Ventilation in corrosive cupboard

Posted by Anonymous on Thu, 2016-08-25 08:47

Ventilation in corrosives cupboard: Are there any regulations regarding ventilation in corrosives and flammables cupboards—we are getting a new building and the architects are asking me for the regulations.

Voting:

No votes yet

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

Showing 1-1 of 1 Responses

Ventilation in corrosive cupboard

Submitted by sat on 29 August 2016

Relevant Standards:

The following Australian Standards are the most relevant for school laboratories.

- **AS/NZ 2243 Safety in Laboratories Series:**
  - AS/NZ 2243.1:2005 Planning and Operational Aspects
  - AS/NZ 2243.2:2006 Chemical Aspects
  - AS/NZ 2243.3:2010 Microbiological safety and containment
  - AS/NZ 2243.4:1998 Ionizing radiations
  - AS/NZ 2243.5:2004 Non-ionizing radiations – Electromagnetic, sound and ultrasound
  - AS/NZ 2243.6:2010 Plant and equipment aspects
  - AS/NZ 2243.8:2014* Fume cupboards
  - AS/NZ 2243.9:2009 Recirculating fume cabinets
  - AS/NZ 2243.10:2004 Storage of chemicals
- **AS/NZS 2982:2010 Laboratory design and construction:**

In particular, see section 10 for secondary school laboratories

- **AS 4775-2007 Emergency eyewash and shower equipment**

References to ventilation:

Requirements for ventilation for chemical storage cabinets can be found in AS/NZ 2243.10:2004 Safety in Laboratories, Part 10. Storage of chemicals:

> **"3.3.4 Ventilation**
>
> Cabinet ventilation should not normally be required unless determined as an essential risk control measure. Cabinet ventilation is not an alternative to vapour-tight closure of all stored containers.
>
> If ventilation is an essential risk control measure (such as could be the case for volatile, extremely toxic or corrosive substances), the cabinet shall be vented to the external atmosphere, i.e. outside the building, in a manner that allows safe dispersal of vapours, fumes or dust without any entering the room in which the cabinet is situated. The circular vents, that are installed in the sides of some cabinets, allow toxic or flammable vapours to escape into the adjoining area and shall be kept closed in a manner that will not be breached by pressure build-up within the cabinet.
>
> The ventilation ducting shall provide at least the same level of fire protection as the cabinet walls, be resistant to the vapours, fumes or dust and prevent the accumulation of residues (e.g. condensation or dust) in the ducting. The ventilation for each cabinet shall be completely independent to prevent cross-contamination or fire flashover. Where flammable vapours or gases could be released, including from Class 4.3 goods, an assessment shall be made and a permanent record kept as to whether electrical equipment (e.g. the fan drive or airflow failure switch)

needs to be of an explosion-protected design complying with the relevant Standard.

> NOTE: Explosion-protected electrical equipment may need to show that it has been approved as compliant with the appropriate Standard. Relevant regulatory requirements should be checked." [1]

Whilst cabinet ventilation is not mandatory, ventilation of the chemical store is mandated:

> **"5.4.4 Ventilation**
>
> The store ventilation shall comply with the design principles specified in AS 1940 and shall have a capacity of not less than that specified in AS 1940. While AS 1940 permits the use of natural ventilation as the sole means of ventilation, mechanical ventilation should be considered to ensure sufficient airflow under all weather conditions. A higher rate of ventilation may be necessary if very volatile, toxic or corrosive substances are stored to ensure a safe working environment. Exposure standards may be used for guidance.
>
> > NOTE: A two-stage ventilation system, where natural or low-capacity mechanical ventilation operates in normal operation and high capacity mechanical ventilation operates in the event of vapour release, may be considered. Activation may be by manual means or through a vapour detection system.
>
> There shall be no recirculation of exhaust air except in a cooled store where a risk assessment has been conducted and appropriate risk control measures have been implemented.
>
> Where stores are mechanically ventilated, the ventilation system shall be exclusive to the room.
>
> If individual cabinets are ventilated, they shall be ventilated to external atmosphere in compliance with Clause 3.3." [1]

The rate of ventilation required in AS1940 is 0.3 m^3 per minute per square metre of floor space or 5 m^3 per minute, whichever is the greater. See our previously answered question regarding extractor fans for more information: Chemical Storage

Some previously related questions with relevant answers are:

Laboratory ventilation: general ventilation;

Chemical Store: chemical store ventilation;

Chemical Storage: extractor fans;

Science Facilities: laboratory standards;

Safety Shower Requirements: safety showers.

References:

[1]These extracts are from AS/NZS 2243 Safety in Laboratories, Part 10: 2004 ‘Storage of chemicals’ reproduced with permission from SAI Global Ltd under Licence 1407-c117

* 29/08/2016 Edited year of publication to be the latest version 2014.
