



Designation: D6569 – 23

Standard Test Method for On-Line Measurement of pH¹

This standard is issued under the fixed designation D6569; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This test method covers the continuous determination of pH of water by electrometric measurement using the glass, the antimony or the ion-selective field-effect transistor (ISFET) electrode as the sensor.

1.2 This test method does not cover measurement of samples with less than 100 $\mu\text{S}/\text{cm}$ conductivity. Refer to Test Method [D5128](#).

1.3 This test method does not cover laboratory or grab sample measurement of pH. Refer to Test Method [D1293](#).

1.4 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 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 Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

[D1129 Terminology Relating to Water](#)

[D1193 Specification for Reagent Water](#)

[D1293 Test Methods for pH of Water](#)

[D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water](#)

¹ This test method is under the jurisdiction of ASTM Committee [D19](#) on Water and is the direct responsibility of Subcommittee [D19.03](#) for Sampling of Water and Water-Formed Deposits, Surveillance of Water, and Flow Measurement of Water.

Current edition approved April 1, 2023. Published April 2023. Originally approved in 2000. Last previous edition approved in 2014 as D6569 – 14 which was withdrawn January 2023 and reinstated in April 2023. DOI: 10.1520/D6569-23.

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.

[D3370 Practices for Sampling Water from Flowing Process Streams](#)

[D3864 Guide for On-Line Monitoring Systems for Water Analysis](#)

[D5128 Test Method for On-Line pH Measurement of Water of Low Conductivity](#)

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology [D1129](#), Test Method [D1293](#) and Guide [D3864](#).

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *liquid junction potential, n*—the dc potential which appears at the point of contact between the reference electrode's salt bridge and the sample solution.

3.2.1.1 *Discussion*—Ideally this potential is near zero and is stable. However, in samples with extreme pH it becomes larger by an unknown amount and is a zero offset.

4. Summary of Test Method

4.1 pH is measured as a voltage between measuring electrode and reference electrode elements. The sensor assembly typically includes a temperature compensator to compensate for the varying output of the measuring electrode due to temperature.

4.2 The sensor signals are processed with an industrial pH analyzer/transmitter.

4.3 The equipment is calibrated with standard pH buffer solutions encompassing or in close proximity to the anticipated pH measurement range.

5. Significance and Use

5.1 pH is a measure of the hydrogen ion activity in water. It is a major parameter affecting the corrosivity and scaling properties of water, biological life in water and many applications of chemical process control. It is therefore important in water purification, use and waste treatment before release to the environment.

5.2 On-line pH measurement is preferred over laboratory measurement to obtain real time, continuous values for automatic control and monitoring purposes.