



When can I take cement
production to the next level?

Siemens SICEMENT^{CIS} –
the foundation for impressive performance.

Answers for industry.

SIEMENS



How can innovation be made to measure?



Is there a silver bullet for plant efficiency?

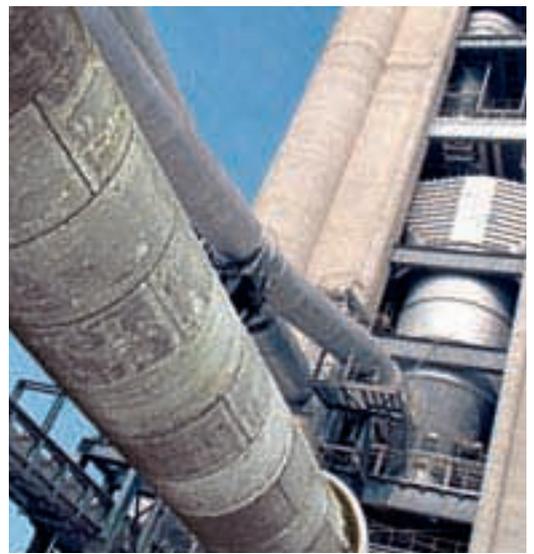
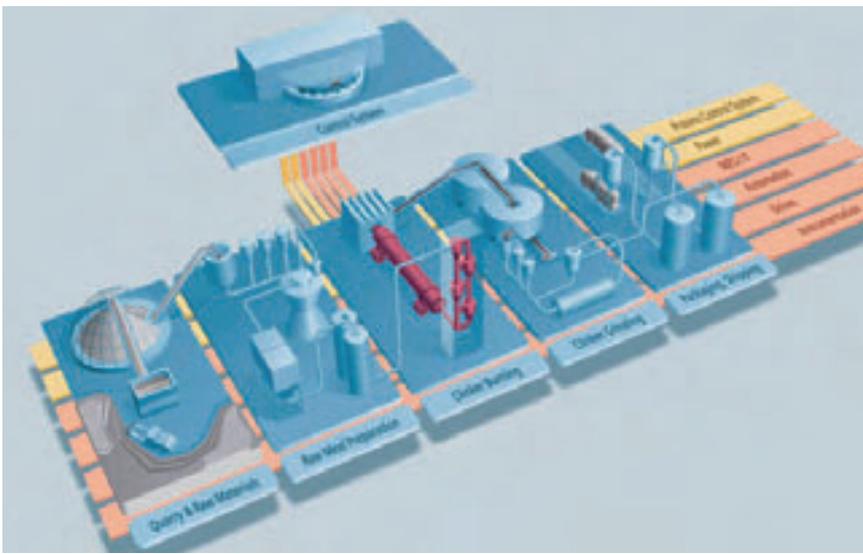
What creates permanent value in times of fast-paced change?

SICEMENT^{CIS} – a comprehensive portfolio of industry-specific solutions

Completely integrated solutions offer you long-term reliability and security of investment

Cement plants consist of multilayered subsystems and complex processes. But what ultimately counts is the efficiency of the overall concept. That is why you need a partner who combines technical expertise with a focus on business. One with a solid handle on your entire project, including the planning phase, startup and service. So you can completely focus on what matters most – your business.

Technological plant concepts with IT applications and services for the operation phase were concerted and joined to a package in our product family SICEMENT^{CIS}. The combining of selected and proven standards to an integrated plant solution offers our customers investment and operation security with 'plug & produce'. Our product family SICEMENT^{CIS} comprises a portfolio of industry-specific solutions and products that can be brought to the market over and over again, as well as respective interfaces that are perfectly coordinated. For highest functionality and productivity in your plant.



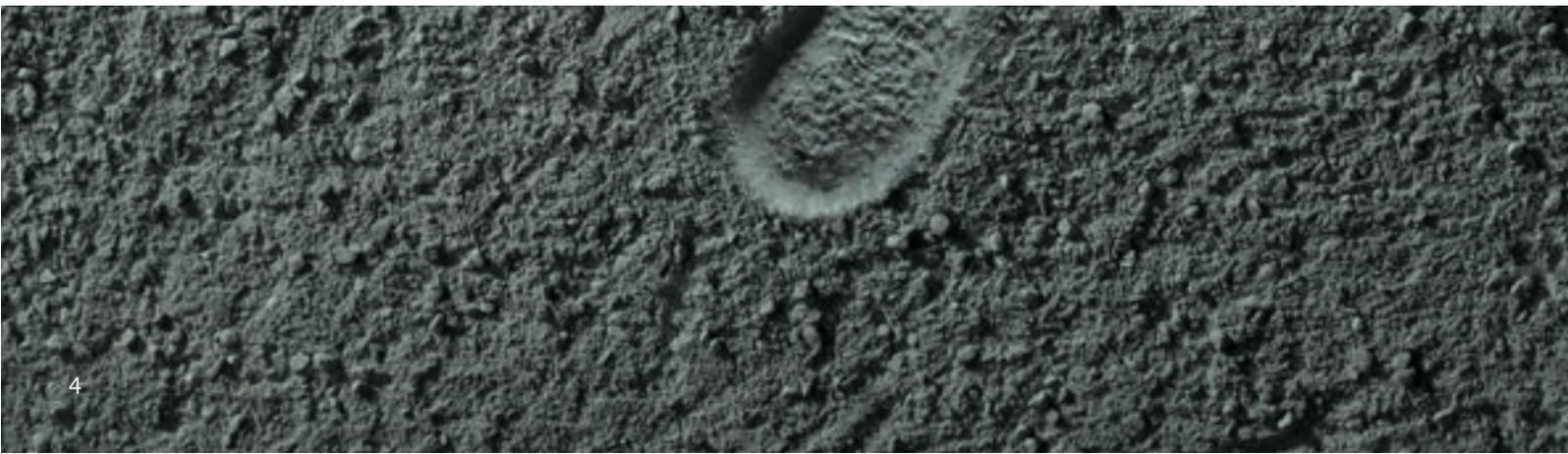
Welcome to the Integrated Solution House for Industry

Global developments demand that you invest efficiently and optimize production costs – throughout your plant's entire life cycle. As an Integrated Solution House for Industry, Siemens Industry Solutions is ideally positioned to fully support cement and lime plant operators, providing complete plant solutions as well as service and modernization offerings to maintain and improve your plant's performance. In addition, our leading environmental solutions – the Green Solutions for Industry – are aimed at optimizing energy efficiency and emissions control.

