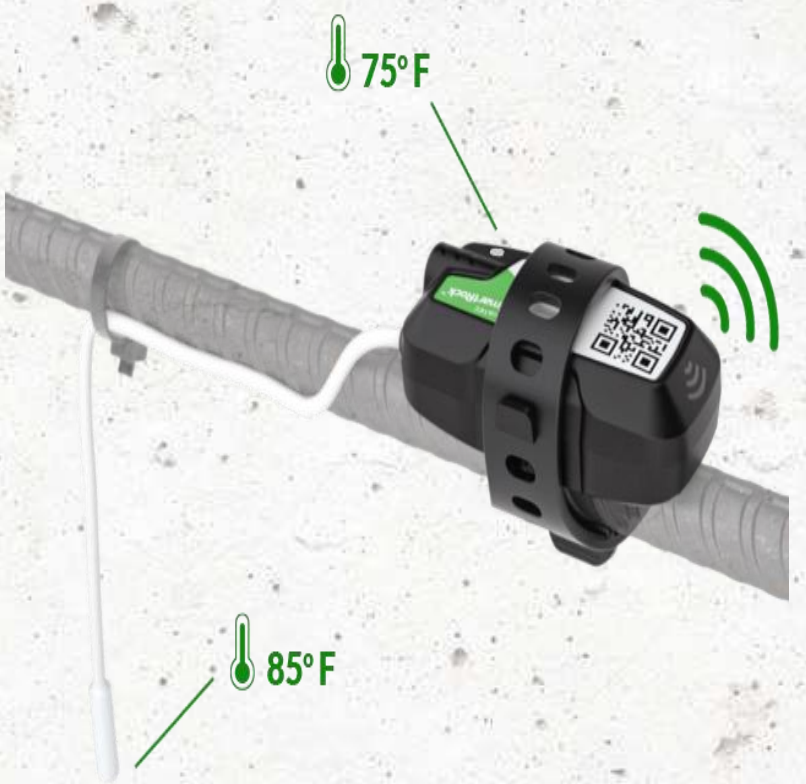
GIATEC
SmartRock™
Revolutionizing the
Construction Industry

Agenda

- Introduction to SmartRock 3 sensor
- Sensor Hardware
- Sensor Activation and Installation
- SmartRock Mobile Application
- Giatec 360
- Maturity and Strength Monitoring

SmartRock 3 sensor

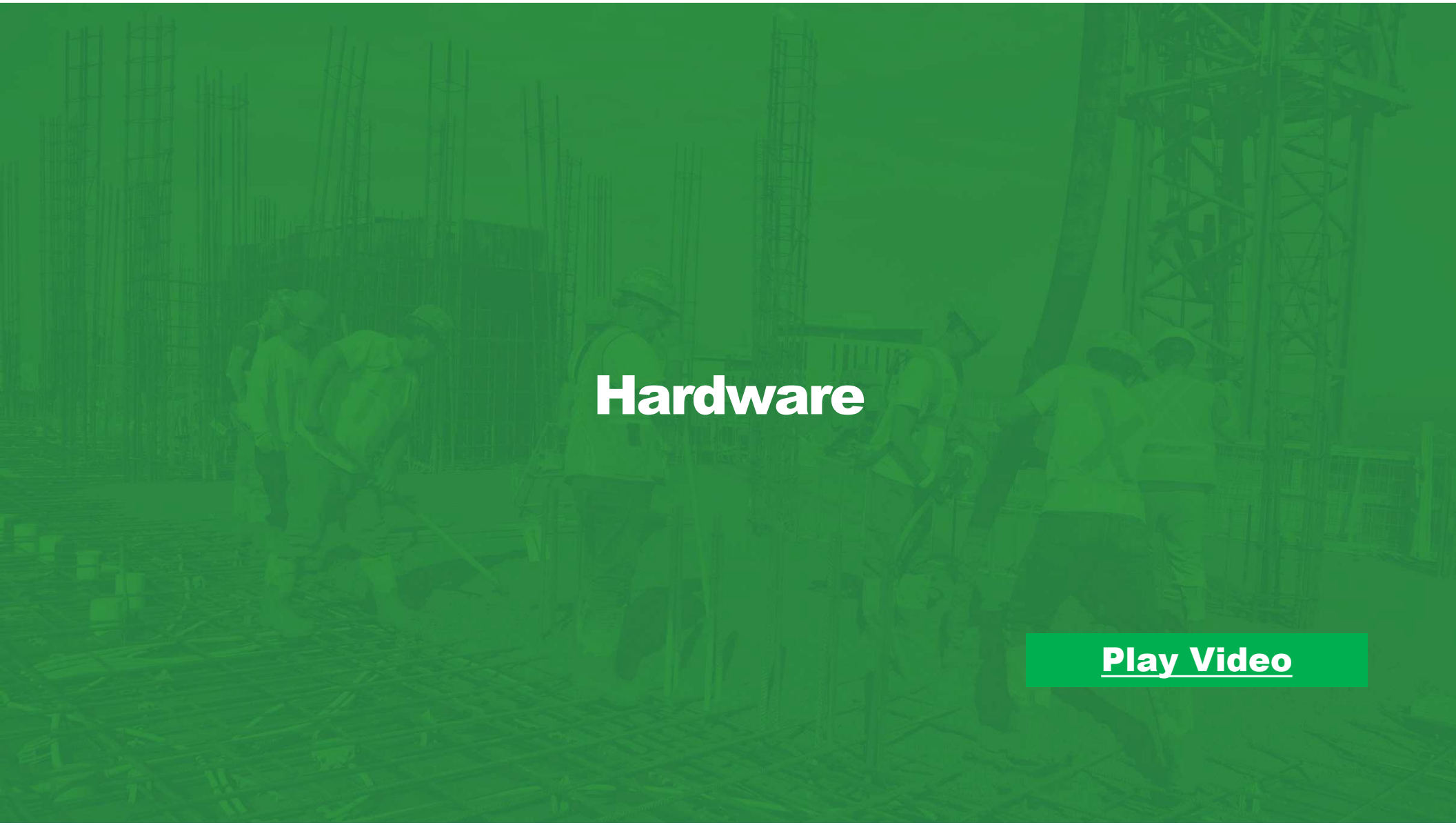
- Real-time temperature monitoring
- Dual-temperature monitoring capabilities
- Wireless and wire-free
- Hassle-free and secure installation
- Easy activation with LED light verification



- Designed to withstand the harshest weather and construction conditions

Features

- Reading Range: -22 to +176°F (-30 to 80°C)
- Accuracy: +- 1.8°F (1°C)
- Measurement Frequency: Every 15 minutes (for 2 months of data)
- Wireless Signal Range:
  - Embedded in concrete: Up to 40 feet or 12 meters
  - Outside concrete: Up to 100 feet or 30 meters
- Temperature Cable Length: 12 inches (30cm) / 10 feet (3m)
- Battery Life: Up to 4 months after installation
- Memory Life: 60 days


Hardware
Play Video

SmartRock3 Sensor

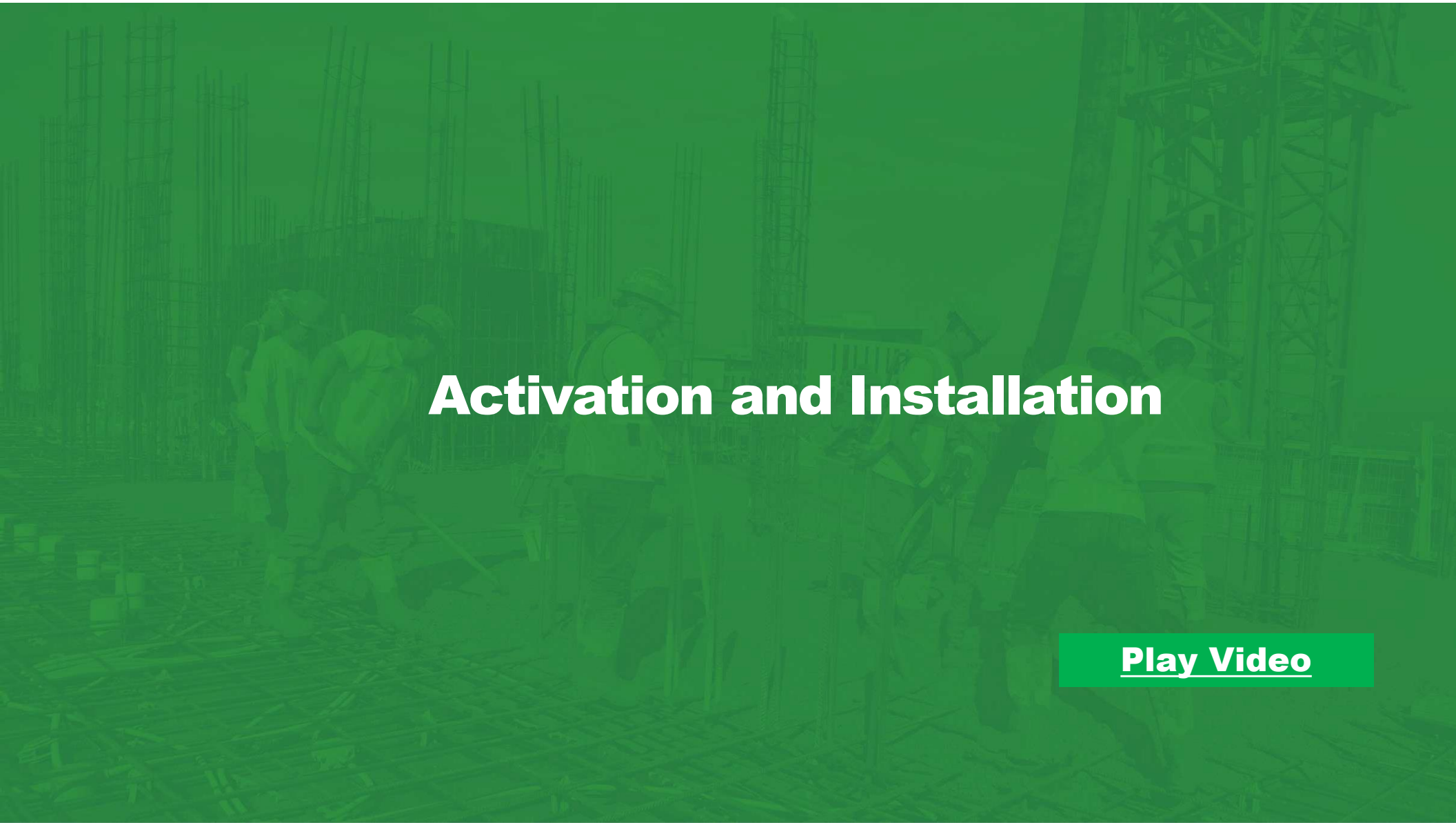
Logger/transmitter: Battery, Bluetooth antenna, memory and secondary temperature sensor

