



Alternative Fuels - Hydrogen, CNG and LNG

Green energy initiatives with reliable fluid system and advice you can trust

Swagelok solution to support net zero emission in 2050.

The need for sustainability is driving clean energy technology innovation. Clean production, reliable distribution, safe storage infrastructure, and accessible transport are today's top priorities.

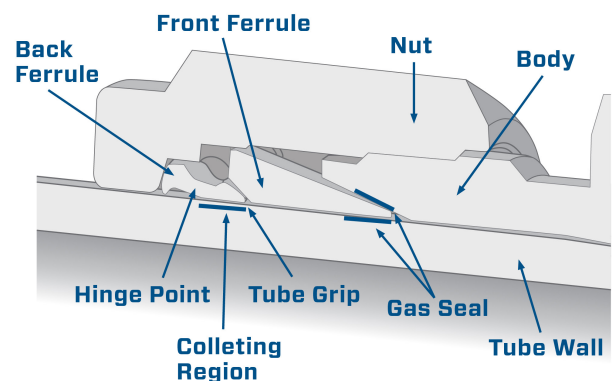
Hydrogen fuel cell, natural gas, or other synthetic fuels (ethanol, methanol, biodiesel, etc.) on-vehicle fluid systems and the infrastructure used to fuel them require high-integrity system components that effectively contain high-pressure, small-molecule gases.

Hydrogen



Swagelok has more than 30 years of experience supporting customers pursuing clean energy solutions that require high-integrity components that effectively contain high-pressure, small molecule gases like hydrogen. Our stainless-steel components are designed to deliver leak-tight systems and long service life.

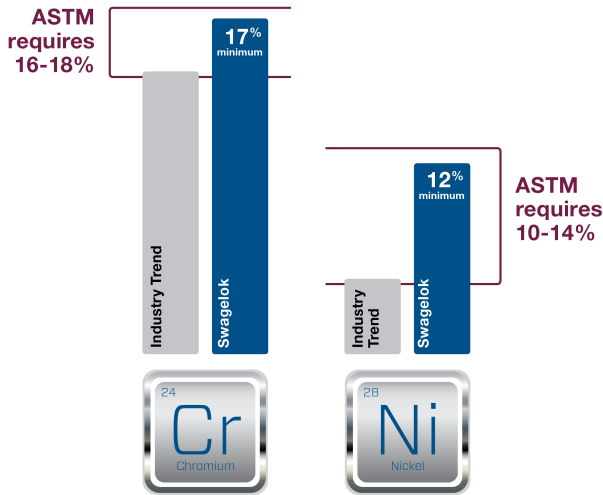
Leak Tight Performance



Swagelok tube fittings have a grip-type design that uses a unique "hinging and collecting" action to achieve optimal performance in three key areas:

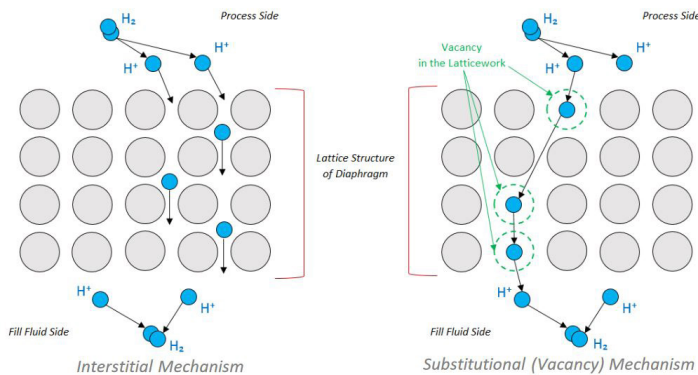
- Tube grip—hinging and colletting action provides more direct tube contact/gripping support.
- Gas seal—burnishing/polishing action of the front ferrule creates concentrated zones of contact on the tube and on the body bevel for a stronger seal.
- Vibration resistance—the colletting region better isolates stress risers at the tube grip to resist bending, deflection, and vibration.

Material Integrity



Chromium and nickel are critical for corrosion resistance and ductility in stainless steel. Swagelok has maintained chromium content in its fittings at a minimum of 17% and nickel at a minimum of 12% for many years.

