

Kraft Curing Systems GmbH, 49699 Lindern, Germany

## Kilsaran Group invests in new curing technology

To keep up with market demand for high quality products, Kilsaran Group (located in Dublin, Ireland) opted for Kraft's Quadrix® Accelerated Concrete Curing Systems to get the job done. Kraft specially designed two curing systems, providing high early strength that matched that of three week, air cured concrete. Doing so allowed Kilsaran to double shift its existing manufacturing plants, reduce operating costs, increase color uniformity and reduce cement consumption (when compared to other existing facilities). According to Declan McCartney, Director of Projects at Kilsaran Group, "It was a no-brainer."

In 2007, Kilsaran Group designed and built one of the most progressive and efficient concrete product manufacturing facilities in the world. Working together with the Topwerk Group and incorporating the high output of the Hess RH 1500 concrete block paving machine, Kilsaran made a bold decision by incorporating the renowned SR Schindler processing line in to the dry side of their facility. This value-added processing equipment gave Kilsaran the ability to cure their block within 24 hours and process in a number of ways, including shot blasting, curling, grinding and splitting before packaging them and either storing in the yard or for immediate shipment to their valued customers.

When it came to curing, Kilsaran then chose Kraft Curing's Quadrix® System to obtain consistent control of curing temperature and relative humidity, providing high early strengths, prevention of efflorescence, reduced cement consumption and low operating costs.

The plant, opened in May 2008, was a complete success and began producing a range of high quality landscaping products right away, thanks to Kraft's dedication to Kilsaran's success! Visitors would marvel at the high production rate and were amazed by the variety of value added processing capabilities, thanks to the Quadrix System curing away behind the well-insulated walls of the curing chamber.

Fast forward to 2014: Kilsaran survived a rough and difficult economic climate after having steadily gained market share throughout the United Kingdom. The increased demand for superior concrete landscaping products brought them right back to Kraft. While Kilsaran's two Hess production plants were furnished with curing equipment, they wanted something that would provide consistent temperature and humidity control and knew that Kraft's



*Before: picture of transfer car area taken from beside the elevator*





Before: transfer car area – elevator & lowerator



After: picture of insulated transfer car area, air circulation & warm air supply

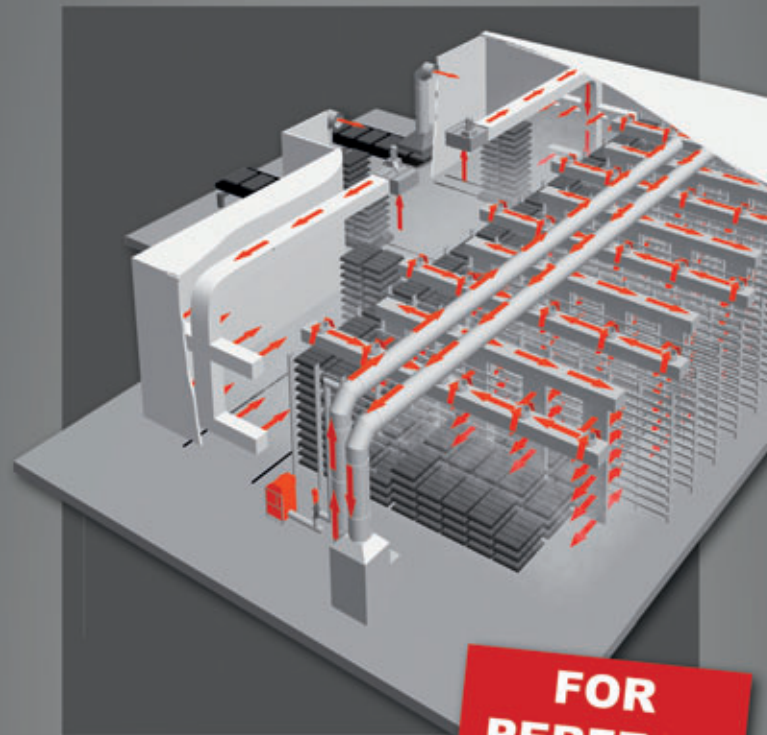
machines could deliver. "With one each very productive Hess RH 1500 and 1200 block paving machines, the lack of proper curing was preventing us from operating at full capacity as well as serving our customers," explained Director of Production, Sean Brady. They knew they needed to work with a team of experts who were on the front of curing technology.

