

## Attachment 1: Eye protection - requirements and types

AS/NZS 2243.1 states that “eye protection shall be used in laboratories where there is a risk of **damage** to the eyes or **contamination** to the body through the eyes. When considering sources of damage, include mechanisms such as impact, splashing of liquids, foreign particle entry and radiation. Eye protection shall be selected and used in accordance with AS/NZS 1336, AS/NZS 1337 and the AS/NZS 1338 series. Specialised eye protection (e.g. wrap-around safety glasses or goggles) shall be worn when a risk of splashing exists and there is a risk of damage to the eyes or contamination to the body through the eyes.”

Accordingly, the selection and use of eye protectors for particular applications must comply with AS/NZS 1336.

The type of eye protectors recommended for specific hazards and applications can be found in Tables 4.1 and 4.2 of AS/NZS 1336 (see exert below). All forms of eye protection selected and purchased must be Australian Standards approved (i.e. comply with AS/NZS 1337 and the AS/NZS 1338 series).

**Safety spectacles/glasses** with side shields provide protection from low impact velocity flying particles. Lenses must be appropriate to the protection required (see ‘Summary of types of eye protectors’ below).

**Safety goggles** fit tightly against the face and must be worn when there is a high risk of splashing into the eyes of a hazardous material (eg biological or chemical). Lenses must be appropriate to the protection required e.g. chemical splash goggles should be marked ‘C’ (see ‘Summary of types of eye protectors’ below).

**Faceshields** provide protection to the eyes, face, forehead and front of neck from low energy flying particles. Some faceshields may also provide protection from hazardous materials (see ‘Summary of types of eye protectors’ below). It is recommended that safety glasses that provide at least low impact resistance be worn underneath a faceshield when it is required to be lifted away from the face. Refer to AS/NZS 2243.1: section 4.2.3 for specific applications where faceshields should be used.

**Prescription spectacles or contact lenses** do not provide adequate protection against hazards likely to be encountered in the laboratory. Individuals requiring eye protection and sight correction must consider the following:

- i) wearing the appropriate wide vision safety goggles over prescription glasses. Note: Impact from flying objects may cause goggles to deflect and could result in the fracture of prescription lenses (even if goggles are not penetrated).
- ii) clip-ons fitted to the outside of prescription spectacles. Note: Clip-ons usually contact the prescription lens and under a sharp impact may lead to the shattering of the spectacle lens. Their light construction also means they can be easily broken. The use of clip-ons in laboratory work must be carefully considered and assessed due to the limited protection they provide against dust/gas/splash/impact.
- iii) prescription eye protectors (an eye protector with prescription protective lenses mounted in a safety spectacle frame) are only able to provide low impact protection because of their design. For protection from other hazards (e.g. dust, splashing hazardous substances, harmful gases, high

- energy flying particles), appropriate protection such as wide vision safety goggles worn over prescription eyewear or contact lenses is required.
- iv) wearing contact lenses under eye protectors is subject to the hazards of the work being undertaken. As some situations may be more hazardous to contact lens wearers, a risk assessment must be conducted to determine if the wearing of contact lenses should be restricted or avoided. All wearers of contact lenses must be trained in the appropriate first aid procedure in the event of chemical exposure to the eyes (including the removal of contact lenses).

### **Summary of types of eye protectors**

The lenses of eye protectors are marked according to the protection they afford the wearer:

- I – medium impact
- V – high impact
- D – dust resistant
- G – gas resistant
- C – splash resistant
- M – molten metal resistant

### **Issue and fitting of eye protectors**

Where practicable, eye protectors should be individually fitted by a person who is competent to select the correct type and size.

Where eye protectors are reissued to different people (eg for student loan) a system must be implemented to ensure their proper maintenance (as per AS/NZS 1336 section 4.5). This includes:

- i) inspection and cleaning of all eye protectors at regular intervals, after use and before reissue to another person
- ii) following manufacturer's instructions for cleaning (in the absence of such instructions refer to AS/NZS 1336: section 4.5)

*Please Note: Australian Standards can be accessed online from the UWS Library E-Resources webpage (<http://library.uws.edu.au/nResources.php>) under 'Standards Australia online' in the database collection.*

