



Standard Test Method for Corrosion Inhibiting Admixtures for Steel in Concrete by Polarization Resistance in Cementitious Slurries¹

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1. Scope

1.1 This test method covers a procedure for determining the effects of chemical admixtures on the corrosion of metals in concrete. This test method can be used to evaluate materials intended to inhibit chloride-induced corrosion of steel in concrete. It can also be used to evaluate the corrosivity of admixtures by themselves or in a chloride environment. This test is not applicable for emulsions.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

C150 Specification for Portland Cement

C670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials

D632 Specification for Sodium Chloride

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

G5 Reference Test Method for Making Potentiodynamic Anodic Polarization Measurements

G59 Test Method for Conducting Potentiodynamic Polarization Resistance Measurements

G193 Terminology and Acronyms Relating to Corrosion

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.

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice see Terminology G193.

4. Significance and Use

4.1 This test method provides a means for assessing corrosion-inhibiting concrete admixtures.

4.2 This test method is useful for development of admixtures intended to reduce corrosion of reinforcing steel in concrete.

4.3 This test method is useful in determining the corrosivity of admixtures toward steel reinforcing if the admixture sample is compared to a control without admixtures.

4.4 Good performance, a reduction in corrosion rate versus chloride alone by at least one order of magnitude in this test, is a strong indication that an admixture is a corrosion inhibitor. However, poor performance requires additional testing to determine if the admixture improves corrosion resistance.

4.5 This test method shall not be used to predict performance in the field.

4.6 The filtering process makes this test not suitable for the evaluation of emulsions.

5. Apparatus

5.1 The test cell as described in Test Method G5.

5.2 Potentiostat, as described in Test Method G5, capable of varying potential at a constant scan rate and measuring the resulting current.

5.3 A method of recording the varying potential and resulting current is needed.

5.4 Electrode holder such as described in Fig. 3 of Test Method G5.

5.5 Electrodes:

5.5.1 Working electrode, prepared from a 12.7 mm length of 9.5 mm diameter rod stock. Carbon steel C1215 should be used.

NOTE 1—If specimen forms are used other than those called for by this test method, for example flat sheet specimens, care should be taken not to introduce crevices which can lead to erroneous results.