

ATPF-1809: SPECIAL TOPICS: P/F PIPE BEAD WELD

Cuyahoga Community College

Viewing: ATPF-1809 : Special Topics: P/F Pipe Bead Weld

Academic Term:

Fall 2026

Subject Code

ATPF - Applied Ind Tech - Pipefitters

Course Number:

1809

Title:

Special Topics: P/F Pipe Bead Weld

Catalog Description:

Basic pipe bead welding course covering purpose, material selection, preparation, and the welding process as described by the National Certified Pipe Welding Bureau NCPWB. In addition, proper pipe bead welding techniques will be demonstrated and practiced.

Credit Hour(s):

2

Lecture Hour(s):

2

Requisites

Prerequisite and Corequisite

Departmental approval: Admission to program.

Outcomes

Course Outcome(s):

Discuss the purpose of pipe bead welding, including material selection, special equipment, and surface preparation of the pipe.

Objective(s):

1. List and define the terms related to pipe bead welding.
2. Discuss the material selection process used for pipe bead welding with respect to wall thickness, pipe diameter and type.
3. List the specialized equipment used and explain the operation of each.
4. Discuss the procedures used for pipe bead welding material preparation including surface grinding and weld markings.
5. Explain the importance of body positioning with respect to uphill welding.

Course Outcome(s):

Explain the welding progression, including purpose, filler change, and bead characteristics and parameters during the weld and for inspections.

Objective(s):

1. Explain the purpose of pipe bead welding with respect to proper pipe welding technique.
2. Adhere to the National Certified Pipe Welding Bureau (NCPWB) procedures regarding travel speed, rod angle, and welding sequence.
3. Explain the difference between initial root pass electrodes and layered progressions.
4. Describe the pipe bead characteristics regarding welding progressions of root, fill, and cap.

Course Outcome(s):

Demonstrate the ability to follow bead progression on the selected pipe in various positions.

Objective(s):

1. Select and prepare pipe coupons for pipe bead welding.
 2. Operate specialized equipment, including cutting machines and welders, safely to perform proper pipe bead welds.
 3. Adjust the pipe fixture using multiple adjustment points for pipe size, height, and position.
 4. Coordinate welding machine settings with respect to progression sequence and electrode selection.
 5. Perform bead welding practices in accordance with NCPWB procedures.
 6. Perform inner pass preparations for subsequent passes, including cleaning and visual inspections during progression and for final evaluation.
-

Methods of Evaluation:

1. Assignments
2. Exams/quizzes
3. Attendance
4. Participation

Course Content Outline:

1. Pipe bead: material selection and equipment and preparation
 - a. Terminology
 - i. Pipe bead welding
 - ii. Root pass
 - iii. Fill pass
 - iv. Cover pass
 - v. Progression
 - vi. Travel speed
 - vii. Rod angle
 - viii. Inspection
 - ix. Coupon
 - x. Schedule 40
 - xi. Schedule 80
 - xii. Fixture
 - b. Material selection
 - i. Wall thickness
 1. Current
 2. Electrode selection
1. Pipe diameter
2. Type
 - a. Schedule 40
 - b. Schedule 80
1. equipment
 - a. pipe cutting
 - b. machine
 - c. grinder
 - d. operation
 - e. fixture
2. procedure
 - a. compliance
 - b. surface grinding
 - i. grinding wheel
 - ii. size
 - c. weld markings
 - i. wrap around
 - ii. soap stone
3. body positioning
 - a. hand placement
 - b. visual
 - c. head

1. Welding progression
 - a. Purpose
 - i. Compliance
 - ii. Inspection
 - b. NCPWB
 - i. Travel speed
 - ii. Rod angle
 - iii. Sequence
 - iv. Inspection
 - v. Code
 - c. Root pass electrode
 - i. E 6010
 - ii. E 7018
 - d. Layered progression
 - i. Fill pass
 - ii. Cap
 - iii. Width
 - iv. Height
1. Pipe Bead Characteristics
 - a. Bead width
 - b. Bead height
 - c. Appearance
1. Application
 - a. Pipe coupons
 - i. Size
 - ii. Schedule
 - iii. Preparation
 1. Cut
 2. Grind
 3. Position
 - b. Equipment
 - i. Coupon cutter
 - ii. Grinder
 - iii. Welder
 1. Polarity
 2. AC-DC powered
 3. Amperage selection
 - c. Pipe fixture
 - i. Pipe size
 - ii. Height
 - iii. Position
 1. 2 G
 2. 6 G
 3. 5 G
 - d. Machine settings
 - i. Polarity
 - ii. Amperage
 - iii. Electrode selection
 - iv. Progression sequence
 - e. Application
 - i. Material selection
 - ii. Material preparation
 - iii. Clamping assembly
 - iv. Bead weld
 - v. Clean/grind
 - vi. Overlay
 - vii. Clean/grind
 - viii. Overlay cap bead

