



ABB in cement manufacturing

From quarry to dispatch
and from plant to enterprise



- Domain know-how and worldwide experience
- Covering the complete value added chain
- Integrating seamlessly a wide product portfolio into engineered electrification and automation solutions

Taking cement production to the next level

Producing consistent, high-quality cement, caring about environmental responsibilities, improving process control and managing information effectively to maintain reliable operation, cost effective production and reducing capital employed – that's what cement manufacturing is all about.

ABB can help you meet these business challenges by providing automation, drives and power systems that improve operating procedures and integrate with new or existing plant equipment. Further, with ABB Ability™, ABB's entire portfolio of digital solutions and services can now be combined. ABB Ability is a unified, cross-industry digital capability with devices, systems, solutions, services and a platform that enables more knowledge of the system, more capabilities and improved performance delivered by connectivity of the plant equipment.

Our experience is unmatched, with a track record of supplying complete electrification and automation solutions for more than 150 cement plants worldwide. Whether you need a single critical component or a complete turnkey electrification system, turn to ABB as your single source.



Energy efficiency

Cement production consumes 8.2 exajoules of energy per year, or about 7 percent of total industrial fuel used. Efforts to reduce energy demands, by using higher efficiency equipment and substituting fuels and raw materials, are important to lower production costs. These changes introduce constraints that must be managed to secure the required quality and productivity of the plant. The optimal operating point within the boundaries of these dynamically variable constraints depends on the right price mix of fuels and timely purchases of electrical energy while constantly reducing demands for these resources.

The ABB plant-wide automation strategy searches for the optimal operation point while maximizing product quality and productivity, at the lowest energy consumption and least environmental impact. This is achieved through a combination of variable speed drives (VSD), advanced process control, energy monitoring and reporting. Electrical energy savings of up to 70 percent can be achieved by using VSD over a fixed-speed

motor and damper. The multi-drive solution provides the optimized drive solution for the grate cooler. The control and optimization of the kiln will reduce thermal fuel consumption by up to 8 percent. When this is combined with the automated collection, organization and distribution of production, quality and energy reports, fast decisions and interaction to reach the goals of energy management are achieved.



Improved quality

There can be no flaws or failures in cement composition, or entire structures could disintegrate. Advanced measuring, information and optimization systems are needed as never before to monitor and correct any deviations in quality standards – from quarry to dispatch. ABB's tailored products, digital applications and services improve processes and help you achieve optimum production standards. The automation system minimizes material and energy use in complex processes.



From your quarry to the product you market

Look no further than ABB. Our approach covers the complete value-added chain, from your quarry to the product you market. We excel at merging equipment, skills, and services to develop a complete, customized solution to strengthen your entire operation regardless of project size. ABB's capabilities, global and local resources offer integrated power, control and information solutions. You specify the requirements just once and we take the responsibility for creating a solution that works smoothly and efficiently.



Power distribution

When you need efficient and reliable power distribution in your cement plant, turn to ABB. We offer the broadest range of high, medium and low voltage equipment for switching and distributing electrical power to the cement plant.

Solutions are engineered for safety, flexibility and security to keep operations running day and night, including emergency power generation and uninterruptible power supply (UPS), industrial sub-stations, harmonic correction equipment, switchgear and transformers. ABB provides you with state-of-the-art technology to reduce to-day's rigorous power demands.



Drives

Selecting the right drive system for a particular application requires knowledge and experience within the process environment. ABB manufactures motors and drives from the sub-kilowatt to the megawatt ratings for cement plants. As the world's largest producer of variable frequency drives – vital to modern cement production – ABB draws on its extensive cement industry knowledge to select the best drives to increase the throughput, reliability and energy efficiency of your operations. This ensures that the selected drive system perfectly fits the site specific requirements.



