WHITEPAPER

EYE PROTECTION AND THE IMPORTANCE OF PROTECTING OUR VISION!

Our eyes are responsible for more than 80% of the information we process, making vision critical for successfully navigating the environment. Any loss to our vision can have a devastating impact on our lives, both at work and home.

Internationally, ocular trauma is the leading cause of monocular blindness and it is widely quoted that 90% of injuries are preventable, and eye protection is key to any prevention strategy.

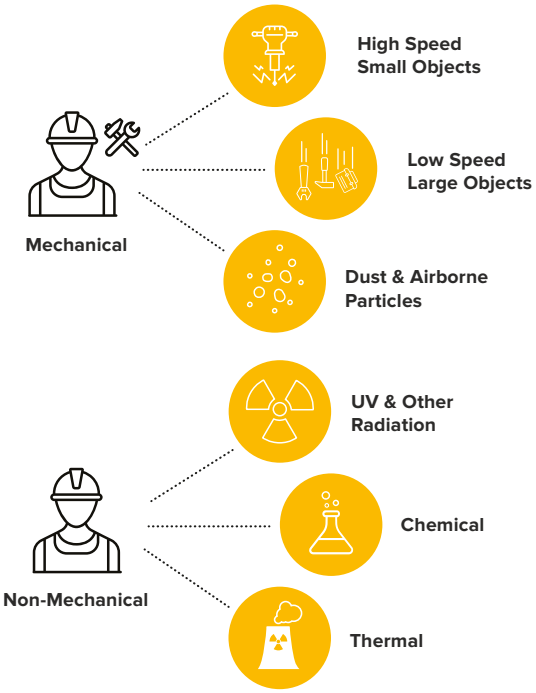
Eye Injuries at Work

Eye injuries in the workplace come at a high cost, not only for the workers but also the employer, the community and the injured person's family. Workplace-related eye injuries are a common cause of lost days at work, reduced productivity, and medical and workers compensation claims.

Industrial environments often associated with eye injuries include forestry, fishing, farming, construction and mining. Working with metal (for example, when hammering, grinding or cutting) is one of the most common sources of work-related eye injuries. Other work hazards that frequently result in eye injuries include chemicals (acids, alkalis, cleaning solutions) and artificial radiation, e.g. when welding.

Advances in eye protection design as well as improved work health and safety regulations have helped reduce work-related eye injuries. But, with more than 50,000 people admitted to hospital in 2 years (2010-11, 2015-15) in Australia[1], we are still far from solving this problem.

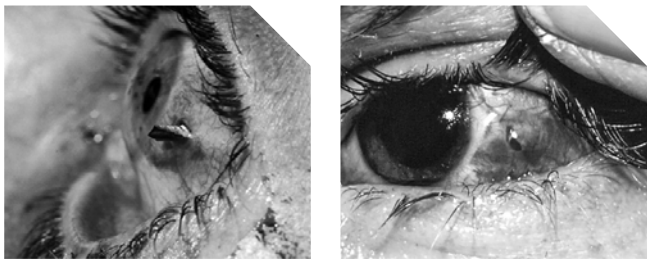
Figure 1: Common Eye Hazards



Consequences of an Eye Injury

After suffering an eye injury with severe vision loss, workers often report difficulty reading and doing their usual job, and up to 40% are unable to return to their previous job. The direct economic cost of an eye injury should be viewed as the 'tip of the iceberg' given a patient may be left with lifelong social and economic consequences following the injury. The cost and time invested in wearing the correct eye protection far outweighs these consequences. We all play an important role in preventing eye injuries by promoting and following eye injury prevention measures at work and at home.

Figure 2: Common Eye Injuries



Metal foreign body

Who's at Risk?

Many occupations and activities are at particularly high risk for eye injuries. For example, occupations using machinery and tools can generate small particles at high speed that become embedded in the eye. Working with metal is known for generating sharp high speed projectiles with severe eye injuries and vision loss resulting. Chemicals are well known as a potential source of eye injury in the workplace and particularly damaging are acids and alkalis used in processing or cleaning.

Eye injuries are the leading cause of vision loss in one eye[2] and often affect young working age males. It is particularly important to take care of high risk individuals. At particular risk are those who have had a previous eye injury, surgery or who are one-eyed (amblyopic). The risks and consequences of vision loss for these high individuals is even higher.

IMPORTANT FACTS ON WORKPLACE EYE SAFETY

90%
OF ALL EYE INJURIES CAN BE PREVENTED[3].

60%
OF ALL EYE INJURIES IN AUSTRALIA OCCUR IN THE WORKPLACE[4].

FRIDAY
IS THE MOST COMMON WORK DAY FOR EYE INJURIES TO HAPPEN[5].

WORKERS AGED 40+
FACE INCREASED RISKS DUE TO **PRESBYOPIA[6]** AND OTHER AGE RELATED EYE CONDITIONS.

What Are the Laws and Regulations Relating to PPE and Eye Protection?

