T-LEVELS | Institute for Apprenticeships & Technical Education

T Level Technical Qualification in Engineering, Manufacturing, Processing and Control

Employer-Set Project (8730-034)

Task 3
Autumn 2023

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Task 3 – Design

You are to develop your initial approach design solution in response to the project brief.

With reference to the project brief, and your response to previous tasks, you must produce a detailed design for the internal and external ‘go/no-go’ gauges for the tube sizes found in Table 2.

Your design must consider:

- the type or style gauge you’ve chosen to use (such as one single gauge with two apertures/ends or multiple gauges) and its impact on handling
- how the gauge will check that the size of stock tube is between its upper limit and its lower limit
- how the gauge must stop stock tubes that are out of stated limits from passing the quality check
- the manufacturing processes you have chosen for the production of the gauge and how this affects the surface finish of the gauge faces.

Part A

You must create a single orthographic dimensioned drawing for an external gauge and a second single orthographic dimensioned drawing for an internal gauge using the dimensions in Table 2. This must address:

- the overall sizes of the gauge showing length and width thickness and any handle (if used)
- a table of the sizes (width and/or depth) of any aperture, and setting dimensions for the gauging faces for the gap gauge
- a table of the sizes (diameter and length) of any diameter, for the go and no-go ends for the internal plug gauge
- any markings that should be engraved on the gauge including limit sizes for the gauge and any other distinguishing marks, such as a drawing number, date of manufacture, and/or serial number
- the material type used
- if the standard commercially sourced components are to be sourced, a Bill Of Materials (BOM) table is to be inserted with product details, supplier and catalogue numbers.

The drawings can either be produced using a CAD package or by hand as a paper-based drawing. Drawings must be produced in 3rd Angle Projection and in accordance with the drawing standard BS 8888.

You can also include draft iterations of your design to show how your design idea has developed during the completion of the tasks.

The submission for this task will typically be two A3 drawings annotated with the gauge sizes for diameter ∅5 mm, ∅20 mm, ∅50 mm, ∅150 mm.

Part B

As part of your design, you must present the calculations used to determine:

- the size limits for the ‘go’ aperture of the gauge and the ‘no-go’ side of the gauge for the entire range of the external stock tube sizes to be checked (i.e. the sizes listed in Table 2)
- the size limits for the ‘go/no-go’ elements of the plug gauge for the range of the internal stock tube bore sizes to be checked (i.e. the internal hole through the sizes listed in Table 2)
- that you have ensured sufficient gauge depth to allow the tubes to be fully inserted into the gauge when checking the external diameter.

Alongside your calculations, you must include reflective notes on how well the ‘go/no-go’ gauge meets the requirements of the brief. This must include:

- rationale for your final design option
- whether your design is fit for purpose
- does it meet the clients requirements.

The submission for this task will typically be two A4 sides this will include any relevant design calculations and reflective notes.

Timing of assessment

- You will have **six hours** to complete your design and calculations.

Conditions of assessment

- Your design must be completed working alone under supervised conditions.
- You must not share or discuss your work with other candidates.
- You will have access to copies of your responses to the previous tasks (for review purposes only).
- You will have access to relevant CAD software or drawing equipment for the completion of your drawing.
- You will **not** have access to the Internet for the completion of this task.
- Assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed.

What you must submit on completion of this task

- **Part A** - **Two orthographic dimensioned drawings** (typically **two** A3 drawings), this may include design iterations if you wish to include them.
- **Part B** - **Design calculations** and **reflection notes** (typically two sides of A4), hard copy or file saved securely (e.g., in a secure online location or on memory stick to be handed in).

Marks available

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Get in touch

City & Guilds Technicals Quality Team

We are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

Should you require assistance, please contact us using the details below:

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