With an extraordinarily ambitious installation schedule, one challenge remained. Kilsaran's existing enclosures and curing systems would need to be removed from the two Hess plants prior to the 2014 / 2015 winter holidays, leaving Kraft with only 33 days to install two insulated enclosures around the racks, transfer car, elevator and lowerator areas and two Quadrix systems. Both plants had to be operational by February 2, 2015.

With this schedule in mind, Kilsaran turned over a site that was completely organized and clean without a sign that demolition had ever

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*Before: transfer car area with building insulation & roller doors*



*After: insulated walls and ceiling, air circulation & lighting*

even taken place in just under three weeks. Kraft's two teams of 20 total installers completed the mechanical installation of the complete insulation and curing systems for both plants in just three weeks! Electrical installation and commissioning were completed by February 2<sup>nd</sup> and production commenced on time with product going in to the newly renovated curing chambers in a complete and consistent atmosphere. "We had our share of worries that the schedule was just a bit too ambitious compared to the amount of work that needed to

be completed. We are very proud of our people who worked to clear the site prior to Kraft's arrival. Kraft provided a Project Manager for the complete product who was available for pre-installation meetings to discuss scheduling and manpower. During the job, there were a total of four, working project supervisors on site managing the critical phases of installation. Everyone kept on schedule and the project was completed on time. We are extremely pleased with the results." - Declan McCartney, Kilsaran Group.

Engineered and refined by Kraft, each Quadrix System operates at the Kilsaran facilities by maintaining 35°C in the curing chambers with a fixed relative humidity level per the requirement of the products being produced. The heart of the Quadrix System is the stainless steel AHCU (Air Heating and Circulation Unit) with air circulation that pulls from the top of the chamber, heats it as required (maintaining the 35°C) and supplies the air back through hundreds of openings throughout the chamber.



## The dosing experts!

Humidity control is supplied by the moisture fogging system and an exhaust unit that a) provides moisture when humidity is below the set point or b) removes moisture when the humidity is too high. In addition, a series of axial circulation ventilators (specially designed for the hot and humid climate inside the curing chamber) are located in the transfer car area and provide for air circulation as well as elimination of condensation and fog.

Kraft designed their air distribution system with hundreds of adjustable openings located throughout the curing chamber for the supply and return of the air. The openings are adjusted by a Kraft service technician when they commission the equipment and, once they have the +/- 1 °C temperature consistency, the openings are locked into place not to be touched again. When the system is running



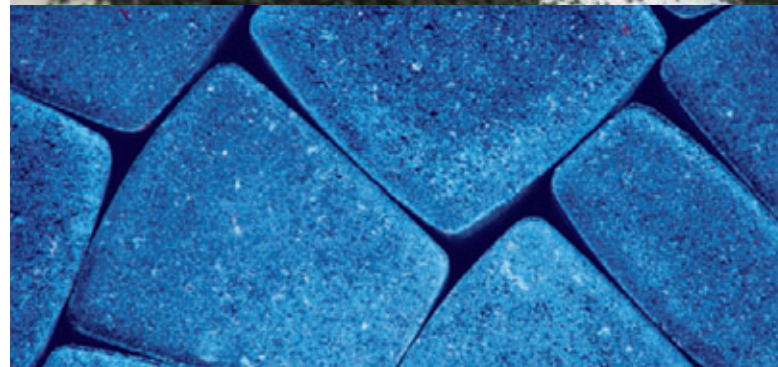
Before: elevator & lowerator area with raised maintenance platforms



After: elevator & lowerator enclosed with insulation panels during construction. Space for raised maintenance platforms and equipment door for access



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*Before: oversized air heating unit, "insulated" with foil coated fibreglass wool and mounted with chicken wire. Insulation panels on chamber were leaking and joints (connection between walls and ceiling panels) were not sealed.*



*After: stainless steel finished and insulated air heating unit with aluminum frame - 50% less heating capacity than previous model. GFK (glass fibre coated - inside and outside walls) duct with 50 mm Polyiso insulation. Tongue and groove construction with stainless steel compression bands at all joints. Insulation panels on chamber walls and ceiling tongue and groove design with sealed u-channel at the floor and insulated and sealed joints.*

(24/7) you can feel a very slight movement of air throughout the racks system. There is no hurricane force wind in one area and complete stillness in another. Bringing the operation together, Kraft's electrical engineer, Phillip Ennulat, de-

signed and built the Kraft AutoCure® Automated Control system, operated on a Siemens S7 platform. This system acts as the brain of the operation and provides:

