



# CONCRETE SIKA ADMIXTURES TECHNOLOGY

BUILDING TRUST





# WE UNDERSTAND AND SUPPORT YOUR BUSINESS

## **EXPERIENCE AND MARKET LEADERSHIP IN CONSTRUCTION CHEMICALS**

Since 1910 Sika has provided products and systems with a clear mission: to optimise the construction process. We can contribute significantly to improved performance, enhanced quality and reduced overall costs, in every construction project.

## **PROVEN COMPETENCE IN CEMENT AND CONCRETE**

Cement and concrete are core competencies of Sika. From the production of cement to extensive ready-mix concrete operations; from site-batched concrete on large projects to precast concrete in factory conditions. We can solve technical

problems, and bring improvements to your production processes. We can generate “added value” for your customers and create new opportunities for your business.

## **SPECIFIED SIKA SOLUTIONS IN MAJOR CONSTRUCTION PROJECTS, WORLDWIDE**

Sika specialists provide extensive support to project owners and engineers in the planning, design and specification phases. Sika products and systems are widely specified worldwide. They are used in tunnels, bridges, power plants, industrial facilities, logistics centres, housing, education, health and office projects – all types of concrete structure.

## **WELCOME ON EVERY CONSTRUCTION SITE, WORLDWIDE**

More than 4,000 Sika specialists visit the contractors on construction sites around the world every single day. We provide special solutions and products to improve the construction process, particularly concreting, throughout the whole range of global climatic conditions and operating environments.

## **ADVANCED DEVELOPMENT CONCEPTS**

In our research and development activities we focus on technical innovations with the greatest benefit to our customers. We operate in the same technology, market and business environments and can therefore give the additional benefit of many potential synergies

# CONTENT

- 04** Sika Technologies for a Changing Industry

---

- 06** Sika Technologies for Durable Concrete

---

- 08** Technologies for your Early and High Strength Concrete

---

- 10** Sika® ViscoCrete® Technology for Self Compacting Concrete

---

- 12** Sika Technologies for Pumped Concrete

---

- 14** Sika Technologies for Precast Concrete

---

- 16** Sika Technologies for Semi-Dry Concrete

---

- 18** Sika Technologies for Cement

## FOR A SUSTAINABLE FUTURE

Sika is committed to a sustainable future, we place the highest priority on environmental considerations and on the safety of our employees and the local population.

### COMMITMENT

Sika is committed to the guiding principle of Sustainable Development. Sustainable Development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations, closely linking economic, ecological and social aspects. Sika puts many resources to work in support of its environmentally conscious management. Sika is committed to the global introduction

and maintenance of ISO 14001, the Environmental Management System. This international standard specifies a process for controlling and improving an organisation's environmental performance by means of an assessment of the company's activities, products, processes and services that might affect the environment.

### PRODUCT ECOLOGY

We assume our responsibility for safety and the environment. The optimisation of resource consumption and the safety of products are of paramount importance in any developmental work within the company. A significant part of sustainable development is borne by the products themselves. The energy and raw material use in the production of Sika products is often compensated

for, many times over by that saved in application.

### EXAMPLE

Concrete is a mixture of cement, water and aggregates such as sand and gravel. A common concrete mix design requires 200 litres of water per cubic metre of concrete. With Sika® ViscoCrete®, a new generation concrete Superplasticiser, the consumption of the precious resource water can be lowered by up to 40%.

# SIKA TECHNOLOGIES FOR A CHANGING INDUSTRY

## **RECENT TRENDS, INCLUDING ECONOMIC AND ECOLOGICAL PRESSURES, COMBINED WITH INCREASED REQUIREMENTS FOR CONCRETE PROPERTIES AND PERFORMANCE, CREATE NEW CHALLENGES.**

These are relevant for all of the parties involved in the design, planning, production and construction processes of concrete and concrete structures. These factors have created a demand for improved and innovative concrete technologies, the core business of Sika. Sika can contribute significantly to your concrete technology excellence!

