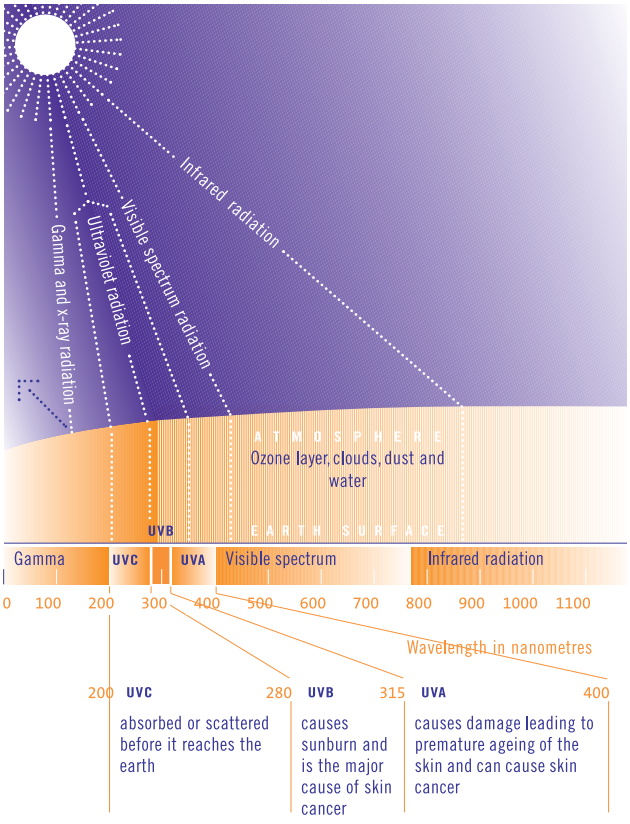
FACTS ABOUT SOLAR ULTRAVIOLET RADIATION

Understanding solar UVR is vital for understanding the sun protection control measures recommended.

UVR is part of the electromagnetic spectrum emitted by the sun. It can be divided into three types: UVA, UVB and UVC. While all UVC and most UVB radiation is absorbed by the atmosphere, all UVA and about 10% of UVB radiation does reach the earth's surface. Both UVA and UVB are known causes of skin cancer.



Source: The Cancer Council Victoria. *Shade for everyone: A practical guide for shade development,* 2004.

Visit your state or territory Cancer Council website for more information on solar UVR, vitamin D and the risks and benefits of sun exposure.

Did you know UVR from the sun:

- is high-energy radiation, capable of causing damage to living organisms
- is carcinogenic to humans
- cannot be seen or felt
- is not related to temperature
- can be high even on cool and cloudy days
- can pass through clouds
- can pass through loosely woven material
- can bounce off reflective surfaces such as metal, concrete, water and snow
- is essential to health in small amounts?

Small amounts of skin exposure to solar UVR are essential in the production of vitamin D and are beneficial for health[9].

Australia experiences some of the highest levels of solar UVR in the world[10], primarily because of our close proximity to the equator. Other reasons include:

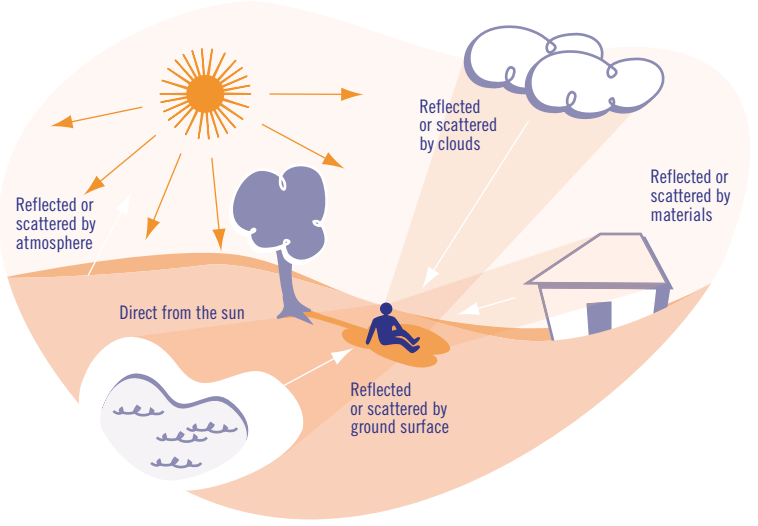
- a relatively high number of clear blue sky days
- Australia's position in the southern hemisphere, where the earth's oval shaped orbit brings us closer to the sun in summer than similar latitudes in the northern hemisphere.

