

Kraft Curing Systems GmbH, 49699 Lindern, Germany

Van Dyk Stene invests in fully automated concrete products plant with integrated curing system

The newly commissioned Van Dyk Stene concrete products plant in Vredenburg in the Western Cape is saving the company 30% on its total cement input costs. The state-of-the-art plant is a showcase for the total concrete solutions available from Pan Mixers South Africa (PMSA), Johannesburg, South Africa and their curing technology partner, Kraft Curing Systems, Lindern, Germany.

Van Dyk Stene was established as a family business in 1968 in the town of Vredenburg, South Africa located approximately 150 km northwest of Cape Town. Since its inception, the company has been dedicated to providing unparalleled customer service and the strict adherence to the highest quality standards in order to manufacture high quality concrete products.

Today, with four production sites including a quarry, over 135 employees and under the leadership of Andre and Mario van Dyk, the company is an industry leader, especially on the Cape West coast, where they manufacture precast concrete elements and concrete products, including kerbs, pavers, bricks and masonry products as well as supply sand and stone material.

On 20 May 2015, Van Dyk Stene hosted an open house to proudly celebrate the opening of its latest modern production facility with their customers, employees and suppliers.

This plant features a complete fully-automated concrete masonry, brick and paver manufacturing plant, featuring PMSA's 1400 Series concrete products machine, batch plant, fully automated wet and dry side equipment. The 1400 Series production machine is capable of producing up to 165,000 bricks, 105,000 pavers or 1,600 pallets of block per 9 hour shift.

Curing Storage and Equipment

In addition to the advanced production equipment, Van Dyk Stene is the first plant

of its kind in Africa to incorporate Kraft Curing System's Kraft Racks™ concrete products rack system and Nautilus™ Air Circulation Curing System. According to Andre van Dyk, "Although we were aware of Kraft Curing reputation and their innovative rack systems and curing solutions from Germany, the tie in with a well-known and trusted local partner such as PMSA made the decision much easier for us."

Kraft supplied their Kraft Racks production pallet storage system for a total of 4,114 pallets enclosing also the transfer car area in order to provide a single atmosphere curing chamber designed for outdoor execution and wind speeds found on the Western Cape. The single atmosphere chamber design captures the heat from (cement)



Curing rack galvanized steel erection completed.



Curing rack exterior insulation, steel transport rails, fast operating door and air circulation system completed.



Completed factory with exterior curing chamber (lower building).



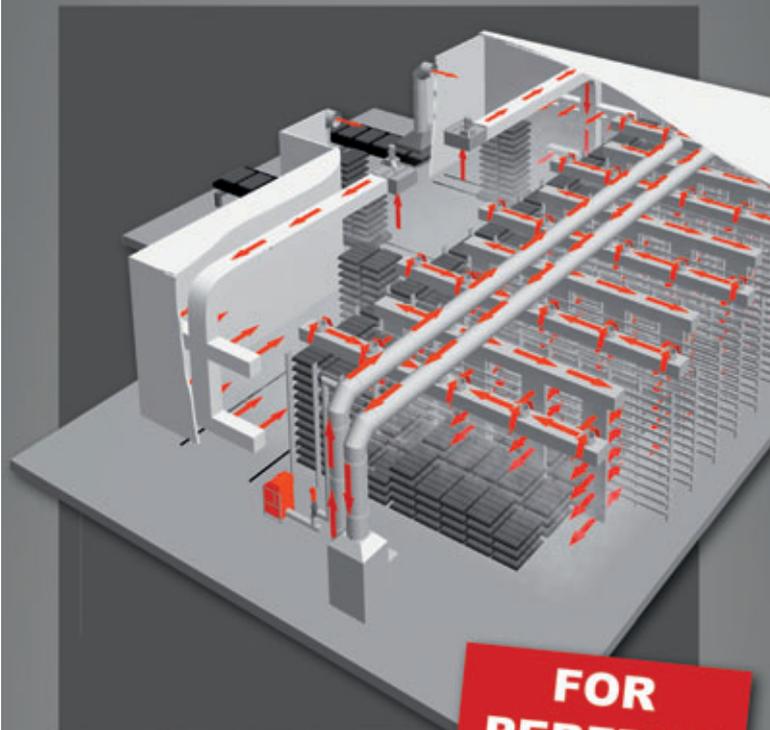
Fast operating tarp door – an economical and simple solution for quick opening and closing allowing uninterrupted transfer car operation with minimal heat and moisture loss from the single atmosphere curing chamber.