In Australia, strict guidelines control the safety of workers. Employers have a duty of care to protect their workers. The Australian Work Health and Safety Regulations (see below) apply to personal protective equipment, including eye protection, and are used to minimise risk to health and safety in a workplace.

Australian Work Health & Safety Regulations 2011 (Excerpt)

It's an **employer's duty** to **provide suitable protective clothing and equipment to employees**.

"The person conducting a business or undertaking (PCBU) who directs the carrying out of work must provide the personal protective equipment to workers at the workplace, unless the personal protective equipment has been provided by another person conducting a business or undertaking".

This applies if personal protective equipment is to be used to minimise a risk to health and safety in relation to work at a workplace.

Penalty in not complying

In the case of an individual $6,000

In the case of a body corporate $30,000

Penalty in the instance of death or serious injury:

In the case of an individual ..... $300,000 to $600,000 or **5 years imprisonment** or **BOTH**

In the case of an offence committed by a body corporate $3,000,000

New Zealand Health & Safety at Work Act 2015 Summary (Excerpt)

The Health and Safety at Work Act 2015 (HSWA) requires PCBUs (persons conducting a business or undertaking) to take all reasonably practicable actions to eliminate or minimise risks to the health and safety of workers (and others that may be at risk from the work being done). This includes protecting people's eyes.[1]

You, the PCBU must provide all necessary PPE (including eye protection) for your workers. You cannot pass the cost of providing eye protection to your workers, or make them provide their own. Workers may choose to provide their own but you must make sure it offers suitable protection. You must engage with your workers before you make decisions or propose changes that may affect their health or safety. This includes consulting with them about what types of eye protection to provide.

USING THE CORRECT EYE PROTECTION CAN HELP PREVENT UP TO 90% OF EYE INJURIES.[3]

What Eye Protection Solutions Are Available and Compatible With Workers and Their Environment?

When choosing the best eye protection it is important to first understand:

i The hazards

ii The worker's needs

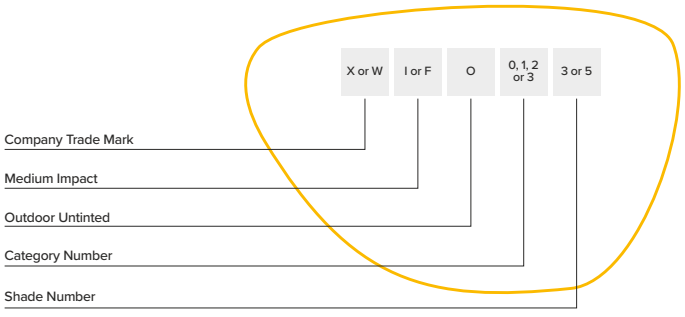
iii Their environment

A number of options exist depending on the hazards (*see Table 1*) and the environment (*Table 2*). For more detailed guidance refer to the **Standard AS/NZS 1336**.[7]

Table 1: Eye Protection for common workplace hazards

Activities/Role	Suitable Eye Protection
Workers involved in machine cutting, grinding of metals where there are small particles at medium to high velocity	• Medium-impact eye protectors etched with an "I" or "F" • High-impact face shields, etched with a "V"
Horticulture, gardening, council workers e.g. lawn mowing, whipper snippers, edgers are exposed to flying fragments at high velocity (NB both user and spectators are at risk)	• Medium-impact eye protectors etched with an "I" or "F" • High-impact face shields, etched with a "V" • Tinted or outdoor untinted, etched with an "O"
Workers exposed to chemicals in a liquid or gas form e.g. cleaning solutions incorporating alkali	• Splash-resistant goggles, etched with a "C" • Face shields (used in addition to goggles)
Laser based surgical and cosmetic procedures where optical and thermal hazards exist e.g. laser hair removal	• Refer to AS 1337.4 and AS 1337.5
Workers exposed to non-ionising radiation e.g. welding, furnace work	• Refer to AS/NZS 1338.1 and AS NZS 1338.2 AS/NZS 1338.3

Figure 3: Safety Lens Markings



When considering the environment a number of factors may influence the choice of eye protection.

Table 2: Examples of environmental conditions and potential solutions

Environmental Condition & Concern	Solution
High humidity – Fogging	Antifog solution. If goggles are required, consider vented, indirect or direct to increase airflow.
Outdoor environments – UV damage, glare	Protection from UV is critical. UV protection is available from an 'Outdoor' untinted eye protector (marked with "O" on the lens) or 'Category 3' (marked with a "3" on the lens – this is the darkest tint category in AS/NZS 1337.1[8]) If glare is an issue, then 'Category 3' provides strong UV and glare protection. Keep in mind that the use of sunscreens can degrade both frame and lens materials if they come in contact.
High voltage work – (e.g. electricians working with conductive materials)	Non-conductive material and safety frames with no metal parts should be worn.
Moving from indoors to outdoors often – Changing light conditions	Photochromic or lightly tinted lenses (marked with a "1" on the lens – 'Category 1' is the lightest tint category).
Dust-eye irritation	Partial or full seal eye protection.
Chemicals – (eye hazard, potential to reduce performance of eye protection)	Certain chemicals (including when airborne) can degrade the performance of some plastics. Check with your safety eye protection supplier about any potential effect on eye protection performance.

