

LANLEO6 - SQA Unit Code F9ED 04

Core land-based engineering principles – Material preparation, shaping and assembling



Overview

This standard covers the processing and preparation of materials, e.g. hardening, tempering, annealing, cleaning, polishing and applying protective coatings.

It also covers the shaping and forming of materials by hand and power tools – examples include grinding, filing, sawing, using applied heat, oxy acetylene and plasma cutting equipment and applied pressure.

The standard includes the assembling of components using threaded, non threaded or chemical fasteners; methods of retaining and locating components; the routing of pipes and wiring harnesses; timing of components to one another; the fitting and removal of gaskets and the orientation and alignment of components.

This standard relates to the following application or context:

1. Preparing and processing materials:
 - 1.1 Cleaning, degreasing and de-scaling
 - 1.2 Finishing – protective coatings which may include, paint, rust prevention, polish etc.
2. Shaping materials:
 - 2.1 Interpreting engineering drawings
 - 2.2 Marking out
 - 2.3 Cutting and profiling
 - 2.4 Verifying specifications
3. Assembly of components:
 - 3.1 Fastener types, hardware and chemical
 - 3.2 Sealing components, gaskets and compounds
 - 3.3 Orientation and routing of components
 - 3.4 Alignment and timing
 - 3.5 Marking the relationship of components
 - 3.6 Verifying operation of an assembly

Anyone undertaking mains electrical work must comply with current regulations.

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Performance criteria

You must be able to:

- P1 interpret information in relation to engineering tasks from engineering drawings, sketches and instructions
- P2 mark out profiles to given specifications
- P3 produce profiles or components to given specifications and tolerances
- P4 assemble components or sub assemblies to given specifications
- P5 work to and within given specifications
- P6 verify that assemblies and components comply with specifications
- P7 process materials for a given application, e.g. degrease, de-scale, harden, anneal, polish, paint

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Knowledge and understanding

You need to know and understand:

- K1 marking out techniques and tools, e.g. engineers blue, templates, jigs, scribes
- K2 cutting and shaping techniques
- K3 material finishing processes and techniques, e.g. annealing, painting, plating, polishing, hardening, case hardening, tempering, hard facing
- K4 fasteners – hardware types, their characteristics and applications, e.g. bolts, nuts, washers, screws, keys, studs, rivets, pins, dowels, keys, circlips and snap rings, belt joiners
- K5 methods of securing components against vibration and rotational movement – mechanical and chemical/adhesive , e.g. cab glass, spring washers, securing tabs, self locking nuts
- K6 material and compound gasket characteristics, function and applications
- K7 the reasons for and the methods of aligning and timing components to one another
- K8 how to route and secure pipes, cables and electrical harnesses
- K9 the reasons for quality control and methods of verifying compliance with specification

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Glossary

Drawings

'Drawings' may include both sketches and engineering drawings.

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