
Overview

This standard covers the application of core land-based engineering principles, specifically material preparation, shaping and assembling. It covers the preparation and finishing of materials, the shaping and forming of materials by hand and power tools and the assembling of components using threaded, non-threaded or chemical fasteners.

When working with machinery or equipment you should be trained and hold current certification, where required, in accordance with the relevant legislation.

When working on high voltage (hazardous voltage/HaV) electric vehicles, de-energising must be done by a person who has been trained in accordance with the manufacturer's procedures.

This standard is for those who work in land-based engineering under supervision.

Note – in accordance with current regulations, mains electricity work must be carried out by a competent person, usually an electrician.

Performance criteria

You must be able to:

1. be aware of the hazards and risks associated with the activity and the location where it is to be carried out
2. be aware of the potential environmental impact associated with the activity and the ways in which this can be controlled
3. select and wear suitable clothing and personal protective equipment (PPE)
4. select, prepare, use, maintain, and store the tools and equipment required to carry out the activity in accordance with the relevant legal requirements, manufacturer's instructions and company practices
5. interpret information in relation to engineering tasks from engineering drawings, sketches and instructions
6. prepare materials and mark out profiles according to the specifications provided
7. apply core land-based engineering principles to produce profiles or components to specifications and tolerances provided
8. assemble components or sub-assemblies to the specifications provided
9. work to and within the specifications provided
10. verify that assemblies and components comply with the specifications provided
11. process materials for the application provided
12. leave the workplace in a safe condition following completion of the activity
13. deal with the different types of waste, including hazardous and non-hazardous, caused by the activity, in accordance with instructions and the relevant legal and environmental requirements
14. complete records, as required, in accordance with company instructions

Knowledge and understanding

You need to know and understand:

1. the hazards and risks associated with land-based engineering
2. the type of clothing and personal protective equipment (PPE) suitable for the activity
3. the tools and equipment required to carry out the activity and how to select, prepare, use, maintain and store these safely and correctly, in accordance with the manufacturer's instructions and company practices
4. how to interpret information from engineering drawings, sketches and instructions
5. the techniques and tools used for marking out materials
6. the processes and techniques used for material preparation
7. the techniques used for material shaping and forming
8. the processes and techniques used for material finishing
9. the different types of fasteners, their characteristics and applications
10. the methods for securing components against vibration and rotational movement, including mechanical and chemical/adhesive
11. the material and compound gasket characteristics, function and applications
12. the reasons for, and the methods of, aligning components with one another
13. the reasons for quality control and the methods of verifying compliance with specifications
14. the importance of leaving the workplace in a safe condition following completion of the activity
15. how to deal with the different types of waste, including hazardous and non-hazardous, caused by the activity, in accordance with instructions and the relevant legal and environmental requirements
16. the potential impact that the activity could have on the environment and the ways in which this can be controlled
17. the records that need to be completed and the company procedure for these

Glossary

- assemble components - e.g. retaining and locating components; routing of pipes and wiring harnesses; timing of components to one another; fitting and removal of gaskets, orientation and alignment of components
- fasteners - e.g. bolts, nuts, washers, screws, keys, studs, rivets, pins, dowels, keys, circlips and snap rings, belt joiners
- finishing - e.g. annealing, painting, plating, polishing, hardening, case hardening, tempering, hard-facing hardening
- marking out techniques and tools - e.g. engineer's blue, templates, jigs
- scriber's preparation - e.g. cleaning, degreasing and de-scaling
- shaping and forming - e.g. grinding, filing, sawing, using applied heat, oxy-acetylene and plasma cutting and applied pressure.
- securing components - e.g. cab glass, spring washers, securing tabs, self-locking nuts

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Apply core land-based engineering principles: material preparation, shaping and assembling



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