Why Regular Spectacles and Sunglasses Are Not Eye Protection?

A common misconception is that regular spectacles can be used as eye protection. Regular spectacles and sunglasses should not be used as eye protection. The plastic or glass material used in regular spectacles may dislodge from the frame and fracture, penetrating the eye and potentially resulting in severe eye injuries and vision loss. Regular prescription spectacles are also unlikely to offer protection from the sides, providing more opportunity for objects to enter the eye from the side.

Regular prescription spectacles should always be replaced with custom-made prescription safety eye protection (complying with AS/ NZS 1337.6[9] when exposed to eye hazards.

Fit, Comfort and Coverage

If safety eye protection is not comfortable it is less likely to be worn. When choosing safety eye protection it is important to take into account the specific needs of workers, including different head shapes and sizes. This may include the need for smaller frames to suit workers with a smaller head width and different bridge widths (nasal contours) and sizes.

It is important to ensure full coverage of the eye area and minimise any gaps between the frame and face as much as possible. These factors will influence the ultimate fit, comfort and safety of your workers, ensuring that the frames stay in place and that they provide adequate protection to the eye area. Safety frames providing adjustable nose pads, arm temple lengths and headbands or straps may also be helpful in optimising fit. It is important to pay close attention to any other PPE that needs to be worn, such as face masks, ensuring that their fit is compatible with the eye protection.

The Importance of Vision for Safe and Productive Work Environments

A key consideration for optimum productivity and performance at work is good vision. A wearer's visual perception includes field of view, any refractive power required, colour perception and sensitivity to glare. The field of view is important because the wearer needs to have an unobstructed view to undertake tasks. The vision and refractive status of workers is also an important factor when selecting eye protection. It is important to ensure that workers have adequate vision, and if not, suitable refractive correction to work safely.

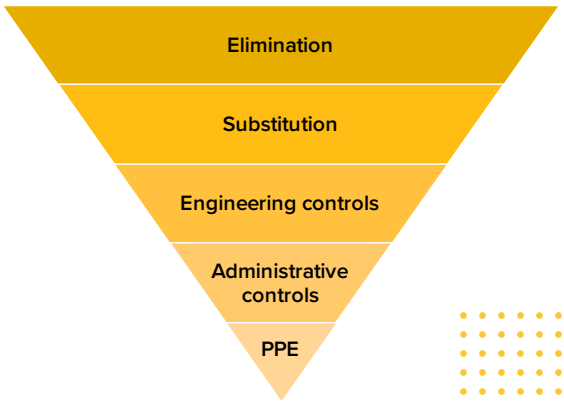
What Solutions Are Available if Eye Protection and Vision Correction (Prescription) is Needed?

Because vision plays an important role at work, employers should ensure visual needs are met with appropriate visual correction incorporated into safety eyewear to ensure good vision in maintained.

Our eyes are very complex, yet we often take for granted that our vision will be perfect as we age. The reality is that undiagnosed visual problems may potentially put us and others in danger. Workers aged over 40 face increased safety risks as an age-related condition called presbyopia affects their eyesight.

When assessing eye protection solutions, a worker's vision demands and needs should be considered. With the aging population and increasing proportion of workers requiring some type of visual correction (e.g. reading spectacles), this is becoming even more important. Other options may also include over spectacles, face shields or goggles worn over regular glasses or contact lenses. The weight, visual performance and clarity of the eye protection should all be taken into account when selecting the right eye protection. For most workers, their visual performance and comfort will be improved with custom-made prescription eye protection.

Figure 4: Hierarchy of Injury Prevention



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9. AS/ NZS 1337.6: 2012. Personal eye protection. Part 6: Prescription eye protectors against low and medium impact. 2012.

Prescription Safety Glasses

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Annette leads the Standardisation activities globally for Essilor as Global Standardisation Manager. She also holds fellowships at the Save Sight Institute, The University of Sydney and The Lion's Eye Institute at the University of Western Australia. Her research focus is on Eye Injuries and their prevention.

She is an optometrist with extensive experience in product development, compliance, standardisation and quality control for prescription spectacles, sunglasses and eye protection.

About PSG – Prescription Safety Glasses Ltd

Established in 2006, PSG is today the largest supplier in Australia and New Zealand of certified Prescription Safety Glasses under standard AS/NZS 1337.6.

Supporting a wide network of local optical retailers, PSG Eyewear provides the best protection and vision through the largest range of frame and lens choices in the AU/NZ market. This in turn protects businesses from lost time injuries.

PSG has a lens selection second to none from the world's number one lens manufacturer, Essilor.