### INNOVATION

The first Sika product was an innovative waterproofer for concrete. Since 1910 we have been recognised as a company who listens to the needs of our customers, developing innovative technologies, systems, concepts and products.

### PROFESSIONAL SERVICE

Our global and regional Technology Centres and rapid technology transfer process, combined with our team of Sika specialists enables us to provide increased value for your business.

### ADVANTAGES OF SIKA SOLUTIONS FOR CONCRETE TECHNOLOGY

A new chapter in concrete admixture technology, Sika® ViscoCrete® superplasticiser, was opened by Sika's innovation for concrete production at the end of the 1990's. Its unique properties allow for the production of high quality concrete and cost optimisation.

Other Sika Technologies:

- Sika® Control® shrinkage reducing admixtures
- Sika® FerroGard® corrosion inhibiting admixtures
- SikaGrind® cement additives
- SikaCrete® silicafume
- SikaPaver® / Plastiment® SD semi-dry concrete admixtures
- Sikament® / SikaPlast® water reducing and superplasticising admixtures
- Sika® AER air entraining admixtures
- Sikatard® hydration stabilisation admixtures
- Sika® Rapid accelerating concrete admixtures
- Sika® Watertight watertight concrete admixtures
- Sika® Separol® concrete release agent





# DESIGN AND PLANNING

## Concreting



**Durable Concrete**



**Watertight Concrete**



**High Strength Concrete**



**Self Compacting Concrete (SCC)**



**Pumped Concrete**



**Underwater Concrete**



**Concrete Essentials**



**Concrete Systems for Floors**



**Semi-dry Concrete**



**High Early Strength Concrete**

# SIKA TECHNOLOGIES FOR DURABLE CONCRETE

## THE KEY TO DURABLE CONCRETE PRODUCTION IS THE SELECTION OF QUALITY CONSTITUENT MATERIALS BROUGHT TOGETHER IN A DENSE CEMENT MATRIX.

This is achieved by:

- Reducing the water/cement ratio
- High consistence with a good flowability in order to fill even intricate formwork
- Proper curing which starts as soon as possible and which is maintained for a sufficient period

With the extraordinary superplasticising capabilities of Sika® ViscoCrete® technology, it is possible to reduce the water content of the concrete significantly and extend its flowability. Depending on the exposure conditions of the concrete, further improvements in durability can be obtained with the addition

of:

- Sika® Control®-40 for the minimisation of shrinkage
- Sika® AER to ensure a defined amount of artificially entrained air voids, for increased frost and freeze/thaw resistance
- SikaCrete® silicafume to improve the density of the matrix and the bond between the cement matrix and the aggregates
- Sika® FerroGard® as a corrosion inhibitor for reinforcement steel, particularly in marine/chloride environments.
- Sika® Watertight Concrete to ensure that a structure can prevent the ingress of water and even vapour.

## DURABLE CONCRETE ACHIEVED WITH SIKA TECHNOLOGIES

The durability of the concrete is a particularly important topic when designing a concrete structure. Sika technologies will ensure the achievement of your specified placing and performance requirements.

Such high durability concrete is used for the following types of applications and structures:

- Dams and watertight structures
- Sewage treatment plants and chemical plants
- Concrete structures with enhanced frost and freeze/thaw resistance such as roads and bridges

Improved durability results in:

- Prolonged service life of concrete structures
- Lower costs for maintenance and refurbishment works
- Improved appearance of the concrete surfaces
- More satisfied customers



# DESIGN AND PLANNING

## Concreting



### **Carbonation Resistance**

Improved carbonation resistance



### **Frost and Freeze/Thaw Resistance**

Air entrained concrete for roads and bridges improves the durability



### **Watertight Concrete**

Reduced permeability leads to better waterproofing properties which increase the durability of underground structures and potable water reservoirs



### **Abrasion Resistance**

Improved abrasion resistance



### **Chemical Resistance**

Tank constructions, sewage treatment plants and chemical plants require chemically resistant concrete



