

Product Information

Handling Low Pressure Gas Cylinders

TECHNICAL BULLETIN

Product Description

Many specialty gas products are provided at relatively low pressure, especially when compared with large cylinders typically used with instrumentation, such as GC. The pressure in a supplied cylinder depends upon the volume of gas purchased and the cylinder capacity. Nominal gas pressure is listed on the product page on the website, and actual gas pressure is shown on each cylinder.

Many cylinders contain gas at or slightly above atmospheric pressure. For example, the typical pressure in a lecture bottle cylinder filled with 0.5 liter of gas is 1–3 psig. After the positive pressure is relieved, ~0.45 liter of gas will remain in the cylinder. For a lecture bottle containing 1 liter of gas, the pressure will be 20–25 psig. Again, ~0.45 liter of gas will remain in the lecture bottle after this positive pressure is relieved.

Procedure

Since many cylinders are at or slightly above atmospheric pressure, care must be taken to extract the gas from the cylinder.

A method needs to be established by the user to safely transfer the contents of the cylinder. Common methods to extract the material from a cylinder are the following:

use of pressure differential – bellows pump or expanding the gas into an evacuated chamber (negative pressure)

use of temperature differential – cryogenic transfer

It should be noted, that without a transfer method, the gas remains at atmospheric pressure once the positive pressure has been relieved.

The user should take care in selecting compatible materials for the gas transfer as well as determining the safest transfer method for the material in the cylinder. Purchasing a larger quantity of gas product is recommended, if transfer methods are not feasible.

Table 1 shows typical expected gas pressures for some standard products. The actual pressures will vary and be dependent upon temperature and type of gas.

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Table 1.
Expected Pressures for Gas Products

Gas Volume Purchased (L)*	Nominal Pressure, psig (21 °C)				
	Nitrogen, Carbon Monoxide, Deuterium	Oxygen	Methane	Carbon Dioxide, Deuterium Chloride, Deuterium Bromide	Ammonia**
0.5	3.6	3.6	3.6	3.6	3.6
1	20	20	20	20	20
5	150	150	150	150	114
10	330	325	320	290	114
25	860	830	780	630	114
45	1570	1470	1325	860	114
50	1730	1630	1460	890	114

This information applies to both the Carbon Steel (Catalog Number Y906581, 3/8", 450 mL capacity) and the Stainless Steel (Catalog Number Y906557, 1/4", 450 mL capacity) Lecture Bottles. EU Lecture Bottles are slightly smaller; therefore, pressures will be slightly greater.

* at Standard Temperature and Pressure (STP)

** ammonia liquefies at 114 psig