Our Promise:

In every customer interaction, regardless of application or operational challenges, we will provide premier Swagelok Fluid-System Product Solutions and Strategic Services to positively impact your bottom line.

Swagelok

Swagelok Pittsburgh | Tri-State Area

Your Local Fluid-System Experts!

49 Meade Avenue, Pittsburgh, PA 15202

Call: **412.761.3212** • Fax: **412.761.2486**

pittsburgh.swagelok.com

@SwagelokPGH SwagelokPittsburgh

Swagelok Pittsburgh | Tri-State Area

Premium-Quality,

LEAK-TIGHT COMPONENTRY

TUBE FITTINGS | VALVES | GAUGES | HOSES | TUBING | REGULATORS | MANIFOLDS

Since 1947, Swagelok products have provided unparalleled reliability, durability, and performance in even the most challenging fluid-handling applications and environments. No matter what your industry – Oil & Gas, Chemical, Petrochemical, Steel, Power, or Applied Research – we offer unique solutions and support to help relieve your most demanding operational pressures: knowledge drain, diminished resources, system inefficiencies, and worker/site safety.

Always-Available

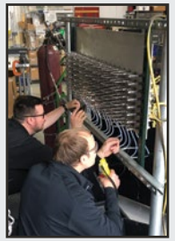
TOOL RENTALS

We lease pristinely maintained Benchtop and Electric Tube Benders, Hydraulic Multi-Head Hydraulic Swaging Units, and Orbital Welders for daily, weekly, or monthly use. Why buy new if your need is short-term or infrequent?

Masterful

CUSTOM FABRICATION

PANEL/SKID DESIGN AND BUILD | SIMPLE TO COMPLEX ASSEMBLIES



- Dedicated Swaging, Bending, Coiling, Orbital Welding, Kitting, Packaging/Wrapping, Inspection, Testing, and Cleaning Stations
- Climate-Controlled Environment
- 5-ton Overhead Crane, with an 18-foot clearance

Comprehensive

SAFETY TRAINING

TRAINING COURSES OFFERED:

- TUBE FITTING INSTALLATION & TUBE BENDING
- FITTING INSPECTION
- HOSE ESSENTIALS
- VALVE ESSENTIALS
- ADVANCED TUBE BENDING
- SAMPLING SYSTEM MAINTENANCE
- PROCESS ANALYZER SAMPLING SYSTEMS
- ORBITAL WELDING

- We offer an unparalleled array of pertinent and timely course titles.
- We can bring our training directly to your site or project location.
- All of our classes include a full money-back guarantee.
- All graduates receive a genuine Swagelok Certificate of Completion, plus several valuable take-home items.
- We supply all class materials – students just need to show up!

We also facilitate your enrollment in Swagelok-conducted multi-day Sampling System and Orbital Welding training events.

Visit swagelok.com for a complete list of class titles, times, locations, and agendas.

Trusted System

EVALUATIONS & ADVISORIES

MEDIA LEAKAGE | INDUSTRIAL HOSE AUDITS: BEST PRACTICES FOR SAFETY, SELECTION, SIZING, AND STORAGE

Our **Energy Management Specialists** will conduct an on-site survey to identify and tag the leaking tube fitting, pipe, and valve connections that put your workers, equipment, end product, and overall profitability at substantial risk. Our certified **Hose Advisors** will closely audit your current hose usage to determine if your hose types, routes, lengths, and end connections are ideally suited to your specific applications.

Proven

APPLICATION EXPERTISE

Let us help you choose the optimum Swagelok componentry or fabricated assembly for your particular application – no matter how complex or routine your job. Our trained and friendly Technical Sales and Support Team provides reliable recommendations on how you can confidently and quickly reduce operational downtime and other major system inefficiencies. Whatever your fluid-system challenge, we have the technical know-how and always-on-hand inventory to enable you to get more done safely: **on-time, on-plan, and on-budget!**

Swagelok is Synonymous with Safety

...and Efficiency, Productivity, and Profitability

Globally - Swagelok Company and *Locally* - Swagelok Pittsburgh | Tri-State Area

...deliver the premium-quality, leak-tight Products and value-added Strategic Support Services that will enable you to get more out the door safely, on-time, on-plan, and on-budget.

