

Calibration Gas Adapter and Procedure

August 2026

Calibration gas (calgas) is usually required to operate a GC. There are larger calgas cylinders like the ones below, and smaller cylinders like the ones on the bench.



The way we like to withdraw expensive calibration gas from the cylinder without wasting it is to install a 1/8" swagelok type nut with a septum inside for a gas syringe to penetrate.

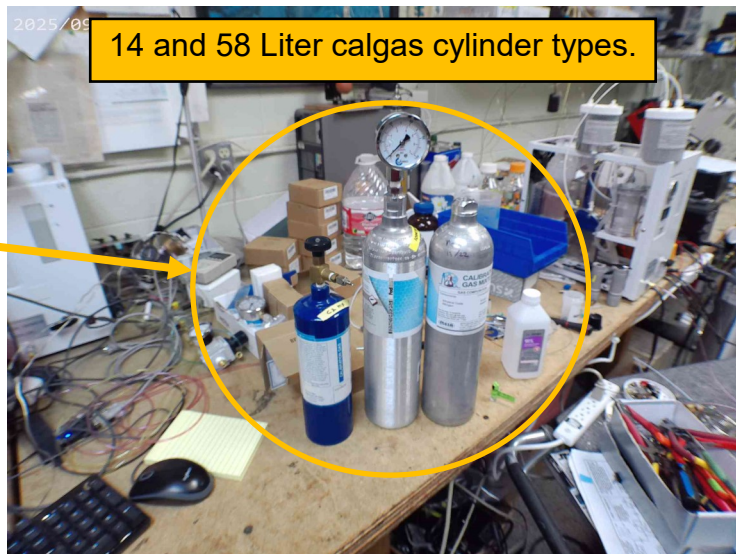


This way you can control exactly how much gas you withdraw. Most SRI GCs only need 20mL of calibration gas, so it makes sense not to waste it by running long tubing between the calibration gas cylinder and the GC. Long tubing has to be purged by at least 5 tubing volumes before the cal gas reaches the GC without dilution.

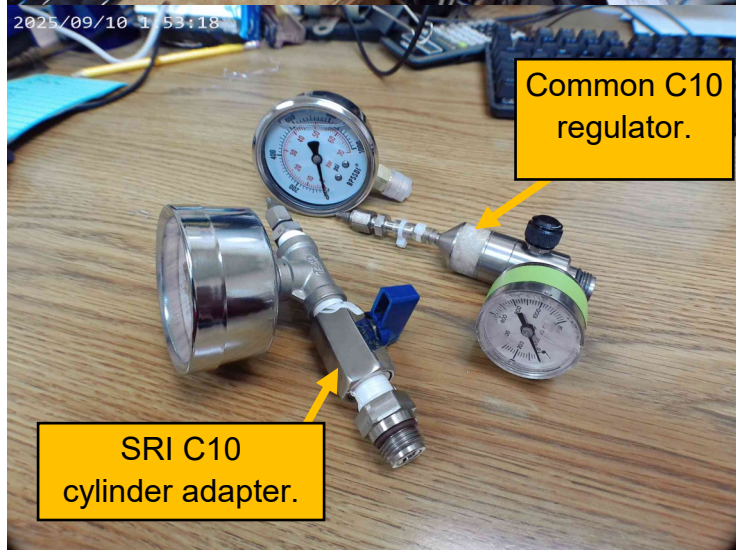


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14 and 58 Liter calgas cylinder types.



Common C10 regulator.



SRI C10 cylinder adapter.



Using a 50ml syringe and 27 gage needle to withdraw calgas from the SRI C10 Adapter.

