Department of Education
SPTVE
SHIELDED METAL ARC WELDING (SMAW)10
Multi Layer Fillet Weld in Flat Position
Quarter 2: Week 5 Module

Albert B. Sierra
Writer

Gerry V. Domalanta
Validator

Dr. Valentina A. Ballesteros
Quality Assurance Team Chair

Schools Division Office – Muntinlupa City
Student Center for Life Skills Bldg., Centennial Ave., Brgy. Tunasan, Muntinlupa City
(02) 8805-9935 / (02) 8805-9940

EXPECTATIONS

At the end of the lesson, the learner is expected to:

1. Identify the procedures in welding multi layer fillet in flat position,
2. enumerate the procedures in welding multi layer fillet and
3. draw the working drawing of the multi layer fillet weld in flat position,

PRE-TEST

Direction: Encircle the letter of the correct answer.

1. A fillet weld is a weld type in the cross-sectional shape of a_____.
   A. Circle C. Square
   B. Rectangle D. Triangle
2. Travel angle for single pass fillet weld is usually set at an angle of _____.
   A. 45 degrees C. 70 degrees
   B. 60 degrees D. 85 degrees
3. Frequently used in all kinds of work, which may be single fillet lap joint or doble fillet.
   A. Butt joint C. Lap joint
   B. Corner joint D. Tee joint
4. Use _____ electrode and tack weld the metal to form a T- joint.
   A. 6010 C. 6013
   B. 6011 D. 7018
5. In stringer bead in flat fillet weld of the same thickness plate, the work Angle is always.
   A. 30 degrees C. 60 degrees
   B. 45 degrees D. 70 degrees
6. Refers to the layers of beads which has been deposited in the base metal.
   A. Arc rays C. Puddle
   B. Pass D. Ripple
7. What is the recommended amperage setting in welding fillet?
   A. 85 C. 95
   B. 90 D. 100
8. What is the specified length of tack welds on fillet welds?
   A. 5 mm C. 15 mm
   B. 10 mm D. 20 mm
9. Welding fillet, the normal arc length is _____.
   A. 1/16 – 1/8 inch. C. ¼ - 3/8 inch.
   B. 1/8 – 3/16 inch. D. 5/16 – ½ inch.
10. Metal to be welded should be tack welded in _____.
    A. Both edge of the plate C. Center and edge of the joint.
    B. Both end and the center of the joint D. Center of the joint

LOOKING BACK

In the previous lesson, you have learned the procedures in multi pass weld in flat position. Now let us see if you still remember these procedures.

Directions: Fill in the missing word/words to complete the sentence.

A. Wear the appropriate _____ (1) before welding.

B. _____ (2) the tools, equipment and materials needed.

C. Set up the welding machine and adjust the correct current _____ (3) at 95 amps.

D. Use _____ (4) electrode and tackweld the metal to form a T- joint.

E. Clamp firmly the workpiece to the _____ (5) and clean the joint tobe welded.

F. the arc at the starting point and hold the rod at _____ (6) then shorten the arc at the finishing points and fill the crater with molten metal.

G. Remove the slag with a _____ (7) and clean the bead using steel brush.

H. Deposit the _____ (8) it should overlap the first bead by half or 2/3.

I. Deposit the _____ (9) it should overlap the second bead by half or 2/3.

J. Properly clean the metal for _____ (10).

K. Visually check the following:

- Plate alignment and squareness
- Bead weave pattern
- Weld defects such as porosity, undercut, overlaps
- Bead connection

BRIEF INTRODUCTION

Multi Layer Fillet Weld in Flat Position

Materials:

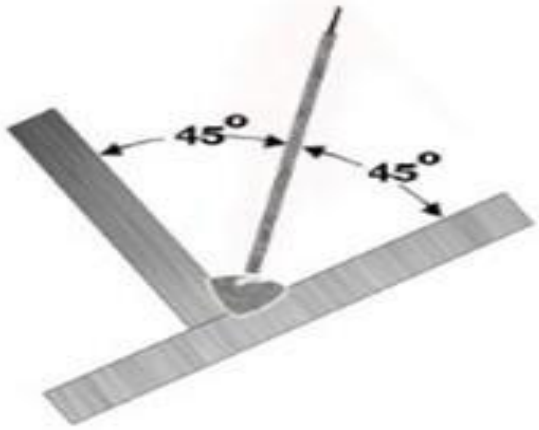
- 2 pcs. Mild Steel plates 10 mm X 50mm X 200 mm
- 8 pcs. E-6013- 3.25mmÆ

Tools and Equipment:

- AC or DC welding machine with accessories
- Chipping Hammer
- Steel brush
- Welding gloves (leather)
- Welding apron (leather)
- Welding helmet/mask
- Portable grinder

