



Designation: D7126 – 06

Standard Test Method for On-Line Colorimetric Measurement of Silica¹

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1. Scope

1.1 This test method covers the on-line determination of soluble silica in water by colorimetric analysis using the molybdenum blue method, also known as the heteropoly blue method.

1.2 This test method is applicable for silica determination in water with silica concentrations within 0.5 - 5000 ppb ($\mu\text{g/L}$).

1.3 This test method covers the determination of soluble silica SiO_2 (silicon dioxide) or silicates in water. Soluble silica compounds are considered molybdate reactive silica. This test method does not cover the determination of colloidal or polymeric silica, which is considered non-molybdate reactive silica.

1.4 This test method does not cover the laboratory or grab sample measurement of silica in water. Refer to Test Method [D859](#).

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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

- 2.1 *ASTM Standards:*²
- [D859 Test Method for Silica in Water](#)
 - [D1066 Practice for Sampling Steam](#)
 - [D1129 Terminology Relating to Water](#)
 - [D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits](#)³
 - [D1193 Specification for Reagent 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](#) on Sampling of Water and Water-Formed Deposits, Analysis of Water for Power Generation and Process Use, On-Line Water Analysis, and Surveillance of 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.

³ Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

- [D3370 Practices for Sampling Water from Closed Conduits](#)
- [D3864 Guide for Continual On-Line Monitoring Systems for Water Analysis](#)
- [D5540 Practice for Flow Control and Temperature Control for On-Line Water Sampling and Analysis](#)

3. Terminology

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

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *heteropoly compound*—a compound in which groups of different elements are joined together by metal-metal bonds.

3.2.2 *metalloid*—an element which has properties that are intermediate between those of a metal and a nonmetal.

3.2.3 *photodetector*—a device for detecting and measuring the intensity of radiant energy.

4. Summary of Test Method

4.1 This test method describes the analysis of soluble silica by analyzing a sample from a continuous stream. This test method is based on the colorimetric determination of soluble silica by the formation and reduction of molybdosilicic acid. Reduced molybdosilicic acid forms a molybdenum blue complex. The optical absorbance of this complex is typically measured at 815 ± 10 nm. The absorbance is directly proportional to the concentration of silica in the sample.

4.2 This on-line test method requires reagents which are added sequentially with separate reaction periods. Each reaction must be allowed to go to completion before the next reagent is added.

5. Significance and Use

5.1 Silicon (Si), a metalloid, is the second most abundant element in the earth's crust. Various forms of silica (silicon dioxide SiO_2) are found in quartz, sand and rocks. The degradation of these rocks results in silica found in natural waters. Silica in natural waters can be found as ionic silica, silicates, colloidal or suspended particles.

5.2 Elevated temperatures and pressure can cause silica in water to vaporize and form deposits or scale. Scale deposits of silica will coat boilers and turbine blades used in power plants. The presence of silica scale affects the ability of metals to