hydration as well as the moisture released by the concrete in order to provide a warm humid atmosphere for fresh products entering the chamber and thereby accelerating the strength gain, reducing the curing duration and cement consumption – especially in warm climates. An automatic fast operating door provides for simple and economical entry/exit for the transfer car. The racks are hot dip galvanized after production in order to prevent corrosion that is often found on racks that are coil galvanized prior to fabrication.

In addition to the rack structure and door, Kraft Curing supplied the Nautilus air circulation system with maximum humidity control. The air circulation system, built around the stainless steel and aluminum radial Nautilus ER2-63 ventilator (designed and manufactured by Kraft) provides a curing climate consistency equal to $\pm 1^{\circ}\text{C}$ temperature, $\pm 3\%$ relative humidity with an air velocity equal to under 1 m/sec. The system includes an exhaust ventilator, operated by a hygrosat humidity sensor. If the humidity inside the curing environment increases above 95%, the exhaust ventilator extract the humid air until the set-point humidity is reached.

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Single Atmosphere Curing Chamber with consistent temperature and relative humidity, no condensation on the ceiling, floor, steel racks or rails. Insulation, air circulation and humidity control is key in proving this type of curing/production environment.



One of 15 air supply drops located throughout the chamber. Each drop includes adjustable air outlets at each level for a completely consistent atmosphere with consistent low air velocity in order to prevent moisture evaporation from the concrete surface.

According to Andre van Dyk, "We are now able to achieve the same strength requirements, but with 30% less cement than our traditional production method. Early strength (ex-chamber) are equal to 35 MPa (N/mm²) with the reduced cement loading. A cost savings that will have a significant impact on the bottom line. In addition we see uniform colors, strengths and a denser surface due to the better cement hydration."

Frugal/Value Innovation

While Kraft supplied the curing racks, steel rails, fast operating door, air circulation ventilator and control systems, the chamber insulation and the air distribution duct system were supplied and installed locally per



Nautilus Radial Air Circulation Ventilator, manufactured exclusively by Kraft Curing of stainless steel and aluminum in order to provide a durable and effective solution for consistent air circulation in a single atmosphere curing chamber.



AutoCure automatic curing control system providing curing temperature measurement and indication and curing humidity measurement, indication and control. Due to the relatively consistent warm ambient temperatures, the single atmosphere curing chamber at Van Dyk Stene is operating at 26°C and 90% relative humidity without the addition of heat.

Kraft Curing drawings, bills of materials and supervision. As part of its "frugal" or "value" innovation concept, Kraft worked together with PMSA and Van Dyk Stene in order to source local high quality materials; providing work for the local economy, value and ease of procurement for the customer and less transport and environmental cost.

"Whether it is Australia, the Emirates, India, Indonesia, South Africa or the United States, It really is silly to transport air duct, insulation panels and many other items from Germany half way around the world when there are eager, affordable and able local suppliers;" comments Michael Kraft, Managing Director of Kraft Curing.

