



Designation: D7262 – 23

Standard Test Methods for Estimating the Permanganate Natural Oxidant Demand of Soil and Aquifer Solids¹

This standard is issued under the fixed designation D7262; 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 These test methods cover the estimation of the permanganate natural oxidant demand (PNOD) through the determination of the quantity of potassium permanganate (KMnO_4) that organic matter and other naturally occurring oxidizable species present in soil or aquifer solids will consume under specified conditions as a function of time. Oxidizable species may include organic constituents and oxidizable inorganic ions, such as ferrous iron and sulfides. The following test methods are included:

Test Method A—48-hour Permanganate Natural Oxidant Demand

Test Method B—Permanganate Natural Oxidant Demand Kinetics

Test Method C—Permanganate Total Oxidant Demand

1.2 These test methods are limited by the reagents employed to a permanganate natural oxidant demand (PNOD) of 40 g KMnO_4 per kg soil or aquifer solids after a period of 48 hours (Methods A and C) or two weeks (Method B).

1.3 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice [D6026](#).

1.4 *Units*—The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 This standard does not purport to interpret the results of the data. It is the responsibility of the user of this standard to interpret the results obtained and to determine the applicability of these results prior to use.

1.6 *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 These test methods are under the jurisdiction of ASTM Committee [D18](#) on Soil and Rock and are the direct responsibility of Subcommittee [D18.21](#) on Groundwater and Vadose Zone Investigations.

Current edition approved July 1, 2023. Published July 2023. Originally approved in 2007. Last previous edition approved in 2016 as D7262–10(2016) ^{ϵ 1}. DOI: 10.1520/D7262-23.

1.7 *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

[D653](#) Terminology Relating to Soil, Rock, and Contained Fluids

[D1193](#) Specification for Reagent Water

[D3740](#) Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

[D4753](#) Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing

[D6026](#) Practice for Using Significant Digits and Data Records in Geotechnical Data

[D6051](#) Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities

[D6169](#) Guide for Selection of Subsurface Soil and Rock Sampling Devices for Environmental and Geotechnical Investigations

[D6282](#) Guide for Direct Push Soil Sampling for Environmental Site Characterizations

[D6286](#) Guide for Selection of Drilling and Direct Push Methods for Geotechnical and Environmental Subsurface Site Characterization

2.2 Other Standards:³

[APHA/AWWA/WEF Method 4500— \$\text{KMnO}_4\$ Standard Methods for the Examination of Water and Wastewater, 20th Ed. 1998](#)

[ANSI/AWWA B603-03 Standard for Permanganates](#)

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 Water Works Association (AWWA), 6666 W. Quincy Ave., Denver, CO 80235, <http://www.awwa.org>.

*A Summary of Changes section appears at the end of this standard