Control and instrumentation

Cement plants need integrated process control systems that can improve plant-wide efficiency and productivity. Our cement automation solutions are based on the world-class DCS ABB Ability™ System 800xA. Its outstanding integration capabilities are building the base for digitalization and provide easy "single window" access to the process, production, quality and business information – from the most remote location to corporate headquarters. Whether you are building a greenfield plant or extending or modernizing an existing plant, ABB provides tailored automation solutions based on the industry-specific ABB Ability™ digital applications for cement, enabling constant monitoring and analysis of your process combined with improved asset availability.

ABB provides a wide range of instrumentation products for cement industry processes such as continuous gas analyzer systems for process gas measurements, emission monitoring, online measurements for bulk materials, as well as instrumentation for other specific applications.



Unrivalled in its scope and applications expertise, ABB is a global leader with solutions certified to international standards and a world-wide network of manufacturing plants.



ABB Ability™ digital applications

The ABB Ability™ portfolio delivers additional value with truly integrated digital applications for unmatched operation, maintenance, as well as process and production optimization in the cement industry. Our digital applications are based on the ABB Ability automation and information management platforms. Their proven standardized building blocks are horizontally and vertically connected and thus ensure the right people have the right information at the right time.

Process and Power Control increases operator effectiveness by unmatched focus on situational awareness in order to avoid operation errors that cause loss of productivity. Advanced Process Control reduces energy consumption and increases productivity while maintaining the desired quality automatically, 24/7. Award winning

optimization solutions, are optimizing more than 400 processes world-wide and help many customers to make effective use of alternative fuels and materials. Asset Management and Condition Monitoring minimize unplanned downtime and increase equipment availability while helping to optimize maintenance activities. Cement Production Scheduling resolves complex constraints to optimize energy consumption and equipment usage in order to manufacture as per demand at lowest cost. Production Information Management systems consolidate data on the plant and enterprise level and provide insights as well as KPIs in easy to understand dashboards and reports. ABB's extensive suite of digital solutions for cement and their connectivity, allow you to drill down into your plant data to whatever level of granularity you select with any chosen key performance indicator (KPI) while enabling a full exchange and view of information between all critical business systems. They supply the best methods to meet requirements, targets and goals including production management solutions. In summary, these applications unleash the full potential to deliver sustainable profitability and create full visibility over your integrated cement manufacturing from plant to enterprise.



Project management and engineering for complete electrical system integration



Site management, installation supervision and commissioning services



Infrastructure: Grounding lightning protection, lighting systems, cabling, communications systems and fire protection



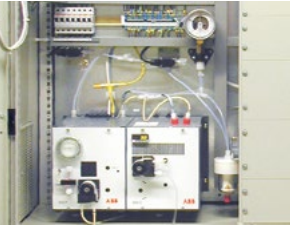
AC motors and complete AC drives systems



