
Overview

This standard identifies the competences you need to produce wooden structural components for yachts or boats using machine tools, in accordance with approved procedures. You will be required to interpret the drawings and work instructions and to select the appropriate equipment to use, based on the type of operation to be performed, the size of the components and materials used. The production of the components will involve the use of both fixed and portable machines, which are designed specifically for wood and composite materials.

The size and complexity of the components produced will vary and this will require you to set up the necessary machines and their associated tooling and to make any necessary adjustments during machining, in order that the parts produced meet the required specification. The components produced will include such items as hull frames, keel/backbone, stem, bulk heads, hull and deck planks, transom, cabin/coach roof, rudder, tiller and wheel, mast, windows/ports, hatch covers and other similar structural components.

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

Your underpinning knowledge will provide a good understanding of your work and will provide an informed approach to applying woodwork machining procedures. You will understand the equipment being used and its application, and will know about the tooling, machine setting arrangements and tool maintenance and safety devices, in adequate depth to provide a sound basis for carrying out the activities, correcting faults and ensuring that the work output is to the required specification. You will be able to identify blunt and damaged cutting tools and will know how to replace and adjust them in use, in order for them to work efficiently.

You will understand the safety precautions required when carrying out the machining activities, especially those for using machine guards and for isolating the equipment when setting or changing cutting tools. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace.

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 confirm that the machine is set up and ready for the machining activities to be carried out
- P3 manipulate the machine tool controls safely and correctly in line with operational procedures
- P4 produce components to the required quality and within the specified dimensional accuracy
- P5 carry out quality sampling checks at suitable intervals
- P6 deal promptly and effectively with problems within your control and report those that cannot be solved
- P7 shut down the equipment to a safe condition on conclusion of the machining activities

Producing wooden structural components for yachts and boats using machines

Knowledge and understanding

You need to know and understand:

- K1 the safe working practices and procedures to be observed whilst using wood working machines to cut and shape the yacht or boat structural components (including working with wood working machinery; the use of appropriate personal protective equipment; machine guards; operation of machine safety devices; stopping the machine in an emergency; closing the machine down on completion of activities)
- K2 statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH, Work Equipment Regulations and Wood Working Regulations
- K3 the health and safety requirements of the work area in which you are carrying out the wood machining activities and the responsibility they place on you
- K4 the importance of checking that the machinery used is working correctly and that the cutting tools are undamaged and are in a safe and sharp condition
- K5 the capabilities and limitations of the cutting equipment to be used
- K6 how to set up and use dust extraction equipment and the importance of ensuring that equipment is operating correctly including carrying out extraction checks on local exhaust ventilation (LEV) equipment
- K7 the personal protective equipment and clothing (PPE) to be worn during the wood machining activities
- K8 the hazards associated with machining wood and manufactured boards and how they can be minimised
- K9 the importance of ensuring that all machines and portable tools are used correctly and within their permitted operating range
- K10 the need to ensure that all plugs, sockets and cables on portable machines are in a safe, tested and usable condition
- K11 how to obtain the necessary job instructions, drawings and specifications that are used during the machining activities and how to interpret their information
- K12 how to carry out currency/issue checks of the specifications you are working with
- K13 the various machines that are used in wood machining and the range of operations they are capable of performing (such as sawing, planing, rebating, profiling)
- K14 how to check that the cutting tools are in a usable and safe condition and the procedure for changing, sharpening and adjusting these when required
- K15 the methods of setting up and operating the cutting tools, equipment and machinery

Producing wooden structural components for yachts and boats using machines

- K16 how different types of machines use different methods to feed the material to the cutting/dressing tool or surface
- K17 the various types of structural components that are to be made and their function within the structure of the yacht or boat
- K18 the terminology that is used for the structural components
- K19 how to identify the wood to be used (to include type, colour, grain structure, size)
- K20 the common defects that occur in the wood to be used
- K21 the types of defects that would render the materials unfit for use
- K22 the importance of colour matching and grain convention when using wood and wood-based materials
- K23 the various methods used to hold the components that are being cut and shaped
- K24 the approved methods of removing material to avoid damaging or distorting the finished components
- K25 the methods used to cut square, angular and circular/curved profiles
- K26 how to conduct any necessary checks to ensure the accuracy and quality of the structural components produced and the type of equipment that is used to carry out these checks
- K27 recognising defects in the components (which may be material defects or those produced through machining)
- K28 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
- K29 the standards to be attained and the company/customer quality control procedures
- K30 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
- K31 the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

