

Department of Education
SPTVE
Shielded Metal Arc Welding
(SMAW) 9
Welding Safety Practices
Quarter 2: Week 8 Module



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EXPECTATIONS

At the end of the module, you should be able to:

1. identify welding safety practices;
2. apply the welding safety practices; and
3. value the importance of welding safety practices.



PRE-TEST

Directions: Read the statements carefully and write TRUE if the statement is correct and FALSE if the statement is wrong. Write your answer in a separate sheet of paper.

1. All fire hazards should be removed from the welding area.
2. Use natural drafts or fans to keep the fumes away from your face.
3. Eye protection is not always needed.
4. It is acceptable to use electrode holders with loose cable connections.
5. Electrodes should not be changed with bare hands or wet gloves.
6. The ceiling height should be less than 16 feet.
7. Keep cylinders away from any welding or other electrical circuits.
8. Turn your face to valve outlet when opening cylinder valve.
9. Read and follow all labels and the Owner's Manual carefully before installing, operating, or servicing unit.
10. Weld in location near degreasing, cleaning, or spraying operations.



LOOKING BACK

DIRECTIONS: Read the statements carefully. Use separate paper for your answer.

- _____ 1. It is a formal written document describing standard welding procedures.
- _____ 2. It is a document that required by all codes for all welders.
- _____ 3. This document combines all the information of the WPS and adds the test results to provide a complete document that certifies the welding specification.
- _____ 4. Under this act, business owners have an obligation and duty of care to construct and operate a safe plant.
- _____ 5. These tests are recorded at the time of welding to ensure the WPS was being followed.



BRIEF INTRODUCTION

Arc welding is safe when sufficient measures are taken to protect the welder from potential hazards. When these measures are overlooked or ignored, welders can encounter such dangers as: electric shock, overexposure to radiation, fumes and gases, fire, or explosion, any of which can result in fatal injuries.

General Arc Welding Safety:

- Before starting any arc welding operation, a complete inspection of the welder should be made.
- Read all warning labels and instructions manuals.
- Remove all potential fire hazards from the welding area.
- Always have a fire extinguisher ready for immediate use.
- Equip welding machines with power disconnect switches which can be shut off quickly.
- The power to the machine should be disconnected before making repairs.
- Proper grounding of welding machines is essential.
- Electrode holders should not be used if they have loose cable connections, defective jaws, or poor insulation.
- An arc should not be struck if someone without proper eye protection is nearby.

Personal Protective Equipment:

- Infrared radiation is a cause of retinal burning and cataracts. Protect your eyes and face with a welding helmet properly fitted and with the proper grade of filter plate.
- Protect your body from welding spatter and arc flash with protective clothing. Such as:
 - Woolen clothing
 - Flame-proof apron
 - Gloves
- Properly fitted clothing that is not frayed or worn.
- Shirts should have long sleeves.
- Trousers should be straight-legged and covering shoes when arc welding.
- Fire resistant cape or shoulder covers are needed for overhead work.
- Check protective clothing equipment before each use to make sure it is in good condition.
- Keep clothes free of grease and oil.

Proper Ventilation

Be sure there is adequate ventilation available when welding in confined areas or where there are barriers to air movement. Natural drafts, fans and positioning of the head can help keep fumes away from the welder's face.

Ventilation is sufficient if:

- The room or welding area contains at least 10,000 cubic feet for each welder.
- The ceiling height is not less than 16 feet.
- Cross ventilation is not blocked by partitions, equipment, or other structural barriers.

- Welding is not done in a confined space.
- If these space requirements are not met then the area needs to be equipped with mechanical ventilating equipment that exhausts at least 2000 cfm of air for each welder, except where local exhaust hoods or booths, or air-line respirators are used.

Avoiding Electrical Shock

Electrical shock can kill. To prevent electrical shock:

- Use well insulated electrode holders and cables.
- Make sure welding cables are dry and free of grease and oil.
- Keep welding cables away from power supply cables.
- Wear dry hole-free gloves.
- Clothing should also be dry.
- Insulate the welder from the ground by using dry insulation, such as a rubber mat or dry wood.
- Ground frames of welding units.
- Never change electrodes with bare hands or wet gloves.



