

## **Process Piping 3 Syllabus**

### **Advanced Fitting for Threaded, Glued and Welded Pipe**

**Time:** 40 hours

**Maximum Class Size:** 12

**Prerequisites:** Oxyfuel Cutting, Introduction to Arc Welding, Process Piping 1 and Process Piping 2

**Course Description:** Process Piping 3 is designed to build on the skills learned in Process Piping 1 and Process Piping 2. This advanced course concentrates not only on fitting for threaded, glued and welded pipe, but participants will learn to concentrate on aesthetic value and perfection. An emphasis is placed on mathematical take-offs, also known as detailing a Pipe Instrumentation Drawing or P.I.D. Hands-on skills such as tack-welding flanges, tees, elbows and butt welds are also practiced until mastered. All these skills can be used for fabrication on job-sites or to provide accurate information to be sent to a fabrication shop. Above-ground P.V.C. pipe-fitting techniques will emphasize neatness and accuracy. The skills mastered in this course will allow the CCL to become an invaluable employee in a variety of industries such as Refineries, Fresh Water Treatment Plants, Sewage Water Treatment Plants, Chemical Plants, and Central Plants.

#### **Goals/Objectives/Student Learning Outcomes:**

##### **Welded Pipe**

- Read Mechanical Blue Prints Cut steel pipe square
- Fit and tac-weld a single flange square with pipe
- Fit and tac-weld a second flange square with pipe and two-holed to each other
- Fit and tac-weld a 90 degree or Tee to a flange or multiple flanges being square and two-holed
- Fit and tac-weld a 90 degree to a straight piece of pipe
- Fit and tac-weld two 90 degrees with one 90 degree rotated to either/ or 90 degrees or 180 degrees
- Build an assembly via tac-welding flanges and bolting together with accuracy

##### **Glued Pipe**

- Read Mechanical Blue Prints
- Identify methods used to join PVC, CPVC, ABS and Double Containment Piping
- Identify proper usages of various types of plastic pipe
- Cut PVC square
- Fit and glue correctly as per IPT Manual (p.78-81)
- Successfully thread PVC/CPVC and fit leak-proof joints
- Successfully thread PVC/CPVC for plastic flanges or plastic valves as per IPT's Manual (p. 81-2)
- Successfully build PVC mock-up with Threaded and Glued Pipe
- Pass Hydro Test of above mock-up

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#### Standards

- 1910.252 Welding, Cutting & Brazing
- 1910.106 Flammable and Combustible Liquids
- 1910.146 Permit Required Confined Space
- 1910.147 Isolation Procedures; Lock Out/Tag Out
- 1910.253 Oxygen-Fuel Gas Welding & Cutting
- 1910.254 Arc Welding & Cutting
- 1926.702 Requirements for Equipment & Tools
- 1926.352 Fire Watch
  - Compressed Air
  - Gas Welding & Cutting
  - Arc Welding & Cutting
  - Fire Prevention
  - Ventilation & Protection in Welding, Cutting & Heating
  - Welding, Cutting & Heating in way of Preservative Coatings
- 1926.1117 Vinyl Chloride
- Cal/OSHA Subchapter 7:
  - Group 2 Article 7- Safe Practices Pipe Lines
  - Group 6 Article 47- Machine and Machine Parts
  - Group 10 Article 85 Gas Systems for Cutting and Welding
  - Group 20 Article 146 Piping, Valves, Fittings

#### Classroom Rules and Procedures

- All classes begin at 6:30 am and end at 3:00 pm
- Upon entering classroom, all participants must sign in and be seated by 6:30 am
- Class will consist of a combination of lecture, video, demonstration, coached group exercises, individual exercises and assessment.
- Students are required to report to class ready to work and maintain the provided PPE

#### Textbooks/Readings/Materials:

- IPT Manual
- Set of Blue Prints
- Fitting Welded Pipe Handout
- Fitting Welded Pipe with Flanges Handout
- Thermoplastic Pipe Handout Packet
- Process Piping Math Quiz
- Process Piping 3 Exit Exam
- Hands-on Performance Evaluation
- Hot Work Permit sample

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- LIUNA's *Oxyfuel Cutting* Participant Guide
- LIUNA *Hearing Safety PG & IG*
- Oxyfuel Cutting DVD
- ARC Welding 1 DVD
- Sample Materials Order Form
- Process Piping Blue Print Reading Quiz
- MWWRF Blue Prints CD
- Photo of Eagle Lake WTP

#### Personal Protective Equipment

- 12 pairs of gloves
- 12 pairs of Safety Glasses
- 20 pairs of Ear plugs
- 12 hard hats

#### Course Requirements

To receive credit for the course, participants must:

- Be present for full forty hours
- Participate in all classroom exercises
- Pass a written exam
- Pass a hands-on exam

#### Course Policies

- Participants must be on-time and ready to work.
- Participants must return from breaks on-time.
- Participants must participate in each exercise and assignment
- Participants who are on "light duty" are not allowed to take this course due to the physically demanding requirements.

#### Assessment and Grading

Participants will be assessed on the following:

- All written exams must be passed with a score of 80% or above.
- All hands-on exercises are graded on performance and participation. They are pass/fail and must be passed with a score of 80% or above.

#### Safety

Failure to maintain and use PPE may result in dismissal from the course.