

ASSIST INFORMATION SHEET:

School science laboratory gas fitting requirements

*The installation and supply of gas to school science laboratories should be according to
AS/NZS 1596:2014 The storage and handling of LP Gas
AS/NZS 2982:2010 Laboratory design and construction
AS/NZS 5601.1:2013 Gas installations Part 1: General installations*

These Australian/New Zealand standards set out the minimum requirements for installations and are subject to the local technical regulators for each state and territory, which may have additional requirements that exceed the requirements as stated in the Australian Standards. Some relevant aspects to be considered in school science laboratory settings are:

Isolation devices and signage:

An isolation device is mandatory and can be either a manual or automatic shut-off valve that is readily accessible and well signed. A manual shut off needs to be a single action lever of the quarter turn type, where the gas supply is open when the handle is in line with the pipe and closed when the handle is across the pipe.

Current requirements for secondary school science laboratories specify an appropriately located push-button shut off, with key operated manual reset. It should ideally be located adjacent to the main electrical shut off near the teacher's bench on an egress path.

Clear signage that is legible and durable is required. Suggested wording for the notice is
**'GAS ISOLATION: Turn off when gas is not in use or in the case of emergency.
Before turning on, ensure all Bunsen burners are turned off'**.

Attachment of Bunsen Burners to the Gas Outlet

There are two styles of fittings permitted: Push on Connectors and Quick Connect devices, also referred to as Bayonet fittings. The Quick –connect devices are subject to some local requirements. For example they are not permitted in schools in Victoria. They are not commonly used in Australian school science areas.

Whilst the bayonet style fittings might be permitted, it is recommended that a local risk assessment be conducted regarding the use of these fittings taking into consideration the following:

- There are difficulties involved with connecting the “quick connect devices”. It usually requires at least two operators to be involved in the procedure: one to push in the connector and the second person to light the Bunsen. It has also been reported in some schools that teachers and students require additional help to push in and twist the connection in place, sometimes requiring the use of pliers to assist.
- Where inline valves/taps are connected to the hosing between the bayonet fitting and the Bunsen burners, it can affect the stability of the Bunsen burner causing it to tip over, creating a serious fire hazard.

- The bayonet style fitting has no tap or valve for each outlet, so in the event of an incident such as a burning leak from a split hose, the individual gas supply cannot be turned off.

The “Push on connectors” are also referred to as fixed turret type outlets or laboratory gas turret cocks. These types of fitting, operate on low gas pressure and the Bunsen burner tubing slides over the special ‘fir tree’ fitting and is held on by friction. This style has many advantages over the bayonet style fitting. The tubing from the Bunsen burner connects easily straight onto the fitting. Once this is secure, the tap can easily be turned on via a lever to enable easy lighting of the Bunsen burner. It is clear to see that the tap is on or off. The experience of many decades of their use in school science areas indicates that they are safe, and rarely if ever accidentally dislodged. However should this happen, the gas supply is quickly and easily cut off by the tap in the turret.

Regarding the tubing required for Bunsen burners, the following points should be considered:

- The statements in the SDSs for both LPG and LNG give instructions not to use natural rubber flexible hoses.
- It is important to have a flexible tubing adequate for the function.
- PVC tends to be rigid and has a memory for coiling, which can create a hazard of the Bunsen burner falling over.
- Silicone tubing appears to be a very suitable alternative to rubber tubing for use with Bunsen burners. Although more expensive, it has a much longer life span and is more heat resistant. It is also not prone to splitting or becoming brittle.
- All tubing should be checked periodically for cracks, hardening and other damage.

Regarding reduced gas flow through the Bunsen burner, this can be caused by one or both of the following:

- Blockages in the jets: these may need to be cleaned due to possible blockages or replaced. This is the most common cause
- A reduced gas pressure that is coming through the reticulated service: the gas pressure may need to be tested and the gas regulator adjusted or replaced

Science ASSIST Recommendations:

Whilst both bayonet type and turret type gas fittings are permitted, Science ASSIST recommends the use of “Push on connectors” also referred to as fixed turret type fittings with taps and silicone tubing.

References

AS/NZS 1596:2014 The storage and handling of LP Gas

AS/NZS 2982:2010 Laboratory design and construction

AS/NZS 5601.1:2013 Gas installations Part 1: General installations

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