



Learners will investigate the selection of materials, proprietary components, making processes and disassembly of a given engineered product. They will plan, reproduce, inspect and test a single component

**Learning Aim A**  
Learners will demonstrate a detailed understanding of the properties of ferrous, non-ferrous and polymeric materials, and how the properties influence the choice of making process when raw materials are transformed into products. Learners should appreciate that some metals are more difficult to cut than others, for example stainless and mild steel, but that their properties may dictate choice, for example stainless steel components working in corrosive conditions. Learners should appreciate that unless the process is simple, expensive vacuum forming dies will be required. Learners will present a detailed evaluation of why a particular making process was chosen. Learners will evaluate the reasons for using particular proprietary components such as fixing devices permanent/semi-permanent) and electronic components when assembling components into a finished product. Learners should acquire information on aspects such as being able to disassemble products so that they can be serviced.

**Learning Aim B**  
Learners will carry out the disassembly of an engineered product using correct tools and procedures that demonstrate a high level of competence. Components are to be systematically laid out and correctly labelled (name of component, material, function). Learners would be expected to make reference to an assembly drawing and other information about the product. Visual examination of each component, dimensional measurements and recording of information is to be carried out accurately. There should be no damage caused to components as the product is disassembled; it is not necessary for learners to reassemble the product but good practice dictates that this should be possible. Learners will present a detailed description of how the components interrelate/interact. They will correctly interpret the dimensional and other data gathered from the disassembly activity. Learners will use this data to produce a product design specification (PDS) that meets given accuracy requirements. Learners will correctly justify the features of the PDS. The PDS will include dimensional constraints, functional requirements, operating performance, and economic and manufacturing considerations.

## Unit Overview

This component builds on the knowledge and skills you have learned and used in Component 1. The manufacture of an engineered product involves design, the correct selection of materials, components and the making processes. This component will give you an understanding of the types and properties of metallic and polymeric materials, and proprietary components commonly used in engineered products. You will acquire an understanding of the selection of materials, proprietary components, making processes and disassembly of a given engineered product. You will then plan, reproduce, inspect and test a single component. This component will support you in progressing to a Level 2 or 3 qualification in a range of engineering sectors, for example aerospace, automotive, electrical, electronic, manufacturing, marine, mechanical or telecommunications. You will develop transferable skills such as problem solving, communication and aspects of critical thinking, all of which will support your progression to Level 2 or 3 vocational or academic qualifications.

## Learning Aims:

- A** Understand materials, components and processes for a given engineered product
- B** Investigate a given engineered product using disassembly techniques
- C** Plan the manufacture of and safely reproduce/inspect/test a given engineered component.

**Learning Aim c**  
Learners will produce a detailed, accurate plan for the making of an engineered component. The plan will correctly specify health and safety requirements, operations/processes, materials, tools and equipment, and inspection requirements for the finished component. Learners will follow the making plan to produce the engineered component to specification. They will work independently but confirm with the assessor that they are fully aware of the hazards involved when using engineering equipment. Learners will accurately record inspection data and propose rectification action if specification details have not been achieved, for example dimensional errors. They present a detailed evaluation of the planning and making of the engineered product; if things have not turned out to plan, they will make recommendations as to how to improve the manufacture process in the future.

## Key Vocabulary

Polymers, Carbon, grains, ductility, brittleness, tensile

## Numeracy links:

Manufacturing uses precise measurements to ensure that accuracy is at its highest.

## Work Related Learning:

Gaining knowledge of how materials and their properties is key to working in any part of engineering

## SMSC and British Values

Understanding the importance that good design can have to solve critical issues in the world.