Swagelok

Swagelok Pittsburgh | Tri-State Area

DISTINCTLY DIFFERENT...

TO MAKE A BOTTOM-LINE DIFFERENCE

Since 1947, **one global Fluid-System truth has remained the same:**
Swagelok Tube Fittings are uniquely different...

...in proprietary **design**, safety, and performance

...in **materials** of construction and metallurgical chemistry

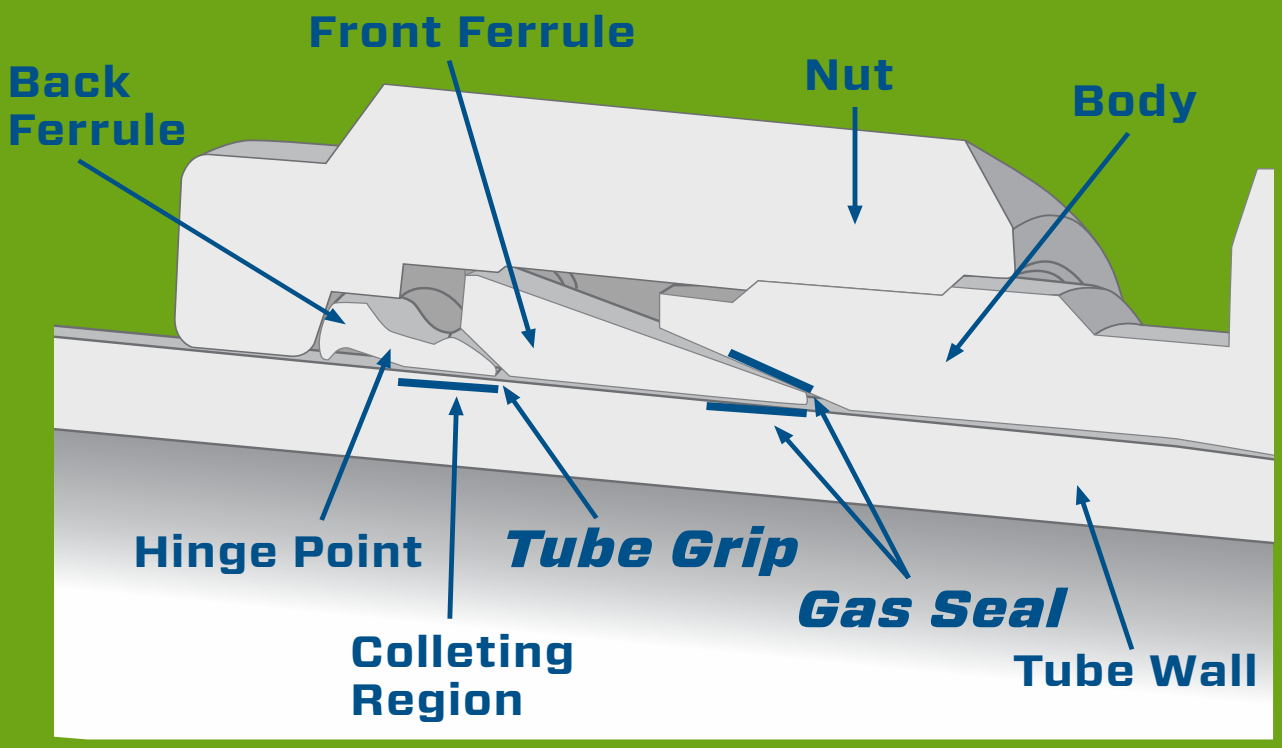
...in how they're **made**, tested, and warrantied

200
Active Swagelok Tube Fittings Patents

40,000,000
Swagelok Tube Fittings Manufactured Yearly

150
Published Tube Fitting Test Reports

Better by Design



The world-renowned Swagelok Tube Fitting, consisting of a body, nut, and front and back ferrules, incorporates a grip-type mechanism that creates a unique **hinging-and-colleting action** that results in:

- more **direct tube contact/gripping support**
- concentrated zones of contact on the tube and body bevel for an **ultra-strong gas seal**
- **better isolation of stress risers at the tube grip** to resist bending, deflection, and vibration

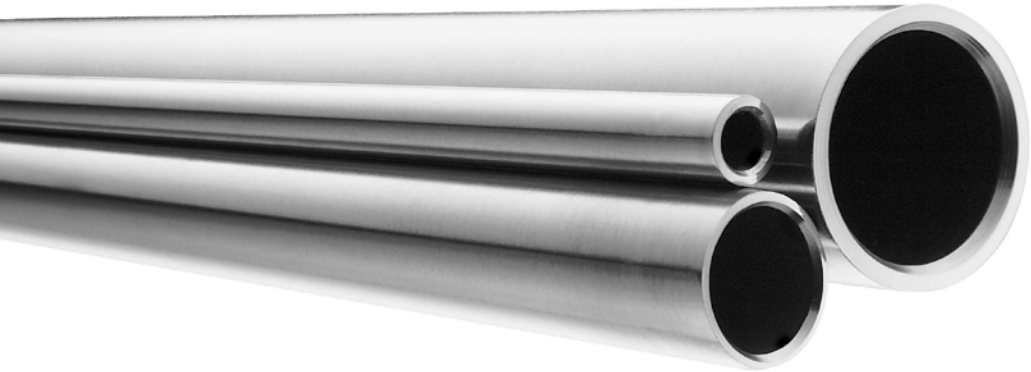
In addition, our patented **SAT12® Low-Temperature Carburization Process**, recipient of the 2006 Engineered Materials Achievement Award, gives our front and back ferrules a tool steel-like hardness and strength without diminishing their ability to fight corrosion or to maintain ductility.

