

# SEMPEO2-42 - SQA Unit Code FP41 04

## Assembling pattern, model and engineering woodwork components



### Overview

This standard covers a broad range of basic competences that you need to assemble pattern, model or engineering woodwork components. These will prepare you for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or they will provide a basis for the development of additional skills and occupational competences in the working environment.

You will be expected to prepare for the pattern, model or engineering woodwork, assembly activities by obtaining all the necessary information, documentation, components, tools and equipment required, and to plan how you intend to carry out the assembly activities and the sequence of operations you intend to use.

You will be required to assemble pattern, model or engineering woodwork components, using mechanical fixing devices and adhesives. The assemblies produced will include such items as patterns for sand casting, moulds/formers for composite manufacture, furniture units, doors and door frames, transportation units, jigs/fixtures and other engineering structures/assemblies.

You will be required to select the appropriate assembly tools and equipment to use, based on the operations to be performed and the types of component to be assembled, and to check that they are in a safe and serviceable condition. You will also be expected to align the components correctly, and to assemble them in the correct order, using the appropriate fixing devices and adhesives.

You will need to identify and/or create any datums that will be required to locate the components during the assembly process. The assembly activities will also include making all necessary visual and dimensional checks, to ensure that the assembly meets the required specification, that fasteners are securely tightened, and that the completed assembly is free from damage and has an appropriate cosmetic appearance.

Your responsibilities will require you to comply with health and safety requirements and organisational policy and procedures for the woodwork assembly activities undertaken. You will need to take account of any potential difficulties or problems that may arise with the activities, and to seek appropriate help and advice in determining and implementing a suitable solution. You will work under a high level of supervision, whilst taking responsibility for your own actions and for the quality and accuracy of the work that you carry out.

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Your underpinning knowledge will provide an understanding of your work, and will enable you to apply appropriate woodwork assembly techniques safely. You will understand the assembly process, and its application, and will know about the equipment, materials and consumables, to the required depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the assembly operations, especially those involved in the use of adhesives. You will be required to demonstrate safe working practices throughout, and will understand the responsibility you owe to yourself and others in the workplace.

#### **Specific Standard Requirements**

In order to demonstrate the ability to combine different pattern, model or woodwork assembly operations, at least one of the assemblies produced must be of a significant nature, and must cover a minimum of **six** of the activities listed in scope 3.

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#### Performance criteria

- You must be able to:*
- P1 work safely at all times, complying with health and safety legislation, regulations and other relevant guidelines
  - P2 plan the assembly activities before you start them
  - P3 obtain and prepare the appropriate components, tools and equipment
  - P4 use the appropriate methods and techniques to assemble the components in their correct positions
  - P5 secure the components, using the specified connectors and securing devices
  - P6 check the completed assembly to ensure that all operations have been completed, and that the finished assembly meets the required specification
  - P7 deal promptly and effectively with problems within your control, and seek help and guidance from the relevant people if you have problems that you cannot resolve
  - P8 leave the work area in a safe and tidy condition on completion of the assembly activities

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#### Knowledge and understanding

*You need to know and understand:*

- K1 the specific safety precautions to be taken whilst carrying out the woodwork assembly activities (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)
- K2 the importance of wearing appropriate protective clothing/equipment (PPE) during the woodwork assembly activities, and of keeping the work area safe and tidy
- K3 the hazards associated with producing wood and composite assemblies, and with the tools and equipment used, (such as dust inhalation, use of hand power tools, trailing leads or hoses, using adhesives), and how they can be minimised
- K4 how to use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards) in relation to work undertaken
- K5 how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
- K6 how to identify the components to be used, component identification systems (such as codes and component orientation indicators, left and right handing)
- K7 preparations to be undertaken on the components prior to fitting them into the assembly
- K8 the assembly methods and procedures to be used, and the importance of adhering to these procedures
- K9 the importance of assembling components in the correct order
- K10 how to mark out the necessary datum lines for the assembly operations
- K11 how the components are to be aligned, oriented and positioned prior to securing them, and the tools and equipment that are used for this
- K12 why some types of assembly require the use of jigs and gauges to aid the assembly
- K13 the various mechanical fasteners that will be used to secure the components, and their method of installation (such as nails, screws and special securing devices)
- K14 the application of adhesives within the assembly activities, and the precautions that must be taken when working with them
- K15 how to conduct any necessary checks to ensure the accuracy and quality of the assembly produced, and the type of equipment that is used
- K16 recognising defects, blemishes, poor alignment, ineffective fasteners and damaged components within the assembly
- K17 how defects and variations should be dealt with, and what factors determine the actions to be taken (including the relative costs of

