



Designation: D 6301 – 98

Standard Practice for the Collection of Samples of Filterable and Nonfilterable Matter in Water¹

This standard is issued under the fixed designation D 6301; 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 practice is applicable for sampling condensed steam or water, such as boiler feedwater, for the collection of filterable and (optional) nonfilterable matter using 0.45- μ m membrane filter (filterable matter) and ion exchange media (nonfilterable matter).

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.*

2. Referenced Documents

2.1 ASTM Standards:

- D 1066 Practice for Sampling Steam²
- D 1129 Terminology Relating to Water²
- D 1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits²
- D 1193 Specification for Reagent Water²
- D 3370 Practice for Sampling Water from Closed Conduits²
- D 3864 Guide for Continual On-Line Monitoring Systems for Water Analysis²

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology D 1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *corrosion product sampler, n*—a device used to collect integrated samples of filterable and (as an option) nonfilterable matter. It consists of a flow totalizer that accurately measures the amount of sample passing through the device and a 0.45- μ m pore size membrane filter. Adding a second filter holder for ion exchange resin impregnated membranes allows for collecting nonfilterable matter.

3.2.2 *filterable matter, n*—includes all matter that is removed by a 0.45- μ m pore size filter.

3.2.3 *nonfilterable matter, n*—includes all matter that will pass through a 0.45- μ m pore size filter and may be captured on anion, or cation ion exchange membranes, or both.

4. Summary of Practice

4.1 A typical sampling apparatus, commonly called a corrosion product sampler, is used to obtain integrated, representative samples of filterable and nonfilterable matter using a 0.45- μ m membrane filter and ion exchange membranes. The sampling is accomplished at system operating pressure and sample temperature of $\leq 50^\circ\text{C}$. The practice utilizes a modified stainless steel high pressure filter housing to accommodate a 47-mm diameter filter (for filterable matter) and if desired, ion exchange membranes (for nonfilterable matter). The sample collection system (corrosion product sampler) is designed and operated specifically for quantitative determination of filterable and nonfilterable matter. An important feature of the sampler is the flow totalizer, which accurately determines the total volume of sample water which has passed through the sampler, regardless of changes in flowrate or pressure during the collection period. Control and pressure reducing valves and metering devices are downstream of the filter housing to eliminate the possible contribution of filterable and nonfilterable matter from these components to the sample stream. Additional flow may bypass the filter housing, so that flows within the sample lines are maintained within required range (see Guide D 3864). If a single sampling point is not representative due to lack of homogeneity in the process fluid (the water being sampled), multiple point sampling may be required.

5. Significance and Use

5.1 The transport of suspended and corrosion products from the preboiler cycle has been shown to be detrimental to all types of steam generating equipment. Corrosion product transport as low as 10 ppb can have significant impact on steam generators performance.

5.2 Deposited corrosion products on PWR steam generator tubes can reduce heat transfer, and, if the deposit is sufficiently thick, can provide a local area for impurities in the bulk water to concentrate, resulting in a corrosive environment. In BWR plants, the transport of corrosion products can cause fuel

¹ This practice is under the jurisdiction of ASTM Committee D-19 on Water and is the direct responsibility of Subcommittee D19.03 on Sampling of Water and Water-formed Deposits, Surveillance of Water, and Flow Measurement of Water Samples.

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

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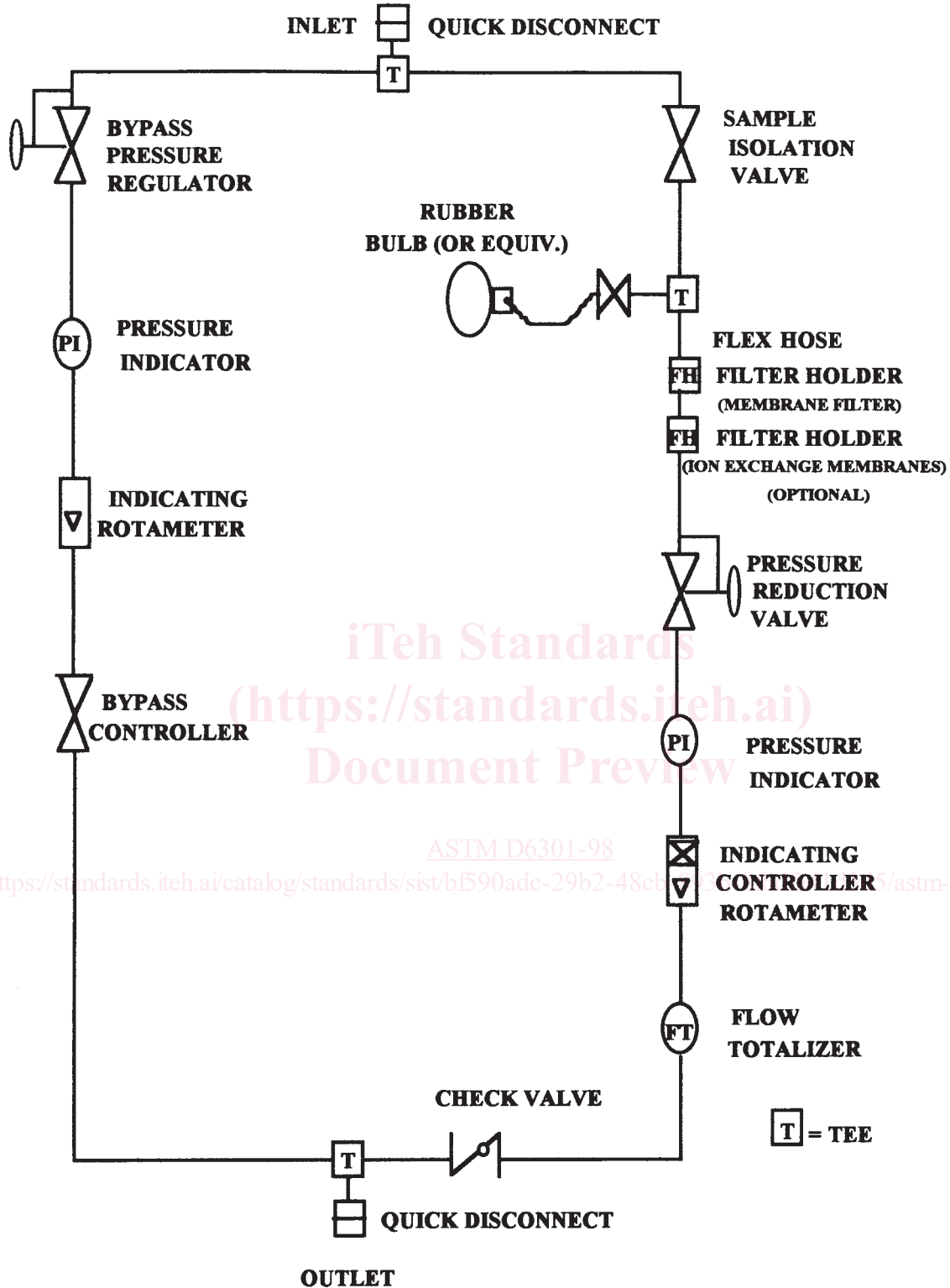


FIG. 1 Simplified Flow Diagram for Corrosion Product Sampler