

## **Rebar Corrosion Voltmeter**

### ***Basic Half Cell System for Locating Areas of Rebar Corrosion***

Caltech Engineering Services offer rebar corrosion voltmeter kit complete economical kit for identifying areas of rebar corrosion in concrete as per ASTM C-876.

Rebar corrosion voltmeter kit includes half-cell and voltmeter integrated with a high impedance and long earth cable and dispensing damp sponge. When rebar corrosion voltmeter DV-05 is connected between the reinforcing steel, Cu-CuSO<sub>4</sub> reference half-cell electrode (Fontana-101F) and specially made highly electrical conductive dispensing sponge on the concrete surface where a measurement can be made for the half-cell potential. This gives measurement of the probability of corrosion activity. By testing at a fixed distance apart, a grid of half-cell potentials can be developed and areas delineated.



DV-05 Rebar Corrosion Voltmeter has following features:

- Easy to use
- Detachable electrode extension pieces facilitate measurements in hard to reach locations - Optional
- High impedance digital meter is designed for tough field conditions
- Electrode is designed for use on horizontal, vertical and inverted positions
- Economical
- Conforms to ASTM C-876

Corrosion, which is an electrochemical process, occurs in concrete when oxygen and moisture are present. The actual corrosion is an exchange of energy within different sections of the uncoated reinforcing steel. The relative energy levels can be determined in relation to a reference electrode with a stable electrochemical potential.



## **Caltech Engineering Services**

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By connecting a high impedance voltmeter between the reinforcing steel and a reference electrode placed on the concrete surface, a measurement can be made for the half cell potential at the location of the reference cell. This then is a measurement of the probability of corrosion activity in the steel in the vicinity of the reference cell. This is used to locate corroding steel reinforcement

The reference half cell is copper in a copper sulphate solution. By taking half cell potential measurements a fixed distance apart a grid of half cell potentials can be quickly made and thus areas delineated with a high probability of corrosion of the reinforcing steel.

To analyze the results, the measurements made with **DV-05** rebar corrosion voltmeter can be plotted on a grid and lines of equipotential contours drawn, highlighting areas of possible corrosion activity.

For example the following guide is listed in ASTM **C-876** using a **copper-copper sulphate half cell**:

- For readings of 350mV and greater there is a 95% chance of active steel corrosion
- For readings 200 to 350mV there is a 50% chance of active steel corrosion
- For readings less than 200mV there is only 5% chance of active steel corrosion

**The method is particularly useful for:**

- Bridge Decks
- Parking Garages
- Concrete Piers & Docks
- Substructure
- Tunnel Lining

Ordering info:

|                     |  |
|---------------------|--|
| <i>DV-05 Kit</i>    | <i>Rebar Corrosion Voltmeter Kit</i>             |
| <i>Fontana-101F</i> | <i>Reference Electrode</i>                       |
| <i>DV-05DS</i>      | <i>Dispensing sponge</i>                         |
| <i>DV-05CR</i>      | <i>Cable reel with 100 ft. (32 meters) cable</i> |
| <i>DV-05 V</i>      | <i>Half Cell Voltmeter</i>                       |



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