

Assembling marine sheet metal components

Overview

This standard identifies the competences you need to assemble marine sheet metal components (up to and including 3mm), in accordance with approved procedures. You will be required to interpret job instructions and drawings correctly, in order to assemble and join sheet metal components and/or light sections, to construct completed marine assemblies or sub-assemblies such as ducting, tanks, cylindrical sections, conical sections, reduction pieces. You will be required to lay out and secure the various component parts of the structure, using mechanical fastenings, resistance welding or self securing methods, in the correct order and to ensure that they are assembled in a manner that is fit for purpose.

Your responsibilities will require you to comply with organisational policy and procedures for the marine sheet metal assembly activities undertaken and to report any problems with the activities, tools, equipment or materials that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with either a high level of supervision or as a member of a team. You will take personal responsibility for your own actions and for the quality and accuracy of the work that you carry out. Where team working is involved, you must demonstrate a significant personal contribution during the team activities in order to satisfy the requirements of the standard and competence in all the areas required by the standard must be demonstrated.

Your underpinning knowledge will be sufficient to provide a sound basis for your work and will provide an informed approach to applying marine sheet metal assembly techniques and their fixing procedures. You will have an understanding of the assembly techniques used and their application. You will know about the methods of assembling components that are of the required strength and fit for purpose, in adequate depth to provide a sound basis for carrying out the activities, recognising and correcting/reporting faults and ensuring that the work output is produced to the required specification.

You will understand the safety precautions required when working with sheet metal components and with their associated 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.

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Performance criteria

You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow the relevant instructions, assembly drawings and any other specifications
3. ensure that the specified components are available and that they are in a usable condition
4. assemble the components in their correct positions using appropriate methods and techniques
5. secure the components using the specified connectors and securing devices
6. produce marine composite assemblies to relevant standards
7. check the completed assembly to ensure that all operations have been completed and the finished assembly meets the required specification
8. deal promptly and effectively with problems within your control and report those that cannot be solved
9. complete relevant paperwork, in accordance with organisational requirements

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Knowledge and understanding

You need to know and understand:

1. the specific safety precautions to be taken when working in a marine fabrication environment and when producing sheet metal assemblies (including general workshop and site safety, appropriate personal protective equipment, accident procedure; statutory regulations, risk assessment procedures and COSHH regulations, safe disposal of waste materials)
2. the personal protective clothing and equipment (PPE) to be worn when carrying out the sheet metal assembly activities (such as leather gloves, eye protection, safety helmets, ear protection)
3. safe working practices and procedures for producing marine sheet metal assemblies
4. the correct methods of moving or lifting bulky sheet metal fabrications
5. the hazards associated with carrying out marine sheet metal assembly work (such as using dangerous or badly maintained tools and equipment, lifting and handling long and heavy components, cuts, slips, trips and falls) and how they can be minimised
6. how to obtain the necessary job instructions, drawings and joining specifications
7. how to interpret information from engineering drawings and related specifications, in relation to work undertaken
8. how to use imperial and metric systems of measurement, workpiece reference points and system of tolerancing
9. how to interpret marking out conventions (such as cutting lines, centre lines, hole positions)
10. the preparations to be carried out on the components, prior to assembling them
11. the various methods of securing the assembled components (such as threaded fasteners, special fasteners, resistance and tack welding methods and techniques, adhesive bonding of components, and self secured joints - such as knocked up, paned down, swaged and joggled)
12. how to set up and align the various components and the tools and equipment that is used for this
13. methods of temporarily holding the joints together to aid the assembly activities (such as clamps, rivet clamps)
14. the importance of using tools or equipment only for the purpose intended; the care that is required when using the tools or equipment; the proper way of preserving tools or equipment between operations
15. why tool/equipment control is critical and what to do if a tool or piece of equipment is unaccounted for on completion of the activities

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16. the problems that can occur when producing sheet metal assemblies, and how these can be avoided
17. inspection techniques that can be applied to check that shape (including straightness) and dimensional accuracy are to specification and within acceptable limits
18. the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

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Scope/range related to performance criteria

1. Carry out all of the following during the marine sheet metal assembly operations:
 1. correctly prepare and set up the components and faces to be joined
 2. use the correct datum faces
 3. use the specified or appropriate fixing method
 4. correctly align the components and faces to be joined
 5. assemble/fabricate the sheet metal components, in the correct order or manner
 6. produce an assembly which meets the required specification
2. Produce three of the following marine sheet metal assemblies:
 1. frames
 2. panels
 3. kit lockers
 4. tanks/reservoirs
 5. sectional trunking
 6. bunk spaces
 7. vent ducting/trunking
 8. toilet cubicles
 9. pyrotechnic lockers
 10. guards
 11. shower cubicles
 12. protective covers/cladding
 13. hoods
 14. galley equipment
 15. stowage racks
 16. stores
 17. other specific marine assembly
3. Use three of the following types of components in the assemblies produced:
 1. sheet metal covers
 2. flanges
 3. pre-fabricated square/rectangular components
 4. light rolled section (angle, channel or tee section)
 5. pre-fabricated cylindrical/conical components
 6. stiffeners and frame components
 7. brackets

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4. Assemble sheet metal components, using two of the following methods:
 1. temporary tack welding
 2. adhesive bonding
 3. soldering or brazing
 4. flanged and mechanically fastened (threaded devices)
 5. resistance spot welding
 6. self securing joints (such as knocked up, paned down, swaged, joggled)
 7. riveting (hollow or solid)
 8. other specific method
5. Produce marine sheet metal assemblies which meet all of the following requirements:
 1. all components are correctly assembled and aligned, in accordance with the specification
 2. overall dimensions are within specification tolerances
 3. assemblies meet appropriate geometric tolerances (square, straight, angles free from twists)
 4. where appropriate, the pitch of erection holes meet specification requirements
 5. completed assemblies have secure and firm joints, are clean and free from burrs or flash
6. Complete the relevant paperwork, to include one from the following and pass it to the appropriate people:
 1. job cards
 2. quality/acceptance documentation
 3. work authorisation documents
 4. other specific reporting method

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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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