

## Overview

This unit covers the skills and knowledge you will need to carry out joining operations by bringing together two or more materials which leads to a permanent physical change in the properties of the materials. This may be by the use of one of the following 'joining' mediums: soldering, bonding, gluing, welding or braising.

This will involve producing joined products according to defined operating procedures. You will be expected to monitor and control the joining operation, minimising any waste, making adjustments within the limits of your permitted authority and ensuring that the completed components are to the required specification. Meeting production targets will be an important issue and your production records must show consistent and satisfactory performance.

Your responsibilities will require you to comply with organisational policy and procedures for the joining activities undertaken, and to report any problems with the joining activities you cannot personally resolve, or are outside your permitted authority to the appropriate people.

You will be expected to work to instructions, with minimum supervision, taking personal responsibility for your actions and for the quality and accuracy of the work that you produce. You will also be expected to complete any necessary documentation accurately and legibly.

Your underpinning knowledge will be sufficient to provide a sound basis for your work, and will enable you to adopt an informed approach to applying the required work instructions and joining procedures. You will have an understanding of the joining process used, and its application, and will know about the equipment, materials and consumables in adequate depth to provide a sound background for carrying out the activities, making allowable adjustments when required, to ensure that the required specification is achieved.

You will understand the safety precautions required when working with the joining tools and equipment. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

This unit on producing joined products involves:

1. working with minimum supervision
2. performing the joining operation, using the correct joining 'medium'
3. monitoring and controlling the joining operation

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4. making adjustments within your permitted authority
5. reporting unsolvable problems, or problems that you are not responsible for, to the appropriate person
6. completing any necessary documentation
7. working in ways which maintain the safety of yourself and others

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### Performance criteria

*You must be able to:*

- P1 work safely at all times, complying with health and safety, environmental and other relevant regulations and guidelines
- P2 obtain and follow the correct job instructions and any relevant joining procedure and quality specifications
- P3 prepare the surface to be joined, making sure that it is free of any defects which may affect the joining operation
- P4 use the correct joining tools, equipment and techniques to correctly position and align the components to be joined
- P5 perform the joining operation according to instructions and safe operating procedures
- P6 monitor and control the joining operation and identify any faults, variations or problems that occur
- P7 make any necessary adjustments within your permitted authority
- P8 report any problems that you cannot solve or are outside your permitted authority to the appropriate person
- P9 minimise any waste during the joining operation
- P10 produce joined products which comply with the joining specification and quality requirements
- P11 work to achieve your production targets
- P12 deal appropriately with finished components and complete any necessary documentation accurately and legibly

### Knowledge and understanding

*You need to know and understand:*

- K1 what are the relevant health and safety requirements of the work area in which you are carrying out the joining operations
- K2 what are the specific safe working practices, joining procedures and environmental regulations that need to be observed
- K3 what are the hazards associated with carrying out the joining operations and how can they be minimised
- K4 what actions need to be taken in case of emergencies
- K5 what personal protective equipment needs to be used during the joining activities and where can it be obtained
- K6 how to obtain the necessary job instructions, operating procedures and joining specifications that are used, and how to interpret them
- K7 what tools and equipment are used for the joining operations undertaken and how to check that they are in safe and usable condition
- K8 what are the methods of surface preparation that are used in the joining operation and why they are necessary
- K9 how to correctly position and align the components to be joined
- K10 what are the specific joining operations to be performed
- K11 how to perform the joining process to achieve the required specification
- K12 why it is important to follow the specified joining sequence and procedure at all times
- K13 what methods can be used to minimise waste during joining operations
- K14 what faults, problems or variations can occur in the joining operation
- K15 how to identify faults, problems or variations in the joining operation
- K16 what allowable adjustments can you make to achieve specification in the joining operation
- K17 why it is important to report faults, variations or problems that are outside your permitted authority and or you cannot solve immediately
- K18 how to monitor and check the quality of the joined components, against the required quality standards and what tools and equipment are used
- K19 what documentation may need to be completed, and why it is important to complete it accurately and legibly
- K20 what your responsibilities are with regard to the reporting lines and procedures in your working area
- K21 who are the appropriate people and what are their responsibilities within your working area

### Additional Information

#### Scope/range related to performance criteria

You must be able to:

1. Follow the relevant joining procedures and safety requirements to include **all** of the following:
  - 1.1. health and safety regulations
  - 1.2. joining equipment / tool operating instructions
  - 1.3. safe working practices
  - 1.4. company standards and procedures
  - 1.5. job instructions
  
2. Perform joining operations using **one** of the following methods:
  - 2.1. hand joining operations
  - 2.2. fully automated machine joining operations
  - 2.3. manually operated machine joining operations
  - 2.4. combined joining operations
  
3. Carry out checks of the joined products to include **all** of the following:
  - 3.1. completeness of joining operations
  - 3.2. security of joint
  - 3.3. positional accuracy of product
  - 3.4. freedom from excessive joining medium
  - 3.5. joint quality and appearance
  
4. Make permitted adjustments to solve production faults, variations or problems related to **two** of the following:
  - 4.1. quality
  - 4.2. accuracy
  - 4.3. material utilisation
  - 4.4. operational safety
  - 4.5. manufacturing changes
  - 4.6. productivity
  
5. Report problems that you cannot solve and or are outside your permitted authority to the appropriate person to include **one** of the following:
  - 5.1. supervisor
  - 5.2. team leader
  - 5.3. quality control
  
6. Work to achieve production targets for **both** of the following:
  - 6.1. output
  - 6.2. quality

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