



Designation: D5413 – 21

Standard Test Methods for Measurement of Water Levels in Open-Water Bodies¹

This standard is issued under the fixed designation D5413; 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 equipment and procedures used in obtaining water levels of rivers, lakes, and reservoirs or other water bodies. Three types of equipment are available as follows:

Test Method A—Nonrecording water-level measurement devices

Test Method B—Recording water-level measurement devices

Test Method C—Remote-interrogation water-level measurement devices

1.2 The procedures detailed in these test methods are widely used by those responsible for investigations of streams, lakes, reservoirs, and estuaries, for example, the U.S. Agricultural Research Service, the U.S. Army Corp of Engineers, and the U.S. Geological Survey.² The referenced ISO standard also furnishes useful information.

1.3 It is the responsibility of the user of these test methods to determine the acceptability of a specific device or procedure to meet operational requirements. Compatibility between sensors, recorders, retrieval equipment, and operational systems is necessary, and data requirements and environmental operating conditions must be considered in equipment selection.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *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.*

1.6 *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 Recom-*

mendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

2. Referenced Documents

2.1 *ASTM Standards:*³

D1129 Terminology Relating to Water

D1941 Test Method for Open Channel Flow Measurement of Water with the Parshall Flume

D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water

D5242 Test Method for Open-Channel Flow Measurement of Water with Thin-Plate Weirs

2.2 *ISO Standard:*⁴

ISO 4373 Measurement of Liquid Flow in Open Channels—Water Level Measuring Devices

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology **D1129**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *elevation, n*—the vertical distance from a datum to a point.

3.2.2 *datum, n*—a level plane that represents a zero or some defined elevation.

3.2.3 *gauge, n*—a generic term that includes water level measuring devices.

3.2.4 *gauge datum, n*—a datum whose surface is at the zero elevation of all the gauges at a gauging station; this datum is often at a known elevation referenced to National Geodetic Vertical Datum of 1929 (NGVD).

3.2.5 *gauge height, n*—the height of a water surface above an established or arbitrary datum at a particular gauging station; also termed stage.

3.2.6 *gauging station, n*—a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

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

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² Sauer, V. B., and Turnipseed, D. P., “Stage Measurement at Gauging Stations,” *Techniques of Water Resources Investigations*, Book 3, Chapter A-7, U.S. Geological Survey, 2010.

³ 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.

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