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- reworking or discarding the defective item)
- K18 how to check that the assembly tools and equipment to be used are in a safe and serviceable condition
- K19 why it is important to keep the tools and equipment clean and free from damage, to practice good housekeeping of tools and equipment, and to maintain a clean and unobstructed working area
- K20 when to act on your own initiative and when to seek help and advice from others
- K21 the importance of leaving the work area in a safe and clean condition on completion of the assembly activities (such as removing and storing clamps, isolating equipment, cleaning the equipment, and removing and disposing of waste)

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### Additional Information

#### Scope/range related to performance criteria

- You must be able to:*
1. Carry out **all** of the following during the pattern, model or engineering woodwork assembly activities:
    - 1.1 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment (PPE) and other relevant safety regulations
    - 1.2 follow job instructions, assembly drawings and procedures
    - 1.3 ensure that all power tools, cables, extension leads or air supply hoses are in a safe, tested and serviceable condition
    - 1.4 check that tools and measuring instruments to be used are within calibration date
    - 1.5 use lifting and slinging equipment in accordance with health and safety guidelines and procedures (where appropriate)
    - 1.6 ensure that components used are free from damage, material defects, foreign objects, or other contamination
    - 1.7 return all tools and equipment to the correct location on completion of the assembly activities
  
  2. Produce pattern, model or engineering woodwork assemblies, which include **three** of the following:
    - 2.1 flat backed patterns (with/without cores)
    - 2.2 furniture units with doors
    - 2.3 full-size models
    - 2.4 irregular joint patterns (with/without cores)
    - 2.5 doors and door frames
    - 2.6 sectional full-size models
    - 2.7 split patterns (with/without cores)
    - 2.8 storage units
    - 2.9 scale models
    - 2.10 solid turnout coreboxes
    - 2.11 frames or bulkheads
    - 2.12 sectional scale models
    - 2.13 split coreboxes
    - 2.14 structures
    - 2.15 jigs or fixtures
    - 2.16 plated patterns (drags)
    - 2.17 show stands or cases
    - 2.18 formers

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- 2.19 plated patterns (copes)
  - 2.20 transportation units
  - 2.21 furniture units with drawers
  - 2.22 furniture units without drawers and doors
  - 2.23 consoles
  - 2.24 other specific assemblies
3. Apply **all** of the following assembly methods and techniques, as appropriate for the assemblies produced:
- 3.1 ensuring that correct and undamaged components are used
  - 3.2 ensuring that the correct 'hand' of component is used at the appropriate position (left or right handed)
  - 3.3 ensuring the correct orientation, position and alignment of components
  - 3.4 using cramps and clamps to hold the components during the assembly activities
  - 3.5 drilling and countersinking/counterboring (where appropriate)
  - 3.6 securing components using mechanical fasteners (such as pins, screws, nails, special fasteners, dowels)
  - 3.7 securing components by using prepared joints
  - 3.8 securing components by using adhesives
  - 3.9 fitting of accessories (hinges, locks, handles, catches)
4. Carry out the required quality checks, to include **ten** from the following, using appropriate equipment:
- 4.1 dimensions
  - 4.2 positional accuracy
  - 4.3 finish
  - 4.4 flatness
  - 4.5 distortion/straightness
  - 4.6 completeness
  - 4.7 squareness
  - 4.8 profile (where appropriate)
  - 4.9 function (where appropriate)
  - 4.10 alignment
  - 4.11 fit/component security
  - 4.12 freedom from damage
  - 4.13 orientation
5. Produce pattern, model or engineering woodwork assemblies which meet **all** of the following:
- 5.1 all components are correctly assembled and aligned in accordance with the specification
  - 5.2 assemblies are dimensionally accurate within specification tolerances
  - 5.3 where appropriate, assemblies meet appropriate geometric

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- tolerances (such as square, straight, angles free from twists)
- 5.4 interlocking components (joints) are secure
- 5.5 doors and drawers are correctly aligned and open freely (where applicable)
- 5.6 moving parts are correctly adjusted and have appropriate clearances



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| <b>Developed by</b>             | SEMTA   |
| <b>Version number</b>           | 2   |
| <b>Date approved</b>            | December 2011   |
| <b>Indicative review date</b>   | December 2016   |
| <b>Validity</b>                 | Current   |
| <b>Status</b>                   | Original  |
| <b>Originating organisation</b> | SEMTA   |
| <b>Original URN</b>             | 42  |
| <b>Relevant occupations</b>     | Engineering and manufacturing technologies; Engineering;  |
| <b>Suite</b>                    | Performing Engineering Operations Suite 2   |
| <b>Key words</b>                | engineering, engineering operations, assembling, pattern, model, engineering woodwork components, manufacturing, mechanical fixing devices, adhesives, moulds |