Procedures:

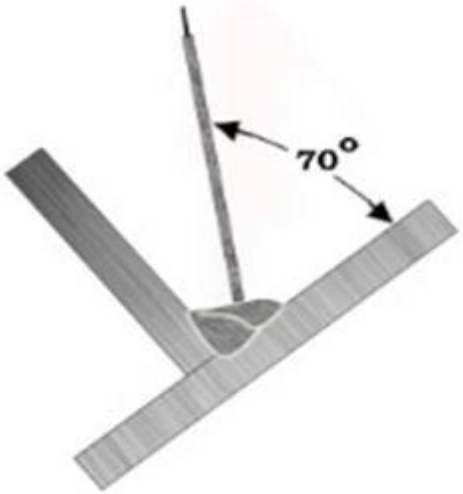
1. Wear the appropriate Personal Protective Equipment (PPE) before welding.
2. Prepare the tools, equipment and materials needed.
3. Set up the welding machine and adjust the correct current amperage settings at 95 amps.
    - 85-100 amperes (range of adjustments)
4. Use E6013 electrode and tackweld the metal to form a T- joint.
5. Clamp firmly the workpiece to the welding positioner and clean the joint to be welded.
6. Strike the arc at the starting point and hold the rod at correct angles then shorten the arc at the finishing points and fill the crater with molten metal. As in the illustration below.



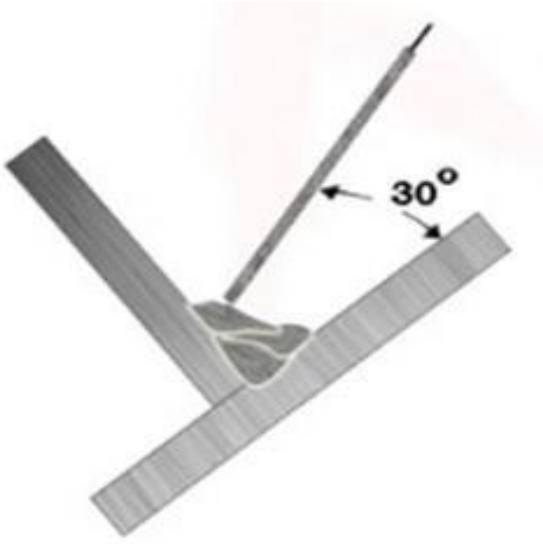
7. Remove the slag with a chipping hammer and clean the bead using

steel brush. **Note:** Use clear goggles/face shield when chipping. The direction of chipping should be away from you.

8. Deposit the second pass. It should overlap the first bead by half or 2/3. As in the illustration below.

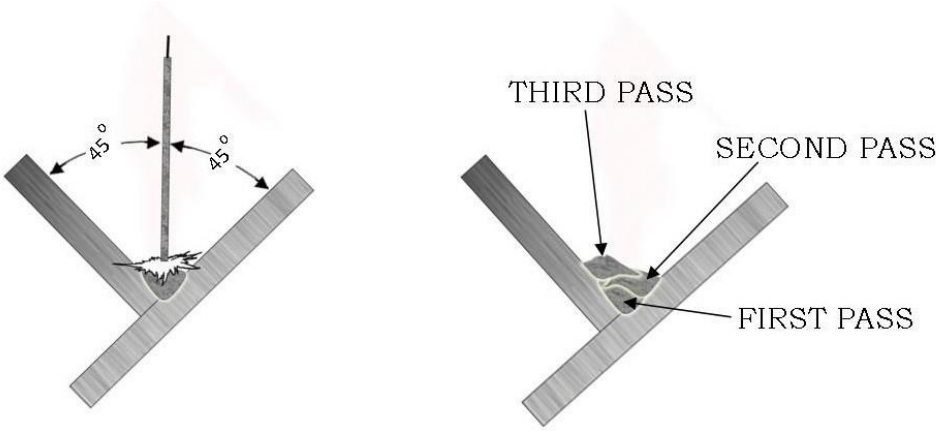


9. Deposit the third pass. It should overlap the second bead by half or 2/3. As in the illustration below.

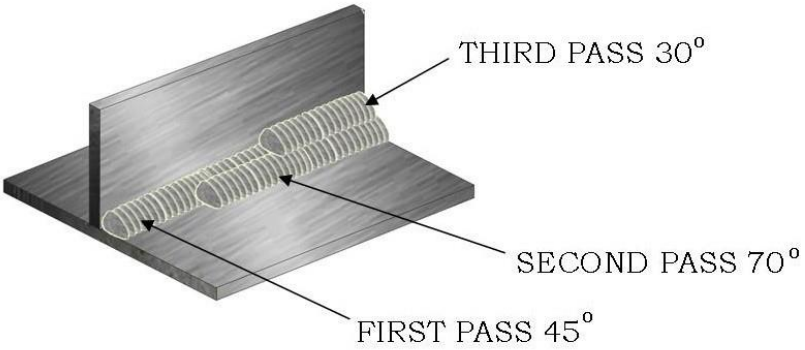


10. Properly clean the metal for inspection.
11. Visually check the following:
    - Plate alignment and squareness
    - Bead weave pattern
    - Weld defects such as porosity, undercut, overlaps
    - Bead connection

