Fume Cupboards in Senior Chem Labs

Posted by Anonymous on Mon, 2016-08-22 16:39

Fume cupboards in senior chemistry labs: With the changes to the Chem course with the Australian Curriculum, and the increased emphasis on organic chem, what are the recommendations for the number of fume cupboards in a lab to enable classes to do practical work? Thanks.

Voting:
No votes yet

Year Level:
7
8
9
10
Senior Secondary
Laboratory Technicians:
Laboratory Technicians

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Submitted by sat on 15 September 2016

Answer reviewed 27 February 2023

In brief, there are no formal written recommendations that we are aware of. Australian educational jurisdictions indicate that fume cupboards are required in science areas, but do not specify the numbers required. Registration requirements for non-government schools in WA specify that schools should comply with Australian standards in high-risk areas such as science. However, the standards do not make any recommendation for the number of fume cupboards that should be included in a school science area . Science ASSIST has developed GUIDELINES for the design and planning of secondary school science facilities in Australian schools.1

Curriculum requirements

Fumes cupboards are invariably incorporated into laboratory preparation areas, as they are essential for laboratory technicians in the preparation of reagents and dispensing of chemicals. It is usual for school science areas to also have at least one fume cupboard that can be accessed from a teaching laboratory for use by teachers and students in demonstrations and activities involving hazardous chemicals. Having at least one such fume cupboard is arguably essential in order to meet current expectations of safe practice.

Access to good facilities is integral to the delivery of a meaningful program for students. There is a growing emphasis for students to engage in hands-on activities rather than watch demonstrations or videos. The nature of chemistry practical work has the potential to expose staff and students to volatile, corrosive, irritating, toxic, or sensitising powders, fumes and vapours. It is therefore essential that there be sufficient controls in place to minimise the risk of exposure. An effective engineering control that provides protection from airborne hazards is the provision of an Australian Standards-compliant fume cupboard.

Whilst schools may be able to make do with existing facilities, if they want to offer opportunities for students to experience engaging hands-on activities, then schools need to consider the optimum facilities to enable this.

Fume cupboards are a significant capital expense and careful consideration is necessary in determining how many are required. We suggest that you carefully consider your curriculum program to assess your requirements for student access to a fume cupboard. You could also document your current demand for access to a fume cupboard as evidence to support the need for the provision of a new installation.

Alternative Risk Management strategies

Where there are insufficient fume cupboards to allow students concurrent access, then risk management strategies need to be implemented, such as:

- adjusting the laboratory timetable as necessary to enable classes to access the fume cupboard when required;
- strategic management of practical activities such as running different activities concurrently, including those that do not require a fume cupboard, so that students can rotate through the activities and access the fume cupboard one group at a time;
- conducting activities on a microscale in a well-ventilated room to minimise the volume of hazardous vapours; and
- conducting teacher demonstrations.

Fume cupboard specifications

The following aspects of ducted fume cupboards (either single- or double-sided) should be considered.

- All fume cupboards should be compliant with and sited and installed according to AS/NZS 2243.8 *Safety in Laboratories Part 8 Fume cupboards.*

- A wider fume cupboard allows for better visibility for demonstrations and also access for more than one group to work concurrently, depending upon the task and the students.
- Effective airflow in double-sided fume cupboards can be compromised if there is a pressure differential between the rooms that share the fume cupboard. If installed, a double-sided fume cupboard must have duplicate controls and emergency isolators on each side.
- Shared fume cupboards are not a preferred option for preparation laboratories. Best practice is for the preparation laboratory to have its own fume cupboard to handle sources of hazardous vapours during preparation operations. This will avoid interruption of adjoining classes and exposure of the students and teacher to hazardous preparation procedures.
- Installation is probably less expensive during the construction of a new facility rather than retro-fitting.

Recirculating fume cabinets

These are sometimes promoted as an alternative to built-in ducted fume cupboards because they are portable, cheaper, and easier to install because they don't need exhaust ducting. Recirculating fume cabinets have numerous limitations and therefore we do not recommend this type of fume cabinet for use in school science laboratories. For more detailed information, see Science ASSIST Information Sheet AIS: Recirculating fume cabinets.

References

1 Science ASSIST. (2017). GUIDELINES for the design and planning of secondary school science facilities in Australian schools. Retrieved from the Science ASSIST website: https://assist.asta.edu.au/resource/4175/guidelines-design-and-planning-...

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