# Skills Assessment: Prepare and weld materials

**Event 2 of 2**

## Criteria

### Unit code, name and release number

MEM05050B - Perform routine gas metal arc welding (1)

### Qualification/Course code, name and release number

MEM30305 - Certificate III in Engineering - Fabrication Trade (4)

## Student details

### Student number

### Student name

## Assessment Declaration

* This assessment is my original work and no part of it has been copied from any other source except where due acknowledgement is made.
* No part of this assessment has been written for me by any other person except where such collaboration has been authorised by the assessor concerned.
* I understand that plagiarism is the presentation of the work, idea or creation of another person as though it is your own. Plagiarism occurs when the origin of the material used is not appropriately cited. No part of this assessment is plagiarised.

### Student signature and Date

Version: *1.0*

Date created: *3 July 2018*

Date modified: *01/10/2019*

For queries, please contact:

IMRS SkillsPoint

Building B, Level 1

Hamilton Campus, 91 Parry St Newcastle West, NSW 2302

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Assessment overview** | The objective of this assessment is to assess your required skills and knowledge as required to be deemed satisfactory in meeting the necessary requirements as stated in the UAG for Perform routine Gas Metal Arc Welding (GMAW) and covers the elements   1. Identify weld requirements 2. Prepare materials for welding 3. Prepare equipment for welding 4. Perform routine welding using GMAW |
| **Assessment Event number** | 2 of 2 |
| **Instructions for this assessment** | This is a skill based assessment and will be assessing you on your ability to demonstrate the skills required in the unit.  This assessment consists of 2 tasks :   1. Task 1: Practical – Prepare and Set Up  * Review and identify the job requirements as provided in the Procedure Sheets. Complete activities to prepare materials and equipment to undertake the welding jobs and complete documentation.  1. Task 2: Welding and Clean Up  * Complete the welding to meet job requirements as provided in the Procedure Sheets.   The observation checklists are provided for each Task to identify the skills you are to demonstrate. Assessment Feedback is provided at the end of this document. |
| **Submission instructions** | On completion of this assessment, you are required to upload it to your Learning Management System or hand it to your assessor for marking.  Ensure you have written your name at the bottom of each page of this assessment.  It is important that you keep a copy of all electronic and hardcopy assessments submitted to TAFE and complete the assessment declaration when submitting the assessment. |
| **What do I need to do to achieve a satisfactory result?** | To successfully complete this assessment the student will be available at the arranged time(s) to complete all the assessment criteria as outlined in the assessment instructions.  All parts of the observable task must be performed to a satisfactory level as indicated in the criteria section of the Observation Checklist.  All oral questions must be answered correctly to be deemed satisfactory in this assessment task; however, Assessors may ask questions to clarify your understanding. |
| **What do I need to provide?** | Pens, measuring equipment, PPE |
| **Due date/time allowed/venue** | *Enter date(s) of observation,*  *Venue*  Task 1: Preparation and welding - 30 minutes  Task 2: Weld 1 - Fillet weld - 1 hour  Weld 2 - Butt weld - 1 hour  Total for all tasks 2.5 hours. |
| **Assessment feedback, review or appeals** | Appeals are addressed in accordance with Every Students Guide to Assessment or TAFE NSW Student Guide. |

## Specific task instructions

The instructions and the criteria provided below will be used by the assessor to determine whether the tasks and activities have been satisfactorily completed. Use these instructions and criteria to ensure you demonstrate the required skills and knowledge.

If this assessment requires you to record information, your assessor will provide you with an appropriate document/template.

## Task 1: Practical – Prepare and Set Up

To complete this part of the assessment, you will be required to participate in a practical demonstration of how to complete a task or activity.

Your responses will be used as part of the overall evidence requirements of the unit.

You should refer to the list of criteria in the Observation Checklist to understand what you need to demonstrate in this section of the assessment. This Checklist outlines the assessment criteria used to assess your performance.

Once completed you will need to submit this assessment and the tasks and activities you are required to complete to your assessor for marking.

