SEMME2116 (SQA Unit Code – HF1H 04)
Cutting and shaping wooden components for yachts and boats using hand tools

Overview

This standard identifies the competences you need to cut and shape wood and manufactured board components for yachts or boats using hand tools, in accordance with approved procedures. You will be required to interpret the drawings and work instructions and to use the appropriate tools, based on the type of operations to be performed, the size of the components to be produced and the materials to be used. The size and complexity of the components produced will vary and it is anticipated that the production of the components will involve roughing out the components using fixed or portable machine tools and finally finishing them using hand tools. The components produced will cover structural components (such as hull frames, deck and hull planks, bulk heads, hatch covers, doors and windows/ports, spars, floors) and furniture or trim items (such as navigational and helm consoles, bunks, top boxes. storage boxes, ladders, steps, decorative mouldings. frames, cases, storage units, furniture and other structures).

Your responsibilities will require you to comply with organisational policy and procedures for the woodwork manufacturing activities undertaken and to report any problems with the manufacturing activities, or with the tools, equipment and materials used, that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will need to complete all necessary job/task documentation accurately and legibly. You will work to instructions, with a minimum of supervision and take personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will be sufficient to provide a sound basis for your work and will provide an informed approach to the production of yacht or boat wooden components using hand woodworking tools and procedures. You will have an understanding of the equipment being used and its application and will know about the cutting tools, their function and maintenance requirements in adequate depth to provide a sound basis for carrying out the activities to the required specification. You will be able to identify blunt and damaged cutting tools and know how to sharpen and adjust them in use in order for them to work efficiently.

You will understand the safety precautions required when carrying out the hand cutting and shaping activities. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

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Performance criteria

You must be able to:

- P1 work safely at all times, complying with health and safety legislation, regulations, directives and other relevant guidelines
- P2 follow relevant specifications for the component to be produced
- P3 obtain the appropriate tools and equipment for the shaping operations and check they are in a safe and usable condition
- P4 shape the materials using appropriate methods and techniques
- P5 check that all the required shaping operations have been completed to the required specification
- P6 deal promptly and effectively with problems within your control and report those that cannot be solved

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Knowledge and understanding

You need to know and understand:

K1 the specific safety precautions to be taken whilst using hand tools to cut and shape the yacht or boat wooden structural components (including any specific legislation, regulations or codes of practice relating to the activities, equipment or materials)

K2 the health and safety requirements of the work area in which you are carrying out the wood working activities and the responsibility they place on you

K3 the personal protective equipment and clothing (PPE) to be worn during the woodworking activities

K4 the hazards associated with cutting and shaping wood and manufactured board materials and with the tools and equipment that is used and how they can be minimised

K5 precautions to be observed in the handling and lifting long lengths of timber and sheet materials

K6 how to obtain the necessary job instructions required for the work being carried out

K7 the various hand tools that are used to cut and shape the materials and the range of operations they are capable of performing (such as rip saws, tenon saws, fret/bow/coping saws; smoothing planes, jack planes, rebating planes; chisels and gouges; spokeshaves)

K8 how to check that the cutting tools are in a usable and safe condition; and the procedure for sharpening and adjusting these when required

K9 how to identify the wood to be used (to include type, colour, grain structure, size)

K10 the common defects that occur in the wood to be used and the types of defects that would render the materials unfit for use

K11 the importance of colour matching and grain convention when using wood and wood-based materials

K12 the various methods used to hold the components that are being shaped, formed or dressed by hand

K13 the approved methods of removing material to avoid damaging or distorting the finished components

K14 the methods used to cut square, angular and circular/curved profiles

K15 how to conduct any necessary checks to ensure the accuracy and quality of the components produced and the type of equipment that is used

K16 recognising defects in the components (which may be material defects or those produced through the cutting and shaping activities)

K17 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

K18 the standards to be attained and the company/customer quality control procedures

K19 the recording documentation to be completed for the activities undertaken and where appropriate, the importance of marking and identifying specific pieces of work in relation to the documentation

K20 the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

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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 cutting and shaping of the yacht or boat wooden components:
   - 1.1 obtain all the necessary information to carry out the hand shaping/fitting activities (such as job instructions, drawings, specifications)
   - 1.2 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations
   - 1.3 check that the hand tools are in a safe and usable condition
   - 1.4 ensure that the work area is free from hazards
   - 1.5 use safe and approved cutting and hand shaping techniques at all times
   - 1.6 ensure the cutting tools are maintained in a serviceable condition

2. Use **four** of the following hand tools to cut and shape the materials to specification:
   - 2.1 saws (rip or tenon)
   - 2.2 spokeshaves
   - 2.3 sanding blocks/paper
   - 2.4 fret/bow/coping saws
   - 2.5 chisels/gouges
   - 2.6 portable powered hand tools
   - 2.7 jack or smoothing planes
   - 2.8 drills/braces
   - 2.9 other specific tool

3. Cut/shape yacht or boat wooden components which combine different features and cover **six** of the following profiles:
   - 3.1 flat faces
   - 3.2 concave profiles
   - 3.3 scarph joints
   - 3.4 parallel faces
   - 3.5 convex profiles
   - 3.6 halving joints
   - 3.7 square faces
   - 3.8 circular/round profiles
   - 3.9 housing joints
   - 3.10 angular/tapered faces
   - 3.11 chamfers and radii

3.12 mitres
3.13 rebates
3.14 drilled holes
3.15 slots/grooves
3.16 curved profiles
3.17 mortise and tenon joints
3.18 other specific joints (such as dovetail, combed)

4. Cut/shape materials for **four** of the following yacht or boat components:
4.1 bulkhead(s)
4.2 transom
4.3 top boxes
4.4 bunks
4.5 doors and door frames
4.6 helm consoles
4.7 furniture units with drawers
4.8 mouldings (such as door frame)
4.9 navigational consoles
4.10 furniture units with doors
4.11 ladders
4.12 windows/ports
4.13 hull frames
4.14 steps
4.15 rudder
4.16 keel/backbone
4.17 bulwarks
4.18 tiller
4.19 stem
4.20 floors
4.21 wheel
4.22 moulds
4.23 stringers
4.24 mast
4.25 horn timber
4.26 carlins
4.27 hatch/hatch covers
4.28 hull planks/strakes
4.29 cabin
4.30 engine/machinery bearers
4.31 deck beams
4.32 coach roof
4.33 deck planks

5. Cut/shape components made from **one** of the following materials:
   - 5.1 hard woods
   - 5.2 soft woods
   - 5.3 manufactured boards

6. Cut/shape yacht or boat wooden components which meet **all** of the following:
   - 6.1 dimensionally accurate within specification tolerances
   - 6.2 have an appropriate cosmetic finish
   - 6.3 free from false tool cuts and material defects
   - 6.4 meet the drawing requirements
   - 6.5 interlocking components (joints) are secure
   - 6.6 meet company and customer requirements

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