

PASS Training
October 5-9 2026
Register here

Sampling System Training

Improve process accuracy & optimize analyzer performance

Process Analyzer Sampling System Training - PASS -5 days

Inaccurate results from an analyzer indicate a problem with the sampling system itself, not the analyzer. Swagelok has serviced the process analyzer market for more than 60 years. To help optimize your own system success, this expertise is now being presented in a five-day course specially developed for technicians, chemists, engineers or anyone involved in the design, building, operation or maintenance of process analyzer sampling systems.



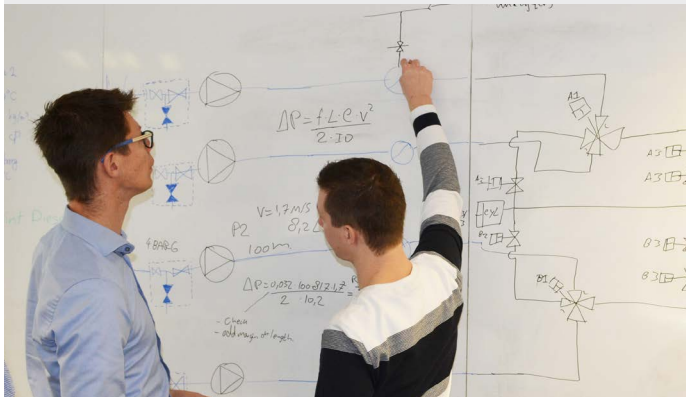
This course will show you how to recognize and diagnose common sampling system design flaws. You will learn how to employ formulas, calculations, and engineering principles rather than rely on guesswork or approximations. In the end, you will design, build, and present your own sampling system.

For who?

Analytical System and System Design Engineers, Instrumentation Engineers, Integrators, Chemists.

Topics

- Diagnose sample transport problems
- Evaluate and determine sample tap location, select an appropriate probe
- Calculate and optimize sample transport lag (or time delay) for liquids and gases
- Calculate pressure drop in a fast loop or return line
- Avoid or account for adsorption and permeation
- Predict how much vapor will condense in a sampling system
- Prevent or control phase separation
- Vaporize a sample, if and when it is appropriate
- Avoid deadlegs in a sampling system
- Read and create sampling system schematics
- Design and build a sampling system



Five Days to the Optimization of Your Process Analyzer Systems

Day 1 Fundamentals

Classwork and Basic Exercises

- Basic performance criteria and challenge
- Sample compatibility with analyzer
- Time delay in sampling
- Mixing and contamination, including deadlegs
- Diagnosing and fixing time delay problems
- Sample transport time calculations for liquids and gases
- Gas compressibility and time delay

Day 2 Classwork and Basic Exercises

Group Project: Design a Complete Sampling System

- Proper use of filters and coalescers
- Liquid, vapor, and gas separation devices
- The difference between vapor and liquid concentration
- Sample Tap Design
- Understanding process conditions, analyzer characteristics
- Location and design of process nozzle
- Probe selection and design

Day 3 Advanced Design Concepts

Group Project: Design a Complete Sampling System

- Phase Preservation
- How to condense or vaporize a sample or avoid it
- How to use phase diagrams and design of field stations and fast loops

Day 4 Advanced Design Work

Group Project: Prepare Group Design Presentations

- Advanced Calculations
- How to determine fluid velocity in line segments
- Laminar and turbulent flow & the effect of temperature and pressure

Day 5 Stream and Calibration Selection

Group Presentation

- Avoiding deadlegs and mixing volume
- Modular sample conditioning systems
- Design and build a modular sampling system
- Techniques of Stream Switching

Bert Laan

Industry Expert and Consultant



In his 30 years experience in industry, Bert has provided expert insight and analysis for a variety of applications.

With extensive experience in research, development, and project management, Bert has supported many industries, including an oil treatment gas recovery project and designed several analyzer systems.
He earned a Chemistry and electornics degree at the University of Kent.

Course dates

October 5 - 9, 2026

Location

Live training at Swagelok Nederland office in Waddinxveen.

More information

Check our website, contact us directly, click or scan QR code to register today.



Attendees of the PASS training receive the technical reference book, Industrial Sampling Systems, authored by Tony Waters—a € 245,–

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