



T Level Technical Qualification in Science

Occupational specialism assessment (OSA)

Metrology Sciences

Assignment 3

Assignment brief

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Task 1: customer drawing query

Scenario

You have been contacted by a potential customer who has supplied a drawing and asked you to provide a quote for producing the parts. You have noticed faults and missing information with the drawing provided.

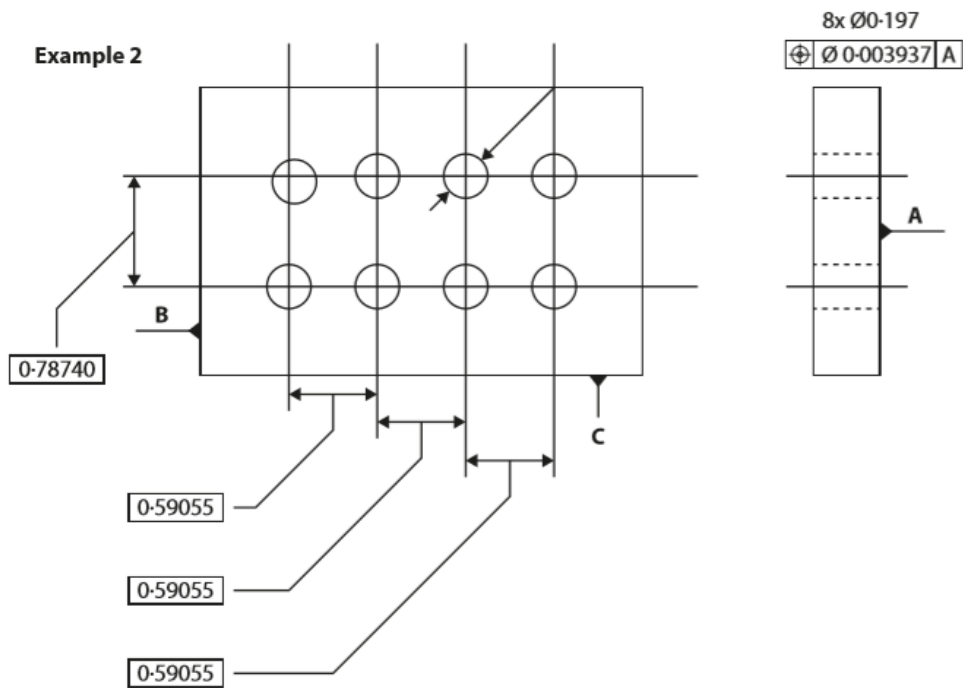
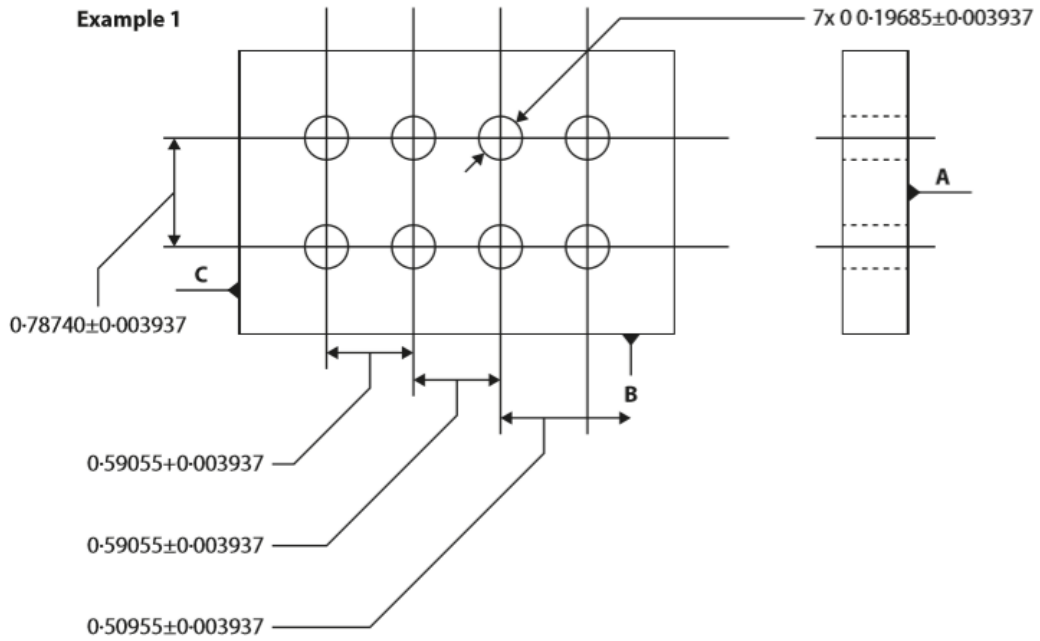
Task

Complete the diagram key so the customer understands the information on the diagram:

Symbol	Geometric characteristic	Tolerance type
—	Straightness	
∠	Angularity	
⌒		Location
	Total runout	Runout
⊕		Location
⊥	Perpendicularity	
	Profile of a surface	Location
	Cylindricity	Form
▭		Form

Correct any incorrect or missing information in the drawings provided by the customer:

All measurements in millimetres unless otherwise stated.



(12 marks)
 (30 minutes)

Task 2: calculating inspection cost

Scenario

The sales department for Precision Engineers has received an enquiry from AirRow Parts Ltd to inspect machined components from supplied die casting parts. As part of your role, you have been asked to produce an estimate for the inspection of these parts, based on the customer requirements and drawing provided.

