CONCRETE
SikaGrind® SYSTEM

GRINDING AIDS FOR OPTIMISED SLAG PRODUCTION AND QUALITY

BUILDING TRUST

GRINDING AIDS

Solutions for Optimised Slag production and Quality

GROUND GRANULATED BLASTFURNACE SLAG (GGBS) is an essential component for producing good quality concrete; its use continues to grow as a replacement for CEMI or to achieve more durable concrete. SikaGrind® products, added at a low dose are used in the grinding of slag in order to inrease efficiency of the mill and seperator and the quality of the finished product.

Any increase in mill throughput reduces the specific energy consumption and CO_2 emmissions.

$$p = \frac{\text{Total energy consumption mill system (kw)}}{\text{Production mill (t/h)}} \text{ (kWh/t)}$$

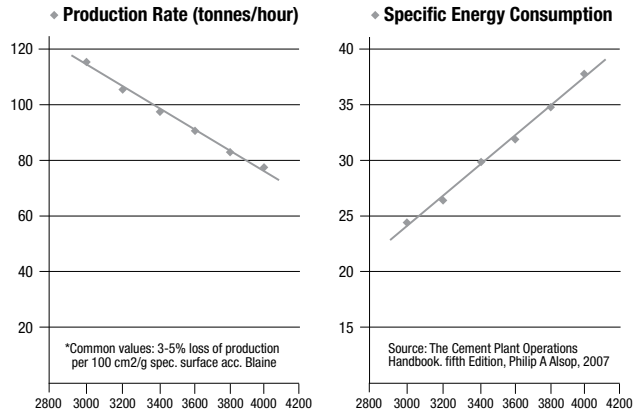
As with many materials when milled, the phenomena of re-agglomeration of the particles takes place during the slag grinding process leading to reduced efficiency of the mill and separator.

ELECTROSTATIC ATTRACTION FORCES ON THE PARTICLE SURFACES CAUSE VARIOUS EFFECTS:

- Cracks in the slag particles that develop during grinding tend to close again
- A coating forms on the mill parts and charge, reducing their efficiency
- Ground particles form agglomerates, in turn reducing separator efficiency.

SIKAGRIND® PRODUCTS, ADDED AT A LOW DOSE ARE USED in the grinding of slag in order to overcome these effects. If at the same time the quality of the finished product can be improved, (strength), then the slag can be ground courser so further improving the mill throughput. This strength increase can be achieved through better particle size distribution and a chemical effect of the grinding aid.

SPECFIC ENERGY CONSUMPTION V FINENESS



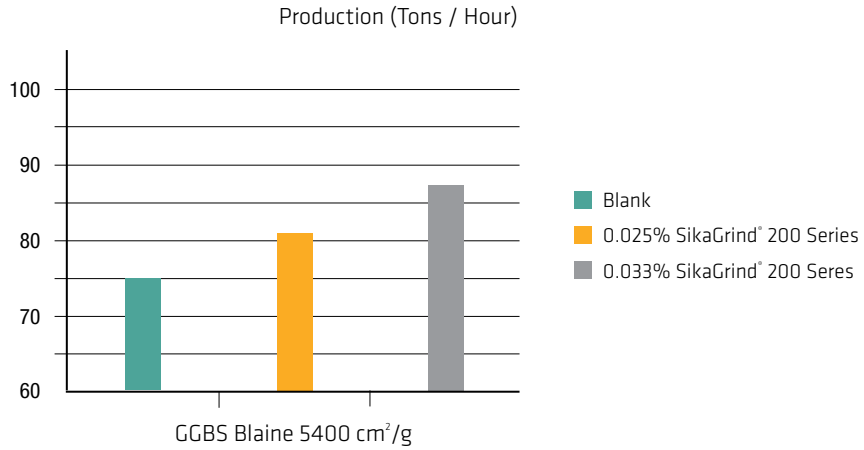
Specific surface (fineness) acc. Blaine (cm^2/g)

