



## Safety Shower and Eyewash

### Introduction

This information sheet is an updated review of the answers to the following questions, and replaces the previously published Q&As:

- Safety Shower Regulations
- How many emergency showers are you required to install?
- The senior labs have access to a safety shower and eyewash station but the junior labs, on a lower floor, have only an eyewash station. I have been asked to find out if there are any OH&S restrictions on the strength of acids and bases and the use of flammable chemicals in the junior labs, given there is no safety shower available.
- Safety showers & eyewashes: We are after a SOP & risk assessment for safety showers and eyewashes to use as a guide to write our own. We would like to extend the flushing of the showers out to a month or once per term. Also, our safety shower does not deliver 70L /min. We have tested it and it is around 40 L / min. The water lines around town into the school will not allow us to get this water flow. Where do we stand with this and can we write something in our risk assessment or SOP to cover this?

### Introduction

There is a requirement for school science departments to provide emergency eyewash and shower equipment where chemicals will be used. A local risk assessment is required to determine the equipment type and number required for a particular school setting. Legislative requirements and Australian Standards apply in Australia, with the most relevant quotes included in the discussion below.

A detailed risk assessment should be undertaken on your school site. Science ASSIST recommends that all science laboratories have separate safety shower and eyewash facilities. The first 10 -15 seconds after an incident are critical to preventing permanent injury and immediate decontamination can only occur where safety equipment is in close proximity.

The requirement for school science teaching areas to provide emergency eyewash and shower facilities is set out in the following documents which can be purchased through the Standards Australia website.<sup>1</sup>

- AS 2243.2:2021 (8.11) Safety in laboratories, Part 2: Chemical aspects and storage
- AS 4775-2007 Emergency eyewash and shower equipment
- AS/NZS 2982.2010 Laboratory design and construction

### Risk assessment

**Risk Assessment of activities:** All operations and experiments involving hazardous materials should have documentation showing an assessment of the risks involved and the implementation of controls to minimise exposure or chance of an emergency and the provision of relevant first aid equipment. For links to the health and safety legislation that covers your school see the Science ASSIST resource [Chemical Management Handbook for Australian Schools – Edition 3](#)<sup>2</sup>

**Site-specific risk assessment:** eyewash and safety showers are used to flush chemicals from eyes, face and body and prevent further injury. They should be part of all emergency response or first aid plans. **The provision of emergency showers, eyewash facilities or any other safety equipment in a school**



**should be based upon a site-specific risk assessment.** It is the responsibility of the employer/school to make this emergency equipment available, if it is deemed necessary.

**Consult the Safety Data Sheets (SDSs):** Practical work is an important aspect in the science curriculum and school science laboratories have the potential for a range of hazards, in particular from chemical use. When addressing the risks of handling chemicals, SDSs should always be consulted. Section 4 of an SDS: First-aid measures, describes the necessary steps/actions to be taken in case of an accident **and** what first aid facilities should be in place.

### **Some factors to consider in your Risk Assessment:**

- Refer to AS 2243.2:2021 (8.11) Safety in laboratories, Part 2: Chemical aspects and storage.
- Safety showers may not be required in rooms that do not use chemicals such as physics rooms.
- If your school is planning a new building or the refurbishment of an existing building, then it may be wise to plan for all rooms to be used as general science laboratories, and to provide access to safety showers for all of them.
- Chemical store rooms or a science preparation area need the provision of access to a safety shower and we recommend that these are included in your local risk assessment.
- Having identified the rooms or areas on each level that require the provision of a safety shower, you could then consider to what extent one shower could effectively serve a number of these areas. We also recommend that in assessing possible travel distances and times to an emergency shower, that you consider those times when the facilities are busy with normal human traffic and not when the areas are relatively unoccupied.

Some science teaching areas have an “open plan” design so that one safety shower could possibly service several rooms or areas. In others, due to spatial distance (for example rooms arranged along a corridor), a separate emergency shower would be required for each room or area.

Therefore, it would be a matter for your local risk assessment to determine how many and what type of facilities are required on each level, with consideration given to the guidelines above.

