



HM Government

**T-LEVELS**

# **T Level Technical Qualification in Engineering, Manufacturing, Process and Control (Level 3)**

## **Composites Manufacturing Technologies Occupational Specialism (8713-333)**

### **Practical Assignment Candidate Pack (Sample)**

September 2025 Version 2.0

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| Version and date    | Change detail  | Section |
|---------------------|--|---------|
| V1.0 June 2023      | Approved version   | n/a     |
| V2.0 September 2025 | Refinement of layout and formatting<br><br>Removal of any duplicated information<br><br>Candidate guidance, Brief and Tasks<br>amalgamated into one document | All     |

## 1. Assessment

This assessment is for the Composites Manufacturing Technologies Occupational Specialism component of the Technical Qualification. This pack consists of a practical assignment brief, including drawings and diagrams as necessary, that you will need to use to complete your assessment tasks.

## 2. Candidate guidance

### General guidance

This is a formal assessment that you will be marked and graded on. You will be marked on the quality and accuracy of the work you produce. It is therefore important that you carry your work out to the highest standard you can.

### Health and safety

You must always work safely, in particular while you are carrying out practical tasks.

You must always follow any relevant health and safety regulations, risk assessments and codes of practice in line with centre requirements.

If your assessor sees you working in a way that is unsafe for yourself or others, they will highlight the issue and ask you to stop the task immediately.

### Plagiarism

Plagiarism is the failure to acknowledge sources properly and/or the submission of another person's work as if it were your own. Plagiarism is not allowed in this assignment.

This assignment is an assessment of your abilities, so the work submitted must be all your own and carried out under the conditions stated. You will be asked to sign a declaration that you have not had any help with the assignment. Your assessor is allowed to give you general advice, such as, clarification of the task instructions. However, general advice will not include:

- any specific advice on how to improve work to meet the required standard
- feedback on anything missing from your work
- any intervention that improves the standard or presentation of work

If there is a need to provide more than general advice your assessor will need to record the advice, they have given and take it into account when marking the submitted work.

Where research is allowed, your assessor must be able to identify which parts of the work you have done yourself, and what you have found from other sources. It is therefore important to make sure you acknowledge the sources you used and clearly reference any information taken from them (e.g. providing as a minimum a list of web addresses, books, articles etc that you used).

### Use of Artificial Intelligence (AI)

AI may only be used as a source where the use of the internet is allowed for a research task. Where you use AI, you must acknowledge its use and show clearly how you have used it. Please be aware that how you have decided to use it may impact on the overall mark you are allocated.

### Guidance and feedback

There are some rules around how much guidance and feedback your assessor can provide as part of completing the assignment. Your assessor is allowed to give you some help in understanding the task instructions if necessary. However, if significant clarification and guidance is provided by your assessor this will be recorded and considered as part of the marking process and may reduce your mark. Your assessor will make it clear if any guidance given may reduce your mark before it is given, so that you understand this when asking for guidance.

## **Timings and planning**

You are advised to study the details of the assessment before starting.

You should check with your assessor that you have all the relevant materials, equipment and information/data sources that you need before starting the assessment.

You should take care when planning to make sure you have appropriately divided the time available between parts of the assignment tasks. Timings for tasks are provided within this pack to support with planning and time allocation.

If you have a good reason for needing more time, you will need to explain the reasons to your assessor and agree a new time for the assessment to take place. Any changes will be at the discretion of the assessor and agreed to by City & Guilds.

## **Word counts**

Typical word counts, where indicated, are to be used as approximates for guidance to support the production of sufficient evidence. The marking will relate to the quality of the evidence produced and not whether the word count has been met.

## **Submission of evidence**

Your work will be submitted as final at the end of each assessment session. You will not have an opportunity to rework any of your evidence once the assessment session ends. However, if through other tasks within the project, you develop your ideas or build on earlier tasks, then you should continue to build on these and should use your evaluation to outline the reasons why this happened.

## **Presentation of work**

The presentation of your work must be neat, legible and appropriate to the task and evidence required for submission.

You should make sure that each piece of evidence, including any forms, are clearly labelled with your name and the task reference.

All electronic files must be given a clear file name that allows your assessor to identify it as your work.

Written work may be digital or handwritten unless stated otherwise.

All sketches and drawings should be neat, tidy and annotated.