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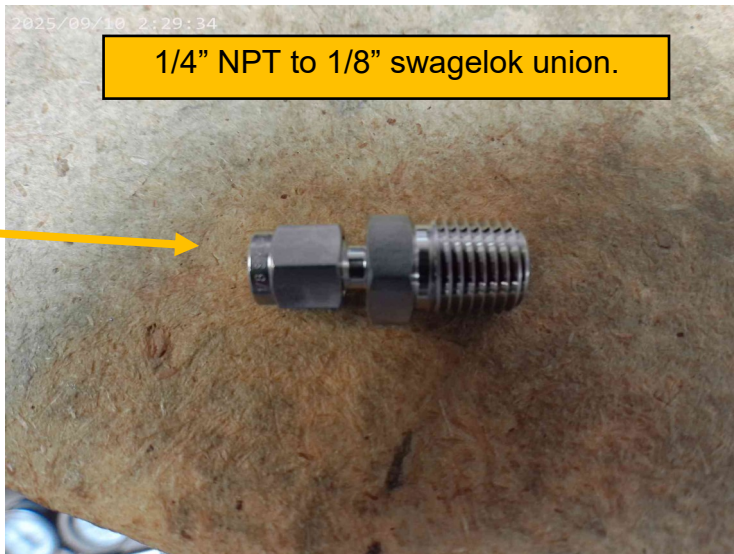
To adapt most larger cylinder regulators to the syringe withdrawal method, you often only need a 1/4" to 1/8" swagelok type union fitting like the one shown here.

Older 14 liter calgas cylinders often had 1/8 or 1/4" NPT thread on their outlet which made installing the septum fitting easy.



Most current calgas cylinders are supplied in 58 Liter cylinders at 500psi pressure and have what is called a "C10" connection which looks like this.

The typical kind of regulator sold for the C10 cylinder looks like this but for some reason is only commonly available with a "barb" outlet fitting which is difficult to connect to without **"improvising"** some kind of tubing interface like the one shown here.



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The SRI C10 Adapter (**SRI part# 8670-9557**) makes it much easier and secure to withdraw gas from a C10 type calgas cylinder without waste or air intrusion.

The blue handle is a quarter turn shutoff valve which makes it easy to control how much gas flows. Especially when the cylinder is new, there can be 500psi of pressure in the cylinder. The quarter turn valve can be finely controlled to allow just a little or a lot of gas to pressurize behind the septum.

The standard gage supplied can read up to 1000psi, which is appropriate for a new 500psi C10 cylinder, but as the pressure inside drops it makes sense to switch to a 100psi gage for better readability of the lower remaining pressure.

The special “snouted” septum nut guides the syringe needle straight in even if the initial angle is wrong. We recommend **27 gage syringe needles that are 1-1.5 inches long**.

