

## OCR-set Assignment

### Assessment Material

OCR Level 1 / 2 Cambridge National Certificate in Engineering Manufacture

R112: Quality control of engineered products

### Set B – available from September 2020



This OCR set assignment is to be used to provide evidence for the unit identified above. Alternatively, centres may ‘tailor’ or modify the assignment within permitted parameters (see Information for Teachers). It is the centre’s responsibility to ensure that any modifications made to this assignment allow learners to show that they can meet all of the learning outcomes and provide sufficient opportunity for learners to demonstrate achievement across the full range of marks.

#### INSTRUCTIONS TO TEACHERS

The OCR administrative codes associated with this unit are:

- unit entry code            R112
- certification codes        Certificate J842

The qualification numbers associated with this unit are:

- unit reference number T/505/3541
- qualification numbers    Certificate [601/1219/0]

**Duration: Approximately 10–12 hours**

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## OCR-set Assignment

### Information for Learners

OCR Level 1 / 2 Cambridge National Certificate in Engineering Manufacture

R112: Quality control of engineered products

# Scenario for the assignment

Manufacturing companies rely on producing high quality products that meet the demands of both their client and customer base. Manufacturers will need to consider their production methods, processes and procedures to ensure that high quality control is carried out throughout. The reputation of any company will be based not only on the products manufactured, but the systems and control of its operation. Just in time and lean manufacturing methods can influence a company's quality control procedures.

The company that manufactures the aluminium hammer (produced in R111) is reviewing the quality control processes and procedures it undertakes with a view to introducing the principles of lean manufacturing throughout its production process.

**Read through all of the tasks carefully, so that you know what you will need to do to complete this assignment.**

# Your Tasks

## Task 1 – Understand the importance of quality control

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Learning Outcome 1, Understand the importance of quality control, is assessed in this task.

The company is reviewing the quality control processes and procedures it currently undertakes throughout its manufacturing operations.

You have been tasked with producing a report outlining the purpose and benefit of quality control as part of a production cost review process.

You will need to include in your report:

- the reasons for implementing quality control in production giving a range of examples
- the quality control procedures used within manufacture that include:
  - quality control
  - quality standards
  - quality assurance
  - total quality management.

## Task 2 – Assessment of product quality through inspection and quality control techniques

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Learning Outcome 2, Be able to assess product quality from inspection and quality control techniques, is assessed in this task.

Quality control is an important part of the production process. A quality control procedure is required for the production of the aluminium hammer to ensure it consistently meets the design specification requirements.

You will need to:

- develop a quality control procedure for the production of the aluminium hammer manufactured in unit R110 or R111 that describes the quality control techniques and inspection checks used for each stage of production
- independently inspect the aluminium hammer using appropriate quality tools and techniques
- produce an evaluation of the aluminium hammer based on the quality control checks used.

You should demonstrate your ability to draw upon relevant skills/knowledge/understanding from other units you have studied in this task.

### Task 3 – Modern technologies can be used in quality control

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Learning Outcome 3, Know how modern technologies can be used in quality control, is assessed in this task.

The company is further considering expanding its resources for quality control to include the applications of modern technologies. A report is required that considers the range of different modern technologies available that could be used within its current production.

You need to produce a report that considers different applications of modern technologies in quality control.

### Task 4 – Principles of lean manufacturing

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Learning Outcome 4, Know the principles of lean manufacturing, is assessed in this task.

To remain competitive in modern manufacturing and reduce production costs it is important that companies consider the principles of lean manufacturing and management of waste.

You will need to provide senior management with information about the principles of lean manufacturing and how they might benefit the company including:

- categories of waste including their cause
- the methods used to reduce waste, considering the different aspects of design for manufacturing assembly, and sustainable design considerations to include:
  - causes of waste in manufacturing
  - categories of waste
  - methods of reducing waste.

