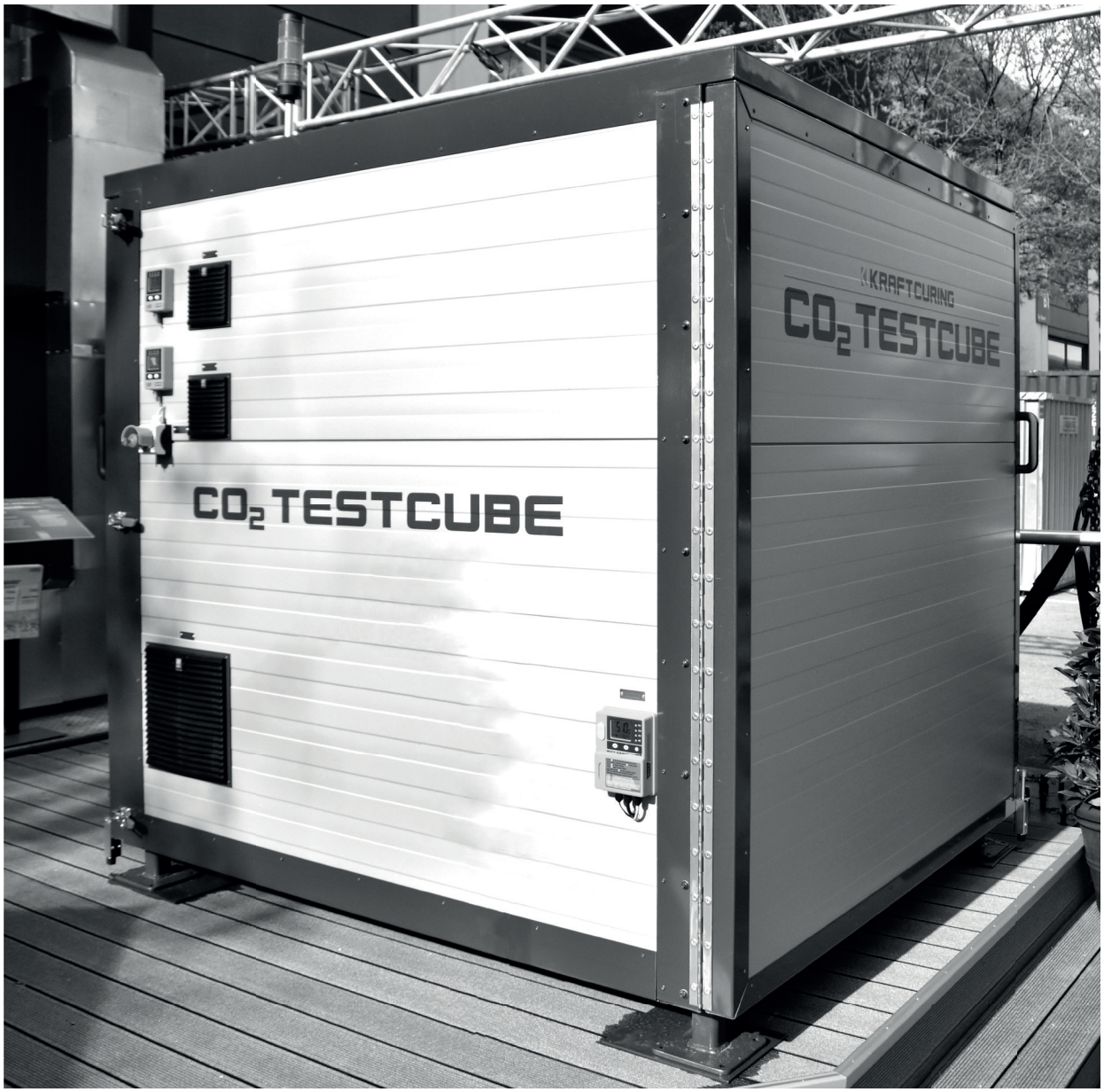
KRAFT CURING

THE CONCRETE CURING SPECIALISTS

WHEN QUALITY
ISN'T AN OPTION!

