# Standard Operating Procedure for changing gas cylinders in S111a

Ensure you are familiar with the standard Risk Assessment for ‘[Transport, Storage and Use of Compressed gas Cylinders](http://www.chm.bris.ac.uk/safety/gcyl.htm)’ on the SoC Safety website.

The cylinders in S111a are arranged in 2 cabinets, one for explosive gases (containing 2×H2, 1×CH4) and one for non-explosive gases (1×N2, 2×Ar, 1xO2). There is also a separate cabinet for B2H6/H2 which is only for use by personnel working on the diborane HFCVD reactor, and various other stored cylinders and lecture-bottles in S111a. This document concerns only the cylinders in the 2 big cabinets.

**Important points:**

1. **HSE laws state that anyone working with high pressure (*e.g*. above 1 atm) gas lines must wear safety glasses.**
2. These cylinders are shared between a number of experiments in S111, S109, S110. NEVER change the output pressure on the regulator, or disconnect or change a cylinder without first contacting *everyone* working on the machines that use this gas. You must ensure that these machines are not currently using the gas, and will not begin to use it for the time period required to change the cylinder. Failure to do this may result in air leaks entering gas lines that are directly connected to chambers full of hydrogen – major explosion risk!
3. You should not touch *any* of the cylinders unless you have been trained to do so by James Smith, Keith Rosser or Paul May. Even if you have changed gas cylinders before in other labs, you need to be authorised before you can change the ones in S111a.
4. The output pressure should be set to 50 psi for all cylinders. Any higher pressures may result in damage to the mass flow controllers on some of the reactors in S111, and these cost £1k each.
5. If you notice the pressure in any of the cylinders becoming low, tell someone so that they can arrange to have the cylinder changed. If the gas in the near-empty cylinder is connected to a reactor that is currently using it, please let the operator of that reactor know urgently so that they can shut down their system safely before the gas runs out completely.
6. When changing a cylinder, ensure that any residual air is thoroughly flushed out of the gas lines by pumping it through one of the vacuum systems connected to that gas. Tell everyone else that you are doing this before you start so they are aware that that gas will be unavailable for that period of time.
7. Do a leak check to ensure that no gas is escaping.
8. If everything is ok, inform everyone involved that the gas line is now usable again.

PWM, JAS 02/03/25