Oklahoma CTE

# Gas Tungsten Arc Welding (2001)

Adopted 2001

**Demonstrate Employability Skills**

18. **Identify employment opportunities.** A.18

19. **Identify levels of training recommended for related careers.** A.19

20. **Understand salary, wages and benefits packages.** A.20

**Safety**

26. Explain the purpose for safety policies. A.26

27. Discuss the role of OSHA and EPA<ul><li>Locate information in MSDS</li></ul> A.27

28. Participate in OSHA training, if possible<ul><li>Lock Out/Tag Out</li><li>HAZCOM</li><li>MSDS</li><li>Bloodborne Pathogens</li></ul> A.28

29. Explain the proper steps in reporting an accident or emergency. A.29

30. Explain the hazards associated with specific types of equipment and tools. A.30

31. Perform machine operator safety checks of equipment and accessories, when necessary. A.31

32. Practice tool safety. A.32

33. Describe the types of fire hazards found in the workplace. A.33

34. Discuss electrical hazards. A.34

35. Demonstrate safe use of personal protective equipment. A.35

36. Demonstrate safe material handling techniques<ul><li>Lifting</li><li>Transporting</li><li>Storing</li></ul> A.36

37. Understand established first aid procedures. A.37

38. Practice good housekeeping. A.38

39. Comply with company safety policies. A.39

**Basic Academic Skills**

40. Apply mathematical operations involving whole numbers, fractions, decimals, percentages, mathematical word problems, ratios, etc., when necessary<ul><li>Addition</li><li>Subtraction</li><li>Multiplication</li><li>Division</li></ul> A.40

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41. Apply advanced mathematical operations, when necessary<ul><li>Algebra</li><li>Geometry</li><li>Trigonometry</li><li>Calculus</li><li>Statistical Methods</li></ul> A.41

42. Apply scientific principles, when necessary<ul><li>Physics</li><li>Chemistry</li></ul> A.42

43. Interpret charts, table, and graphs. A.43

44. Apply reading and writing skills, when necessary. A.44

**Blueprint Reading**

50. Identify basic elements of blueprints<ul><li>Terms</li><li>Components</li><li>Symbols</li></ul> A.50

51. Discuss different types of drawings. A.51

52. Interpret drawings<ul><li>Bill of Materials</li><li>Revisions</li><li>Tolerances</li></ul> A.52

53. Interpret symbols. A.53

**Measurement Tools and Techniques**

54. Identify types of measuring instruments. A.54

55. Use appropriate measurement instrument for a measurement task. A.55

56. Read measuring instruments. A.56

57. Identify the appropriate formula and units for a measurement task. A.57

58. Differentiate between English and Metric measurement systems, when necessary. A.58

59. Communicate measurements using proper symbols or words. A.59

B. Interpret Drawing and Welding Symbols and Written Welding Procedures

01. Interpret basic elements of drawing/sketch<ul><li>Structural members</li><li>Sequence of assembly</li><li>Dimensions and tolerances</li><li>Scale</li><li>View interpretation</li><li>List of materials</li></ul> B.01

02. Interpret welding symbol information<ul><li>Type of weld required</li><li>Filler metal</li><li>Special details</li><li>Non-destructive testing requirements</li></ul> B.02

03. Interpret written welding procedures<ul><li>Procedure ID number crossreferencing to drawing</li><li>Appropriate welding process/base materials/filler materials</li><li>Appropriate machine settings</li></ul> B.03

**Perform Gas Tungsten Arc Welding (GTAW)**

**01. Perform safety inspections of equipment and accessories<ul><li>Protective clothing and equipment</li><li>Hand tools</li><li>Welding equipment and accessories</li><li>Shielding gas equipment and accessories</li><li>Work area</li></ul>** F.01

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**Make minor external repairs to equipment and accessories (preventative maintenance only)<ul><li>Manufacturer's recommendations</li><li>Company**

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| | repair policy</li><li>Equipment troubleshooting</li><li>Porosity</li><li>Gas leaks</li></ul> F.02 |
| | 03. Set up for gas tungsten arc welding operations on plain carbon steel, aluminum, and stainless steel plate<ul><li>Review appropriate weld problems</li><li>Filler metal selection</li><li>Adjust voltage</li><li>Proper gas flow rate</li><li>Parts set up and preheated as necessary</li><li>Base metal preparation</li></ul> F.03 |
| | 04. Operate gas tungsten arc welding equipment<ul><li>Make fillet and groove welds on plain carbon steel plate, aluminum and stainless steel plate</li><li>Workmanship</li></ul> F.04 |
| | 05. Make fillet welds, 2F and 3F positions, on plain carbon steel plate<ul><li>EWCe-2 electrodes</li></ul> F.05 |
| | 06. Make groove welds, 3G position without backing, on plain carbon steel plate EWCe-2 electrodes F.06 |
| | 07. Make 1F-2F welds on aluminum plate<ul><li>EWP &/or EWZr tungsten electrodes</li></ul> F.07 |
| | 08. Make 1G with backing welds on aluminum plate EWP and/or EWZr tungsten electrodes. F.08 |
| | 09. Make 1F-2F-3F welds on stainless steel plate EWCe-2 electrodes. F.09 |
| | 10. Make 1G-2G-3G welds on stainless steel plate EWCe-2 electrodes. F.10 |
| **Perform Plasma Arc Cutting and Gouging** | 01. Perform safety inspections of equipment and accessories<ul><li>Protective clothing and equipment</li><li>Plasma arc cutting equipment and accessories</li><li>Compressed gas system and accessories</li><li>Required tools</li><li>Work area</li><li>Communicate hazard warnings</li></ul> J.01 |
| | 02. Make minor external repairs to equipment and accessories (preventative maintenance only)<ul><li>Manufacturer's recommendations</li><li>Company repair policy</li><li>Equipment troubleshooting (clean gas and tip)</li></ul> J.02 |
| | 03. Set up for manual plasma arc cutting operations on plain carbon steel, aluminum, and stainless steel plate<ul><li>Regulator set for appropriate plasma gas</li><li>Tip selection based on gas</li></ul> J.03 |
| | 04. Operate manual plasma arc cutting equipment. J.04 |
| | 05. Perform shape cutting operations on plain carbon steel, aluminum, and stainless steel plate. J.05 |

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**Perform Welding Inspection and Testing**

01. **Examine cut surfaces and edges of prepared base metal parts<ul><li>Appearance</li><li>Uniformity</li><li>Proper fit-up</li><li>Base metal preparation</li></ul>** K.01

02. **Examine tack, intermediate layers, and completed welds<ul><li>Visual check for weld discontinuity and defects to an acceptable criteria</li><li>Destructive or non-destructive examination</li></ul>** K.02