### **Reduced Shrinkage**

Minimised shrinkage of the concrete leads to extended service life of concrete structures



# SIKA TECHNOLOGIES FOR YOUR EARLY AND HIGH STRENGTH CONCRETE

## STRENGTH IN CONCRETE IS REFERRED TO AS “INITIAL/EARLY STRENGTH” OR “ULTIMATE / HIGH STRENGTH”.

The critical factors influencing the strength of the concrete are:

- The type of cement
- The concrete admixtures
- The concrete temperature
- The water/cement ratio

Special Sika® ViscoCrete® products have been developed, which produce a significant increase in initial or ultimate strength. Due to the strong water reducing and plasticising effects of the Sika® ViscoCrete® technology, the water/cement ratio can be kept to a minimum and the optimum mix design can be

developed.

If it is necessary to speed up the hydration process even further, SikaRapid® technology will enable you to reach target strengths within hours.

- Sika® ViscoCrete® to reduce water contents, improve rheology characteristics and cement hydration efficiency
- SikaRapid® to improve early strength development and/or modified setting characteristics

## EARLY AND HIGH STRENGTH CONCRETE ACHIEVED WITH SIKA TECHNOLOGIES

The production of early and high strength concrete with Sika® ViscoCrete® and/or SikaRapid® technology results in significant advantages:

For ready mixed concrete the advantages of early and high strength concrete are:

- Faster construction time
- Development of most cost efficient mix designs
- Lower concrete consumption (when thinner elements can be designed)
- Improved site capacity by increasing formwork rotation
- Improved service life of structure

For precast concrete the advantages of a fast and defined strength development are:

- Rapid rotation of moulds and finishing of concrete surfaces
- Early pre-stressing at low temperatures
- Reduced energy consumption for heat or steam curing
- Development of most cost efficient mix designs
- Reduced cycle times will allow the reduction of the number of moulds required





# DESIGN AND PLANNING

## Concreting



### High Early Strength for Precast Concrete

Saves energy and reduces production and material costs



### Early Strength for Increased Formwork Rotation

Reduced cost and shortened stripping times



### High Strength Concrete

Reduce structure thicknesses



### Improved Early Strength for Slipformed Concrete

Speeds up the construction process



### Improved Early Strength in Cold Weather

Makes it possible to work at lower temperatures



### High Strength Concrete for Ready Mixed Concrete

Reduced mix cost

# Sika® ViscoCrete® TECHNOLOGY FOR SELF COMPACTING CONCRETE

## STRENGTH IN CONCRETE IS REFERRED TO AS “INITIAL/EARLY STRENGTH” OR “ULTIMATE / HIGH STRENGTH”.

Sika® ViscoCrete® technology enables results, once thought impossible

- Excellent self compacting properties
- Significant water reductions
- Easy and simplified placing
- Excellent flow even around dense reinforcement
- Easy finishing
- High strength
- Consistent slump and flow

Sika® ViscoCrete® Self Compacting Concrete (SCC) is a concept to produce concrete, which is extremely fluid as well as cohesive. With the Sika® ViscoCrete® range of concrete admixtures, it is possible to produce a concrete which is very easy and fast to pour and place without vibration. The concrete moves effortlessly, even through intricate formwork and dense reinforcement, without bleeding or segregation.

- Sika® ViscoCrete® to reduce water contents, improve rheology characteristics and cement hydration efficiency
- Sika® Stabiliser to improve the internal cohesion properties of fresh concrete

## SELF COMPACTING CONCRETE (SCC) ACHIEVED WITH SIKA TECHNOLOGIES

The outstanding properties and advantages of Sika® ViscoCrete® technology are of considerable benefit to everyone involved in the project: concrete producers, contractors, specifiers and clients.