**Task 1: Prepare and Set Up**

Task 1 consists of three (3) steps as described below:

**Step 1:**

You will need to correctly prepare materials as per requirements listed in the Procedure Sheets provided for Task 1 and Task 2. Your initials must be stamped on assessment pieces as shown on Procedure Sheet.

**Step 2:**

You are required to prepare and set up the GMAW plant and equipment correctly to safely perform welding operations as per Standard Operating Procedure which is located with the GMAW machine.

**Step 3:**

You are required to show evidence that you can select the appropriate consumables and make the appropriate machine adjustments to produce a welding bead on 10mm LCS. All details are to be completed in the Welding Procedure Sheet for setting the machine that is provided in Task 1.

Simulated Environment Conditions

***Note: The assessor may direct you to use different welding equipment in different welding bays/space to ensure competency is applied in new and different situations.***

The assessment is to be carried out in the workshop complying with all WHS requirements and compliance with Standard Operating Procedures.

The assessment complete with welding procedure sheet and welds should take approximately 30 minutes.

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| **Task 1: Prepare Materials** |
| Step 1: Line of fusion 10mm LCS plate  * Surface of section of 10mm LCS plate to have line of fusion welding carried out on to be cleaned of any paint, grease, oil. * Surface to be wire brushed to remove any surface oxides. |
| Step 2: 6mm LCS plate Fillet weld  * Surfaces of both 50mm x 150mm x 6mm LCS plate to be cleaned of any paint, grease, oil. * Surface to be wire brushed to remove any surface oxides. |
| Step 3: 6mm LCS plate Butt weld  * Surfaces of both 50mm x 150mm x 6mm LCS plate to be cleaned of any paint, grease, oil. * Surface to be wire brushed to remove any surface oxides. |

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| Task 1: Prepare equipment for welding |

## Activity: Student to complete all information in table on the task procedure sheet below

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| Weld run | Wire speed setting | Current reading | Voltage setting Course | Voltage setting fine | Voltage reading | Transfer mode |
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| Electrode wire data | | | Shielding gas data | | Material | |
| Wire Diameter - | | | Gas type | | Type -Thickness - | |
| Wire Classification - | | | Flow rate | |
| Gun lead angle to job - | | |
| Gun lateral angle to job - | | |

## Task 1: Prepare and Set Up- Observation Checklist

The Observation Checklist will be used by your assessor to mark your performance in the practical tasks. Use this Checklist to understand what skills you need to demonstrate to prepare materials and equipment before welding. The Checklist provides the assessment criteria used to determine whether you have successfully completed this assessment event. All the criteria must be met. Your demonstration will be used as part of the overall evidence requirements of the unit. The assessor may ask questions while the demonstration is taking place or if appropriate directly after the task/activity has been completed.

| Task 1  Item # | Prepare and set up  Step 1 | S | | U/S | | Assessor Comments (Describe the student’s ability in demonstrating the required skills and knowledge) | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Review job requirements and prepare material to perform bead welding for machine set up settings. (As per Task 1: Prepare the Material Procedure Sheet.)   * Material selected for welding as per Step 1 as specified on procedure sheet. * Prepare materials for welding as per procedure sheet * Ensure materials are free of contaminants | |  | |  | |  | |
| 2 | Prepare materials to perform the fillet weld  (As per Task 1 - Prepare the Material Procedure Sheet).   * Material selected for welding as per Step 2 as specified on procedure sheet. * Prepare materials for welding as per procedure sheet   Ensure materials are free of contaminants | |  | |  | |  | |
| 3 | Prepare materials to perform butt weld  (as per Task 1 - Prepare Material Procedure Sheet).  Material selected for welding as per Step 3 as specified on procedure sheet.  Prepare materials for welding as per procedure sheet   * Ensure materials are free of contaminants | |  | |  | |  | |

