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RELY ON EXCELLENCE

A Partnership to build on

EagleBurgmann designs custom-made fabric expansion joints for cement plants

Our modern civilization is quite literally built upon cement. Binding agents made from burnt lime are not a new invention however: In ancient Rome, "caementum" ("quarry stone", "stone chips") was used to build structures like the Pantheon. Today, building materials made from cement are used in buildings, roads, bridges, dams etc. Cement production is a heat-intensive process and causes thermal expansion in duct systems. To compensate this, Indian cement producer Ramco Cement needed fabric expansion joints with a diameter of several meters for two of their plants. On the basis of a close collaboration, EagleBurgmann was able to design components that increase the efficiency of the plant in the long run.

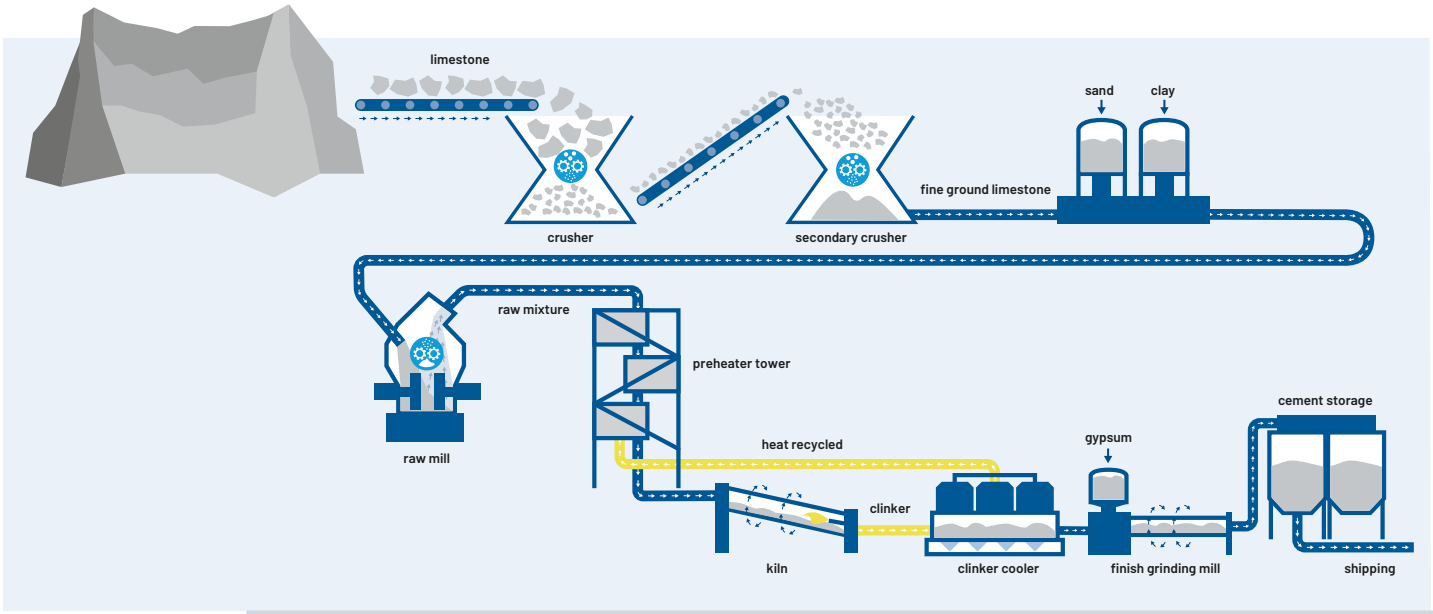
In 2019, India was the world's second biggest cement producer with an annual production of 320 million tonnes. As in every cement plant, the approximately 250 facilities in India rely on expansion joints to cancel out the thermal expansion of the duct system. In a plant with a production capacity of 3.000 tonnes per day (tpd), some 150 expansion joints are needed.

Cement is the binding agent that gives strength to common building materials such as concrete and mortar. By adding different kinds of rock, it can be processed to various materials with distinct properties. Mixing cement with water and sand produces mortar, further adding gravel makes for concrete.

High demand for cement in emerging nations

According to numbers of the US Geological Survey, China has used 6.6 billion tonnes of cement in the three years from 2011 to 2013. For comparison: The United States' cement consumption in the entire 20th century amounts to a mere 4.5 billion tonnes. Due to rapid urbanization, demand for concrete is especially high in emerging nations.

From limestone to cement: Extreme temperature fluctuations at work



Cement is made from limestone, clay, sand and gypsum in a continuous drying and grinding process. The limestone is pre-crushed, mixed with sand and clay and dried in a raw mill. The raw mixture then is conveyed to the rotary kiln, where it is burnt to cement clinker at 1.450 °C. These are cooled to 200 °C and ground up with gypsum to produce the final product. Accompanying with the manufacturing process, machinery and duct systems are exposed to high temperature fluctuations. Expansion joints are required to compensate for the resulting thermal expansion and render a cement plant operational.

