WELD A255: ORBITAL WELDING LEVEL 1

Item	Value
Curriculum Committee Approval Date	12/12/2012
Top Code	095650 - Welding Technology
Units	3 Total Units
Hours	108 Total Hours (Lecture Hours 36; Lab Hours 72)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	Yes
Basic Skills	Not Basic Skills (N)
Repeatable	No
Open Entry/Open Exit	No
Grading Policy	Standard Letter (S)

Course Description

Advanced welding theory and practice covering the process of gas tungsten arc welding using an automatic orbital welding system. Instruction includes safety, equipment use, and certification requirements. PREREQUISITE: WELD A100 or WELD A101 or WELD A140. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Demonstrate proper safety procedures.
2. Correctly prepare tube ends for welding.
3. Correctly adjust variables (amperage, voltage and orbit speed) to make a fusion weld on various diameter tubes.

Course Objectives

- 1. Demonstrate proper safety procedures.
- 2. Demonstrate basic setup procedures variables (amperage, voltage and orbit speed) to make a fusion weld on various diameter tubes.
- 3. Demonstrate welding procedures of orbital welding.
- 4. Calculate speed and heat variables for weld programs.
- 5. Calculate gas pressures for weld head and back-up purge.
- 6. Demonstrate correct weld preparation of pipe and/or tubing.
- 7. Practice installation of tubing in weld head.
- 8. Operate orbital welding equipment to produce acceptable welds.
- 9. Compare welds to industry standards.
- 10. Evaluate weld qualification procedures.
- 11. Correctly assemble and disassemble various diameter orbital welding weld heads.

Lecture Content

Safety General safety rules Welding equipment safety Personal safety in welding Orbital Welding GTAW process Industrial applications Micro-electronic industry Food processing industry Bio-pharmaceutical industry Orbital Welding Equipment and Supplies Power Sources Weld Heads Tube clamp inserts Tungsten Remote Pendant Gasses Argon Mixed Gasses Pressure Regulations and gauges Purge Hoses and Purge Dams Pipe and Tubing Weld Profiles Acceptable criteria Unacceptable criteria General Operations Equipment Installation Power Supply Connections Weld Head Connections Pressure Gas Connections Weld Schedule Development 1 tubing Non-programmable variables Tungsten length and geometry Tungsten Installation Setting weld gas flow rates Programmable variables Creating a weld program Auto/Manual calibration Calculate: Tungsten length Calculate RPM s Calculate Amps Calculate start and stop times Test Run Trial Weld Weld Evaluation Schedule Modification Preparation of the Weld Joint Cleaning and facing Pipe or Tubing Installation of Pipe or Tube into weld head Do s and Don ts

Lab Content

Safety General safety rules Welding equipment safety Personal safety in welding Orbital Welding GTAW process Industrial applications Micro-electronic industry Food processing industry Bio-pharmaceutical industry Orbital Welding Equipment and Supplies Power Sources Weld Heads Tube clamp inserts Tungsten Remote Pendant Gasses Argon Mixed Gasses Pressure Regulations and gauges Purge Hoses and Purge Dams Pipe and Tubing Weld Profiles Acceptable criteria Unacceptable criteria General Operations Equipment Installation Power Supply Connections Weld Head Connections Pressure Gas Connections Weld Schedule Development 1 tubing Non-programmable variables Tungsten length and geometry Tungsten Installation Setting weld gas flow rates Programmable variables Creating a weld program Auto/Manual calibration Calculate: Tungsten length Calculate RPM s Calculate Amps Calculate start and stop times Test Run Trial Weld Weld Evaluation Schedule Modification Preparation of the Weld Joint Cleaning and facing Pipe or Tubing Installation of Pipe or Tube into weld head Do s and Don ts

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- Lab (04)
- DE Live Online Lab (04S)

Instructional Techniques

Lecture and demonstrations, co-operative learning groups. Student's presentation of projects.

Reading Assignments

textbook reading as assigned by instructor

Writing Assignments

Written skill evaluation, written exams

Out-of-class Assignments

Homework as assigned

Demonstration of Critical Thinking

Competency-based skill evaluation and written exams

Required Writing, Problem Solving, Skills Demonstration

Problem solving performance evaluation

Eligible Disciplines

Welding: Any bachelor's degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required Galvery, William and Frank Marlow. Welding Essentials: Questions and Answers , 2nd ed. New York: Industrial Press, 2007