

Prevention of head injuries is an important part of every safety program. A single head injury can handicap an employee for life, and can even be fatal. Many injuries can be avoided by wearing occupational head protection, specifically a safety helmet, or “hard hat.” This document outlines the purpose of head protection and types of hard hats. It also discusses training requirements for employees who use hard hats as part of their personal protective equipment (PPE).

Hazard Assessment

Every organization should perform a PPE hazard assessment at its workplace. This assessment is designed to identify the hazards of each job and to recommend PPE that will help keep the worker safe. Head protection should be provided if any of the following hazards are observed during the assessment:

- Objects that can fall from above and strike workers on the head
- Fixed objects, such as exposed pipes or beams, or mobile objects, such as a load being moved by an overhead hoist, against which workers can bump their heads
- Exposure to live electrical conductors

Purpose of Head Protection

In general, hard hats should:

- Resist penetration by objects
- Absorb the shock of a blow
- Be water and flame resistant
- Come with instructions explaining proper adjustment and replacement of the suspension and headband

Types of Head Protection

Hard hats have a rigid shell that resists and deflects blows to the head. The suspension system inside the hard hat, which suspends the hard outer shell

1¼ inches from the user’s head, acts as a shock absorber during impact and provides ventilation during wear.

Some hard hats (Class E) serve as an insulator against electrical shocks. The brim of a hard hat shields the user’s face, neck and shoulders against splashes, spills, drips and sunlight. Hard hats can be modified to include face shields, goggles, hoods and hearing protection.

Regardless of the features found on hard hats, the design, construction, testing and use of hard hats should meet the standards established by ANSI Z89.1-2009.

ANSI Z89.1-1997 (revised in 2003 and 2009) describes the different hard hat classifications. The 2003 and 2009 revisions do not affect these classifications, but do include minor changes; ensuring consistency with other national standards that test and evaluate equipment performance, “reverse donning” of hard hats, low temperature hard hats and high-visibility hard hats.



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Hard hats complying with the ANSI Z89.1-1997 standard are available in two types and three classes. Type I hard hats provide protection strictly from blows to the top of the head, while Type II hard hats provide protection from blows both to the top and sides of the head. Within each type are the following classes:

- **Class G (General)**—intended to reduce the force of impact of falling objects and to reduce the danger of contact with exposed low-voltage electrical conductors. For certification, sample shells are proof-tested at 2,200 volts of electrical charge. These hard hats were previously known as Class A under the Z89.1-1986 standard.
- **Class E (Electrical)**—intended to reduce the impact force of falling objects as well as the danger of contact with exposed high-voltage electrical conductors. Sample shells are proof-tested at 20,000 volts. These hard hats were known as Class B under the Z89.1-1986 standard.
- **Class C (Conductive)**—intended to reduce the force of impact of falling objects, but offer no electrical protection. These hard hats were also known as Class C under the Z89.1-1986 standard.

Each hard hat should contain a warning label that provides the manufacturer's name, type of hat, class code and other safety information. The month and year of manufacture should also be molded into the hard hat, typically on the brim.

Employee Training

An integral part of an occupational head protection program is ensuring that employees have been trained on the use and care of their hard hats. Employees should receive training that covers at least the following topics:

- Why head protection is necessary, citing the workplace hazards that expose workers to head injury
- How head protection protects workers
- The limitations of head protection, such as Type I hard hats not providing side impact protection
- When workers must wear the head protection
- How to wear the head protection properly
- How to adjust straps and other components of the head protection to improve comfort and ensure proper fit
- How to identify signs of wear, including cracked, torn or deteriorated suspension systems; deformed or damaged brims or shells; and flaking, chalking or loss of surface gloss
- How to clean and disinfect the hard hat as needed
- When hard hats or their components should be replaced

Employees often have questions during the training program regarding personalization of the hard hat. Before allowing any kind of personalization, contact the hard hat manufacturer regarding their stance on stickers, decals and paint. Check also on recommendations regarding wearing the hard hat backwards (or “reverse donning,” as it is referred to in the 2009 Z89.1 revision). Stickers and decals can hide deterioration or cracks, and paint can weaken the shell of the hard hat and reduce or eliminate electrical resistance.

For Additional Information

EMC Insurance Companies: www.emcins.com

- Tech Sheet—Personal Protective Equipment Hazard Assessment

Occupational Safety & Health Administration:

www.osha.gov

- Head Protection Standards 1910.135 and 1926.100
- Publication 3151—Personal Protective Equipment