QR Code: Scan QR code to tag the sensor

Temperature Cable: NTC

Activation channel: Pull out probe to activate sensor

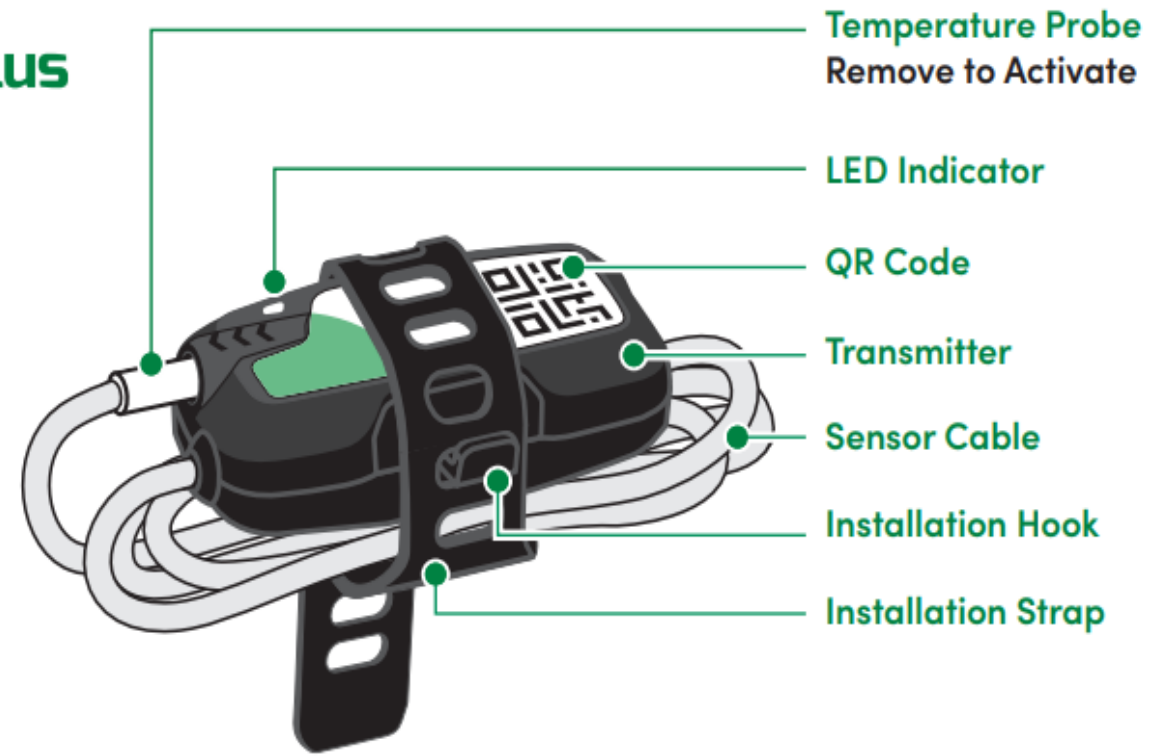
Installation strap: To secure sensor to reinforcement



Activation and Installation

Play Video

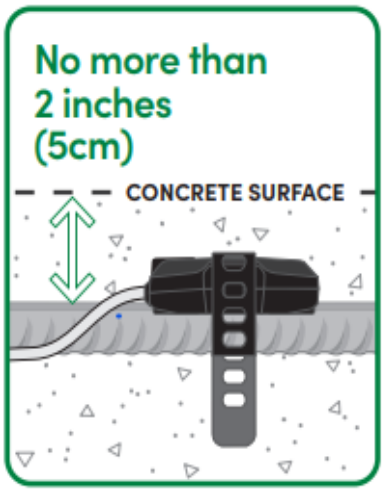
Get started with your SmartRock™ or SmartRock™ Plus sensors in these easy steps



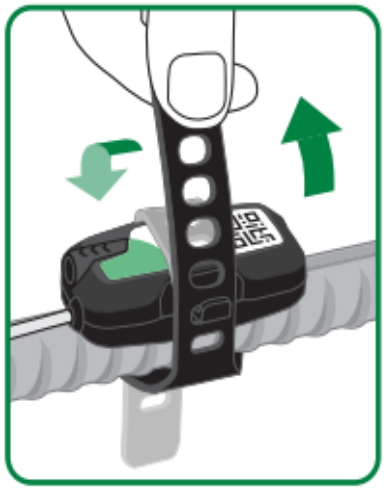
1 Remove the temperature probe from the sensor to activate

2 Add the sensor to your project by scanning the QR Code

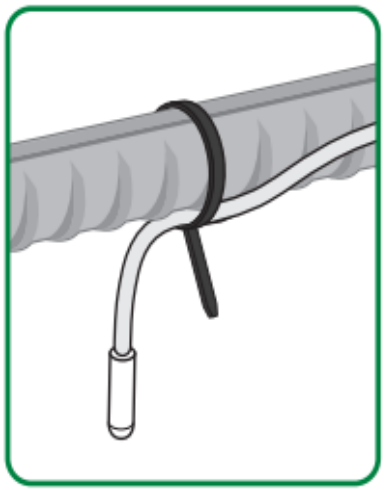
3 Assign the sensor a name in the mobile app and on it's label



4 Install the transmitter on rebar no more than 2 inches (5cm) from concrete surface



5 Pull strap tight over the installation hook and fold remaining strap over



6 Secure the cable and temperature probe below the rebar

7 Pour concrete and monitor results in the mobile app or remotely with SmartHub™

SmartRock

Installation

Install on top of reinforcement using the installation straps

Maximum cover depth of no more than 2 in. (5cm)

Run the temperature cable along the bottom of the rebar using the plastic zip ties provided in the sensor package