PLANT DATA

Plant trials were carried out with a major producer of GGBS. The objectives were to increase mill throughput and if possible increase strengths without changing the target fineness (Blaine). The following data was collected during the trials and demonstrates the positive effects of SikaGrind® 200 in slag production which has led to significant cost savings:

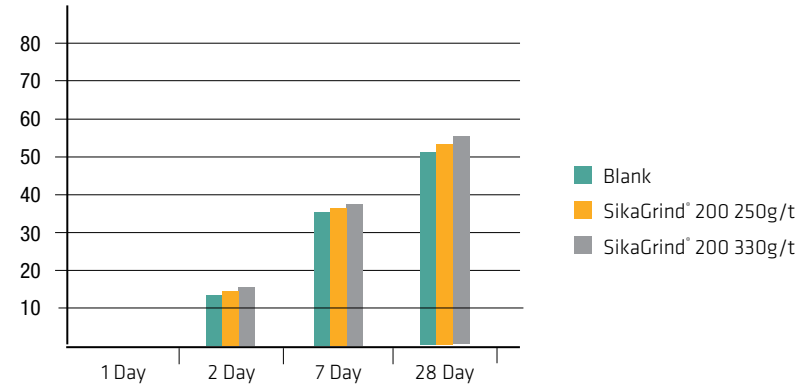
- Increased mill throughput leading to lower KwH/tonne
- Increased strength which means the slag can be ground coaser to achieve the target strength leading to further increases in mill throughout separator efficiency.

INCREASED MILL OUTPUT WITH SIKAGRIND® (PLANT RESULT)



SikaGrind® increases the production significantly

STRENGTH INCREASE WITH SIKAGRIND® - BS EN 1015-11:99



Analysis of samples shows that the strength increase is achieved primarily through better particle size distribution with a contribution from the chemical effect of SikaGrind® 200.

In this particular example the customer was able to reduce the surface area of the slag by up to 300cm²/gm based on the 'rule of thumb' that for every 1mpa increase in strength the surface area can be reduced by 100cm²/gm to maintain target strength. In turn for every 100cm²/gm reduction in fineness an increase of 3% in mill throughput can be expected; so in this instance a further increase of 9% is achievable.

Alternatively, the customer has the option of keeping the surface area the same resulting in a better quality product for the end user.

The pressure on cement and slag producers to reduce costs and CO^2 emmissions whilst maintaining or improving quality demands ever increasing production efficiencies and innovation. Sika supports the manufacturers in their aims with SikaGrind® products, often tailor made to achieve specific targets.

SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:

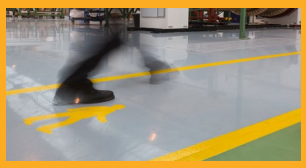
WATERPROOFING

CONCRETE

REFURBISHMENT

DISTRIBUTION

SEALING AND BONDING



FLOORING

ROOFING

INDUSTRY

FOR MORE INFORMATION:

Telephone **01707 394444** or visit **www.sika.co.uk**

WHO WE ARE

Sika Limited is part of the global Sika Group, specialising in the manufacture and supply of chemical based products for construction and industry. Sika is a world-leader in its field with subsidiaries in more than 80 countries, 15,200 employees, and annual sales of CHF 4.8 billion (£3.3bn). We are also committed to providing quality, service, safety and environmental care.

In the UK, we provide market-leading solutions for concrete, waterproofing, roofing, flooring, refurbishment, sealing & bonding, and industry, and have manufacturing sites in Welwyn Garden City, Preston, and Leeds with 700 employees and a turnover of £190 million.

CONCRETE/SIKAGRIND SYSTEM NOVEMBER 2013

bsi. ISO 9001 Quality Management

bsi. ISO 14001 Environmental Management

bsi. OHSAS 18001 Occupational Health and Safety Management

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