

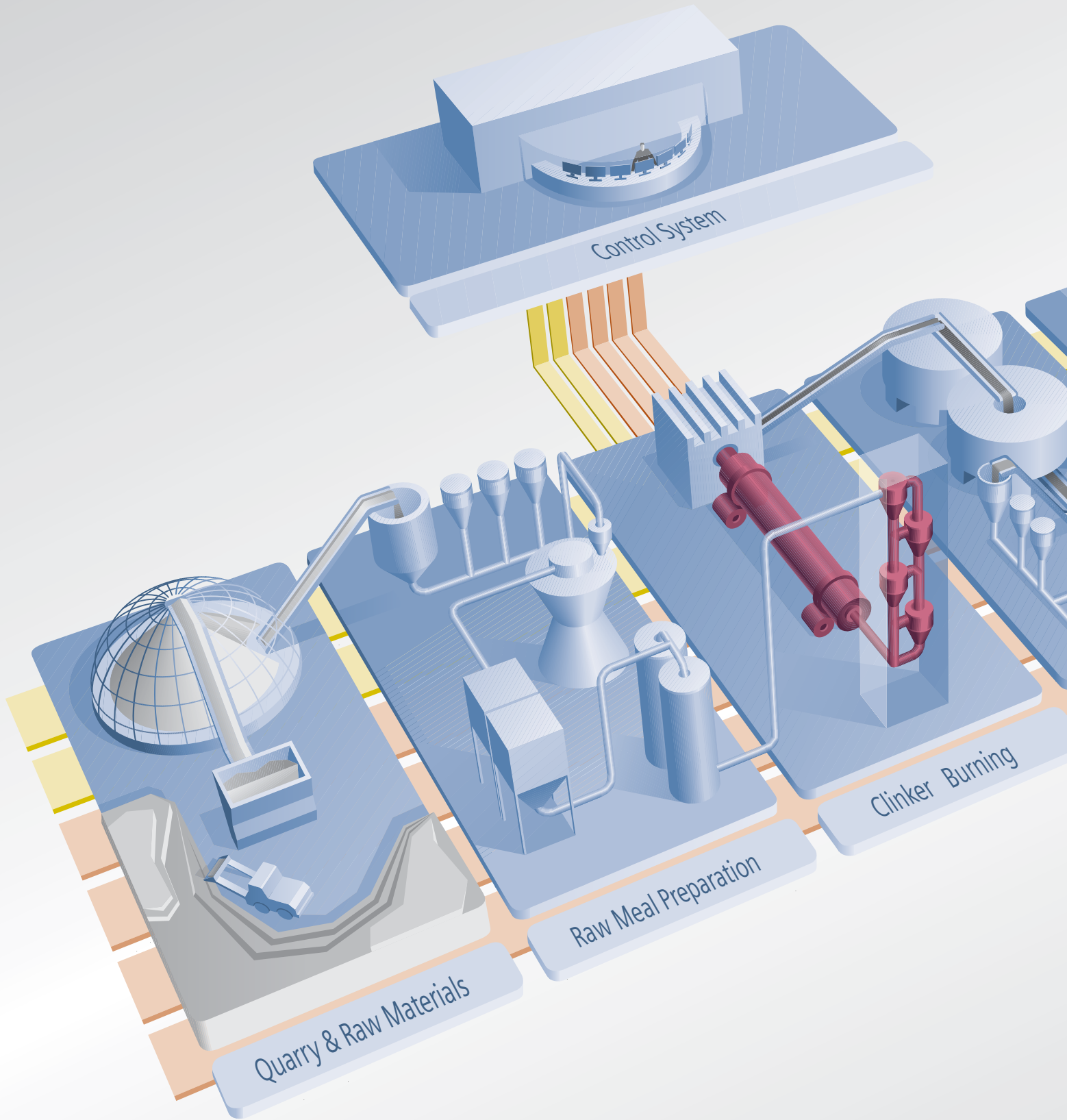
SIEMENS

Industrial Solutions and Services

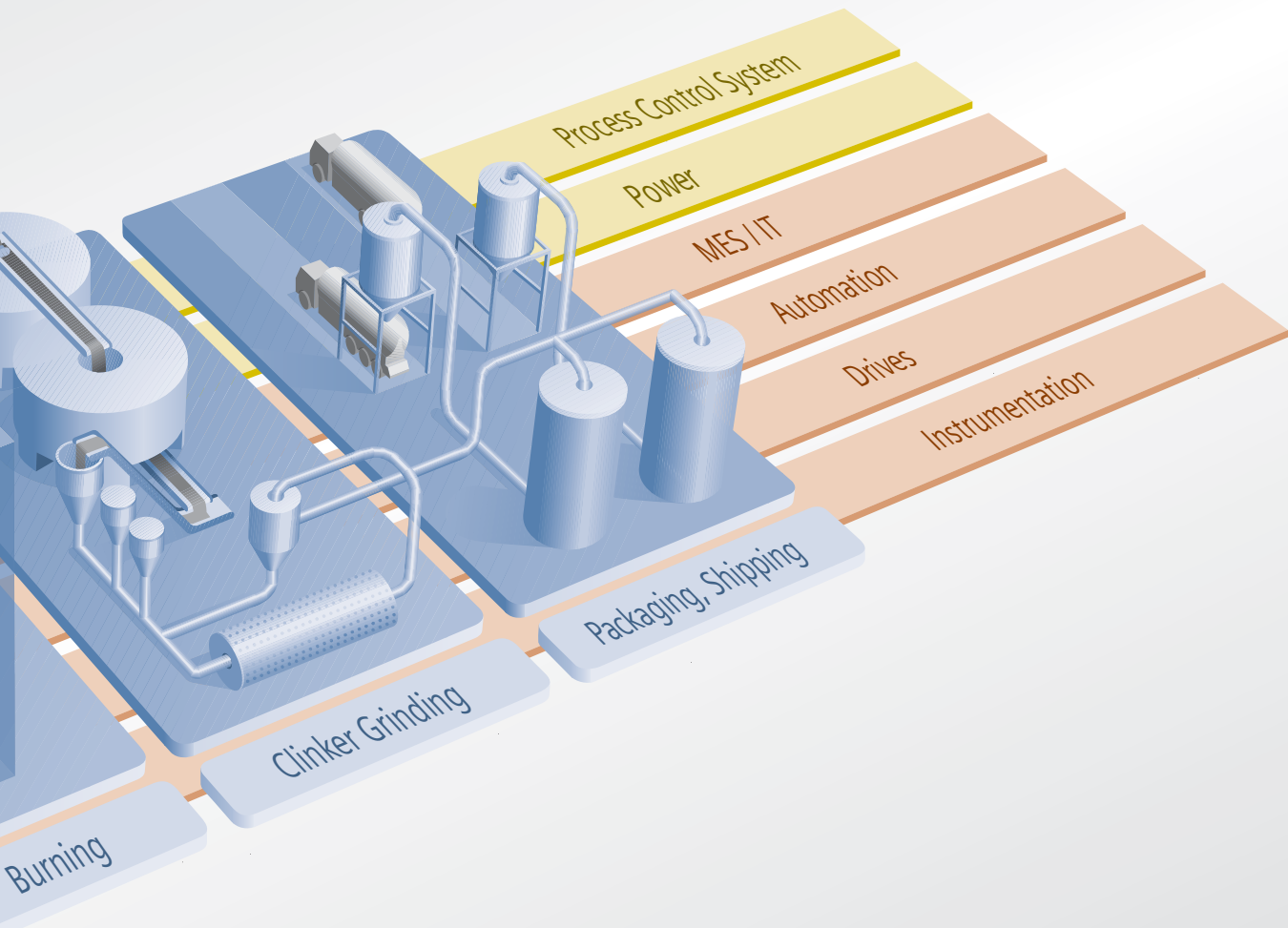
Creating end-to-end
efficiency – solutions
for the cement industry

SiemensIndustrial Services

Your Success is Our Goal



Integrated solutions for the cement industry



How you benefit from our integrated solutions

Our perfectly systems-engineered components provide a consistent basis for planning and implementation of your plant. We use customized engineering services to integrate these modules into a smoothly functioning whole, thereby eliminating interface problems right from the start.

How our experience adds value for you

What specific criteria determine your choice of system components? What's the best way to exploit opportunities? In our many years of experience as partners of the cement industry, we've accumulated a wealth of technological expertise that lets us meet even the most complex specifications to your complete satisfaction.



