



Republic of the Philippines
Department of Education
National Capital Region
Schools Division Office – Muntinlupa City

SPECIAL PROGRAM FOR TECHNICAL VOCATIONAL EDUCATION [SPTVE]
SHIELDED METAL ARC WELDING 9
Quarter 3: Week 7

I. **Topic:** Preparing Personal Protective Equipment [PPE] Prior to Welding

II. **Objectives:**

1. Prepare Personal Protective Equipment [PPE] in accordance with occupational health and safety.
2. Check welding protective equipment in accordance with safety procedures.

III. **Brief Introduction of the Lesson:**

The hazards in arc welding can endanger a welder's life if he/she is not wearing the proper protective clothing and equipment. Here are some information on the suitable outfit that a welder must wear while welding:

WELDING SHIELD/HELMET- Welding shield/helmet is used to protect the face and eyes from the arc rays (Infrared Rays, Ultra Violet Rays) and heat and spatter from the molten metal. The arc is viewed through a filter which reduces the intensity of radiation but allows a safe amount of light to pass for viewing the weld pool and end of the electrode.

The recommended minimum protective filter based on the welding current to be used is shown in the table below:

Approximate Range Of Welding Current	Filter Lens Number
Up to 100	8
100 - 200	10
200 - 300	11
300 - 400	12
Over 400	13

LEATHER JACKET-Leather jacket is made of chrome leather and prevents the entry of sparks between the welder's clothes and body.

LEATHER APRON-Leather apron is made of chrome leather and provides a welder with complete protection from sparks and hot metal from his/her chest to mid-calf.

LEATHER GLOVES -Gloves are made of chrome leather and protect the welder's hands from heat, spatter, and radiation.

LEATHER SPATS -Spats are made of chrome leather and protect the feet from spatter.

SAFETY GLASSES/GOGGLES -Safety clear glasses are used to protect the eyes when chipping slag and grinding.

WELDERS CAP -Welders cap is used to protect welder's head from spatters in out of position welding or in confined spaces.

WELDERS LEATHER BOOTS -Welding Leather Boots is used to protect our feet from falling spatter, sparks, and hot metals when welding overhead and confined spaces.

FACE SHIELD -Face Shield must also be worn where required to protect eyes. Welders must wear safety glasses and chippers and grinders often use face shield in addition to safety glasses.

RESPIRATOR -An apparatus worn over the mouth and nose or the entire face to prevent the inhalation of dust, smoke, or other noxious substances.

PROTECTIVE COVER ALL -Made from light asbestos coated with aluminum to protect the whole body during welding.

EARMUFFS -Used for ear coverings and are connected by a flexible band and worn as protection against extreme noise.

The primary approach in any safety effort is to maintain or change the physical environment so that accidents would not occur. However, it is necessary for economic reasons or in temporary or changing conditions to safeguard personnel by equipping them individually with specialized personal protective equipment (PPE). Although the use of PPE is an important consideration in the development of a safety and health program, it should not be used permanently for maintaining a safe and healthy work environment.

In general, government regulations list the use of PPE as a case of last resort. Analyzing accident situations is done to determine whether PPE can prevent a recurrence. When work conditions cannot be made more safely clearly PPE is necessary.

Proper Training: To obtain the worker's complete compliance with the requirements to wear the PPE, the following factors must be considered:

1. the extent to which the personnel who must wear the equipment understand its necessity;





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2. the ease and comfort with which it can be worn with a minimum of interference with normal procedures;
3. the available economic, social, and disciplinary sanctions which can be used to influence the attitudes of the workers

Head Protection: Safety hats should be inspected prior to their use.

- Inspect suspension systems that show evidence of materials cracking, tearing, fraying or other signs of deterioration. Suspension should provide a minimum clearance of 1 to 1.25 inch between the top of the worker's head and the inside crown of the hat.
- Check any signs of cracks or perforations of brim or shell, deformation of shell, or evidence of exposure to excessive heat, chemicals or radiation.
- Remove any accumulation of conductive material on or inside the shell that cannot be removed prior to use.
- Objects should not be placed inside the safety hat between the shell and the suspension device. This space is designed so an impact will not transmit to the head of the worker.
- Safety hats should be kept free of abrasions, scrapes, and nicks and should not be deliberately dropped, thrown, or otherwise abused because they will lose their protective qualities.

Eye and Face Protection: Eye protectors must meet the minimum requirements:

1. Ventilation should not be drilled in safety hats.
2. Provide adequate protection against the particular hazards for which they are designed.
3. Be reasonably comfortable when worn under the designated conditions.
4. Fit snugly without interfering with the movements or vision of the wearer.
5. Be durable.
6. Be capable of being disinfected.
7. Be kept clean and in good repair.
8. Design, construction, testing, and use of eye and face protection must be in accordance with ANZI Z8.1-1989. The fitting of goggles and safety spectacles should be performed by someone skilled in the procedure. Prescribed safety spectacles should be fitted only by a qualified optical person. Safety spectacles require special frames. Combinations of normal street wear frames with safety lenses are not in compliance with the required standards for eye protectors.