## OCR-set Assignment

### Information for Teachers

OCR Level 1 / 2 Cambridge National Certificate in Engineering Manufacture

R112: Quality control of engineered products

# Guidance on using this assignment

## 1 General guidance

- 1.1 OCR assignments are available to download free of charge from our website:  
[www.ocr.org.uk](http://www.ocr.org.uk)
- 1.2 OCR assignments are intended to be used for summative assessment of learners. The OCR specification gives more information on the arrangements for assessing internally assessed units.
- 1.3 This assignment has been designed to meet the full assessment requirements of the unit. Learners will need to take part in a planned learning programme that covers the underpinning knowledge, understanding and skills of the unit.

## 2 Before carrying out the assignment

- 2.1 Learners should be provided with a copy of the *Information for Learners* section of this assignment.
- 2.2 Learners will not need to carry out any preparations prior to undertaking the assessment tasks, such as collating resources to use in the assessment.
- 2.3 We have estimated that it will take approximately 10–12 hours to complete all tasks. Learners would need approximately 1–2 hours to complete Task 1 and approximately 4–5 hours to complete Task 2, approximately 1–2 hours to complete Task 3 and 2–3 hours to complete Task 4. These timings are for guidance only but should be used by the teacher to give learners an indication of how long to spend on each task. Centres can decide how the time can be allocated between each part or individual task. Centres are also permitted to spread the tasks across several sessions and therefore it is permissible for evidence to be produced over several sessions.

## 3 When completing the assignment and producing evidence

- 3.1 Each learner must produce individual and authentic evidence for each task within the assignment.
- 3.2 Centre staff may give support and guidance to learners. This support and guidance should focus on checking that learners understand what is expected of them and giving general feedback that enables the learner to take the initiative in making improvements, rather than detailing what amendments should be made. It is not acceptable for teachers/deliverers to provide answers, to work through answers in detail or to detail specifically what amendments should be made.
- 3.3 Learners may use information from any relevant source to help them with producing evidence for the tasks.
- 3.4 Learners must be guided on the use of information from other sources to ensure that confidentiality is maintained at all times.



- 3.5 Usually, the type of evidence required may be modified, with the exception of certain types of evidence listed below under '*Permitted changes*'. It is important to note that it is possible to generate the evidence in a variety of formats. Centres must advise learners as to the most appropriate format of evidence. The nature of this assessment means that learners are free to use the format that they feel is most appropriate for the purpose and target audience for each individual task (see Section 6).

#### 4 Presentation of work for marking and moderation

- 4.1 Centres wishing to produce digital evidence in the form of an e-portfolio should refer to the appendix in the specification on guidance for the production of electronic assessment.
- 4.2 Centres may wish to discourage learners from excessive use of plastic wallets for presentation of their evidence as this may hinder the assessment process. Instead centres may wish to encourage learners to present their work so that it is easily accessible, e.g. spiral bound, stapled booklet, treasury tag.
- 4.3 All work must be marked against the marking criteria for the unit. Marks are allocated to learning outcomes rather than tasks. Please see Appendix B Marking criteria for centre assessment and Section 4, The centre assessed units, in the specification for this qualification for more information on marking, moderation and submission of work.

#### 5 Scope of permitted set assignment modification

The set assignment is self-contained in its present form. The set of tasks form a coherent whole addressing all the learning outcomes and allowing access to the full range of marks.

**You must not change the following:**

- the learning outcomes
- the marking criteria
- the requirements for supervision and authentication as described in the specification (Section 4 *The centre assessed units*)
- the maximum duration for completion of the assignment.

Permitted changes:

The set assignment can be modified in terms of the areas described below but centres must be sure that learners still have the opportunity to cover all of the learning outcomes and to access the full range of marks:

- the scenario, which can be contextualised or amended to suit local needs
- each specific task may be appropriately contextualised to match with any permitted changes you have made to the scenario.

Should the centre change the context of the assignment they must make sure that the product to be designed and prototyped is of equal complexity to that given in this set assignment.

OCR has ensured that in the language used and the tasks and scenario provided we have avoided discrimination, bias and stereotyping and support equality and diversity. In the development of qualifications and assessments we use the guidance given in the Ofqual publication *Fair access by design*, notably this includes:

- using language and layout in assessment materials that does not present barriers to learners
- using stimulus and source materials in assessment materials (where appropriate) that do not present barriers to learners.