As a global partner and electrical contractor with comprehensive industry expertise, we help you:

- maximize your ROI
- extend your plant's service life
- improve its competitiveness

The Integrated Solution House for Industry: built for greater efficiency.



The house's central building block: Completely Integrated Solutions

The portfolio offered by the Integrated Solution House for Industry is bundled in our Completely Integrated Solutions. These solutions are based on tested standards that we "adapt" to meet our customers' specific requirements. They combine best-in-class products, systems and services in a smart overall solution for cement plants – resulting in highly competitive greenfield plants as well as expanded and modernized plants.

In particular, Completely Integrated Solutions help you by:

Optimizing the entire process chain –

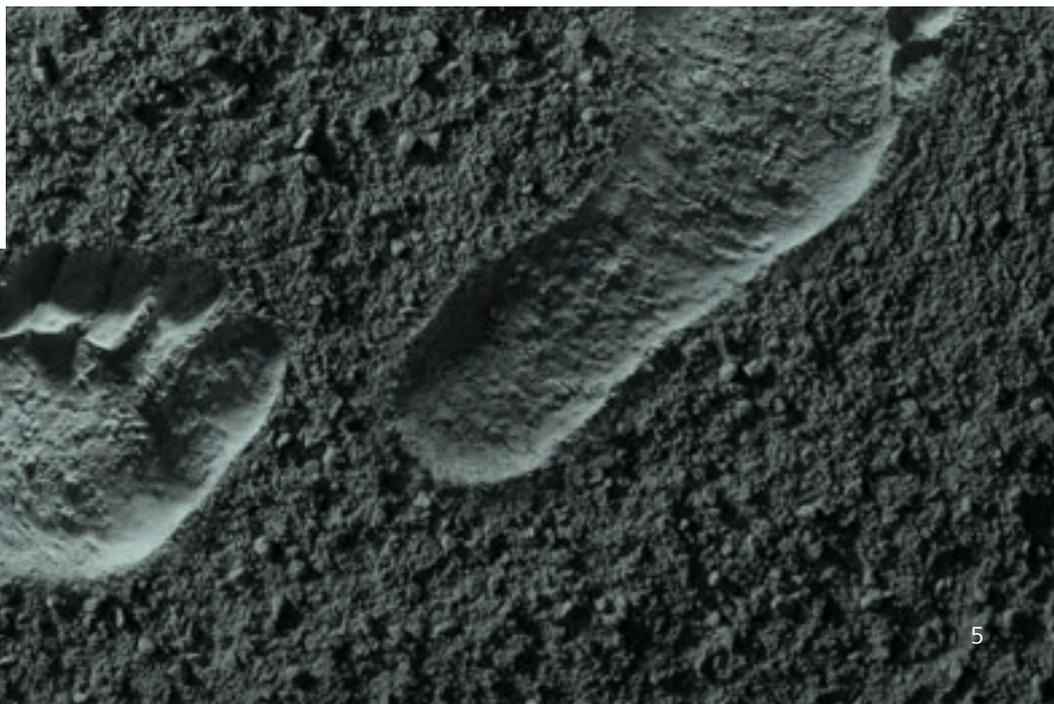
from drives, controls and a complete range of instrumentation devices to balance-of-plant solutions. Our comprehensive SICEMENT^{CS} approach ensures high quality and productivity, optimized total system expenses and high energy efficiency.

Connecting all IT and automation levels within your company –

with industry-specific IT and MES solutions for the cement industry. From energy management to product quality to monthly balance sheets, our solutions create real-time transparency, help save energy and are the basis for further cost reduction.

Supporting you throughout the life cycle –

from consulting to commissioning, training and spare-parts procurement, as well as maintenance and modernization with SICEMENT^{CS} Services. Your benefits: high productivity and ensured future viability throughout the entire plant life cycle.





SICEMENT^{CIS} Power – electric power systems to rely on

Covering the wide range of power requirements

Electric power generating and distribution systems in a cement plant are subject to harsh conditions. At the same time, energy consumption is continually on the rise. To make sure that the required power will always be there when you need it, and to prevent costly shutdowns, we help you address electric power needs proactively.

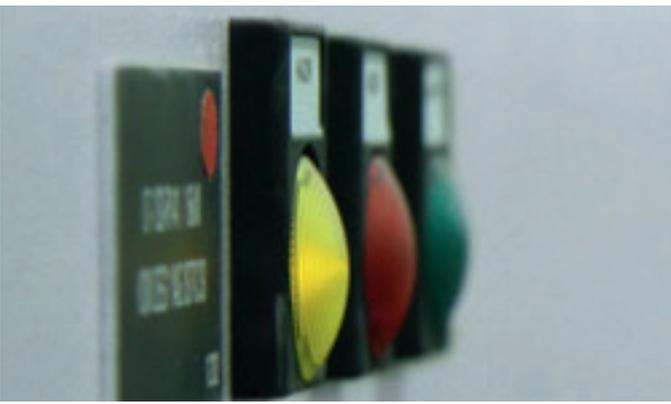
The wide range of power requirement in a cement plant for all individual consumers from a few kW to some MW together with the high number of similar network elements are the main characteristics of the distribution system and the reason for the comparatively high specific costs. Therefore utmost standardization of equipment and use of maintenance-free components are of decisive importance for an economical system layout.