Additional Information

Scope/range related to performance criteria

You must be able to:

1. Carry out **all** of the following during the production of the yacht or boat wooden structural components:
 - 1.1. obtain all the necessary information to carry out the production/machining 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 machine and its cutting tools are fit for purpose and are in a safe and usable condition
 - 1.4. ensure that the work area is free from hazards
 - 1.5. ensure that all machine guards and safety devices are correctly positioned
 - 1.6. check that dust extraction equipment is functioning correctly
 - 1.7. set and adjust the machine to produce the components to the required specification
 - 1.8. use safe and approved machining techniques at all times
2. Use fixed and portable machines, to include **six** of the following:
 - 2.1. circular saw
 - 2.2. band saw
 - 2.3. sander (such as face, belt, bobbin)
 - 2.4. router
 - 2.5. planer/thicknesser
 - 2.6. morticer/tenoner
 - 2.7. combing machine
 - 2.8. lathe
 - 2.9. spindle moulder (single or double)
 - 2.10. bench or pedestal drill
 - 2.11. other special purpose machine
3. Produce components which combine different features and cover **ten** of the following profiles:
 - 3.1. flat faces
 - 3.2. parallel faces
 - 3.3. square faces

Producing wooden structural components for yachts and boats using machines

- 3.4. angular/tapered faces
 - 3.5. rebates
 - 3.6. curved profiles
 - 3.7. concave profiles
 - 3.8. convex profiles
 - 3.9. circular/round profiles
 - 3.10. chamfers and radii
 - 3.11. drilled holes
 - 3.12. mortise and tenon joints
 - 3.13. scarph joints
 - 3.14. halving joints
 - 3.15. housing joints
 - 3.16. mitres
 - 3.17. slots/grooves
 - 3.18. other specific joints (such as dovetail, combed)
4. Produce **eight** of the following yacht or boat wooden structural components:
- 4.1. hull frames
 - 4.2. keel/backbone
 - 4.3. stem
 - 4.4. moulds
 - 4.5. horn timber
 - 4.6. hull planks/strakes
 - 4.7. deck beams
 - 4.8. deck planks
 - 4.9. transom
 - 4.10. bulkhead
 - 4.11. bulwarks
 - 4.12. floors
 - 4.13. stringers
 - 4.14. carlins
 - 4.15. cabin
 - 4.16. coach roof
 - 4.17. windows/ports
 - 4.18. rudder
 - 4.19. tiller
 - 4.20. wheel
 - 4.21. mast
 - 4.22. hatch/hatch covers
 - 4.23. engine/machinery bearers
5. Produce components made from **all** of the following materials:
- 5.1. hard woods
 - 5.2. soft woods

Producing wooden structural components for yachts and boats using machines

- 5.3. manufactured board
6. Use appropriate measuring equipment and tools to check **all** of the following:
 - 6.1. dimensions
 - 6.2. flatness
 - 6.3. squareness
 - 6.4. angles/taper
 - 6.5. alignment
 - 6.6. position
 - 6.7. profile
 - 6.8. distortion/straightness
7. Produce yacht or boat wooden structural components which meet **all** of the following:
 - 7.1. dimensionally accurate within specification tolerances
 - 7.2. free from false tool cuts and material defects
 - 7.3. interlocking components (joints) are secure
 - 7.4. have an appropriate surface texture
 - 7.5. meet the drawing, specification or job requirements
 - 7.6. free from defects due to stress relief (twisting/warping)and excessive burrs
 - 7.7. meet company and customer requirements
8. Complete the relevant paperwork, to include **one** from the following and pass it to the appropriate people:
 - 8.1. installation records
 - 8.2. work authorisation documents
 - 8.3. acceptance documentation
 - 8.4. craft/vessel log
 - 8.5. job cards
 - 8.6. other specific recording method

SEMME3230 – HY0W 04

Producing wooden structural components for yachts and boats using machines

Developed by	SEMTA
Version number	2
Date approved	March 2014
Indicative review date	April 2017
Validity	Current
Status	Original
Originating organisation	SEMTA
Original URN	SEMME3230
Relevant occupations	Marine Engineering Trades
Suite	Marine engineering suite 3
Key words	Marine; engineering; yacht; boat; structural; components; machines; wooden