In building a new plant, you can't just consider the initial investment. In many cases, the true value of such an acquisition only materializes 20 or 30 years down the road. Long-term, goal-oriented planning – perhaps even with higher investment costs – can therefore result in substantial savings. Trouble-free operation and maximized plant availability are crucial for success. The same is true in modernization projects: customized solutions can result in enormous improvements, even in the short term.

And there are always opportunities for improvements in areas such as energy consumption, which can account for as much as 40% of the total production costs. Environmental aspects also pose difficult challenges for the cement industry. Worldwide conventions are calling for a drastic reduction in the specific demand for energy from combustibles.

That's why companies in the cement industry need a partner with integrated solutions that address the entire problem. A reliable systems supplier with a sharp focus on operational efficiency throughout the entire life cycle.

A partner who can provide the services required to ensure that efficiency. So you can focus on your core business, instead of concerning yourself with data flow optimization or fault management.



Innovators at work – Siemens for cement

No matter how difficult and contradictory your requirements, Siemens Industrial Services is a strong partner you can always rely on. Backed by many years of experience, we understand what really counts in your industry in terms of both technology and business requirements. In every case, we draw both on the skills of a global player in the industrial service sector and on the engineering expertise of a leading manufacturer of electrical and electronics systems.


And our industrial IT solutions give you greater understanding of your process. That's a sound basis for making smart business decisions. Around the world. Both today and in the future.



Cement plants consist of multilayered subsystems and complex processes. But what ultimately counts is the efficiency of the overall concept. That's 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.



Comprehensive solutions for greater efficiency system-wide



Perfect timing

We work closely with your technicians and the mechanical engineering firms involved in your projects to optimize the time it takes for implementation. We're at home in multivendor environments, and we're a partner everyone likes to work with. Mutual cooperation among the most diverse companies is a basic requirement and the cornerstone of a successful track record. We integrate existing plant sections to combine efficiency with progress. And in doing so, we ensure the continuity of your system structure.

Made-to-measure innovation

We join together with our customers to develop enduring, innovative solutions that help make plants more efficient – naturally, always using the highest technical standards. After all, there will always be new conventions, regulations and market requirements to meet. Throughout the process, we focus on adding value, for example by analyzing your electric power network and demonstrating effective new ways to reduce costs and energy consumption. And of course we can support you in all aspects of financing as well.

The latest technology

There's no question that our solutions stand the test of time. This is because we continue to develop our products and systems to higher levels that are always at the leading edge of technology. It makes sense – and adds value. Of course, continuity is also part of our success. The best evidence of this is our CEMAT control system. Ever since 1976, it's been setting standards in the cement industry – and it will continue to do so.

Integrated project management

The success of a project depends in large part on the people who make it happen, and on the management tool they're using. So effective project management plays a crucial role in what we do. We employ experienced and committed people as well as practically proven management methods to ensure exact compliance with the specified cost levels and schedule. A continuous information exchange with all project participants in every phase of planning and implementation assures complete transparency throughout the entire project.



Integrating processes – optimizing energy efficiency

What counts in the cement industry? Boosting productivity, increasing systems availability, reducing standstill times and lowering operating costs. We supply a wide range of solutions you can use to make each step in the process more efficient.

Higher efficiency, lower cost in grinding

Grinding the raw material with both horizontal and vertical mills requires vast amounts of energy. As a result, the main challenge in the grinding process is to minimize energy consumption across the board.

Our speed-regulated mill blowers substantially reduce energy consumption. And we use our MCS mill optimization system to further improve the operating point and efficiency.



Clinker production: constant quality, individual solutions

During clinker production in the rotary kiln, temperatures soar to 1,400 degrees Celsius. That's why continuous and consistent operation of the kiln system is as important as a reliable energy supply. The goal, after all, is to produce clinker that's consistent in quality. With CEMAT, our process control system for the cement industry, you can operate and monitor your plant under optimized conditions with no interruptions or variances.

Our FLK gas sampling system – which has extremely low maintenance requirements – is one of a number of solutions we supply to let you continuously monitor the clinker process. It's designed specifically for the critically important measuring point at the kiln's infeed. As a result, you've always got complete control over both clinker quality and emission levels.

Milling the clinker: reliable standards, innovative features

After the addition of gypsum and additives, the final milling occurs in the cement mill. The end product is cement. Our control system provides all you need for transparent storage and milling of the clinker.