| Task 1  Item # | | Prepare and set up  Step 2 | S | U/S | Assessor Comments (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- |
| 1 | Standard Operating Procedure (SOP) for the GMAW are followed.   * Wear correct PPE suitable for task * Carry out pre start checks * Follow safe practices and housekeeping * Carry of shut down procedure | |  |  |  |
| 2 | Correct PPE is selected and worn as per Standard Operating Procedure (SOP) to perform welding tasks. | |  |  |  |
| 3 | Immediate location in the vicinity of welding operations free of combustible materials and liquids. | |  |  |  |
| 4 | Adequate ventilation and extraction system is operating efficiently | |  |  |  |
| 5 | Welding screens and curtains where fitted are used or temporary welding screens are erected as per SOP and workshop safety guidelines | |  |  |  |
| 6 | Primary power source set up for welding of Task 1 | |  |  |  |
| 7 | Secondary power source torch cable is set up for welding Task 1 | |  |  |  |
| 8 | Secondary power source return (earth) cable is set up for welding Task 1 | |  |  |  |

| Task 1  Item # | | Prepare and set up  Step 3 | S | U/S | Assessor Comments (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- |
| 1 | Select the appropriate roll of welding consumable electrode for welding for Task 1. | |  |  |  |
| 2 | Wire electrode roll installed correctly in the machine as per manufacturers recommendation and following workshop safety guidelines. | |  |  |  |
| 3 | Wire feed drive rolls and unit checked and adjusted for compatibility to wire type and diameter. | |  |  |  |
| 4 | Torch lead liner checked for suitability. | |  |  |  |
| 5 | Feed wire electrode from machine to welding torch in preparation for welding. | |  |  |  |
| 6 | Welding contact tip checked and fitted | |  |  |  |
| 7 | Welding torch nozzle checked and fitted | |  |  |  |
| 8 | Welding torch gas diffuser checked and fitted. | |  |  |  |
| 9 | Welding torch nozzle insulator checked and fitted. | |  |  |  |
| 10 | Correct grade and type of shielding gas selected. | |  |  |  |
| 11 | Correct regulator/flowmeter identified and fitted to cylinder. | |  |  |  |
| 12 | Check shielding gas connection hose from flowmeter to machine. | |  |  |  |
| 13 | Machine Volts are set for welding Task 1 step 1 | |  |  |  |
| 14 | Machine amps (wire feed speed) are set for welding | |  |  |  |
| 15 | Student Operates the GMAW machine and produces a line of fusion weld as per Task 1 part 3 procedure sheet | |  |  |  |
| 16 | Task Procedure sheet completed. | |  |  |  |

## Task 2: Weld and Clean Up

To complete this part of the assessment, you will be required to participate in a practical demonstration of how to complete a task or activity.

These practicals will be observed by your assessor, or can be digitally recorded and submitted as evidence.

Your responses will be used as part of the overall evidence requirements of the unit.

You should refer to the list of criteria in the Observation Checklist to understand what you need to demonstrate in this section of the assessment. This Checklist outlines the assessment criteria used to assess your performance.

Once completed you will need to submit this assessment and the tasks and activities you are required to complete to your assessor for marking.

**Contingency Management:**

While undertaking this task a number of unforeseen circumstances may arise. The assessor will have the opportunity to question you to gather an understanding of how the student will respond to these events. Below is a table with examples of possible questions.

The assessor has the opportunity in the observation checklist to record relevant questions and responses in the table ***“Table 3 Additional Questions”***

Table 4 Unforeseen Circumstances

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| --- | --- | --- |
| Scenario | Assessors question | Acceptable students response |
| Power failure in workshop | What is the correct action in the case of power failure? |  |
| Welding machine failure | What do you need to do if the welding machine fails and prevents you from carrying out the welding task? |  |
| Emergency evacuation | What do you do if an emergency evacuation drill happens during the assessment? |  |

Task 2 consists of 2 steps as described below:

**Step 1: Fillet Weld**

The student is to display the application of safe welding practices whilst performing GMAW to complete the Fillet weld on 6mm LCS plates as per requirements for step 1.

You are required to weld a 6mm single run fillet weld in the horizontal/vertical position on 2 pieces of 50 x 150 x 6mm LCS as per requirements for step 1. Weld joint preparations on the materials have been previously prepared in Task 1 step 2 of this assessment.

The produced fillet weld is to conform to the assessment criteria detailed on the Welding Procedure Sheet for step 1.