Calculations should be set out clearly, showing all working and any assumptions you made. You should use appropriate units at all times, consistent with the requirements of the assignment.

## **Instructions for this assignment**

Ensure you read all the provided assessment information issued by the assessor

You must work independently and not share your work with any other candidates in these supervised assessment sessions.

Your work will be kept secure during any supervised breaks that are taken.

Internet access is **not** allowed, unless otherwise stated in the task.

You will not be permitted any additional notes, such as printed resources and textbooks, unless otherwise stated in the conditions for assessment.

You must complete all the tasks and present all evidence that is detailed in each task.

This assessment booklet contains the assignment brief.

The tasks have been separated into individual documents which will be handed to you at the start of each task.

Any additional documents/templates needed for the task will be provided to you by the assessor.

**Within each task you will find the following:**

- **Conditions of assessment:** This will tell you the duration and rules you must follow when completing a task.
- **Controlled conditions:** This will tell you the rules you must follow when completing each task. For example, you must not share or discuss your work with other candidates.
- **What must be produced for marking:** This describes the evidence you must submit when the task is completed. Be aware that failure to submit any evidence requested can adversely affect your overall mark for the assessment.
- **Additional evidence for this task:** This describes other forms of evidence that will be collected by the assessor to support the marking of your performance. This will often include but is not limited to, photographic and video evidence.
- **Resources:** Provides a list of equipment, documents or tools that you will have access to, to complete the task/sub task.

### 3. Assignment brief

You are working as a composite materials technician in a large-scale composite fabrication facility. You have been asked to join a team of composite engineers that are setting up production processes to create small batch (100 parts per batch) production of composite components.

You have been tasked with producing an assembly to be used as a spacer block within the aerospace industry to ensure the correct spacing of wing skins in a jig during the manufacturing process.

Each component has a number of plies which are either laid up on a platen or onto a core material.

Technical drawings for the assembly have been provided by the design department which indicate the specified composite materials to be used for the construction of the spacer block assembly.

You are required to:

- create a sample spacer block assembly using specified composite materials and the vacuum bag consolidation method
- perform in-production quality checks to ensure the dimensions and make any required adjustments to conform to the specification
- quality test the finished spacer block assembly
- evaluate the processes utilised and evaluate your work
- identify and attribute faults in other manufactured assemblies to deficiencies in material selection, production or process
- record and present your findings to your supervisor at a handover meeting.

This assignment has a time allocation of **24 hours and 15 minutes**.

