ECIIPSM01

Shape engineering components by material removal using hand tools (powered and unpowered) in engineering construction

Overview

This standard is about shaping engineering components by material removal using hand tools (powered and unpowered) in engineering construction.

You will need to be able to shape materials using the appropriate materials and techniques and check that the specification has been met whilst adhering to health and safety legislation, regulations and safe working practices. In the context of this standard, your responsibility is to interpret and work within given specifications, selecting techniques and making variations to achieve the best possible result. In some cases, you may still be expected to refer to others for final authorisation, even though you remain responsible for identifying and implementing decisions.

Who this standard is for

This standard is for Mechanical Fitters, Pipefitters, Platers and Trayfitters.

Performance criteria

You must be able to:

You must be able to:

P1 work safely at all times, complying with health and safety and other relevant legislation, regulations, guidelines and local rules or procedures

P2 ensure that the work environment, material, tools and equipment are suitably prepared for the work activities to be undertaken

P3 obtain the required materials and check them for quantity and quality

P4 obtain and follow the relevant engineering drawings and related specifications and quality standards for the component to be produced

P5 shape the materials using appropriate shaping methods and techniques with hand tools (powered and unpowered)

P6 check that all the required shaping operations have been completed to the required specification

P7 reinstate the work area

P8 deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and understanding

You need to know and understand:

You must be able to:

K1 relevant legislative, regulatory and local requirements or procedures and safe working practices

K2 preparation and reinstatement requirements in respect of the work area, material, and equipment, and the possible consequences of incorrect actions in these areas

K3 engineering drawings and related specifications

K4 hand tool (powered and unpowered) shaping methods, techniques and terminology

K4.1 which tools to use and when

K4.2 how to sequence the stages of work

K4.3 how to modify the way of working to meet particular needs

K5 how to check components comply with specification and the equipment and procedures for doing this

K6 how to identify defects

K7 your responsibilities for ensuring care and security of tools and equipment used

K8 your responsibilities with regard to reporting lines and procedures in your working environment

Scope/range

Work environment
Typical work environments could include:

1 at height
2 confined spaces
3 controlled operational and offshore installations
4 designated work areas
5 engineering construction sites
6 existing plants and structures
7 fabrication workshops
8 nuclear power stations
9 onshore and offshore installations
10 potential explosive atmospheres
11 shafts
12 shipyards
13 tunnels
14 working on access structures (scaffold)
15 working inside plant and systems

Materials

The materials worked on have properties which can mean that shaping them requires modification to the typical approach used. Typical materials used in engineering construction activities such as fabricating steel structures, mechanical fitting, pipefitting or trayfitting could include:

1 composites
2 ferrous and non-ferrous metals
3 plastics

The form these materials take could be:

4 bar
5 blocks

6 commercial materials (mesh, chequer, grid) 7 fabricated sections 8 formed sections 9 pipe 10 plate 11 rods 12 rolled sections 13 tube

Engineering drawings and related specifications
These could include:

1 assembly
2 component
3 general arrangement
4 isometrics

Specifications could include:

5 manufacturers' instructions
6 method statements
7 product worksheets

Shaping methods and techniques

Typical techniques used to shape fabricated steel structures, pipework components, components for mechanical fitting and/or trayfitting could include:

1 abrasive finishing
2 drilling
3 filing
4 grinding
5 punching
6 sawing
7 shearing
8 thermal cutting

Additional techniques used to shape pipework could include:

9 thread cutting
10 wheel cutting

Additional techniques used in other craft/technical areas such as mechanical fitting could include:

11 chiselling
12 scraping

Reinstate the work area This term could include:

1 Returning the work area to a safe condition
2 correctly disposing of waste materials
3 storage of reusable materials, consumables and equipment in accordance with appropriate procedures
4 completion of all necessary documentation

Glossary

Hand tools (powered and unpowered)

Powered and unpowered hand tools are tools that are portable and not fixed.

Links to other NOS

Fabricating Steel Structures – Plating

Installing Plant and Systems – Pipefitting

Trayfitting – Towers and Columns

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