Power distribution systems of industrial cement plants are tailored exclusively to the needs of users with a large number of applications, with various motors and consumers and with very costly supply interruptions.

Decentralized load and motor control centers for economical operation

In order to avoid uneconomical high losses it is mandatory to install electrical substations with the MV switch gears, MV/LV transformers as well as LV main distribution and motor control centers as close as possible to the different plant areas. LV load centers and motor control centers should therefore be of compact and decentralized design.

Whether you are expanding or modernizing, we provide support for electric power supply and distribution consistently based on industry-proven solutions.



SICEMENT^{CIS} Power

- Worldwide leading high-, medium- and low-voltage switchgear, MCCs, transformers, and circuit breakers
- Consistent power optimization and management concepts
- Energy optimization

Worldwide experience for customized solutions

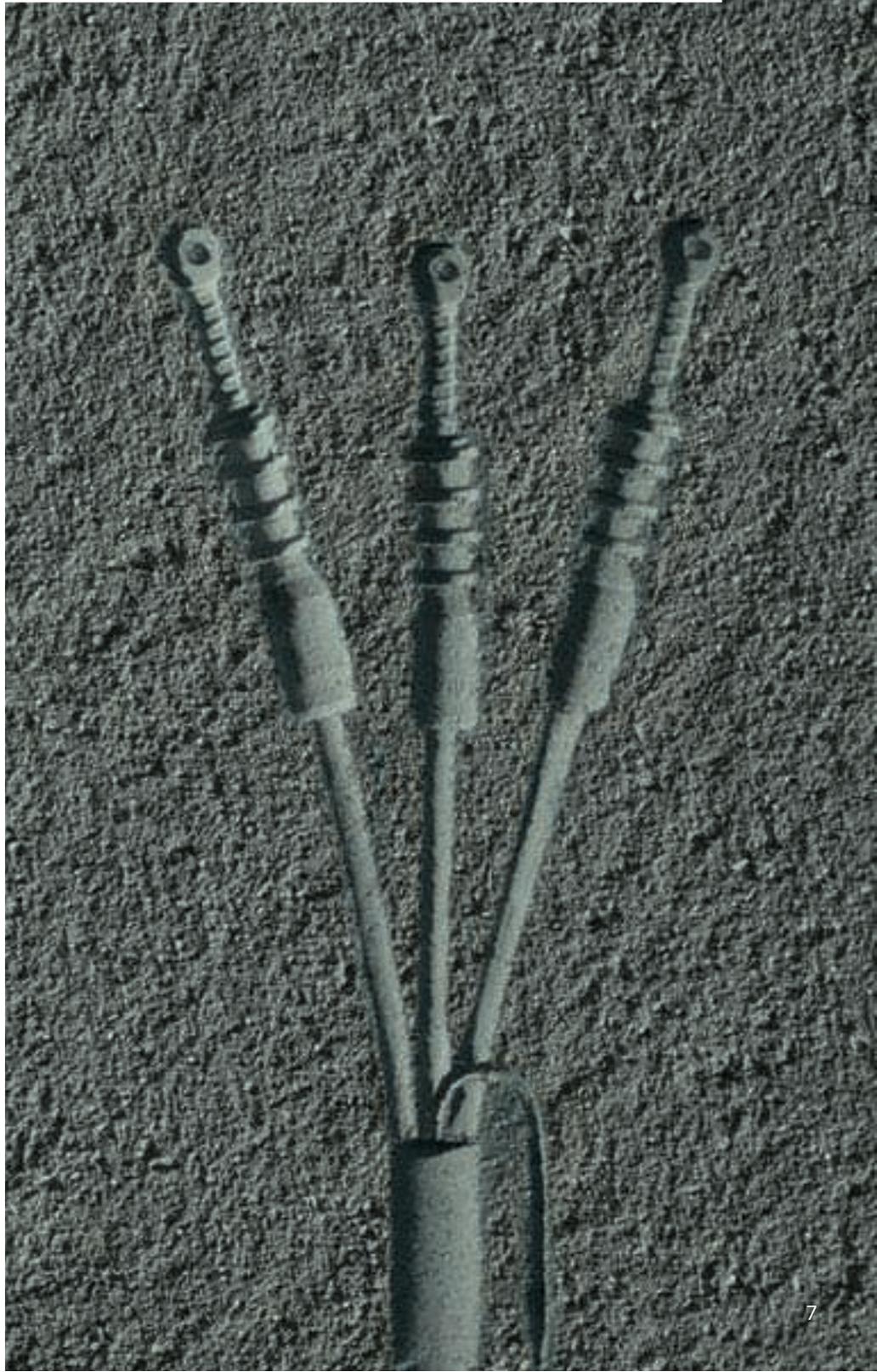
SICEMENT^{CIS} Power components and systems cater to these requirements based on worldwide experience in transmission and distribution networks. We conduct large-scale upgrades of entire electric power systems, for example, including the removal of obsolete equipment, remarketing, or disposal, as needed.