Figure 1 – Completed assembly view

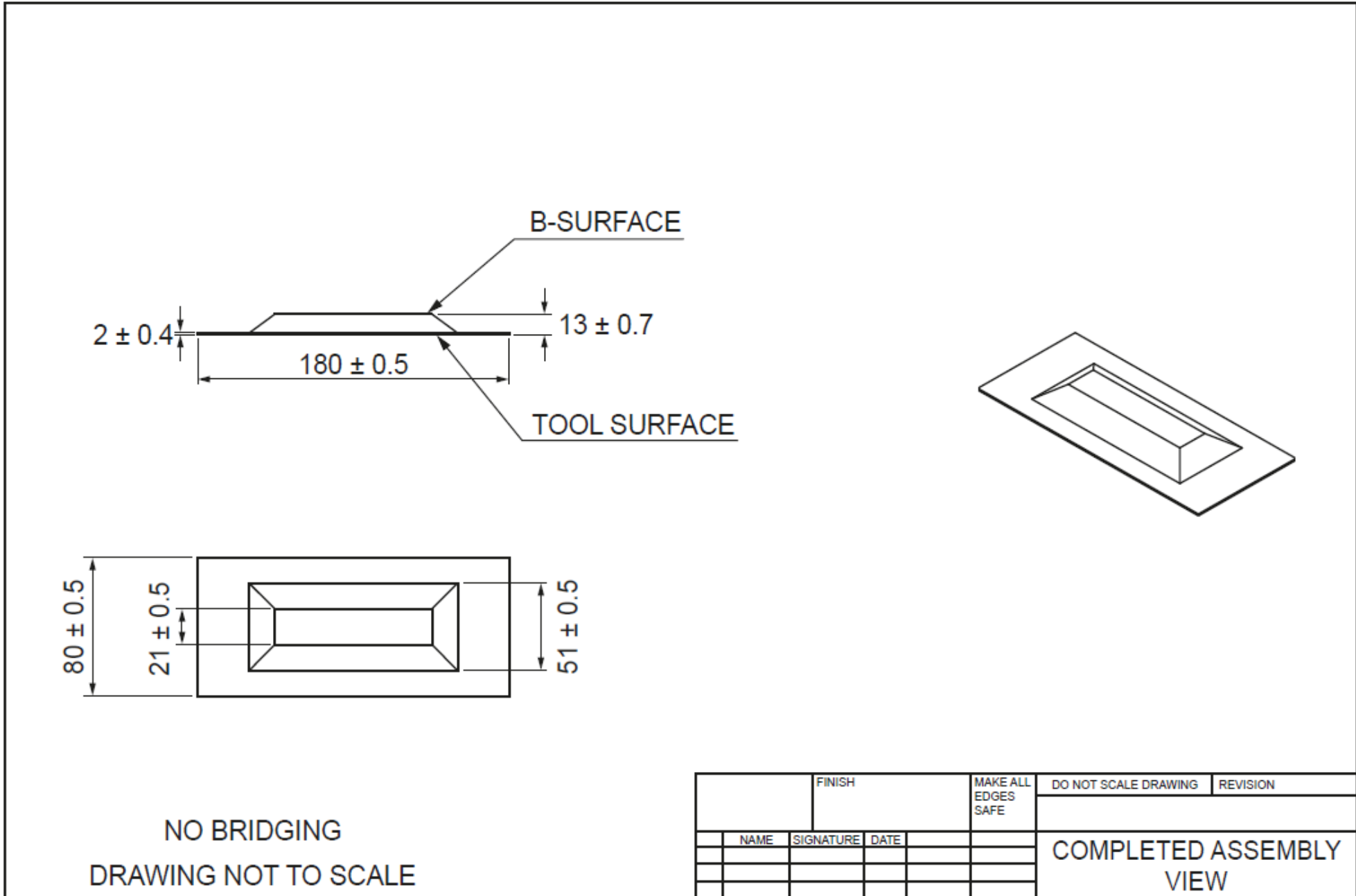


