

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

**Employer-Set Project
(8730-034)**

**Task 3
Summer 2023**

Task 3 – Design

You are to develop your 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 of a quenching tank with consideration to:

- the size and shape of a fabricated oil quenching tank that can hold a volume of oil between 20 and 50 litres that contains a reasonably well-fitting wire mesh basket capable of being lifted out
- the amount of volume required to allow for the size of the components placed into the oil and boiling effect whilst workpieces are being quenched
- the size and type of an oil tight drain point fitted low down on one of the sides to allow controlled draining of the tank
- a well-fitting lid with a handle to enable it to be easily lifted on and off as required.

Create a dimensioned assembly drawing for a quenching tank that addresses the brief detailing:

- the principal dimensions of the tank and its separate lid
- the size of the wire mesh basket to be fitted
- the location and basic dimensions of the drain plug
- the material type and thickness of the tank and base
- the construction method i.e., welded, soldered, riveted, glued or folded joints
- a Bill of Materials (BOM) identifying the principle parts and any commercially sourced standard parts such as handles, drain plugs, nuts, bolts and washers etc.

You do not need to create all detail drawings and assemblies, just a dimensioned assembly drawing containing all the critical dimensions and identification of standard parts.

Include any relevant design calculations related to your assembly drawing and notes reflecting on how well the quenching tank meets the outlined requirements.

You can include draft iterations of your design to show how your design idea has developed.

Assembly 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.

The submission for this task will typically be two A3 drawings (one for the tank and one for the lid) and two A4 sides of supporting calculations and notes.

Timing of assessment

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

Conditions of assessment

- Your design should 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 for the completion of drawings.
- 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

- Drawing (typically two A3 drawings) – this may include design iterations if you wish to include them.
- Supporting 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).

Additional evidence of your performance that will be captured for marking

- N/A

Marks available

- 24

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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