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## Overview

This standard identifies the competencies you need to bend and form plate for fabrications in accordance with approved procedures using power operated pinch or pyramid rolls which may be hand adjusted or console controlled. You will be required to select the most appropriate type and size of power rolling machine based on the operations to be performed and the thickness and size of the material to be rolled. Setting up the rolls will involve setting and adjusting the gap between feed and forming rolls to suit plate thickness, positioning side roller and adjusting to suit required radius, checking and setting parallelism of rollers and applying suitable pressure to rollers throughout the forming operation.

You will be expected to carry out or direct the rolling operations for their effective use to form the material to the required profile without flats or deformities. You will also need ensure that all the required safety devices are operating correctly and that the machine guards are in place and correctly adjusted. Materials to be rolled may include ferrous and non-ferrous and will include operations such as rolling cylinders and cones, producing curved sections, counter curved sections, pipe sections and straightening plate. This will call for care in selecting the right machines so as to avoid damage to the tools and 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 rolling activities that you cannot personally resolve, or are outside your personal 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 produce.

Your underpinning knowledge will provide a good understanding of your work, and provide an informed approach to applying the power rolling procedures required. You will understand the process and its application, and will know about the equipment, and materials in adequate depth to provide a sound basis for setting up the equipment, correcting faults and carrying out the activities to the required specification. You will need to understand the safety precautions required when working with power rolls and the safeguards necessary for undertaking the activities safely and correctly. You will be required to demonstrate safe working practices and procedures throughout, and will understand the responsibilities you owe to yourself and others in the workplace.

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## Forming platework using power rolling machines

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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 equipment is set up correctly and is ready for use
  - P3 manipulate the machine controls safely and correctly in line with operational procedures
  - P4 produce components to the required specification
  - 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 with rolling machines in a fabrication environment (general workshop and site safety, appropriate personal protective equipment (PPE), accident procedure; statutory regulations, risk assessment procedures and COSHH regulations)
- K2 checks that need to be carried out to ensure that the power rolls are safe and in a fit condition to use
- K3 the personal protective clothing and equipment that needs to be worn when working with heavy platework (such as gloves, eye/ear protection, safety helmets)
- K4 the handling precautions and correct methods of moving or lifting sheet or plate materials
- K5 the hazards associated with fabrication work and how they can be minimised, such as handling sheet/fabricated components, using hot metal techniques, using dangerous or badly maintained tools and equipment, moving parts of power rolling machines
- K6 how to obtain the necessary drawings, specifications and job 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 marking out conventions used in platework and how to recognise the bending, forming and cutting lines
- K10 the basic principle of operation of the power rolling machine used and the type of work it can perform
- K11 how to select an appropriate machine for the operations to be performed (roll size; power of machine)
- K12 how to set up the machine to produce the required form (cylinders, cones, curved sections, straightening plates)
- K13 techniques of rolling (including pre-setting plate edges, adjusting pressure throughout the rolling operations, checking component for parallelism or form throughout the operations)
- K14 how to release the rolls and remove the workpiece when rolling cylindrical and conical sections
- K15 ways of limiting distortion, marking, creases and flats in curved sections
- K16 how the materials need to be prepared prior to rolling, and the effects of raw material scale or burrs on the finished article

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- K17 material characteristics with regard to forming using rolling machines
- K18 the care and maintenance procedures that need to be observed to ensure the machines are in a serviceable condition
- K19 the sort of problems that can occur with the rolling activities, and how they can be avoided
- K20 the organisational quality control procedures and how to recognise rolling defects
- K21 the inspection checks that need to be carried out and the tools and equipment that are used
- K22 the accuracy that can be achieved by rolling and limitations of the rolling processes
- K23 the extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

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### Additional Information

#### Scope/range related to performance criteria

- You must be able to:*
1. confirm that the equipment is safe to use and fit for purpose by carrying out **all** of the following checks:
    - 1.1 the rolls are appropriate for the material used and operations being performed
    - 1.2 the machine guards and safety devices are in position and operating correctly
    - 1.3 rolls are appropriate for the operation and in a serviceable condition (suitable diameter; free from damage)
    - 1.4 roll settings are suitable for the material thickness and operations to be performed
    - 1.5 equipment for supporting the plate at the start of the rolling operations is in place
  2. use **one** of the following types of power rolling machine:
    - 2.1 powered rolls hand adjusted
    - 2.2 powered rolls console adjusted
    - 2.3 different roll sizes (diameter) and power
  3. perform rolling operations that produce **five** of the following:
    - 3.1 cylinders
    - 3.2 cones
    - 3.3 segments of a cylindrical tank
    - 3.4 curved section or sector of an otherwise flat plate
    - 3.5 counter curved sections
    - 3.6 pipe sections
    - 3.7 flattening or straightening plate
  4. carry out rolling operations on **one** type of material from the following:
    - 4.1 carbon steel
    - 4.2 stainless steel
    - 4.3 aluminium
    - 4.4 special metals
  5. produce rolled components that conform to **all** of the following quality and accuracy standards:
    - 5.1 dimensional accuracy is within the specification tolerances
    - 5.2 the rolled section conforms to best practice and or specification without deformation or cracking
    - 5.3 the component conforms to the required shape/geometry (to the template profile)

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