Improved Production and Placing Process:

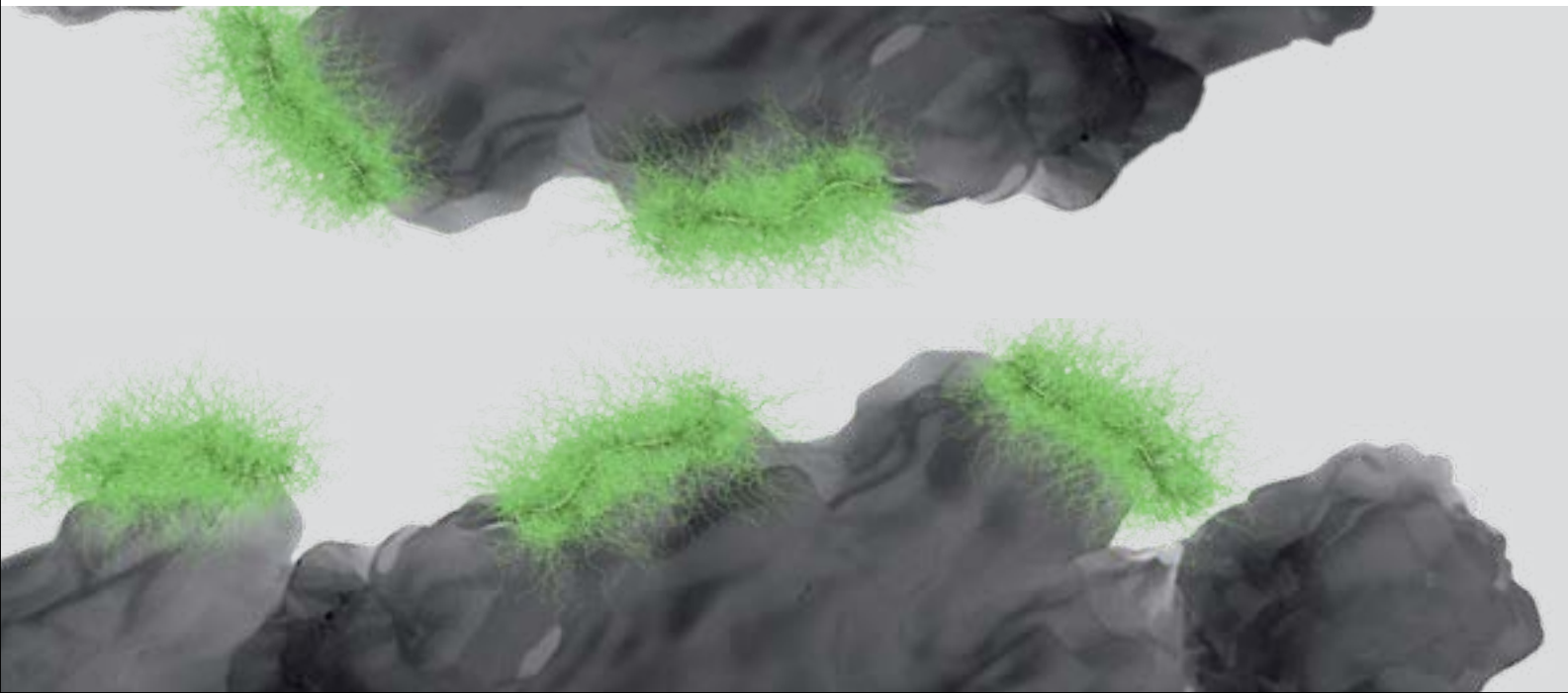
- Reduced labour and equipment costs
- Faster placing times
- Less finishing work
- Lower concrete consumption (when thinner elements can be produced)
- Faster turnaround of formwork and moulds

Improved Quality and Durability:

- Fewer rejects or claims
- Increased service life
- Smooth and uniform surfaces

Improved Health and Safety:

- Less vibration reduces the danger of “white finger syndrome” for operatives
- Reduced vibration prevents hearing damage and improves workplace communication
- Less disturbance of other trades or neighbours



# DESIGN AND PLANNING

## Concreting



### Improved Placing Properties

Faster placing and less finishing work on site reduces labour and equipment costs



### Enhanced Workability

Simplified concreting of complicated structures, accelerates the production and the whole construction process