Ear Protection -The prevention of excessive noise exposure is the only way to avoid hearing damage. Engineering and administrative control must be used if the sound levels are exceeded. If such controls fail to reduce the sound levels within the level specified, personal hearing protection must be used. Molded earplugs should be individually fitted by a professional.

Some earplugs are disposable, to be used one time and then thrown away. The non-disposable type should be cleaned after each use for proper protection. Earmuffs must make a perfect seal around the ear to be effective. Glasses, long sideburns, long hair and facial movements, such as chewing, may reduce protection. Special equipment is available for use with glasses or beards.

Foot and Leg Protection: For protection of feet and legs from falling or rolling objects, sharp objects, molten metal, hot surfaces, and wet slippery surfaces, workers should use appropriate foot guards, safety shoes, boots and leggings.

Safety Belts, Lifelines and Lanyards: Lifelines, safety belts, and lanyards are used only for safeguarding employees. Any lifeline, safety belt, or lanyard are actually subjected to in-serving loading, as distinguished from static load testing shall be immediately removed from service and shall not be used again for employee safeguarding.

IV. Activities:

Activity 1: Direction: Write the letter of the correct answer on a separate sheet of paper.

1. Safety belts were designed to safeguard workers _____.
 - a. by carrying heavy load
 - b. by holding hot metals
 - c. from noise exposure
 - d. from falling
2. Safety hats should be free from abrasions, cracks, or fraying and should not be deliberately dropped or thrown because _____.
 - a. a space should be designed to protect.





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- b. ventilation should be drilled in them.
 - c. they will lose their protective quality.
 - d. their appearance and style should be modern.
3. Earmuffs and earplugs are effectively used_____.
- a. for engineering and administrative control.
 - b. for workers to look fashionable.
 - c. to match the glasses and hair style of workers.
 - d. to avoid hearing damage.
4. The main purpose of wearing eye and face protection is to_____.
- a. keep clean and be in good condition.
 - b. be capable of being disinfected.
 - c. fit snugly without interference of eye movement.
 - d. provide adequate protection against hazards.
5. A responsible worker shows awareness about safety except
- a. Awareness to the limited application of PPE
 - b. Awareness to the unlimited application of PPE
 - c. Person who wears PPE understands its necessity
 - d. Influence the attitudes of the workers about safety

Activity 2: Direction: Write the letter of the correct answer on a separate sheet of paper.

- 1. Which are made from light asbestos coated with aluminum protect all of the body during welding?
 - a. Protective Cover all
 - b. Respirator
 - c. Safety glasses
 - d. Welding apron
 - e. Welding spats
- 2. Which is worn over the mouth and nose or the entire face to prevent the inhalation of dust, smoke, or other noxious substances?
 - a. Protective Cover all
 - b. Respirator
 - c. Safety glasses
 - d. Welding apron
 - e. Welding spats
- 3. Which provides a welder with complete protection from sparks and hot metal from his/her chest to mid-calf?
 - a. Protective Cover all
 - b. Respirator
 - c. Safety glasses
 - d. Welding apron
 - e. Welding spats
- 4. Which are made of chrome leather and protect our feet from spatter?
 - a. Protective Cover all
 - b. Respirator
 - c. Safety glasses
 - d. Welding apron
 - e. Welding spats
- 5. Which are used where grinding and chipping off slags?
 - a. Protective Cover all
 - b. Respirator
 - c. Safety glasses
 - d. Welding apron
 - e. Welding spats

Activity 3: Directions: Illustrate at least seven [7] PPE to be used prior to welding. Use short bond paper.





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V. Assessment: Direction: Write the letter of your answer on a separate sheet of paper.

1. A safety hats should be free from _____.
 - a. all of the above
 - b. cracks
 - c. deformation of shell
 - d. scrapes
2. Eye and face protection provide adequate protection against _____.
 - a. gas
 - b. hazards
 - c. noise
 - d. slippery surface
3. If the sound levels are exceeded and fail to reduce the sound levels within level specified, what equipment you can use?
 - a. earmuffs
 - b. leather spats
 - c. respirator
 - d. welding helmet
4. Welders must wear _____ for protection of feet from falling or rolling objects, sharp objects, molten metal, hot surfaces and wet slippery surfaces.
 - a. earmuffs
 - b. leather spats
 - c. respirator
 - d. welding helmet
5. This is used only for safeguarding employees.
 - a. all of the above
 - b. lanyards
 - c. lifelines
 - d. safety belts

VI. Reflection:

Why do students need to prepare PPE prior to welding?
Can they follow proper instructions in using the prescribed PPE?
What are the benefits of using the right kind of PPE during welding operation?

References:

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