How are you currently monitoring corrosion in reinforced concrete? Does it involve drilling a hole in your structure, sticking a probe in, and using a logger to collect data that needs to be analyzed offsite? This process takes days, even weeks, just to measure concrete corrosion in ONE structure, and often you discover it’s too late to repair the damage. With our iCOR® device, you can detect damage early and predict the rate of future deterioration in seconds using our patented CEPRA technology.

**iCOR®: Non-destructive Concrete Corrosion Monitoring**

As an NDT tool, the iCOR® is an award-winning device that has been recognized for its positive impact in corrosion monitoring and mitigation. The device is unique in its ability to perform three-in-one concrete testing measurements of: rebar corrosion rate, half-cell potential, and in-situ electrical resistivity. These measurements are critical to the success of rehabilitation projects and to the repair of concrete structures. Measuring these properties, without the need to drill a hole to connect to the rebar, directly make iCOR® the first of its kind.

The device can perform directional rebar corrosion measurements in both X and Y axis’ independently. Once you have set up your structure specifications in the app, preinstalled on the iCOR® tablet, simply conduct a measurement on a specific location of the grid by moving the device on the concrete surface to the corresponding grid points on your tablet. The device then communicates these measurements to your app which processes the information and outputs concrete corrosion results in real-time. This data can be viewed as a corrosion rate map, in a PDF report, and CSV data file.

Understand the process of corrosion in reinforced concrete structures in this article.

https://www.giatecscientific.com Detect the Rate of Corrosion in Reinforced Concrete Structures in Seconds
The Science Behind iCOR®

The iCOR® uses our patented Connectionless Electrical Pulse Response Analysis (CEPRA) technology to measure the electrical response of the rebar inside the concrete using four probes placed on the surface of the slab. This technique is based on the different voltage responses that the corroded and non-corroded rebar have at low frequency impedance.

The iCOR® method consists of applying narrow DC/AC pulse currents through two outside electrodes and subsequently measuring the voltage between these points. The voltage response of a corrodible rebar is different from that of a non-corrodible rebar. This makes it possible to detect these areas of deterioration from the surface of the concrete. Further, by using the input current, the recorded voltage value, and a complex algorithm, the iCOR® device can calculate the state of corrosion of steel reinforcements in concrete construction, allowing for the rate of deterioration of the rebar to be known.

Curious to learn more about our methodology? Check out the iCOR® resources section Here

The iCOR® has proved to be robust on-site and I am confident in the results that I see. My favorite feature is that data on corrosion rate, concrete resistivity, and half-cell potential can be recorded simultaneously. This information is essential when interpreting the rate of corrosion deterioration.

- Dr. Jose Pacheo of CTL Group.

Why Choose iCOR® for Detecting Concrete Corrosion?

1. **Award-winning technology**: This device was presented with the 2019 Corrosion Innovation of the Year Award by the National Association of Corrosion Engineers (NACE)

2. **No connection to the rebar required**: Unlike other corrosion testing devices available, iCOR® is a wireless NDT device that does not require a connection to the reinforcement, making it extremely convenient for monitoring the health of reinforced concrete structures.

3. **Comprehensive condition assessment of concrete**: This device allows engineers to fully understand concrete quality and rebar corrosion activity, helping them make
timely decisions regarding the rehabilitation and repair of their structures.

4. **No waiting periods between measurements:** The iCOR® does not polarize reinforcements when performing measurements. This means you can collect data over the same location without having to wait hours between readings, unlike other techniques.

5. **Fast and easy to use:** Making the switch to iCOR® is fast and easy. Minimal training is required.

6. **User-friendly app:** The iCOR® device sends data straight to your tablet via an app, where it can be easily stored, analyzed, and shared with other team members.

7. **Time savings and cost reduction:** Getting all three measurements with one device significantly save time, costs, and resources associated with the condition assessment of reinforced concrete structures.

This is my first experience performing corrosion detection and I am very happy with iCOR®. All the results obtained from iCOR® have shown consistent results compared with other non-destructive testing methods. The application is very user-friendly, providing me very clear and useful information on-site, which allows me to perform time effective measurements.

- Milad Moghaddas, Project Coordinator/Engineer, QuakeWrap Inc.

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Editor’s Note: This post was originally published in April 2018 and has been updated for accuracy and comprehensiveness.