Figure 2 – Exploded assembly

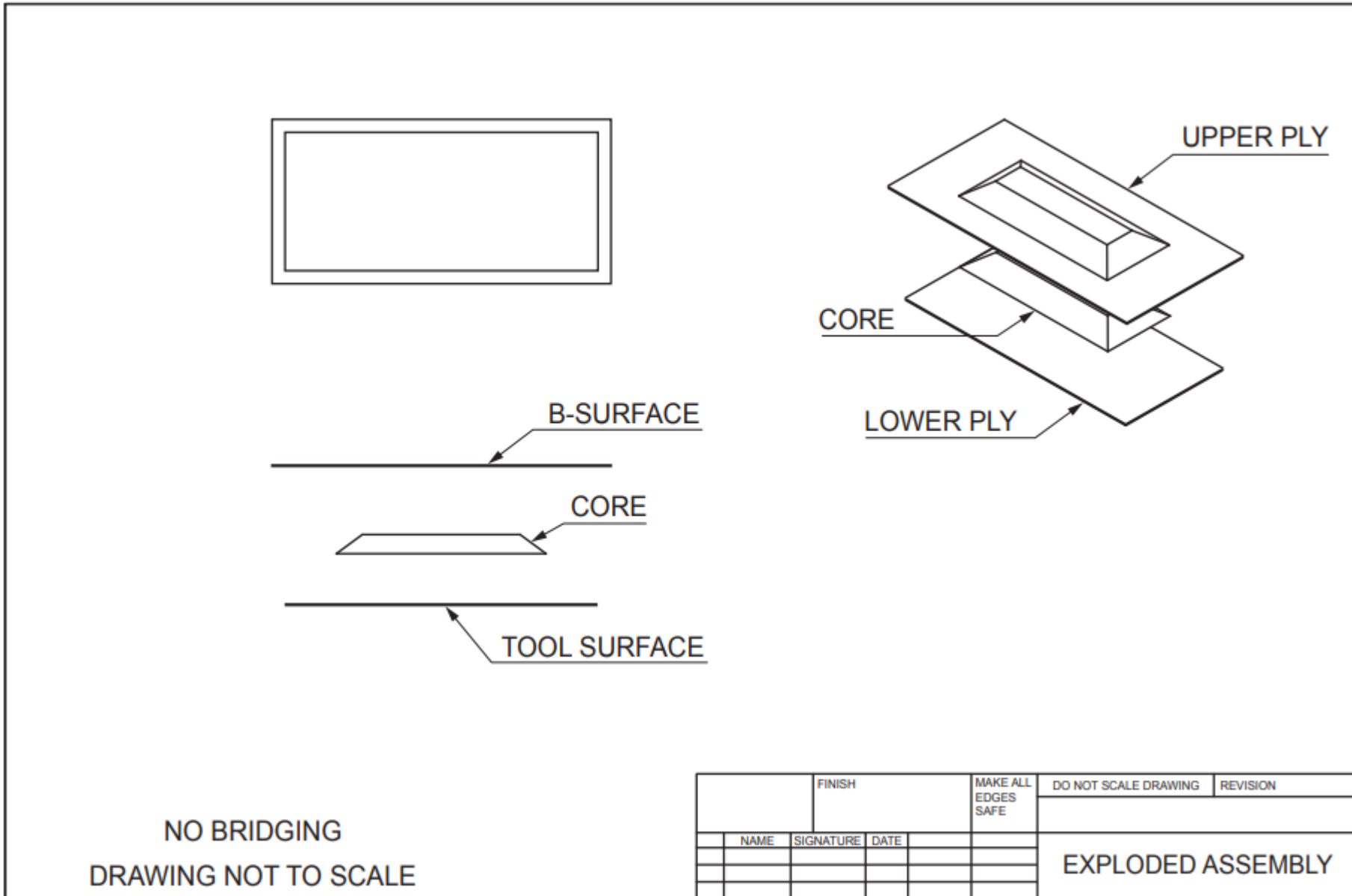


Figure 3 - Lower