

ASTM D7126 - 10 Standard Test Method for On-Line Colorimetric Measurement of Silica

Significance and Use

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.

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 transfer heat. Silica needs to be removed when deionized water is used as a rinse for manufacturing wafers in the semiconductor industry.

Silica is commonly removed by demineralization using anion exchange resins, distillation, reverse osmosis or precipitation in a lime softening process. The on-line measurement of silica is the preferred method to laboratory analyses for industries trying to obtain and monitor ultra-pure water. Since silica is one of the first species to breakthrough anion exchange resins, on-line silica monitoring is frequently used to determine the need for regeneration of an anion or mixed resin bed.

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 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

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

2. Referenced Documents (*purchase separately*)

ASTM Standards

[D859](#) Test Method for Silica in Water

[D1066](#) Practice for Sampling Steam

[D1129](#) Terminology Relating to Water

D1193 Specification for Reagent Water

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

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

<http://www.astm.org/Standards/D7126.htm>

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