Health Effects of Solar UVR

Our skin and eyes are at risk from solar ultraviolet radiation (UVR). It is well known that over-exposure to UVR from the sun can cause sunburn, skin damage and, ultimately, skin cancer. Long term exposure to ultraviolet radiation can also cause cataracts, a clouding in the lens of the eye which obscures vision as well as short-term eye damage such as snow-blindness if the UVR intensity is sufficiently high.

Direct and Scattered Solar UVR

We are usually exposed to almost as much UVR scattered from particles in the atmosphere as we do directly from the sun. Hence staying out of the direct sun does not eliminate the hazard and still means that both the skin and the eyes can suffer long-term damage from scattered UVR.

The eye cannot see UVR so the use of sunglasses to eliminate solar UVR, in particular the more-damaging UVB radiation, is highly desirable. Reducing the amount of UVR that the eye is exposed to over a person's lifetime is likely to prove beneficial in preventing eye damage.

Good quality sunglasses (particularly, the "wrap-around" type) provide the eyes with substantial protection against solar UVR and are recommended for both children and adults. The important points to look for when purchasing sunglasses are detailed on the back of this pamphlet

Note: *Sunglasses should <u>not</u> be worn at night, especially while driving, as they reduce visibility in an environment which already has low light levels.*

When to Wear Sunglasses

Wear sunglasses outdoors, particularly in the following circumstances:

- ***During Summer.*** The level of UVR at noon in summer can be more than three times as high as in winter. More importantly, the levels of UVB, the type of UVR that causes the most damage, can be as much as ten times higher (which is why sunburn takes such a short time in summer).
- ***Around noon.*** (1PM during daylight saving). Seventy percent of the harmful UVB radiation that is received each day occurs within three hours either side of this time.
- ***On the beach or boating.*** There are usually few buildings or structures to block the sun or sky, so people are exposed to direct and scattered radiation from the whole sky as well as reflections from water.
- ***Skiing at high altitude.*** Solar UVR increases with altitude and at 2000 metres (typical of Australian ski fields) can be as much as thirty percent higher than at sea level. The high reflectivity of snow worsens the problem, so that the UVR dose to the eye can be quite large. Consequently, good eye protection while skiing is very important.

Medical use of Sunglasses

Psoriasis patients undergoing PUVA therapy with UVR sources are extremely sensitive to UVA radiation for some time afterwards. They therefore require good eye protection and should wear sunglasses or goggles which absorb all of the UVR.

Sunglasses and Lenses

Sunglass lenses may be made from a variety of plastics such as acrylic or polycarbonate. Acrylic lenses are light, reasonably scratch resistant and generally tough enough for everyday use. Polycarbonate is usually optically superior to acrylic. Plastic lenses are light and impact resistant and the material is naturally UVR resistant. There are sunglass lenses made from glass which have excellent optical quality and are scratch resistant but they tend to be heavier and may shatter on impact.

Polarized lenses are also very popular as they reduce glare from many surfaces alleviating eye fatigue and eyestrain. Because they are effective at reducing glare, they may not be suitable for activities where high contrast must be discerned.

There are a number of coloured lenses available especially for fashion spectacles. Typical lenses for sunglasses have a dark tint. The amount of tint varies between products and the darker the lenses the more they reduce visible light.

It is the UVR-absorbing properties of the plastic that the lenses are made from that provides the protection and not the colouration of the lenses. This means that dark sunglasses are not necessarily more effective at protecting the eyes from UVR than lightly tinted sunglasses.

If the tint is too dark the Australian Standard may require additional labelling of **"NOT SUITABLE FOR DRIVING AT NIGHT"**.

When choosing your sunglasses, consider the colour of the lenses. As a guide grey lenses provide a high degree of glare reduction and are suitable for bright light activities. Bronze lenses enhance contrast on hazy or overcast days and are suitable for everyday use. Other colours may offer other benefits.

A Standard for Sunglasses

All sunglasses sold in Australia must be tested and labelled according to the Australian/New Zealand standard *AS/NZS 1067:2003 Sunglasses and Fashion Spectacles*. This mandatory standard sets limits on the allowed transmittances of fashion spectacles and sunglasses.

Sunglasses meeting the standard are available in adults and children's sizes. Wearing sunglasses that meet the standard's requirements for effective sunglasses ensures your eyes have adequate protection against UVR damage.

The standard defines five categories of lenses:

Lens category	Description	Additional markings
0	**Fashion spectacles - not sunglasses** very low sunglare reduction - some UV protection.	NONE
1	**Fashion spectacles - not sunglasses** limited sunglare reduction - some UV protection.	**NOT SUITABLE FOR DRIVING AT NIGHT**
2	**Sunglasses** - medium sunglare reduction and good UV protection	NONE
3	**Sunglasses** - high sunglare reduction and good UV protection	NONE
4	**Special purpose sunglasses** – very high sunglare reduction and good UV protection	**MUST NOT BE USED WHEN DRIVING**

Sunglasses that comply with the requirements of AS/NZS 1067 shall be labelled to state this compliance. Sunglass lenses in lens category 4 must be marked with the prescribed symbol and the warning "**MUST NOT BE USED WHEN DRIVING**".

In addition to the AS/NZS 1067:2003 label several other markings may be found on sunglasses. Sunglasses labelled "**EPF 10**" (Eye Protection Factor rating 10) actually exceed the requirements of AS/NZS 1067. Sunglasses may also be labelled "**Absorbs 100% UVR**".

Sunglasses that are to be worn while driving must comply with the colouration limits of AS/NZS 1067. Colours, in particular traffic signals, will still be recognisable when viewed through the lenses.

Guidelines for purchasing sunglasses

1. Check that the glasses are either sunglasses or special purpose sunglasses and not fashion spectacles.

2. Check that the sunglasses carry a label that indicates they comply with or exceed the requirements of AS/NZS 1067:2003 or are rated EPF 10.

3. If the glasses are to be used while driving, then check that colours are easily recognized when viewed through the lenses.

4. If you purchase sunglasses or fashion spectacles on the internet they should still comply with AS/NZS 1067. There should be clear and legible labelling attached with the identity of the manufacturer or supplier, the lens category number, description and additional markings if applicable. The label should also refer to the AS/NZS 1067.

Further information is available from

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Australian Government

Australian Radiation Protection and Nuclear Safety Agency

SUNGLASSES

AND PROTECTION FROM SOLAR ULTRAVIOLET RADIATION

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