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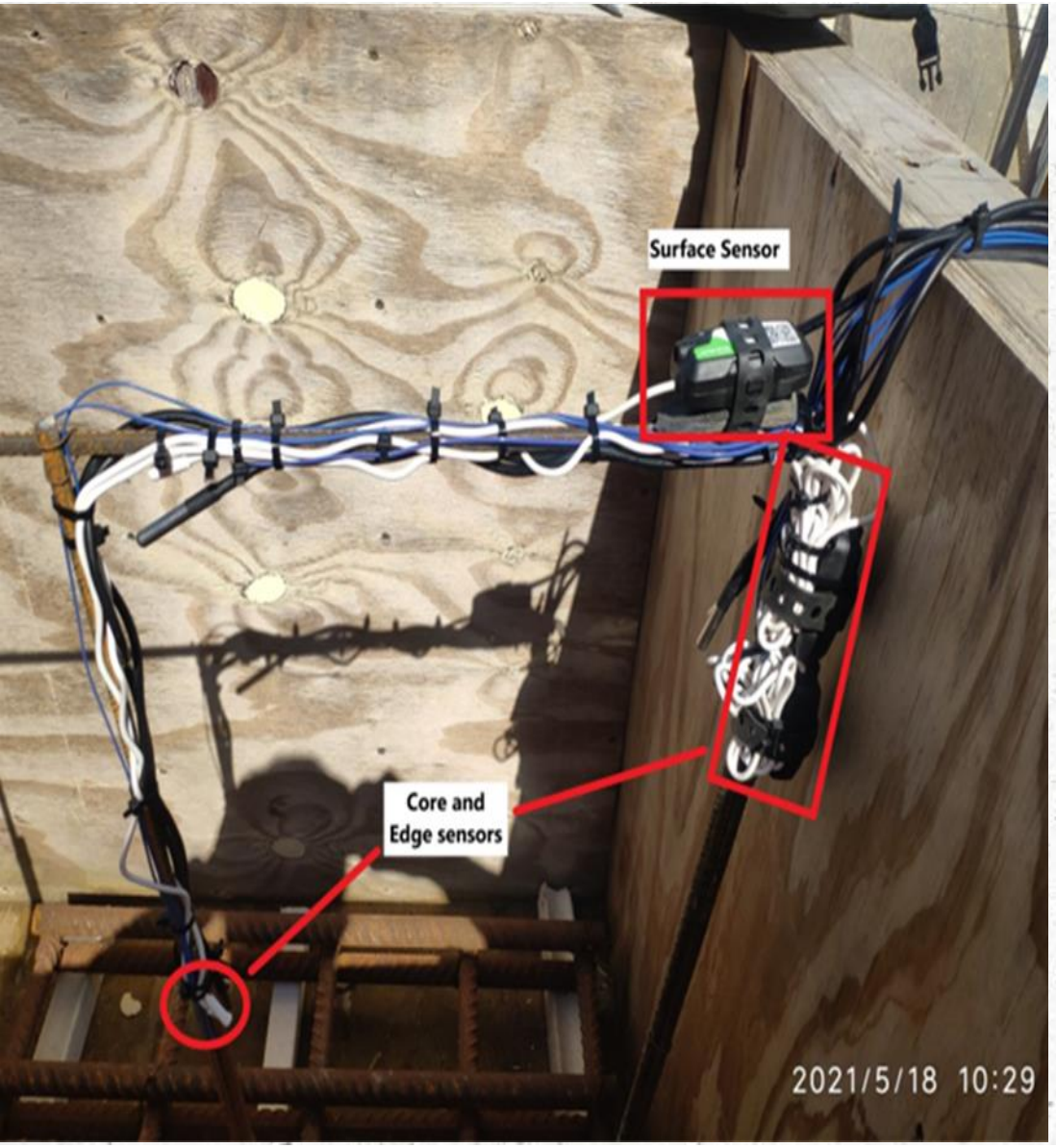
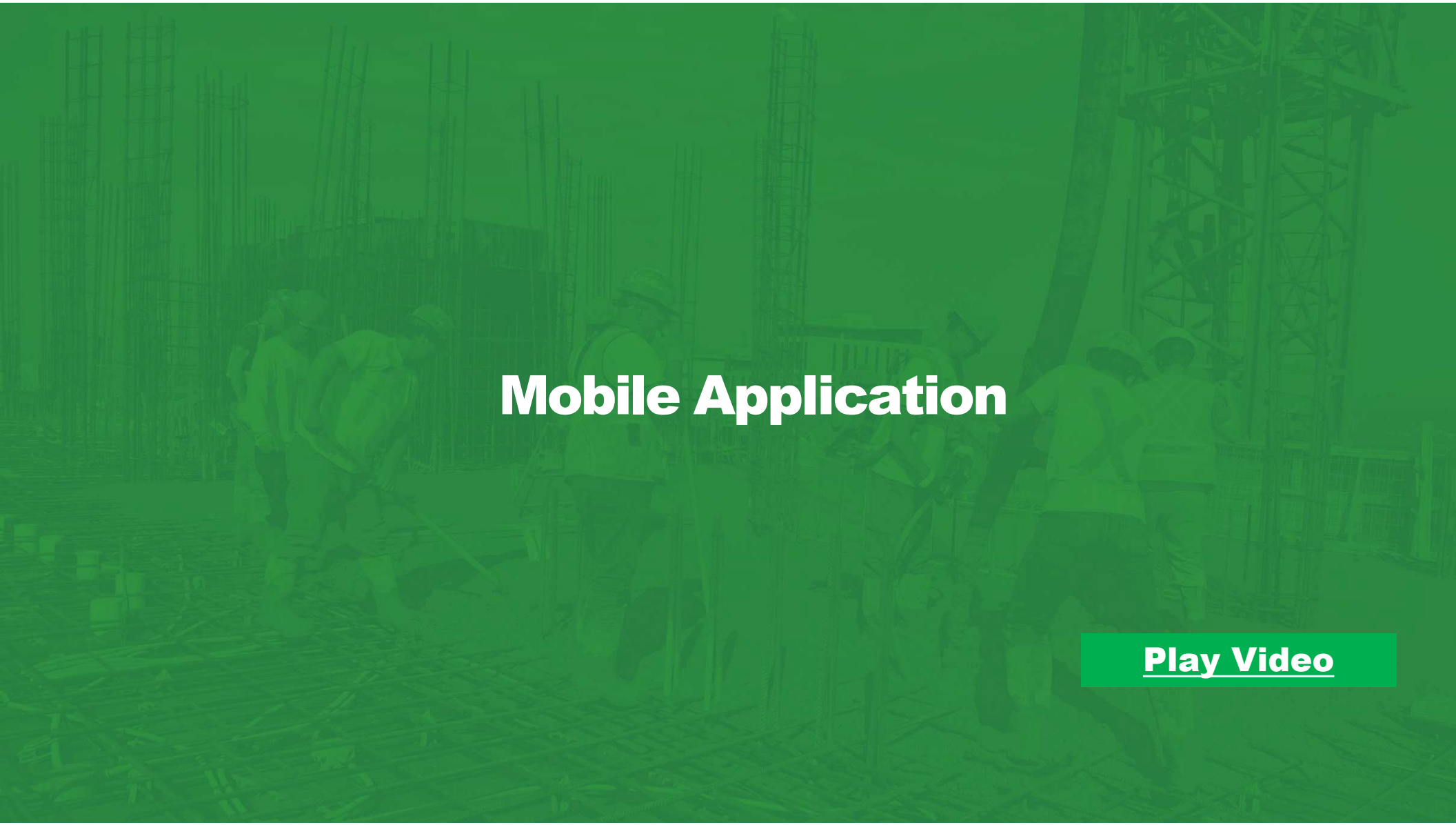


Good Installation

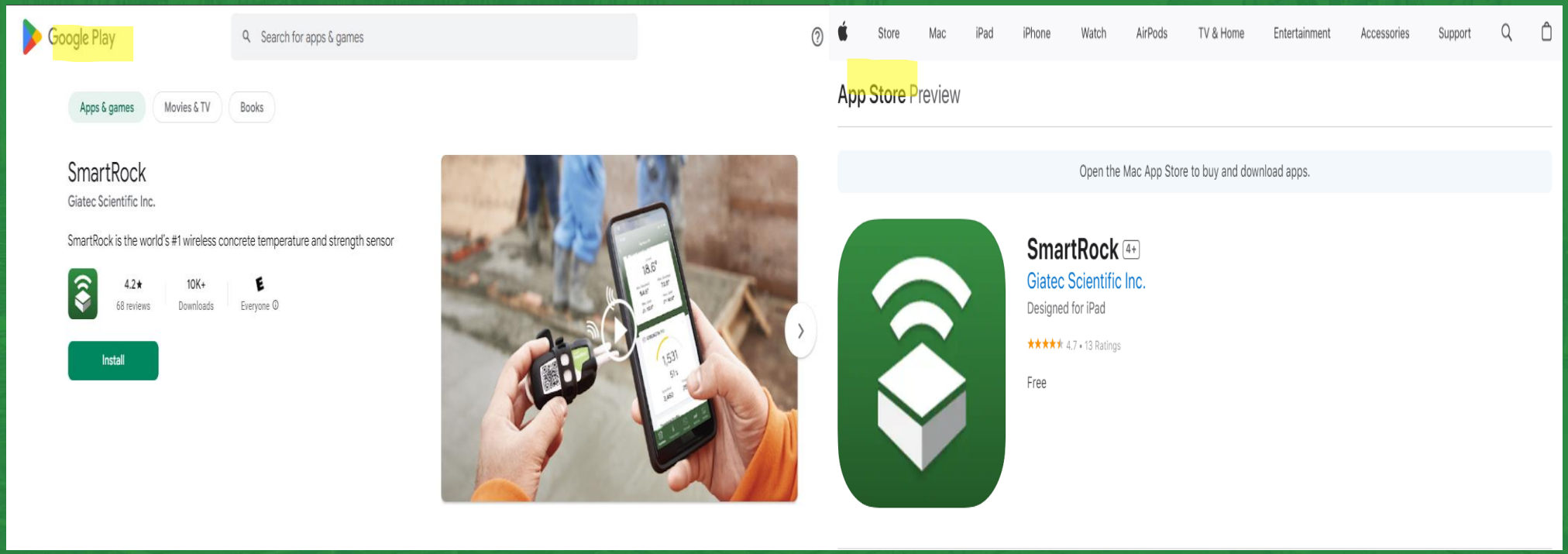
Bad Installation – Cable not securely attached to the rebar



