



Designation: D7808 – 22

Standard Practice for Determining the Site Precision of a Process Stream Analyzer on Process Stream Material¹

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INTRODUCTION

When a process stream analyzer is used to monitor or control a process, the results produced by the analyzer are typically used as surrogates for values that would otherwise have been obtained via analyses of process samples using a Primary Test Method (PTM). Successful application of the analyzer requires that the Predicted Primary Test Method Result (PPTMR) produced by the analyzer agrees with the Primary Test Method Result (PTMR) to within some user specified accuracy (bias and precision). To achieve this goal, it is typically necessary to develop a correlation that relates raw, Uncorrected Analyzer Results (UARs) to PTMRs. The correlation and the analyzers performance are then assessed during the analyzer validation to establish the expected agreement between the PPTMR and PTMR. In establishing the correlation, and assessing the performance, it is necessary to know the precision of both the PPTMR and the PTMR. The precision of the PTMRs is typically established through statistical quality control procedures described in **D6299**. The precision of the PPTMRs is established via procedures described herein. The techniques used to determine process analyzer site precision can also be used for ongoing quality control of the analyzer measurement system.

1. Scope*

1.1 This practice describes a procedure to quantify the site precision of a process analyzer via repetitive measurement of a single process sample over an extended time period. The procedure may be applied to multiple process samples to obtain site precision estimates at different property levels

1.1.1 The site precision is required for use of the statistical methodology of **D6708** in establishing the correlation between analyzer results and primary test method results using Practice **D7235**.

1.1.2 The site precision is also required when employing the statistical methodology of **D6708** to validate a process analyzer via Practices **D3764** or **D6122**.

1.2 This practice is not applicable to in-line analyzers where the same quality control sample cannot be repetitively introduced.

1.3 This practice is meant to be applied to analyzers that measure physical properties or compositions.

1.4 This practice can be applied to any process analyzer system where the feed stream can be captured and stored in sufficient quantity with no stratification or stability concerns.

1.4.1 The captured stream sample introduction must be able to meet the process analyzer sample conditioning requirements, feed temperature and inlet pressure.

1.4.2 This practice is designed for use with samples that are single liquid phase, petroleum products whose vapor pressure, at sampling and sample storage conditions, is less than or equal to 110 kPa (16.0 psi) absolute and whose **D86** final boiling point is less than or equal to 400 °C (752 °F).

NOTE 1—The general procedures described in this practice may be applicable to materials outside this range, including multiphase materials, but such application may involve special sampling and safety considerations which are outside the scope of this practice.

1.5 The values for operating conditions are stated in SI units and are to be regarded as the standard. The values given in parentheses are the historical inch-pound units for information only.

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

1.7 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the*

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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*A Summary of Changes section appears at the end of this standard