All sections of the Welding Procedure Sheet table are to be fully completed.

The student is to clean and submit the completed job for assessment. On completion of assessment student to clean welding bay, turn off machine and gas and recycle material as per site procedures.

**Step 2: Multi run butt weld**

The student is to display the application of safe welding practices whilst performing GMAW multi pass butt weld on 6mm LCS plates for step 2.

You are required to Weld a 6mm multi pass butt weld in the flat position on two(2) pieces of 50 x 150 x 6mm LCS for step 2. Weld joint preparations on the materials have been previously prepared in Task 1 step 3 of this assessment.

The produced fillet weld is to conform to the assessment criteria detailed on the Welding Procedure Sheet for step 2.

All sections of the welding procedure sheet table are to be fully completed.

The student is to clean and submit the completed job for assessment. On completion of the assessment you are to clean the welding bay, turn off the machine and gas, and recycle material as per site procedures.

**Conditions**

Simulated Environment Conditions

***Note: The assessor may direct you to use different welding equipment in different welding bays/space to ensure competency is applied in new and different situations.***

The assessment is to be carried out in the workshop complying with all WHS requirements and compliance with Standard Operating Procedures.

The assessment complete with welding procedure sheet and welds should take approximately 30 minutes.

The assessment is to be carried out in the workshop complying with all WHS requirements and Standard Operating Procedures.

Student may set the machine on scrap material prior to performing the assessment welds

The assessment complete with Welding Procedure Sheet and welding jobs 1 and 2 should take approximately 2 hours (1 hour for each weld).

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| Task 2: Step 1 Fillet weld – single run Procedure sheet Page 1 of 2 |
| **Assessment Criteria:**   * Deposit a 6mm single run fillet weld in the horizontal/vertical position using the GMAW process to the required specifications * Craters at the end of weld deposits to be filled * Welding to be carried out complying to safe welding practices * All splatter to be removed and job to be thoroughly cleaned with a wire brush * Weld will be assessed on appearance, size, contour and external defects * Maximum allowable number of defects is 4 per 150mm of weld, Reinforcement size to be +2mm – 0mm. Angular distortion = -5⁰, Transverse/longitudinal distortion 0⁰ to 5⁰, Porosity to be less than 10% of joint * Record the Welding variables in the table in this procedure sheet |
| **Apply a single run fillet weld in the horizontal/vertical position** |

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| **Task 2: Step 1 Fillet weld – single run Procedure sheet Page 2 of 2** |

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| Weld run | Wire speed setting | Current reading ***(Where available)*** | Voltage setting Course | Voltage setting fine | Voltage reading*(Where available)* | Transfer mode |
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| Electrode wire data | | | Shielding gas data | | Material | |
| Wire Diameter - | | | Gas type | | Type -Thickness - | |
| Wire Classification - | | | Flow rate | |
| Gun lead angle to job - | | |
| Gun lateral angle to job - | | |

## Task 2: Step 1 Fillet weld Observation Checklist

The Observation Checklist will be used by your assessor to mark your performance in Task 2. Use this Checklist to understand what skills you need to demonstrate to perform a fillet weld. The Checklist lists the assessment criteria used to determine whether you have successfully completed this assessment event. All the criteria must be met. Your demonstration will be used as part of the overall evidence requirements of the unit. The assessor may ask questions while the demonstration is taking place or if appropriate directly after the task/activity has been completed.

| Task 2 Item # | | Weld and clean up  Step 1 | S | U/S | Assessor Comments (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- |
| 1 | Student demonstrates contingency planning skills during or after Task 2: Weld and clean up.  Respond to verbal questions asked by assessor. | |  |  |  |
| 2 | Student has successfully completed Task 1 - Setting up equipment and consumables for welding | |  |  |  |
| 3 | Standard Operating Procedure (SOP) for the GMAW are followed.   * Wear correct PPE suitable for task * Carry out pre start checks * Follow safe practices and housekeeping * Carry of shut down procedure | |  |  |  |
| 4 | Job pieces are tacked for welding. | |  |  |  |
| 5 | Fillet weld deposited to specifications. | |  |  |  |
| 6 | On completion of weld follow instructions given by the assessor on what is required for the weld to meet the specifications on the weld procedure sheet and the measurements to be used to clean the finished job | |  |  |  |
| 7 | Consideration given to economical use of material and consumables before, during and after practical activities. | |  |  |  |

