

# The real facts about head protection



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In Australian workplaces, head protection is required when and wherever there is a reasonable prospect of hazard or injury to an individual. You won't find a building site or industrial facility in the country that doesn't feature 'Hard Hat Area' signage indicating that safety helmets must be worn. There are so many environmental and individual factors that determine the effectiveness of available head protection. Why then do workers often just reach for whatever is in the back of the van or truck, without any thought of the real risks posed and the overall suitability of the headwear being used?

Just one form of potential industrial hazard is traumatic brain injury (TBI) resulting from impact. The fallout of such an injury can be both extreme and long-lasting. Victims may suffer neurological and cognitive impairment and experience personality or behavioural changes, as well as persistent detrimental lifestyle consequences including unemployment, financial hardship and deterioration of personal relationships. When the stakes are that high, it's hard to understand why anyone would adopt a casual attitude to one of the most important forms of Personal Protection Equipment (PPE), or why employers would tolerate this line of thinking.

## One size does not fit all

Just as no two work sites are the same, there is no 'one-size-fits-all' solution for head protection. The selection of an appropriate safety helmet should be a high priority for employers when workers are at risk. AS/NZS 1801:1997 was developed to lessen the severity of head injury from occupational hazards and specifies the requirements for protective helmets including the construction and materials of the helmet shell and head harness, the mechanical strength of the shell and the finish of the helmet.

The standard broadly classifies protective headwear into three types:

- Type 1 – general industrial safety helmets
- Type 2 – helmets intended for high temperature workplaces
- Type 3 – helmets intended for bushfire fighting

In addition to these general classifications, determining the most suitable headwear depends on a number of factors including:

- The nature of the work being undertaken
- Whether the helmet is for prolonged or occasional use
- If the worker is generally stationary or required to move around to perform required tasks



- If the site location is indoor, outdoor or underground
- Whether there is any potential exposure to falling objects
- Probability of temperature extremes
- Susceptibility to liquid splashes
- Likelihood of electrical risks
- Specific difficult working conditions including at heights or in confined spaces

As a minimum, hard hats should perform a range of basic functions:

- Resist penetration and deflect blows to the head
- Have a suspension system that can absorb the force of impact
- Serve as an insulator against electrical shocks (when warranted)
- Be water resistant and slow burning
- Shield the scalp, face, neck and shoulders

Selection of the correct equipment requires a risk analysis of the workplace and the tasks to be undertaken. Providing the correct level of protection and optimal comfort will enable the wearer to focus on the task, rather than the equipment, to increase efficiency and reduce the risk of accident or injury.

### Anatomy of head protection

The basic material selection and construction of a hard hat is outlined in AS/NZS 1801. It requires the helmet to consist of an outer shell and a means of absorbing energy within the shell; that is protective padding, a harness, or both. The shell should be fabricated from materials that are hard, durable and inherently moisture-resistant and should also be of one-piece construction.

Arguably more important than the shell itself, the harness, or suspension, is a key element of head protection design, as it distributes force in the event of impact. According to the standard, the harness "should be adjustable and provide a secure fit on the wearer's head and should not be easily dislodged". Correct seating improves overall function, so adjustability to fit the wearer, provision of even load distribution and slippage prevention are important.

A six point harness provides improved injury reduction potential, as it can redistribute severe loads (such as impact) over 30% more surface area than a four point harness.

A hard hat should feature good functional ventilation, as working in heat shouldn't present the wearer with a potentially deadly choice; is it preferable to suffer heat stroke or injury? Removing a hard hat to cool down, even temporarily, puts a worker at risk, so cooling vents for improved air circulation and comfort can be a useful feature.

Enhanced design ensures that water leakage is not an issue. Saturated sweat bands or leaks inside the helmet can lead to temporary reduction in eyesight and allow slippage due to movement. Neither scenario is ideal as both can cause the wearer to remove the hat, increasing risk of injury.

Sun exposure should be minimised through the inclusion of a suitable peak and glare diminished by the use of a specifically designed anti-glare peak lining.

### Accessories are not an afterthought

Many activities and conditions will call for additional protective elements to be incorporated into safety helmets. These may include:

- Helmet mounted hearing protection
- Eye and face protection, such as visors and frames
- Neck curtains and sun brims to increase protection from debris, sun and rain
- Chinstraps to prevent helmet loss
- Winter liners for extreme temperatures
- High visibility reflective tapes that ensure workers are easily seen – these should be appropriate to the location, whether indoor, outdoor and underground
- Communications systems

AS/NZS 1801 requires that the addition of helmet accessories "shall in no way degrade the helmet performance below the performance requirements" of the standard. This means that alterations, such as drilling holes in order to facilitate the addition of accessories, are essentially prohibited outside the point of manufacture. It stipulates, clause by clause, that the addition of any ancillary element must not interfere with overall compliance.

To avoid non-compliance, and to ensure uncompromised protection for workers, employers should select accessories that have been tested and approved as part of a fully integrated head and face protection solution. This not only guarantees standard conformity, but also ensures seamless compatibility between the helmet and additional extras.

### An ongoing concern

Selection and acquisition of appropriate head protection is not the end of the line, contrary to what some employers may think. Regular inspections and appropriate storage are as important as the original purchase, more so in some cases. As durable as the helmet components are, the protective properties will still degrade through exposure to common work environments such as extreme temperatures, chemical exposure and sunlight, and through normal wear and tear.

To ensure they are still fit-for-purpose, safety helmets should be examined daily and after each use. Any evidence of cracks, large chips or impact could jeopardise the integrity of the shell, so the helmet should immediately be retired from service. Discolouration, a chalky appearance or brittleness may also signal degradation and necessitate removal.

Just as important as the shell, the suspension should be checked for cracks, breaks, frayed straps or damaged stitching. Any of these conditions require immediate re-



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placement of the suspension system. In general terms, the shell should be replaced between three and five years and the suspension every one or two.

Adequate maintenance and storage of head protection systems will ensure the greatest level of longevity; hard hats should never be stored in sunlight and care should be taken not to damage the suspension system when stowed away. The hard hat shell and suspension should be cleaned with a mild detergent and rinsed with warm water. Adhesives, paints and cleaning solvents should not be used unless approved by the manufacturer, as they may damage the shell and lessen protection effectiveness.



Note: This Bulletin contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.



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**MSA – The Safety Company**

1000 Cranberry Woods Drive  
Cranberry Township, PA 16066 USA  
Phone 724-776-8600  
[www.MSAafety.com](http://www.MSAafety.com)

**U.S. Customer Service Center**

Phone 1-800-MSA-2222  
Fax 1-800-967-0398

**Pacific Asia Region**

**MSA Singapore**  
MSA S.E Asia Pte Ltd  
35 Marsiling Industrial Estate Road 3,  
#04-01, Singapore 739257  
Phone: +65 6350 4500  
Fax: +65 6350 4505

**MSA Australia**

Phone: 1300 728 672 / +61 02 9688 0333  
Fax: +61 2 9896 1835

**MSA Indonesia**

Phone: +62 21 6409 000  
Fax: +62 21 641 2831

**MSA Malaysia**

Phone: +603 8724 8208/9208  
Fax: +603 8724 2208

**MSA New Zealand**

Customer Service  
Phone: 0800 441 335

**MSA Philippines**

Phone: +63 9209 742 191

**MSA Thailand**

Phone: +66 2617 8211  
Fax: +66 2617 8214

For sales enquiry, contact us [here](http://www.MSAafety.com).

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