

## FREQUENTLY ASKED QUESTIONS

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### Requirements on Use of Eye and Face Protection in Teaching and Research Laboratories and Workshops

#### Section 1: Drivers for Policy Change

##### **Q1. Why do we need eye and face protection in teaching and research laboratories and workshops?**

Following an increasing trend of incidents involving hazardous material splashes to the eyes, NUS senior management has revised the policy on the use of eye protection in research laboratories and workshops. This [mandatory eye protection policy](#) has been effective since 3<sup>rd</sup> August 2015. From 1<sup>st</sup> Jan 2017, the eye protection policy for research laboratories has been extended to teaching laboratories and workshops.

Hazards with the potential to cause injuries to the eyes exist in many laboratories. Controlling hazards at its source is the best way to prevent an injury. Engineering controls (e.g. fume hoods, biosafety cabinets, gloveboxes) serve as a primary protection against splashes while the eye and/or face protection serves as a secondary protection. The potential for injury to the eye in the event of an accidental hazardous material spill or splash, is further reduced by using the appropriate eye and/or face protection.

Hazardous material splashes into the eye can potentially cause irreversible effects.

- Damage of the mucous membranes of the eye and associated structures by biohazardous splashes can lead to eye infection.
- Acid splashes to the eye can cause damage to the cornea, the clear anterior layer of the eye responsible for vision.
- Alkali chemicals can penetrate into the deeper structures of the eyes compared to acids and can damage both the external structures like the cornea and the internal structures like the lens, which can lead to loss of vision. In general, more damage occurs with higher pH hazardous materials.

According to [Prevent Blindness America](#), it is estimated that 90 percent of eye injuries in the workplace can be avoided with the use of safety eyewear.

##### **Q2. Is eye protection required in laboratories/rooms (i.e. computer laboratories) which house only computers and instruments with no hazardous materials or activities?**

Eye protection requirement is only required for laboratories where hazardous materials (chemicals, biological, etc.) and activities (use of machinery, open lasers etc.) are present. In laboratories or rooms where there are no hazardous materials or activities, eye protection requirement is not applicable.

#### Section 2: Types of Eye and Face Protection

##### **Q3. How do I determine the nature of eye and/or face protection required?**

For all teaching, research laboratories and workshops where hazardous materials and/or activities are present, safety glasses shall be the minimum requirement:

- The Principal Investigator (PI) or laboratory supervisor shall determine the nature of eye and/or face protection that shall be worn by all personnel (including all researchers, contactors, cleaners, and visitors) working in or visiting the laboratory or workshop.
- The nature of eye and/or face protection shall be determined through the risk assessment conducted by the PI or laboratory supervisor.
- When conducting the risk assessment, the PI shall use the criteria listed in Section 6.4.2 Eye and Face Protection of the Chemical Safety Manual.
- Ensure the requirements of the eye and/or face protection are communicated to external parties (such as visitors, contractors, cleaners, etc.) who will be visiting or working in the laboratory or workshop

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### Q4. What type of eye and/or face protection should I use for my lab work?

You should conduct a risk assessment for your laboratory work activity and determine the type of eye and/or face protection you require based on the risk level. You may make reference to NUS Chemical Safety Manual on the criteria for selecting eye and/or face protection.

### Q5. Can I use prescription spectacles as safety eye wear?

Prescription spectacles designed for normal wear do not provide protection against splashes of hazardous materials and against impact. Safety eye wear complying with the American National Standards Institute (ANSI) standard Z87.1 or other equivalent standards for impact resistance shall be used. Either Prescription Safety Glasses or Over-The-Glasses (OTG) safety glasses that can be worn over standard prescription spectacles should be considered for individuals who need prescription glasses.

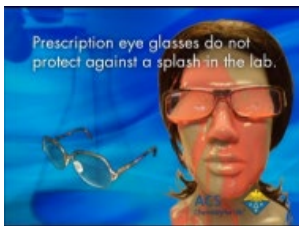
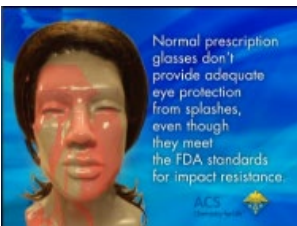


### Q6. Are there alternatives if my safety eye wear/over-the-glasses safety glasses cause me discomfort and giddiness?

Common causes of discomfort from safety eye wear use include improper fit and use, poor condition due to damage and scratches and poor quality. Different models and types of safety eye wear should be made available during selection to ensure a better fit and comfort. Prescription safety glasses are also an alternative to wearing prescription spectacles with over-the-glasses safety glasses. You can protect your eyes from hazards and counter your short or far-sightedness at the same time, by using prescription safety glasses.

### Q7. What is the difference between safety glasses and safety goggles?

Safety glasses do not protect the eyes adequately from large splashes as the gap between the lens and the user's face allows flying objects and hazardous materials to reach the eyes. Safety goggles can offer full protection against splashes as it provides a complete seal around the eyes, conforming to the user's face to prevent liquids from seeping into the eye area.

You may refer to Table 1 on the effectiveness of protection against splashes offered by various eyewear.