ACTIVITIES

- A. **Directions:** Create a slogan about welding safety practices. Use long bond paper for your answer.

WELDING SAFETY PRACTICES SLOGAN

B. Directions: Draw the complete Personal Protective Equipment. Label it and write the functions of each. Use long bond paper for your drawing.

NAME OF PPE	ILLUSTRATION/DRAWING	FUNCTION/s

C. Directions: The table below indicates the welding lens manufacturer's selection chart for selecting a safe lens for shielded metal arc welding. Study the table and answer the questions below. Use a separate paper for your answer.

Electrode Size	Amperage	Shade #
-	30 to 75	8
1/16 – 5/32	75 – 200	10
3/16 – 1/4	200 – 400	12
5/16 – 3/8	400 +	14

1. To know the lens protection required, determine the _____ and
2. _____.
3. Can you use less than a #8 length shade for shielded metal arc welding?
4. The larger the diameter of the electrodes, the _____ (higher/lower) the number required for a lens shade.
5. Is it important to wear welding lens appropriate to electrode size and amperage? Why?



REMEMBER

- Safety is a critical consideration for any welding project. Arc welding is a safe occupation when proper precautions are taken, but if safety measures are ignored, welders face an array of hazards that can be potentially dangerous, including electric shock, fumes and gases, fire, explosions, and more.
- Welding safety guidelines demand that you are educating yourself and fellow workers, staying alert, and using common sense.
- In any welding situation, welding operators should pay close attention safety information on the products being used and the material safety data sheets provided by the manufacturer and work with their employer and co-workers to follow appropriate safe practices for their workplace.



CHECK YOUR UNDERSTANDING

- A. Directions:** Watch the video “The 5 Most Common Welding Hazards” from <https://www.youtube.com/watch?v=DTvazwpwxL8>. Identify the 5 hazards mentioned in the video and write 3-5 precautions for each hazard. Use separate paper for your answer.

[illegible]



POST TEST

A. Directions: Read the statements carefully and write SAFE if the statement ensures safety or UNSAFE if it does not ensure safety. Use separate paper for your answer.

1. Weld without a helmet.
2. Weld while standing on wet ground or in water.
3. Weld with gloves.
4. Weld without safety glasses when wearing a helmet.
5. Wear only t-shirt in welding.
6. Chip slag without safety glasses.
7. Change electrode with your bare hands.
8. Leave hot metal lying where someone may come in contact with it.
9. Repair hoses with tape.
10. Light the torch with a match or another torch.
11. Keep the protector caps on cylinders not in use.
12. Wear leather gloves while cutting.
13. Use soap and water to find leaks.
14. Weld indoor when the ventilation is not running.
15. Before you start welding, warn people nearby.

B. Directions: Write at least five [5] accidents that can occur during welding operation. Use a separate paper for your answer.

- 16.
- 17.
- 18.
- 19.
- 20.

REFERENCES:

Public Technical Vocational Schools, COMPETENCY-BASED LEARNING MATERIAL, Third Year, Shielded Metal Arc Welding [Department of Education 2008]

Welding Technology, 2nd Edition, Gower A. Kennedy

Welding Guide Fabrication Shop, Ismael V. Palabrica

Metal Works 1, SEDP Series, Industrial Technology

Basic Manual Metal Arc Welding, National Training Center for Technical Education and Staff Development

Welding Principles and Applications, Larry Jeffus and Harold V. Johnson

Key to Correction:

Posttest	1. UNSAFE	1. TRUE
	2. UNSAFE	2. TRUE
	3. SAFE	3. FALSE
	4. UNSAFE	4. FALSE
	5. UNSAFE	5. TRUE
	6. UNSAFE	6. FALSE
	7. UNSAFE	7. TRUE
	8. UNSAFE	8. FALSE
	9. UNSAFE	9. TRUE
	10. UNSAFE	10. FALSE
	11. SAFE	
	12. SAFE	
	13. SAFE	
	14. UNSAFE	
	15. SAFE	