



CEMENT ADDITIVES ENABLING SUSTAINABLE CALCINED CLAY CEMENTS

TAKING THE LEAD TO REDUCE CO₂ EMISSIONS

BUILDING TRUST



LIMESTONE CALCINED CLAY CEMENTS

Technology reducing CO₂ Emissions

CEMENT IS ONE OF THE LARGEST manufactured products on earth, by mass, with over 4.0 billion tons of cement produced yearly worldwide. As cement production accounts for up to 7% of global CO₂ emissions, it needs to play its part in achieving a carbon neutral industry.

CC stands for Calcined Clay in cement, and together with the well-known Limestone Calcined Clay Cement (LC³), are two of the promising new technologies that will help the cement industry reduce emissions and work towards a more sustainable environment. CC and LC³ offer similar performances to 100% Portland Cement, with a reduced CO₂ footprint, and are composed of widely abundant materials.

LC³ is typically made up of 50% clinker, 30% calcined clay, 15% limestone and 5% gypsum, e.g. CEM II/B (Q-LL); Q=CC. It substantially reduces the amount of clinker and lowers the CO₂ emissions during production. It uses alternative materials during cement production which may be cheap and more accessible than traditional components, reducing also the production costs.

The calcination of the new added clay requires lower burning temperature than the traditional process to produce clinker. Additionally, the limestone is not calcined and there is a considerable reduction of CO₂ emissions for this type of cement.

The Swiss Federal Institute of Technology in Lausanne, together with other key players in the construction materials industry, are targeting the reduction of CO₂ produced by cement with the LC³ technology by replacing up to 50% of clinker in cement production.

The new CC and LC³ technologies are envisaged to play a significant and growing role in the cement and concrete industry. Sika is playing our part by developing innovative additives to enable it.



Around 7% of the world's CO₂ emissions are caused by cement manufacturing.



Clinker production contributes to high CO₂ emission during cement manufacturing.



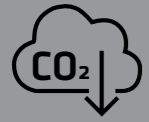
Scientists developed the calcined clay technology to reduce up to 50% of clinker in cement and up to 40% CO₂ emissions during cement manufacturing.



Sika's innovative SikaGrind® CC additives enable cement producers to manufacture limestone calcined clay cement, reducing CO₂.

CC AND LC³ TECHNOLOGY FOR SUSTAINABLE CEMENTS

Advantages and benefits



LOW CARBON

CC and LC³ can save 30 – 40% of CO₂ compared to Ordinary Portland Cement (OPC).



READY TO BE IMPLEMENTED

CC and LC³ are used similar to ordinary Portland cement (OPC), yet they are better in performance.



RESOURCE SAVING

CC and LC³ use abundantly available materials and can save scarce resources.



COST EFFECTIVE

CC and LC³ technologies reduce cement production costs.



GLOBAL SCALABLE

Suitable clays for CC and LC³ are sufficiently available all over the world.



DURABILITY

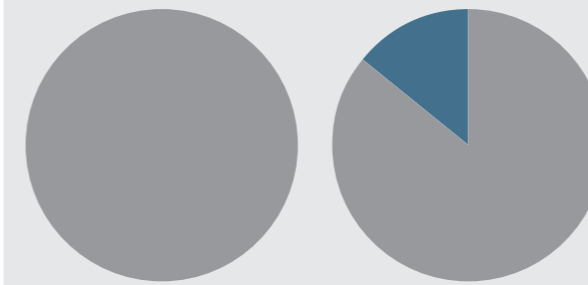
Performance can be adapted to specific requirements.

TRADITIONAL CEMENT VS CALCINED CLAY TECHNOLOGY

HIGH CLINKER CONTENT - HIGH CO₂

CEM I

CEM II/A-LL



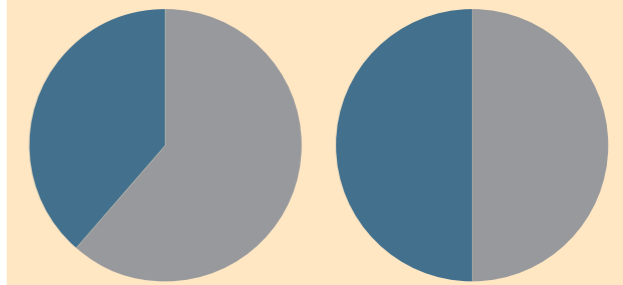
■ Clinker

■ Others

LOW CLINKER CONTENT - LOW CO₂

CEM III/A

CEM II/C (Q-LL)



■ Clinker

■ Others



SikaGrind® CC RANGE

Sika's additives to enable calcined clay technology



CC AND LC³ TECHNOLOGIES ALLOW SIGNIFICANT REDUCTION OF CLINKER AND CO₂.