### Outstanding Filling of Intricate Formwork

SCC allows the production of very thin elements, saving materials and increasing architectural design possibilities



### Self Compacting Performance

Elimination of vibration and less noise improves the production process and working conditions



### Optimised Rheology for Uniform Surfaces

Improved surface finish, even around complex details, increasing quality and durability



### Excellent Flowability

With enhanced flow the concrete compacts even around dense reinforcement, improving durability



# SIKA TECHNOLOGIES FOR PUMPED CONCRETE

## THE DESIGN OF A SUITABLE CONCRETE MIX IS ESSENTIAL SO THAT THE CONCRETE IS PUMPABLE WITHOUT SEGREGATION AND BLOCKING OF THE PIPES

The critical factors influencing the pumpability of the concrete are:

- Low water content to prevent segregation and bleeding
- Optimised mix design with efficient use of fines and cements
- Cement and aggregate type
- Selection of correct consistence for application

With Sika® ViscoCrete® and Sika® Stabiliser technology it is possible to produce fresh concrete with the required consistence and good internal cohesion. Friction and resistance

in pipes is reduced, helping maintain pumping pressure at a more constant and lower level. Sika technology for pumped concrete allows the realisation of the most demanding and challenging concrete requirements on construction sites all over the UK. The successful construction of many structures is based on Sika technology, in combination with our experience in the development of the best mix designs.

- Sika® ViscoCrete® to reduce water contents, improve rheology characteristics and cement hydration efficiency
- Sika® Stabiliser to improve the internal cohesion properties of fresh concrete

## PUMPED CONCRETE ACHIEVED WITH SIKA TECHNOLOGIES

The improved internal cohesion of fresh concrete and the reduced friction during pumping created by Sika® ViscoCrete® and Sika® Stabiliser technologies will give significant advantages:.

Increasing the performance of the concreting process will make the concrete more cost efficient with the following additional benefits:

- Faster and consistent placing
- Optimised cost of mix design with efficient use of fines/ cements
- Enables use of poorer aggregates and grading (i.e. recycled aggregates)
- Increased quality and durability
- Less blockages
- Less labour
- Longer pumping distances can be achieved
- Reduced wear on pumping equipment
- Taller heights can be reached in the construction of superstructures
- Improved concrete surfaces





# DESIGN AND PLANNING

## Concreting



### Excellent Workability

Reduced labour and manpower with easy and consistent placing of the concrete



### Reduces Pump Pressure

Increased pouring speed and reduced wear of equipment



### Enhanced Pumping Properties

Improved logistics with faster discharge and concreting in confined surroundings



### Cohesive Mix with Improved Workability

Optimised cost of your concrete mix with lower cement content and use of more economic aggregates



### Improved Cohesion

Reduced segregation and bleed



### Mix Stability

Continuous pumping of concrete over taller heights and longer distances

# SIKA TECHNOLOGIES FOR PRECAST CONCRETE

## THE PRECAST CONCRETE INDUSTRY IS DRIVEN BY QUALITY WITH SIGNIFICANT VALUE BEING PLACED ON PRODUCTIVITY AND FACTORY EFFICIENCY.

Sika® ViscoCrete® technology is now challenging the world of precast concrete providing the possibility of optimised production.

- Excellent self compacting properties
- Easy and simplified placing
- Reduced water cement ratio
- Improved early age strengths

Sika® ViscoCrete® technology substantially improves the basic properties of concrete. The positive impact is substantial and clearly visible, particularly in outstanding workability, high early

strengths, easy finishing and fine surface finishes.

- Sika® ViscoCrete® reduce water contents, improve rheology characteristics and cement hydration efficiency
- SikaRapid® improve early strength development and/or modified setting characteristics
- Sika® Stabiliser improve the internal cohesion properties of fresh concrete
- Sika® Separol® concrete release agents provide the possibility to produce fair-faced concrete surfaces for fulfilling aesthetical requirements

## PRECAST CONCRETE ACHIEVED WITH SIKA TECHNOLOGIES

The manufacture of precast concrete relies on quality constituent materials and the production process.