Factors affecting levels of solar UVR

Solar UVR can reach you on the ground directly from the sun. It can also be scattered by particles in the air and reflected by ground surfaces such as metal, concrete, sand and snow.

The total amount of solar UVR present in a given location is affected by the following:

- Sun elevation: The higher the sun in the sky, the higher the levels of UVR at the earth's surface. Therefore levels of solar UVR are highest in the middle of the day and during summer.
- Latitude: The closer to equatorial regions, the higher the levels of solar UVR.
- Cloud cover: Solar UVR can pass through light cloud cover, and on lightly overcast days the intensity of UVR can be similar to that of a cloud-free day. Heavy cloud can reduce the intensity of UVR. Scattered cloud has a variable effect on levels of UVR, which rise and fall as clouds pass in front of the sun.

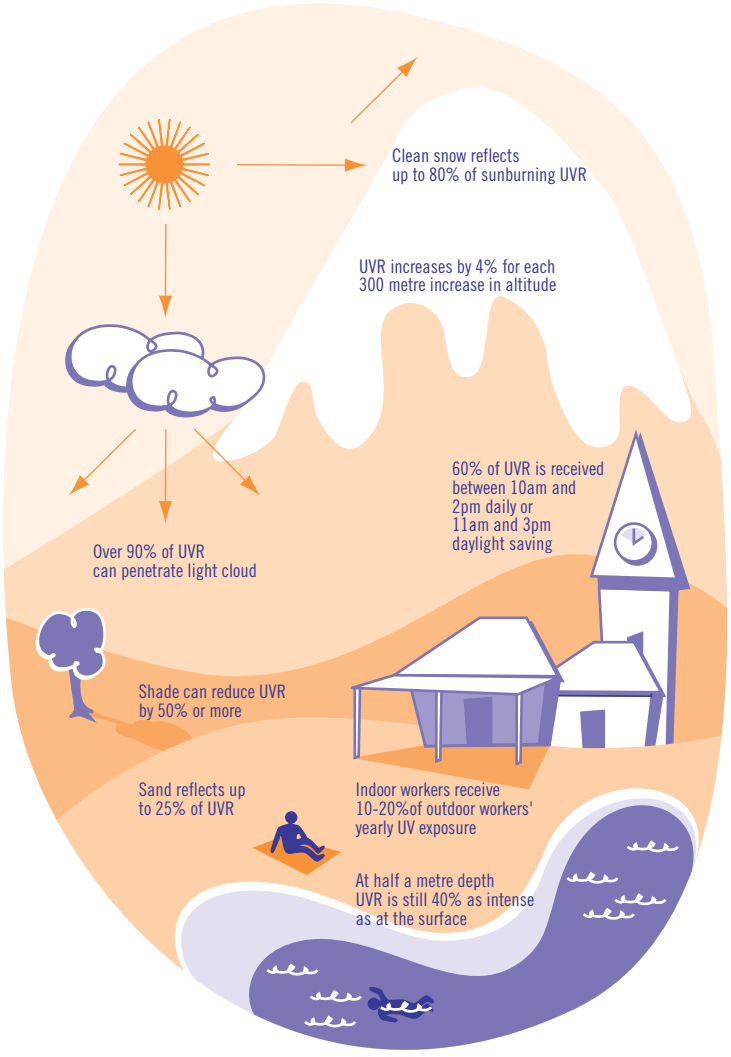


Source: The Cancer Council Victoria. *Shade for everyone: A practical guide for shade development,* 2004.

- Altitude: At higher altitudes, the atmosphere is thinner and absorbs less UVR.
- Ozone: Ozone absorbs some of the UVR that would otherwise reach the earth's surface.
- Reflective surfaces: Some building and ground surfaces such as polished aluminium, construction materials, lightly coloured concrete and water can reflect UVR back onto the skin and eyes.

