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The Basics of Head Protection



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OSHA 1910.135(a)(2)

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The Basics of Head Protection

Few injuries are more fatal or more damaging than head injuries. Concussions, brain injuries, permanent or temporary brain damage are just a few of the possible outcomes of a blow to the head. Additionally, workers who are exposed to potential electric shock need to protect against that as well.

Basic to any workers Personal Protective Equipment is the hard hat.

Hard hats are designed to protect workers against electrical hazards, burns, falling objects, collisions with fixed objects and flying debris. Hard hats must meet the requirements for the American National Standards Institute (ANSI Standard Z89.1). Employers must pay for the hard hats for their employees wherever there is potential for injury, according to the OSHA standard.

The OSHA Standard Number: 1910.135 states:

1910.135(a)(1)

The employer shall ensure that each affected employee wears a protective helmet when working in areas where there is a potential for injury to the head from falling objects.

1910.135(a)(2)

The employer shall ensure that a protective helmet designed to reduce electrical shock hazard is worn by each such affected employee when near exposed electrical conductors which could contact the head.

How do I know if I need to be wearing a hard hat?

- Is there a possibility that something might fall from overhead?
- Are there any exposed electrical components (wiring, conductors, etc...) that might come into contact with your head?
- Are there fixed objects that are low enough that they might be bumped into?

If you answered “yes” to anyone of these questions, then you should be wearing a hard hat.



The Makeup of a Hard Hat

A hard hat is basically made up of:

1. a hard outer shell, usually made out of polyethylene plastic that deflects blows and protects the head from injury
2. An inner suspension usually made up of webbing that keeps the outer protective shell at least 1 - 1¼" away from the head and acts as a "shock absorber". The suspension also allows for ventilation.

Additionally, the suspension includes a head band. Sweat bands can be added to the head band for additional comfort.



Understanding the Hard Hat Ratings

The standard breaks the hazards into 2 main categories but the categories also contain subcategories that will help you decide which hard hat you will need

1. Falling objects
 - a. Type I – is designed to protect only against object falling from straight overhead, hitting the hard hat on the top.
 - b. Type II – is designed to protect against blows to the top of the head as well as side impact.
2. Electrical Hazards
 - a. Class A (old standard) or Class G (new standard) – is a hard hat that provides electrical protection up to 2,200 volts.
 - b. Class B (Old Standard) or Class E (new standard) – is a hard hat with electrical protection up to 20,000 volts.
 - c. Class C (Old Standard) or Class C (New standard) – is a hard hat that has not been rated for electrical conductivity.

All hard hats that meet the ANSI standard will be labeled on the inside of the hat.

Note: A vented hard hat cannot be electrically rated because the vents allow electrical current to get into the hat.

Bump Caps, designed primarily for protection against “bumping” into low head clearance areas and objects are not ANSI approved and should not be considered adequate protection in areas where the types of hazards that we have been discussing are present.

Terms that you should know when talking about hard hats

Bump Cap – Not ANSI approved head protection designed for protection against low clearance objects only. A bump cap is not to be used in lieu of a hard hat where a hard hat is required.

Cap style – refers to a hard hat that has a brim on the front of the hat only.

Four-Point Suspension – refers to the number of clips that connect the suspension to the inside of the hard hat. Hard hats usually come in a four-point or a six-point suspension.

Full Brim – refers to a hard hat that has a brim that wraps around the entire hard hat, as opposed to the cap style hard hat where the brim is only in the front of the hard hat.

Pin lock – refers to the hard hat suspension that adjusts to the head size but means of a set of holes on the one side of the strap and little “pins” that snap into the holes on the other side (the same type of adjustment used on most baseball caps).

Ratchet – refers to the hard hat suspension that adjusts to the head size using a ratchet adjustment knob. Simple, easy and quick, this allows the hard hat to be fit tight and comfortably.

Six-Point Suspension – See “Four-point Suspension”

Slots – refers to the slot in the side of the hard hat that is designed to accept accessories such as ear muffs, face shields or other hard hat accessories.

Maintenance and upkeep of the Hard Hat

The upkeep and maintenance of a hard hat is fairly simply. The hard hat is made up of the shell and the suspension.

Maintenance of the shell – Common sense more than anything will dictate how you care for your hard hat shell. Discoloration, cracks, areas that are dull and lack the sheen, scratches, etc... are indications that the hard hat should be replaced. Employees should be trained to keep their hard hats clean. Certain paint thinners and certain types of alcohol wipes could potentially damage the hard hat. You should check with the manufacturer of the hard hat to determine the best way to clean a dirty hard hat. Hot water and detergent is usually sufficient.

Maintenance of the suspension – The suspension is the webbing that keeps the hard hat “suspended” above the head. The suspension is easily replaced and fairly inexpensive. Frayed, torn, ripped or otherwise damaged suspensions should be replaced. A dirty suspension can be cleaned using a mild detergent and hot water. Harsh chemicals and alcohol should be avoided.

Should employees be allowed to put stickers on their hard hat?

You would be hard pressed to go to any construction site without seeing many of the workers wearing hard hats covered with stickers. While personalization of the hard hat is usually the objective, we personally recommend against stickers on the hard hat for the following reasons”

1. Stickers can potentially cover up cracks or other damages.
2. There is no way to know or control the nature of the chemicals that are used in the adhesive. While most adhesives are not harmful to the polyethylene plastic that makes up the hard hat, there is no way to know if the particular adhesive on the sticker you are about to apply is not going to deteriorate it.

3. Stickers can potentially increase the conductivity of the hard hat, especially if they are too close to the rim of the hat.

Although there is no set “expiration date” on a hard hat, the polymers that the hard hat is made up of can break down over time, especially with UV and/or high heat. OSHA recommends replacing a hard hat after five years.

You will see the date that the hard hat was made inside the hard hat in the form of a circle with an arrow. The year is in the middle of the circle and the arrow points to the number of the month. In the photo below, for example, the hard hat was made in June of 2008.



Testing for the possible degradation of the hard hat

“Compress the shell inward from the sides about 1” (2.5 cm) with both hands and then release the pressure without dropping the shell. The shell should quickly return to its original shape, exhibiting elasticity. Compare the elasticity of the sample with that of a new shell. If the sample does not exhibit elasticity similar to that of a new shell, or if it cracks due to brittleness, it should be replaced immediately.”

Taken from Bullard.com

A complete Head Protection Plan

Developing a complete head protection plan for your company requires training, implementation and enforcement. Employees need training on:

- The necessity of head protection
- How proper head protection will protect them
- What head protection will not do (Limitations of head protection)

- Where they need to wear the hard hat or bump cap
- How to wear the head protection so that it is effective, safe and comfortable
- How to maintain their hard hat properly (signs of wear and tear, how to clean, etc...)

As an employer, your responsibility does not end simply because you have provided head protection for your employees. A proper head protection policy should identify when and where the employee is required to wear head protection, what type of head protection the employee is required to wear as well as making sure that the employees understand why they need head protection and understand how the head protection you provide is going to protect them adequately.

Additional Information

You can download the OSHA Personal Protective Equipment publication for further information on the head protection requirements. This document is available at <http://www.osha.gov/Publications/osha3151.pdf>