### **Standard operating procedure (SOP)**

Science ASSIST does not currently have an SOP or Risk assessment for the testing of safety showers and eyewash facilities. Your school jurisdiction may have their own policy/guidelines which should be consulted. The University of Queensland and University of Wollongong have some guidelines that may be helpful.<sup>3,4</sup>

Points for consideration include:

- **A site-specific risk assessment** to determine the type and number of shower/eyewash/combo eyewash-drench hoses that are required. You should consider the types of activities and chemicals used in the laboratory and should note:
  - the number and layout of the science laboratories and preparation room(s)
  - the types and concentration of hazardous chemicals used in the laboratories and preparation rooms. Generally pure chemicals and concentrated chemicals such as concentrated acids are used in a preparation room and small quantities of diluted solutions are used in laboratories, although concentrated acids may sometimes be used in the classroom laboratories by teachers for demonstrations. Generally, the risks are higher in the preparation room.



- **Laboratory rules and safe procedures for handling chemicals:** this could include the risk control measures as per the hierarchy of controls. See our [AIS: Risk Management and risk assessment](#)<sup>5</sup> for further information. The hierarchy of controls include:
  - Elimination
  - Substitution
  - Engineering controls
  - Administrative controls
  - Personal protective equipment (PPE)
  
- **Information regarding the installation:**  
Safety showers and eyewash facilities should be:
  - located so that they can be accessed without obstruction. (Within 10 seconds of the hazard.)
  - plumbed according to the manufacturer's requirements to a potable water supply.
  
- **Information regarding the use and maintenance of safety showers and eyewash facilities:**
  - **Instructions for use.** This will depend upon the model(s) that you have.
  - **Staff and student training requirements**
    - The location and use of emergency shower/eyewash equipment.
    - Records of staff training should be kept.
  - **Maintenance schedules should be established**
    - The Australian Standard AS 4775-2007 recommends that they should be flushed on a weekly basis and tested on an annual basis and this may be varied subject to a risk assessment.
    - Records of testing should be kept.

## First Aid in the workplace

Workplaces have a duty to provide adequate first aid facilities. [The Model Code of Practice for First Aid in the Workplace](#)<sup>6</sup> provides guidance on meeting these obligations. Contact the regulator in your state/territory to determine if this code of practice applies in your jurisdiction.

### **Section 3.3 Other first aid equipment:**

*"In addition to first aid kits, you should consider whether any other first aid equipment is necessary to treat the injuries or illnesses that could occur as a result of a hazard at your workplace...."*

### **eyewash AND SHOWER EQUIPMENT**

*"eyewash and shower equipment may be permanently fixed or portable, depending on the workplace. eyewash equipment should be provided where there is a risk of hazardous chemicals or infectious substances causing eye injuries.*

*Immediate access should be provided to shower equipment in workplaces where there is a risk of:*

- *exposure to hazardous chemicals resulting in skin absorption or contamination from infectious substances*
- *serious burns to a large area of the face or body (including chemical or electrical burns or burns that are deep, in sensitive areas or greater than a 20 cent piece).*



Shower facilities can consist of:

- a deluge facility
- a permanently rigged hand-held shower hose, or
- a portable plastic or rubber shower hose designed to be easily attached to a tap spout—for small, relatively low risk workplaces where a fixed deluge facility would not be reasonably practicable, but the risk of serious burns is still foreseeable, for example a fish and chip shop.”

## Safety in Laboratories

Section 5.11 AS/NZS 2982.2010<sup>7</sup> Safety Equipment states:

*“The following safety equipment shall be available and accessible to users of the laboratory chemical store and any associated loading bay or dock:*

- *A permanently fixed, aerated eyewash facility capable of operation in a hands- free mode once activated.*
- *At least one safety shower capable of operation in a hands- free mode once activated.*
- *Adequate first aid facilities and supplies (see appropriate National, State or Territory regulations).”*

## Design and construction

### AS/NZS 2982.2010 Laboratory design and construction

Section 6: Health and Safety Requirements states:

#### *“6.2.1 Provision of equipment*

*At least one safety shower and eyewash or eye/face wash facility shall be installed, in each laboratory where hazardous substances are used. See Clause 3.9.4.*

#### **NOTES:**

*1 Safety showers, eyewashes and eye/face washers may be supported but not replaced with hand-held drench hoses.*

*2 Safety showers should not normally be used to remove microbiological contamination due to the hazards associated with aerosol creation and possible spread of contamination. However, if chemical hazards are present in a microbiology laboratory, a safety shower is still required.*

#### **6.2.2 Operation and access**

*Each safety shower, eyewash or eye/face wash facility shall be capable of operation so that water flow remains constant without requiring the use of the operator’s hands.*

