

Texas Instruments Expansion

Dallas County, TX, USA (2024)

PRODUCT USED:

Maturix[®] Smart Concrete[®] Sensors

CONSULTANT:

EGL Consulting

BACKGROUND

By the start of spring in 2020, a global shortage of semiconductors had started to emerge. That was a significant dilemma for the United States of America (USA) as only 12% of the country handled their own semiconductor manufacturing. They relied on the global economy to help fill their demand for additional semiconductors. But without that extra help, they'd have fewer semiconductors to use for producing items like cellphones, computers, high-tech fridges, vehicles, and more.

It's a dilemma that the USA still has but is hoping to solve by encouraging local semiconductor manufacturers to increase their production.

Stepping up to do their part as an award-winning American semiconductor manufacturer, Texas Instruments has chosen to expand the number of semiconductors they create in Texas. Currently, they have two 50-year-old plants in the state that produce 200-millimeter wafers full of semiconductors. But by 2024, they plan to close down those plants and replace them with a new state-of-the-art facility that will double their manufacturing through the use of 300-millimeter wafers. Costing around \$850 million to construct, this 870,000-square foot factory will not only boost Texas Instruments' productivity, but it will also give them regional benefits. Because it's situated in Dallas County, the new facility will benefit from the quality of the region's talent, supplier base, and local airport locations.

However, it would need to be built for Texas Instruments' expected completion year of 2024. For that to happen, the company's construction team needed to ensure that the construction project would be delivered on time and that their project schedule would be optimized. One particularly promising solution for that would be to optimize the team's concrete curing with continuous concrete monitoring. The monitoring data and real-time insights from that would reduce redundant curing time to make the overall curing process more efficient and shorten the expected project schedule.

SOLUTION

In their search for a way to optimize their concrete monitoring, Texas Instruments' construction team collaborated with EGL Consulting.





TEXAS INSTRUMENTS

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Under the consulting company's guidance, the team decided to manage their concrete monitoring with Maturix Smart Concrete Sensors. With this sensor solution, the construction team was able to easily determine their concrete's maturity curve by performing compression tests with their specific concrete mix and entering the data into a user-friendly digital platform. And in turn, that allowed the sensor solution to leverage the data needed to accurately represent the concrete's compressive strength with the method from ASTM C1074 — *Standard Practice for Estimating Concrete Strength by the Maturity Method*. Connected to a type K thermocouple wire embedded in the concrete, the sensor solution used the maturity data while also monitoring the temperature of the concrete every 10 minutes. That way, the construction team was able to follow the status of their concrete's development in real time.

In short, it was an easy process, where only a little time was spent on setting up the sensors. From there, the sensors did all of the calculating and wirelessly transmitted their calculations to the digital platform, which could be accessed by approved users through any connected device. As a result, the construction team knew exactly when their concrete hit the appropriate level of strength. They didn't need to spare extra time to visit the worksite to get that data, so they were free to expedite other areas of construction that needed work while saving time and money they might otherwise have used for data retrieval and strength calculations.

To maintain this level of progress and keep their work running smoothly with this newly adopted concrete monitoring method, they kept in touch with Kryton's technical support. That enabled them to get the answers they needed without slowing down. Finding the whole process to be pleasant, they didn't come across any challenges with monitoring the concrete despite the team being new to the Maturix[®] system. In fact, when asked if EGL Consulting would continue to recommend this approach to other companies, the head of the company, Victor Villarreal, had the following to say:

Absolutely. It's very easy to use, and one of the beauties compared to other systems out there is that you don't have to go to the structure to figure out what your reading is. You don't have to get close. You do it remotely. I've done it from home, and I check what the concrete is doing and make sure it's getting strength. So that's pretty convenient that everybody knows what the strength is without having to walk to the structure. And the other thing is that these sensors are reusable. The actual reader doesn't go into the concrete. So it's reusable. So it's very, very competitive compared to other systems that seem to do something similar, but not quite at the same level.

Overall, Maturix made it possible for Texas Instruments' construction team to work effectively and efficiently, cutting out unnecessary costs to the project's schedule and budget.