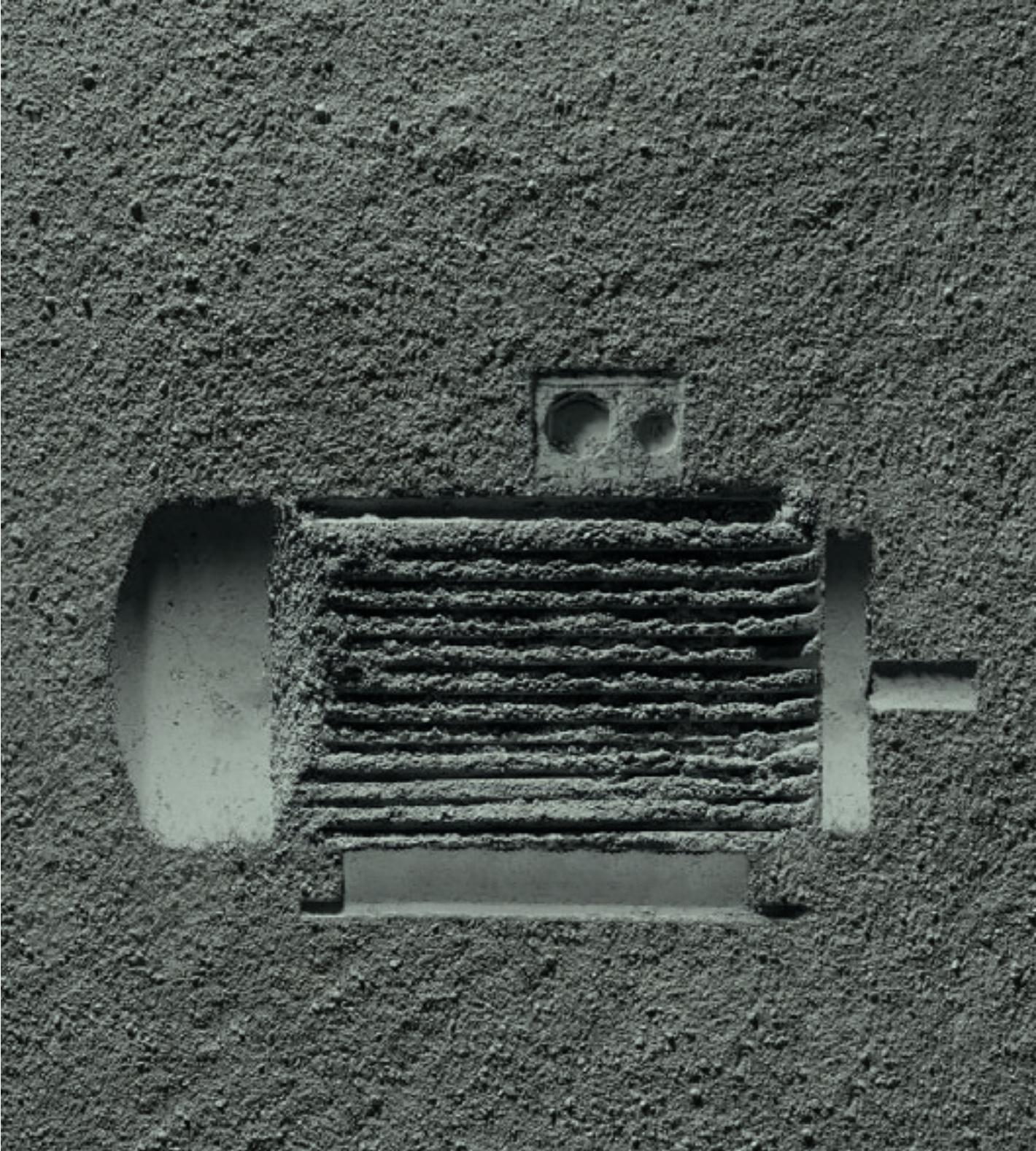
Your strategic and budgetary requirements define the scope of the solution. With Siemens, you benefit from plant engineering customized to your needs and from a partner you can rely on for advice and consulting, all the way to the recommissioning of your electric supply system.

Our solution packages maximize:

- Operational reliability and personal safety
- Flexible system operation
- Clear protection coordination
- Short fault clearing time and efficient system automation

These are the basic conditions for integration and operation of SICEMENT^{CIS} Power components and systems.





SICEMENT^{CIS} Drives – boosting performance to a higher level

Efficient and reliable operation

A cement plant's drives represent the link between electrical and mechanical equipment. As these components usually come from different suppliers, they have different technical requirements and specifications. Thus, tailor-made drives are often necessary to achieve best drive efficiency and optimum plant performance. Our solution: SICEMENT^{CIS} Drives for kiln drives, but also mill, crusher, cooler and exhaustor fan drives.

We not only offer but also design constant and variable-speed drives as well as twin drives for various applications. To assure a reliable operation over many years, auxiliary items such as spare parts are also integrated within our offer. Yet not only the right kind of drive, but also the correct size of the drives is important for consistent operation.

The Siemens Cement Department offers, supplies, and commissions every kind of drive needed in the cement industry. And revamping of existing drives is yet another field in which we offer our services.

Modernization

High efficiency and reliability for all drives is essential to run your entire plant economically. A total replacement

of drive systems, however, is usually not necessary. Even older drive systems can make a comeback as genuine top performers with the help of customized modernization solutions. The key is across-the-board conversion to state-of-the-art variable speed control systems. Overall productivity will increase by installing accurately controlled drives. By thoroughly analyzing and assessing needs and requirements in your plants, we generate a specific solution concept that will serve as a solid basis for your future investment decisions. We also consider all aspects of the implementation phase, from detailed planning and documentation to delivering and installing the entire electrical drive system, commissioning and trial run.

Reduced cost and increased availability

Optional services can contain, for instance, integration with higher-level control systems, including third-party systems. Our solutions help you reduce maintenance costs and increase system availability so your drives stay fit for the future.

After the successful installation of new and improved drive systems, we can offer an after-sales service contract, so you can completely rely on safe operation throughout the life cycle of your equipment.



