

Safety Note #23

## EYE PROTECTION FROM ULTRAVIOLET RADIATION



Data from a 1988 study by the National Institutes for Occupational Safety and Health (NIOSH) indicate approximately 650,000 occupational eye injuries occur per year. Most eye injuries can be prevented by using eye protection. This safety note discusses eye protection from the harmful effects of overexposure to ultraviolet (UV) radiation.

### UV Radiation

- The broad spectrum of solar radiation (i.e., energy transmitted from the sun, including sunlight) encompasses radiation within UV wavelengths.
- UV radiation has relatively short wavelengths (100-400 nanometers [nm]) and is not visible to the human eye. Note: the thickness of a human hair is about 80,000 nm.
- The UV portion of solar radiation includes UVA, UVB, and UVC wavelengths.
- UVC and part of UVB radiation are absorbed by the earth's upper atmosphere.
- Overexposure to UVA and remaining UVB radiation can cause damage to the eye.

### Eye Damage Attributed to UV Radiation

1. Burns - a painful burn to the surface of the eye that can occur suddenly and last temporarily. Also termed snow blindness. Staring directly at the sun can permanently scar the retina at the back of the eye.
2. Cataracts - a cloudiness of the lens caused by long-term overexposure to UV radiation.
3. Pterygium - a benign growth on the surface of the eye due to chronic UV radiation exposure. May require surgical removal. Note: pronounced "te-rij-e-um."
4. Macular degeneration - damage to the central vision area due to cumulative UV radiation exposure. Age related and major cause of blindness in people over 50 years.
5. Cancer - occurring on eyelids and skin around the eyes.

### Protecting Your Eyes From UV Radiation

- Working outdoors exposes employees to UV radiation levels 20 times greater than those for employees working indoors.
- UV radiation exposure increases by about 10% with every 3,000 foot increase in elevation.
- Using sunglasses or goggles that absorb UV radiation reduces the risk for eye damage.
- To effectively prevent eye damage, sunglasses or goggles should filter 99 - 100% of UVA and UVB radiation.
- Childhood exposure to UV radiation may cause more eye damage than during adulthood.
- Photosensitizing chemicals increase the sensitivity of eyes to sunlight. Consult your doctor about potential effects from sunlight if you are taking medications to treat psoriasis, antibiotics such as tetracycline and doxycycline, or sulfa drugs.
- UV radiation exposure also occurs during cloudy days.