

**T Level Technical Qualification in
Engineering, Manufacturing,
Process and Control
(8713-33)**

**Composites Manufacturing
Technologies (333)**

**Practical Assignment
Sample Assessor Pack**

**First teaching from September 2022
Version 1.0**

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1. Assessment

The assessment for this component consists of a practical assignment that includes an assignment brief and then a number of tasks for the candidate to complete. Tasks are assessed by assessment themes that cover a range of knowledge and skills from the performance outcomes. They are designed to allow judgement of the candidate to be made across different categories of performance.

The assessment for this component has been allocated a set number of marks against each assessment theme, based on weightings recommended by stakeholders of the qualification. This mark allocation remains the same for all versions of the assessments, ensuring consistency across assessment versions and over time.

Performance outcomes

The weightings for each performance outcome will remain the same for every version of the practical assignment. This ensures the appropriate depth and breadth of knowledge and skills for each specialism can be reliably assessed in every version and meets the needs of industry while keeping comparability between each assessment over time.

| Performance outcome | Typical knowledge and skills | Weighting |
|---|--|-----------|
| PO2 Analyse and interpret engineering and manufacturing requirements, systems, processes, technical drawings and specifications. | Interpret requirements of a brief through the analysis and interrogation of available information sources and formats. Consider all relevant aspects of a brief, challenging and confirming expectations including risks and issues. Select and use techniques, processes and technologies that will assist in the analysis of information available. | 10% |
| PO3 Plan and prepare the relevant processes, tools, equipment, and resources, needed to manufacture relevant products and produce appropriate outcomes. | Plans to meet the requirements of a brief effectively with consideration of required resources and technology. Identify and mitigate potential issues prior to the production activity. Check materials conform to specification. Prepare the work area including required tools and equipment for moulding composite products. Measure and mark out materials to specification and plan for wastage and disposal. | 28% |
| PO4 Produce relevant products and outcomes, considering the specified requirements, context and materials, using the relevant composite manufacturing technologies, methods and processes. | Prepare moulds and materials prior to laminating activities. Laminate the required product and apply debulking and consolidation processes. Cure the product according to manufacturer's specification. De-mould the components, safe-edge, trim and prepare for assembly. Assemble the product and carry out finishing processes. | 43% |
| PO5 Support the delivery (and management) of relevant projects and activities, helping to evaluate and review processes and outcomes, and to improve practices. | Monitor production processes, identifying potential risks, issues and problems. Deal with issues and problems quickly and efficiently, using appropriate techniques and processes to address or resolve them, escalate issues in line with correct lines of reporting. Monitor work to ensure efficiency, and carry out checks as part of the production process, ensuring safety at all times. | 10% |
| PO6 Communicate production information, proposals and solutions, producing, recording and explaining relevant technical information, representations, processes and outcomes. | Use different techniques to communicate technical information effectively with consideration of audience and format. Produce technical documentation using available tools and technology, accurately recording information, data and risks as part of handover of the process to client/end user. | 9% |

Grade descriptors

To achieve a pass (threshold competence), a candidate will typically be able to:

Interpret information, plan, assess risk and follow safe working methods when applying practical skills to an acceptable standard in response to the requirements of the brief.

Adequately prepare working areas, acknowledging potential risks and applying acceptable housekeeping techniques during tasks.

Demonstrate basic technical practical skills in preparing moulds, shaping composite materials and cores, laying-up, debulking, consolidating, curing and de-moulding, assembling and finishing that are in line with industry standards and meet the requirements of the brief.

Adequately demonstrate ability to follow laminating and assembly procedures to produce composite components to meet the requirements of the brief.

Demonstrate basic knowledge and understanding of the principles and processes required for composite engineering to produce a product that meets the required tolerances within the brief.

Work safely showing an understanding in the selection and use of relevant tools and equipment and demonstrate a basic awareness of straightforward preparation and application processes within the working environments for preparing moulds, shaping composite materials and cores, laying-up, debulking, consolidating, curing and de-moulding, assembling and finishing composite assemblies.

Identify causes of problems or common issues related to production control, operating procedures and quality control and have some knowledge and skills in how to rectify them.

Mostly use general industry and technical terminology accurately across different communication methods with some consideration of technical and non-technical audiences.

To achieve a distinction, a candidate will typically be able to:

Competently and thoroughly interpret technical information, applying technical skills to plan, assess risk and follow safe working methods to practical tasks and procedures to an exemplary standard in response to the requirements of the brief, producing an excellent quality of work that meets regulations and standards.