UP TO **42%**
of safety incidents are due to
PREVENTABLE ERRORS.

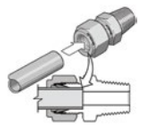
Here are some tips to help your maintenance technicians operate safely and confidently.

How to Properly and Safely Install and Reassemble Tube Fittings

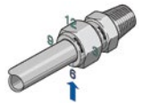
MANUAL INSTALLATION

1. Insert the tubing into the tube fitting.

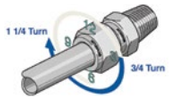
Make sure that the tubing rests firmly on the shoulder of the fitting body and that the nut is finger-tight.



2. Scribe the nut at the 6 o'clock position.



3. Hold the fitting body steady and tighten the nut 1¼ turns.



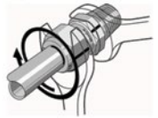
For 1/16", 1/8", and 3/16", plus 2mm, 3mm, and 4mm tube fittings, tighten the nut three-quarters turn to the 3 o'clock position.

REASSEMBLY INSTRUCTIONS

1. Prior to disassembly, mark the tubing and flats.

2. Insert tube end connection with pre-swaged ferrules into the fitting body.

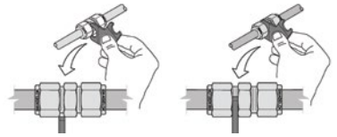
3. Rotate nut to pulled-up position; tighten slightly.



Do NOT use a gap inspection gauge with reassembled fittings.

To Further Enhance Worker and Workplace Safety

GAP INSPECTION GAUGE



Sufficiently Tightened | **Additional Tightening Required**

DEPTH MARKING TOOL

With tube fully bottomed, mark the tube at the top of the Depth Marking Tool.

Tube below the line must not be visible when tube is inserted into fitting body prior to tightening. Mark will be visible at top of nut after tightening.

Common Installation Errors Resulting in Fitting Failure and Safety Concerns

Fatigue
- Improper Tubing Support
- Side Load

Stress Corrosion Cracking
- Exposure to Chlorine and/or Other Corrosive Media

Non-Conforming Tubing
- Hardness
- Outside Diameter
- Wall Thickness

Tubing Blowout
- Improper Initial Assembly
- Un-Bottomed Tubing in Tube Fitting
- Under-Tightened Tube Fitting on Initial Assembly
- Improper Remake Assembly
- Undersized Tubing

Improper Tube Fitting Assembly
- Missing Components
- Bad Threads as a Result of Cross-Threading or Over-Tightening

Tube Fitting Hardware Safety

Do not intermix or interchange fitting ferrules, nuts, and/or bodies from different manufacturers.

There is **NO** worldwide design standard!

From the United States Nuclear Regulatory Commission:
"The NRC and licensees have noted problems with the installation of compression fittings, including interchanging hardware from different manufacturers."

Cited in the United Kingdom's Loss of Containment Manual:
"It is not permissible to interchange sub-components of different designs or types of fittings."

Additional Swagelok Safety Tips

- Never bleed system pressure by loosening fitting nut or plug.
- Never make up and/or tighten fittings when system is pressurized.
- Make sure tubing rests firmly on the shoulder of the tube fitting body before tightening nut.
- Use a gap-inspection gauge to ensure sufficient tightening (NOT on reassembly, though).
- Always use proper thread lubricants and sealants on tapered pipe threads.
- Always turn the fitting nut, not the fitting body, during assembly.
- Never use a fitting to correct tubing misalignment.
- Never mix tube fitting and tubing materials – galvanic corrosion or leakage could occur.
- Always make sure tubing material is softer than fitting material.
- Always check wall thickness extremes against fitting manufacturer's suggested minimum wall thickness limitations.
- Always remember that tubing surface finish is critical – to create proper sealing; avoid tubing with excessive depressions, scratches, or similar defects.
- Never force tubing into a fitting (it should easily fit through nut, ferrules, and body).

Tube Support Options and Considerations

- Proper support limits the effects of system impulse and vibration.
- Always use resilient tubing supports.
- Always support long tubing runs to avoid sagging.
- Always mount instruments independently.
- Fluid density and tube size dictate support frequency.
- Supports are employed near tubing bends to isolate movement caused by changes in direction of fluid flow.