**TABLE 4.1**  
**EXAMPLES OF SPECIFIC HAZARDS AND CONTROL METHODS**

Typical processes giving rise to hazards	Hazard (of the process)	Typical methods of controlling hazards	Suitable type of eye protectors (See Table 4.2)
Manual chipping, riveting, spalling, hammering, handling wire and brick cutting	Flying fragments and objects with low velocity or low mass	Fixed or mobile screens	Low impact  NOTE: Medium impact (marked I) and high impact (marked V) will give greater protection
Machine disc cutting of materials, scaling, grinding and machining metals, certain wood-working operations, stone dressing	Small flying particles with medium velocity or medium mass	Fixed or mobile screens exhaust systems, dust extractors, water	Medium impact (marked I)  NOTE: High impact (marked V) will give greater protection
Use of explosive powered tools	High velocity particles	Fixed or mobile screens	High impact (marked V)
Road work, coal handling, textile trades, some chemical works, leather buffing, timber sanding	Airborne dusts	For indoor work—exhaust systems, dust extractors, suction conveyors For outdoor work—damping down of work area, sealing of dusty surfaces, use of large fixed or mobile screens	Dust resistant (marked D)  Gas resistant (marked G)
Hot bitumen, pickling baths, metal cleaning, plating, handling corrosives	Liquid splash, harmful liquids and corrosives	Screens, catchments, splashguards, overflows, tilting apparatus and splash trays	Splash resistant (marked C)
Chemical processes spray painting aerosols	Gases, vapours	Enclosures and exhaust systems, screens, catchments	Gas resistant (marked G)
Chemical processes spray painting aerosols	Liquid splashes	Splashguards, overflows, tilting apparatus and splash trays	Splash resistant (marked C)
Metal casting, molten slag, molten metal, hot solids, galvanising baths, lead joining	Splashing metals	Screens, catchments, splashguards, overflows, tilting apparatus and splash trays	Molten metal resistant (marked M)
Welding, cutting, brazing, furnace work	Non-ionizing radiation only (see Section 5)	Fixed or mobile screens	Marked in accordance with AS/NZS 1338 Parts 1, 2 or 3 as appropriate
Overhead cutting and welding, metal gouging, forging	Non-ionizing radiation with hot solids	Fixed or mobile screens	Welding goggles or welding helmets complying with AS/NZS 1338.1
Gas welding producing flying sparks	Non-ionizing radiation with hot solids	Fixed or mobile screens	Welding goggles or welding helmets with rearward facing indirect ventilation, with lenses complying with AS/NZS 1338.1
Outdoor work	Sunglare and glare from visible radiation	Suitable screens or sunshades	Low impact or medium impact (marked I), tinted

(continued)

TABLE 4.1 (continued)

Typical processes giving rise to hazards	Hazard (of the process)	Typical methods of controlling hazards	Suitable type of eye protectors (See Table 4.2)
Outdoor work (cont)	Solar ultraviolet radiation	Suitable screens or sunshades	Low impact or medium impact (marked I) if tinted, or outdoor untinted (marked O)
Dental treatment * (hazard to patient)	Flying particles, liquid droplets, dental instruments	High velocity evacuation	Low impact spectacles (with side shields) of close fitting design, and wide vision spectacles
Dental treatment * (hazard to dentist, dental assistant)	Flying particles, liquid droplets, blue light cure	High velocity evacuation	Low impact (with side shields if spectacles)
UV radiation of substrate	Germicidal lamp UV weathering tests	Fixed or mobile screens	Those with filters complying with AS/NZS 1338.2

\* Information on blue light sources used for curing dental resins is given in Clause 4.2.3.

TABLE 4.2  
RECOMMENDED EYE PROTECTION

Identification of eye protector	Type of eye protector	Eye protector marking—Lens identification* (See AS/NZS 1337)	Purpose and application of eye protection
Low impact	1 Safety spectacles	HT* or CT*	Frontal protection to the eyes from low energy flying fragments and objects. Tinted lenses will provide a degree of protection from glare. Metal frames not suitable for electrical hazards.
	2 Safety spectacles with side shields	HT* or CT*	As for 1, but additional protection provided.
	3 Wide vision spectacles		As for 2 but additional protection required.
	4 Safety clip-ons	HT* or CT*	As for 1
	5 Eye cup goggles		As for 2
	6 Coverall goggles direct ventilation	HT* or CT*	As for 2, can be worn over prescription spectacles.
	7 Wide vision goggles with direct ventilation	—	As for 2, some types may be worn over prescription spectacles.
	8 EYESHIELD	—	Protection to the eyes from low energy flying fragments and small particles. Tinted lenses will provide a degree of protection from glare.

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TABLE 4.2 (continued)

Identification of eye protector	Type of eye protector	Eye protector marking—Lens identification* (See AS/NZS 1337)	Purpose and application of eye protection
Medium impact	9 Faceshield	—	Protection provided to eyes, face, forehead and front of neck from low energy flying fragments and small particles. Tinted lenses will provide a degree of protection from glare.
	10 Goggles all types (5, 6 and 7) with indirect ventilation	HT* or CT* C, D optional	As for 7, Splash or dust protection where marked.
	11 Hoods and helmets incorporating an eyeshield or a faceshield	HT* or CT* C, D optional	'All round' protection to the eyes, head and neck from flying fragments and small particles. Respiratory protection may be provided (see AS/NZS 1715 and AS/NZS 1716). Splash or dust protection where marked.
	12 Wide vision spectacles	I	Frontal and side protection to the eyes from medium energy flying particles. Tinted lenses will provide a degree of protection from glare.
	13 Wide vision goggles with direct ventilation	I	'All round' protection to the eyes from medium energy flying particles. Tinted lenses will provide a degree of protection from glare.
	14 Wide vision goggles with indirect ventilation	I	'All round' protection to the eyes from medium energy flying particles. Tinted lenses will provide a degree of protection from glare.
	15 Eyeshields	I	Provide protection to the eyes, upper face, and forehead from medium energy flying particles. Tinted lenses will provide a degree of protection from glare.
High impact	16 Faceshields	I	Provide protection to the eyes, face, forehead and front of neck from medium energy flying particles. Tinted lenses will provide a degree of protection from glare.
	17 Hoods and helmets incorporating an eyeshield or faceshield	I	'All round' protection to the eyes, head and neck from medium energy flying particles. Tinted lenses will provide a degree of protection from glare.
	18 Faceshields	V	As for 16. Also from high energy flying fragments and small particles.

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