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| Task 2: Step 2 job 2 Multi run Butt weld in flat position Procedure sheet Page 1 of 2 |
| **Assessment Criteria:**   * Deposit a multi run butt weld in the flat position using the GMAW process to the required specifications. * Tack sequence as per drawing in this procedure sheet. * Deposit necessary weld runs and fill craters at ends of welds as per instructions from your assessor. * Welding operations to comply with safe welding practices and consideration given to economical use of materials and consumables. * All spatter to be removed and job thoroughly cleaned with a wire brush. * Weld will be assessed on appearance, size, contour and external defects. * Maximum allowable number of defects is 4 per 150mm of weld. * Angular distortion to be less than = -5⁰, Reinforcement to be +2mm – 0mm visual inspection, porosity less than 10% of the joint length. |
| **Multi run butt weld in flat position** |

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| **Task 2: Step 2 job 2 Multi run Butt weld in flat position Procedure sheet Page 2 of 2** |

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| **Weld run** | **Wire speed setting** | **Current reading**  ***(Where available)*** | **Voltage setting Course** | **Voltage setting fine** | **Voltage reading**  ***(Where available)*** | **Transfer mode** |
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| **Electrode** **wire data** | | | **Shielding** **gas data** | | **Material** | |
| **Wire Diameter -** | | | **Gas type** | | **Type -**  **Thickness -** | |
| **Wire Classification -** | | | **Flow rate** | |
| **Gun lead angle to job -** | | |
| **Gun lateral angle to job -** | | |

## Task 2: Step 2 Multi run butt weld Observation Checklist

The Observation Checklist will be used by your assessor to mark your performance. Use this Checklist to understand what skills you need to demonstrate to perform a multi run butt weld. The Checklist lists the assessment criteria used to determine whether you have successfully completed this assessment event. All the criteria must be met. Your demonstration will be used as part of the overall evidence requirements of the unit. The assessor may ask questions while the demonstration is taking place or if appropriate directly after the task/activity has been completed.

| Task 2 | | Part 2: Weld Multi run butt weld | S | U/S | Assessor Comments (Describe the student’s ability in demonstrating the required skills and knowledge) |
| --- | --- | --- | --- | --- | --- |
| 1 | Student has successfully completed Task 1 - Setting up equipment and consumables for welding | |  |  |  |
| 2 | Standard Operating Procedure (SOP) for the GMAW are followed.   * Wear correct PPE suitable for task * Carry out pre start checks * Follow safe practices and housekeeping   Carry of shut down procedure | |  |  |  |
| 3 | Job pieces are tacked for welding. | |  |  |  |
| 4 | Multi run butt weld deposited to specifications | |  |  |  |
| 5 | On completion of weld follow instructions given by the assessor on what is required for the weld to meet the specifications on the weld procedure sheet and the measurements to be used to clean the finished job | |  |  |  |
| 6. | Consideration given to economical use of material and consumables before, during and after practical activities. | |  |  |  |

## Part 3: Assessment Feedback

*NOTE: This section* ***must*** *have the assessor signature and student signature to complete the feedback.*

### Assessment outcome: Task 1 Prepare and weld testing

Satisfactory

Unsatisfactory

### Assessment outcome: Task 2 Weld using GMAW

Satisfactory

Unsatisfactory

### Assessor Feedback

Was the assessment event successfully completed?

If no, was the resubmission/re-assessment successfully completed?

Was reasonable adjustment in place for this assessment event?  
*If yes, ensure it is detailed on the assessment document.*

Comments:

### Assessor name, signature and date:

### Student acknowledgement of assessment outcome

Would you like to make any comments about this assessment?

### Student name, signature and date

***NOTE: Make sure you have written your name at the bottom of each page of your submission before attaching the cover sheet and submitting to your assessor for marking.***