ply arrangement

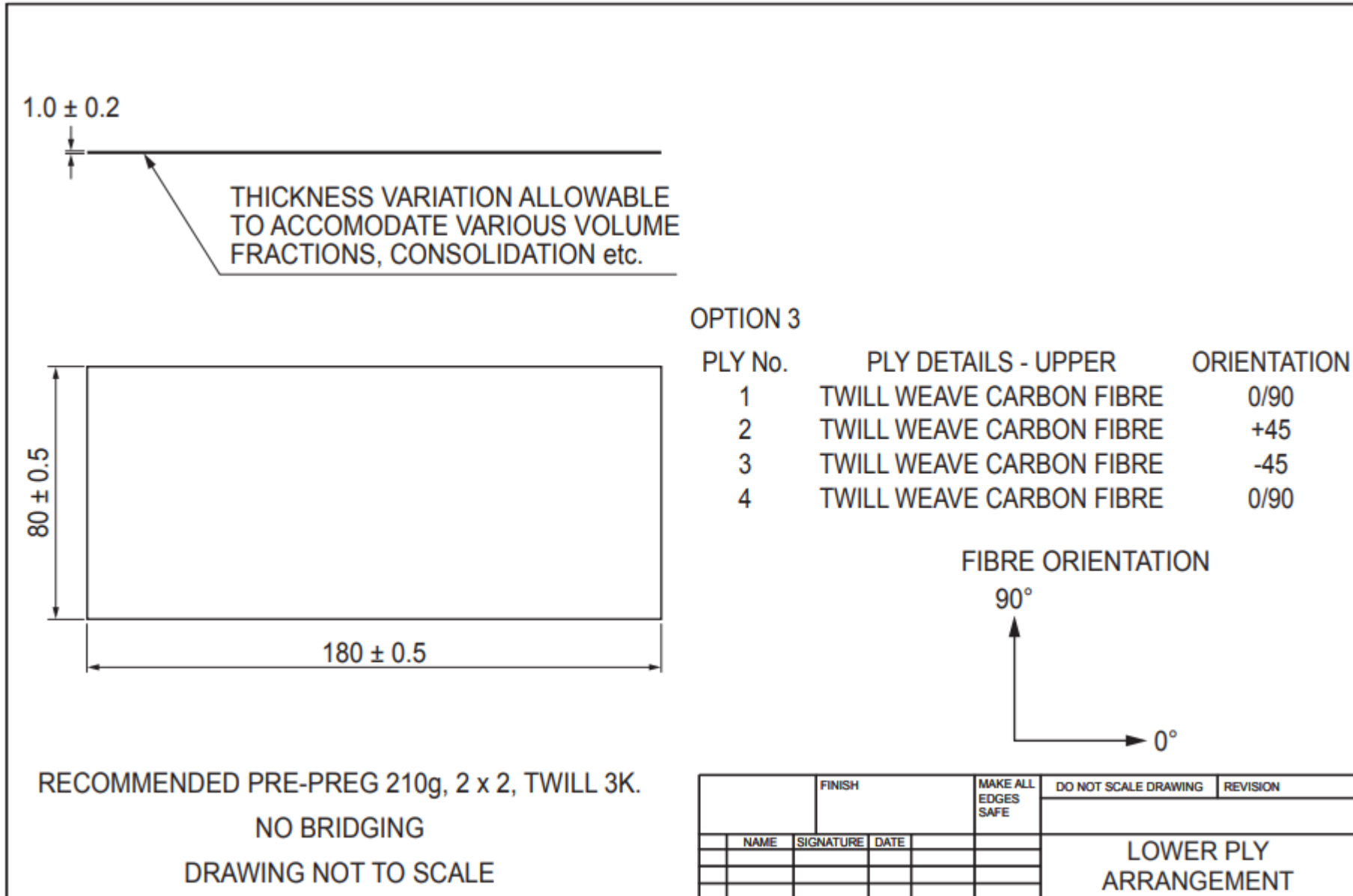


Figure 4 - Core material