Mobile Application

Play Video

Available on Google Play and App Store



Tagging the sensor

1. **Create Project**
   - Create a project
   - Create sections within the project
2. **Turn on Sensor**
   - Activate sensor by pulling probe from housing
   - Scan & name sensor in the app
3. **Name Sensor**
   - Write the sensor name on the sensors white label
   - Insert probe in the housing
4. **Activate next sensor**
   - Repeat steps 1-3 for each sensor

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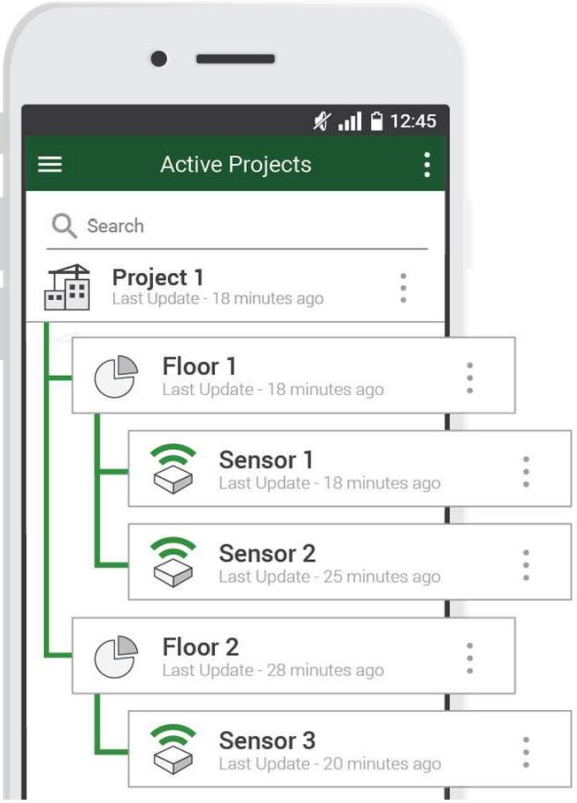
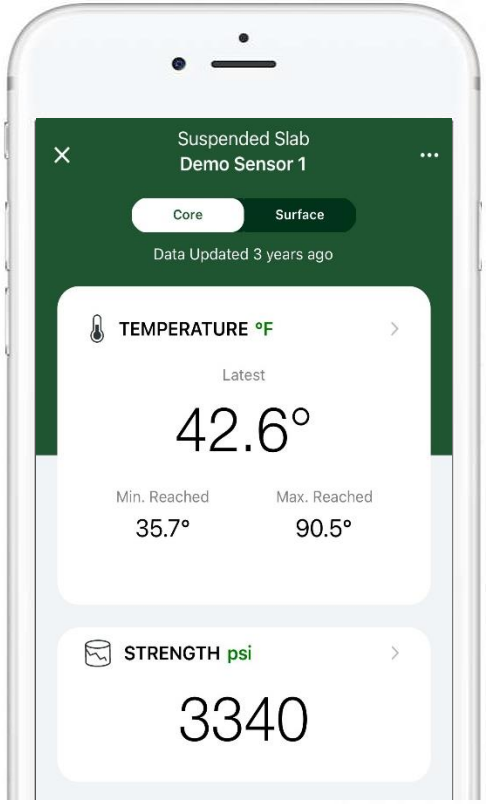
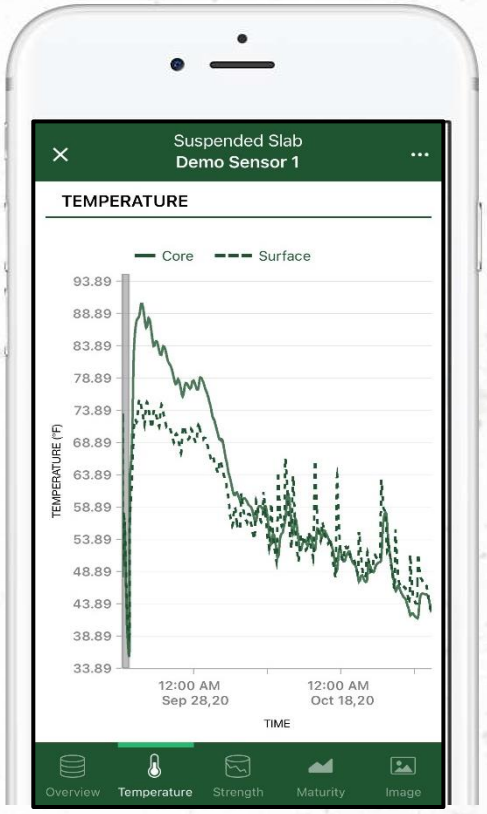
General organization