*These devices and their activating mechanisms shall be located so that the approach to them is unobstructed.*

*NOTE: A travel distance not exceeding 15 m (corresponding to approximately 10 seconds travel time) to such devices from any point in the laboratory is considered good practice. Lesser travel distances may be appropriate for high-risk applications.*



### 6.2.3 Equipment specifications

*Safety shower, eyewash and eye/face wash equipment shall comply with AS 4775.”*

## Emergency eyewash and shower equipment

The University of Queensland document contains a good summary of the requirements <https://ppl.app.uq.edu.au/content/2.30.03-emergency-eyewash-and-safety-shower-equipment>

**An eyewash and shower facility:** This is required in laboratories where hazardous substances are being used. Exposure to strong and concentrated forms of corrosive and flammable chemicals can result in more severe injuries to eyes, skin, and damage to clothing than with weaker solutions. Consideration must also be given to the volumes of chemicals handled. The handling of relatively large volumes of strong corrosive/flammable chemicals requires access to more stringent first aid measures in the event of an accident, compared to dealing with relatively smaller volumes of weaker solutions.

**School science laboratories:** Three common chemicals (an acid, base and a flammable liquid) that are used in the junior curriculum are 0.1M hydrochloric acid, 0.1M sodium hydroxide (both of which are considered non-hazardous), and universal indicator solution, which is both hazardous and flammable. According to their safety data sheets,<sup>8</sup> the first-aid measures for dealing with all of these solutions getting in the eye or spilled on skin include the following:

- **Eye:** Flush with water for at least 15 minutes.
- **Skin:** Remove contaminated clothing and flush with water.
- **First Aid Facilities:** Maintain an eyewash fountain and safety shower in the work area, or, maintain eyewash fountain and drench facilities in the work area.

**Personal Protective Equipment (PPE):** It should also be emphasised that, when handling any chemicals, all science staff and students are required to use approved and appropriate PPE such as safety glasses, face shields, gloves, lab coats or aprons when there is a reasonable probability of a hazard or injury to the eyes, face, skin or clothing from chemical exposure. It is the school’s responsibility to ensure access to this protective equipment. Provision of other first-aid measures such as emergency eyewash stations and safety showers do not eliminate the need for use of PPE.

## Testing Frequency

- It is important to have emergency response equipment working optimally at all times. For example, in the event of an eye injury, it would not be desirable to flood an injured eye with dirty or stagnant water. Science ASSIST does not recommend varying the frequency of testing the eyewash. Changing the frequency of weekly flushing for safety showers should be carefully considered with a site-specific risk assessment in line with the type of hazardous material being handled.
- The University of Wollongong has an extensive [Safety shower Guideline](#).
- Many university departments test their shower and eyewash facilities monthly, however if dealing with very corrosive chemicals with a high splash potential then a weekly check is advisable. Some universities test eyewashes weekly and safety showers monthly.
- If you are concerned about the mess from water when testing a shower, then you may wish to consider purchasing a shower test sock. For example, see <https://au.prattsafety.com/emergency-showers-and-eyewash/shower-accessories/pratt-shower-test-sock-and-receptacle>. You could collect the water in a bucket and put the water on the garden.

## Water flow rate:



The University of Wollongong has prepared Safety shower Guidelines based on Australian safety standard AS 4775-2007, which state:

- Minimum flow rates - all units should be plumbed at 210kPa and must be able to maintain a period of not less than 15 minutes.
- Showers 75.7 litres per minute
- Eye/face wash 11.4 litres per minute
- Drench hose 11.4 litres per minute
- eyewash 1.5 litres per minute
- Rates can be tested with a flow meter or by other means of measuring flushing fluid flow such as timing to fill a bucket.
- Results are to be recorded on the 'Maintenance Checklist - Safety shower flow rate'.

If your school cannot deliver more water volume than what is supplied (without additional engineering and cost), we consider that it is reasonable to make note of the current flow rate and check that it is effective and continuous to provide:

- a sensible spread of spray and flow from the shower.
- low pressure, soft flow from the eyewash to both eyes simultaneously so as not to cause injury.

If these parameters are met, then Science ASSIST considers that your school is doing what is reasonably practical to meet its first aid obligations to provide a suitable emergency shower/eyewash facility.