SICEMENT^{CIS} Drives

- Durable and energy-efficient drive solutions for all production processes, e.g., crushers, kilns, fans and mills
- Variable-speed and fixed-speed drives
- MV and LV drives

SICEMENT^{CIS} CEMAT – when seamless control of all processes turns into added value

Absolute transparency is essential to achieve a significant increase in productivity in today's industrial cement plants. That goes for every aspect of the business, from energy management and product quality to monthly balance sheets. Installing an integrated process control system that connects all levels and process phases is key to success. Automation, information, and integration are what drive future potential.

SIMATIC PCS7: cutting-edge customized process control

You will want the latest technology – tested and proven. This is why we provide high level reliability with standard hardware and software based on the process control system SIMATIC PCS7 – yet perfectly matched to the needs of the cement industry.

CEMAT®: optimized processes in cement plants at a glance

CEMAT – the ultimate control system for the cement industry – was specifically designed for cement plants in cooperation with cement companies, and has been well proven in this harsh environment over many years of service. The system is well accepted in the cement industry, and the number of CEMAT users is growing continuously.

The CEMAT process control system provides you with new opportunities for making the most of the value chain on all levels of your enterprise, from resource management and productivity control to cost reduction, and from the arrival of raw materials to the finished product. You can access all relevant data, almost in real time, with just a few clicks. Hence, CEMAT makes it easy to optimize your plant's production capabilities. Offering excellent usability, it detects faults before they turn into problems and provides

solutions to minimize potential shutdown times.

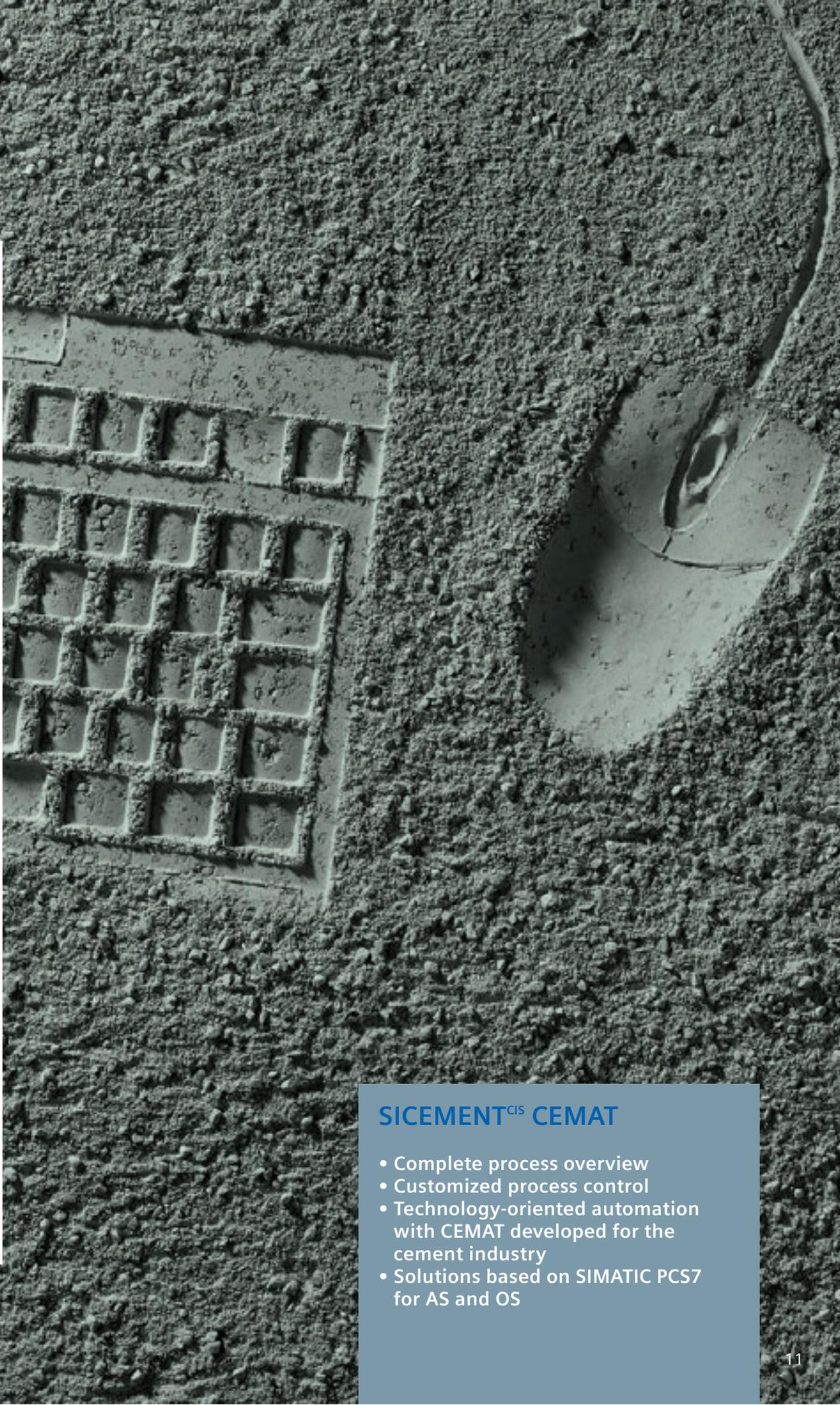
To help you improve performance, CEMAT also makes recommendations for plant modifications and modernizations. The system quickly identifies and eliminates weak spots and thus serves as another powerful tool for moving your company successfully into the future.