The use of speed-controlled mill blowers substantially reduces energy consumption. Just as in the grinding of the raw material, our MCS mill control system plays a key role in optimizing the operating point and improving efficiency.

The auxiliary processes: minimal complexity, maximum performance

Auxiliary processes have long ceased to be minor matters. Consequently, all subsystems, such as electrostatic precipitators, must be maximized in performance. However, upgrading mechanical filters and especially converting to woven-fabric filters is very cost-intensive.

That's why we've developed an economical alternative for you. It's quite simple: Instead of replacing the entire system, we merely replace components in the power supply and filter controls. Our solution uses the latest frequency converter technology with innovative and freely combinable thyristor controls. That's how we achieve consistently economical energy management to optimize this process.

Electric power from waste heat: economically sound, ecologically valuable

The large amounts of energy required for all the process phases in a cement plant are usually vented into the atmosphere as waste heat. This potential wellspring of energy can be used to generate electric power.

We've developed the right solutions to make this possible and implemented them in compact systems that work reliably even in the harshest industrial environments. By using components already proven thousands of times in practice, we ensure consistently high availability. No additional personnel are needed.

Networking knowledge, adding value



To achieve significant productivity increases in today's cement industry plants, absolute transparency is essential. That goes for every aspect of the business, from energy management to product quality to monthly balance sheets. Having integrated systems that connect all levels and process phases is key to success. Automation, information, and integration are what drive future opportunities.

IT and MES: the transparent underpinnings

Interconnect your production-specific and management-level data intelligently, and gain advantages from a customized process control system. We provide you with all the tools you need to optimize your operational processes. Right from the start, our standardized MES and IT solutions highlight key information to help you establish new dimensions of transparency and give you seamless control of all production and business processes.

CEMAT: the process control system for the cement industry

Because our solutions have been developed in cooperation with cement companies, our CEMAT® process control system is perfectly matched to the special requirements of the industry. It provides you with new opportunities for making the most of the value chain on all levels, from resource management to productivity control to cost reduction, and from the arrival of raw materials to the finished product. You can access all your data, almost in real time, with just a few mouse clicks. CEMAT gives you the transparency you need.

CEMAT: improving your plant's reliability

You'll want the latest technology – technology that's been tested and proven. We can supply you with exactly that level of reliability, on everything from high-voltage switchgear to individual thermoelements, from process control to management information system. We offer the entire spectrum of electrical/electronics engineering and information technology that meets all requirements. And we supply standard hardware and software that's perfectly matched to the needs of the cement industry. Because CEMAT connects your pro-

duction process control system with completely transparent business processes, you get a much clearer overview of what's happening.

More control over performance

CEMAT makes it easy to optimize your plant's production capabilities. Simple and convenient to use, it detects faults before they become problems and provides solutions to minimize potential shutdown times. With the aim of helping you improve performance, CEMAT also makes recommendations for plant modifications and modernizations. The system swiftly identifies and eliminates weak spots. It serves as another powerful tool for moving your company successfully into the future.

CEMAT is a modular system

Users can expand and change the configuration of the modularly designed CEMAT system. CEMAT is based entirely on standard hardware used worldwide. Thanks to the close work we've done with our customers to develop and standardize software packages for the whole range of tasks in a cement plant, including automation, information, and integration, all our parts work together seamlessly.





Tangible benefits from end-to-end IT integration

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

Real-time information increases transparency to support decision-making. Our state-of-the-art technologies seamlessly integrate information across all production levels. You benefit by getting a complete, current overview of what's happening with all of your plant's processes, from the production to the management level, and from the arrival of materials to the finished goods. Such improved access to information helps you make better decisions and use resources more effectively. Ultimately this means you can deliver your products faster and respond to market requirements with greater agility. Product quality is improved, acquisition costs are lowered, and tracking and tracing is made more precise.

To help you optimize your business processes across the board, we provide you with a diversity of efficient solutions that are perfectly matched to your industry's requirements. Our standardized IT and MES systems consolidate all important information, both at the production and management levels. What's more, our SIMATIC IT MES solutions are freely scalable. Whether you want to build a new plant or optimize processes, our solution provides you with what you need. SIMATIC IT's wide range of solution packages match your requirements at reasonable cost, and our packages 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 about product and process quality, effective linking of all interacting components and processes, and management of downtimes based on long-term analysis. These capabilities allow you to immediately localize deviations, respond promptly to changing conditions, make sound decisions, and achieve your objectives.