AC multi-drives/AC single-drives



Variable speed drives for high pressure grinding rolls applications



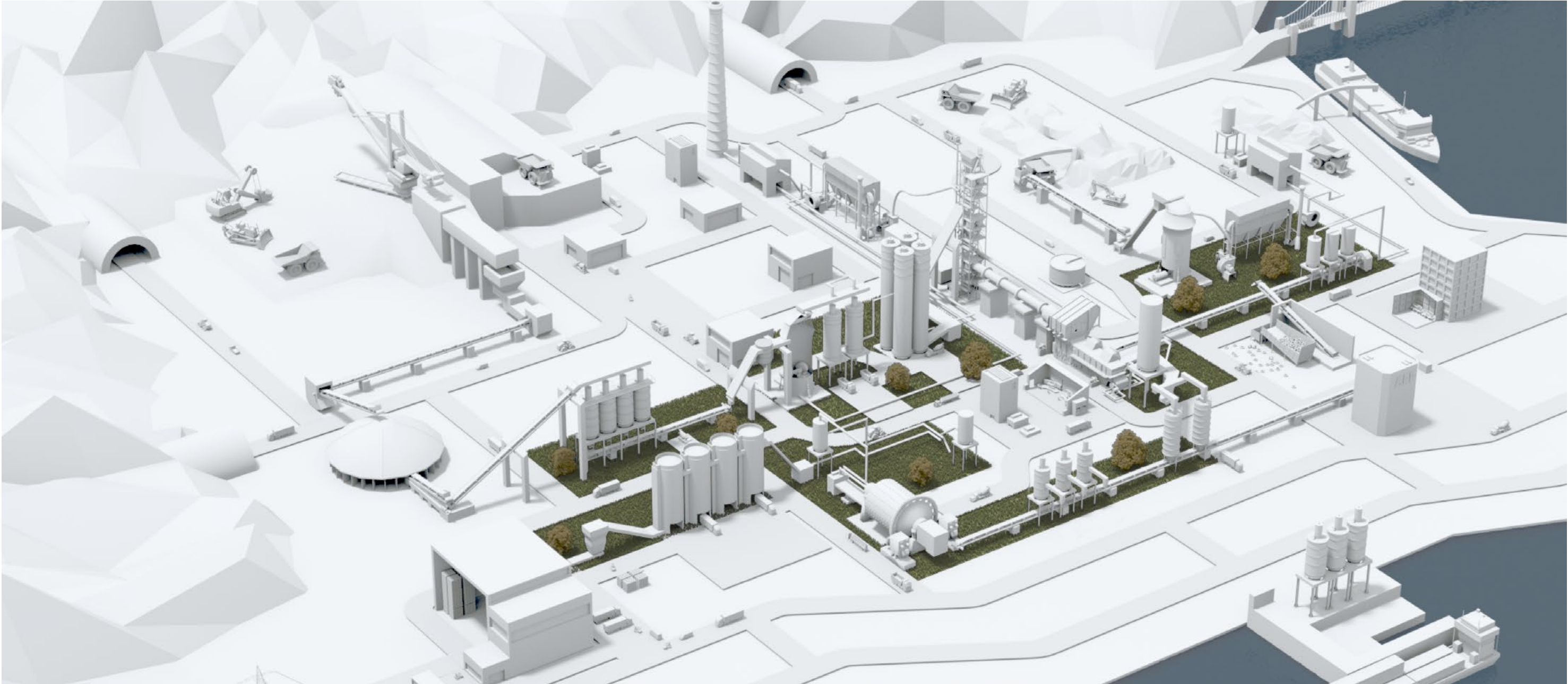
Process instrumentation, gas and emissions monitoring system, online material measuring



Training



Maintenance, repair, spare parts and installation service



Gas insulated switchgear and industrial substations



Transformers, switchgear, static var compensators and harmonic filters



Motor control centers



Emergency power generation and UPS



Integration of robots



Process control systems and advanced application software for plant automation



Process optimization systems for maximizing production, optimizing quality and minimizing production costs



Automated integration of process data with business systems for effective management



ABB Ability™ collaborative services

With our comprehensive suite of digital collaborative services designed to enhance day-to-day equipment efficiency, we ensure plant performance is on highest level and easy access to expert guidance is ensured whenever and wherever required.

ABB has an extensive network of service centers all over the world to support your local facilities by connecting our specialists with your teams and equipment on site in real time. Remote Assistance enables a secure connection between ABB and the customer in order to provide real time guidance through remote access and augmented reality. Predictive Maintenance enables us to deliver a plant where the equipment alerts you through intelligent cloud-based data analytics when it needs to be serviced. Performance Optimization services are designed to increase your productivity and keep it on the highest level through remote monitoring of KPIs to guarantee that process optimization is running at target level.



Lifecycle services

Our life-cycle support contracts, as well as our offerings for training, help you to reduce direct maintenance costs, improve operational reliability and to increase revenues. Training is key to ensuring that operators, engineers and managers are equipped with the correct skills and knowledge to improve productivity at your site. Companies that invest in their staff, and further training and development help ensure that skills and job satisfaction continue to grow.