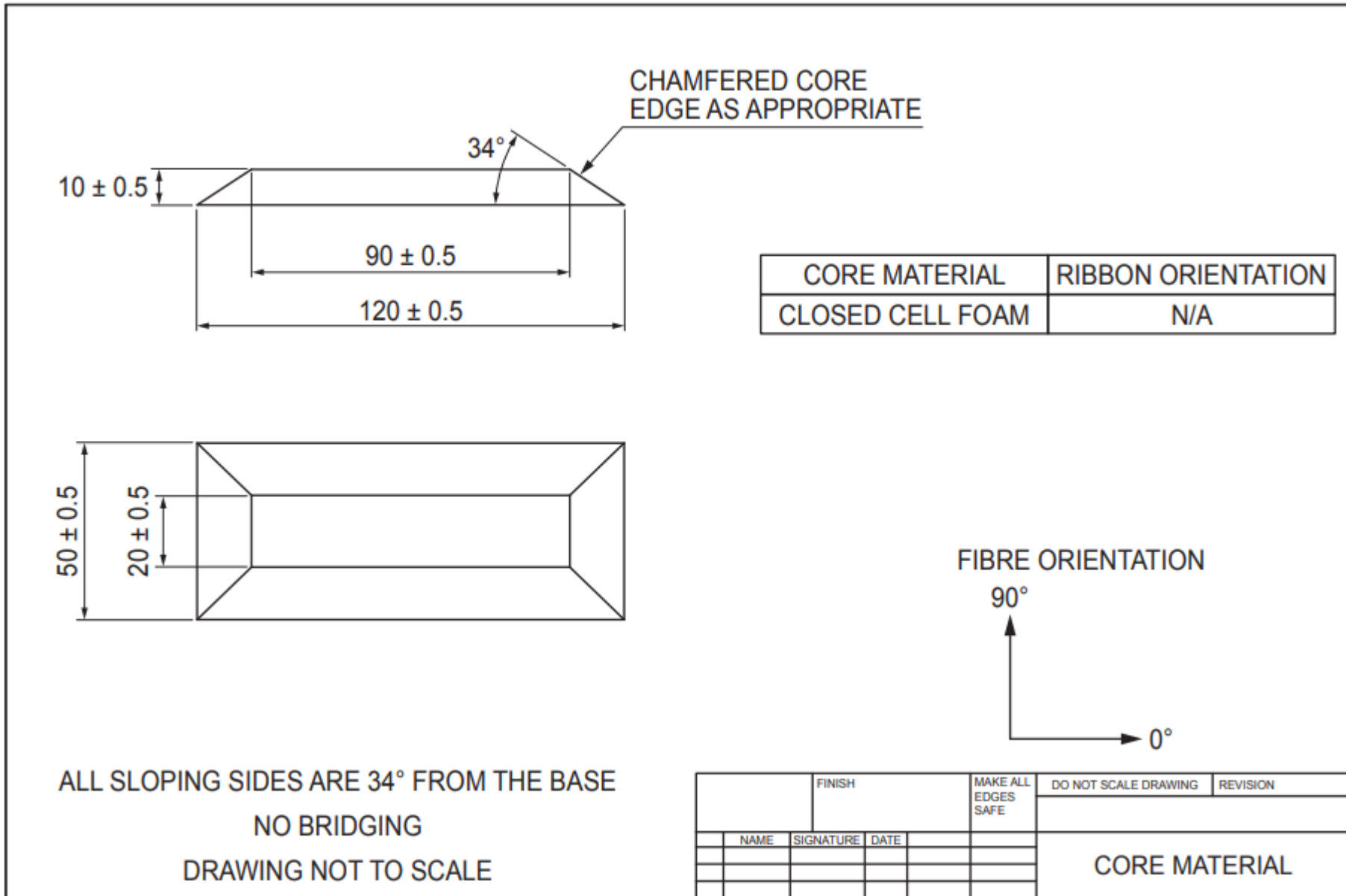
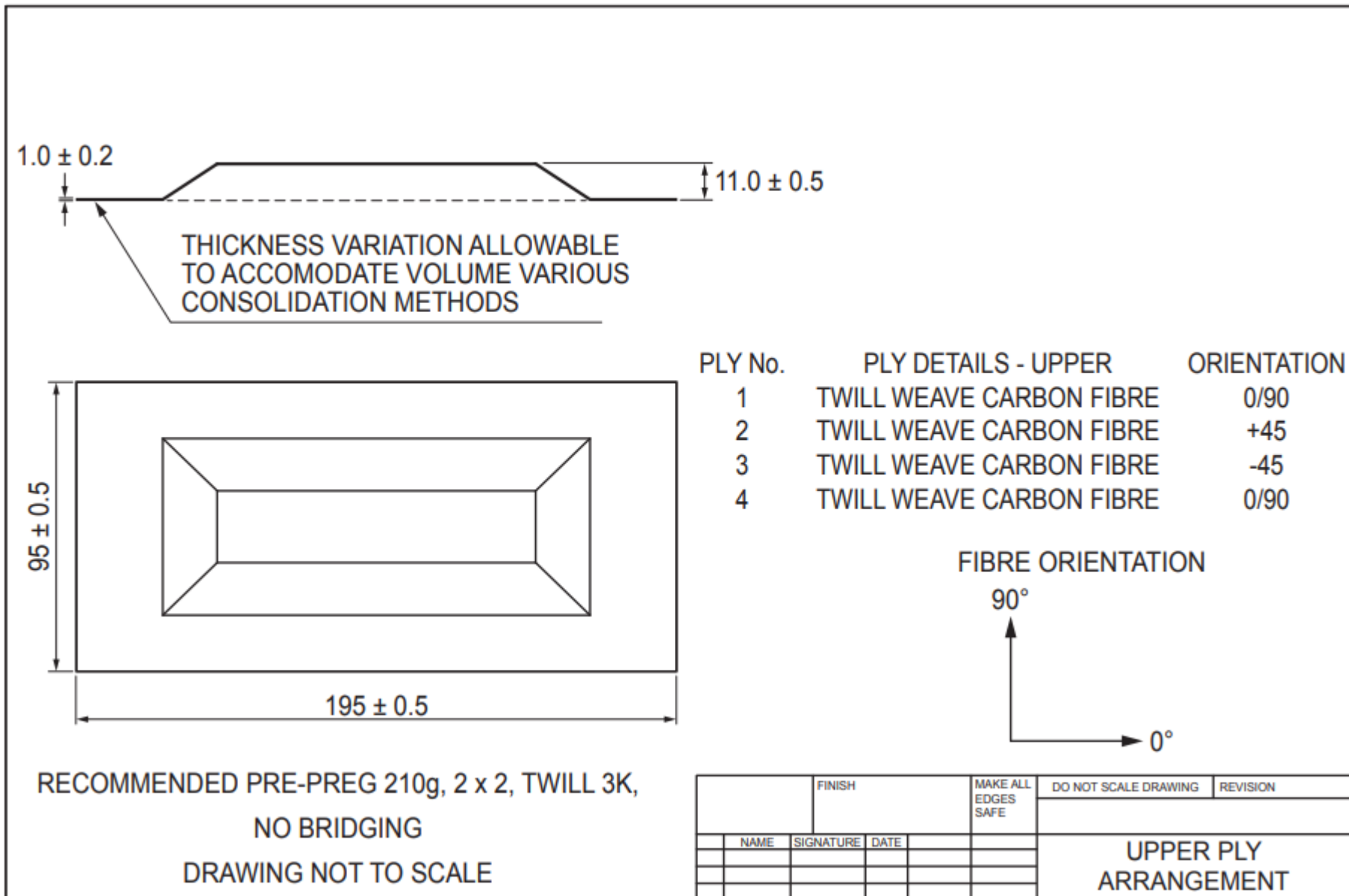


