

CONCEPT PAPER

For

RFID based

Concrete Maturity Monitoring



A WIRELESS SYSTEM - No Cables Needed

The 2004 NOVA Award



So how does it work and why it is HardTrack so unique?

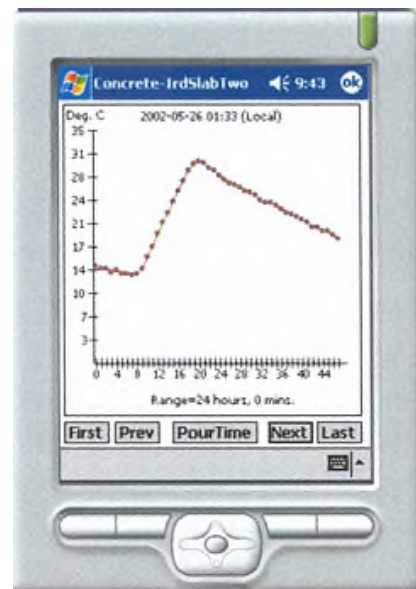
First of all the system is the only system in the market place that uses RFID (Radio Frequency Identification). Our RFID “tags” not only use Radio Frequency to communicate, but they are also very “smart” tags. They have the ability to take the ambient temperature in either F or C, as well as store the temperature in its memory. The tags are actually buried in the concrete. Just before we bury them, we give them a command - we tell them to wake up every 30 minutes, take the temperature, and store it in memory.

For significantly improving construction quality and costs with a method truly unique and innovative, not just an evolution of existing methods

A few hours later, the next day or when ever appropriate, we take a handheld portable (see back page), get somewhere near where the tag is buried, push a button, it will then upload the temperature from the tag, push another button and the software will tell exactly how hard the concrete is at that moment in time. It is very accurate; it works and is recommended by anybody who has used it.

Bob Templeton, Executive Director of the National Partnership for Highway Quality, observes, “They jumped outside the of traditional practice, pushed the technology, and were singled out for the NOVA Award from more than 420 nominations from 20 countries. The recognition throws the spotlight on stellar contributions to quality and raises the bar for mobility.

HardTrack is the platform which will allow you to launch major gains in the completion of your projects. It will assure your customers you are maintaining the quality your contract requires, as well as what your firm wishes to deliver



A graph on HardTrack’s portable, showing the tracking of the temperature from the start of the pour.

What will Concrete Maturity give you?

The technology used by Concrete Maturity was developed over 50 years ago. The results of using maturity was outstanding accuracy, however, because the equipment needed for Maturity was cumbersome and it was not very conducive to lugging around construction sites. Test Cylinders and Flexible Beams had been around a long time, so they continued to be the norm in estimating the strength of concrete. Unfortunately the relationship of the test cylinder's temperature to the actual in-place temperature of maturing concrete does not have any real correlation. By using HardTrack you will be using the actual in-place (in-situ) temperature to calculate the strength of the concrete, and you can also receive immediate feedback on other pertinent information while you are at the pour site.

Our Wireless Concrete Monitoring System has recently celebrated its 5th birthday. Its accomplishments during the past five years has been spectacular. The software is very user friendly. The benefits and savings our users have experienced are spectacular. While we started out in North America, we have branched out so now the rave reviews are also come across the big pond as well. While many of our customers were not aware of RFID (Radio Frequency Identification) and weren't real sure what we were talking about when we said the system was "wireless". They soon learned there was another method, which is significantly more cost effective. They are now able to use the more accurate in-situ temperature rather than having to rely on test cylinders or beams.



iQ32 Temp Tag



Our HardTrack system has been proven equally effective in major construction projects as well in pavement construction. It has the ability to compute the actual strength of the concrete, by reading the information directly from within the concrete at a distance of a number of feet away, then pushing a button on the handheld computer to have it calculate the current strength of the concrete. While it is not always possible to read the "tag" from the Pickup, as the engineer is doing on the left. It will allow



Handheld Portable

you to capture the information from 15—20 feet away.

HardTrack Offers the User Great Flexibility

Purchasers of HardTrack have a couple of inexpensive options to help you prove the system. The most convenient way to use HardTrack is using a Handheld Portable. However, by using one of your laptops, we have a PCMCIA card that along with the software will allow you to avoid the cost of the Portable. Once the value of HardTrack is proven, you could update to a portable should you chose to.

The RFID tags that log the time and temperature data also offer you flexibility and cost savings. The picture on the right shows two styles. The black one is the wireless tag that is completely buried within the concrete and can be read through the concrete to a depth of 8 inches. The white tag has a two meter lead with the temperature probe at the end. This tag allows the system to monitor deep pours with longer lengths available. Additionally it provides a cost effective solution to using maturity as you can bury the probe and leave the tag outside of the pour, which allows you to reuse it. You would be sacrificing the probe but saving the tag.



iQ32TE Temp Tag with probe

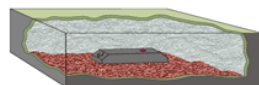


Illustration of tag buried in concrete



Tag about to be buried