Modernizing Automation and Process Control Systems

Within the realm of automation technologies, new developments constantly require up-to-date solutions. Modernizing, expanding or updating automation and production control systems eventually becomes necessary in every plant. CEMAT was designed in close cooperation with many cement manufacturers in the world and is based on international standards and regulations. Our goal is to make the system upstream compatible with the result that even former versions can either be upgraded to the latest version available or run as a fully integrated system in a new configuration. Thus your installed CEMAT system will always be 'a new system' and you can be confident that a CEMAT installation is always open for any later innovation and extension.

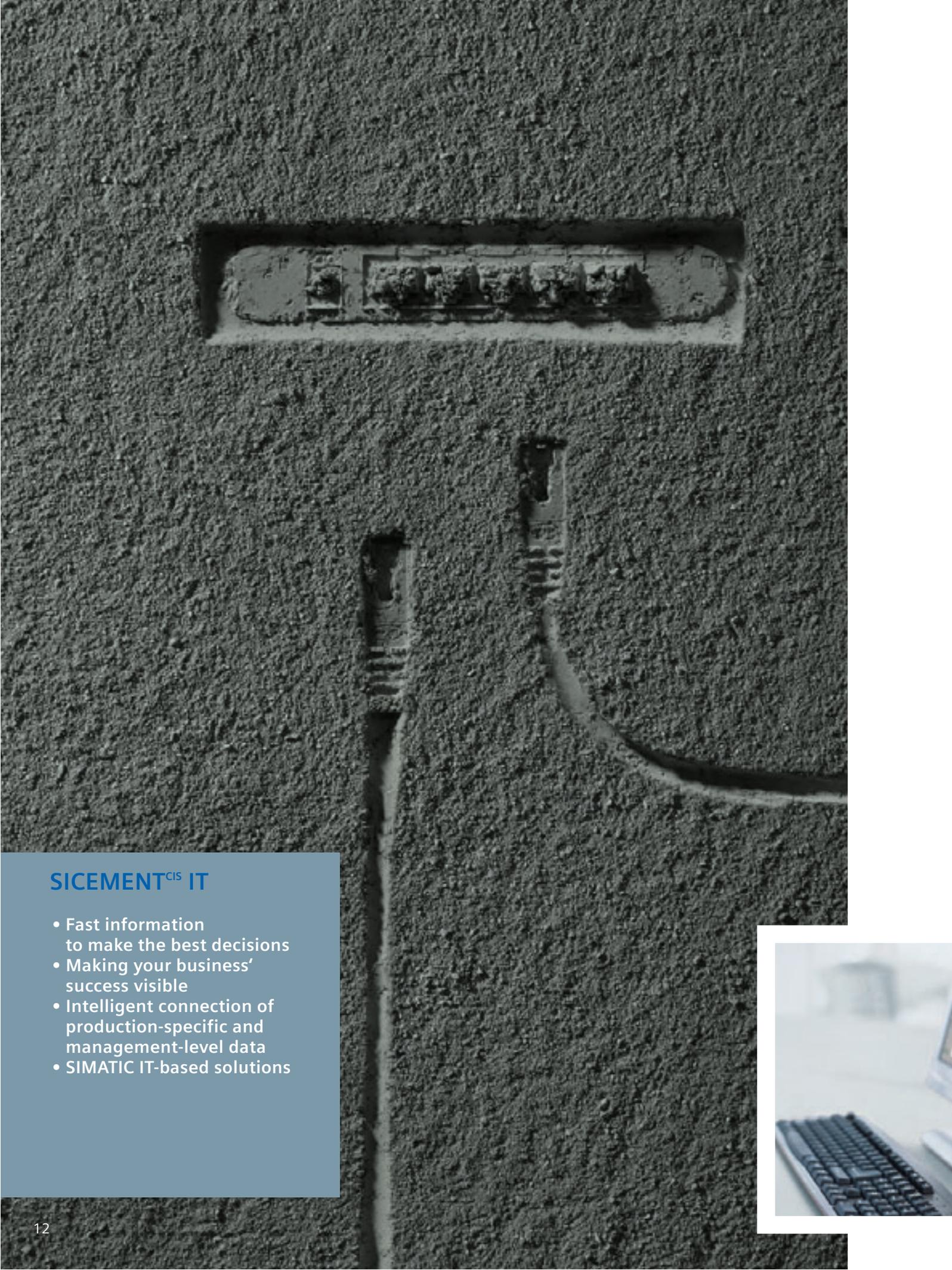
Our support in modernization processes encompasses thorough analyses of your specific plant configuration, implementation of hardware and software engineering, and delivery and installation of the required components. High performance during a modernization or upgrade process is ensured right from the start through testing and commissioning by experienced specialists, documentation, and training of your operating personnel. As a result, your investment in modernization can soon be amortized.





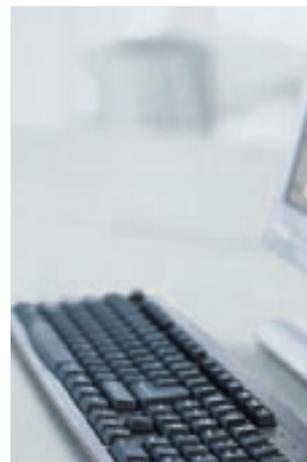
SICEMENT^{CIS} CEMAT

- Complete process overview
- Customized process control
- Technology-oriented automation with CEMAT developed for the cement industry
- Solutions based on SIMATIC PCS7 for AS and OS



SICEMENT^{CIS} IT

- Fast information to make the best decisions
- Making your business' success visible
- Intelligent connection of production-specific and management-level data
- SIMATIC IT-based solutions



SICEMENT^{CIS} IT – consistent data management for seamless control of all production and business processes

