

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

Overview

This standard covers the application of core land-based engineering principles: material preparation, shaping and assembling. It includes 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.

This standard is for those who work in land-based engineering and is appropriate for persons working under supervision.

Note: due to current regulations an approved electrician should be involved when working with mains electricity.

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Performance criteria

You must be able to:

1. interpret information in relation to engineering tasks from engineering drawings, sketches and instructions
2. prepare materials and mark out profiles to given specifications
3. apply core land-based engineering principles to produce profiles or components to given specifications and tolerances
4. **assemble components** or sub assemblies to given specifications
5. work to and within given specifications
6. verify that assemblies and components comply with specifications
7. process materials for a given application

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Knowledge and understanding

You need to know and understand:

1. how to interpret information from engineering drawings, sketches and instructions
2. techniques and tools used for **marking out** materials
3. material **preparation** processes and techniques
4. material **shaping and forming** techniques
5. material **finishing** processes and techniques
6. **fasteners** - hardware types, their characteristics and applications
7. methods of **securing** components against vibration and rotational movement, including mechanical and chemical/adhesive
8. material and compound gasket characteristics, function and applications
9. the reasons for and the methods of aligning components to one another
10. the reasons for quality control and methods of verifying compliance with specifications

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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, scribes

preparation - e.g. cleaning, degreasing and de-scaling

securing components - e.g. cab glass, spring washers, securing tabs, self-locking nuts

shaping and forming - e.g. grinding, filing, sawing, using applied heat, oxy-acetylene and plasma cutting and applied pressure.

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Developed by	Lantra
Version Number	2
Date Approved	December 2015
Indicative Review Date	December 2020
Validity	Current
Status	Original
Originating Organisation	Lantra
Original URN	LANLEO6
Relevant Occupations	Land-based Engineering
Suite	Land-based Engineering Operations
Keywords	engineering; principles; materials; preparation; shaping; assembly; land-based; equipment; machinery