This Research Report is issued under the fixed designation RR: G01-1021. You agree not to reproduce or circulate or quote, in whole or part, this document outside of ASTM International Committee/Society activities, or submit it to any other organization or standards body (whether national, international or other) except with the approval of the Chairman of the Committee having jurisdiction and the written authorization of the President of the Society. If you do not agree to these conditions, please immediately destroy all copies of this document. *Copyright ASTM International*, 100 Barr Harbor Drive, West Conshohocken, PA 19428. All rights reserved.

12 August 2004

## Committee G01 on Corrosion of Metals Subcommittee G01.14 on Corrosion of Metals in Construction Materials

# Research Report RR # G01-1021

### Inter-Laboratory Study to Establish Precision Statements for ASTM G180, Standard Test Method for Initial Screening of Corrosion Inhibiting Admixtures for Steel in Concrete

Technical Contact: Mr. Antonio Aldykiewicz, Cambridge, MA 02140 USA 317-498-4542 Antonio.J.Aldykiewicz.Jr@grace.com

> ASTM International 100 Barr Harbor Drive West Conshohocken, PA 19428-2959

This is a preview. Click here to purchase the full publication.

# RESEARCH REPORT FOR ASTM G 180 Standard Test Method for Initial Screening of Corrosion Inhibiting Admixtures for Steel in Concrete

4

By

#### Antonio J. Aldykiewicz, Jr., Ph.D. and Neal S. Berke, Ph.D. Grace Construction Products Cambridge, MA

An interlaboratory test program was conducted between six laboratories. The laboratories were EG&G/PAR, University of South Florida, Virginia Tech, University of Connecticut, Master Builders, and Grace Construction Products. The laboratories followed the procedure in Appendix 1 which is attached.

Results are given in Table 1. The names of the laboratories are not shown and do not necessarily agree with the order mentioned above.

The data were analyzed by Philip Press, Inc. A copy of the report is given in Appendix 2.

This is a preview. Click here to purchase the full publication.



9489 Battler Court Columbia, MD 21045 Telephone 410-997-0537 FAX 410-964-2707 E-mail: pjpress@pjpress.com

To: Neal Berke

From: Philip J. Press

Date: June 22, 2001

CC:

Subject: Revised Precision Statements for Pore Solution ASTM Round Robin

Statistical analysis of data from an ASTM Round Robin study of a pore solution test for corrosion inhibiting admixtures for steel reinforcement in concrete has been performed using ASTM E691 Interlaboratory Data Analysis Software. Results are shown in the attached Table 1 for 1/Rp measurements. Values of repeatability ( $S_r$ , r), and reproducibility ( $S_R$ , R) are for the logarithm (base 10) of 1/Rp, where  $S_r$ , r,  $S_R$  and R are defined as follows:

 $S_r$  = repeatability standard deviation [log( $\mu$ S/cm<sup>2</sup>] (1s)

r = 95% repeatability limit within a laboratory [log( $\mu$ S/cm<sup>2</sup>] (2ds)

 $S_R$  = reproducibility standard deviation [log( $\mu$ S/cm<sup>2</sup>] (1s)

R = 95% reproducibility limit between laboratories  $[log(\mu S/cm^2)]$  (2ds)

The study meets the minimum requirements for determining precision prescribed in ASTM Practice E691 in terms of the number of laboratories, materials and determinations.

Figure 1 is a graph of r and R versus average  $[log_{10}(1/Rp) + 1]$ . Because the ASTM data analysis software does not accept negative numbers, a value of 1 was added to every  $log_{10}(1/Rp)$  value. Adding a constant to all values does not change the standard deviation estimates. It does, however, change the calculated averages. In Table 1, the average values were corrected by subtracting 1 from the software output. In Figure 1, the average values were not corrected. There is no indication that precision varies systematically with average level. Therefore, pooled estimates of precision were determined which should be valid over the range of 1/Rp encompassed in the interlaboratory study.

Figures 2 and 3 show consistency statistics for  $log_{10}(1/Rp)$  by laboratory and by material, respectively. The h statistic examines consistency of test results from laboratory to laboratory. The k statistic examines consistency of within-laboratory precision from laboratory to laboratory. In these plots, the horizontal lines are the critical values for h and k at the 0.5% statistical significance level. There are a couple of excursions beyond the critical values for h or k in each plot, but there