The transparent underpinnings

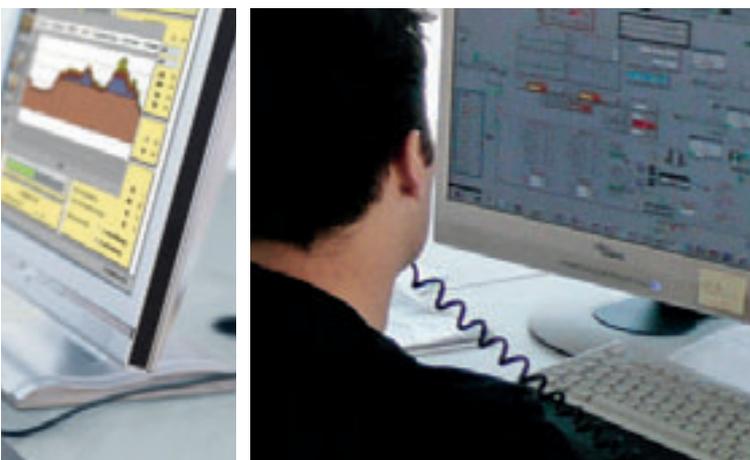
Uninterrupted access to all relevant process information is critical in today's cement industry. We supply you with management information systems that ensure complete transparency throughout your operation, from energy management and product quality assurance to business processes. You can access all information you need with just a few mouse clicks.

Real-time information increases transparency for high-quality decision-making. Our state-of-the-art technologies seamlessly integrate information across all production levels. You will benefit from a complete and current overview of all processes in your plant, from production to management level, and from arrival of materials to finished goods. Such improved access to information helps you make better decisions and use resources more efficiently. Ultimately this means you can deliver your products faster and respond to market requirements with higher speed and greater flexibility. In addition, product quality is improved and acquisition costs are lowered.

Our standardized management information systems consolidate all important information, both at production and management levels. Whether you want to build a new plant or optimize processes, our solution provides you with what you need. Our solution packages match your requirements at a reasonable price, and have been designed to accommodate the most diverse needs throughout the cement industry.

An eye on your success

Our IT systems enable you to intelligently link production-specific data to various management levels. These systems generate indicators that support continuous improvement of the entire plant's performance. This is made possible through reliable real-time information on product and process quality, effective linking of all interacting components and processes, and management of downtimes based on long-term analyses. These capabilities allow you to immediately locate deviations, respond promptly to changing conditions, make sound decisions, and achieve your business objectives.



SICEMENT^{CIS} Instrumentation – suitable, accurate and reliable instrumentation

Process instrumentation for the cement industry

An advanced process automation system can save costs, but only when it is combined with suitable, accurate and reliable instrumentation. From the quarry to the kiln, from the cooler to packing, precise monitoring of production rates, accurate dosing and pinpoint measurement are all vital for maximum productivity in a cement plant.

Many types of instrumentation which are suitable for an ordinary process plant, however, may not fulfill the harsh environmental conditions of a cement plant. Effective and reliable level measurement in silos, for example, is sometimes difficult due to the need for long-range sensing in the presence of extreme dust and high temperature. Likewise, a precise and reliable analysis of both gas and exhaust emissions from the kiln matters, as far as extremely difficult environmental conditions in the rotary kiln are concerned.

SICEMENT^{CIS} Instrumentation

Siemens offers a comprehensive range of field devices for the cement industry – process analytics and special instrumentation systems are an integral part of the SICEMENT^{CIS} concept:

- Pressure, temperature, flow and level transmitters
- Pneumatic valve positioners
- Process controllers, process recorders and process protection devices
- Sensors for a complete portfolio of proven and innovative products and systems: from proximity switches, vision sensors and fail-safe sensors to RF identification systems and code-reading systems
- Extractive or in situ continuous process gas analytics
- A complete range of weighing and batching systems
- High temperature and plant surveillance CCTV systems
- Kiln shell scanner systems

Supplying data reliably and fast

SICEMENT^{CIS} Instrumentation, with state-of-the-art fieldbus communication protocols, guarantees a homogeneous solution, not only among different devices but also regarding different control systems. The SIMATIC NET industrial communication networks, designed specifically for harsh industrial environments, supply data from the production plant, the manufacturing process or company headquarters fast and reliably, locally and on a global scale.

Benefiting from vast experience and successful projects

All services from basic engineering up to installation and commissioning are provided by utilizing our vast experience from projects implemented successfully in cooperation with cement customers worldwide. A cement plant using SICEMENT^{CIS} instrumentation can benefit from outstanding earnings:

- More stable kiln operation
- Increase in production capacity
- Energy savings
- Optimization of free-lime content with more efficient burning process
- Better product quality
- Decrease in air polluting and dangerous exhaust gases
- Increased return on investment





SICEMENT^{CIS} Instrumentation

- Sensors and transmitters
- Full integration in Totally Integrated Automation
- Technology-oriented process instrumentation
- Advanced gas sampling and analysis system for rotary cement kilns





SICEMENT^{CIS} BoP – coordinated solutions for plant infrastructure

Coordinated communication solutions

Telecontrol and data transmission includes analog/digital transmission links as well as all applications of wireless communication forms to all related monitoring areas such as central and decentral operator rooms, automation technology, as well as the electrical e-rooms of all decentralized areas.

SICEMENT^{CIS} BoP offers a variety of modules for a complete range of communication and observation tasks such as:

- Telephone and paging systems
- Clock systems
- Camera systems for plant observing
- Access control, public address and parking control systems
- Fire detection systems

Thanks to the unlimited equipping options all system variants necessary for communication tasks can be implemented on a customer-specific basis.

High-quality installation materials

Cables and cable systems intended for the transmission and distribution of electrical energy in a cement plant are subject to harsh conditions. Dust, humidity, the influence of the sun, high temperatures and physical stress present demanding challenges on the different design values of cables and cabling systems used in the specific area of an industrial cement plant. These cables and cabling systems, especially isolation and cable-carrying systems, must be reliable and have a long service life.