## Recommendations

Regulatory body advice and Australian Standards are not prescriptive due to the numerous different work environments and this needs to be considered in the context of the school setting. Provision of an eyewash station and the requirement for a safety shower are determined on the basis of a risk assessment. A risk assessment should take into account the hazards, concentrations and quantities of materials which are used and stored, as well as any preparation carried out in the laboratories. In the absence of a safety shower, the school may decide to reduce the level of hazard by removing some chemicals from the area and modifying preparation procedures.

**Science ASSIST recommends** the following in a school science laboratory where any chemical is being handled, even if it is in relatively small, diluted volumes.

- First aid for any chemical exposure begins with flushing and rinsing with water for a minimum 20 mins.
- In addition to an eyewash facility, access is available to some type of drench facility, such as a separate drench hose, a combination eyewash/drench hose or emergency shower.
- The emergency units are clear of obstructions and within 10 seconds reach.

**Note:** These should be regularly maintained to function optimally for the purpose of irrigating eyes, skin or clothing in the event of any chemical exposure.

## In summary:

We suggest that you prepare information for your administration to consider and seek confirmation from your jurisdiction or governing body that the school is meeting compliance with the Workplace Health and Safety duties. This information should include but not limited to:



- a site-specific risk assessment outlining the hazards, risks and control measures that you have in place.
- a proposal to vary the frequency of the testing of the safety shower.
- the eyewash unit status regarding meeting the requirements specified in Australian Standard AS/NZS 2982.1
- the emergency shower
  - providing 40 L/min which is less than the 76 L/min specified in Australian Standard AS 4775 because of insufficient pressure being supplied to the school.
  - exceeding the water flow rate of 11.4 L/min for a combination eyewash/face shower.
  - exceeding the water flow rate of the 9 L/min specified for domestic showers.

## References

<sup>1</sup> Standards Australia website, (2023), <https://store.standards.org.au/>

<sup>2</sup> Science ASSIST website, (2018, November), 'Chemical management handbook for Australian schools – edition 3', <https://assist.asta.edu.au/resource/4193/chemical-management-handbook-australian-schools-edition-3>

<sup>3</sup> University of Queensland website, (2017, August 29), '2.30.03 Emergency Eyewash and Safety Shower Equipment', retrieved from <https://ppl.app.uq.edu.au/content/2.30.03-emergency-eyewash-and-safety-shower-equipment>

<sup>4</sup> University of Wollongong website, (2016, June), search for 'Emergency eyewash station and safety shower guidelines', <https://www.uow.edu.au/about/services/safe-at-work/whs-framework/whs-documents/>

<sup>5</sup> Science ASSIST website, (2015, August), 'AIS: Risk Management and risk assessment', Science ASSIST. 2015. AIS: Risk Management and risk assessment', <https://assist.asta.edu.au/resource/3079/ais-risk-management-and-risk-assessment>

<sup>6</sup> Safe Work Australia website, (2019, July), 'First aid in the workplace – Code of Practice', retrieved from <https://www.safeworkaustralia.gov.au/doc/model-code-practice-first-aid-workplace>

<sup>7</sup> Standards Australia, (2010), 'AS/NZS 2982-2010 'Laboratory design and construction'', reproduced by ASTA with the permission of Standards Australia Limited under licence CLF1222asta

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<sup>8</sup> Chemsupply Australia website, (accessed 2023, March), search for the chemical by name to obtain a current SDS <https://shop.chemsupply.com.au/>

## Further reading

Storemasta website, (2022, July 26), 'Deciding where to put your safety shower and eyewash station', retrieved from <https://blog.storemasta.com.au/location-safety-shower-eyewash-station>

University of Queensland website, (2016, August), 'UQBR SOP 49 Testing and use of emergency showers/eyewash stations and gas cylinders,' retrieved from <https://biological-resources.uq.edu.au/files/2198/testing%20of%20emergency%20shower>

Ecospill website, (2022, December 27), 'Safety shower Australian standard: definition and requirements', retrieved from <https://www.ecospill.com.au/safety-shower-australian-standard-definition-requirements/>



## Standards

Standards Australia. 2021. AS2243.2.2021 Safety in Laboratories, Part 2: Chemical aspects and storage.

Standards Australia. 2010. AS/NZS 2982.2010 *Laboratory design and construction*.

Standards Australia. 2008. AS 3780-2008 *The storage and handling of corrosive substances*.

Standards Australia. 2007. AS 4775-2007 *Emergency eyewash and shower equipment*.

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