Sika technology now allow for the optimisation of:

- Rapid rotation of moulds and finishing of concrete surfaces
- Improved surface finish
- Early prestressing at low temperatures
- Reduced energy consumption for heating or steam curing
- Develop the most cost-efficient mix designs
- Reduction of cycle times allows you to reduce the number of moulds needed
- Reduced cement volume and use of replacement materials
- Accelerated strength development





# PROCESS OPTIMISATION

## Business Improvement



### Materials

Extend the use of cost effective readily available materials.  
Reduce cement volume and types Improved performance



### Quality

Reduced quality variations and rejections. Reduced refinishing works



### Production

Accelerate production and reduce vibration With Self Compacting Concrete: No vibration. Reduce labour requirements and improve working conditions



### Added Value

Produce top quality architectural finishes. Thinner units and innovative designs



### Logistics

Faster development of high early strengths. Faster mould turnaround. Reduce energy cost



### Business Support

Sika solutions for specifiers and contractors. Professional technical support from Sika

# SIKA TECHNOLOGIES FOR SEMI-DRY CONCRETE

**SEMI-DRY CONCRETE IS USED FOR MANY DIFFERENT APPLICATIONS ALL OVER THE UK SUCH AS PAVING STONES, BLOCKS AND PIPES. ITS MAIN ADVANTAGE IS THE ABILITY TO KEEP ITS SHAPE DIRECTLY AFTER COMPACTION.**

To achieve the desired appearance of the surfaces and meet the demands of the current standards the concrete should be designed with suitable selected locally available materials.

SikaPaver® and Sika® Plastiment® SD Technology improves the:

- Homogeneous filling of moulds
- Compactability of semi-dry concrete
- Dispersion of colour pigments
- Formation of cement paste on the flanks
- Green strength directly after compaction
- Uniform surface texture and product shape
- Early strength after initial curing
- Resistance against efflorescence
- Frost and freeze/thaw resistance

With the use of SikaPaver® and Sika® Plastiment® SD technology it is possible to minimise everyday variations of the raw materials, achieve sufficient compaction of the semi-dry concrete and gain the desired uniform appearance of the final products.

- SikaPaver® and Sika® Plastiment® SD provides a complete range of products for all semi-dry application

## SEMI-DRY CONCRETE ACHIEVED WITH SIKA TECHNOLOGIES

The properties of SikaPaver® and Sika® Plastiment® SD Technology are of considerable benefit to semi-dry concrete producers, specifiers and the final clients. SikaPaver® and Sika® Plastiment® SD Technology has helped to optimise both cost and technical aspects of semi-dry concrete production in compliance to demands of customers and standards.

Increasing the performance of the concreting process will make your concrete more cost-efficient with the following additional benefits

- Cost effective mix design (cement reduction)
- Faster production with increased output
- Reduced wear and tear of equipment
- Fewer rejects
- Reduced tendency of efflorescence
- Brilliant colours





# PROCESS OPTIMISATION

## Business Improvement



### Materials

Extend the use of low-cost, readily available materials.  
Reduce cement volume/increase use of cement replacements.  
Optimise pigment dosage consistently



### Quality

Improved surface finish and appearance. Reduced quality variations



### Production

Ensure optimum compaction. Improve early strengths.  
Increased uniformity



### Added Value

Manufacture of quality products. Shorter delivery times



### Logistics

Reduce rejects. Minimise stock of finished products. Faster delivery times



### Business Support

Sika solutions for specifiers and contractors. Professional technical support from Sika

# SIKA TECHNOLOGIES FOR CEMENT

## **INCREASED VOLUME DEMANDS, PRICE COMPETITION AND ENVIRONMENTAL REQUIREMENTS HAVE CREATED PRESSURES ON THE CEMENT INDUSTRY.**

By focusing on these requirements Sika can help to design specific new products based on our innovative and cost effective technologies.

