



Swagelok®

Grab Sampling Systems

LOCAL SOLUTIONS, GLOBAL SUPPORT

Swagelok® is bringing new solutions to grab sampling

CONFIGURABLE. LOCAL. RELIABLE.



WHAT IS GRAB SAMPLING?

GRAB SAMPLE SOLUTIONS

GRAB SAMPLE SUPPORT

GRAB SAMPLE ACCESSORIES

SUPPLY CHAIN & QUALITY



ENGINEERED TO PERFORM UNDER PRESSURE

Learn how Swagelok® is bringing new solutions to grab sampling.

WHAT IS GRAB SAMPLING?



: Why Use a Grab Sample System, Sampling Basics, Sampling Benefits and Specifying a Grab Sampling System.

GRAB SAMPLE SOLUTIONS



: Grab Sample System Types, Product Selection Matrix, Grab Sample Modules (GSM), Grab Sample Liquid (GSL) and Grab Sample Cylinders (GSC).

GRAB SAMPLE SUPPORT



: Assess, Recommend, Configure, Assemble and Train.

GRAB SAMPLE ACCESSORIES



: Several options are available for your Grab Sampling Systems.

SUPPLY CHAIN & QUALITY



: Get the support you require, Locally and Globally.



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GRAB SAMPLING BENEFITS

WHAT IS GRAB SAMPLING?

Grab sampling, also known as lab sampling or spot sampling, is the collecting of a sample of liquid or gas in a pipeline, tank, or system with the intent of transporting the sample to a laboratory for analysis.

Grab Sampling can validate process conditions, ensure end products meet quality specifications, determine product quality during custody transfer and provide verification of environmental emissions.

Trust Swagelok Grab Sampling Systems when capturing a representative sample is essential.





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WHY USE A GRAB SAMPLING SYSTEM

Grab sampling can validate online analyzers are “fit for use”. However, placing a captured sample into an open bottle for transport back to the lab may not provide a representative sample. Some chemicals will evaporate or fractionate if not maintained under pressure.

As more industries bring additional analytical equipment on-line, it becomes more imperative to have quality sample systems that can accurately capture the process for later analysis.





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SAMPLING BASICS

Depending on the process phase, temperature, consistency, chemical makeup and other factors, there are a variety of approaches that can be used to extract a sample.

Determining the container type needed is the first decision that must be made in order to select the appropriate sampler.

Another important aspect is the temperature of the system fluid. Many processes operate at elevated temperatures and can pose a hazard from direct scalding during operator interaction or from the temperature limits of seats and seals being exceeded. Swagelok recommends consideration of a sample cooler when the supply temperature exceeds 140°F (60°C.) Note that thermal safety may affect sample integrity.





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SPECIFYING A GRAB SAMPLE SYSTEM

- **Pressure:** Each GSM and GSL system has a maximum rated pressure, not to be exceeded. Note: The use of a rupture disc or relief valve is recommended with chemicals that may rapidly expand and pressurize due to temperature changes.
- **Temperature:** Each GSM and GSL system has a maximum fluid operating temperature. Note: Some models may have reduced pressure ratings at elevated temperatures. Also, some models may have minimum fluid operating temperatures, below which proper function cannot be assured.
- **Phase:** A cylinder sampler (GSM) can be suitable for either liquid or vapor systems. A bottle sampler (GSL) may not prevent the release of vapors and is better suited for most non-volatile liquid systems.

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- **Hazardous/flammable material:** The sampling system must provide sufficient protection for the operator and environment from the system fluid. Certain chemicals such as aqueous chlorine and pyrophoric compounds require more stringent leak or chemical protection than may be provided by a Swagelok GSM or GSL.
- **Materials of Construction (including coatings, etc.):** The materials used in the sampling system must be compatible with the system fluid. The standard material of construction for Swagelok sampling systems is 316 stainless steel. Alternate materials such as brass and alloy 400 are available for some configurations.
- **Surface treatments:** Surface treatments can reduce the absorption and adsorption of the sample fluid into metallic surfaces, leading to a more representative sample. Electropolished (EP) tubing is available. In addition to or in place of electropolishing, many coatings can be applied to the wetted components: SilcoNert®, Silcolloy®, and Dursan® are frequently requested coatings.
- **Purge:** Some chemicals may leave residue or contaminate the lines if not flushed from the system. Selecting the purge option provides a means to introduce a purge fluid (air, solvent, etc.) to remove residual contamination from the sample lines.