When developing your sun protection program it is important to remember that your workers will need protection from exposure to both direct and indirect sources of solar UVR.

For complete protection, a combination of sun protection measures is needed.



Source: The Cancer Council Victoria. *Shade for everyone: A practical guide for shade development,* 2004.

Describing levels of solar UVR

Due to the points outlined above, levels of solar UVR vary across Australia on any given day. The UV Index, a rating system adopted from the World Health Organization, is a simple way of describing the amount of solar UVR at the earth's surface.

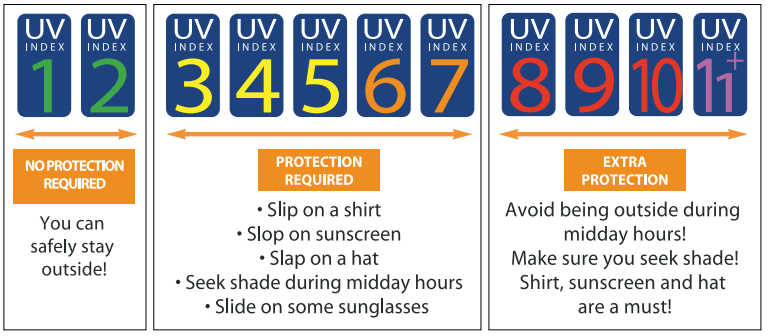
The values of the UV Index range from zero upward. The higher the number, the stronger the levels of solar UVR and the less time it takes for damage to occur.

The UV Index has five categories:

- Low: UV Index of 1–2
- Moderate: UV Index of 3–5
- High: UV Index of 6–7
- Very High: UV Index of 8–10
- Extreme: UV Index of 11 and above

When the UV Index is at 3 and above, the amount of solar UVR reaching the earth's surface is strong enough to damage the skin, which can lead to skin cancer.

The Cancer Council Australia recommends the use of sun protection measures when the UV Index is 3 or above and at all times when in alpine regions or near highly reflective surfaces.



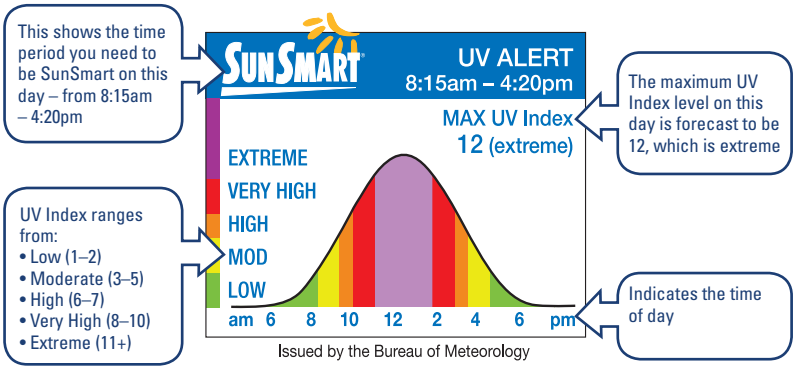
Source: World Health Organization. *INTERSUN: the global UV project: A guide and compendium,* 2003.

The SunSmart UV Alert

The SunSmart UV Alert is a tool workplaces can use to protect workers from the sun's UVR.

Based on the UV Index, the Bureau of Meteorology issues the SunSmart UV Alert whenever the UV Index is forecast to reach 3 or above.

The SunSmart UV Alert is reported daily in newspapers around Australia, some mobile phone and radio weather forecasts and on the Bureau of Meteorology website. Visit www.bom.gov.au and search for the SunSmart UV Alert.



For a detailed list of substances that cause photosensitivity refer to the Guidance Note for the Protection of Workers from Ultraviolet Radiation in Sunlight (NOHSC). Visit www.ascc.gov.au to view or obtain a copy.

Photosensitivity

Photosensitivity is an abnormally high sensitivity of the skin or eyes to UVR. This can cause the skin to burn more easily and increase your risk of skin cancer.