SikaGrind® Technology enables many of these requirement to be achieved by:

- Reducing clinker volumes
- Increased production rates and milling efficiency
- Reduced CO<sub>2</sub> emissions
- Lowering energy consumption
- Improving cement quality

To assist process improvements and cement optimisation, Sika specialists provide technical support to reduce your

energy costs and emissions, increase productivity and speed up loading and transportation. The performance of cements can be substantially increased, allowing the production of high grade cements with reduced clinker content and shorter grinding periods required.

- SikaGrind® grinding additives - to enhance the properties of cement and increase the grinding efficiency.
- SikaGrind® quality improvers - to improve the performance of cement and allow the use of increased clinker replacement

## **CEMENT IMPROVEMENTS ACHIEVED WITH SIKA TECHNOLOGIES**

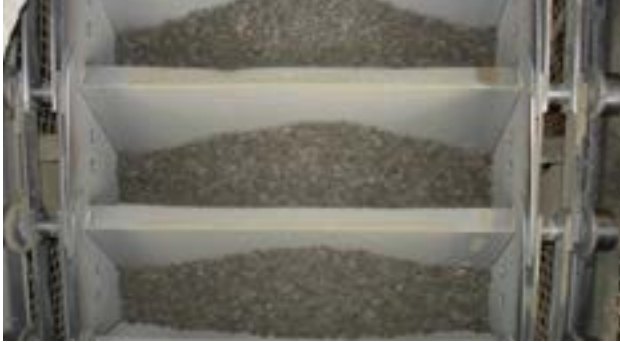
In a rapidly changing world, the ability to focus on specific requirements of the cement industry is key.

- Improved milling efficiency
- Reduced CO<sub>2</sub> emissions
- Lower dependence on clinker
- Reduced energy consumption
- More satisfied customers



# PROCESS OPTIMISATION

Business Improvement



## Materials

Extend the use of cost effective clinker replacements. Reduce clinker volume. Preserve natural resources



## Quality

Optimise cement granulometry. Enhance strength development of the cement. Reduced quality variations



## Production

Increased production rate. Reduced grinding/energy costs. Improve separator efficiency. Reduced CO<sub>2</sub> emission



## Added Value

Improved cement quality. High value speciality cements



## Logistics

Reduced blockages in conveyor systems. Speed up loading and unloading of trucks



## Business Support

Sika solutions for specifiers and contractors. Professional technical support from Sika



# SIKA FULL RANGE SOLUTIONS FOR CONSTRUCTION:



WATERPROOFING



CONCRETE



REFURBISHMENT



MERCHANT



SEALING AND BONDING



FLOORING



ROOFING



INDUSTRY

## FOR MORE INFORMATION:



### WHO WE ARE

Sika Limited and Sika Ireland Limited are 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 90 countries around the world and manufactures in over 160 factories. With approximately 17,000 employees Sika generates annual sales of CHF 5.6 billion (£3.9bn). We are also committed to providing quality, service, safety and environmental care.

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

The information, and, in particular, the recommendations relating to the application and end use of Sika® products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Product Data Sheet for the product concerned, copies of which will be supplied on request..



FM 12504



EMS 45308



OHS 585274

### SIKA LIMITED

Head Office  
Watchmead  
Welwyn Garden City  
Hertfordshire, AL7 1BQ  
United Kingdom

### Contact

Phone +44 1 707 394444  
Fax +44 1 707 329129  
E-Mail [enquiries@uk.sika.com](mailto:enquiries@uk.sika.com)  
[www.sika.co.uk](http://www.sika.co.uk)  
@SikaLimited

### SIKA IRELAND LIMITED

Sika House  
Ballymun Industrial Estate  
St Margaret's Road  
Dublin 11, D11 DA2V

### Contact

Phone +353 1 862 0709  
Fax +353 1 862 0707  
E-Mail [info@ie.sika.com](mailto:info@ie.sika.com)  
[www.sika.ie](http://www.sika.ie)

BUILDING TRUST