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Side/Active Menu bar

Switch between multiple company accounts

Alternate way to tag sensors

Create, manage mix, and request producer mixes

Create, and manage thresholds

Invite users, Modify user permission

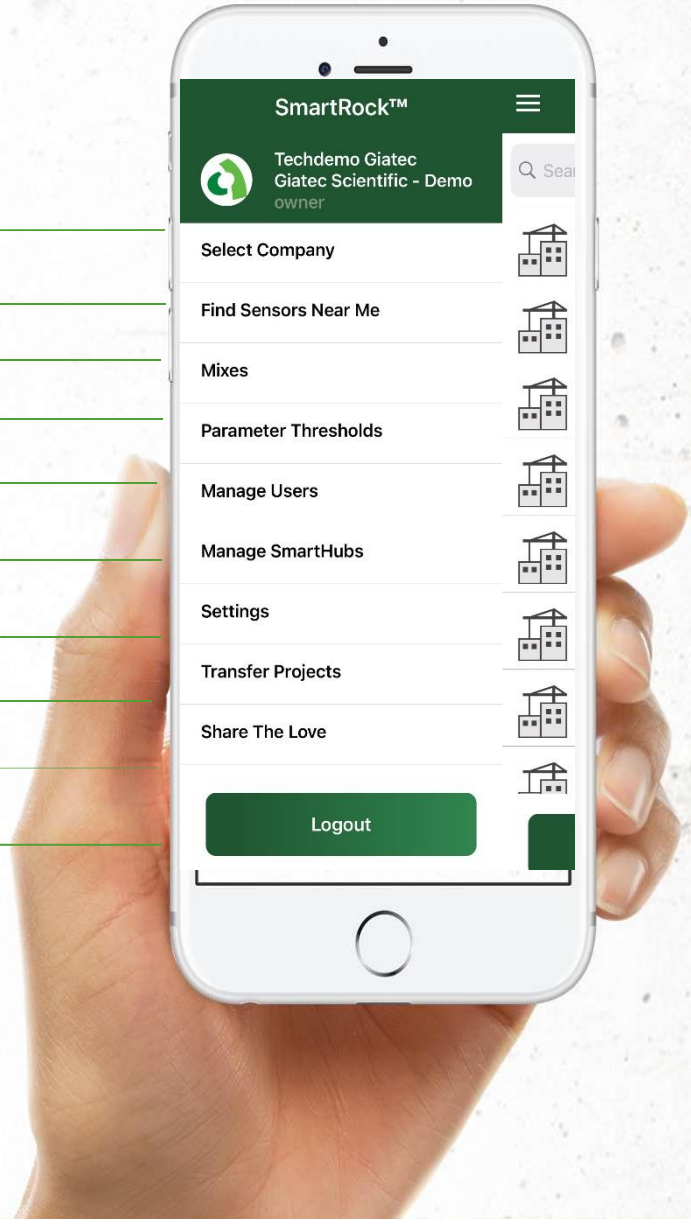
Smart Hub Device Management

To modify the unit system, selecting the sensor type

Transfer projects between accounts

Share a word about the app with colleagues

Log Out of the application



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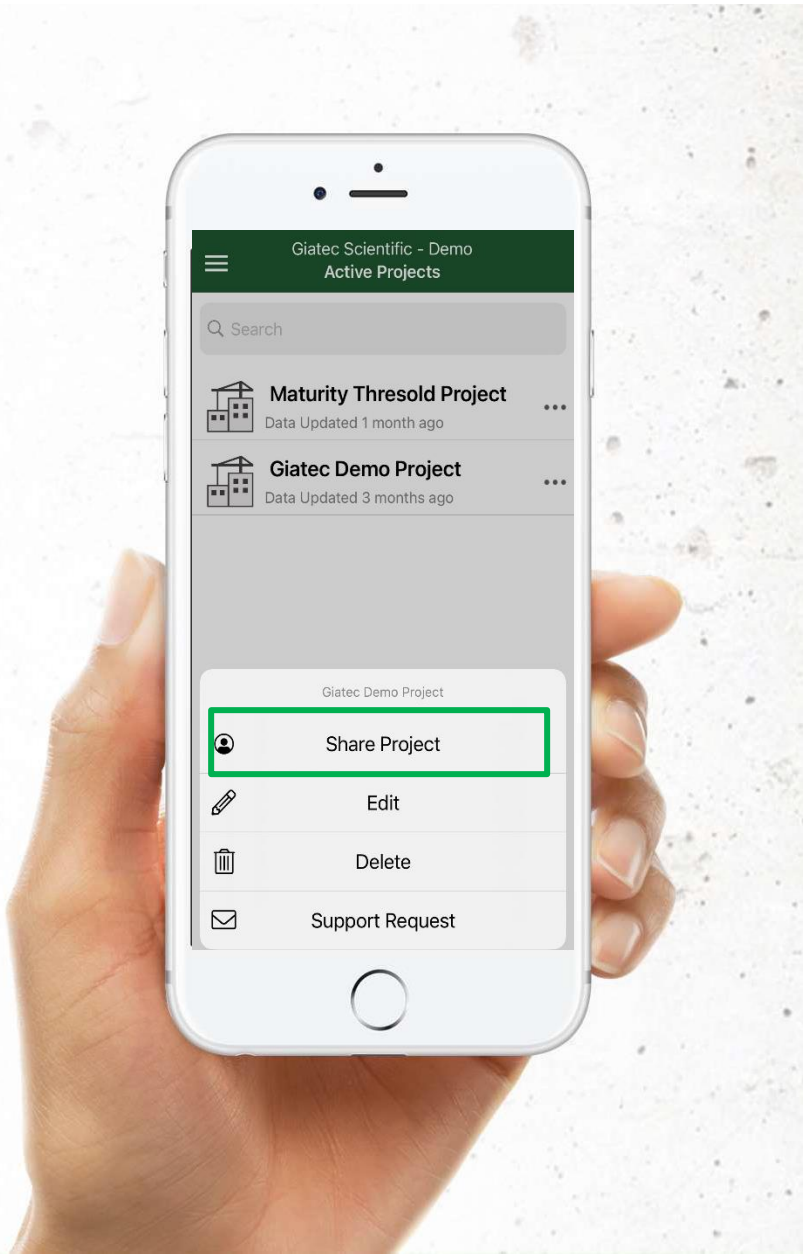
Share Project

Use the “Share Project” option to share the entire project with colleagues.

Once the project is shared, everyone gets the project updates automatically



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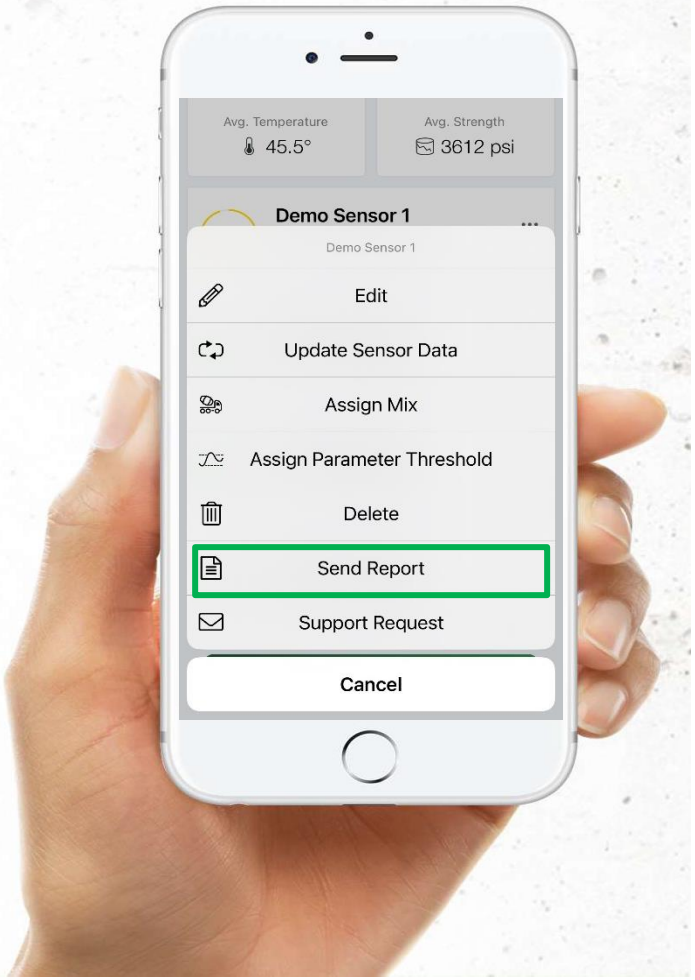
Export sensor data

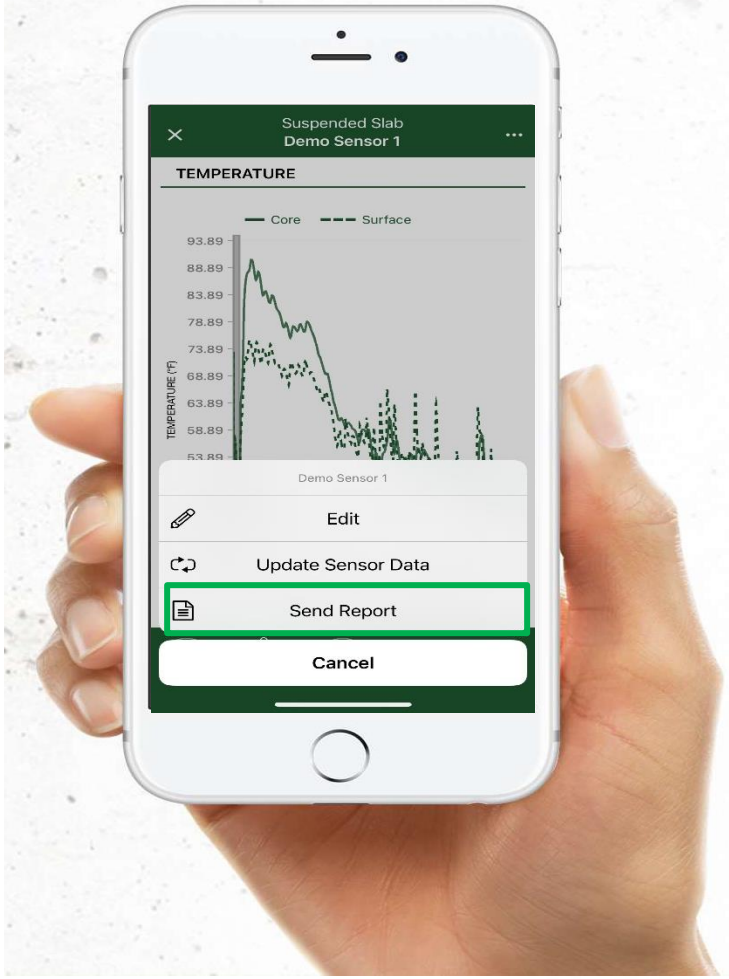
1



1. On the Sensor page, use the “Send Report” option to create PDF and CSV and share them through email with your colleagues.

2. Using the ... dots on the top-right corner of the Temperature, Strength, and Maturity charts, the “Send Report” option will allow the user to create PDF and CSV.

2



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Giatec 360
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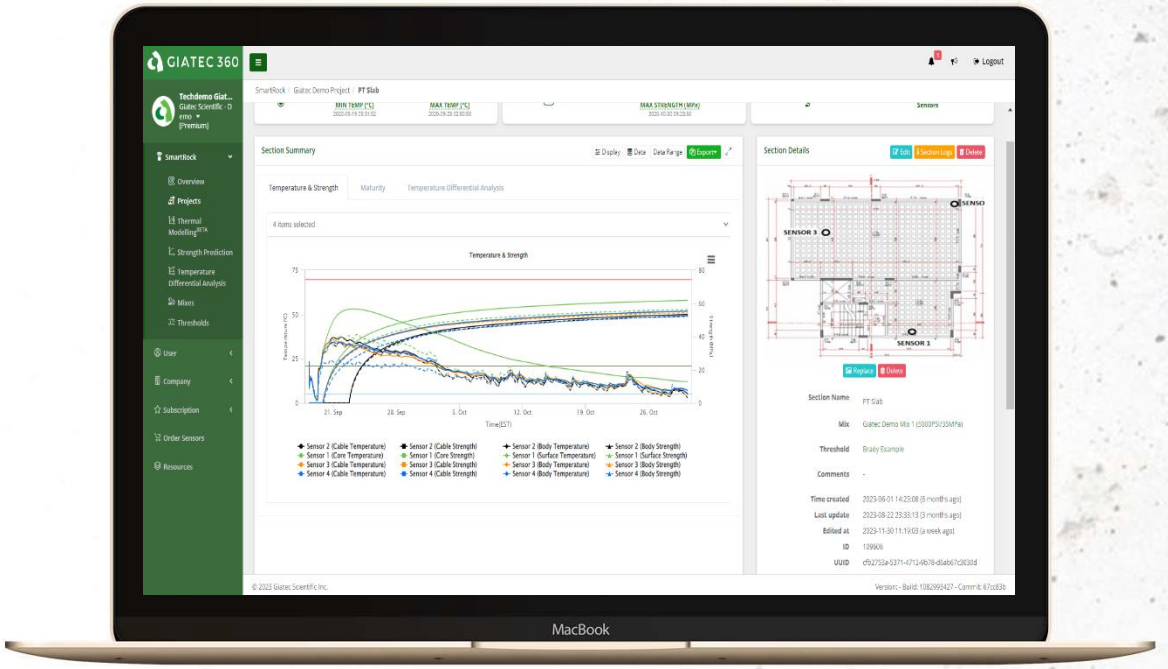
Communication

What is Giatec 360?