Illustrations on effectiveness of protection		Remarks
		Prescription glasses do not protect the eyes against splashes.
		Safety glasses do not protect the eyes adequately against large splashes.

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		<p>Safety goggles offer full protection to the eyes against splashes. The face region will not be protected against splashes.</p>
<p>Illustrations above are stills from American Chemical Society Video on Safety in the Academic Chemistry Laboratory: Eye Protection. Used with permission from Safety in the Academic Laboratory: Eye Protection (<a href="http://www.acs.org/safety">www.acs.org/safety</a>), Copyright 2009, American Chemical Society. Not to be used for commercial purposes.</p>		

Table 1. Effectiveness of Protection against Splashes offered by Various Eyewear

### Q8. Why do I need safety glasses or goggles when I am using a face shield?

A face shield provides protection against direct impact to the face but the flying objects or splashes could get around the face shield (airborne or deflected) and cause injury to the eyes. Face shields alone do not provide sufficient impact protection, hence a combination of a face shield and safety glasses/goggles shall be used for higher risk activities.

### Section 3: Locations of Eye and Face Protection Use

#### Q9. Am I required to use eye and/or face protection at the study area located at the end of the laboratory bench?

It would depend on the nature of activities conducted in the vicinity of the study area. Eye and/or face protection would not be required if there is no probability of hazardous material splash to those at the study area, for example where a safety barrier is provided to segregate the area or where a safe distance of at least 1.5 m from the hazardous activity had been provided.

#### Q10. Am I required to use eye and/or face protection in the teaching laboratory and workshop?

It is mandatory to use eye and/or face protection in the teaching laboratories and workshops where hazardous materials and/or activities are present from 1<sup>st</sup> Jan 2017. Having undergraduates wear eye protection inculcates a safety mindset of ensuring adequate protection when using hazardous and injurious materials, this is useful when they subsequently graduate to doing research at the undergraduate or postgraduate level. It is the responsibility of the supervisor or the lecturer conducting the teaching session to adopt a risk-based approach to determine the eye and/or face protection requirements in the teaching laboratories.

#### Q11. Am I required to use eye and/or face protection when I am not handling corrosive, injurious or infectious agents?

Eye and/or face protection is required if there is a potential that you may be exposed to the corrosive, injurious or infectious agents due to the proximity of the activities of your co-researchers. Given that some laboratories may see a high volume of people conducting research in a limited work area, eye and/or face protection serves as a secondary protection where the potential for injury to the eye and face in the event of an accidental spill or splash, will be minimised.

#### Q12. Are students required to use eye protection if the student teaching module is conducted in a research laboratory where no experiments are conducted?

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It depends on the nature of the student teaching module and whether there is exposure to hazardous materials.

### **Section 4: Eye Protection Exemption**

#### **Q13. What should I do if the use of eye and/or face protection is not reasonably practicable in the teaching, research laboratory or workshop?**

For such situations, the Principal Investigator or Laboratory Supervisor shall submit an [exemption request form](#) with supporting documents to the Head of Department or Director of Research Centre/Institute for endorsement. For activities or locations where the exemption of eye protection is requested, the justification for exemption must be reasonable and not result in a higher risk level when eye protection is not used. OSHE will evaluate and approve waivers for common activities on behalf of Institutional Biosafety Committee (IBC)/Institutional Laboratory Safety Committee (ILSC). For exceptional cases, OSHE would seek IBC/ILSC expertise for review and approval. Approved exemptions shall be filed in the laboratory Safety and Health Management System dossier.

#### **Q14. Must eye protection be worn during use of microscope?**

No, eye protection is not required to be worn during the [viewing of samples](#) through the eyepiece of the microscope. Also, an exemption request is not required to be submitted for this activity. However, eye protection should be used before and after using the eye piece of the microscope.

#### **Q15. If the student teaching module is conducted in a research laboratory and the student module owner wishes to apply for eye protection exemption, what would be the process?**

The academic supervisor in charge of the teaching module would submit the exemption request with the agreement of the PI in charge of the research laboratory. The exemption request must be supported by both the Head of Department or Director of the requestor and the research laboratory department.

### **Section 4: Procurement and Maintenance**

#### **Q16. Are funds provided to personnel who require eye and/or face protection?**

PIs and departments will adhere to the current process for funds request for the procurement of safety eye wear – they may approach the respective Deans or Directors for funds if necessary. PIs may also use their share of Indirect Research Cost (IRC) to purchase the safety eye wear.

#### **Q17. What maintenance and care is required for eye and face protection?**

It is important that all eye and face protection are inspected, cleaned and maintained at regular interval. Cleaning is particularly important as dirty or fogged lenses and shield could impair vision and cause discomfort.

### **Section 5: Further resources on Eye and Face protection**

- a) SS 473: 2011 Part 1: Specification for Personal Eye-Protectors – General Requirements
- b) SS 473: 2011 Part 2: Specification for Personal Eye-Protectors – Selection, Use & Maintenance
- c) Friedenwald, J. S., Hughes, W. F., & Herrmann, H. (1946). Acid burns of the eye. Archives of ophthalmology, 35(2), 98-108.
- d) [Nash, James L. \(2005\). Beware the Hidden Eye Hazards. Occupational Hazards, Vol. 67, No.](#)