



Designation: D3977 – 97 (Reapproved 2019)

Standard Test Methods for Determining Sediment Concentration in Water Samples¹

This standard is issued under the fixed designation D3977; 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 determination of sediment concentrations in water and wastewater samples collected from lakes, reservoirs, ponds, streams, and other water bodies. In lakes and other quiescent-water bodies, concentrations of sediment in samples are nearly equal to concentrations at sampling points; in most instances, sample concentrations are not strongly influenced by collection techniques. In rivers and other flowing-water bodies, concentrations of sediment in samples depend upon the manner in which the samples are collected. Concentrations in isokinetically-collected samples can be multiplied by water discharges to obtain sediment discharges in the vicinity of the sampling points.

1.2 The procedures given in these test methods are used by the Agricultural Research Service, Geological Survey, National Resources Conservation Service, Bureau of Reclamation, and other agencies responsible for studying water bodies. These test methods are adapted from a laboratory-procedure manual² and a quality-assurance plan.³

1.3 These test methods include:

	Sections
Test Method A—Evaporation	8 to 13
Test Method B—Filtration	14 to 19
Test Method C—Wet-Sieving-Filtration	20 to 25

1.4 Test Method A can be used only on sediments that settle within the allotted storage time of the samples which usually ranges from a few days to a few weeks. A correction factor must be applied if dissolved-solids concentration exceeds about 10 % of the sediment concentration.

1.5 Test Method B can be used only on samples containing sand concentrations less than about 10 000 ppm and clay

concentrations less than about 200 ppm. The sediment need not be settleable because filters are used to separate water from the sediment. Correction factors for dissolved solids are not required.

1.6 Test Method C can be used if two concentration values are required: one for sand-size particles and one for the combination of silt and clay-size particles. The silt-clay fraction need not be settleable.

1.7 These test methods must not be confused with turbidity measurements discussed in Test Method D1889. Turbidity is the optical property of a sample that causes light rays to be scattered and absorbed; it is not an accurate measure of the mass or concentration of sediment in the sample.

1.8 These test methods contain some procedures similar to those in Methods of Test D1888 which pertains to measuring particulate and dissolved matter in water.

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

1.10 *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.*

1.11 *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:*⁴

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

D1888 Methods Of Test for Particulate and Dissolved Matter

¹ These test methods are under the jurisdiction of ASTM Committee D19 on Water and are the direct responsibility of Subcommittee D19.07 on Sediments, Geomorphology, and Open-Channel Flow.

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² Guy, H. P., "Laboratory Theory and Methods for Sediment Analysis," *Techniques of Water Resources Investigations*, U.S. Geological Survey, Book 5, Chapter C1, 1941.

³ Matthes, W. J., Jr., Sholar, C., J., and George, J. R., "Quality-Assurance Plan for the Analysis of Fluvial Sediment," *U.S. Geological Survey Open File Report*, Vol 90, 1990.

⁴ 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.