



*In partnership with
Eye Research Australia*

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Eyes, like skin, are susceptible to damage from exposure to ultraviolet radiation. UV radiation from the sun or from a solarium is not seen or felt, but the damage it causes is cumulative.

Key messages

Repeated exposure of the eyes to UV radiation causes both short-term eye complaints and permanent eye damage. Short-term complaints include mild irritations such as excessive blinking, swelling, or difficulty looking at strong light.¹ UV exposure can also cause acute photo keratopathy, which is essentially sunburn of the cornea, like snow blindness or welders flash burns.

Exposure to UV radiation over long periods can result in more serious damage to the eyes, including cataracts, pterygium, solar keratopathy, cancer of the conjunctiva and skin cancer of the eyelids and around the eyes.¹⁻⁸ (These effects are described on page 2.)

The Cancer Council Australia and Eye Research Australia recommend:

- Reducing UV radiation exposure as much as possible.
- Wearing a broad-brimmed, bucket or legionnaire style hat.
- Wearing close-fitting, wrap around style sunglasses that meet the Australian Standard AS/NZS 1067:2003 for sunglasses (categories 2, 3 and 4).
- Glasses which transmit very little UV radiation, such as those labelled UV 400 or EPF (Eye Protection Factor) 9 or 10.
- Sunglasses should not be worn at night as this reduces visibility.
- If outdoor workers need protection from flying particles, dust, splashing materials and harmful gases, eye protectors should be worn that comply with Australian Standard AS/NZS 1337:1992 (eye protectors for industrial applications).

Health effects of UV radiation on the eyes

Repeated exposure of the eyes to UV radiation causes both short-term eye complaints and permanent eye damage. Short-term complaints include mild irritations such as excessive blinking, swelling, or difficulty looking at strong light.¹ UV exposure can also cause acute photo keratopathy, which is essentially sunburn of the cornea, like snow blindness or welders flash burns.

Exposure to UV radiation over long periods can result in more serious damage to the eyes. This includes cataracts (cloudiness of the lens); pterygium (pronounced tur-rig-i-um), an overgrowth of the conjunctiva on to the cornea; solar keratopathy (cloudiness of the cornea); cancer of the conjunctiva (the membrane covering the white part of the eye); and skin cancer of the eyelids and around the eyes.¹⁻⁸ It has been estimated that 10% of cataracts are potentially due to UVB radiation exposure to the eye.⁹ Around 160,000 cataracts are treated in Australia each year at a cost of \$320 million.⁹ It is estimated that almost half of the 8600 cases of pterygium treated annually in Australia are also caused by sun exposure.^{10,11}

Reducing ultraviolet radiation exposure to the eyes

Australian Standard

The Australian Standard (AS/NZS 1607:2003) classifies sunglasses and fashion spectacles based on the amount of UV radiation that passes through the lenses, as well as defining lens dimensions (width and height) and safety requirements. Within the standard there are five categories of sunglasses and fashion spectacles:¹²

Lens category	Description
0	Fashion spectacles: not sunglasses - Very low sun-glare reduction - Some UV protection
1	Fashion spectacles: not sunglasses - Limited sun-glare reduction - Some UV protection
2	Sunglasses - Medium sun-glare reduction - Good UV protection
3	Sunglasses - High sun-glare reduction - Good UV protection
4	Sunglasses: special purpose - Very high sun-glare reduction - Good UV protection

[adapted from AS/NZS 1067:2003]

Sunglasses and fashion spectacles that meet the Australian Standard should be labelled with AS/NZS 1067:2003 and a category number. **Fashion spectacles (Categories 0 and 1) are not sunglasses and do not provide adequate protection against UV radiation.**

Some sunglasses may also be labelled with an EPF number, developed by the Australian Radiation Protection and Nuclear Safety Authority (ARPANSA) ranging from 1 to 10. Sunglasses labelled EPF of 9 or 10 transmit very little UV radiation.¹³ Other sunglasses may be labelled UV 400 (blocking 100% of UV) or state the amount of UV radiation blocked as a percentage such as 99.9% or 100%.

For the best protection, use wraparound, close fitting, large-lens sunglasses that help to reduce reflected UV radiation and glare that can pass around the edge of the sunglasses and reach the eyes.

Eye protection at work

For eye protection in the workplace, tinted eye protectors that comply with Australian Standard AS/NZS 1337:1992 are recommended as these provide at least the same amount of protection against UV radiation as sunglasses, as well as impact protection. Look for eye protectors carrying the Standards Australia mark. Untinted eye protectors marked 'O' (for outdoor) also have sufficient UV protection for outdoor use.¹⁴

Sunglasses and children

Since eye damage from UV radiation is cumulative, it is important to protect children's eyes. Exposure of very young children to UV radiation should be limited, especially when UV levels are moderate ($UV \geq 3$) or above. During these times, it is important that children wear a sun protective hat and protective clothing in order to limit their UV radiation exposure. Wearing a hat will provide some protection to the eyes. However, once children are old enough to manage wearing sunglasses they should be encouraged to do so if they have to be outside at times of high UV levels. These glasses should meet the Australian Standard for sunglasses (not fashion spectacles). Sunglasses labelled as toys are not covered by the Australian Standard and therefore should not be used to provide sun protection.

Prescription glasses

The Australian Standard for sunglasses and fashion spectacles does not cover either tinted or clear prescription glasses. However, some tinted or clear prescription lenses may provide protection from UV radiation. Lenses can also be coated with a UV protective layer. Lenses that darken when exposed to sunlight provide additional comfort by reducing glare but do not necessarily filter out more UV radiation. Prescription glasses used for sun protection should be close-fitting and wraparound to provide maximum protection, as with non-prescription glasses. If you wear prescription glasses, ask your optometrist about the level of UV protection they provide.

Cancer Council recommendations

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- Reducing UV radiation exposure as much as possible.
- Wearing a broad-brimmed, bucket or legionnaire style hat.
- Wearing close-fitting, wrap around style sunglasses that meet the Australian Standard AS/NZS 1067:2003 for sunglasses (categories 2, 3 and 4).
- Glasses which transmit very little UV radiation, such as those labelled UV 400 or EPF (Eye Protection Factor) 9 or 10.
- Sunglasses should not be worn at night as this reduces visibility.
- If outdoor workers need protection from flying particles, dust, splashing materials and harmful gases, eye protectors should be worn that comply with Australian Standard AS/NZS 1337:1992 (eye protectors for industrial applications).

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