CO_2 TESTCUBE



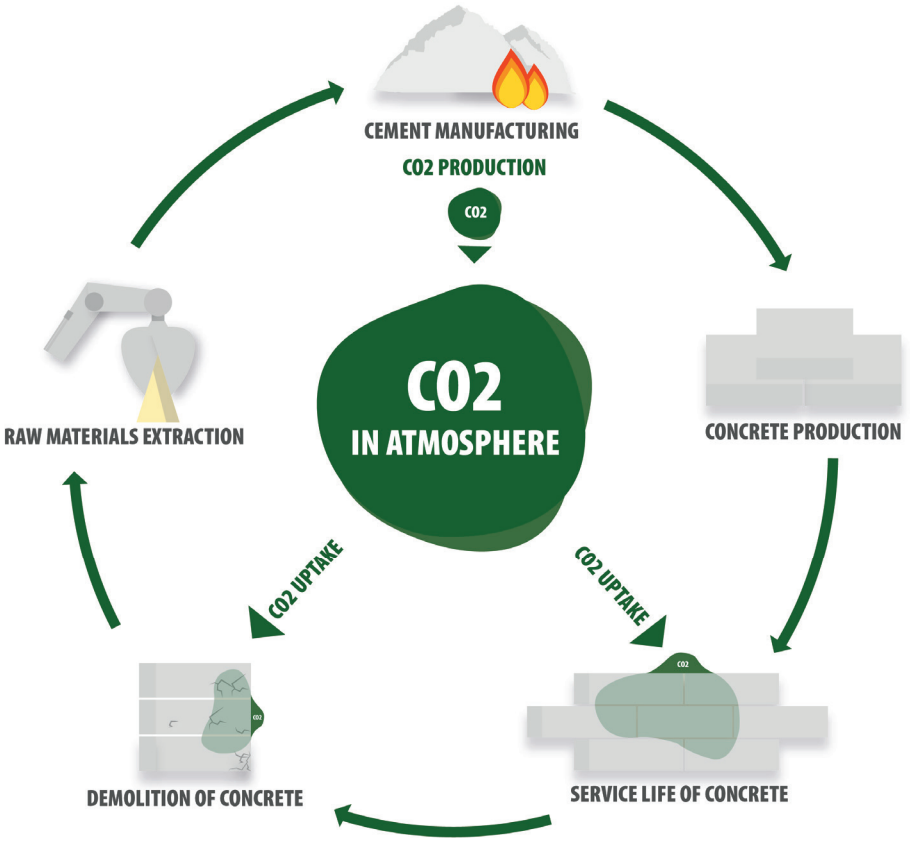
VERSION 01.23

ASCERTAIN THE CARBON SEQUESTRATION POTENTIAL OF YOUR CONCRETE PRODUCTS


OVATION COMES TO LIFE
ACKS WITH QUADRIX®
Halle Hall
KRAFT CURING
CO2 TESTCUBE
CO2
CONTROL
CABINET
CO2
TANK

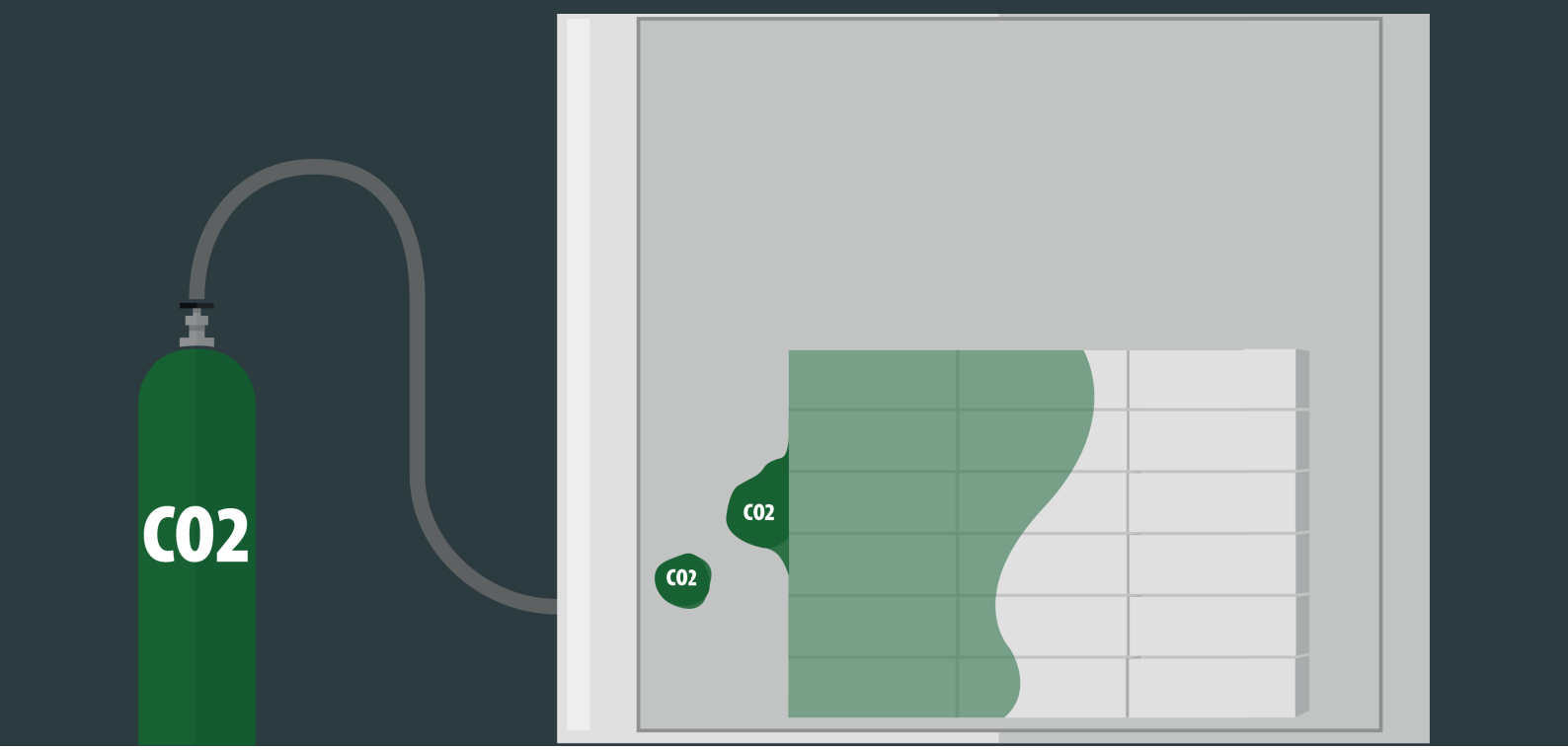
THE FUTURE OF CONCRETE CURING.

The cement industry is one of the two largest producers of carbon dioxide (CO_2), creating up to 8% of worldwide man-made emissions of this gas. If cement was a country, it would rank number 3 in carbon emissions globally. Fortunately during its service life, concrete acts as a sponge, taking in large amounts of CO_2 from the atmosphere.



When CO_2 is introduced into a controlled concrete curing environment within a chamber at the early stages of curing it is called curing carbonation.
Curing carbonation is part of an accelerated curing process that injects carbon dioxide into the chamber, where the concrete elements are cured. The CO_2 is absorbed in the fresh concrete under low pressure.

The TestCube is a test chamber that allows you to experiment with heat, relative humidity, and CO_2 concentration. Available to rent or purchase, the TestCube allows hardscape producers to determine how much CO_2 each product can absorb.



ASCERTAINING CARBON SEQUESTRATION POTENTIAL.

To test the carbon sequestration potential of concrete, Kraft Curing has run experiments in a single atmosphere curing chamber holding in which concrete pavers were being produced.

The experiment production took place in a chamber holding about 6000 pallets and producing 20 hours per day at 180 pallets of fresh concrete per hour. For around 3600 pallets of fresh concrete, approximately 10 tons of CO_2 were being consumed per day at a CO_2 concentration in the chamber of 0,5%. The atmospheric air has a CO_2 concentration of 0,04%. This process of introducing CO_2 at the early stages of curing is called **curing carbonation**.