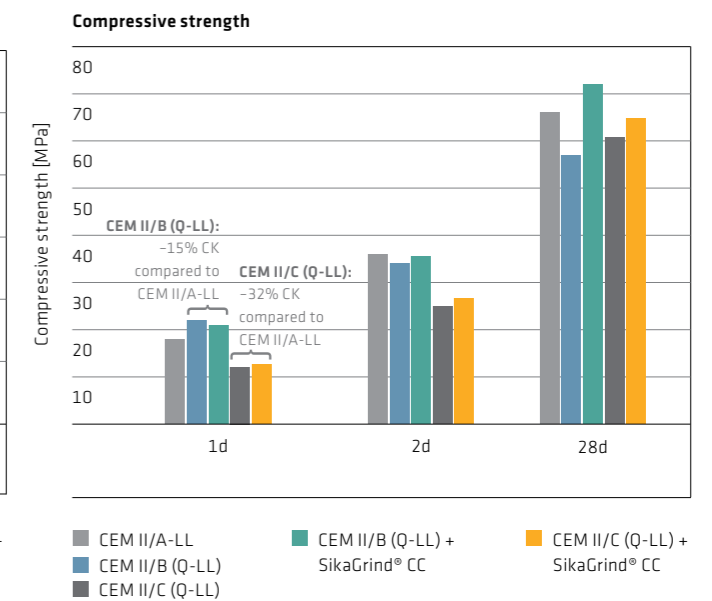
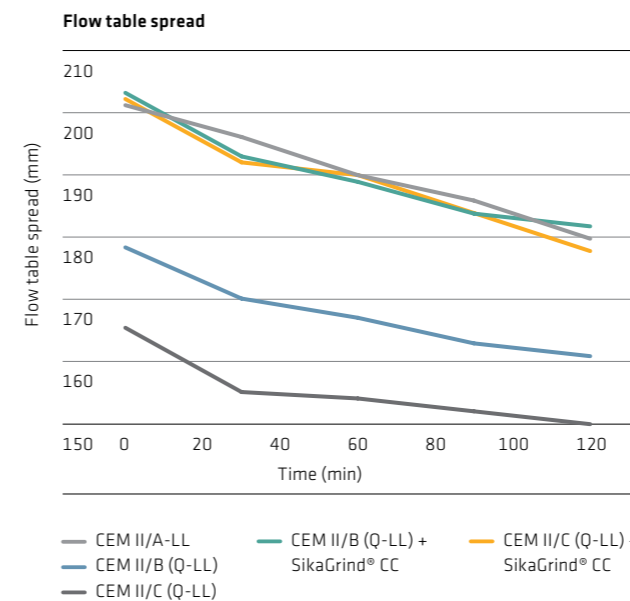
Compared to existing cements, CC and LC³ show some challenges in cement and concrete: namely they have a higher water demand and sometimes results in a reduced early strength development. Performance strongly depends on the type of clay and clinker, as well as on the requirements from the industry.

Sika solutions help reduce water consumption, increase strength while maintaining workability, hardening and extending durability of concrete. SikaGrind® CC are liquid grinding aids specifically developed for the production of Calcined Clay Cement improving specific characteristics of the new types of cements compared to traditional formulations.

