Designation: D7825 – 12

Standard Guide for Generating a Process Stream Property Value through the Application of a Process Stream Analyzer[1]

This standard is issued under the fixed designation D7825; 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 guide covers and provides a workflow overview of the necessary steps related to generating a Process Stream Property Value obtained from the application of a process stream analyzer.

1.2 Generating a Process Stream Property Value from the application of a process stream analyzer requires the use of several ASTM standards. These standards describe procedures to collect a representative sample, establish and validate the relationship to the primary test method, and calculate a property value with an expected uncertainty. Each standard builds or prepares data, or both, to be used in another standard. The workflow process culminates to produce a process stream analyzer result that represents a user defined batch of product. The sequence in which the standards are to be utilized is defined in this guide.

1.3 *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]

D3764 Practice for Validation of the Performance of Process Stream Analyzer Systems

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

D6122 Practice for Validation of the Performance of Multivariate Online, At-Line, and Laboratory Infrared Spectrophotometer Based Analyzer Systems

D6299 Practice for Applying Statistical Quality Assurance and Control Charting Techniques to Evaluate Analytical Measurement System Performance

D6624 Practice for Determining a Flow-Proportioned Average Property Value (FPAPV) for a Collected Batch of Process Stream Material Using Stream Analyzer Data

D6708 Practice for Statistical Assessment and Improvement of Expected Agreement Between Two Test Methods that Purport to Measure the Same Property of a Material

D7235 Guide for Establishing a Linear Correlation Relationship Between Analyzer and Primary Test Method Results Using Relevant ASTM Standard Practices

D7278 Guide for Prediction of Analyzer Sample System Lag Times

D7453 Practice for Sampling of Petroleum Products for Analysis by Process Stream Analyzers and for Process Stream Analyzer System Validation

D7808 Practice For Determining the Site Precision of a Process Stream Analyzer on Process Stream Material

E1655 Practices for Infrared Multivariate Quantitative Analysis

E2617 Practice for Validation of Empirically Derived Multivariate Calibrations

3. Terminology

3.1 *Definitions*—Please refer to the individually cited ASTM standards for definitions.

3.2 *Acronyms:*

3.2.1 *FPAPV(s)*—Flow Proportional Average Property Value(s)

3.2.2 *MLR*—Multilinear Regression

3.2.3 *PCR*—Principal Components Regression

3.2.4 *PLS*—Partial Least Squares

3.2.5 *PSPV(s)*—Process Stream Property Value(s)

3.2.6 *PTM*—Primary Test Method

3.2.7 *PTMR(s)*—Primary Test Method Result(s)

3.2.8 *PPTMR(s)*—Predicted Primary Test Method Result(s)

3.2.9 *QC*—Quality Control

3.2.10 *UAR(s)*—Uncorrected Analyzer Result(s)

[1] This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.25 on Performance Assessment and Validation of Process Stream Analyzer Systems.

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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.

4. Significance and Use

4.1 The standards employed in the Process Stream Analyzer PSPV Generation Flow Diagram each have a specific deliverable that when combined into a single system produces a PSPV enabling the representation of product by process stream analyzer.

4.2 The description of each standard in the process provides the user with an overview of the application of the standard in the process for developing a PSPV.

5. Flow Diagram and Work Process

5.1 A flow chart showing the process for generating a PSPV is shown in Fig. 1.

5.2 The various standards shown in the flow chart are applied in sequence, building on the results of the previous standards. The end result is a PSPV which is expected to agree with a PTMR for the same material to within the user-specified requirements.

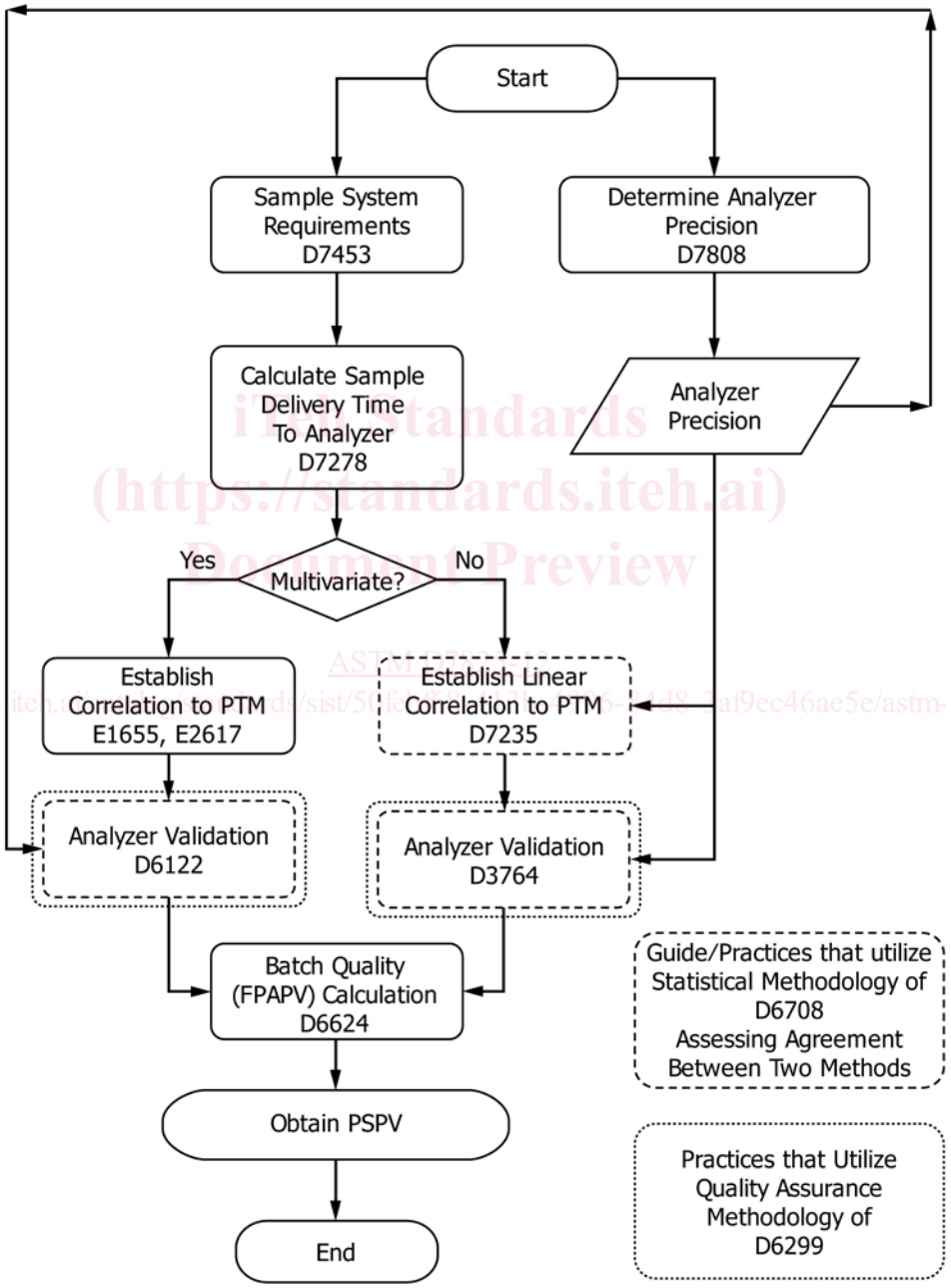

FIG. 1 Process Stream Analyzer PSPV Generation Flow Diagram