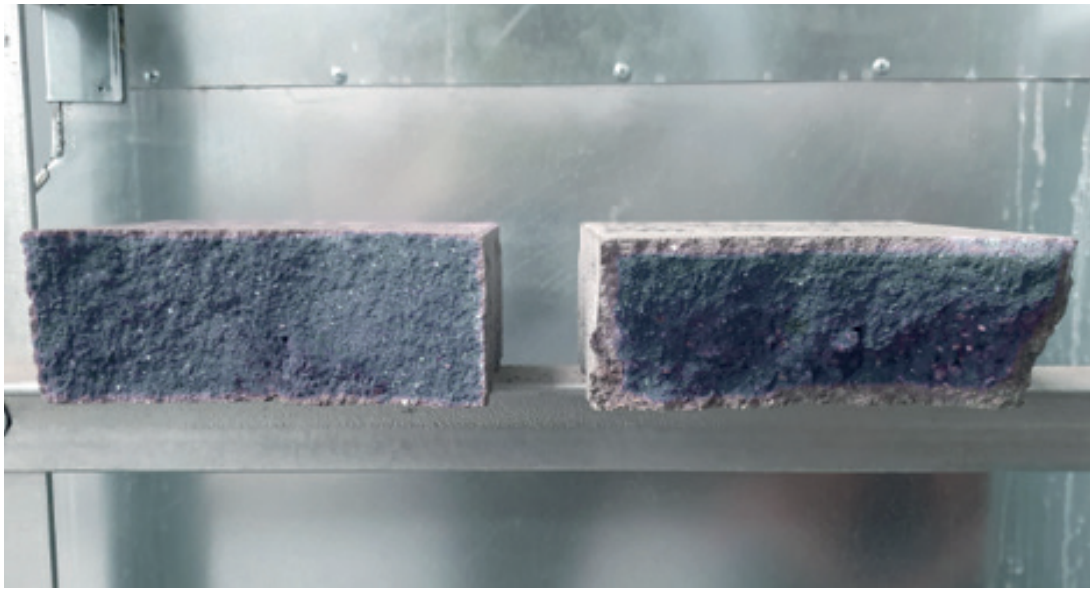
CURING CARBONATION.

During curing carbonation, the CSH-gel in concrete and the products of hydration react with CO_2 , which increase the production of calcium carbonate in the capillaries at and near the surface of concrete products.

A benefit of this method is the formation of the compound $CaCO_3$, which creates a less permeable, denser surface with harder corners and edges. It also prevents water from being absorbed into and absorbing out of the concrete so that no efflorescence occurs.

CO_2 absorption can be tested with the use of a diluted Thymolphthalein solution, which, when in contact with high pH levels, turns blue.

- **No efflorescence due to lack of water condensating out of product**
- **Denser surface with harder corners and edges**
- **Reduces the company carbon footprint through the use of captured CO_2**



Visible here, through use of the Thymolphtalein solution, CO_2 has penetrated further into the right concrete paver.

The concrete curing chamber has room for 6 production boards and is equipped with CO2, humidity, and temperature sensors.

THE TESTCUBE.

CO_2 sensors show CO_2 levels in the equipment room and concrete curing chamber

The TestCube is a new test chamber developed for a few pallets of concrete. It allows you to experiment with heat up to 60°C (140°F), between 40% and 100% rH, and a CO_2 concentration from 0,04% to 80%.

A TestCube can either be purchased or rented to determine how much CO_2 concrete products can absorb, and allowing you to obtain an overview of energy production. A consumption meter on the CO_2 supply can test for example: 24 hours at 40°C (104°F) at 95% rH and 3% CO_2 concentration and determine the absorption per pallet or per block. This TestCube is a smaller, more capable and CO_2 able version of the Kraft Testainer. It is simple to use and move, requiring less space and is more cost-effective to purchase. The mobile unit is simple to operate and allows you to test in any concrete factory.

FEATURES.

The TestCube contains two compartments - the equipment room and the curing chamber. The concrete curing chamber has room for 6 production boards and is equipped with CO_2, humidity, and temperature sensors. The sensors allow for monitoring of these factors through the sensors located outside of the chamber and also through use of the AutoCure® PLC - which allows for a fully automatic and repeatable curing process. When working with CO_2 , certain precautionary measures should be taken to ensure the safety of any personell working with the TestCube. The door to the curing chamber is equipped with safety locks, which lock the doors when the CO_2 levels go above 400 ppm.

The equipment room is fitted with a miniaturized curing system - equipped with humidification (Kraft Curing AutoFog®), air circulation, electric heating and CO_2 control. The equipment room also includes the insulated ducting and gas line.

Safety Lock on curing chamber door

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