



Designation: D8332 – 20

Standard Practice for Collection of Water Samples with High, Medium, or Low Suspended Solids for Identification and Quantification of Microplastic Particles and Fibers¹

This standard is issued under the fixed designation D8332; 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 practice provides for the collection of water samples with high, medium, or low suspended solids to determine the presence, count, polymer type, and physical characteristics of microplastic particles and fibers. This collection practice has been validated for the collection of samples from drinking water, surface waters, wastewater influent and effluent (secondary and tertiary), and marine waters. This practice is not limited to these particular water matrices; however, the applicability of this practice to other aqueous matrices must be demonstrated.

1.2 Water samples are passed through filters or sieves of adequate mesh size to enable capture of the smallest desired particle size. For waters with high or medium suspended solids content, a series of sieves with increasingly smaller mesh size should be used to prevent clogging and allow for the collection of desired particle size fractions.

1.3 Subsequent sample preparation followed by analysis utilizing either Pyrolysis gas chromatography/mass spectrometry (Py-GC/MS), IR spectroscopy, or Raman spectroscopy may be used to identify the quantity (mass or number count) and composition (polymer type) of microplastic particles/fibers. The spectroscopic methods can provide a count of the number of particles and fibers present in a sample, and Py-GC/MS can provide the mass present in a sample. When desired, microplastic particle/fiber size, shape and surface characteristics can be ascertained with appropriate instruments such as a scanning electron microscope (SEM).

1.4 *Units*—The values stated in SI units are to be regarded as the standard except where standard U.S. equipment is specified in imperial units, for example, inches and gallons. No other units of measurement are included in this standard.

1.5 *Standard Practice*—This practice offers a set of instructions for performing one or more specific operations. This

practice cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this practice may be applicable in all circumstances. This practice is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this practice be applied without consideration of a project's many unique aspects.

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.*

1.7 *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

D883 Terminology Relating to Plastics

D1193 Specification for Reagent Water

3. Terminology

3.1 *Definitions*:

3.1.1 For definitions of terms used in this standard, refer to Terminology D883.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *effluent, n*—any stage of treated wastewater.

3.2.2 *influent, n*—raw sewage entering a wastewater treatment facility.

3.2.3 *microplastic, n*—any solid, synthetic organic polymeric material to which chemical additives or other substances may have been added, which are particles <5 mm in their

¹ This practice is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.06 on Methods for Analysis for Organic Substances in Water.

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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.