ABB field services ensure all risks that threaten disruption of planned production are mitigated. A comprehensive range of field services helps us to meet any requirements you may have. They include scheduled or on-demand maintenance, emergency repairs, extended on-site start-up support, long-term on-site support and detailed field service reports. Efficient spare parts management is vital to maintaining productivity at your plant. Our expert field engineers are available 24/7 to diagnose, repair, upgrade, install or perform on-site maintenance for ABB systems and for many other manufacturers' products.

ABB also helps you to find the most competitive financing to purchase the equipment needed.



Electrification and plant engineering

Efficiency of an industrial plant is not only influenced by its major mechanical and electrical installations. The appropriate planning and engineering also play an important role.

We ensure the selection of the right technologies and products, their correct dimensioning, compliance with environmental conditions as well as the implementation of industry dedicated smart solutions. All of this leads to enormous savings in investment and energy consumption adding up to a significant enhancement in a plants' economy over its lifecycle.

Viewed as an integrated entity, the plant's infrastructure also includes items like optimized substation and electrical room layouts, cable engineering, grounding systems, fire detection and protection, air-conditioning and ventilation systems, communication systems and much more. ABB's electrification solutions are engineered for safety, flexibility, security and the highest operational availability to keep your plant running day and night.



Revamping

Building a brand new greenfield cement plant is clearly a major undertaking, but the modernization of an old plant to the latest standards, production and efficiency levels while it is still in operation, demands a completely different set of skills and competencies from the supplier and partner.

The challenges faced by each customer and plant make each revamping project unique in its complexity. It is also heavily dependent on local conditions, the plant's history, quality of local raw materials and their inherent natural variations. Revamping a cement production plant demands a sound automation and electrification solution, which can deal with these variations at a moment's notice, and adapt to its "new conditions" as efficiently as possible.

In addition, such a solution can only be successful when the client's partner and supplier fully understands the complexity of the cement manufacturing process and has the experience necessary to realize these unique solutions, within a strictly planned downtime schedule. This is where ABB excels, and stands out as the accepted worldwide leader in the field.





Your benefits

Due to ABB's vast global resources, combined with its strong local presence, you can benefit from many advantages. While getting the best technology from anywhere in the world you can also profit from complete support through the life-cycle of your installation – including engineering, training, commissioning, service and support – throughout the year.

We can help you achieve industrial and energy efficiency as well as environmental compliance with products, systems and services that ensure product quality, minimize environmental impact and reduce costs.



Increasing productivity & reliability

Besides improving clinker quality, results measured in over 170 production lines show an average 3 percent fuel consumption decrease and a 5 percent production increase. Cement plants require integrated process control systems that make use of process measurements, drive and power distribution information, to increase plant-wide efficiency, productivity and reliability. Plants must also manage vital process and business information if management objectives are to be met. Accurate and timely information for your staff is critical to achieving greater productivity. ABB is a leader in providing you with immediate access to essential information. Our advanced cement information management solutions aid you in pro-active decision-making. It allows you to access thousands of data points instantly, when and where needed – including business, financial, production, environmental, technical and quality management information. With complete access to plant and operating data from a single "window", you can deploy personnel and resources decisively and effectively. Further information transparency enables effective asset management in order to achieve reliable operation.



Environmental safety

Environmental regulations get tougher each year. The more stringent they become, the more money is spent on waste processing, disposal and supervision. ABB technologies in environmental measurements and monitoring, process control and optimization, will enable you to increase operational efficiency as well as environmental safety. ABB also helps to safely utilize waste products as an energy source through incineration. The incineration can take place in the kiln or pre-heater as a supplementary fuel. This reduces the cost and consumption of primary fuel.

ABB's expertise and experience helps cement producers to maintain stable combustion conditions while increasing the use of a huge variety of waste products. In partnership with our customers we help in moving you towards your goal of zero fuel costs.



A comprehensive approach

ABB, dedicated to excellence in cement, develops a customer-specific approach. A full range of proven automation, drive applications and power modules takes you from an automation island to a complete energy and process optimization and management information system that drives plant-wide efficiency. At ABB, we see your plant and its requirements as a single, fully integrated entity.



Contact us

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