- The Giatec 360 dashboard is the next level in data analytics, reporting, and user management capabilities for SmartRock sensors.
- As a desktop extension of the app, the information is synced on the Giatec 360 dashboard giving clients access to numerous features that provide more insights into their projects.



https://cloud.giatecscientific.com/auth/login

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Giatec 360 Features

	Basic Giatec 360 (Free)	Premium Giatec 360 (First 3 months free, then 89$/month)
Online Platform Giatec 360	Manage users	Manage users
	View Project Names and Assign them to Users	View Project Names and Assign them to Users
	Role based access control	Manage User Access Levels and Projects
		Procore Integration
		Generate Full PDF/CSV Reports
		Temperature Differential Analysis
		Concrete Strength Prediction Manage Mixes
		Manage Thresholds
		View User Activity Logs and Connected Device
		Receive notifications on mobile and web
		Thermal model for mass concrete and all the Upcoming Features

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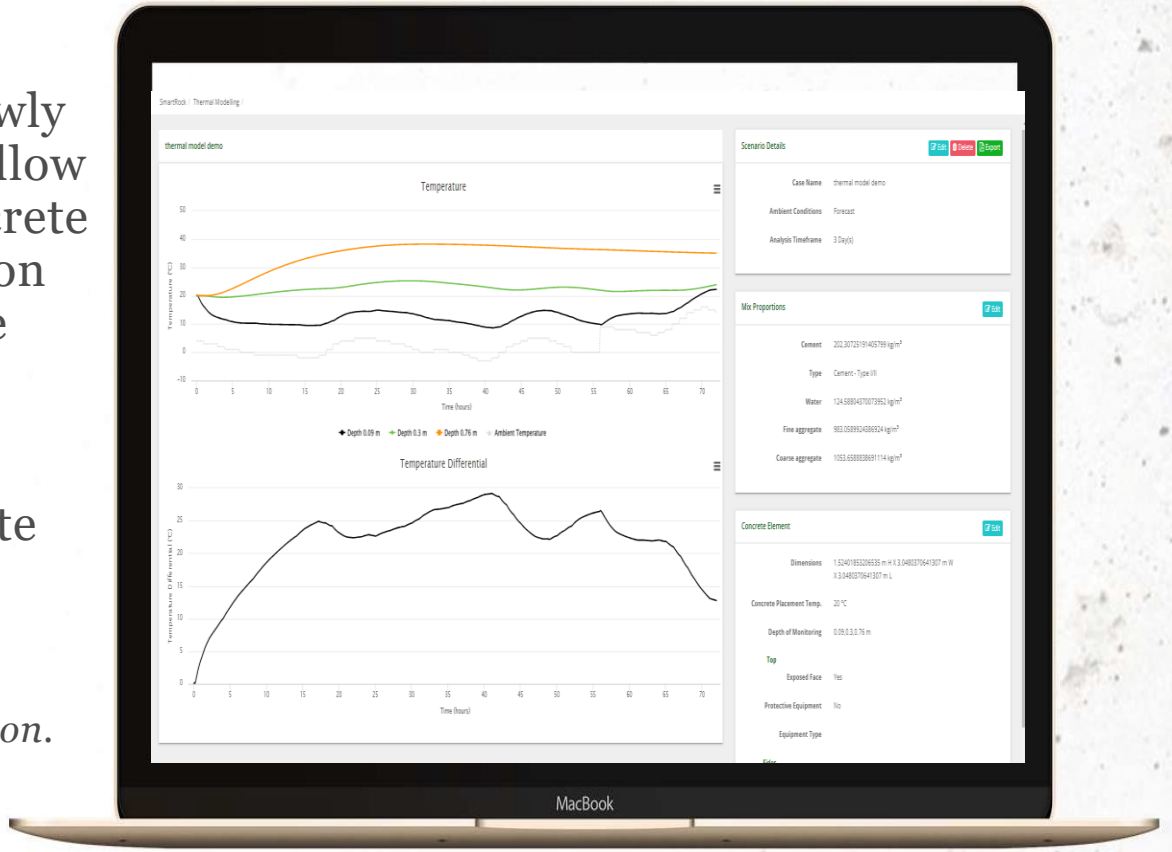
Thermal Modeling

The Thermal Modeling feature is newly introduced on Giatec 360 that will allow users to predict the behavior of concrete in consideration of the mix proportion and the weather forecast prior to the pour.

This is best suitable for mass concrete pour.

***This feature is currently on the BETA version.*



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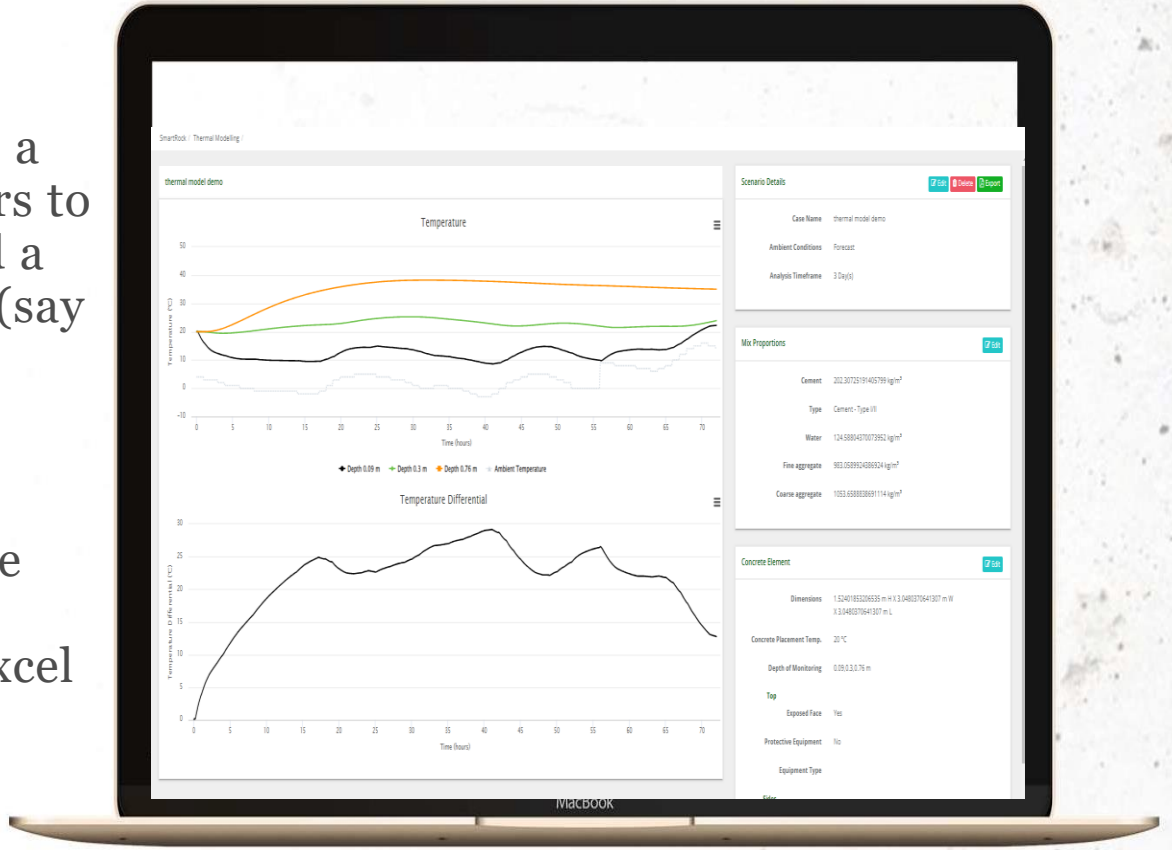
Special Features

Temperature Differential Analysis

Temperature Differential Analysis is a feature that is designed to allow users to identify if the sensors have exceeded a particular temperature value or not (say 20 C or 35 F).

This analysis can be performed for individual sensors as well as multiple sensors at a time. The results can be generated in the form of a PDF or Excel report.



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SmartRock Concept

Output

Input

Maturity Calibration

Output

Concrete Strength

Concrete temperature monitoring

Concrete strength monitoring

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Maturity Calibration
5 easy steps!

Calibration Requirements

- A calibration is specific to one mix
- Follow ASTM C1074
- Minimum of 5 data points
- Needs to be cured under lab condition

* The calibration specimens will herein be referred to as standard 4x8 cylinders, but 6x12 cylinders and 4-inch cubes can also be used. Small beams can also be used to calibrate for tensile strength.