WORKING DRAWING



"V" WELD POSITION



POSITION OF ELECTRODE

Figure 15. Multi layer fillet welds

ACTIVITIES

Activity 1

Directions: Arrange the welding procedures of multi layer fillet weld in flat position. Write 1 on the blank for the first procedure, 2 for the second procedure and 3 to 11 for the succeeding procedure.

_____Prepare the tools, equipment and materials needed.
_____Strike the arc at the starting point and hold the rod at correct angles thenshorten the arc at the finishing points and fill the crater with molten metal.
_____Visually check the following:
_____Remove the slag with a chipping hammer and clean the bead using steel brush.
_____Use E6013 electrode and tack weld the metal to form a T- joint.
_____Properly clean the metal for inspection.
_____Clamp firmly the workpiece to the welding positioner and clean the joint tobe welded.
_____Set up the welding machine and adjust the correct current amperage settings at 95 amps.
._____Wear the appropriate Personal Protective Equipment (PPE) before welding.
_____Deposit the second pass. It should overlap the first bead by half or 2/3
_____Deposit the third pass. It should overlap the second bead by half or 2/3.

Activity 2

Directions: Draw the illustration/working drawing of multi layer fillet weld in flat position in separate answer sheet. See figure 15.

REMEMBER

The welding steps and procedures are very important or required to follow completely because it serves as a guide of a welder for the effective welding in accordance with welding procedure specification, or WPS.

CHECK YOUR UNDERSTANDING

Directions: Enumerate the steps on how to weld multi layer fillet in flat position.

1) _____
2) _____
3)_____
_____
4) _____
5) _____
_____
6) _____
_____
_____
7) _____
_____
_____
8) _____
_____
_____
9) _____
_____
_____
10) _____
11) _____

POST TEST

Direction: Encircle the letter of the correct answer.

1. What is the recommended amperage setting in welding multi layer fillet?
   A. 85 C. 95
   B. 90 D. 100
2. In stringer bead in flat fillet weld of the same thickness plate, the work angle is always.
   A. 30 degrees C. 60 degrees
   B. 45 degrees D. 70 degrees
3. Travel angle for single pass fillet weld is usually set at an angle of _____.
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4. Use _____ electrode and tack weld the metal to form a T-joint.
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6. to be welded should be tack welded in _____.
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   A. Circle C. Square
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   A. Arc rays C. Puddle
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10. Frequently used in all kinds of work, which may be single fillet lap joint or doble fillet.
    A. Butt joint C. Lap joint
    B. Corner joint D. Tee joint

Key to Corrections: **Pre-test** 1. B 2. C 3. B 4. A 5. B 6. D 7. C 8. D 9. C 10.B **Looking Back** 1. Personal protective equipment 2. Prepare 3. Amperage setting 4. E6013 5. Welding positioner 6. Correct angles 7. Chipping hammer 8. Second pass 9. Third pass 10. Inspect **Activity** **Act.1** A.2 G. 5 B.6 H. 3 C.11 I. 1 D.7 J. 8 E.4 K. 9 F.10	**Checking your understanding** 1.Wear the appropriate Personal22Protective Equipment (PPE) before welding. 3. Prepare the tools, equipment and materials needed. 4. Set up the welding machine and adjust the correct current amperage settings at 95 amps. 5. Clamp firmly the workpiece to the welding positioner, and clean the joint to be welded. 6. Strike the arc at the starting point and hold the rod at correct angles then shorten the arc at the finishing points and fill the crater with molten metal. 7. Remove the slag with a chipping hammer and clean the bead using steel brush. 8.Deposit the second pass. It should overlap the first bead by half or 2/3. 9. Deposit the third pass. It should overlap the second bead by half or 2/3. 10.Properly clean the metal for inspection. 11.Visually check the following; -plate alignment/squarenness -beave weave pattern -weld defects -bead connection	**Post-test** 1. C 2. B 3. B 4. C 5. B 6. B 7. D 8. A 9. C 10. D

References

- *K12 Basic Education Curriculumn, Grade 10, SMAW LM Final Check and verified page 70-76.*
- Public Technical Vocational High Schools, Competency-Based Learning material, SMAW NCI, (Department of Education 2008)