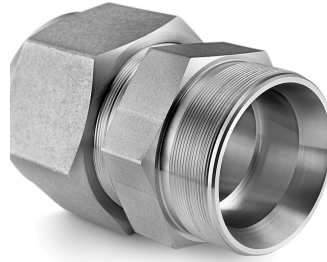
High Ductility creates a hydrogen embrittlement resistance. Hydrogen Embrittlement occurs when metals become brittle as a result of the introduction and diffusion of hydrogen into the material.



Source: Yokogawa Corporations

Swagelok Product supporting Hydrogen – CNG/LNG Applications

Fittings



We offer a wide variety of fittings for alternative fuel system applications, including [Swagelok® FK series fittings](#) that deliver outstanding tube grip and leak resistance, assembly-by-torque [\(AbT\) fittings](#) that are quick and easy to install, and [Swagelok® tube fittings](#) that deliver gas-tight seals resistant to vibration fatigue.

Valves



Whether you are working with hydrogen, natural gas, or synthetic fuels (ethanol, methanol, biodiesel), find dependable [ball valves](#) for on-vehicle or dispenser use, [check valves](#) for excess flow prevention in on-vehicle applications, [relief valves](#) for purge and bleed applications, and [instrument manifolds](#) that minimize potential leak points in refueling stations.

Swagelok®

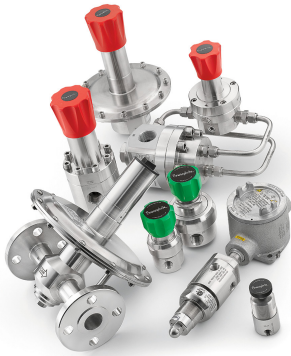
Swagelok Indonesia

Hoses and Flexible Tubing



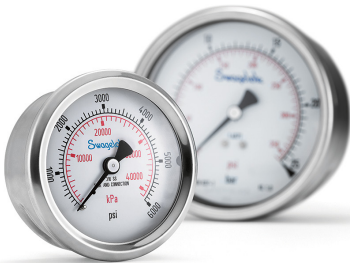
Choose from millions of variations of [metal core](#), [PTFE/PFA core](#), [rubber core](#), and [thermoplastic core](#) hose and [flexible tubing](#) options to find products designed to perform well in hydrogen and natural gas on-vehicle and refueling infrastructure applications.

Regulators



Choose the right pressure regulators rated appropriately to maintain ideal pressures in alternative fueling infrastructure applications.

Measurements Devices



Maintain optimal fluid conditions in on-vehicle alternative fuel applications and in refueling infrastructure with [pressure gauges](#) and additional measurement devices that are easy to use and read.

Tubeing and Tube Accessories



Find [metal tubing](#) with the material composition and performance characteristics required for hydrogen and CNG/LNG applications, both on vehicles and in fueling stations.

Services for the Clean Energy Industry

Strained workforces, a lack of skilled technicians, and supply chain complexities are just some of the challenges that can make the development of fluid system applications difficult. Swagelok can provide the support you need to overcome design challenges, select components, and troubleshoot issues while developing low- or zero-emission fuel storage, transportation, and delivery systems.

Field Engineering



Our experienced field engineers are stationed around the world and can help you identify and solve application challenges, troubleshoot problems, and recommend materials based on factors that contribute to corrosion, hydrogen embrittlement, and chemical compatibility issues.

Fluid System Training



A well-trained team can help ensure that your approach is consistent and that your standards are upheld on every installation. Swagelok offers training on topics such as [materials science](#), [tube bending](#), hose routing, [orbital welding](#), and [product selection, installation, and inspection](#), helping you ensure your team members can effectively assemble and operate critical gas systems.

Global Capabilities, Local Service

We have the relationships, global manufacturing capabilities, logistics networks, technical support resources, and local field engineers in place to help you build and operate critical fluid systems efficiently and cost-effectively worldwide.

- Our global distribution network provides comprehensive local support from more than 200 sales and service centers located across 70 countries.
- We provide technical expertise and collaboration through six global technology centers and 20 manufacturing facilities located across the globe.
- Our global supply chain and order fulfillment processes are designed to get you the products you need just in time. Many products are stocked locally, and we can provide specialized inventory management services to help you maintain cost-effective, convenient access to components.
- Local specialists backed by a global team of experts provide component selection and fluid system troubleshooting support. They provide the insights and recommendations you need to improve the performance, productivity, reliability, and safety of your fluid systems while controlling costs and mitigating environmental risks

**For more information, please contact info@indonesia.swagelok.com,
your local Swagelok sales and service center or visit our website
<http://indonesia.swagelok.com>**

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