



Designation: **C876 – 22 C876 – 22a**

Standard Test Method for Corrosion Potentials of Uncoated Reinforcing Steel in Concrete¹

This standard is issued under the fixed designation C876; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the estimation of the electrical corrosion potential of uncoated reinforcing steel in field and laboratory concrete, for the purpose of determining the corrosion activity of the reinforcing steel.

1.2 This test method is limited by electrical circuitry. Concrete surface in building interiors and desert environments lose sufficient moisture so that the concrete resistivity becomes so high that special testing techniques not covered in this test method may be required (see 5.1.4.1). Concrete surfaces that are coated or treated with sealers may not provide an acceptable electrical circuit. The basic configuration of the electrical circuit is shown in Fig. 1.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to after SI units that are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method
G3 Practice for Conventions Applicable to Electrochemical Measurements in Corrosion Testing
G15G193 Terminology and Acronyms Relating to Corrosion and Corrosion Testing (Withdrawn 2010)
G16 Guide for Applying Statistics to Analysis of Corrosion Data

3. Terminology

3.1 For definitions of terms used in this test method, refer to Terminology G15G193.

¹ This test method is under the jurisdiction of ASTM Committee G01 on Corrosion of Metals and is the direct responsibility of Subcommittee G01.14 on Corrosion of Metals in Construction Materials.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

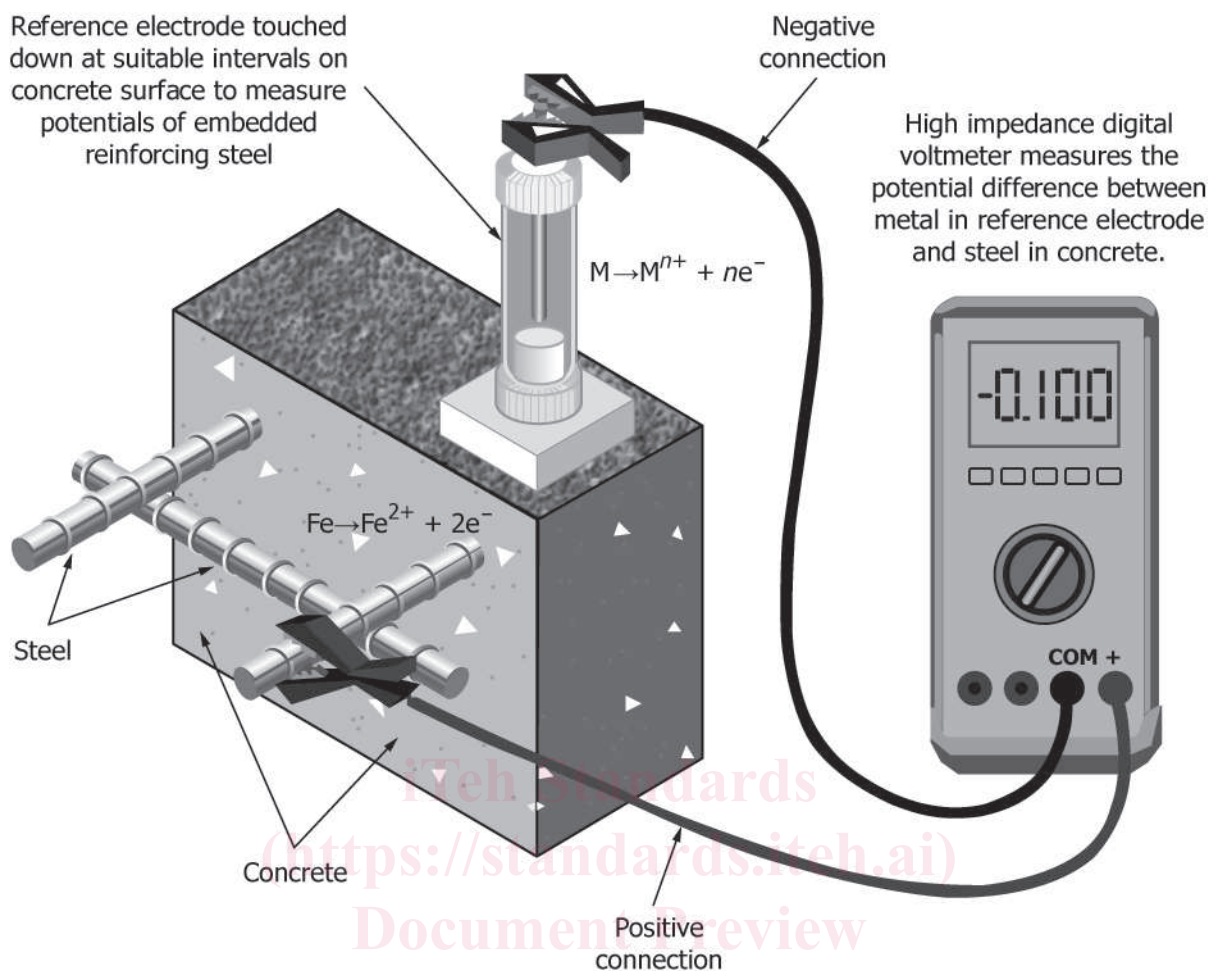


FIG. 1 Reference Electrode Circuitry

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4. Significance and Use

4.1 This test method is suitable for in-service evaluation and for use in research and development work.

4.2 This test method is applicable to members regardless of their size or the depth of concrete cover over the reinforcing steel. Concrete cover in excess of 3 in. (75 mm) can result in an averaging of adjacent reinforcement corrosion potentials that can result in a loss of the ability to discriminate variation in relative corrosion activity.

4.3 This test method is not applicable to reinforced concrete structures with epoxy-coated reinforcement.

4.4 This test method is not applicable to reinforced concrete structures in which waterproofing membranes are located between the reinforcement cage and the concrete surface as they can prevent the conduction of electricity and result in erroneous readings.

4.5 This test method may be used at any time during the life of a concrete member after the concrete has set, although it is generally most useful for evaluating mature reinforced concrete that is suspected to be susceptible to corrosion.

4.6 The results obtained by the use of this test method shall not be considered as a means for estimating the structural properties of the steel or of the reinforced concrete member.