



Designation: D4940 – 98 (Reapproved 2003)

Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blasting Abrasives¹

This standard is issued under the fixed designation D4940; 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 describes a procedure for rapid evaluation of abrasives for the presence of ionic contamination by determining the total concentration of water soluble ionic contaminants by means of a conductivity test.

1.2 This test method does not identify the ionic species present nor provide quantitative results on each species.

1.3 This test method is based on a volume comparison among abrasives of similar sizes. A volume comparison is more closely related to surface area of the abrasives than is a weight comparison.

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

2. Referenced Documents

2.1 *ASTM Standards:*²

D1193 Specification for Reagent Water

E832 Specification for Laboratory Filter Papers

2.2 *Other Standard:*

ISO 11127-6 Preparation of Steel Substrates before Application of Paints and Related Products - Test Methods for Non-Metallic Blast Cleaning Abrasives - Part 6: Determination of Water-Soluble Contaminants by Conductivity Measurement³

2.3 *SSPC: The Society for Protective Coatings*

SSPC-AB 1 "Specification for Mineral and Slag Abrasives"⁴

¹ This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.46 on Industrial Protective Coatings.

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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 Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, http://www.ansi.org.

⁴ Available from Society for Protective Coatings (SSPC), 40 24th St., 6th Floor, Pittsburgh, PA 15222-4656, http://www.sspc.org..

3. Summary of Test Method

3.1 Abrasive and pure water are combined into a slurry that is stirred to leach the soluble salts from the abrasive. This slurry is filtered and conductance of the filtrate is measured. The conductivity, which is related to the concentration of soluble ionic materials contaminating the abrasive surface, is calculated from the conductance and the cell constant.

4. Significance and Use

4.1 By-product abrasives manufactured from slags that are air cooled or quenched with pure water, normally contain low concentrations of ionic materials, as do mined mineral abrasives. However, slags quenched with seawater or other contaminated water, contain high amounts of ionic material as does seashore sand. This contamination of the abrasive can transfer to the steel surfaces being blasted, where it may accelerate corrosion. This test is useful in establishing the cleanliness of the abrasive at the jobsite.

4.2 This test method provides a value that indicates the concentration of total water soluble ions based on their electrolytic mobility. Thus, it provides an indication of ionic corrosion potential.

NOTE 1—A typical value of conductivity for a high level of contamination is 500 $\mu\text{mho/cm}$. A typical value for a low level of contamination is 50 $\mu\text{mho/cm}$.

5. Apparatus

5.1 *Conductivity Bridge and Cell*—Any commercial conductivity bridge and conductivity cell having a range of at least 5 $\mu\text{mho/cm}$ to 1 000 000 $\mu\text{mho/cm}$ and temperature compensation capability is satisfactory. Either a dip-type, pipet-type, or cup-type cell may be used. A means of adjusting for temperature or controlling the temperature is essential. While some instruments have an adjustment to compensate for temperature, one means is to use a 25°C constant temperature bath. Another method is to stir the solution with a clean thermometer while the vessel is warmed or cooled by an external source.

NOTE 2—ISO 11127-6 is another method for assessing the level of soluble salt contamination present in an abrasive. It differs from this test method in two major areas:

(1) The ISO method uses a weight to volume ratio between the abrasive and the fluid (deionized water) used to extract soluble salts from the