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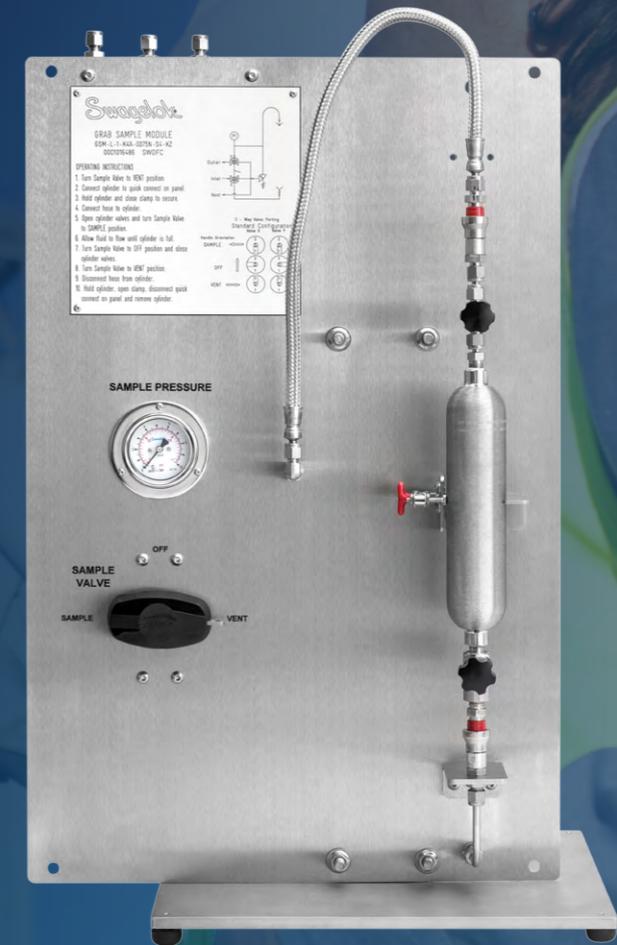
SPECIFYING A GRAB
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GRAB SAMPLING BENEFITS

The benefits of working with Swagelok for your grab sampling needs include:

- Unparalleled sampling expertise
- Local assembly and support
- One supplier for all the components
- Best practices integrated into standard designs
- Provides a simple, effective way to safely collect samples
- Keeps samples in their representative state for analysis
- Can be adapted to meet system requirements
- Assembled and tested by certified technicians
- Easy to install and operate
- One part number
- Backed by the Swagelok Limited Lifetime Warranty



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GRAB SAMPLE LIQUIDS (GSL)

GRAB SAMPLE CYLINDERS (GSC)

GRAB SAMPLE SOLUTIONS

The Swagelok grab sampling systems provide solutions to satisfy gas and liquid non-slurry sampling service in a consistent, reliable package. Two system types allow for capture into one of two types of containers — pressure-containing metal cylinders as found in the Grab Sample Module (GSM) or non-pressure-containing glass or polyethylene bottles as found in the Liquid Only Sampling Module (GSL).

SWAGELOK OFFERS TWO CATEGORIES OF GRAB SAMPLE SYSTEMS:

Cylinder Type



Bottle Type



DID YOU KNOW?

A key feature of the GSM is the switching valve that directs flow. Using the Swagelok 40G series ball valve for this switching valve, configurations are available with either 2 or 3 valves. This allows for simultaneous control of fluid routing, reducing the number of sequencing steps required to draw a sample.

The likelihood of errant sampling is reduced and a clear indication of sequencing is provided to the operator.

This valve assembly is a standard on all GSM panels as well as fixed volume GSL panels.



2-valve Switching Valve



3-valve Switching Valve



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GRAB SAMPLE SYSTEM TYPES

Swagelok offers two categories of grab sampling systems to fill a variety of intended uses.

The **Grab Sample Module (GSM)** is a sampling panel using cylinders for capturing either liquid or gas into a sealed, pressure-containing vessel. Closed loop sampling provides a sample that is fresh and extracted and held under the same process conditions that existed at the time of sample, with the exception of temperature. The sample vessel is docked in place and the process fluid is continuously circulated through the sample vessel.