If centres wish to modify the set assignment we strongly advise that staff responsible for modifying the set assignment and the quality assurance of it refer to the publication *Fair access by design*.

**If modifications are made to the set assignment, whether to just the scenario or to both the scenario and individual tasks, it is up to the centre to ensure that all learning outcomes can still be met and that learners can access the full range of marks.**

## 6 Specific guidance on the task

ICT facilities including digital photography and/or video will be required to produce the portfolio of evidence required for assessment.

A portfolio of evidence should be produced for assessment. This may be presented in the form of an electronic portfolio containing both written and video evidence showing all processes and procedures involved in the manufacture of the prototype product with written evidence to support production planning and quality control tasks.

### Task 1

Learners should give clear reasons for implementing quality control in production and should consider quality control procedures, giving examples. Assessment is to be based upon the detail provided in the quality control procedure presented. Learners should be able to select, describe and justify appropriate quality control procedures to be applied.

This exercise could be based on the products made in Units R110 and R111, although the centre could provide suitable alternative products as necessary.

The evidence provided by the learner for this unit must be unique, and not the same evidence from Units R110 or R111. The components manufactured in R110 and R111 could be used to perform quality control inspection for this unit.

Where learners carry out the exercise as a team, it is important that the individual learner's contribution is clearly identified in the portfolio presented.

### Task 2

Assessment is to be based upon the detail provided in the quality control procedure presented. Learners should be able to select, describe and justify appropriate quality control procedures to be applied.

This exercise could be based on the products made in Units R110 and R111, although the centre could provide suitable alternative products as necessary. The evidence provided by the learner for this unit must be unique, and not the same evidence from Units R110 or R111. The components manufactured in R110 and R111 could be used to perform quality control inspection for this unit.

Where learners carry out the exercise as a team, it is important that the individual learner's contribution is clearly identified in the portfolio presented. Learners should show theoretical knowledge of a range of inspection and quality control techniques as indicated in the unit content. They will also be assessed on their ability to select and use appropriate tools and equipment to carry out an inspection of a product and evaluate product quality based on the outcome of the inspection.

Evidence of inspecting a product using appropriate tools and techniques should be provided in the portfolio by videos and/or digital photos, which may be supported by signed witness statements.

Learners will be able to develop their understanding of quality control checks from R110 further in the planning for the review of manufactured products.

### **Task 3**

Learners will be required to demonstrate their knowledge of the use of modern technologies in quality control. A method that could be applied to the high-volume manufacture of the products used for LO1 and LO2 may be selected and described (if appropriate).

This can be research based by presenting a detailed, illustrated description of the process or from a practical application with written commentary.

### **Task 4**

Assessment will be based on the learner's ability to demonstrate their knowledge of the principles of lean manufacturing which could relate to the products manufactured in unit R110 or R111. Learners should consider a range of categories of waste including their cause. They should describe the methods used to reduce waste, considering the different aspects of design for manufacturing assembly, and sustainable design considerations.

**Total marks for assignment: 60**



# Witness Statement – Task 2

<b>LEARNER NAME</b>	
<b>Date</b>	
<b>Unit</b>	R112 – Quality control of engineered products
<b>LO2</b>	Be able to assess product quality from inspection and quality control techniques

Independent working to assess product quality	
<b>Witness observations</b>	

Name of witness: \_\_\_\_\_

Relationship to learner: \_\_\_\_\_

Assessor comments: How the observations demonstrate achievement against the marking criteria

**RECORD OF QUESTIONS/ANSWERS (if applicable)****ASSESSOR QUESTION 1****LEARNER RESPONSE 1****ASSESSOR QUESTION 2****LEARNER RESPONSE 2****ASSESSOR QUESTION 3****LEARNER RESPONSE 3****ASSESSOR SIGNATURE:****DATE:****LEARNER SIGNATURE:****DATE:**