SEMFWE3-34
Cutting materials using saws and abrasive discs

Overview

This standard identifies the competencies you need to cut and shape materials using saws and abrasive discs in accordance with approved procedures. You will be required to select the appropriate equipment for the operations to be carried out and check that it is in a safe and usable condition. In carrying out the cutting and shaping operations you will be expected to use both saws and abrasive discs to cut and shape the materials to the required accuracy and specification.

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

Your underpinning knowledge will provide a good understanding of your work, and provide an informed approach to applying cutting procedures when using saws and abrasive discs. You will understand the suitability of the cutting processes, and their applications, and will know about the characteristics of the materials and the appropriate processes and techniques 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 carrying out the cutting and shaping activities. 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:

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

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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 power operated saws and abrasive disc cutting machines (statutory regulations, risk assessment procedures and COSHH regulations)

K2 the personal protective clothing and equipment (PPE) that needs to be worn when carrying out the fabrication activities (such as leather gloves, eye/ear protection, safety helmets)

K3 safe working practices and procedures to be observed when working with the machines including emergency shutdown procedures

K4 the correct methods of moving or lifting heavy plate or rolled sections

K5 the hazards associated with fabrication work and cutting operations and how they can be minimised (such using dangerous or badly maintained tools and equipment; airborne particles; hot metal; burrs and sharp edges)

K6 how to obtain the necessary drawings, specifications and work instructions

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 first and third angle drawings, imperial and metric systems of measurement, workpiece reference points and system of tolerancing

K9 how to interpret marking out conventions (cutting lines, centre lines, etc.)

K10 the range of machine saws available (such as power hacksaws, circular saws and band saws)

K11 the abrasive cutting equipment available to include hand held portable machines and bench type radiac cutting machines

K12 the selection and fitting of abrasive cutting discs, cutting disc identification markings and how to identify the correct type of disc for the type of material being cut

K13 statutory regulations regarding the fitting and use of abrasive discs

K14 the material cutting characteristics and process considerations that need to be taken into account when cutting materials

K15 the use and care of tools and equipment such as checking that trailing leads, plugs and sockets are in a safe, tested and usable condition

K16 the use of safety screens to protect other uses from flying sparks whilst using abrasive cutting discs

K17 the importance of ensuring that the machine guards are correctly fitted and positioned before using the equipment

K18 how to set and adjust power saws for the various operations being

	performed
K19	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
K20	the problems that can occur when cutting materials using saws or abrasive discs, and how these can be avoided
K21	inspection techniques that can be applied to check shape and dimensional accuracy is to specification and within acceptable limits
K22	the extent of your own responsibility and who you should report to if you have problems that you cannot resolve
K23	reporting lines and procedures, line supervision and technical experts

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Additional Information

Scope/range related to performance criteria

You must be able to:

1. ensure that the equipment is fit for purpose and used safely by carrying out **all** of the following:
   - 1.1 selecting the appropriate equipment/machine for the operation being performed
   - 1.2 checking the machine guards and safety devices are in position and function correctly
   - 1.3 checking cutting discs/blades are in a serviceable condition (free from damage or chips; sharp)
   - 1.4 isolating the equipment from its power supply whilst changing blades or discs
   - 1.5 using the equipment safely and correctly and only for its intended purpose
2. use **two** of the following types of cutting equipment:
   - 2.1 machine saw
   - 2.2 hand held portable abrasive disc
   - 2.3 band saw
   - 2.4 radiac abrasive disc
3. carry out **all** of the following cutting and shaping activities:
   - 3.1 straight sawing
   - 3.2 abrasive disc cutting
   - 3.3 contour shaping using saws
4. cut and shape components which contain **all** of the following features:
   - 4.1 straight parallel cuts
   - 4.2 curved contours
   - 4.3 square cuts
   - 4.4 angled/mitred cuts
5. produce components that comply with **all** of the following quality and accuracy standards:
   - 5.1 dimensional accuracy is within specification tolerances
   - 5.2 cuts are square and clean and free from excessive burrs
   - 5.3 angled cuts are within specification requirements
6. cut and shape **three** of the following forms of material:
   - 6.1 flat plate
   - 6.2 solid bar (square, round, hexagonal etc)
   - 6.3 rolled sections (angle, channel, RSJ)
   - 6.4 pipe/tube
   - 6.5 rail section
   - 6.6 non-ferrous materials

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