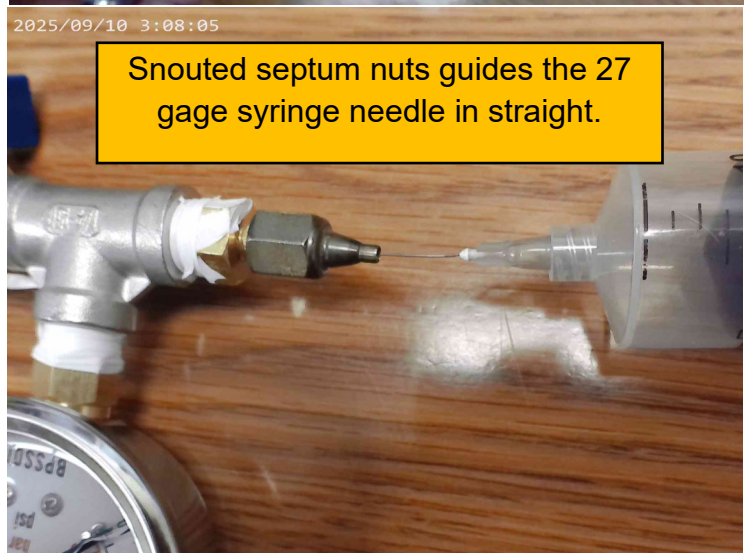
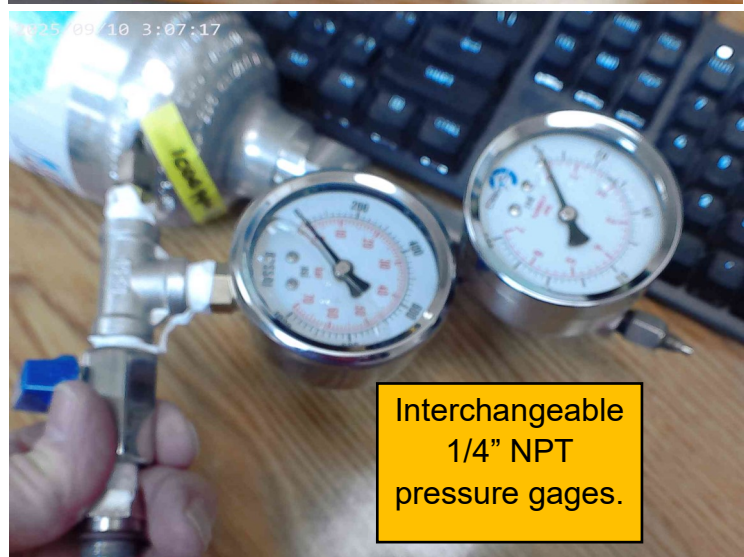
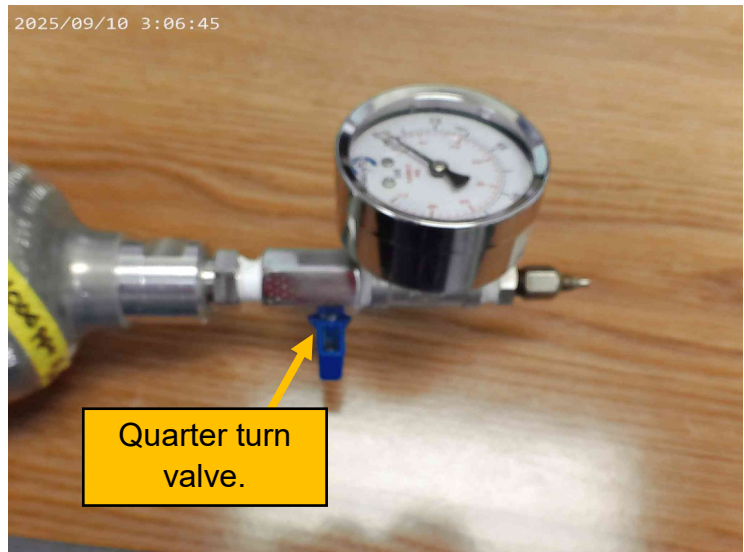
50ml plastic syringes are the most useful, but syringes (and 27gage needles) like this are available from Amazon and other vendors in larger sizes as well.



50,100 and 200ml Luer-Lok syringes.



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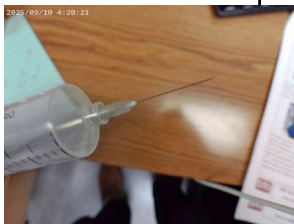
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Once the calibration gas is trapped in the syringe it will not diffuse out through the small diameter 27 gage syringe needle very quickly, so there is time to walk over to the GC which hopefully has a Luer-Lok fitting like this to connect the syringe to. This fitting comes with every SRI GC that also has gas sampling valve(s) or can be ordered using **SRI part# 8690-0061.**

The Luer-Lok fitting is attached to the GC's sample inlet port. In most cases it is best to purge 20 -30 ml of calgas (or sample gas) through the gas sampling valves loops and connecting tubing to completely replace the previous loop contents.

Its also easy to make dilutions (for construction of a multi-level calibration curve) in the 50ml syringe. If the syringe is filled with 1000ppm calgas for example and you push the plunger down to the 5ml mark and then pull back to 50 ml with room air, the calgas is now diluted to 100ppm. If you do this twice then the concentration in the syringe is 10ppm. If the oxygen/nitrogen/CO2 in room air would bias the results, then you can also dilute in some inert gas like the GC carrier.



Luer-Lok fitting for GC's sample IN port.



You can keep the calgas in the syringe for a longer time using a septum or stop-cock to block the syringe exit.



Dilute a high concentration with air.



Or dilute with carrier gas by using the GC's injection port to fill the syringe.



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