COURSE FAB3030: GAS TUNGSTEN ARC WELDING

Level: Advanced

Theme: Fabrication Processes

Prerequisite: FAB2030 Oxyfuel Welding

Description: Students develop basic knowledge and skills related to the use of gas tungsten arc welding (GTAW) equipment and supplies to weld mild steel in the flat and horizontal positions.

Parameters: Access to a welding facility complete with gas tungsten arc welding equipment and supplies and to instruction from an individual with welding trade qualifications.

Supporting Courses: FAB2060 Arc Welding 2
FAB2070 Gas Metal Arc Welding 1

Curriculum and Assessment Standards

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will:	*Assessment of student achievement should be based on:*	
• identify health and safety hazards associated with GTAW, and take preventive measures to avoid accidents and personal injury to self and others	• observed performance related to: – appropriate selection and use of personal protective equipment – safe use of equipment and supplies – measures taken to ensure the safety of others	15
• outline the advantages of GTAW over other forms of welding	• written or oral presentation that outlines four advantages of gas tungsten arc welding	15
• demonstrate basic GTAW competencies in the flat and horizontal positions	• completion of mild steel fillet and groove welds in the flat, horizontal and vertical positions. *Assessment Tool* *Fabrication Process: Tungsten Arc Welding, FAB3030–1* *Standard* *Welds should be clean and bright, with ripples that are uniformly formed and free of craters; penetration should be even throughout the weld.* *Competency level of 3*	70

COURSE FAB3030: GAS TUNGSTEN ARC WELDING (continued)

General Outcomes	Assessment Criteria and Conditions	Suggested Emphasis
The student will: • demonstrate basic competencies.	*Assessment of student achievement should be based on:* • observations of individual effort and interpersonal interaction during the learning process. *Assessment Tool* *Basic Competencies Reference Guide and any assessment tools noted above*	

Concept	Specific Outcomes	Notes
	The student should:	
Orientation		
• Occupational Health and Safety	• identify and describe the health and safety issues associated with GTAW such as: – electric current – inert gases – arc radiation – ventilation	This course requires specialized equipment. Students who wish to get credit in this course may need to access this equipment in an off-campus environment.
	• describe a safety plan in case of accident	
• Gas Tungsten Arc Welding	• describe the basic components and operating principles of GTAW	
	• identify the advantages of GTAW over other forms of arc welding	
• Power Supply	• describe the major types of power supplies and current outputs; e.g.: – high frequency current – alternating current (AC) – direct current straight polarity (DCSP) – direct current reverse polarity (DCRP)	
	• identify the appropriate type of current used for welding: – low carbon steel – aluminium – stainless steel	

COURSE FAB3030: GAS TUNGSTEN ARC WELDING (continued)

Concept	Specific Outcomes	Notes
	The student should:	
• Shielding Gases	• explain the purpose of a shielding gas	
	• identify the appropriate type of gas to be used with: – low carbon steel – aluminium – stainless steel	
• Electrodes	• select, prepare and install the appropriate electrode for: – AC – DCSP or DCEN – DCRP or DCEP welding	
• Filler Metal	• demonstrate proper handling techniques to prevent weld contamination	
	• identify the degreasers that are commonly used to clean filler materials.	
Planning and Management		
• Start-up and Shut-down	• identify and demonstrate the appropriate start-up and shut-down procedures for welding mild steel	
• Technique	• demonstrate typical methods used to start an arc	
	• describe the correct torch angle for a lap and groove weld in the flat, horizontal and vertical positions	
• Weld Preparation	• show that mill scale, rust, paint and oil has been removed from the weldments	To avoid weld contamination, stress the importance of having clean surfaces.
• Standards	• list the characteristics of a weld that meets trade standards.	
Implementation		
• Gas Tungsten Arc Welding	• make lap and groove welds in the flat, horizontal and vertical positions.	

COURSE FAB3030: GAS TUNGSTEN ARC WELDING (continued)

Concept	Specific Outcomes	Notes
Assessment	*The student should:*	
• Quality Control	• perform a visual inspection of a weld and describe its characteristics	Welds should be clean and bright, have uniform beads and even penetration.
• Career Information	• identify career opportunities related to GTAW	
• Career Preparation	• prepare a record of completed activities within a portfolio.	