SEMPEO113

Cutting and shaping platework components

Overview

This standard covers a range of basic heavy platework (above 3 mm) competences that will prepare you for entry into the engineering or manufacturing sectors, creating a progression between education and employment, or that will provide a basis for the development of additional skills and occupational competences in the working environment.

You will be expected to prepare for the plateworking activities by obtaining all the necessary job instructions, materials, tools, equipment and any documentation that may be required.

In producing the platework components, you will be expected to use appropriate tools and equipment to mark out the material for a range of features to be produced, and then to use hand tools, portable power tools and simple machines to produce a variety of shapes, profiles and forms. You will also be expected to produce simple platework assemblies, using mechanical fastening devices and tack welding. On completion of the plateworking activities, you will be expected to return all tools and equipment to the correct location, and to leave the work area in a safe and tidy condition.

Your responsibilities will require you to comply with health and safety requirements and organisational policy and procedures for the plateworking activities undertaken. You will need to report any difficulties or problems that may arise, and to carry out any agreed actions. You will work under a high level of supervision, whilst taking responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide an understanding of your work, and will enable you to apply appropriate plateworking techniques and procedures safely. You will understand the cutting, forming and assembly processes, and their application, and will know about the tools and equipment used, to the required depth to provide a sound basis for carrying out the activities to the required specification.

You will understand the safety precautions required when carrying out the plateworking activities, and when using the various tools and equipment, especially guillotines and bending/forming 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.

Specific Standard Requirements

At least one of the platework components produced must combine features and techniques, for example: by producing a component which involves cutting the plate material to size using guillotines, marking out and drilling a number of bolt holes and preparing the plate edges for welding using abrasive discs.

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 the appropriate tools and equipment for the plateworking operations, and check that they are in a safe and usable condition
3. mark out the components for the required operations, using appropriate tools and techniques
4. cut and shape the materials to the required specification, using appropriate tools and techniques
5. use the appropriate methods and techniques to assemble and secure the components in their correct positions
6. check that the produced components meet the standard required
7. report any difficulties or problems that may arise with the platework activities, and carry out any agreed actions
8. leave the work area in a safe and tidy condition on completion of the platework activities

Knowledge and understanding

You need to know and understand:

1. the health and safety requirements, and safe working practices and procedures required for the plateworking activities undertaken
2. the personal protective clothing and equipment (PPE) to be worn when carrying out the plateworking activities (such as leather gloves, eye protection, ear protection), and the importance of keeping the work area safe and tidy
3. how to handle plate and section materials safely and correctly, and the need to wear gloves and other related safety equipment
4. the hazards associated with carrying out heavy plateworking activities (such as handling sheet materials, using dangerous or badly maintained tools and equipment, operating guillotines, cropping and bending machines, and when using power saws, drilling machines and abrasive cutting discs), and how they can be minimised
5. the procedure for obtaining the required drawings, job instructions and other related specifications
6. how to use and extract information from engineering drawings and related specifications (to include BS or ISO standard symbols and abbreviations, imperial and metric systems of measurement, workpiece reference points and system of tolerancing)
7. how to prepare the materials in readiness for the marking-out activities, in order to enhance clarity, accuracy and safety (such as visually checking for defects, cleaning the materials, removing burrs and sharp edges, applying a marking-out medium)
8. how to select and establish a suitable datum; the importance of ensuring that marking out is undertaken from the selected datum, and the possible effects of working from a different datum
9. the methods of marking out cutting guidelines, square and rectangular profiles, circular and radial profiles, angles and hole positions using templates or marking-out equipment
10. ways of laying out the marking-out shapes or patterns to maximise the use of materials
11. how to cut platework and section materials (such as using guillotines, cropping machines, abrasive discs, drilling machines, machine saws and thermal cutting equipment)

12. how to form platework and section materials (such as using heating techniques, hammers and flanging bars, rolls and bending machines)
13. how to produce holes in platework and section materials (using portable and bench/pedestal drilling machines and radial arm machines)
14. how to hold platework materials for cutting operations (such as clamping for drilling, holding work when using portable grinders)
15. the safety mechanisms and devices that are on the machines, and why they must always be used (such as machine guards, interlocks, safety operating devices)
16. the various methods of securing the assembled components; the range of mechanical fastening devices that are used (such as nuts and bolts, rivets, tack welding methods and techniques)
17. the preparations to be carried out on the components prior to assembling them
18. methods of temporarily holding the joints together to aid the assembly activities
19. the problems that can occur with the plateworking activities (such as defects caused by incorrectly set or blunt shearing blades), and how these can be overcome
20. when to act on your own initiative and when to seek help and advice from others
21. the importance of leaving the work area in a safe and clean condition on completion of activities (such as removing and storing power leads, isolating machines, cleaning the equipment, and removing and disposing of waste)

Scope/range related to performance criteria

1.

Carry out **all** of the following during the plateworking activities:

1.1 adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment (PPE) and other relevant safety regulations
1.2 ensure that all power tool cables, extension leads or air supply hoses are in a tested and serviceable condition
1.3 apply safe and appropriate platework cutting and forming techniques and procedures at all times
1.4 return all tools and equipment to the correct location on completion of the plateworking activities

2.

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

2.1 direct marking using instruments
2.2 use of templates
2.3 tracing/transfer methods
2.4 other specific method

3.

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

3.1 scriber
3.2 rule or tape
3.3 square
3.4 dividers or trammels
3.5 punch
3.6 straight edge
3.7 protractor
3.8 chalk, bluing or paint

4.

Mark out material to include **four** of the following features:

4.1 datum and centre lines
4.2 curved profiles
4.3 square/rectangular profiles
4.4 cutting and bending detail (including allowances)
4.5 angles
4.6 hole centring and outlining (such as circular or linear)
4.7 circles

5.

Cut and finish material to the marked-out shape, using **two** of the following:

5.1 guillotine
5.2 cropping machine
5.3 machine saw

5.4 abrasive disc
5.5 drill (such as bench, pillar, radial)
5.6 thermal cutting equipment (such as hand held or machine)

6.

Perform cutting operations to produce components that combine operations and cover **three** of the following features:

6.1 component with parallel sides
6.2 components with sides square to each other
6.3 holes linearly pitched
6.4 components with angled sides
6.5 components with curved contours
6.6 holes radially pitched
6.7 bevel edges or weld preps

7.

Use **one** of the following types of forming equipment/techniques:

7.1 bending machine (hand or powered)
7.2 presses
7.3 rolling machine (hand or powered)
7.4 heating techniques

8.

Carry out forming operations to produce components that cover **two** of the following features:

8.1 bends at 90°
8.2 flattening or straightening plate
8.3 cylinders
8.4 bends of various angles
8.5 producing curved plates/sections

9.

Assemble platework components, using **one** of the following methods:

9.1 temporary tack welding
9.2 mechanically fastened (such as bolts, screws)
9.3 riveting (hot or cold)

10.

Use **two** the following materials:

10.1 flat plate
10.2 rolled sections (angle, channel, RSJ, rail section)
10.3 pipe/tube
10.4 solid bar (such as square, round, hexagonal)

11.

Produce platework components which meet **all** of the following:

11.1 all dimensions are within +/- 3.0mm or +/- 0.125"
11.2 finished components meet the required shape/geometry (such as square, straight, angles free from twists)

11.3 completed components are free from excessive tooling marks, deformation, cracking, sharp edges, slivers or burrs
11.4 all components are correctly assembled and have secure and firm joints

Behaviours

Additional Information

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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