

# Shade

Workers should work in shade or take breaks in shade, where possible. This is a very effective way of reducing solar UV exposure and preventing heat stress.<sup>1</sup>

Workplaces should consider implementing 'built' shade. This includes permanent and temporary shade structures as an **engineering control**. Policies or procedures are **administrative controls** that encourage workers to use 'natural' shade from trees as much as possible during work or breaks.

Hierarchy of Risk Controls for Sun Safety:
1. Elimination or substitution
<b>2. Engineering controls</b>
3. Controls that increase awareness
<b>4. Administrative controls</b>
5. Personal protection

## What Makes the Best Shade?

The following factors determine the effectiveness of shade structures or trees in providing protection:<sup>2</sup>

- **Reflection:** the amount of reflected solar UV from the surrounding environment greatly influences the solar UV levels within the shaded area. Generally, hard or smooth surfaces reflect more solar UV than surfaces that are soft or rough.
- **Skyview:** this is the amount of sky that can be seen while you are under the shade. The more sky you can see, the less protection provided by the shade.
- **Shade characteristics:** the amount of protection provided by human-made shade depends on: (1) how much solar UV is able to be transmitted through the material. This is described in terms of the Ultraviolet Protection Factor (UPF)\*; and (2) the design – structures where the roofs have large overhangs and side protection provide the best shade. For trees, the best shade is provided by trees which have dense foliage and a canopy that is close to the ground. Tree shade is variable due to season, the angle of the sun, and cloud cover.

## How to Maximize the Protection of 'Built' Shade<sup>3</sup>

### Permanent or semi-permanent structures:

- Install shelter sheds, gazebos, and fixed shade sails
- Can be useful for stationary job tasks and at areas where coffee and lunch breaks are taken
- Made from a range of materials including metals, polycarbonates, fabrics, and shade cloth



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Production of this resource has been made possible through financial support from Health Canada through the Canadian Partnership Against Cancer.

**Portable shade structures (umbrellas, tents, awnings):**

- Can be used when workers are working in different locations and move around on the job
- Should be made from high UPF material. This often means densely woven fabric such as canvas
- Should be easy to transport, store, and erect
- Can be a relatively inexpensive option when no other shade is available

**Design features and materials:**

- **Metal roofing** material such as tin or aluminum is often used on permanent structures and provides excellent protection as it has a very high UPF
- **Polycarbonates** can also be used for permanent structures. They are manufactured in clear or tinted sheeting. Their key purpose is to waterproof an outdoor area while allowing visible light through. Transparent polycarbonates usually have UPF ratings of 50+, but they can be quite hot to be under
- **Fabric materials** are often used for portable structures. The UV protection can vary depending on the color, weave, and coatings that have been applied. Canvas usually has a UPF of 50+. Depending on the material, they may have a shorter life-span than shade cloth and other materials.
- **Shade cloth** can also be used for permanent and semi-permanent structures. It consists of closely woven or mesh materials and is primarily designed to control visible light. Depending on the tightness of the weave, shade cloths can have UPFs from 2 to 10, meaning they offer much less protection than other shade materials.
- UPF rating for shade materials should be 40 or greater for maximum protection. UPF ratings for shade apply to the material only. The overall protection provided by the shade structure also depends on its design, its placement relative to the sun, and how it is used.<sup>4</sup>

**Positioning and structure:**

- The sun angle changes throughout the day and with different seasons. Consider these angles when planning the location and design of shade structures.<sup>4</sup>
- Your position under a shade structure is important. The best shade protection is at the centre of the shaded area. The more open the structure, the more UV that gets in.<sup>2</sup>

## Implementing Shade at Your Workplace

Are your workers in vehicles or equipment? When purchasing equipment or machinery, look for opportunities to add shade to the equipment to protect outdoor workers who operate them.

Is there natural shade available? Encourage workers to seek shade as much as possible.

Can you provide temporary shade from portable tents for workers doing certain tasks?

Not all shade provides complete protection. Shade should be used together with other sun protection measures, such as personal protection (long sleeved shirts and pants, wide-brimmed hats or hard hats with brim attachments, eye protection, and sunscreen).<sup>5</sup>

Even if shade cannot be provided during work tasks, efforts should be made to ensure shade is available during breaks. Having breaks in shade is an important way to reduce a workers overall UV exposure.<sup>1</sup> This could be included in the workplace's sun safety policy.

Where possible, try to relocate work tasks to take advantage of existing shade through trees, buildings or other structures. This may require work procedures to be developed.

Cost considerations should include both the initial and maintenance costs for shade structures.

Be aware of reflective surfaces in the area surrounding the shade structure. These may increase UV exposure even when workers are in shaded areas.<sup>4</sup>

**\*Note:** Ultraviolet Protection Factor (UPF) is a rating used to describe how much protection fabrics and materials provide from UV radiation. It provides an indication of the ability of the material to block UV radiation passing through it. A fabric or material with a UPF 40 allows only 1/40th (2.5%) of UV radiation to pass through, therefore blocking 97.5% of UV radiation from passing through. For fabrics and materials to be sun protective, they should have a minimum UPF of 15 (this allows 6.7% of UV to pass through). A UPF of 40 or more provides excellent UV protection.