

Overview

This standard identifies the competences you need to prepare for and mark out materials used for the manufacture and assembly of wooden structural components used in yachts or boats, in accordance with approved procedures. You will need to interpret the information contained in the drawings, instructions and specifications, in order to mark out the materials and components accurately and correctly. You will be expected to select the appropriate timber, identify any defects in the wood that could make it unfit for use, and select and use the correct marking out tools and equipment, based on the features to be marked out, the accuracy required, and the information presented to you. You will need to use these instruments to mark out datums, profiles, simple joints, hole positions, assembly positions and cutting lines, which will be followed when producing the required components. Materials to be marked out will include softwoods, hardwoods and manufactured board, which may be in sheet form, stock sections, part-manufactured components or sub-assemblies.

Your responsibilities will require you to comply with organisational policy and procedures for the marking out activities undertaken and to report any problems with the activities, equipment or materials 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, equipment and materials used in the marking out are correctly accounted for on completion of the activities and to complete all necessary job/task documentation accurately and legibly. You will be expected to work with a minimum of supervision, taking 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 appropriate marking out procedures for yacht or boat wooden structural components. You will understand the marking out procedures used, and their application, and will know about the techniques, tools and equipment used, in adequate depth to provide a sound basis for carrying out the activities and ensuring that the marked out materials are to the required specification.

You will understand the safety precautions required when carrying out the marking out operations. You will be required to demonstrate safe working practices throughout and will understand the responsibility you owe to yourself and others in the workplace, both ashore and afloat.

Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety legislation, regulations, directives and other relevant guidelines
2. obtain and use the correct information for marking out
3. obtain the appropriate marking out equipment and check that it is in a usable condition
4. prepare suitable datums and marking out surfaces
5. mark out using appropriate methods
6. check that the marking out complies with the specification
7. deal promptly and effectively with problems within your control and report those that cannot be resolved
8. complete relevant documentation in line with organisational procedures

Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken when marking out wood and manufactured board materials and with the tools and equipment that are used (including any specific statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)
2. hazards associated with the marking out activities and how they can be minimised (such as marking out equipment used, lifting and handling sheet material, long lengths of materials, splinters from wood)
3. the importance of wearing protective clothing and other appropriate safety equipment (PPE) during the marking out activities
4. the process to obtain the required drawings and job instructions
5. how to extract information from boat building drawings/plans and related specifications (to include symbols and conventions to appropriate BS or ISO standards) in relation to work undertaken
6. how to carry out currency/issue checks of the specifications you are working with
7. how to interpret first and third angle projections, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
8. how to produce a three dimensional shape from the two dimensional information
9. how to identify the wood materials that are to be used (to include colour, grain structure, size)
10. the common defects that occur in the wood to be used
11. the types of defects that would render the materials unfit for use
12. the importance of colour matching and grain convention when using wood and wood-based materials
13. the material characteristics and process considerations to be taken into account when marking out wood
14. the principles of marking out and the types of equipment used
15. the range of operations that the various items of marking out equipment are capable of performing
16. the use of marking out conventions when marking out the workpiece (including datums, centre lines, cutting guidelines, square and rectangular profiles, joints,

circular and curved profiles, angles, holes which are linearly positioned, boxed and on pitch circles)

17. how to select and establish suitable datums; the importance of ensuring that marking out is undertaken from the selected datums; and the possible effects of working from different datums

18. the use of geometrical construction methods applied to marking out

19. ways of laying out the marking out shapes or patterns to maximise the use of materials

20. methods of marking out large or long shapes

21. marking out and transferring information from templates

22. setting and adjusting tools (such as squares, protractors, marking gauges)

23. the importance of using tools only for the purpose intended; the care that is required when using the equipment and tools; the proper way of preserving and storing tools and equipment between operations

24. the need for clear lines and dimensional accuracy in marking out to specification and drawing requirements

25. the problems that can occur in marking out yacht or boat wooden structural components and how these can be avoided

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

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

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

Scope/range related to performance criteria

1.

Obtain and use appropriate documentation for the marking out activities, to include **three** of the following:

- 1.1 drawings (such as detail, general arrangement)
- 1.2 plans
- 1.3 work instructions
- 1.4 sketches

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1.

Use marking out methods and techniques, including **two** of the following:

- 1.1 direct marking, using instruments
- 1.2 use of templates
- 1.3 tracing/transfer methods

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1.

Select and mark out **two** types of wood, which conform to specification in respect of type and condition:

- 1.1 hard wood
- 1.2 soft wood
- 1.3 manufactured board

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1.

Check the materials used are free from **all** of the following defects:

- 1.1 structural
- 1.2 cosmetic
- 1.3 dimensional
- 1.4 distortion

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1.

Use a range of marking out equipment, to include **eight** of the following:

- 1.1 pencil
- 1.2 marking knife
- 1.3 rule or tape
- 1.4 straight edge
- 1.5 square

- 1.6 protractor
- 1.7 sliding bevel
- 1.8 dividers, compass or trammels
- 1.9 marking or combination gauge
- 1.10 templates

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1.

Mark out material, to include **eight** of the following features:

- 1.1 datum and centre lines
- 1.2 square/rectangular profiles
- 1.3 angles
- 1.4 circles
- 1.5 curved profiles
- 1.6 cutting detail
- 1.7 hole centring and outlining
- 1.8 rebates
- 1.9 assembly positions
- 1.10 joints (such as halving, housing, mortice and tenon, scarph, mitres)

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1.

Mark out for the production of **eight** of the following yacht or boat structural components:

- 1.1 hull frames
- 1.2 keel/backbone
- 1.3 stem
- 1.4 moulds
- 1.5 horn timber
- 1.6 hull planks/strakes
- 1.7 deck beams
- 1.8 deck planks
- 1.9 transom
- 1.10 bulkhead
- 1.11 bulwarks
- 1.12 floors
- 1.13 stringers
- 1.14 carlins
- 1.15 cabin
- 1.16 coach roof
- 1.17 windows/ports
- 1.18 rudder
- 1.19 tiller
- 1.20 wheel
- 1.21 mast
- 1.22 hatch/hatch covers

1.23 engine/machinery bearers

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1.

Mark out components for yacht or boat structural components which meet **all** of the following requirements:

- 1.1 dimensionally accurate (to the drawing or specification)
- 1.2 has clearly formed lines and profiles
- 1.3 waste material is clearly identified* *
- 1.4 uses recognised marking out conventions
- 1.5 datum faces/points are clearly marked and identified
- 1.6 meets company/customer standards and codes of practice

Behaviours

Behaviours:

You will be able to apply the appropriate behaviours required in the workplace to meet the job profile and overall company objectives, such as:

- strong work ethic
- positive attitude
- team player
- dependability
- responsibility
- honesty
- integrity
- motivation
- commitment

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