Maturity Steps-Overview

Step 1: Prepare Samples

Step 2: Curing

Step 3: Strength Monitoring

Same process as making lab-cured cylinders, additionally measuring temperature in two cylinders → Simple!

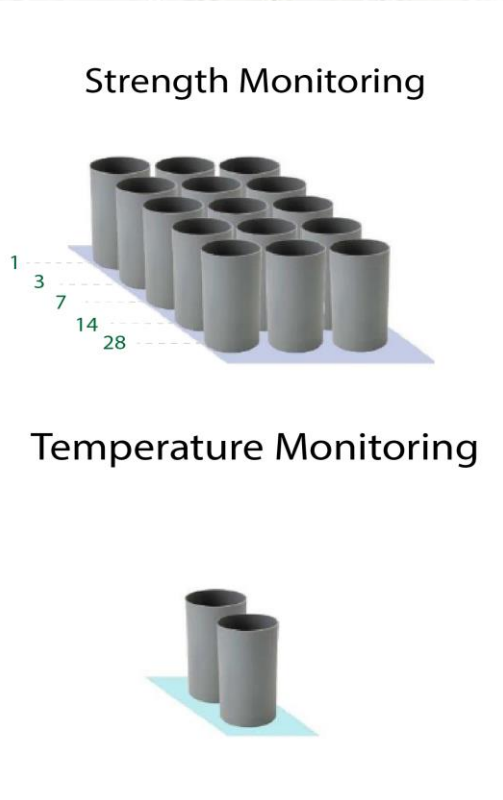
Step 4: Maturity Index

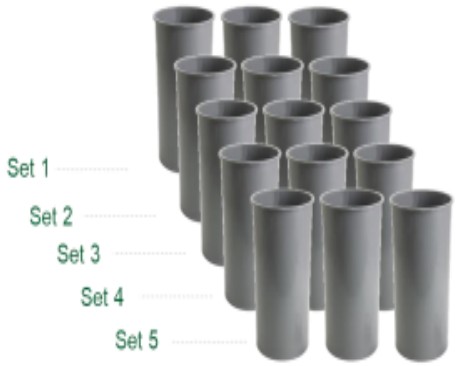
Step 5: Maturity Strength Curve

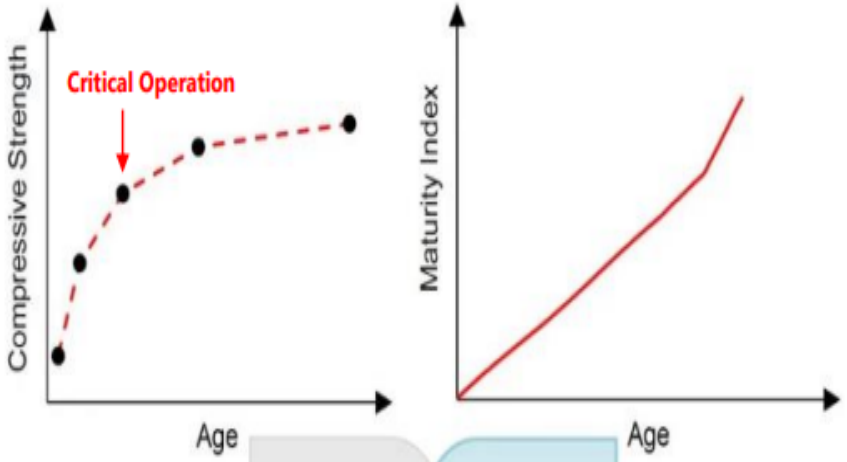
More complex steps if done manually → Calculated automatically with the Giatec system !

Step 1: Prepare Samples

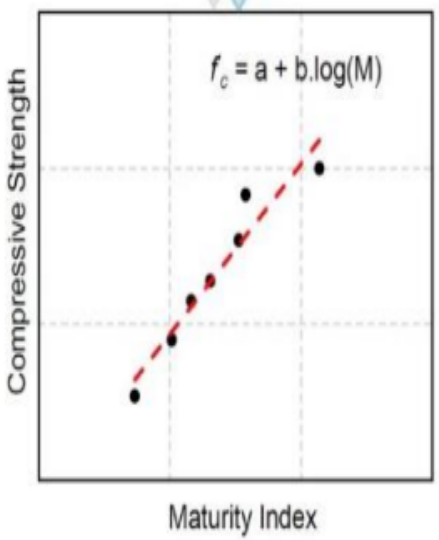
- Prepare a minimum of 17 cylinders
- 15 of the samples will be used for strength monitoring
- 2 will be used for temperature monitoring by placing a temperature sensor in the middle of the specimen







Break Schedule	Critical Operation - Target Strength		
	24 hrs	3 days	7 days
Break 1	12-16 hrs	1 day	1 day
Break 2	18-20 hrs	2 days	3 days
Break 3	24 hrs	3 days	7 days
Break 4	36 hrs	7 days	14 days
Break 5	3 days	14 days	28 days



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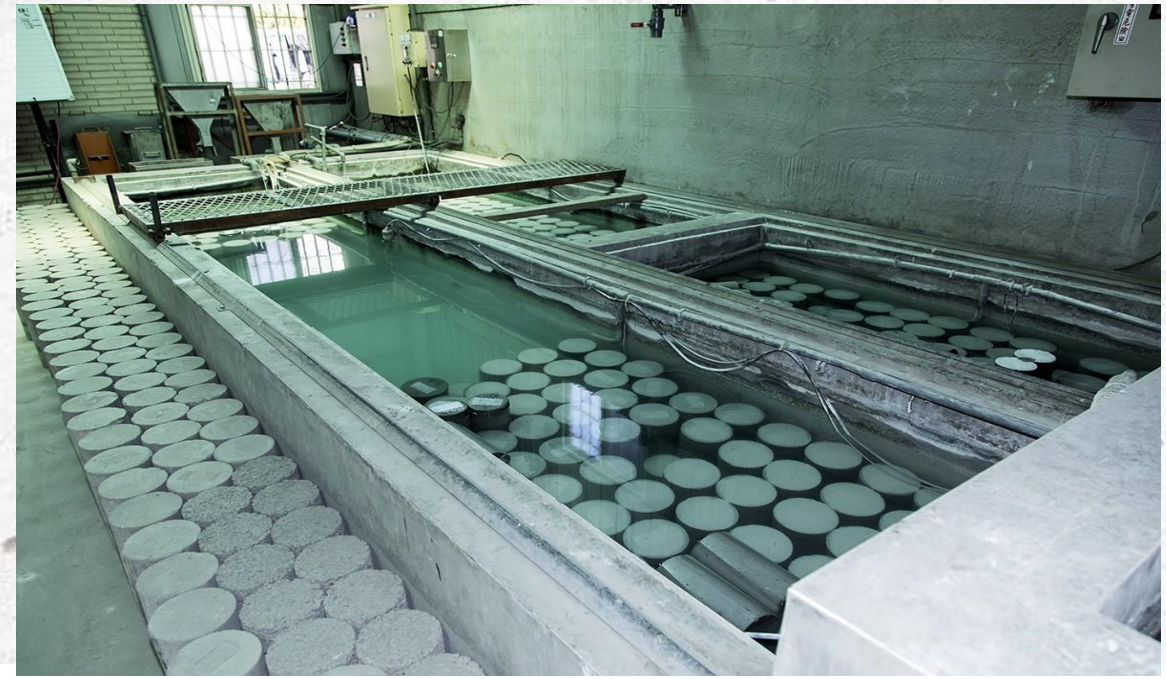
583-02
6K
583-02
6K

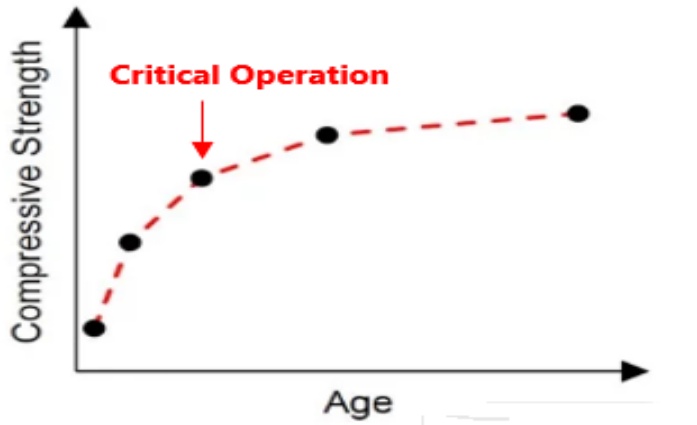
Step 2: Curing

- Provide the same curing condition for all samples
- Section 8.3 of the standard requires that the specimens be cured according to ASTM C511, in a water bath or in a moist room.