Reliable components for critical areas

In 2020, Ramco Cement, one of the biggest cement manufacturers in South India, needed fabric expansion joints for two of their plants. Instead of obtaining them from an OEM, they ordered the 132 expansion joints directly from EagleBurgmann. "The area from rotary kiln to clinker cooler and heat recovery to the admixture of the gypsum is a highly critical section of the plant", explains Bhaskar Chatterjee, assistant sales manager for expansion joints at EagleBurgmann. "For this crucial area, EagleBurgmann has equipped almost every large cement plant in India with expansion joints." This also includes facilities of Ramco Cement, where EagleBurgmann expansion joints are in service reliably since years.

Expertise in material, manufacturing and process are required

EagleBurgmann supplied Ramco Cement's plants with isolation joints as well as duct expansion joints. Isolation joints are mainly used to isolate vibrations in the ducts and machinery, while duct expansion joints compensate for the thermal expansion of the duct system. Duct expansion joints can have diameters of up to 4,5 m. When choosing the right products and materials, all relevant factors such as flow media, dust content, flow direction, pressure and temperature had to be taken into account. The experts from EagleBurgmann can rely on extensive experience and know-how in the fields of process, materials and manufacturing and hence ensure that the expansion joints can reliably withstand all stresses and loads that may occur during operation.

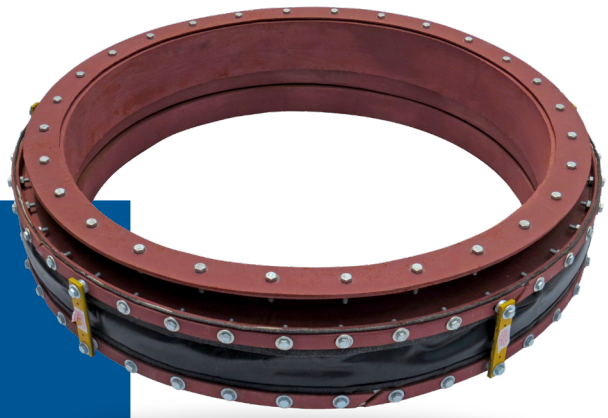
High agility, short delivery periods

"Apart from successful collaborations in the past, our fast response was key in convincing the customer to work with us", says Shankar Gopalan, business development manager at EagleBurgmann. Within only two days, EagleBurgmann's design team submitted the technical drawings to the customer. This gave Ramco Cement enough time to thoroughly evaluate the proposed solutions, even though the project timeline was tight. The quick response also assured the customer of EagleBurgmann's high agility – which was especially important with this project due to a delivery period of only eight weeks.

Constant communication between the EagleBurgmann team and the stakeholders at Ramco Cement was a decisive factor in the project's success. "We not only communicated and coordinated with the technical project team, but also with their management and finance department", says Daniel Vijaykumar, deputy general manager sales at EagleBurgmann. At project launch, EagleBurgmann and Ramco Cement agreed on a quality plan to assure the project's success. As the project progressed, this quality plan was constantly checked. Every delivered product had to meet the defined checkpoints – from raw materials to the characteristics of the final product.

Dimension's that aren't for everybody
As the global demand for cement increases, so do cement plant's production capacities. Whereas a single plant used to produce up to 2.500 tpd cement clinker per day, this number has increased to 8.000 tpd in modern facilities. To handle these throughput volumes, duct systems and expansion joints of bigger diameters are needed. "With this project, the size of the expansion joints was particularly challenging. We're talking about diameters of three meters and more", says Gopalan. "Steel frames of this size are produced in segments. Welding them requires highly skilled and experienced employees." EagleBurgmann has the infrastructure and personnel to manufacture, store and handle expansion joints of this size.

Cost-effective solutions with the end customer in mind
At its place of destination in the cement plant, the expansion joints were installed in heights of up to 40 m. During the development stage EagleBurgmann realized that future replacements of the entire fabric expansion joints in these places may turn out to be time-consuming and costly for Ramco Cement. "When working with the customer, we always have the long-term operating costs in mind. That's why we proposed a steel frame design that doesn't require the whole expansion joint to be exchanged", Gopalan explains the customer-specific modifications to the design. "Instead, all it takes to exchange the fabric is loosening the nuts and bolts."



"We were looking for a cost-effective solution that offers long-term reliability. In this regard we always felt expertly advised and supported by EagleBurgmann. "

R. Shanmugavel, deputy general manager projects , Ramco Cement

EagleBurgmann – at the leading edge of industrial sealing technology

Our products are used wherever safety and reliability count: in the industries of oil & gas, refineries, petrochemicals, chemicals, pharmaceuticals, food, power, water and many more. About 6,000 employees contribute their ideas, solutions and dedication every day to ensure that customers around the globe can rely on our seals. With our modular TotalSealCare Service, we emphasize our strong customer orientation and offer custom-tailored services for every need. **Rely on excellence.**

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