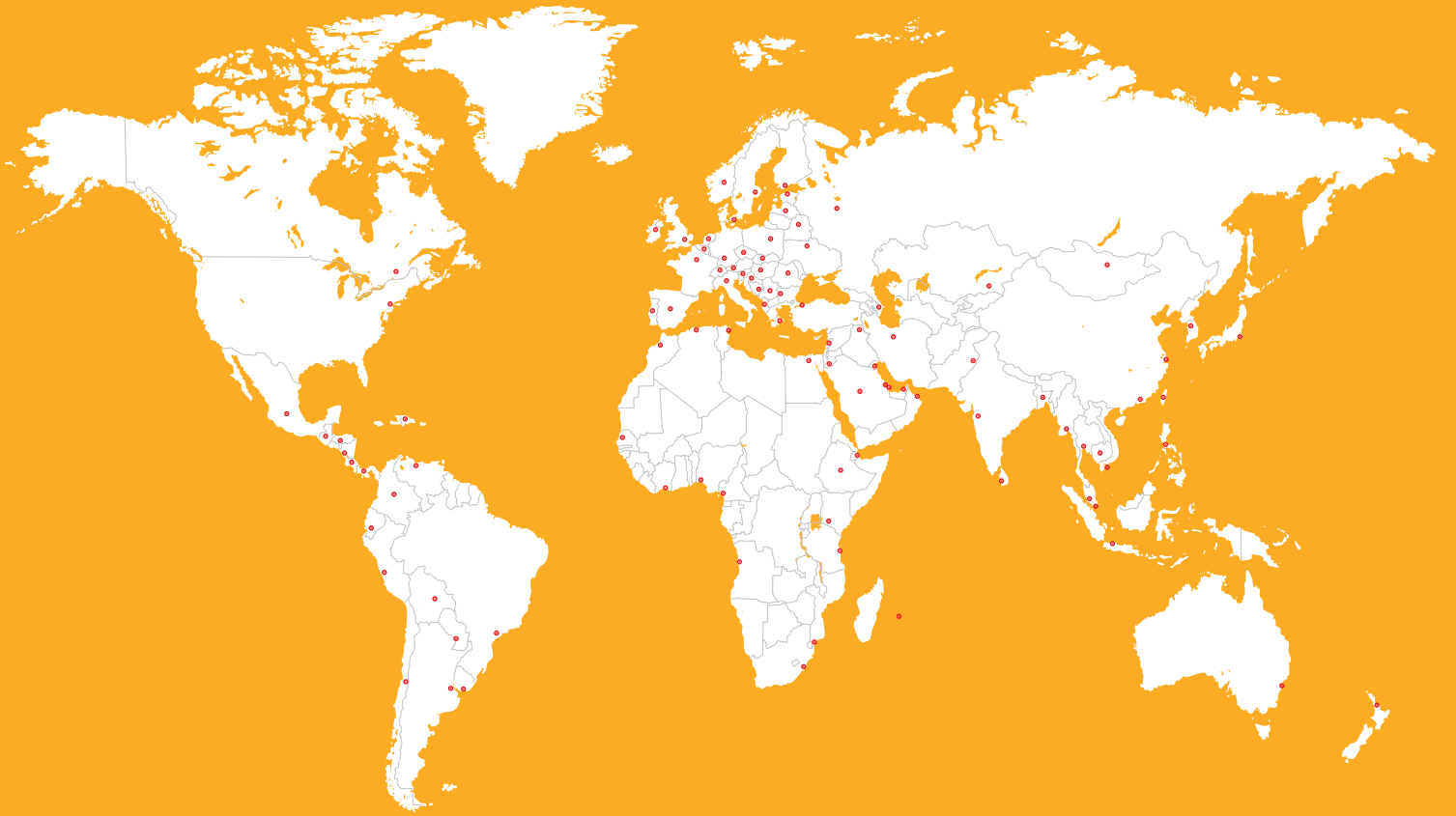
SikaGrind® CC PRODUCTS MITIGATE THE WATER DEMAND INCREASE DUE TO CALCINED CLAYS AND IMPROVE THE WORKABILITY OF THE CONCRETE.



CHALLENGES ADDRESSED BY SIKA



GLOBAL BUT LOCAL PARTNERSHIP



WE ARE SIKA

Sika is a specialty chemicals company with a globally leading position in the development and production of systems and products for bonding, sealing, damping, reinforcing, and protection in the building sector and automotive industry. Sika has subsidiaries in 103 countries around the world and, in over 400 factories, produces innovative technologies for customers worldwide. In doing so, it plays a crucial role in enabling the transformation of the construction and vehicle industries toward greater environmental compatibility. With more than 33,000 employees, the company generated sales of CHF 11.2 billion in 2023.

Our most current General Sales Conditions shall apply.
Please consult the Data Sheet prior to any use and processing.

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