- Precise temperature and humidity measurement

- Operational hours for burner and humidity control (indicating system's fuel consumption)
- Real-time graphing functions on a color touch screen



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- Operational status indication of the heating and circulation
- Visual graph showing temperature and humidity over 48 hours
- Operational status indication of heating and circulation systems
- Password protected network connection to allow for sharing of all curing data

When asked about the precision and unique abilities of the Kraft Curing System, Sean Brady's response was clear: "The results on the concrete have proven to be exceptional. The decision to purchase another Kraft unit was a crucial factor in the success of Kilsaran's production as Kilsaran was confident in the technology advantage and reliability of Kraft Curing Systems."

### Plant & Equipment Improvements

1. Efficient curing due to complete "Single Atmosphere"/ "Big Box" solution (includes transfer car area, elevator and lowerator for retaining heat and moisture).
2. Elimination of maintenance intensive motorized roller-shutter doors.
3. Complete dry enclosure, even at 90% relative humidity (single atmosphere prevents condensation, downtime on plant and equipment operating chamber)
4. Replacement of light sensors with lasers and heated reflectors reduced additional downtime.
5. Energy costs reduced by 30% over the previous curing system.

### Concrete Product Improvements

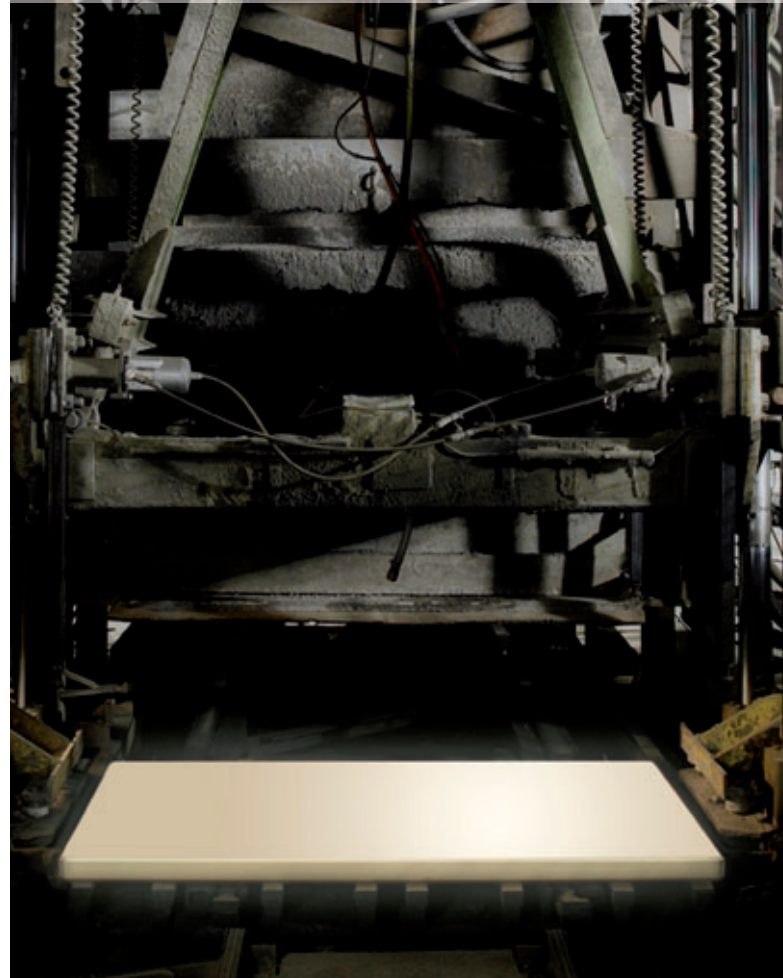
1. Higher early strengths allowing the plants the ability to operate two shifts per day.
2. Concrete products appear more uniform in strength and color due to the temperature consistency.
3. No signs of primary efflorescence, prevented by consistent relative humidity under 100%.
4. Little to no signs of damage during handling and cubing due to harder product.
5. Better cured product offers more protection against secondary efflorescence.

#### FURTHER INFORMATION



Kraft Curing Systems GmbH  
Muehlenberg 2  
49699 Lindern, Germany  
T +49 5957 96120  
F +49 5957 961210  
[info@kraftcuring.com](mailto:info@kraftcuring.com)  
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