1. Inner pass preparation
 - a. Wire brush and clean
 - b. Flashlight inspection
 - c. Corrections

Religious Accommodation

Before reviewing the course schedule, students should carefully review the following religious accommodation policy and other required instructional policies:

Religious Accommodation:

Students seeking an accommodation for absences permitted under Ohio's Testing Your Faith Act must provide the instructor with written notice of the specific dates for which the student requires an accommodation and must do so not later than fourteen (14) days after the first day of instruction. Please submit requests for accommodations at this link: <https://portal2.tri-c.edu/ReligiousAccommodation/ReligiousAccommodationForm>. Students with questions about their religious accommodations under Ohio's Testing Your Faith Act may contact the College's Office of General Counsel and Legal Services by phone at 216.987.4856 or via email at legal@tri-c.edu.

Other Required Instructional Policies:

<https://www.tri-c.edu/student-resources/curriculum/documents/syllabus-part-b.pdf>

Weekly Schedule

	Topics
Week 1	Welding Safety and Pipe Groove Welding * Personal Protective Equipment * Purpose of Pipe Groove Welding * Pipe Groove Welding Progression * Shop
Week 2	Welding Safety and Pipe Groove Welding * Personal Protective Equipment * Purpose of Pipe Groove Welding * Pipe Groove Welding Progression * Shop
Week 3	Coupon Preparation * Prepare Bevel and Land * Adjusting Weld Booth Set-up * Cutting Machine * Shop
Week 4	Coupon Preparation * Prepare Bevel and Land * Adjusting Weld Booth Set-up * Cutting Machine * Shop
Week 5	National Certified Pipe Welding Bureau Guidelines * Weld Procedure Specifications * Minimum and Maximum Gap * Electrode Identification a) Number b) Size c) Amperage Setting * Shop
Week 6	National Certified Pipe Welding Bureau Guidelines * Weld Procedure Specifications * Minimum and Maximum Gap * Electrode Identification a) Number b) Size c) Amperage Setting * Shop

Week 7	Weld Progression * Initial Root Pass a) Rod Angle b) Rod Selection c) Arc Length d) Travel Speed e) Key Hole * Welding Bead Characteristics * Uphill Welding Process * Shop
Week 8	Weld Progression * Initial Root Pass a) Rod Angle b) Rod Selection c) Arc Length d) Travel Speed e) Key Hole * Welding Bead Characteristics * Uphill Welding Process * Shop
Week 9	Weld Progression (continued) * Fill Pass * Proper Electrodes * Shop
Week 10	Weld Progression (continued) * Fill Pass * Proper Electrodes * Shop
Week 11	Weld Progression (continued) * Cover Pass * Height and Width of Cap * Shop
Week 12	Weld Progression (continued) * Cover Pass * Height and Width of Cap * Shop
Week 13	Practice Proper Body Position * Weld Booth Techniques * Shop
Week 14	Practice Proper Body Position * Weld Booth Techniques * Shop
Week 15	Review
Week 16	Assessment

The Course Schedule is subject to change due to pedagogical needs, instructor discretion, parts of term, and unexpected events.

Required/Recommended Readings

Instructor-provided materials

Resources for the Instructor

Frankland, Thomas W. . *Pipe Trades Manual*. McGraw-Hill, 1969.

United Association Training Department. *Welding Skills Manual* . Annapolis, MD: United Association , www.ua.org/training

Additional Resources for the Instructor

<http://www.thefabricator.com/article/arcwelding/stick-welding-tips-for-top-performance> (<http://www.thefabricator.com/article/arcwelding/stick-welding-tips-for-top-performance/>)

<http://www.millerwelds.com/resources/articles/stick-electrode-selection/>
<http://www.millerwelds.com/resources/articles/smaw-stick-arc-welding-tips-techniques/>
www.ua.org (<https://catalog.tri-c.edu>www.ua.org)

Top of page

Key: 581