

Overview

This standard identifies the competences you need to cut and shape sheet metal (up to and including 3 mm) in order to fabricate clips, brackets, covers, trunking and similar components (including templates) for marine sheet metalwork applications, in accordance with approved procedures. You will be required to select the appropriate equipment to use, based on the type and thickness of material and the accuracy to be achieved. This will require you to use hand tools, hand power tools and machinery, as applicable. The cutting and shaping will involve producing straight cuts, external curved contours, cut-ins, notches and round and square holes.

Materials to be cut and shaped may include ferrous and non-ferrous. This will call for care in selecting the right tools, so as to avoid damage to the tools and danger to oneself.

Your responsibilities will require you to comply with organisational policy and procedures for the sheet metal cutting activities undertaken and to report any problems with the cutting activities, equipment, materials that you cannot personally resolve, or are outside your permitted authority, to the relevant person. 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 sheet metal cutting and shaping procedures on marine components. You will understand the cutting equipment, the processes and their application and will know about the materials in adequate depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when working with the fabrication tools and machinery. 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:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. follow relevant specifications for the component to be produced
3. obtain the appropriate tools and equipment for the shaping operations and check they are in a safe and usable condition
4. shape the materials using appropriate methods and techniques
5. check that all the required shaping operations have been completed to the required specification
6. deal promptly and effectively with problems within your control and report those that cannot be solved
7. 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 working with sheet metal equipment and materials in a marine fabrication environment (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 marine fabrication activities (such as leather gloves, eye/ear protection, safety helmets)
3. the correct methods of moving or lifting sheet metal
4. safe working practices and procedures to be observed when using manual and power operated tools
5. the hazards associated with marine fabrication work (such as using dangerous or badly maintained tools and equipment, operating guillotines and when using hand and bench shears) and how they can be minimised
6. the procedures for obtaining the necessary drawings and specifications, and how to check that they are the latest issue
7. how to extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate BS or ISO standards) in relation to work undertaken
8. how to carry out currency/issue checks of the specifications you are working with
9. how to interpret first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing
10. how to interpret the marking out conventions on the materials to be cut and shaped (such as cutting lines, centre lines, hole positions)
11. the tools and techniques available for cutting and shaping sheet metal (such as tin snips, bench shears, guillotines, portable power tools, bench drills, saws)
12. what preparations you may have to carry out on the material prior to cutting it
13. the material characteristics and process considerations to be taken into account when cutting and shaping sheet metal
14. the use and care of tools and equipment, including checks that must be made to ensure that the tools are fit for purpose (such as sharp, undamaged, tested, plugs and cables secure and free from damage, machine guards or safety devices operating correctly)

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15. setting and adjusting tools and equipment (including the use of backstops on guillotines)
16. 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
17. the problems that can occur with cutting and shaping sheet metal and how these can be avoided
18. the importance of using the machine guards and safety protection equipment at all times
19. inspection techniques that can be applied to check that shape and dimensional accuracy are to specification and within acceptable limits
20. 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.

Cut and finish material to the marked out shape, using six of the following:

- 1.1 tin snips
- 1.2 files
- 1.3 bench shears
- 1.4 pneumatic tools
- 1.5 hacksaw
- 1.6 plasma burner
- 1.7 drills
- 1.8 nibblers
- 1.9 saws
- 1.10 grinder
- 1.11 trepanning
- 1.12 polishing tool
- 1.13 other specific tool

2.

Cut and finish material to the marked out shape, using three of the following machine tools:

- 2.1 guillotine
- 2.2 nibbling machine
- 2.3 pillar drill
- 2.4 trepanning machine
- 2.5 bench saw
- 2.6 band saw
- 2.7 punch/cropping machine
- 2.8 grinding/polishing
- 2.9 other specific machine tool

3.

Perform operations to produce all of the following shapes:

- 3.1 straight cuts
- 3.2 internal curved contours
- 3.3 cut-ins (straight and curved)
- 3.4 round holes
- 3.5 notches
- 3.6 square holes
- 3.7 external curved contours

4.

Use sheet metal of two different thicknesses, up to and including 3 mm, for **two** appropriate materials from the following

- 4.1 hot rolled mild steel

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- 4.2 brass
- 4.3 cold rolled mild steel
- 4.4 copper
- 4.5 coated mild steel (such as primed, tinned, galvanised)
- 4.6 lead
- 4.7 stainless steel
- 4.8 titanium
- 4.9 aluminium

5.

Produce cut and shaped components which meet all of the following:

- 5.1 company/customer standards requirements
- 5.2 dimensionally accurate (to drawing or specifications)
- 5.3 free from distortion
- 5.4 free from sharp edges, slivers or burrs

6.

Complete the relevant documentation in line with organisational procedures, to include one from the following and pass it to the appropriate people:

- 6.1 build records
- 6.2 log cards
- 6.3 job cards
- 6.4 quality documentation
- 6.5 other specific recording methods

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

SEMME3153



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Developed by Enginuity

Version Number 3

Date Approved 31 Mar 2019

Indicative Review Date 29 Apr 2021

Validity Current

Status Original

Originating Organisation Senta

Original URN SEMME3153

Relevant Occupations Marine Engineering Trades

Suite Marine Engineering Suite 3

Keywords engineering; marine; manual; machining; sheet metal; cutting; sawing; drilling; guillotining; cropping; blacksmithing
