



Safety Footwear

Loss Control Bulletin

Appropriate foot protection is required for employees who are exposed to potential foot injuries from: electrical hazards, hot, corrosive, poisonous substances, falling objects, crushing, or penetrating actions or abnormally wet locations. Footwear should also be evaluated to reduce or eliminate slip and fall hazards. Falls on the same level are often due to a loss of balance caused by too much or too little friction between the floor surface and the shoe.

OSHA 1910.136(a) General requirements. The employer shall ensure that each affected employee uses protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, or objects piercing the sole, and where such employee's feet are exposed to electrical hazards.

Some occupations for which foot protection should be routinely considered are: shipping and receiving clerks, stock clerks, carpenters, electricians, machinists, mechanics and repairers, plumbers and pipe fitters, structural metal workers, assemblers, drywall installers and lathers, packers, wrappers, craters, punch and stamping press operators, sawyers, welders, laborers, freight handlers, gardeners and grounds-keepers, timber cutting and logging workers, stock handlers, and warehouse laborers.

Slips, Trips, & Falls

According to the National Safety Council, falls from the same level account for 20 percent of all occupational accidents.

Slips on the same level are usually due to a loss of balance caused by too little friction between a person's foot and the walking surface. Common causes of slips are:

- Wet and oily surfaces
- Weather hazards such as ice or snow

Crushing and Impact

Crushed foot injuries occur when a large and heavy object come in contact with the foot. Crushed foot injuries may occur in many industries including, industrial, agricultural, and transportation. Safety shoes or boots with compression protection are recommended for work activities involving skid trucks (manual material handling carts), bulk rolls (such as paper rolls), and heavy pipes, all of which could potentially roll over an employee's feet. Crush injuries can result in serious bone and soft tissues damage and can easily cause secondary complications such as Compartment Syndrome, a medical condition that may lead to serious and often irreversible tissue and nerve damage.

Protective footwear should meet the requirements of the American Society for Testing and Materials (ASTM) standard F2413-05. The standard covers minimum requirements for Impact and Compression.

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Resistant Footwear. Footwear meeting the ASTM standard must be marked with the specific portion of the standard to which it complies. ASTM standard F2413-05 also covers metatarsal guards, conductivity, electric shock resistance and static dissipative footwear.

Under this standard, protective footwear must have the protective toe cap and any metatarsal guards sewn into the shoe during the manufacturing process. Add on toe caps and metatarsal guards are acceptable to OSHA only if the employer can show that they are equally effective. Only use add-on devices if acceptable testing results have been provided. Most manufacturers of add-on devices use an outside lab to test the products.

Puncture Hazards

Safety shoes or boots with puncture protection are essential where sharp objects such as nails, wire, tacks, screws, large staples, or scrap metal could be stepped on by employees. Puncture resistant footwear is designed with a puncture resistant plate positioned between the insole and outsole. It is an integral and permanent part of the footwear. Puncture resistant footwear must show no signs of cracking after being subjected to 1.5 million flexes and have a minimum puncture resistance of 270 pounds. Traditionally, the plates have been constructed with steel, but as with the compression resistant footwear, composite materials are now being used by some manufacturers. Add on puncture resistant insoles are now available as an insert.

Electrical

Conductive Protective Footwear is available that protects the wearer from static electricity buildup around volatile compounds. Electric Shock Resistant Footwear is available for employees who work around open circuits and may be exposed to electrical shock hazards.

Hazard Assessment

Conduct a walk-through survey of all work areas identify sources of potential hazards to workers. Consideration should be given to the basic hazard categories: impact, penetration, compression, and electrical, chemical, heat, slippery and wet conditions.

Selecting Footwear

After completing the hazard assessment, become familiar with the potential hazards and the type of protective footwear that is available. Safety shoes or boots must meet the ASTM Standard F2413-05.

When selecting footwear, look for labels that indicate the footwear meets the required minimum performance. The following is an example of an ASTM marking that may be found on protective footwear:

ASTM F2413-05 M I/75/C/75/Mt75 PR CS

Line #1: ASTM F2413-05:

This line identifies the ASTM standard – it indicates that the protective footwear meets the performance requirements of ASTM F2413 issued in 2005.



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Line #2: M I/75 C/75 Mt75:

This line identifies the gender [M (Male) or F (Female)] of the user. It also identifies the existence of impact resistance (I), the impact resistance rating (75 or 50 foot-pounds), compression resistance (C) and the compression resistance rating (75 or 50 which correlates to 2500 pounds and 1750 pounds of compression respectively). The metatarsal designation (Mt) and rating (75 or 50 foot-pounds) is also identified.

Lines #3 & 4: PR CS

These lines are used to identify footwear made to offer protection from other specific types of hazards referenced in the standard. They are used to designate conductive (CD) properties, electrical insulation properties (EH), footwear designed to reduce the accumulation of excess static electricity (SD), puncture resistance (PR), chain saw cut resistance (CS) and dielectric insulation (DI), if applicable.

Line 4 is only used when more than three types of protections are provided.

Provide documented training to each employee who is required to use Personal Protective Equipment (PPE), such as safety footwear. Employees shall be trained to know at least the following:

- When PPE is necessary
- What PPE is necessary
- How to properly put on, remove, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and disposal of the PPE