Staying at the forefront – modernize where it counts

There are many good reasons to modernize. Even if the mechanical underpinnings of your plant are still working well after many years, there is still a need to improve productivity and production quality by converting to state-of-the-art control systems. We take care of that with cement-specific and systems-engineered solutions. In this context we have developed frequently requested modernization concepts into standardized solutions that are tailored exactly to your plant. In short, we provide sound modernization solutions for every aspect of the cement industry.



The very latest technology – at the right cost

By modernizing your existing automation, process control, and drive systems step by step, we ensure that your plant's performance is up to date – and we get you there comfortably within your budget. During the conversion, we draw on our extensive experience with modernization projects to reduce shutdown times to a minimum.

Exploiting new opportunities

No matter which state-of-the-art technology governs your process – the excitation system, the frequency converter, the automation or visualization system for your drives and processes – it inevitably gets older and consequently more error-prone. Speed and quality of the control system, intuitive operator control, ergonomic visualization, and reliability all suffer. What's more, older systems often lack interfaces to quality management processes, and obtaining replacement parts and accessing expertise to service them become increasingly problematic. Modernizations become necessary to improve productivity and quality, but sometimes they prove too costly. The situation requires a creative new approach.

A safe long-term investment

With our scalable concepts, you can upgrade your automation, drive, and process control systems while staying within your budget. You'll affordably bring your plant to new competitive levels of availability and productivity.

We provide the following proven, standardized solutions:

- Migration of SIMOVERT and SIMOREG standard, multimotor, and large-scale drives to modern three-phase drives, which are more flexible in use and easier to maintain
- Migration of automation and process control systems, such as from TELEPERM M to SIMATIC PCS 7 or from SIMATIC S5 to SIMATIC S7, as well as from third-party systems such as AEG Modicon 350 / 500 to SIMATIC S7.

All solutions are standardized to accommodate present and future requirements, and are designed to keep standstill time to a minimum.





A perfect start by modernizing drive systems

High performance and reliability of all drives are essential to the efficiency of the entire plant, and these can be achieved without total replacement. Even older drive systems can make a comeback as genuine top performers through the application of customized modernization solutions. The key is across-the-board conversion to state-of-the-art open- and closed-loop control systems.

Based on an accurate needs analysis of 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 electrical and electronic components to recommissioning. Optional services can include, for instance, integration with higher-level control systems or with existing systems, including third-party systems. Our solutions help you reduce maintenance costs and increase systems availability so your drives stay fit for the future.

Upgrading automation and process control systems

In the realm of automation technologies, new developments constantly require up-to-date solutions. In every plant modernization or expansion, updating automation and production control systems eventually becomes necessary.

We build on your existing, basic automation as we seamlessly modernize and optimize your plant, from operator process control to process analysis to production control systems. You'll benefit from our many years of experience in the cement industry as we support you with comprehensive and customized solutions.

Our support encompasses thorough analyses of your specific plant configuration, implementation of hardware and software engineering, and delivery and installation of the required components. High performance 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.

Our process control system for the cement industry, which we continually develop and refine, migrates flawlessly to new versions. This ensures that our systems engineering and functionality will continue to be useful long into the future. Our solutions can also be integrated with existing systems, including third-party systems.



Solutions to rely on: modernizing electric power systems

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 shut-downs, we help you address electric power needs proactively.

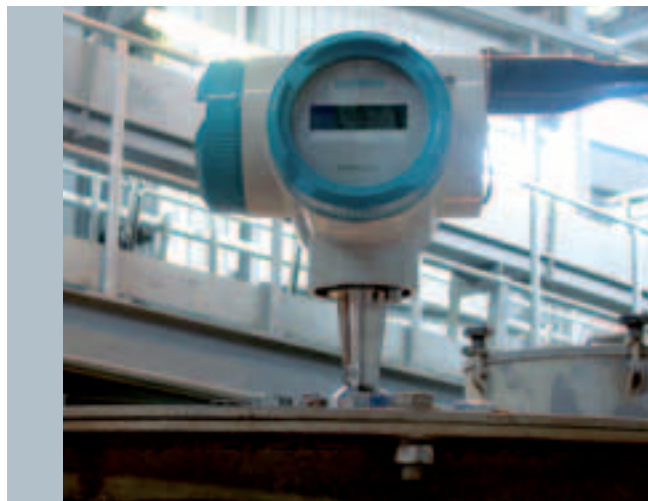
Whether you're expanding or modernizing, we provide support for electric power supply and distribution that's based on industry-proven solutions. We do large-scale upgrades of entire electric power systems, for example, including removal of obsolete equipment, remarketing, or disposal, as needed. Your strategic and budgetary requirements define the scope of the solution. With Siemens, you benefit from plant engineering that's 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 solutions packages maximize operational reliability and personal safety.

