
Overview

This standard identifies the competencies you need for cutting and shaping metal plate and sections (3 mm thickness and above) for fabrications using guillotines and section cropping machines, in accordance with approved procedures. You will be required to select the appropriate equipment and machine settings to use, for the material, thickness and the accuracy to be achieved. Items to be cut and shaped may include ferrous and non-ferrous materials, and will include parallel cuts, square cuts, and cuts that are at an angle. These cuts will be achieved by working to marking out, and by setting the machine's backstop when multiple cutting is required. This will call for care in selecting the right tools, so as to avoid damage to the materials and tools, or danger to oneself.

Your responsibilities will require you to comply with organisational policy and procedures, seeking out relevant information for the activities undertaken, and to report any problems with the equipment, materials or cutting activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work to instructions, with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will be sufficient to provide a good understanding of your work, and will provide an informed approach to applying metal shearing procedures. You will have an understanding of the shearing processes, the equipment and its application, and will know about the process 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 shearing machines and 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.

Performance criteria

You must be able to:

- P1 work safely at all times, complying with health and safety and other relevant regulations and 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

Knowledge and understanding

You need to know and understand:

- K1 the specific safety precautions to be taken when working in a fabrication environment and when working with shearing machines (general workshop and site safety, appropriate personal protective equipment (PPE), accident procedure; statutory requirements, risk assessment procedures and relevant requirements of HASAWA, COSHH and Work Equipment Regulations; safe disposal of waste materials)
- K2 the personal protective clothing and equipment to be worn when carrying out the fabrication activities (such as leather gloves, eye/ear protection, safety helmets)
- K3 safe working practices and procedures for operating machine tools
- K4 the correct methods of moving or lifting heavy plate, and the equipment to be used
- K5 the hazards associated with fabrication work and shearing operations (such as using dangerous or badly maintained tools and equipment; lifting and handling plate; operating machinery), and how they can be minimised
- K6 how to obtain the necessary drawings and specifications
- K7 how to use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate British, European or relevant International standards in relation to work undertaken)
- K8 how to interpret marking out conventions (such as cutting lines, centre lines)
- K9 the various shearing machine cutting methods and techniques (such as cutting to marking out; using machine backstops)
- K10 material handling and preparation methods (such as degreasing, de-burring, straightening)
- K11 the material cutting characteristics and process considerations that need to be taken into account when shearing plate material
- K12 the method of setting and adjusting guillotine blades for the material thickness
- K13 tool and equipment care and control procedures, and how to recognise when the cutting blades require changing
- K14 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
- K15 the safety mechanisms and devices that are on the machine, and why they must always be used (machine guards, interlocks, safety operating devices)
- K16 the problems that can occur when using shearing machines, and how these can be avoided

- K17 inspection techniques that can be applied to check that shape and dimensional accuracy are to specification and within acceptable limits
- K18 the extent of your own authority and whom you should report to if you have problems that you cannot resolve
- K19 reporting lines and procedures, line supervision and technical experts

Additional Information

Scope/range related to performance criteria

- You must be able to:*
1. confirm that the equipment is safe and fit for purpose by carrying out all of the following checks:
 - 1.1 the appropriate equipment/machine is selected for the operation being performed
 - 1.2 the machine guards and safety devices are in position and function correctly
 2. cut metal plate using both of the following types of shearing machine:
 - 2.1 guillotines
 - 2.2 section cropping machine
 3. cut materials using both of the following techniques:
 - 3.1 to markings
 - 3.2 using machine backstop for multiple cutting
 4. perform operations that produce straight and accurate cuts, which include both of the following:
 - 4.1 parallel cuts
 - 4.2 square cuts
 5. cut plate, sections or bars for one material from the following:
 - 5.1 mild steel
 - 5.2 brass or copper
 - 5.3 stainless steel
 - 5.4 tin plate
 - 5.5 aluminium
 - 5.6 other specific materials
 6. produce cut components which meet all of the following quality and accuracy standards:
 - 6.1 dimensional accuracy is within the tolerances specified on the drawing/specification
 - 6.2 cut components are free from excessive distortion
 - 6.3 cut edges are neat and free from false tool cuts and shearing slivers

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