A sample receiver is required for the capture of the sample with a GSM — the **Grab Sample Cylinder (GSC)**. The sample cylinders available are approved for transportation and are available with DOT or TPED approvals.

The **Grab Sample Liquid (GSL)** is a liquid-only sampling system for drawing fluid into a non-pressure containing bottle which can be drawn and transported without the risk of spillage or evaporation. This can be accomplished by using a bottle with a self-sealing septum cap. Bottles are a lower cost collection option that can be replaced easily if conditions warrant.



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Fixed volume samplers are an option that can be implemented for improved safety. This option completely separates the process pressure from the sample bottle and the user, preventing over-filling and overpressure conditions.

Product Selection Matrix

This table provides a summary of common system criteria and the grab sampling system recommended for the listed combinations.

Ordering Number	Pressurized Storage	Sample Receiver	Sample Phase	Continuous Flow	Purge	Fixed Volume	Back Purge
GSM - L - 1 (-N)	Yes	Cylinder	Liquid	No	No	Yes	No
GSM - L - 1 (-P)	Yes	Cylinder	Liquid	No	Yes	Yes	No
GSM - L - 2 (-N)	Yes	Cylinder	Liquid	Yes	No	Yes	No
GSM - L - 2 (-P)	Yes	Cylinder	Liquid	Yes	Yes	Yes	No
GSM - G - 1 (-N)	Yes	Cylinder	Gas	No	No	No	No
GSM - G - 1 (-P)	Yes	Cylinder	Gas	No	Yes	No	No
GSM - G - 2 (-N)	Yes	Cylinder	Gas	Yes	No	No	No
GSM - G - 2 (-P)	Yes	Cylinder	Gas	Yes	Yes	No	No
GSL1	No	Bottle	Liquid	No	No	No	No
GSL2	No	Bottle	Liquid	No	Yes	No	No
GSL3	No	Bottle	Liquid	Yes	No	No	No
GSL4	No	Bottle	Liquid	Yes	Yes	No	No
GSL5	No	Bottle	Liquid	No	Yes	No	No
GSL6	No	Bottle	Liquid	No	No	Yes	No
GSL7	No	Bottle	Liquid	Yes	No	Yes	No



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GRAB SAMPLE MODULES (GSM) FEATURES

The GSM closed-looped sampling system pulls from a positive-pressure process and returns back to the process at a lower pressure location (e.g. upstream of a pump), using the differential pressure to drive the fluid through the sample system. This circuit draws a flow path that connects to the sampler then returns to the process or to flare. A GSM can be left in the bypass or sample position indefinitely when using this arrangement, keeping the transport lines fresh and ready for sample capture.

A key feature of the GSM is the switching valve that directs flow. Using the Swagelok 40G series ball valve for this switching valve, configurations are available with either 2 or 3 valves. This allows for simultaneous control of fluid routing, reducing the number of sequencing steps required to draw a sample.





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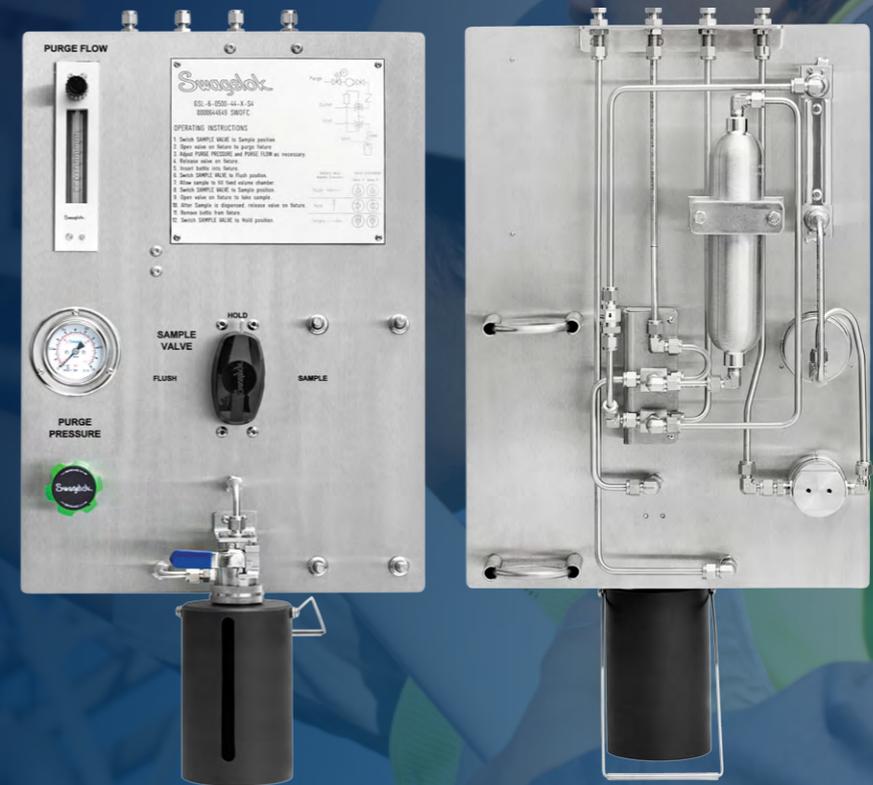
GRAB SAMPLE
LIQUIDS (GSL)

