SPECIAL PROGRAM FOR TECHNICAL VOCATIONAL EDUCATION [SPTVE]
SHIELDED METAL ARC WELDING 9 / Quarter 3: Week 1 Module

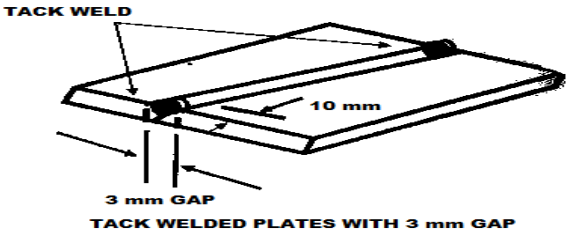
I. **Topic:** Perform Tack Welding

II. Objectives: 1. Prepare metals for tacking based on acceptable weld requirements.
2. Perform Tack welding in accordance with the welding procedure.
3. Use appropriate Personal Protective Equipment [PPE].

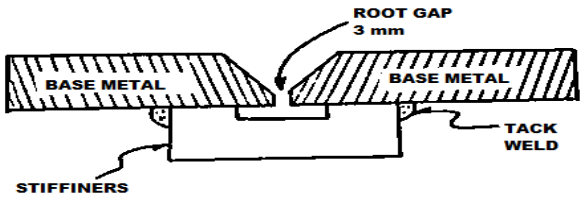
III. Brief Introduction of the Lesson:

In carrying out some welding operation, very often the pieces have to be tack welded. Tack welds are simply short sections of weld beads measured ¼" to ½" long used to maintain the proper root opening between the two sections of metals being welded. These tack welds are spaced along the seam and must be firmly used into the joints. These are the kinds of tacking:

1. Permanent Tacking is a type of tack weld measured at about ¼" up to ½" length. It is used fir up temporarily the two pieces of heavy metal being joined.
2. Semi-permanent Tacking is a tack weld done only in a very short bead. It is used to fit up temporarily the two light pieces of metal to be joined.
3. Bridge Tacking is a method of tacking using stiffeners or backing plate to keep both plates aligned.



TACK WELDED PLATES WITH 3 mm GAP



BRIDGE TACKING

In performing tacking weld, you must consider the following:

- ✓ Correct Electrode. The choice of electrode involves such items; as position of the weld properties of the base metal, diameter of electrode, types of joint and current value without the right choice of electrode it is almost impossible to get the results desired, regardless to the welding technique used.
- ✓ Correct Arc Length. As a rule, length of the arc should be approximately equal to the diameter of the electrode. For example, an electrode 1/8" in diameter should have arc length about 1/8".
- ✓ Correct Electrode Angle and Speed Travel. Upon tack welding, the welder should maintain a stable/uniform speed on the portion of the metal to be tacked weld together with proper travel angle and work angle.
- ✓ Correct Current. The welder must consider the current setting in order to have a good performance. If the current is set too high, the electrodes melt too fast and the molten pool is large and irregular on the other hand. If the current is set too low, there is no enough heat to melt the base metal and the molten pool will be small. The result full up will be irregular shape. More current is required for thick and heavy pieces than for light thin sections.
- ✓ Properties of the Base Metal. A top-quality weld should be as strong as the parent metal. This means that the electrode to be used must produce a weld metal with approximately the same mechanical properties as the parent metal.

IV. Activities:

Activity 1: DIRECTIONS: Draw the tools, equipment and PPE needed in tack welding. Use separate paper for your performance drawing. [At least 8 items]

Activity 2: DIRECTIONS: Read the sentences carefully. Write the letter of the correct answer on a separate sheet of paper.

1. In tack welding, where is the exact point of tack welding to be placed?
   a. in the middle of the edges of the base metal
   b. in one side of plate edges
   c. in the middle and on both end of plate edges
   d. none of the above
2. A type of tack that uses stiffeners to keep both base metals aligned.
   a. permanent tacking c. bridge tacking
   b. semi-permanent tacking d. none of the above
3. The kind of tack weld that is done in very short bead, it is use to fit up weld temporarily.
   a. permanent tacking c. bridge tacking
   b. semi-permanent tacking d. none of the above
4. The kind of tack weld that measures at about 1/4" to ½" length. It is used to fit up heavy pieces of metal.
   a. permanent tacking c. bridge tacking

b. semi-permanent tacking d. none of the above

5. After tack welding plates should be check for:
   a. angular plate alignment c. distortion
   b. correct root gap d. all of the above

Activity 3:

DIRECTION: Illustrate the following:

A. Tack welded plate with specific measurements
B. Bridge tacking method

Use a separate sheet of paper for your performance.

V. Assessment:

DIRECTIONS: Read each sentence carefully. Write the letter of the correct answer on a separate paper.

1. An electrode 1/8" in diameter should have arc length about _____.
   a. 1/2"
   b. 1/4"
   c. 1/8"
   d. 3/4"

2. What will happen if the current is set too high?
   a. Electrode melt too fast and molten pool will be large.
   b. There will be no enough heat to melt the base metal and molten pool will be small.
   c. It will become regular shape.
   d. None of the above

3. What will happen if the current is set too low?
   a. Electrode melt too fast and molten pool will be large.
   b. There will be no enough heat to melt the base metal and molten pool will be small.
   c. It will become regular shape.
   d. None of the above

4. This tool removes the remnants of the bead.
   a. chipping hammer
   b. portable grinder
   c. steel brush
   d. none of the above

5. This tool removes the slag from the bead.
   a. chipping hammer
   b. portable grinder
   c. steel brush
   d. none of the above

VI. Reflection:

What is the importance of learning the information and techniques in performing tack welding for Grade 9 Shielded Metal Arc Welding [SMAW] students?

Can you perform tack welding properly when face to face hands on will go on?

References:

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[Department of Education 2008]

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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

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