Ultimate control: modernizing instrumentation and analytics

By using the latest in intelligent process instrumentation and gas analytical technology, cement plants can refine the quality of data transmitted to the control room, thereby improving control over the entire process. Latest-generation process instruments and analytical devices from Siemens support advanced, predictive maintenance. These capabilities allow maintenance cycles to be optimized, help safeguard against equipment failure and, ultimately, reduce costly downtime.

We offer a comprehensive range of process instrumentation, weighers, and analytical devices that are specifically matched to the demands of the cement industry. Our team of industry specialists understands the challenges faced by cement operators, and product innovation is driven by this know-how. The SITRANS LR radar-level measurement devices, for example, are specifically designed to withstand the high dust levels in cement plants and ensure unparalleled reliability and accuracy, even in the most difficult applications.

Totally Integrated Automation (TIA) allows Siemens process instrumentation to be effortlessly integrated into existing systems and makes process upgrades simple and transparent.





Proactive, economical maintenance

In the cement industry, as everywhere else, maintenance is becoming a key success factor. Production losses and downtimes must be minimized in ways that are reliable and efficient. The key is having a proactive – rather than reactive – maintenance strategy that's tailored to your company's technical and business requirements.

SIMAIN – maintenance made to measure

With our many years of service and maintenance experience around the globe, we understand the requirements of the cement industry. We've put that experience to use in designing SIMAIN, our modular, manufacturer-independent array of maintenance services that are entirely focused on our customers' individual requirements and business. SIMAIN services, classified as Business Based Maintenance or as Maintenance Services, support maintenance needs related to both organizational and process issues as well as engineering tasks and problems.

SIMAIN – Business Based Maintenance for optimized processes

SIMAIN – Business Based Maintenance offers you a range of services designed primarily to help you optimize your maintenance processes. It's tailored to your specific company objectives, allowing you to develop maintenance strategies that are best for you and to design and coordinate processes and programs accordingly. Services range from "Maintenance Business Review" and "CMMS Integration" (Computerized Maintenance Management System) to "Maintenance Improvement Program" and "Maintenance Contracting".

We get you on the right track with an expert Maintenance Business Review. This helps you identify ways to increase process transparency and spot opportunities for improvement. Next we help you develop ways to optimize your production in accordance with industry-proven methods. Unlike conventional consulting firms, we then work with you as a team to help you implement these changes, usually through a specific Maintenance Improvement Program tailored to your needs. If third-party management of your auxiliary processes works for your business strategy, we can also provide ongoing maintenance services and management.

SIMAIN – Maintenance Services: competent support for your team

If you already have an effective maintenance organization, you'll benefit from our SIMAIN – Maintenance Services. Unlike Business Based Maintenance, which is process-focused, SIMAIN – Maintenance Services provides your maintenance team with technical support when and where you need it. SIMAIN preserves and restores the functionality of your systems and plants through specialized selective support and Supply of Spare Parts. Our core competence is in the area of electrical engineering, including automation and drives technology, process control and instrumentation, and energy technology.

SIMAIN – Maintenance Services is also designed modularly. Modules can be individually combined into special service packages to suit your systems engineering and production processes. This allows you timely access to special expertise without having to develop it in-house. Efficient and comprehensive modules include On-site Fault elimination, On-call Service, and Remote Monitor-

ing. Service response times and arrival times are defined by mutual agreement. In the event of an equipment failure, you are ensured access to our specialized expertise in the most cost-effective way. It may be, for example, that we can resolve your technical problems by telephone or remotely. If you require an in-person visit, you can rely on the speediest possible solution of the problem.