Plus, Swagelok Tube Fittings are easy to install: No threading, welding, soldering, flaring, or brazing required – just your standard wrenches!

Our Goal: *Zero Customer Disappointments!*

Superior Materials

Not all stainless steel is the same. Our premium, special-recipe "Swagelok" 316 stainless steel exceeds ASTM minimum requirements for nickel and chromium – resulting in optimum corrosion resistance and ductility. In our extensive Chloride Stress Corrosion Cracking (CSCC) test of 72 Swagelok nuts versus 110 of multiple competitive brands, Swagelok had ZERO visible cracking or leakage, yet 39% of the comparable fittings cracked or leaked.



Genuine Swagelok

We own our entire manufacturing process, including all forging, machining, electro-polishing, welding, assembly, and testing…with all activities done only by us – in our facilities. Raw material traceability is extremely critical and integral to Swagelok's unparalleled total quality system. In fact, we can track what lot of material makes up a part and which components are in an assembly. And all Swagelok tube fittings are fully backed by the Swagelok Limited Lifetime Warranty – a promise as strong as our products.

At Swagelok, we have a proven passion for perfection. We routinely and rigorously test thousands of random samples each year – subjecting them to extreme burn, rotary flex and impulse, and shock impact conditions – to absolutely ensure that you receive the safest, most dependable tube fittings in the fluid-system industry.

TUBE GRIP TEST REPORTS

Hydrostatic Pressure Test

Objective: Swagelok assemblies were tested to observe the tube grip performance of 316 stainless steel Swagelok tube fittings with advanced geometry back ferrules using heavy-wall tubing under laboratory conditions at ambient room temperature.

Results:

Tubing Size	Working Pressure	Samples Tested	Samples Passed
¼" x 0.065	10200	168	168
⅜" x 0.083	7500	144	144
¼" x 0.083	6700	120	120
⅝" x 0.095	6000	108	108
¼" x 0.109	5800	120	120
⅞" x 0.109	4800	60	60
1" x 0.120	4700	120	120

Tensile Pull Test

Objective: Swagelok assemblies were tested to observe the tensile pull performance of the 316 stainless steel Swagelok tube fittings with advanced geometry back ferrules under laboratory conditions at ambient room temperature.

Results:

Tubing Size	Calculated Tensile Load	Samples Tested	Samples Passed
¼" x 0.065	1237 lbs	24	24
⅜" x 0.065	2079 lbs	24	24
¼" x 0.083	3560 lbs	20	20
⅝" x 0.095	4745 lbs	12	12
¼" x 0.109	6585 lbs	12	12
⅞" x 0.109	7869 lbs	12	12
1" x 0.120	9130 lbs	12	12

VIBRATION RESISTANCE TEST REPORTS

Rotary Flexure Test

Objective: Swagelok assemblies were tested to observe the fatigue endurance of 316 stainless steel Swagelok tube fittings with advanced geometry back ferrules under laboratory conditions at various levels of applied alternating-bending stress of the tubing.

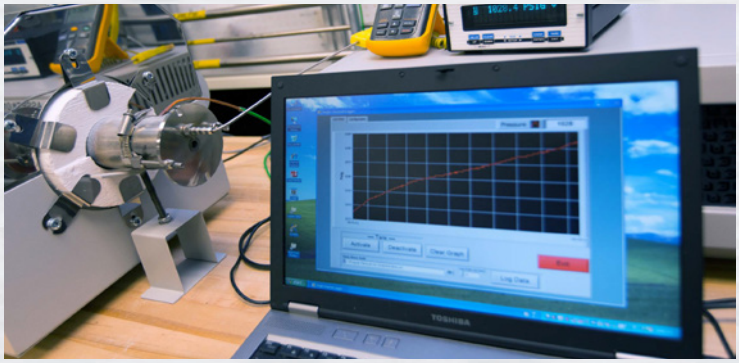
Results:

Nominal Alternating Bending Stress	Samples Tested	Samples Passed
20000	154	154
15000	154	154
10000	154	154

Seismic Intensity Analysis

Objective: Swagelok assemblies were subjected to Table Vibration and High Impact Shock tests to observe for leakage in conditions simulating severe earthquake events.

Results: No tube fitting leakage was detected before OR after any vibration exposure. No tube fitting leakage was found during repeated shock test exposure.