Figure 5 - Upper ply arrangement



## 4. Tasks

### Task 1 – Planning

You must:

- a) analyse the brief to produce a resources list needed for the production and fabrication of the composite assembly and spacer block, with justifications for the selections
- b) produce a risk assessment for the activities needed to produce and fabricate the assembly to specification
- c) create a method statement with justifications
- d) produce a quality check sheet for use in Task 3B
- e) carry out calibration checks on measurement equipment, with the results recorded on the resources list.

#### Conditions of assessment:

- the time allocated for this task is **3 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

#### Controlled conditions:

- you must only work on your tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

#### What must be produced for marking:

- resources list with justifications for the selections, and measurement equipment calibration check recorded
- risk assessment
- method statement with justifications
- quality check sheet.

#### Resources:

- technical drawings
- writing materials
- measuring equipment (with calibration certificate (if applicable))
- engineering technical data references (e.g. manufacturer's data sheets).

## Task 2a – Preparing the mould

You must:

- a) prepare the work area
- b) prepare the mould
- c) reinstate the work area.

### Conditions of assessment:

- the time allocated for this task is **2 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

### Controlled conditions:

- you must only work on your tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- prepared mould.

### Additional evidence for this task:

- assessor observations of:
  - mould preparation
  - preparation of materials
  - the prepared work area, the work area during the task and the work area on completion of the task.

To support the comments made within the Practical Observation the assessor must capture the following photographs that must be submitted as supporting evidence for each candidate.

### Photographic evidence which shows:

- mould preparation
- preparation of materials
- the prepared work area and the work area on completion of the task.

### Resources:

- writing materials
- mould
- cleaning supplies and tools
- a range of release agents
- appropriate PPE (as per resources list)
- copies of completed documentation from Task 1.

## Task 2b – Production of the spacer block

You must:

- a) prepare the work area for the laying up activities
- b) construct the spacer block components (lower, core and upper) demonstrating:
  - marking out and cutting materials
  - laying up
  - curing
  - demoulding
- c) re-instate the work area.

### Conditions of assessment:

- the time allocated for this task is **11 hours** (this does not include curing time)
- you must carry out the task on your own, under **controlled conditions** while being observed.

### Controlled conditions:

- you must only work on your tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidenced produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- the completed spacer block components.

### Additional evidence for this task:

- assessor observation of:
  - production of the spacer block components to include
    - the handling and application of composite materials
    - the application and use of tools and equipment
    - the work area during and on completion of the tasks
  - the finished (demoulded and cured) spacer block components.

To support the comments made within the Practical Observation the assessor must capture the following photographs that must be uploaded as supporting evidence for each candidate.

### Photographic evidence which shows:

- marking out and cutting materials
- the laying up process
- the curing process
- the demoulding process
- the finished (demoulded and cured) spacer block components.

**Resources:**

- writing materials
- twill weave carbon epoxy pre-preg composite material (210g/m<sup>2</sup> 2x2 twill weave carbon epoxy pre-preg recommended)
- closed core foam sheet
- demoulding equipment including demoulding wedges, trimming, finishing and measuring equipment
- laminating consumables to include peel-ply, breather fabric, tacky tape, bagging film, vacuum breach units
- vacuum application and consolidation equipment
- curing equipment
- marking and measuring out equipment
- tools (as per resources list)
- appropriate PPE (as per resources list)
- copies of completed documentation from Task 1
- component output from Task 2a.

## Task 2c – Assembly

You must:

- a) prepare the work area for the assembly activities
- b) complete the spacer block assembly; demonstrating:
  - the bonding process
  - the curing process
  - the trimming and finishing process.

### Conditions of assessment:

- the time allocated for this task is **3 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

### Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidenced produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- the completed spacer block assembly.