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LIQUID-ONLY SAMPLING SYSTEM (GSL) FEATURES

A liquid-only sampling system (GSL) can be used in a number of liquid applications where the process fluid is not at risk of fractionating or evaporating when stored at atmospheric pressure. This allows the use of less expensive glass laboratory bottles to draw and store the sample. Using bottles also provides immediate feedback on the visual quality of the sample stream.

Swagelok GSL systems use the same switching valve as a GSM system to provide simplified operation for complex tasks. The GSL systems also include Sentry® Equipment's Model MVS to draw a sample into a bottle. The MVS is equipped with a spring-return handle to prevent unintentional dispensing.





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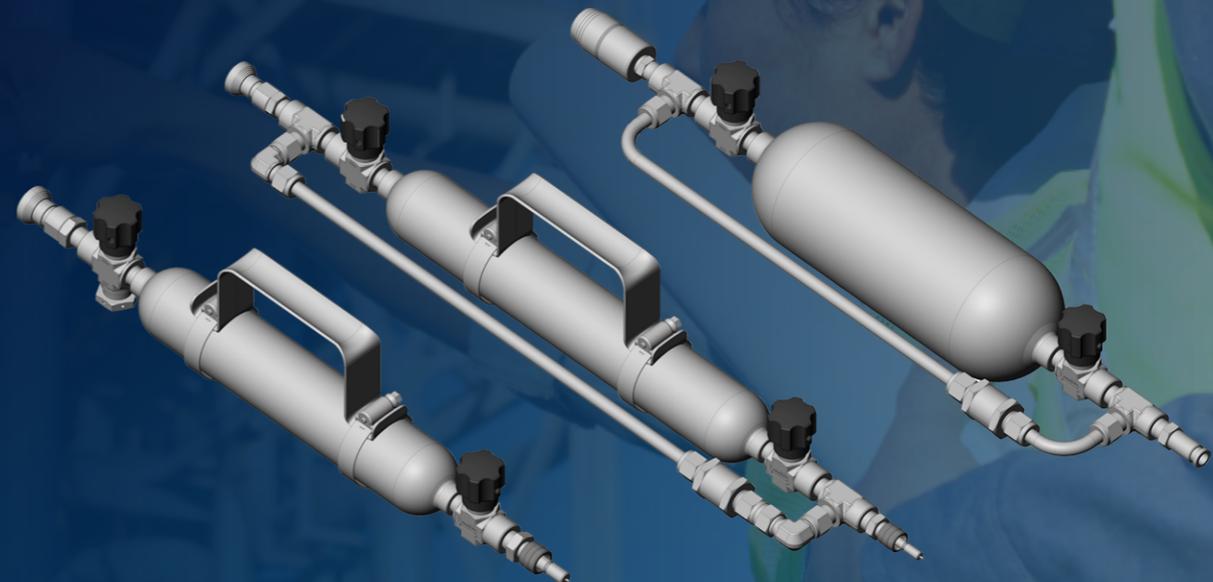
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GRAB SAMPLE CYLINDERS (GSC) FEATURES

A sample cylinder is required for every GSM system and should be ordered separately when purchasing a new GSM. Various configurations of sample cylinder assemblies, defined as Grab Sample Cylinders (GSC), are available:

- Five standard cylinder sizes (150, 300, 400, 500, & 1000 cm³)
- Multiple cylinder and valve material options
- With or without purge bypass tube
- Choice of quick connects
- Accessories: outage tubes, rupture discs, and handles
- Cylinder treatment/certification
- Stem and body protectors
- PTFE coated inner wall, SilcoNert® coating, or electropolished inner diameter
- DOT or TPED approved





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LOCAL SOLUTIONS, GLOBAL SUPPORT

Your local Swagelok Sales Representative and Custom Solutions Engineer will work with you to determine the type of panel and the proper configuration to meet your sample system needs. Each grab sample panel will be built to your specifications at your local Swagelok Service Center.

WE CAN:



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Does your sampling system provide you with a repeatable and representative sample? Or are sampling challenges costing you time and money? The team of trained and certified Custom Solutions technicians and engineers at your local Swagelok Sales and Service Center will work with you to evaluate your current sampling system and determine your needs.



For an even more in-depth look, [Swagelok Evaluation and Advisory Services](#) offers an expert analysis of your grab sampling system. Our experienced experts will visit your facility, evaluate your systems and advise on enhancements that will improve your operations. We'll identify ways to eliminate potential safety concerns, obtain more representative samples and improve the reliability of your grab sampling systems. You will receive a detailed report and recommend solutions tailored to your toughest fluid system applications and challenges. This will help you to increase operator safety, reduce environmental concerns and identify unseen opportunities for overall system improvement.



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Ensuring your grab sampling system is suitable for your particular purpose is key. Temperature, Pressure, Phase, Container type, Materials of Construction and where the panel will be installed are just a few of the criteria to consider in order to properly specify a grab sampling system.

To determine what will work best, your local Swagelok Representative will take you through a checklist of details to ensure the panel we recommend will meet your system needs. The product selection matrix provides some common system criteria that may help you with the decision making process.

Next, a certified engineer will review your information and recommend a panel per your requirements.

Swagelok Grab Sample System Checklist:

Grab Sampling can validate process conditions, ensure end products meet quality specs, determine product quality during custody transfer and provide verification of environmental emissions.
Trust Swagelok Grab Sampling Systems when capturing a representative sample is essential.
 Please answer with the dropdown menu to the best of your knowledge in regards to your Sample System requirements.

Grab Sample Module (GSM) & Cylinder (BSC) Grab Sample Liquid (GSL) Quantity

Customer Information:

Company: Project Name: Sales Rep:
 Contact: Email: Phone:
 Today's Date: Date Bid Due: Need by Date:

Process Fluid Data:

Gas Liquid Process Fluid: Fluid Hazard Conditions
 Min/Max Pressure Min/Max Temp
 Inlet Pressure Inlet Temp
 Outlet Pressure Outlet Temp
 Vent/Flare Pressure Viscosity at Temp
 Purge Pressure Tag#'s
 Condensable? Yes No At what Temp? Particulates? Yes No Size?

Materials of Construction:

Panel Components Tubing Seal Material
 Other: Other: Other:

Sample Station Options:

Cylinder	Boston Round Bottle	Media Bottle	Cylinder Material
Quantity: <input type="text"/>	Quantity: <input type="text"/>	Quantity: <input type="text"/>	Quantity: <input type="text"/>
Size: <input type="text"/>	Size: <input type="text"/>	Size: <input type="text"/>	Bottle Description <input type="text"/>
Other: <input type="text"/>	Other: <input type="text"/>	Other: <input type="text"/>	

Replacing Existing Station: No Yes Supplier: Model:

Continuous Flow: No Yes
 Purge: No Yes
 Relief Valve: No Yes
 Check Valves: No Inlet Outlet Vent Purge
 Isolation Valves: No Inlet Outlet Vent Purge
 Block Valves: No Inlet Outlet
 Flowmeter: No Yes
 Outage Tube: No Yes Minimum Outage: %
 Rupture Disc: No Yes
 Gauges: No Pressure Temp General Industrial Safety Process
 Inlet/Outlet Connections: 1/4" 3/8" Other:
 Sample Cooler: No Yes Cooling Media: Operating Temp:
 Mounting: Wall Pipe Stand Qty:
 Enclosure: No Yes Insulated: Heated? Steam Electric Material
 Panel Material: SS Aluminum Other: Decal
 Quick Connects: No QCA OTM2 QCS Other:

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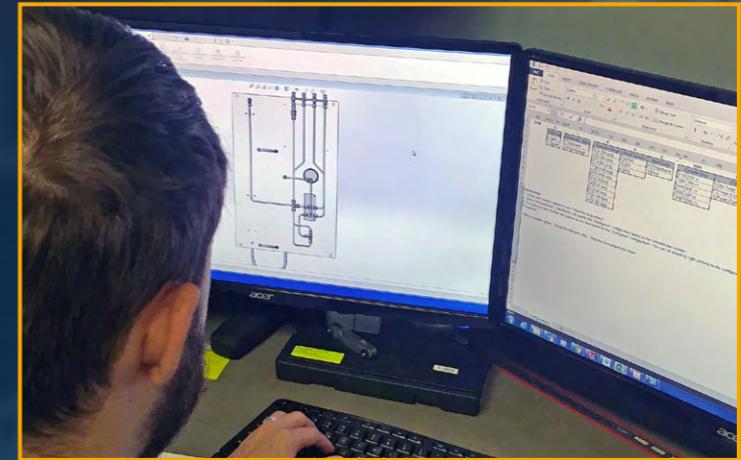


CONFIGURE

Our certified engineer will be happy to work with you to meet your system requirements.

Using our several standard panel designs as a platform, we can work with your team to:

- Substitute comparable Swagelok and non-Swagelok (non-competitive) products
- Add products within the existing schematics – sample coolers, flow meters, shut-off valves, drain valves, etc.
- Make changes in layout
- Make structural changes/additions – panel/bracket materials, enclosures, etc.
- Convert to larger/smaller tube size (or metric)
- Suggest alternative materials of construction
- Discuss flow / pressure drop calculations (and make changes based on results)
- Suggest sizing of sample coolers/heaters and enclosure heaters





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Every local Swagelok technician has undergone a comprehensive training and certification program, that is repeated every three years, to ensure your sample panel will be assembled to strict guidelines and to your specifications. In addition, our certified engineer will monitor each step of the process to ensure quality and consistency.

Every Swagelok GSM and GSL is shell tested at the selected gauge pressure of the assembly, up to a maximum of 1,000 psig (69 bar). Additional testing is available upon request.

Swagelok products are backed by
The Swagelok Limited Lifetime Warranty





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Swagelok is committed to helping you work safer and smarter. Upon completion of your grab sample panels, a representative from your local Swagelok sales and service center can provide hands-on training to your technicians on proper use and maintenance.

For a more in-depth look at Industrial Sampling Systems, you may consider Swagelok's Sampling Systems Training. Swagelok's hands-on sampling system training is one more way we can help your team prevent, diagnose and eliminate issues that can result in costly inefficiencies.

The courses are derived from Industrial Sampling Systems, a technical reference book authored by industry expert and consultant, Tony Waters.

[Download this white paper to see 10 common mistakes that could be harming your operations.](#)

And for further information, select one of the courses below:

[Sample System Problem Solving and Maintenance \(SSM\)](#)

[Process Analyzer Sampling System \(PASS\) Training](#)

[Process Analyzer Sampling System \(PASS\) Subsystem Training](#)





GRAB SAMPLE ACCESSORIES

Several options are available for your grab sampling system, such as:

- Additional instrumentation - gauges, flowmeters, and transducers
- Sentry® sample coolers
- Process connections - threaded and flanged connections
- Enclosures and stands
- Automation - add a pneumatically or electrically actuated valve to automate your sampling sequence
- Exotic alloys - certain components are available in alloy 400, alloy C-276, or alloy 600
- Outage Tubes
- Nonrotating Stem Needle Valves
- Rupture Disc Units
- Relief Valves
- Carrying Handle





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A STRONGER SUPPLY CHAIN

WE MAKE YOUR WORLD SMALLER.

Swagelok can support your success wherever it takes you. Our business model puts **local inventory close to you:**

- Our **global distribution network** operates in **70 countries** from **225 Sales and Service Centers**, **20 manufacturing facilities**, and **five global tech centers**.
- **Local talent runs the operation.** Our people know the culture, speak the language, and understand the region.
- Our **7,800 associates worldwide work together** to provide factory support, field engineering, technical services, coordinated deliveries, inventory replenishment, and a range of special expertise.
- With our **inventory and availability**, you are **never far from the products you need**, when you need them.

