



Standard Guide for Continual 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:

D 1129 Terminology Relating to Water²

D 1193 Specification for Reagent Water²

D 2579 Test Methods for Total and Organic Carbon in Water²

D 3370 Practices for Sampling Water from Closed Conduits²

D 4210 Practice for Intralaboratory Quality Control Procedures and a Discussion on Reporting Low-Level Data²

D 5540 Practice for Flow Control and Temperature Control for On-line Water Sampling and Analysis²

E 178 Practice for Dealing with Outlying Observations³

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 D 1129.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 Calibrations:

3.2.1.1 *laboratory check sample for flow-through systems*—calibration curve calculated from withdrawn samples or additional standards that may be spiked or diluted and analyzed using the appropriate laboratory analyzer.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

3.2.1.3 *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.

3.2.1.4 *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.

3.2.1.5 *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.

3.2.4 *full scale*—the maximum measuring limit of the system for a given range.

3.2.5 *input*—the value of the parameter being measured at the inlet to the analyzer.

3.2.6 *interference*—an undesired output caused by a substance or substances other than the one being measured. The effect of interfering substance(s) on the measured parameter of interest shall be expressed as a percentage change ($\pm$) in the

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² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 14.02.

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