

SMART^{therm}

BY LAFARGE

LAFARGE DIGITAL CONCRETE SMARTSERVICES

ENABLING THE FUTURE OF CONSTRUCTION



GLOBAL LEADER IN INNOVATIVE AND
SUSTAINABLE BUILDING SOLUTIONS



PREDICTIVE TEMPERATURE SIMULATION IN MASS CONCRETE ELEMENTS

SMARTherm by Lafarge allows you to simulate the temperature of large concrete elements, to optimize concrete mixes to avoid risks from heat of hydration without real-size tests.

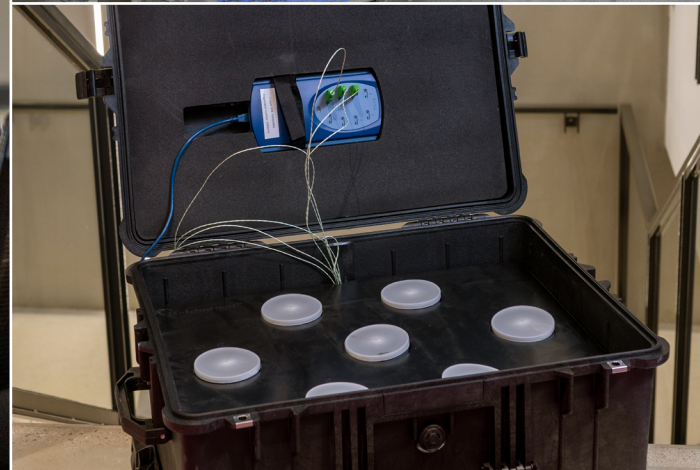
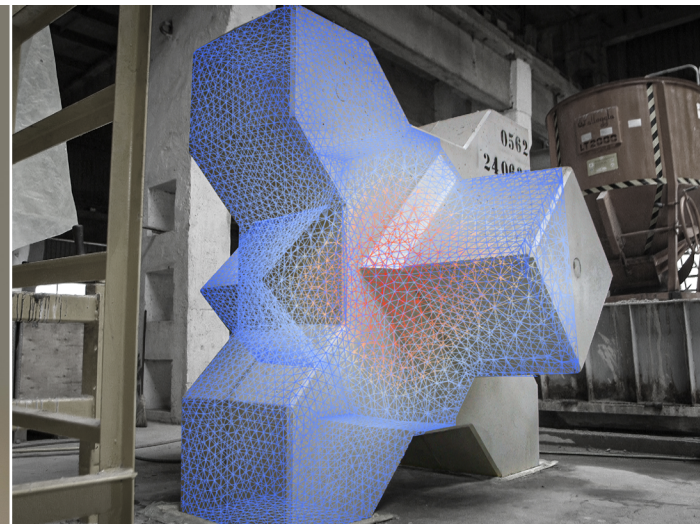
THE CHALLENGE: SIMULATING CONCRETE CURING TEMPERATURES

Testing and verifying curing temperatures for large concrete elements is a complex and time-consuming endeavor. Yet assessing the temperatures levels and temperature gradients that develop when building large concrete elements is crucial to avoid potential issues related to heat of hydration. To ensure attainment of temperature specifications and avoid exceeding critical heat levels, real-size mockups are a often used to test various concrete mix designs. This method, however, is expensive, time-consuming and can lead to considerable amounts of waste.

THE DIGITAL SOLUTION: SMARTHERM BY LAFARGE

With SMARTherm Lafarge offers you a digital simulation of the concrete temperature during curing. The characterization of the heat of hydration can be performed for several concrete

mix designs simultaneously, leading to considerable time savings. Furthermore, several simulation can be performed to anticipate and account for varying environmental conditions during curing. Depending on the complexity of the geometry of the concrete element, the simulation can be two- or three-dimensional. No matter how challenging the concrete application, you will get an precise simulation of the temperature development of your concrete elements, allowing you to choose the best concrete mix design to adhere to temperature specifications, while reducing waste and cost.



BENEFITS



REDUCE COSTS

No waste for potential real-size mockup to test temperatures in mass concrete elements



REDUCE RISKS

Less problems related to heat of hydration, e.g. crack formation or early freezing



OPTIMIZE MIX DESIGNS

Finding the best mix to comply with all temperature specifications whilst minimizing costs.

