Safety Shoes

By Daniel E. Gleghorn, CSP

Before you begin

Here are methods and strategies for presentations. Through group discussion, employees will raise awareness of safety footwear, hazard protection factors and possible consequences of not wearing them. Through peer-to-peer feedback and employee suggestions, the leader will facilitate, guide and coach employees throughout the work force where appropriate.

Introduction

Over the years, workers have raised many questions about safety protective footwear.

- What is the proper footwear?
- When should employees wear it?

The Occupational Safety and Health Administration (OSHA) 1910.136(b)(1)(i), American Society for Testing and Materials (ASTM) F-2412-2005 "Standard Test Methods for Foot Protection" and ASTM F-2413-2005, "Standard Specification for Performance Requirements for Protective Footwear," cover safety footwear. References in § 1910.6 incorporate both ASTM standards.

The previous American National Standards Institute (ANSI) Z41, rewritten in 2004 as an ASTM standard, includes several changes.

1) There are now only two classifications, Class 75 and Class 50.
2) The compression test now uses clay to determine the clearance rather than the pass/go feeler gauge and has a stabilizing fork to hold the sample.
3) The conductive footwear test now uses steel shot at a depth of 1.18 in. (30 mm) inside the footwear rather than the flat bottomed heel electrode.
4) SD type II no longer exists.
5) It added two new protection sections for chainsaw cut and dielectric insulation. Now reports the minimum height of the clay without rounding up.

Note: Changes in safety cap manufacture and any change in soling system or hardness of outside require testing at an independent testing laboratory to re-qualify footwear.

Group activity

Ask each person to provide one (or more) example(s) of protective footwear used in your facility. The types of footwear may be:

- Impact resistance;
- Electrical resistance non-conductive;
- Static dissipative;
- Conductive resistance;
- Puncture resistant bottoms;
- Slip resistance

(You may want to list these examples on a flip chart or white board.)

Type 1: Impact resistance
Example: A work area with heavy parts or equipment that may fall on or roll over a person's feet.

Answer: This presents a safety hazard due to heavy material possibly falling or rolling causing injury to the feet. ASTM has established a standard for Toe Cap Impact and Compression Resistance for the toe area and Metatarsal Impact Resistance that reduces the chance of injury to the bones on top of the foot. A person will greatly reduce the chance of foot injury wearing these types of shoes (footwear).

Type 2: Electric shock resistance non-conductive
Example: Wherever electrical currents exist so does the possibility of electrical shock to a worker's feet if proper footwear is not considered.

Answer: ASTM established a standard for secondary protection to the wearer against the hazards of incidental contact with live electrical circuits and electrically energized conductors. Employees working in electrical shock exposure areas, who wear electric shock resistant footwear, greatly reduce these types of incidents and injuries.

Type 3: Static dissipative
Example: In some jobs, static electricity may cause injury to the worker by causing an electrical shock through the feet.

Answer: ASTM established a standard for footwear designed to reduce the accumulation of excess static electricity by conducting body charge to the ground while maintaining a sufficient high level of resistance that protects the wearer from electrical hazards, due to live currents.

Type 4: Conductive resistance
Example: In some cases, static electricity may cause damage to product(s), or in cases where explosives or volatile chemicals are present, disastrous fires or explosions.

Answer: ASTM established a standard for conductive properties that reduce hazards that may result from static electricity buildup and reduce the possibility of ignition of explosives and volatile chemicals.

Type 5: Puncture resistant bottoms
Example: In some jobs, sharp objects on the walking or working surface may cause injury to the worker's feet. These objects may be nails in building material or other sharp material.

Answer: ASTM established a standard for footwear designed to reduce the possibility of injury caused by sharp objects that can penetrate the bottom assembly of the footwear.

Type 6: Slips resistance
Example: Slips and falls are the third largest cause of workplace injuries in the nation. They are the single most common reason for visits to the emergency room. Slips and falls are the number two cause of accidental death and disability. Seventy percent of slips and falls occur on level ground.

Answer: ASTM established a testing method to determine the slip resistance of safety footwear. No shoe is 100-percent slip proof. Manufacturers can design a sole to increase slip resistance for varying surfaces but not all. When considering a slip resistant safety shoe, contemplate the flooring materials and contaminants you will expose the shoe to and whether the shoe has been tested for the conditions that will be present in your facility. Floor materials include: tile, quarry tile and stainless steel (consider if your facility uses these or other materials). Contaminants possibly present can be: dry versus wet versus oily wet (review what contaminants are present in your facility).

What can you do to avoid injuries in your workplace by wearing the proper safety foot wear? Keep in mind, there are several issues to consider when choosing the proper safety footwear.

- Are there heavy items that may fall on your feet?
- Are there sources of electricity that might cause current to pass through the feet causing electrical shock?
- Are there situations where static electricity might cause electric shock, ignition of explosives, volatile chemicals or damage to equipment or product?
- Are there sharp objects, i.e., nails in boards, metal shards, etc.?
- Are there areas where slippery conditions might cause a person to lose his/her balance and fall or receive an injury while trying to catch his/her balance?

Conclusion

1. Make sure employees understand the potential for injury or damage when they do not wear the proper footwear.
2. Review the items the group discussed during the discussion, including selecting the proper footwear.
3. Make sure employees understand company policy regarding the wearing of proper footwear.

Quiz – True or false

1. Safety toe footwear will eliminate the possibility of injury to the feet.
2. Electric shock resistance non-conductive soles will greatly reduce the possibility of electrical shock through the feet.
3. Static electricity can cause shock through the feet.
4. Any good safety shoe will prevent puncture wounds to the bottom of the feet.
5. A good slip resistance sole will prevent slips on any working surface.

Answers: 1. - F, 2. -T, 3.-T, 4.-F, 5.-F

References

"Footwear 101" A Safety Presentation by HYTEST SAFETY FOOTWEAR, Information provided by Thomas A. Girolami, President, Great Lakes Industrial Shoe Co.

ASTM F 2412-05 "Standard Test Methods for Foot Protection" and ASTM F 2413-05, "Standard Specification for Performance Requirements for Protective Footwear," ASTM (American Society for Testing and Materials)

OSHA 1910.136, "Foot Protection"

Author
Daniel E. Gleghorn is a certified safety professional (CSP) and has more than 44 years of experience auditing facilities and programs, developing safety strategies, implementing safety strategies and programs, and conducting training for the strategies and programs. Gleghorn has been published with the Ohio Bureau of Worker Compensation. He has given presentations to the National Safety Council, Michigan Safety Conference, University of Michigan and ASSE. He is a current member of the Society of Ohio Safety Engineers (SOSE), McKinley Chapter ASSE and the North East Ohio Section of the American Industrial Hygiene Association.