We are ONE interconnected global team.



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GLOBAL DISTRIBUTION NETWORK

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SWAGELOK PROMISE

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OUR GLOBAL DISTRIBUTION NETWORK

Swagelok knows that *inventory, availability, and reach* keep your operation and budget on point. That's why we built our *global distribution base* to deliver under pressure:



20 MANUFACTURING CENTERS

The Swagelok Advantage starts with highly reliable components machined from high-quality raw materials.

DISTRIBUTION WAREHOUSE

Delivers direct to your local Sales and Service Center with 99% inventory and shipping accuracy.

225 SALES AND SERVICE CENTERS

Auto-replenishment and sale forecasting support regional inventory levels that meet your everyday needs.

100,000's CUSTOMERS WORLDWIDE

Enjoy fast access to the products that keep plants and processes running safely and reliably.



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INVENTORY AND AVAILABILITY

Availability is a critical part of our brand promise.

We ensure our distributors have the right level of inventory for the products you need immediately:

- Thousands of standard products in inventory
- Over 6,800 line items shipped daily
- 99% shipping and inventory accuracy
- We also collaborate with key customers to supply:
 - Short lead times on **Assemble to Order (ATO)** products
 - A robust supply of **Make to Order (MTO)** products
 - **Engineer to Order Products (ETOP)** for unique needs

It's Only Fitting

Swagelok keeps significant amounts of raw materials on hand in case our suppliers' own supply chains are interrupted. We also have a team of 35 professionals working side-by-side with our suppliers to overcome any issues.



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TRACEABILITY & QUALITY

Raw material traceability is an integral part of Swagelok's overall quality system throughout all phases of material receipt, manufacturing, processing, storage, and delivery. All fittings are marked with the Swagelok name, material type, and trace identifier. The quality system our fittings are manufactured under has been approved by:

- ISO 9001:2000
- UN/ECE R110
- METI/KHK
- Canadian Registrations
- CSA NGV 3.1 and 4.6
- ASME N and NPT
- The U.S. Navy
- DNV GL (Det Norske Veritas)
- American Bureau of Shipping
- The Bureau Veritas
- Lloyd's Register





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A PROMISE AS STRONG AS OUR PRODUCTS

The **SWAGELOK LIMITED LIFETIME WARRANTY** demonstrates our relentless commitment to quality and our customers. Every Swagelok product is backed by this promise for the life of the product.

PROTECT YOUR FLUID SYSTEM INVESTMENT FROM INSTALLATION TO EVERYTHING AFTER.



LIMITED LIFETIME WARRANTY

The Swagelok Limited Lifetime Warranty

Swagelok and its authorized distributors hereby warrant to the purchaser of their Products that the non-electrical components shall be free from defects in material and workmanship for the life of the Products. All electrical components installed in or on the Product are warranted to be free from defects in material and workmanship for twelve months from the date of purchase. The purchaser's remedies shall be limited to replacement and, in non-ground-vehicle applications, installation of any parts that fail through a defect in material or workmanship. Liability for installation is limited to reasonable costs that have been approved in advance and in writing by Swagelok.

All customer-specified components carry the applicable manufacturer's warranty. Warranty coverage hereunder only applies to Products purchased directly from either Swagelok or its authorized distributors and representatives. All other purchases are specifically excluded from any warranty coverage.

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WHAT IS
GRAB SAMPLING?

GRAB SAMPLE
SOLUTIONS

GRAB SAMPLE
SUPPORT

GRAB SAMPLE
ACCESSORIES

SUPPLY CHAIN
& QUALITY



GLOBAL DISTRIBUTION
NETWORK

INVENTORY
AND AVAILABILITY

TRACEABILITY
& QUALITY

SWAGELOK PROMISE

SWAGELOK COMPLETE
PRODUCT GUIDE

COMPLETE PRODUCT GUIDE

Customers depend on Swagelok for tube fittings and much more. We offer many products designed for everyday needs and unusual challenges, most available with Swagelok tube fittings, and we can deliver the right combination of options to fit any job:



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