TARGET APPLICATIONS



Raft foundations



Windfarm foundations



Dams



Bored piles



Mass structural elements, such as bridge beams, pile caps and bases

HOW IT WORKS

The work of Lafarge experts includes the following steps:

1



Characterize the binder's heat of hydration.

2



Based on the binder's heat of hydration, derive the specific «thermal fingerprint» of the concrete mix.

3



The experts from Lafarge will run a virtual, digitized simulation of the temperature development in your mass elements. These simulations can encompass different concrete mix designs and boundary conditions.

4



Depending of the complexity of the element and project to be assessed, both two-dimensional or three-dimensional assessment can be conducted.

5

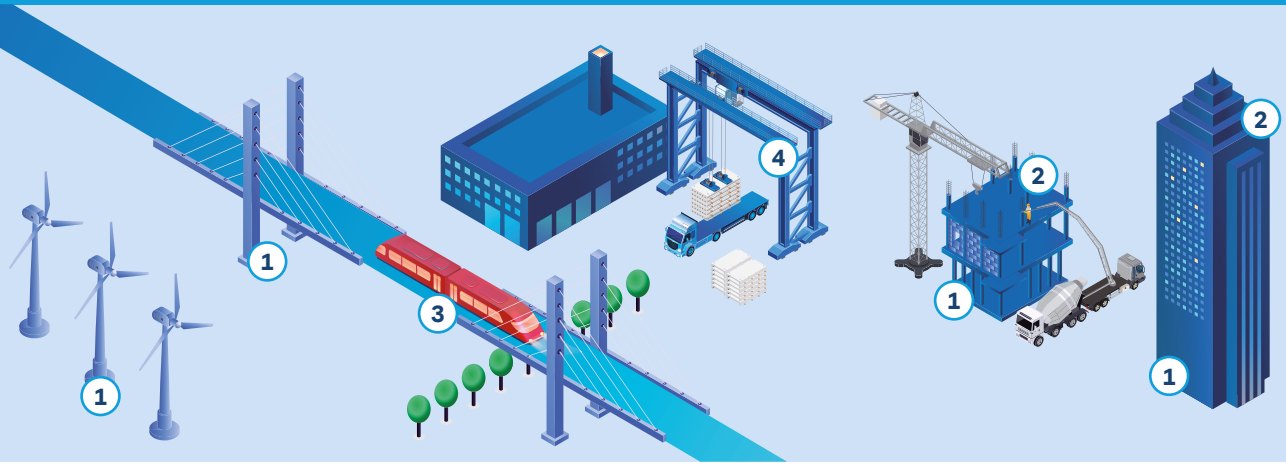


All results are summarized in an easy-to-read, comprehensive report

LAFARGE DIGITAL CONCRETE SMARTSERVICES FOR YOUR CONSTRUCTION PROJECTS

With the digital concrete services, Lafarge supports you from concept to completion of your construction endeavors. Our solutions improve the construction process from the design of your concrete applications, to the off-site manufacturing of any concrete components, to the usage of concrete on the construction site. Our services benefits from Lafarge's expert knowledge from the most extensive network of concrete operations in the world, as well as the largest concrete research laboratory in the industry. We will help you complete your projects on time, cost-effectively, sustainably and to a high standard of quality.

LET US SUPPORT YOUR CONSTRUCTION PROJECT DIGITALLY!



	SMARTCast by Lafarge	SMARTFlow by Lafarge	SMARTTherm by Lafarge
1 Foundations	<p>■</p> <p>Monitor temperatures in real time, to be alert to heat of hydration issues</p>		<p>■</p> <p>Simulate temperature for mass pours, ensure compliance with temperature specs</p>
2 High rise columns, slabs and structural walls	<p>■</p> <p>Monitor strength development in real time, accelerate construction</p>	<p>■</p> <p>Choose the right pumping equipment and concrete mix design for the job</p>	
3 Large spans	<p>■</p> <p>Monitor your casts in real time, to ensure quality, durability, accelerate construction and control your post-tensioning</p>	<p>■</p> <p>Choose the right pumping equipment and concrete mix for pumping over long, horizontal distances</p>	
4 Pre-cast concrete manufacturing	<p>■</p> <p>Accelerate your production process with real-time information</p>		<p>■</p> <p>Simulate temperature for mass pours, ensure compliance with temperature specs</p>

SMARTTherm 130123

LET'S TALK ABOUT YOUR IDEAS

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