt™ blocks are manufactured under controlled conditions. They are dried in a very strict and specially-preheated environment to reduce the time for site heatup. A quality assurance check is also performed to obtain the correct cold crushing strength (CCS) and all the other physical properties required.

The blocks are cast in steel forms with one anchor and bolts for corner blocks, plus two anchors and bolts typical for both square and half-square blocks, so they are ready for installation and use when they arrive at site. Blocks can be produced in various sizes to fit the location.

Installation is very quick and easy. Holes are drilled on the bullnose or wall shell so that the threaded bolts can be fixed from outside and bolted in place, while the bullnose shell will be covered with 13mm ceramic fibre. Each block will be separated with expansion paper.

Bullnose blocks during Installation at Norcem's Brevik cement plant, Norway

Brevik: (right)bullnose after 21 months in operation

Brevik: bullnose installation: close up view

Cooler block roof installation can be carried out the same way or in case of roof beam construction, steel plates with holes can be welded to the edges of the

beams, and then the nuts are tightened to fix the blocks in place.

Blocks can be manufactured in the following Höganäs castable qualities to suit the conditions of the application:

- 562 Denscast Sicto: LCC (low cement castable) high-density, with 56 per cent silicon carbide (SiC), mainly used for bullnose and benches against corrosion and alkali attack resistance due to alternative fuels
- Denscast SiC 30: LCC based on 32 per cent SiC and chamotte, mainly applicable in bullnose and benches against corrosion and alkali attack resistance, which results from alternative fuels
- 547 Denscast 80 QF: LCC based on mullite and tubular alumina, with 78 per cent $Al_2O_3$, mainly applicable for bullnose and grate cooler hot zone walls, roof and benches under standard conditions
- 552 Denscast 60 QF: LCC based on chamotte and andalusite, with 61 per cent $Al_2O_3$, mainly applicable for grate cooler hot zone walls and roof under standard conditions
- 544 Denscast 50 A QF: LCC alkali-resistant low-cement castable based on chamotte with 52 per cent $Al_2O_3$, mainly applicable for grate cooler cold zone walls and roof under standard conditions.

Past experience has showed a block life time between 24-60 months, depending on various kiln conditions and output from the kiln. They have been used successfully by Holcim, HeidelbergCement and other major cement plants around the world.

Selected references illustrating the performance of the blocks versus time are shown in this article.

Norcem Brevik: cooler back wall

Norcem Brevik cooler side wall after 48 months