



Designation: D5127 – 13 (Reapproved 2018)

Standard Guide for Ultra-Pure Water Used in the Electronics and Semiconductor Industries¹

This standard is issued under the fixed designation D5127; 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 guide provides recommendations for water quality related to electronics and semiconductor-industry manufacturing. Seven classifications of water are described, including water for line widths as low as 0.032 μm . In all cases, the recommendations are for water at the point of distribution (POD).

1.2 Water is used for washing and rinsing of semiconductor components during manufacture. Water is also used for cleaning and etching operations, making steam for oxidation of silicon surfaces, preparing photomasks, and depositing luminescent materials. Other applications are in the development and fabrication of solid-state devices, thin-film devices, communication lasers, light-emitting diodes, photo-detectors, printed circuits, memory devices, vacuum-tube devices, or electrolytic devices.

1.3 Users needing water qualities different from those described here should consult other water standards, such as Specification [D1193](#) and Guide [D5196](#).

1.4 *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.*

1.5 *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.*

¹ This guide is under the jurisdiction of ASTM Committee [D19](#) on Water and is the direct responsibility of Subcommittee [D19.02](#) on Quality Systems, Specification, and Statistics.

Current edition approved Oct. 15, 2018. Published November 2018. Originally approved in 1990. Last previous edition approved in 2013 as D5127 – 13. DOI: 10.1520/D5127-13R18.

2. Referenced Documents

2.1 ASTM Standards:²

- [D1129 Terminology Relating to Water](#)
- [D1193 Specification for Reagent Water](#)
- [D1976 Test Method for Elements in Water by Inductively-Coupled Plasma Atomic Emission Spectroscopy](#)
- [D2791 Test Method for On-line Determination of Sodium in Water](#)
- [D3919 Practice for Measuring Trace Elements in Water by Graphite Furnace Atomic Absorption Spectrophotometry](#)
- [D4191 Test Method for Sodium in Water by Atomic Absorption Spectrophotometry](#)
- [D4192 Test Method for Potassium in Water by Atomic Absorption Spectrophotometry](#)
- [D4327 Test Method for Anions in Water by Suppressed Ion Chromatography](#)
- [D4453 Practice for Handling of High Purity Water Samples](#)
- [D4517 Test Method for Low-Level Total Silica in High-Purity Water by Flameless Atomic Absorption Spectroscopy](#)
- [D5173 Guide for On-Line Monitoring of Total Organic Carbon in Water by Oxidation and Detection of Resulting Carbon Dioxide](#)
- [D5196 Guide for Bio-Applications Grade Water](#)
- [D5391 Test Method for Electrical Conductivity and Resistivity of a Flowing High Purity Water Sample](#)
- [D5462 Test Method for On-Line Measurement of Low-Level Dissolved Oxygen in Water](#)
- [D5542 Test Methods for Trace Anions in High Purity Water by Ion Chromatography](#)
- [D5544 Test Method for On-Line Measurement of Residue After Evaporation of High-Purity Water](#)
- [D5673 Test Method for Elements in Water by Inductively Coupled Plasma—Mass Spectrometry](#)

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.