

DOMESTIC APPLIANCE MAINTENANCE

Lesson 14: Teacher's guide

Personal Protective Equipment (PPE) - Part 2



A. Uses and importance of personal protective equipment



B. Competencies

Main competency

Safely handle simple tools, electrical components, and potentially hazardous materials.

Sub competency:

Use personal protective equipment (PPE) where necessary during maintenance.

C. Learning outcomes

By the end of this lesson, students should be able to show understanding of the different PPE (personal protective equipment) and their uses.

D. Resources and materials

Different PPE (if available):

- i. Hard hats
- ii. Safety goggles
- iii. Face shields
- iv. Earplugs
- v. Flame-resistant clothing
- vi. Safety shoes

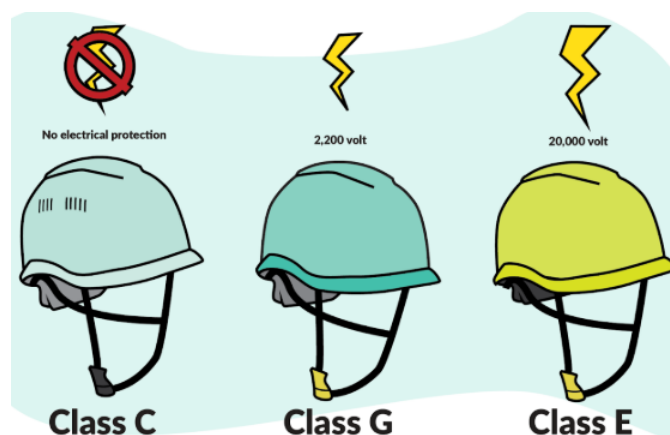
E. Implementation guidelines

Introduction

Start with a brief discussion on various types of personal protective equipment (PPE) and their importance.

1. Head protection

Electricians typically wear hard hats that have electrical insulation properties to protect their heads from falling objects, electrical shocks, and impact hazards. There are three classes of hard hats based on the level of protection they offer against electrical hazards. Class C (Conductive) hard hats do not provide any electrical protection. Class G (General) hard hats are rated for 2,200 volts and are suitable for general use with minimal electrical hazards. Class E (Electrical) hard hats are rated for 20,000 volts, making them ideal for electricians and utility workers.



2. Eye and Face Protection

Safety goggles are used to prevent foreign objects or debris from damaging your eyes. They are tight-fitting eye protection that completely cover the eyes, eye sockets, and the facial area around the eyes, thereby providing protection from impact, dust, mists, and splashes.



Safety goggles

Face shields are used to protect the eyes, nose, mouth, and face from flying objects, arc flashes, chemical splashes, dust, debris, and metal cuttings.



Face shield

3. Earplugs

Earplugs are made up of foam or other materials that can be worn to protect the ears from excessive noise levels when working with noisy electrical equipment.



Earplugs

4. Flame-resistant clothing

Flame-resistant clothing is made from non-conductive materials, to minimise the risk of burns from arc flashes or electrical fires. Arc flash suits comprise flame-resistant jackets, trousers, and hoods or face shields to safeguard against the thermal effects of arc flashes.



Flame-resistant clothing

5. Safety shoes

Safety shoes with non-conductive soles are used to protect against electrical shock and provide insulation for the feet.



Safety shoes

NOTE TO TEACHER

Teacher may bring these different PPE (if available) to show to the students.

Safety Aspects

- Identify potential risks such as electric shock, arc flashes, arc blasts, burns, and exposure to flying debris or chemicals to determine the most suitable types of personal protective equipment required.
- Carry out regular inspections of all electrical personal protective equipment (PPE) to identify any signs of damage, wear, or deterioration. Look for cuts, tears, fraying, or other defects that may compromise the protective qualities, and replace any damaged or defective PPE immediately.
- Adhere to the correct procedures for donning (putting on) and doffing (removing) PPE to ensure maximum safety.

Conclusion

Summarise the key points:

- The different PPE and their uses.
- The importance of these PPE.

F. Assessment (in worksheet)

G. Extension activity

Encourage students to find out about dielectric boots.



Dielectric boots are electrically insulating safety boots designed for use in environments where there is a risk of electric shock from high voltages. They provide protection because their insulating properties stop electric current from flowing to the ground. High voltage electric current can cause cardiac arrest or result in severe burns.

There are several parts of an insulated work boot that make it safe. It has:

- i. a thick, vulcanised rubber sole.
- ii. insulating properties.
- iii. excellent grip.
- iv. a high shaft that is protective, yet easy to remove.

The first part of the boot that is usually checked is the sole. A thick rubber sole is essential for preventing electrical current from flowing to the ground.

Another aspect to consider is insulation. Insulated work boots provide protection against high voltage electrical currents, as their insulating properties can prevent the current from being grounded.

Waterproofing invariably involves the use of rubber, as it is one of the best materials for keeping your feet dry. In addition to providing waterproofing, rubber is also excellent at preventing high voltages from grounding.

Wearing insulated boots often requires working in extreme temperatures and conditions, so it is essential that the boots provide excellent grip on icy and wet surfaces. The thicker the sole and the chunkier the lugs, the greater the protection from electric current.