

## **SPECIAL PROGRAM IN TECHNICAL VOCATIONAL EDUCATION (SPTVE)**

### **SHIELDED METAL ARC WELDING 10 Quarter 3: Week 1 Module**

I. Topic: Perform Fillet Welding

II. Objectives:

1. identify the contour and weld symbol;
2. draw the contour and weld symbol in fillet welding; and
3. appreciate the importance of contour and weld symbols in fillet welding.

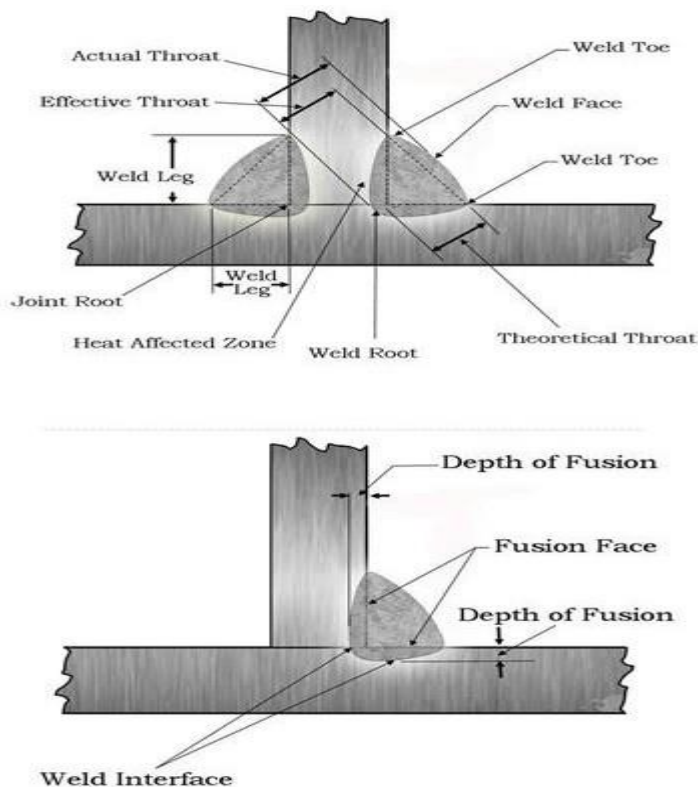
III. Brief Introduction of the Lesson

The fillet weld is the most common weld used in the industry. It is a type of weld in the cross-sectional shape of a triangle. It joins two surfaces at approximately at right angle, to form a lap joint, t-joint or corner joint. Parts of fillet weld includes the following: weld root, weld face, weld toe, fillet weld leg, and fillet weld throat.

- Weld Root – the area where the filler metal intersects the metal opposite the weld face. It is shown in cross-sectional shape and is the deepest point of the fillet weld triangle.
- Weld Face – the exposed surface of a weld bonded by the weld toes of the side on which welding was done. It may be concave or convex. A concave weld face is curved inward. A convex weld face is curved outward.
- Weld Toe – the intersection of the base metal and the weld face. It is the point at which weld meets the base metal.
- Fillet Weld Leg – the distance from the joint root to the weld toe.
- Joint Root – the point of a joint to be welded where members are closest to each other.
- Fillet Weld Throat – throat and theatrical throat refers to the actual throat, effective throat and theoretical throat.
  1. Actual throat – the shortest distance from the face.
  2. Effective Throat – the shortest distance from the face to weld root.
  3. Theoretical Throat – the distance from the face to the weld root before welding.
- Fusion – the condition that occurs where the base metal and filler metal are melted together.
- Weld Interface – the area where the filler metal and the base metal are mixed together.
- Fusion Face- the surface of the base metal that is melted during welding process.
- Depth of fusion – the distance from the fusion face to the weld interface.



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Weld Contour is the cross-sectional shape of the completed weld face. Weld finish is the method used to achieve the required surface finish. Both the fillet weld contour and finish are specified on the welding symbols. The contour symbol is placed next to the angled line of the fillet weld symbol to indicate a flat, convex or concave contour.

Fillet welds requiring mechanical finishing after welding to obtain the desired contour have a letter next to the weld contour symbol to show the finishing method needed. The finishing methods that maybe specified are the following: C for Chipping, H for Hammering, G for Grinding, M for Machining, R for Rolling, or U for Unspecified.

IV. Activities:

Activity 1.

**Directions:** A. Complete the table by drawing the symbol and welding symbol from weld contour.

CONTOUR	SYMBOL	WELD SYMBOL
Flat		
Convex		
Concave		





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B. Draw the finishing methods

FINISHING METHODS				
LETTER	MECHNICAL METHOD	SYMBOL		
		FLAT	CONVEX	CONCAVE
C	Cutting			
H	Hammering			
G	Grinding			
M	Machining			
R	Rolling			
U	Unspecified			

Activity 2

**Directions:** Write the correct answer on the space provided.

- \_\_\_\_\_ - throat and theatrical throat refers to the actual throat, effective throat and theoretical throat.
- \_\_\_\_\_ - the condition that occurs where the base metal and filler metal are melted together.
- \_\_\_\_\_ - the area where the filler metal and the base metal are mixed together.
- \_\_\_\_\_ - the surface of the base metal that is melted during welding process.
- \_\_\_\_\_ - the distance from the fusion face to the weld interface.
- \_\_\_\_\_ - the area where the filler metal intersects the metal opposite the weld face. It is shown in cross-sectional shape and is the deepest point of the fillet weld triangle.
- \_\_\_\_\_ - the exposed surface of a weld bonded by the weld toes of the side on which welding was done. It may be concave or convex. A concave weld face is curved inward. A convex weld face is curved outward.
- \_\_\_\_\_ - the intersection of the base metal and the weld face. It is the point at which weld meets the base metal.
- \_\_\_\_\_ - the distance from the joint root to the weld toe.
- \_\_\_\_\_ - the point of a joint to be welded where members are closest to each other.





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V. Assessment:

**Directions:** Write the letter of the best answer. Use a separate answer sheet.

1. The exposed surface of fillet weld bounded by the weld toes of the side on which welding was done.
  - a. Weld root
  - b. Weld face
  - c. Weld leg
  - d. Weld Joint
2. Fillet weld leg is the distance from the joint root to.
  - a. Weld toe
  - b. Weld bead
  - c. Weld face
  - d. Weld root
3. The surface of the base metal that is melted during the welding process.
  - a. Depth of fusion
  - b. Fusion face
  - c. Fusion area
  - d. Length of fusion
4. The fillet weld sizes are indicated by:
  - a. Notes on print
  - b. Dimensions included on the weld symbol
  - c. Graphic representation
  - d. Specific instruction
5. To obtain the desired contour in fillet welding, it requires:
  - a. Surface finishing
  - b. Mechanical finishing
  - c. Weld finishing
  - d. All of the above

V. Reflection:

Direction: Answer the following question.

1. Why is a Fillet weld is most commonly used in the industry?
2. Discuss the difference between weld contour and weld finish.

References:

- K12 Basic Education Curriculum, Grade 10 SMAW LM Final Check and verified page 49-50
- Public Technical Vocational High Schools, Competency-Based Learning material, SMAW NCI, (Department of Education 2008)

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