GAS SEAL TEST REPORTS

Chloride Stress Corrosion Cracking Test

Objective: Swagelok assemblies were tested under laboratory conditions to observe the effects of an environment that promotes Chloride Stress Corrosion Cracking of 316 stainless steel.

Results:

- All 64 samples successfully passed 720 hours in the salt spray chamber – without pressure loss.
- All samples successfully passed the pre- and post-salt spray nitrogen gas pressure tests – without leakage.
- Liquid penetrant evaluation of the sample components found no evidence of crack formation.
- No evidence of CSCC crack initiation and propagation beyond surface structures of the sample components was observed.

Nitrogen Gas Seal Test with Repeated Reassemblies

Objective: Swagelok assemblies were tested to observe the performance of stainless steel Swagelok tube fittings with advanced geometry back ferrules with thin-wall stainless steel tubing during a gas seal test with repeated reassembly under laboratory conditions.

Results:

Tubing Size	Working Pressure	Samples Tested	Samples Passed
¼″ x 0.028	4000	16	16
5⁄16″ x 0.035	4000	16	16
⅜″ x 0.035	3300	16	16
½″ x 0.049	3700	16	16

Nitrogen Gas Seal Test

Objective: Swagelok assemblies were tested to observe the performance of 316 stainless steel Swagelok tube fittings with advanced geometry back ferrules during a reassembly gas seal test.

Results:

Tubing Size	Working Pressure	Test Pressure	Samples Tested	Samples Passed
⅝″ x 0.065	4000	5000	24	24
⅝″ x 0.095	6000	7500	12	12
¾″ x 0.065	3300	4125	24	24
¾″ x 0.109	5800	7250	12	12
⅞″ x 0.083	3600	4500	24	24
⅞″ x 0.109	4800	6000	12	12
1″ x 0.083	3100	3900	12	12
1″ x 0.120	4700	5900	12	12

Nitrogen Gas Test

Objective: Swagelok assemblies were tested to observe the leak-tight performance of stainless steel Swagelok tube fittings with thin-wall, stainless steel tubing during a gas seal test under laboratory conditions.

Results:

Tubing Size	Working Pressure	Samples Tested	Samples Passed
¼″ x 0.028	4000	192	192
⅜″ x 0.035	3300	144	144
½″ x 0.065	3700	132	132
⅝″ x 0.109	4000	108	108
¾″ x 0.083	3300	120	120
⅞″ x 0.109	3600	60	59
1″ x 0.083	3100	144	143

Made to a Different Standard

Swagelok 3/8" Tube Fitting Assemblies

Competitive 3/8" Tube Fitting Assemblies

Not all tube fittings are made to the same exacting tolerances. In fact, there's no global design standard. That's precisely why the intermixing or interchanging of fitting brands will likely result in uneven production, harmful emissions, increased maintenance labor, and, perhaps, dangerous blowouts. Swagelok's proven, proprietary two-ferrule design delivers **superior performance AND ultimate worker safety** – especially in the most challenging fluid-system applications.

The Swagelok Tube Fitting Advantage & Promise:

- **Ultra-Reliable, Unprecedented Leak-Tight Performance**
- **Safe and Easy to Install and Maintain**
- **Expert Swagelok Technical Support Always Available**
- **Engineering Assistance to Ensure Optimum Product Selection for Application**
- **Comprehensive Installation and Inspection Safety Training.**
- **Panel Design and Build Capabilities**

Leakage: Cost & Consequence

Make your workplace safer and more profitable by choosing and properly installing the industry's most reliable and proven fittings: Genuine Swagelok.

Swagelok's renowned Tube Fitting Installation & Tube Bending Safety Essentials class teaches students how to safely and correctly assemble tube fittings. Participants also learn how to select, handle, prepare, cut, and debur tubing of different materials before making bends of 45°, 90°, 180° – plus offsets. Get TWO Swagelok Certificates of Completion for just one day of training!

LOST FLUID

millions of litres
are wasted each year
(1 gallon of hydraulic fluid ≈ $14 USD)

LOST PRODUCTION

especially important in offshore oil where laws already limit production to a specific number of days per month

EQUIPMENT DAMAGE

loss of lubrication can lead to premature wear/machine failure

OFF-SPECIFICATION PRODUCT

can be produced inadvertently due to improperly calibrated or operating instruments; material must be reworked, sold at reduced price, or disposed of

DEGRADED WORK ENVIRONMENT

oil drippage can cause accidents; emissions can be expensive, dangerous—even illegal

FINES FOR NONCOMPLIANCE

systems and equipment that violate validated processes can quickly become costly

CLEANUP

it takes time to locate and repair leaks; some call for special teams to manage toxic chemicals; there's also the cost of shutting down a system to thoroughly clean it

Swagelok Pittsburgh | Tri-State Area

To learn more HOW Swagelok Company and Swagelok Tube Fittings are truly different versus all other competitive manufacturers and brands – and how that difference will substantially improve your Bottom Line health, contact and follow us at:

Contact Us:

P: 412.761.3212

pittsburgh.swagelok.com

Follow Us:

@SwagelokPGH

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