SICEMENT^{CIS} BoP perfectly fulfills these requirements for cables and cable constructions as materials and manufacturing processes are permanently improved and further developed. The tough requirements for cables and cabling are determined by different applications and functions of energized equipment and their specific areas of installation.



Energy-efficient high-performance lighting solutions

Since the dramatic increase of energy costs, turning off the lights has become a symbol of energy savings.

SICEMENT^{CIS} BoP can support you with our technical know-how to provide adequate but economic lighting, especially in cement plants where lighting is directly related to safe operation and the quality of operation. Highly efficient light sources provide an excellent opportunity for energy efficiency in cement plants. Many shortcomings of light sources in the past have been either overcome or improved to such a point that their installation poses no major problems today.

SICEMENT^{CIS} BoP covers the tasks of:

- Indoor lighting
- Outdoor lighting
- Emergency lighting
- Safety lighting

Earthing and lightning protection

The main purpose of earthing and lightning protection systems in cement plants is the protection of personnel and property, as well as protection against transmitting excess voltage, static discharges, effects of lightning strikes, or stray currents as well as to create a defined network condition for protection and metering purposes.

SICEMENT^{CIS} BoP covers the tasks of:

- Internal/external earthing and lightning system design for all process buildings and electrical rooms
- Definition of meshed earthing networks covering all plant areas
- Integration of new plant parts into an existing earthing grid
- Supply, installation, integration, measuring and commissioning of earthing and lightning equipment according to local requirements and preconditions

SICEMENT^{CIS} Balance of Plant (BoP)

- Coordinated communication solutions for phone and paging
- Energy-efficient high-performance lighting solutions
- High-quality installation materials, e.g., cables and cable trays
- Earthing and lightning protection

SICEMENT^{CIS} Services – proactive, economical maintenance

SIMAIN – maintenance made to measure for SICEMENT^{CIS} Services

With our many years of service and maintenance experience around the globe, we understand the requirements of the cement industry. We have put this experience to use in designing SIMAIN®, our modular, manufacturer-independent array of maintenance services that is entirely focused on our customers' individual requirements and their business. SIMAIN services, classified as Asset Performance Management or as Field and OnCall Services, support maintenance needs related to both organizational and process issues as well as engineering tasks and problems.

SIMAIN – Asset Performance Management for SICEMENT^{CIS} Services

Asset Performance Management offers a range of services designed to improve energy efficiency and to optimize maintenance processes, both in a performance-based way. "Energy Optimization" is the service package devoted exclusively to identify and analyze savings potential and to increase the energy efficiency of your production facility for a sustainable cost reduction.

Ranging from analysis to implementation of identified measures – we are your reliable solution partner.

We will get you on track with expert "Maintenance Improvement" support. This helps you identify ways to increase process transparency and spot opportunities for improvement. Unlike conventional consulting firms, we will work with you as a team to help you implement inevitable changes, usually with specific Maintenance Improvement tailored to your needs. If third-party maintenance works for your business strategy, we can also provide ongoing 'Integral Plant Maintenance.'

SIMAIN – Field and OnCall Services for SICEMENT^{CIS} Services

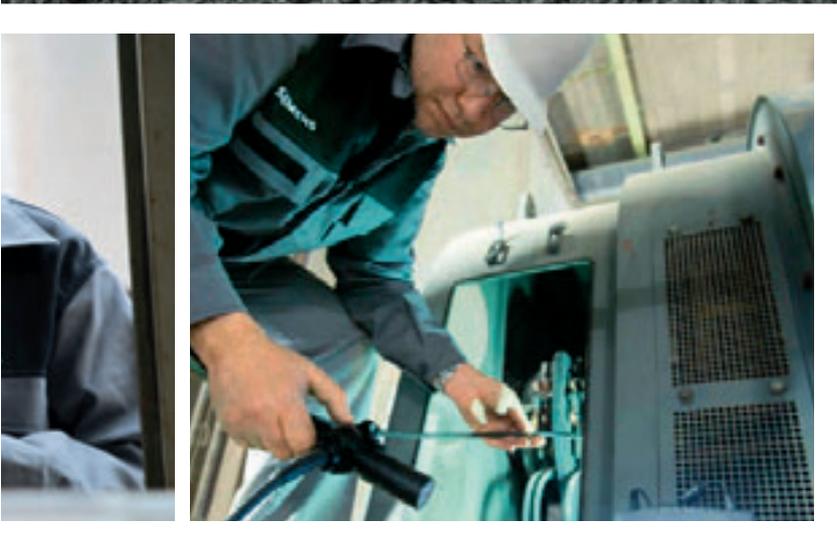
Unlike Asset Performance Management, which is process-focused, SIMAIN – Field and OnCall Services provides your maintenance team with technical support when and where you need it. It preserves and restores the functionality of your systems and plants with specialized selective support and the supply of spare parts.

SIMAIN – Field and OnCall Services has a modular design. Modules can be individually combined into special service packages to suit your needs. Efficient and comprehensive modules include on-site fault elimination, reliability improvement, and remote monitoring. Service response times are defined by comprehensive service agreements. In the event of an equipment failure, you are ensured access to our specialized expertise regionally as well as globally, and in the most cost-effective way.

SICEMENT^{CIS} Services

- Modernization Solutions
- Maintenance Improvement
- Integral Plant Maintenance
- Field and OnCall Services
- Logistics Services
- Repair Services





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Order No.: E10001-T480-A77-V2 -7600
Printed in Germany
Dispo No.: 21646 No.: 37500
FB 1305 WS 07091.5
Subject to change without prior notice

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www.siemens.com/cement