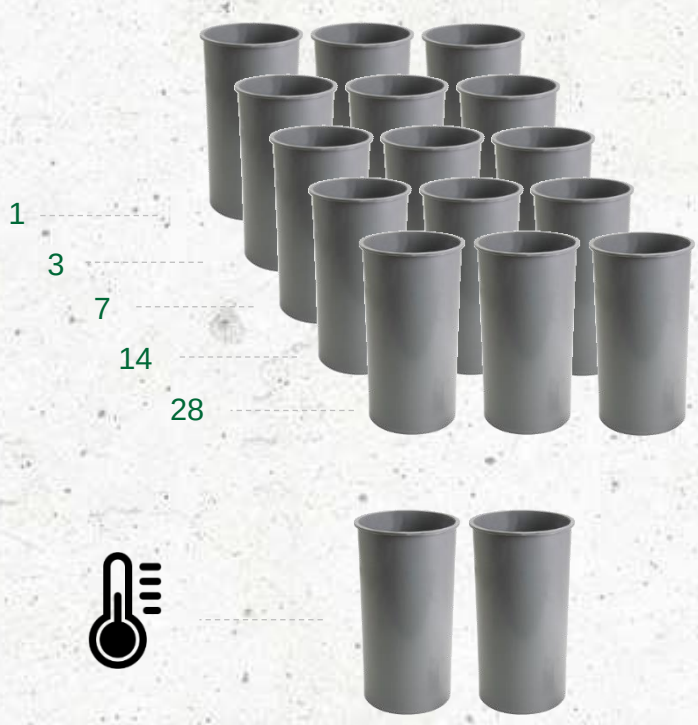
Step 3: Strength Monitoring

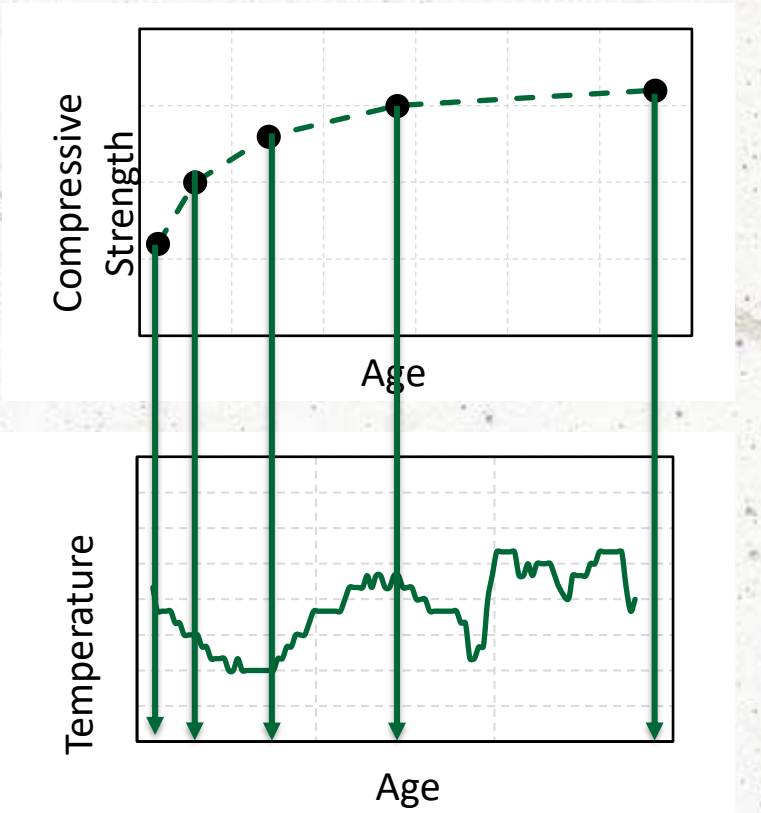
- Select a minimum of 5 measurement times (example: 1, 3, 7, 14, and 28 days)
- Break 2 cylinders for every age and use the average for your strength value
- Test the third cylinder if the difference in strength exceeds 10% of the average
- Take note of the time the cylinders were broken



Concrete Compressive Strength	Age at Target Strength to open forms, tension, etc.		
	24 hrs.	3 days	7 days
Break 1	As early as possible	1 day	1 day
Break 2	18 – 20 hrs.	2 days	3 days
Break 3	24 hrs.	3 days	7 days
Break 4	36 hrs.	7 days	14 days
Break 5	3 days	14 days	28 days

Concrete Maturity – Calibration Method





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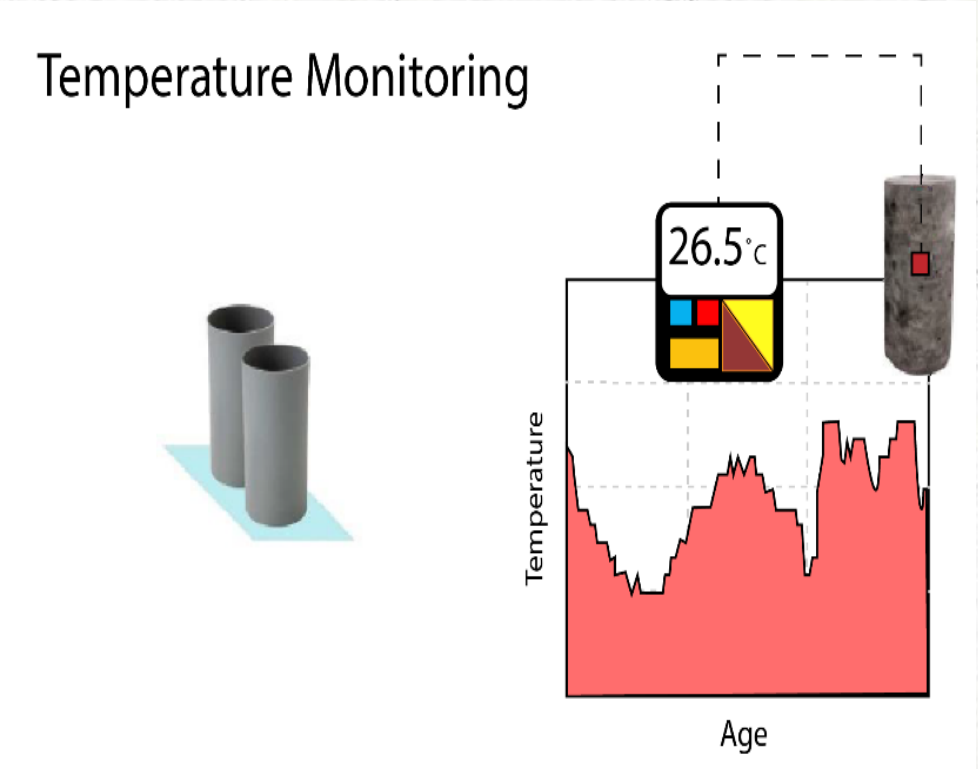
Step 4: Maturity Index

- Calculate average maturity at a specified age.
- Depending on the system used, maturity can be calculated automatically, or a manual calculation might be required.



Automatically calculate the maturity value at a specific age with the Giatec system

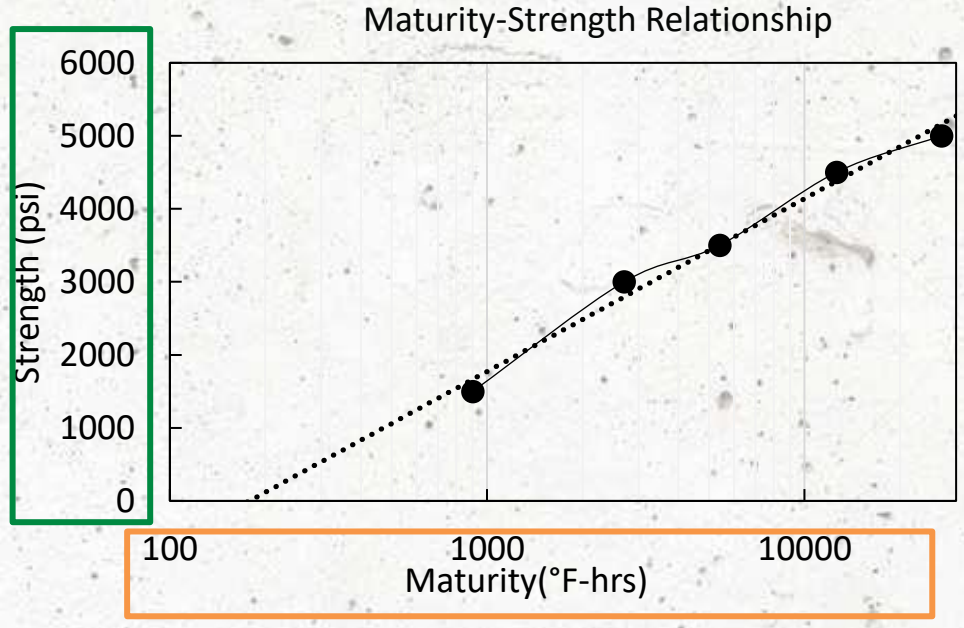
Step 5: Maturity-Strength Curve

Step 3: Strength

Equation of the fitted line:

$$Strength = a + b\ log10\ (Maturity)$$

Days	Maturity (°F-hrs)	Strength (psi)
1	900	1500
3	2700	3000
7	5400	3500
14	12600	4500
28	27000	5000



Step 4: Maturity Index

Thank You!

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