Kraft Curing Systems GmbH, 49699 Lindern, Germany

CityStoneDesign: Reaching higher quality standards through curing

Invest s.r.o. established its first concrete products production facility in 1995 in Sala outside of Bratislava, the capital city of Slovakia. In 2010 a second factory was built in Geca. In the meantime there are two production lines in Sala. In 2014, the project "CityStoneDesign" began and the new company "CityStoneDesign s.r.o." was established in early 2015 – a manufacturer of concrete landscape products. The market in Slovakia is, perhaps like many markets throughout Europe for concrete landscape products, very competitive. CityStoneDesign was established to create a new marketing strategy, new vision and new product portfolio. By rebranding, the owners wanted to show the new value, new quality approach and new, creative ideas to their customers, especially by using the word "design". "With CityStoneDesign, we emphasize new exciting products as well as product quality through extraordinary aesthetics paired with technological excellence and functionality", says Peter Bozek, CityStoneDesign Project Manager for Europe with current locations in Germany, Slovakia and the Czech Republic.

Intuition, research and passion sum up the corporate philosophy of the company. "We use it to discover new areas for research. Research we do on the basis of our extraordinary experience in technology, technic and marketing", explains Bozek. "And our passion is that we want to change from the producer of industrial products into a leader in the premium products segment".

Beside over 80 valued employees who make CityStoneDesign successful each and every day, there are also Torsten Graf from Germany, the creator and founder of the CityStoneDesign concept, and Peter Perina who is the production manager in Slovakia and responsible for all of the technical requirements necessary to achieve the aspiration.

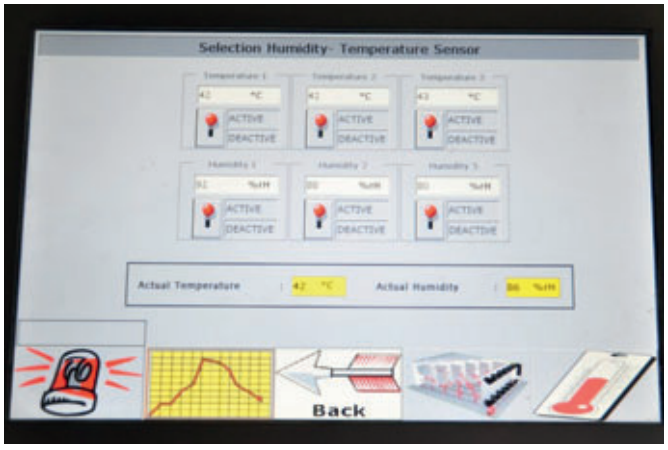
Late in 2014, the company made an investment in a Quadrix® Accelerated Curing System from Kraft Curing. The investment in curing helps to meet the product quality goals of the company: "Our main goal with CityStoneDesign is to escape from being a producer/prisoner of standard products. In order to do so, we needed to produce new products with extraordinary quality. And, in order to accomplish that, we needed to address fluctuating production parameters so that we could identify the root cause for challenging quality problems. When we would meet to discuss the factors contributing to quality problems we always ended up with no results – there were simply too many variables in the production process. The only way to break this vicious circle was to establish certain and consistent conditions at least in one important point of the technological process: hardening," describes Peter Bozek the company's goals. "However, when I say the word "curing" I mean to control the process of hardening so that it is always constant, without variables or fluctuations in duration, temperature and humidity. The Quadrix system allows us to speed up the hardening process by curing at a temperature between 30°C and 45°C with +/-1°C consistency and between 80% and 95% relative humidity with +/-3% consistency. The process of curing allows us to create a fixed or static situation and permits us to investigate the root cause of quality problems. Now, when we meet to discuss quality issues, 9 times from 10, we are able to find the root cause and begin attempting solutions. Why? Because we have a stable and consistent curing environment".