Conclusion

Van Dyk Stene began planning the factory in September of 2014. 9 Months later on 20 May 2015 the fully operational plant celebrates with an open house. The company has invested heavily in



*Integral solutions of
high technology and precision.*

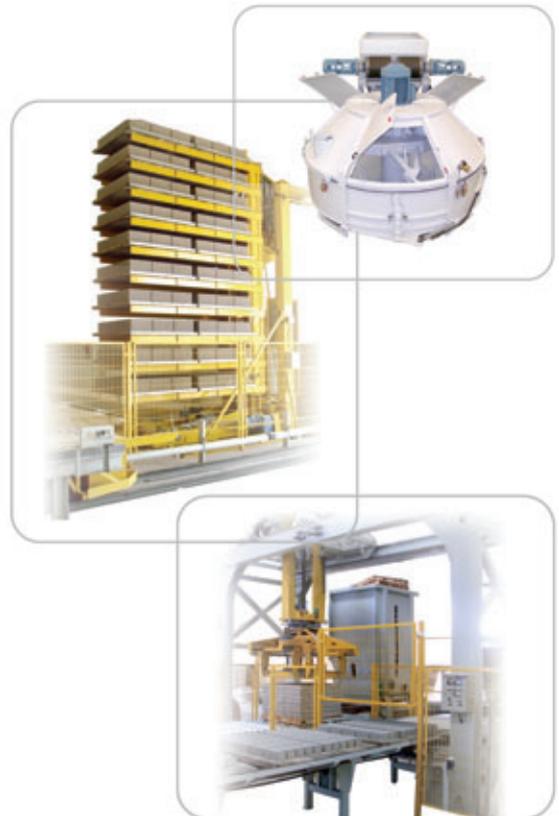


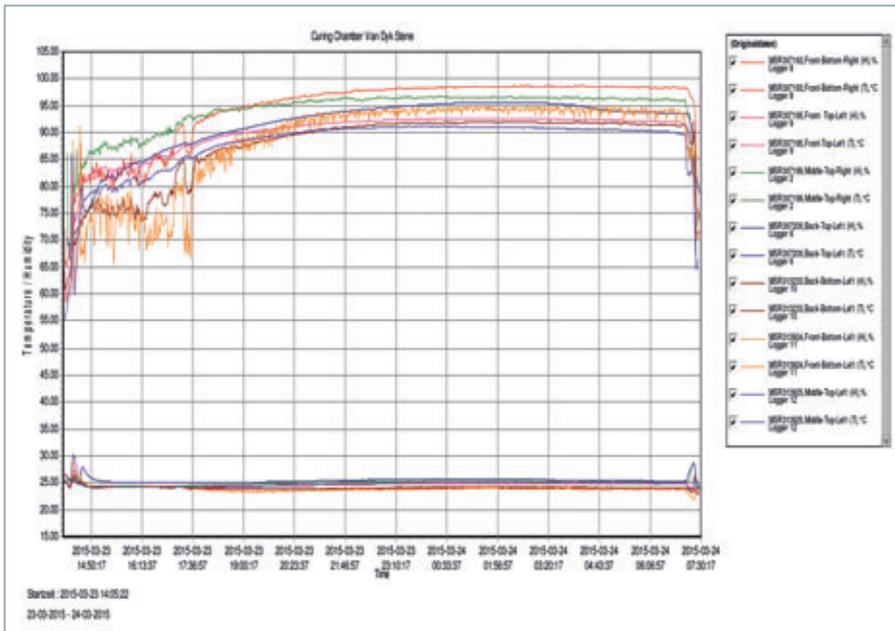
VIBROCOMPRESSING PRESSES FOR MAKING SMALL CONCRETE PRODUCTS

Full automatic plants, comprising batching, handling and packaging system.

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modern production techniques for efficient high-volume output of its extensive product range. "The latest example of our commitment to innovation is the addition of our concrete curing process facility," points out Andre van Dyk.

When the air circulation system is commissioned, a total of between 8 and 20 temperature/humidity data loggers are placed throughout the curing chamber. The project is not complete until the temperature difference is no more than +/-1°C. Once this value has been achieved, the adjustable outlets and inlets are secured and no further adjustment is ever required. A graph, identical to the one seen here, is provided for the customer as proof that the project parameters have been met.



PMSA block making machine RE 1400

FURTHER INFORMATION



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