### Additional evidence for this task:

- assessor observation to include:
  - assembly of the spacer block in stages, including bonding, curing, trimming and finishing processes
  - the completed spacer block assembly
  - the handling and application of composite materials
  - the application and use of tools and equipment
  - work area during and on completion of the tasks.

To support the comments made within the Practical Observation the assessor must capture the following photographs that must be submitted as supporting evidence for each candidate.

### Photographic evidence which shows:

- assembly of the spacer block in stages, including bonding, curing, trimming and finishing processes
- the completed spacer block assembly.

### Resources

- writing materials
- twill weave carbon epoxy pre-preg composite material (210g/m<sup>2</sup> 2x2 twill weave carbon epoxy pre-preg recommended)

- demoulding equipment including demoulding wedges, trimming, finishing and measuring equipment
- laminating consumables to include peel-ply, breather fabric, tacky tape, bagging film, vacuum breach units
- vacuum application and consolidation equipment
- curing equipment
- marking out equipment
- measuring out equipment (with calibration certificate (if applicable))
- tools (as per resources list)
- appropriate PPE (as per resources list)
- copies of completed documentation from Task 1
- component output from Task 2b.

## Task 3a – Defect identification

You must:

- a) carry out a defect identification inspection of a prefabricated defect sample assembly
- b) suggest processes that should be introduced or modified to prevent defects that are present in the defect sample assembly from reoccurring in future production runs.

### Conditions of assessment:

- the time allocated for this task is **2 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

### Controlled conditions:

- you must only work on your tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- list of identified defects with cause and prevention indicated.

### Additional evidence for this task:

- assessor observation:
  - defect identification process.

### Resources:

- pre-fabricated defect sample assembly
- writing materials
- measurement equipment (with calibration certificate (if applicable))
- copies of completed documentation from Task 1.

## Task 3b – Quality review and recording

You must:

- a) perform quality assurance checks on your finished spacer block assembly
- b) produce an inspection report evaluating the production of your finished spacer block assembly. The report should typically be 800 words.

This must include:

- finished sizes of components and confirmation the spacer block assembly conforms to the dimensional requirements of the specification
- an explanation of the quality checks undertaken and the reasons for their use
- an evaluation of the fitness for purpose of the finished spacer block assembly and method of production used with reasoning and justifications
- a concessions list for every facet of the spacer block assembly that does not conform to the specification, reasons for occurrence and how to prevent reoccurrence
- any amendments needed to your method statement with reasoning
- any improvements or adaptations required to the spacer block, including any reasoning and justifications if adaptations or improvements are not required.

### Conditions of assessment:

- the time allocated for this task is **3 hours**
- you must carry out the task on your own, under **controlled conditions** while being observed.

### Controlled conditions:

- you must only work on your tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- completed quality check sheet
- quality inspection report.

### Additional evidence for this task:

- assessor observations:
  - quality checking process
  - application of measuring equipment.

To support the comments made within the Practical Observation the assessor must capture the following photographs that must be submitted as supporting evidence for each candidate.

**Photographic evidence which shows:**

- the quality checking process being undertaken and the use of the quality check sheet.

**Resources:**

- measuring equipment (with calibration certificate (if applicable))
- quality check sheet (from Task 1)
- writing materials
- access to a computer to write the report
- copies of completed documentation from Task 1.
- completed assembly from Task 2C.

## Task 3c – Handover

You must:

- a) hold a meeting with your supervisor to complete handover procedures, including:
  - confirmation of work completed
  - overview of findings in Quality Inspection Report
  - suggested improvements to design or process
  - handover of finished spacer block assembly and Quality Inspection Report.

### Conditions of assessment:

- the time allocated for this task is **15 minutes**
- you must carry out the task on your own, under **controlled conditions** while being observed
- you must carry out the handover meeting, with the assessor (or another staff member) taking the part of the supervisor
- there will be no interaction required or permitted by your assessor as part of the handover.

### Controlled conditions:

- you must only work on your tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed by candidates
- all practical work areas and any evidence produced must be kept secure and only accessible by the assessor
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

### What must be produced for marking:

- assessor observations:
  - handover meeting.

### Additional evidence for this task:

- quality inspection report
- the completed spacer block assembly.

To support the comments made within the Practical Observation the assessor must capture the following video that must be submitted as supporting evidence for each candidate.

### Video evidence which shows:

- the handover meeting.

### Resources:

- quality inspection report
- the completed spacer block assembly.

## End of assessment

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