Example of fluctuations

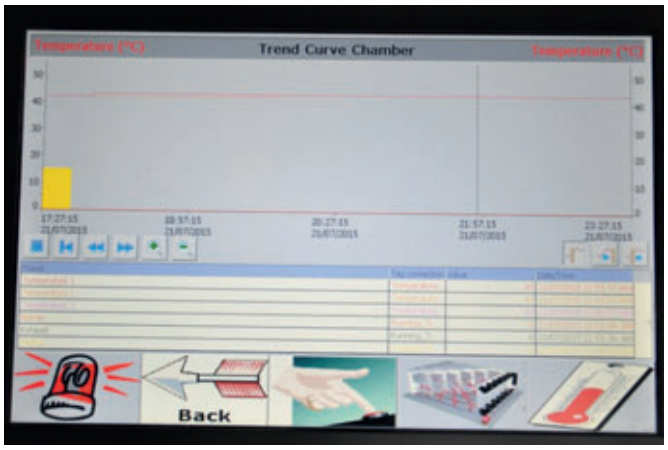
CityStoneDesign operates throughout the year, shutting down in the winter only when necessary. Prior to installing Quadrix, they had two mix designs for the base mix: summer and winter. In the winter they used more cement than in summer in order to achieve higher early strengths when it is cold, otherwise they cannot remove the products from the curing chamber. The worst part of having two mixes is knowing when to switch from one to the other in spring and fall. "If we switch at the wrong time we either waste money on cement or lose production. Now, we can run only one mix throughout the year because we have summer everyday inside the curing chamber", explains Bozek.

CityStoneDesign's large landscape display garden uses several secondary processing steps as well as color blending in order to offer a multitude of colors, finishes and textures providing designs from rustic to modern.

The complete Quadrix® unit has a 1400 mm x 2.400 mm footprint and may be located on-top, to the rear or to the side of the curing chamber. All internal components including combustion chamber and heat exchanger are stainless steel. On the wall – right – the AutoFog™ moisture addition system, in a compact 600 mm x 600 mm wall mounted panel, provides humidity via 10 micro nozzles for a very fine fog.



AutoCure™ provides curing environment information including temperature and relative humidity – in this case monitored at 3 locations throughout the curing chamber. Here the curing temperature is indicated at 42°C and the relative humidity at 86%.



AutoCure™ provides a graphical trend curve which indicates curing temperature and relative humidity over the past 24 hours. The data may also be archived for quality control purposes.

Fresh concrete products pass through a small adjustable opening in the curing chamber wall within 30 seconds of being produced – eliminating evaporation of moisture from the concrete. "Our machine operators say: the edges are now perfect!"

Consistency

Kraft Curing convinced them that they could increase the production capacity, increase the flexibility and eliminate problems with color inconsistency due to fluctuations in the temperature in different areas of the curing chamber; front, back, top and bottom. CityStoneDesign has been able to achieve all of these goals. For instance, if necessary they are now able to remove and handle products within 8 hours (70% of the final strength) of entering the curing chamber. The machine operators say: "The edges are now perfect!" They also say, that there are no visual differences between products. In addition, CityStoneDesign has seen a radical decrease in complaints and also in efflorescence, but it will be possible to notice in longer period of time.

Economics of curing

CityStoneDesign sees a 5% to 10% reduction in cement costs and in their point of view they are not yet at the end of the investigations. They see the opportunity to replace Portland cement with supplemental cementitious materials such as blast furnace slag and fly ash. "This not only helps reduce our costs, but helps us to prevent efflorescence. In terms of operating cost, we are using propane gas and we see the cost between €0.03 and €0.05 per square meter of product. When we calculate the numbers, we are confident that we have made the right choice, especially when we see the tangible and intangible savings", calculates Peter Bozek.

He has known Kraft since the 1990's when they introduced the vapor curing system and he was well aware of their professional reputation in the field of concrete curing. Mr. Bozek has worked with Kraft's local sales manager, Jan Kania, for 20 years and felt comfortable working with him: "To some extend the price is important, but if the system is crucial to so many important factors, the price doesn't play the main role. We feel we made a good decision as Kraft did a particular good effort to finish the installation very fast due to the beginning of the production season".

CityStoneDesign plans to invest in a second Quadrix System in the near future. That goes along with their strategy of improvement and leading the market in terms of design and quality. "Such system should be our corporate standard if we want to keep the leader's position on the market. I think, that this is the typical problem of the "last mile issue". If you made the whole communication network, you cannot save on the connections to the final customers. The curing chamber is crucial for the quality. There should be no space for any technological problems at this point", concludes Peter Bozek.

FURTHER INFORMATION

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CITYSTONEDESIGN®

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Installation of steel frame and insulation panels for insulation wall between the production and curing areas.

Installation of insulation panels around the elevator prior to completion of trim work. The insulation of the wall requires a total of 5 working days.