Photosensitivity is caused by ingestion, inhalation or skin contact with substances known as photosensitisers. Some substances that cause photosensitivity include industrial chemicals, drugs, plants and some essential oils and fragrances.

A risk assessment used to identify work situations where employees are exposed to the sun should also identify any photosensitising substances which may be associated with the work people do.

Common substances that cause photosensitivity

Coal tar and derivatives	
anthracene	phenanthrene
pitch	creosote
Dyes	
acridine	fluorescin
bromofluorescein	methylene blue
eosine	rhodamine
erythrocin	rose bengal
Chlorinated hydrocarbons	
chlorobenzols	triphenyls
diphenyls	
Plants	
bergamot	fennel
bind weed	fig
buttercup	lemon
chrysanthemum	lime
dill	St John's Wort

Source: National Occupational Health and Safety Commission. *Guidance note for the protection of workers from ultraviolet radiation in sunlight*, 1991.

Some medications can cause photosensitivity. Check with your doctor or pharmacist, as alternative medication may be available.

Solar UVR and glass

There are many different types of glass. Each provides very different levels of sun protection.

House window glass

House window glass has an ultraviolet protection factor (UPF) of 10. This means one tenth (10%) of solar UVR will pass through. The window absorbs the remaining 90%. This type of glass provides only moderate protection against solar UVR.

Office building glass

Office building glass has a UPF of 50+, which means one fiftieth (less than 1%) of solar UVR will pass through. The window absorbs the remaining 99%. This type of glass provides excellent protection.

Vehicle glass

The levels of solar UVR inside a car vary, depending on whether the side windows are open or closed and the orientation of the vehicle with respect to the sun.

Laminated windscreens, which are made of a tough plastic layer bonded between two panes of glass, have UPF ratings of 50+. However the plain window glass used in car side windows is usually about a UPF 12, which provides only moderate protection unless clear or tinted film is applied.

A person sitting in a car can still receive significant exposure to solar UVR. The Cancer Council Australia recommends that people who spend long periods of time in a car when UV levels are 3 and above use sun protection. This will ensure occupants are protected both in the vehicle and when they leave it.

Refer to The Cancer Council Australia position statement on tinting of car and window glass. Go to: www.cancer.org.au

Solar UVR and heat

In addition to UVR, the sun emits other radiation including visible light and infrared radiation. We can see visible light and we feel infrared radiation as heat.

Heat or high temperatures are not related to levels of UVR. Temperature relates to the amount of infrared radiation present in sunlight, not UVR, so it is incorrect to use temperature as a guide to determine when sun protection is needed.

Refer to your state or territory OHS authority for more information on heat illness and heat discomfort.

Heat illness

When the body is unable to cope with working in heat, heat illness can occur. Heat illness covers a range of medical conditions including heat stroke, heat exhaustion, heat cramps and skin rashes. Signs and symptoms of heat illness include nausea, dizziness, clumsiness, collapse and convulsions. If left untreated, heat illness can be fatal.

DID YOU KNOW?

It is a common misconception that you can 'feel yourself getting sunburnt'. Solar UVR cannot be seen or felt so it can damage our skin without us knowing.

Exposure to solar UVR and heat illness are separate occupational hazards for outdoor workers. However, the effect of heat must be considered when implementing a sun protection program for the following reasons:

- Working in hot conditions may contribute to non-compliance with sun protection measures. The use of personal protective equipment and clothing may decline due to heat discomfort.
- Inappropriately designed and heavy covering clothing worn for sun protection can contribute to an employee's risk of heat illness. Select material and a design that provides sun protection while keeping workers cool in hot conditions.
- In some cases, control measures can reduce workers' risk of both heat illness and exposure to solar UVR. These include:
  - Provision of shade for outdoor work.
  - Rest breaks in cooler, shaded or indoor areas. Additional breaks may be needed.
  - Provision of loose fitting, lightweight clothing for air movement and sun protection.
  - Changes to work schedules that allow heavy work to occur during cooler times of the day. This may also coincide with the times when solar UVR is less intense, such as early in the morning or late in the afternoon.
  - The use of more people and rotation of workers between cooler, shaded tasks and hot outdoor work.