



Standard Guide for On-Line Monitoring Systems for Water Analysis¹

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1. Scope

1.1 This guide covers the selection, establishment, application, and validation and verification of monitoring systems for determining water characteristics by continual sampling, automatic analysis, and recording or otherwise signaling of output data. The system chosen will depend on the purpose for which it is intended: whether it is for regulatory compliance, process monitoring, or to alert the user of adverse trends. If it is to be used for regulatory compliance, the method published or referenced in the regulations should be used in conjunction with this guide and other ASTM methods.

1.2 *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.* Specific hazard statements are given in Section 7.

2. Referenced Documents

2.1 ASTM Standards:²

D1129 Terminology Relating to Water

D1193 Specification for Reagent Water

D3370 Practices for Sampling Water from Closed Conduits

D4210 Practice for Intralaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data (Withdrawn 2002)³

D5540 Practice for Flow Control and Temperature Control for On-Line Water Sampling and Analysis

E178 Practice for Dealing With Outlying Observations

¹ This guide is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.03 on Sampling 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 The last approved version of this historical standard is referenced on www.astm.org.

2.2 ASTM Special Technical Publication: STP 442 Manual on Water⁴

3. Terminology

3.1 *Definitions*—For definitions of terms used in this guide refer to Terminology D1129.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 Calibrations:

3.2.1.1 *laboratory calibration curve for flow-through systems*—calibration curve calculated from withdrawn samples or additional standards that may be spiked or diluted and analyzed using the appropriate laboratory analyzer.

3.2.1.2 *laboratory calibration curve for flow-through systems*—type of sample used to generate a laboratory calibration curve for flow-through systems.

3.2.1.3 *line sample calibration*—coincidental comparison of a line sample and adjustment of a continuous analyzer to the compared laboratory analyzer or a second continuous analyzer.

3.2.1.4 *multiple standard calibration*—where the calibration curve is calculated from a series of calibration standards covering the range of the measurements of the sample being analyzed.

3.2.1.5 *probe calibration*—where the probe is removed from the sample stream and exposed to a calibration solution and the analyzer is adjusted to indicate the appropriate value. Alternately, two probes are exposed to the same solution and the on-line analyzer is adjusted to coincide with the pre-calibrated laboratory instrument.

3.2.1.6 *reference sample calibration*—coincidental comparison of a reference sample and adjustment of a continuous analyzer to the compared laboratory analyzer results.

3.2.2 *cycle time*—the interval between repetitive sample introductions in a monitoring system with discrete sampling.

3.2.3 *drift*—the change in system output, with constant input over a stated time period of unadjusted, continuous operation; usually expressed as percentage of full scale over a 24-h period.

3.2.3.1 *span drift*—drift when the input is at a constant, stated upscale value.

3.2.3.2 *zero drift*—drift when the input is at zero.

⁴ Available from ASTM Headquarters. Contact Customer Service, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.