With SIMAIN – Maintenance Services, our focus is always on your system's availability and reliability. That's why we concentrate on those critical key components whose failure would cause significant production losses. Our drive specialists, for instance, conduct continuous on-line vibration monitoring of drive motors for large rotary kiln fans so as to ensure early detection of any bearings problems. Automatic detection of fault patterns and alert notification in the event of a fault help you avoid major systems defects and prolonged shutdowns.

We also support you with Supply and Purchasing of Spare Parts, as well as with Sales and Rental of Instruments and Tools you need in your maintenance activities. To this end, we optimize inventories and ensure availability to match your requirements. Our Maintenance Services also include physical, electrical, and mechanical Calibration of your measuring instruments – in combination with efficient Management of Calibration Cycles.



With SIMAIN we support you in developing Proactive Maintenance, achieving your desired plant availability, and optimizing your maintenance costs.



A global business – services without borders

Worldwide cement production for building construction, civil engineering, and other applications exceeds 1.6 billion metric tons annually. A high-quality material that's also environmentally sound, cement continues to be the number one building material around the globe.

That's why companies in the cement industry need a global partner with a wide range of services. Siemens is that partner. Our many years developing and implementing engineering and technological innovations ensure that our solutions will deliver what they promise: value-added service. Backed by our comprehensive service network, our experienced industry specialists create solutions that work.

Our main centers for the cement industry are located in:

- **Erlangen, Germany (Headquarters)**
- **Asia**
- **Europe**
- **Latin America**
- **Near and Middle East**

Proven solutions around the world

Cimpor – Cimentos de Portugal

The task:

Convert the process monitoring system to SIMATIC WinCC in the Alhandra cement plant.

Our solution:

Migration of the old, no longer supported controls and instruments to SIMATIC WinCC; services for engineering, software, installation and commissioning, cabling and network switches, computer server and operator stations.

Successful results:

Replacement of the process monitoring system without interrupting production. Cimpor now has a flexible system that will accommodate trouble-free future expansions. What's more, automatic diagnosis of system shutdowns ensures that potential weak points in the plant are promptly detected and eliminated. The result is a substantial improvement in systems availability.

Italcementi, Calusco plant, Bergamo, Italy

The task:

Implement a new production line and modernize the existing plant in this consortium.

Our solution:

Planning, design, engineering, and project management of the overall solution as well as commissioning.

Additionally:

Delivery of the medium-voltage distribution, 110V DC systems, distribution transformer, emergency power distribution, diesel generator, MV/LV drive systems, VVVF drives, control system, instrumentation, laboratory system, UPS, lighting, grounding/lightning protection, cables, and installation materials.

Successful results:

Increase of 13 percent in incoming and outgoing materials. The contractually defined daily production volume of 3,600 metric tons was exceeded as soon as the plant was started up. The energy balance sheet and emission values are well below the average of comparable plants. As a result, Italcementi can amortize its investment swiftly.

Titan Cement, Thessaloniki plant, Greece

The task:

Modernize the production plant.

Our solution:

Engineering and design of the overall solution for a new clinker production line; delivery of electrical equipment, production control systems, and instrumentation; project management and coordination, cable layout, installation, commissioning and acceptance test, plus expert training of employees.

Successful results:

Conversion of three rotary kilns to a single system, resulting in an increase in production capacity and a reduction in operating costs by 25 percent.

Holcim, Thi Vai cement plant, Vietnam

The task:

Expand the existing plant by a second milling system.

Our solution:

CEMAT V6 process automation system, I/O control cabinets, cables and cable supports, main and low-voltage switchgear, lighting and operator controls of the safety systems.

Additionally:

Instrumentation, project management, engineering, installation, commissioning, and training.

Successful results:

Hanspeter Humbel, technical director of Holcim Vietnam Ltd.: "On many occasions during the course of this project, Siemens has proven its commitment to a successful and on-schedule implementation. Any problems were addressed in a cooperative manner, so that we could always count on being fully supported by Siemens. Its very flexible and professional project management enabled Siemens to meet its contractually agreed-upon schedule, notwithstanding considerable delays resulting from the slow progress in the construction work."

The challenge:

Intelligently
assembling
the key factors
for success

Times change, but strong values endure.

We know there's no room for trial and error,
or for compromises, in the cement industry.

The focus is always on adding value.

On maximizing ROI. And on minimizing
operating costs.

Information:

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