Task

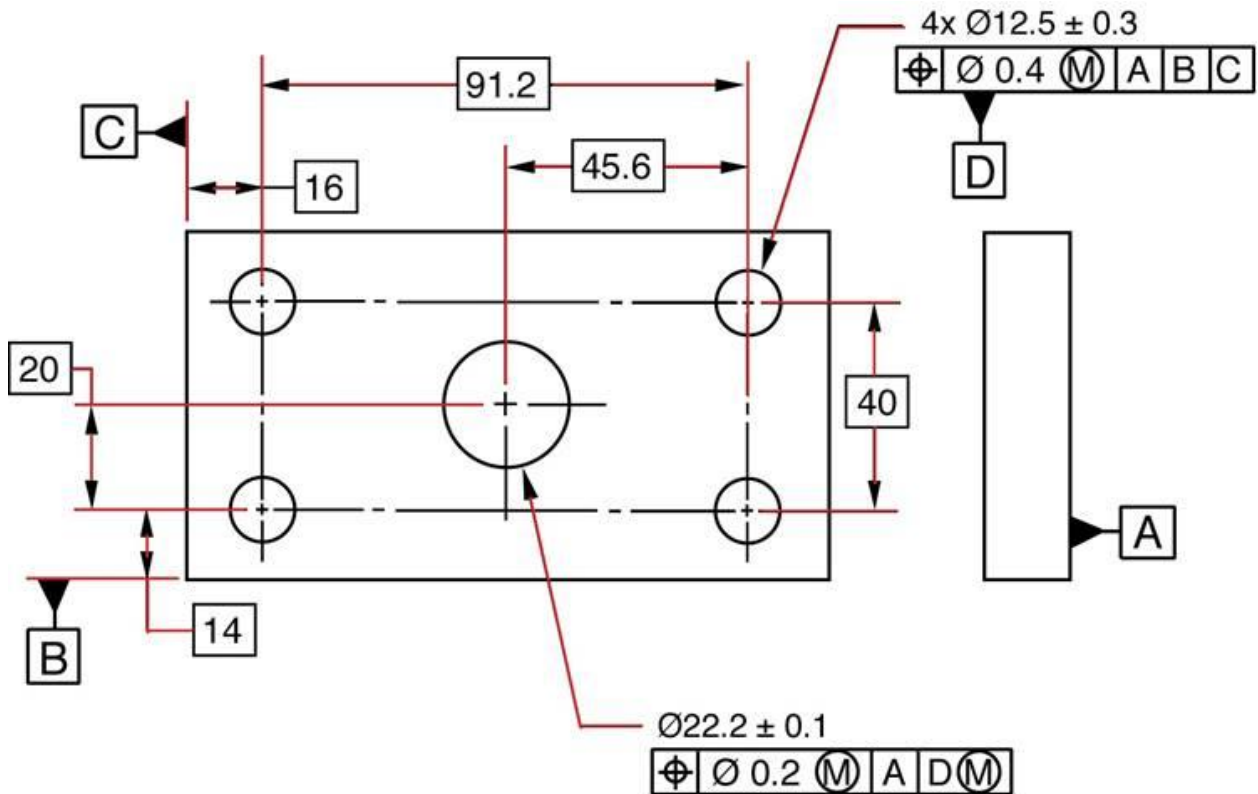
Produce a cost per product, and a total cost for an inspection of a batch of 100 units. A template has been provided to support you. If you wish, you may make your own template, as long as it meets the needs of the task.

The estimate should include each key feature in the drawing and should show the equipment required, with reference to any uncertainty associated with the equipment.

(22 marks)

(1 hour 30 minutes)

All measurements in millimetres unless otherwise stated.



NCFE 2020

Task 3: designing a plan for inspection

Scenario

Your estimation for the inspection of the 100 parts has been accepted and you have been provided with all 100 parts, based on the customer requirements. Before you inspect them, you need to create an inspection procedure and define how the parts will be measured. The procedure shall highlight any issue which may occur with repeatability.

Task

Use the drawing of the part from task 2 to create working instructions detailing your plan. Your plan should include:

- how you will inspect every critical feature
- your sampling method to ensure all aspects are recorded
- the data collection method selected
- creation of a suitable uncertainty budget
- how you will ensure calibration of equipment selected
- appropriate tooling and equipment selection, with justification, taking consideration of the relative uncertainty of measurement of the equipment selected for each measurement
- how you will ensure environmental factors are dealt with
- how you will be minimising the impact of hazards and complying with relevant health and safety law and legislation
- any other relevant inclusions

(29 marks – 9 marks assigned to the uncertainty calculation)
(2 hours 30 minutes)

Appendix 1: task 2 template – inspection cost template

Number	Ref location	Characteristic designator	Requirement	Unit	Upper limit	Lower limit	Equipment and preparation required	Accuracy/uncertainty consideration	Estimation of prep time	Estimation of number of measurements	Estimation of time per measurement	Total time
							Total					

Rate at £110/hr	
Total time	
Time per part	
Total cost	
Cost per part	

Any additional notes not displayed in quote table:

Document information

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Change History Record

Version	Description of change	Approval	Date of Issue
v1.0	Post approval, updated for publication.		January 2021
v1.1	NCFE rebrand.		September 2021