Thoroughly prepare working area, mitigating potential risks prior to commencing tasks and consistently apply exemplary housekeeping techniques during tasks.

Demonstrate exemplary technical practical skills in preparing moulds, shaping composite materials and cores, laying-up, debulking, consolidating, curing and de-moulding, assembling and finishing that are in line with industry standards and meet the requirements of the brief.

Demonstrate exemplary ability to follow laminating and assembly procedure to produce composite components to meet the requirements of the brief.

Demonstrate exemplary knowledge and understanding of the principles and processes required for composite engineering to produce a product that meets the required tolerances within the brief.

Work safely and make informed and appropriate use of tools, materials and equipment within the working environments for preparing moulds, shaping composite materials and cores, laying-up, debulking, consolidating, curing and de-moulding, assembling and finishing composite assemblies.

Identify causes and diagnose problems or common issues related to composites manufacturing and have a thorough understanding and the skills to be able resolve and rectify them.

Consistently and accurately use industry and technical terminology across different communication methods with full consideration of technical and non-technical audiences.

2. 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

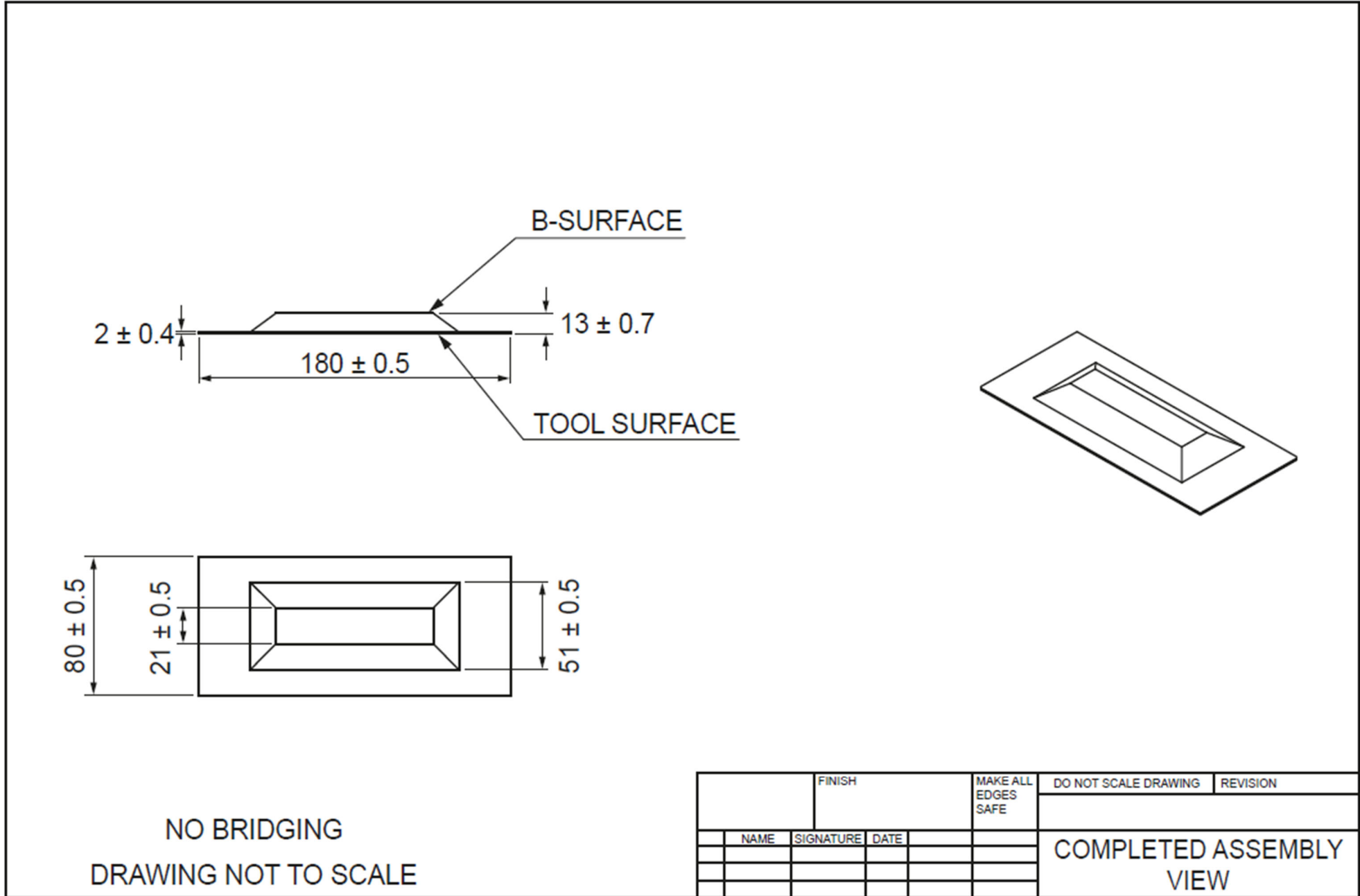


Figure 2 – Exploded assembly

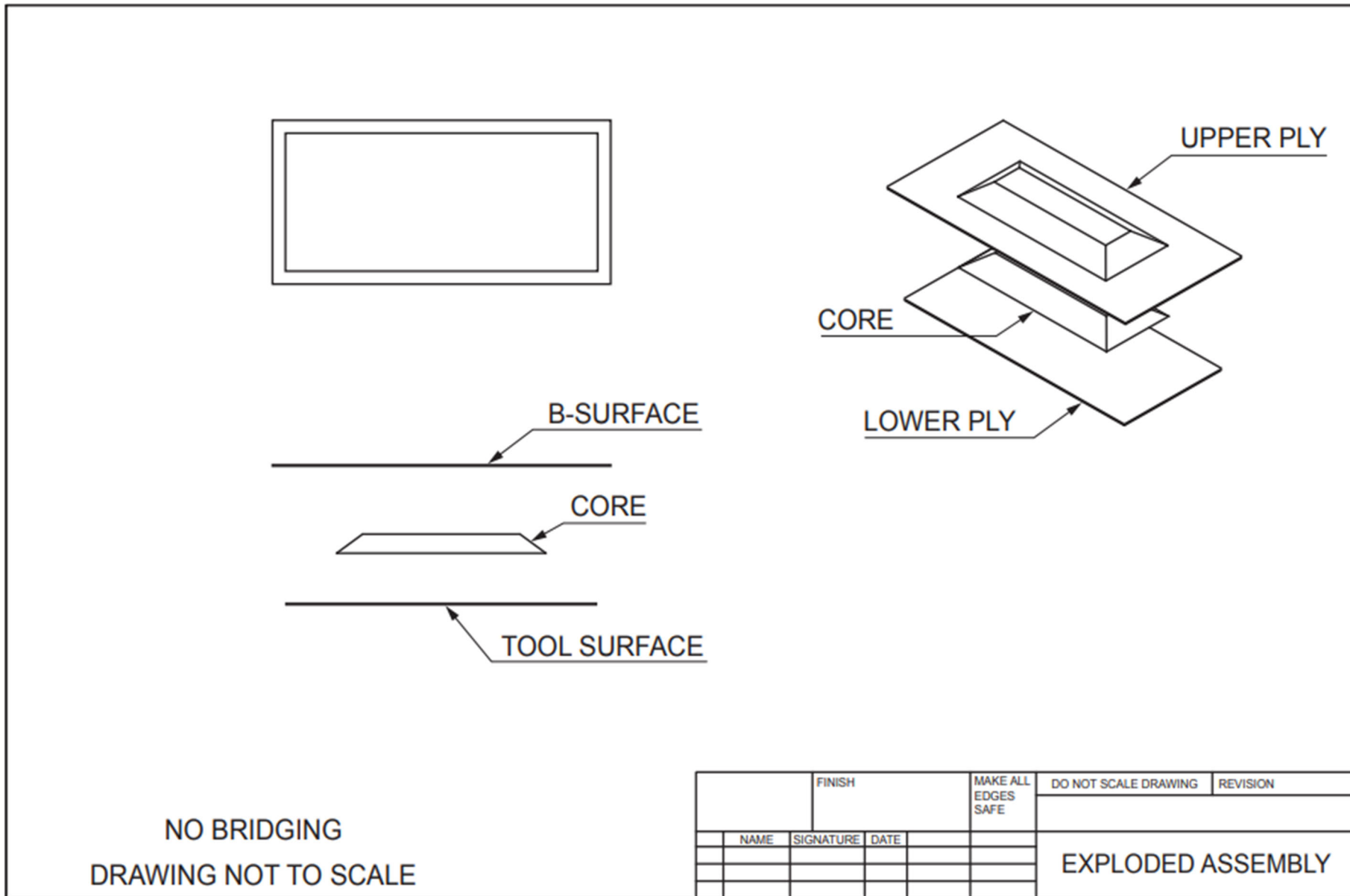


Figure 3 - Lower ply arrangement

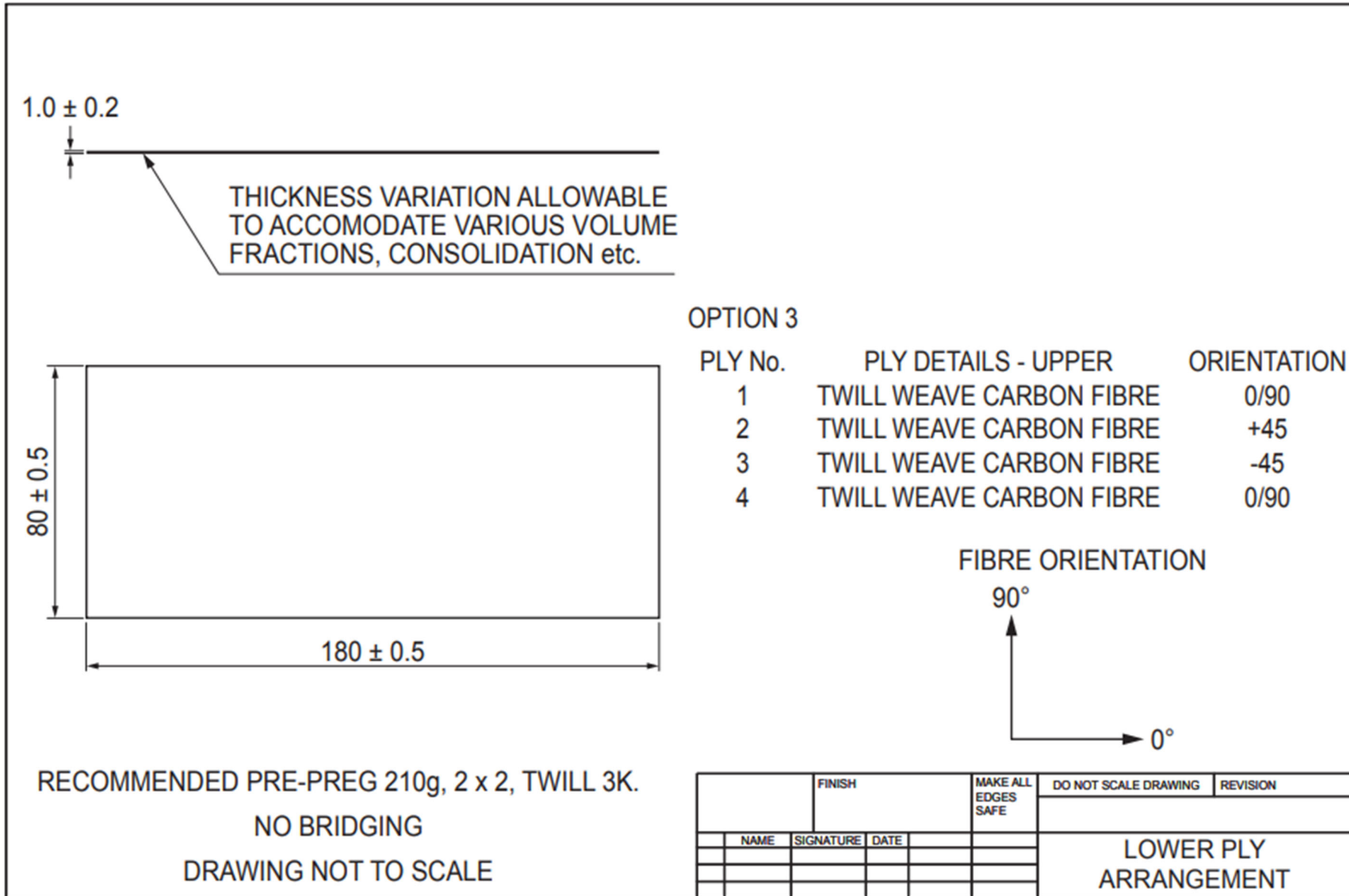


Figure 4 - Core material

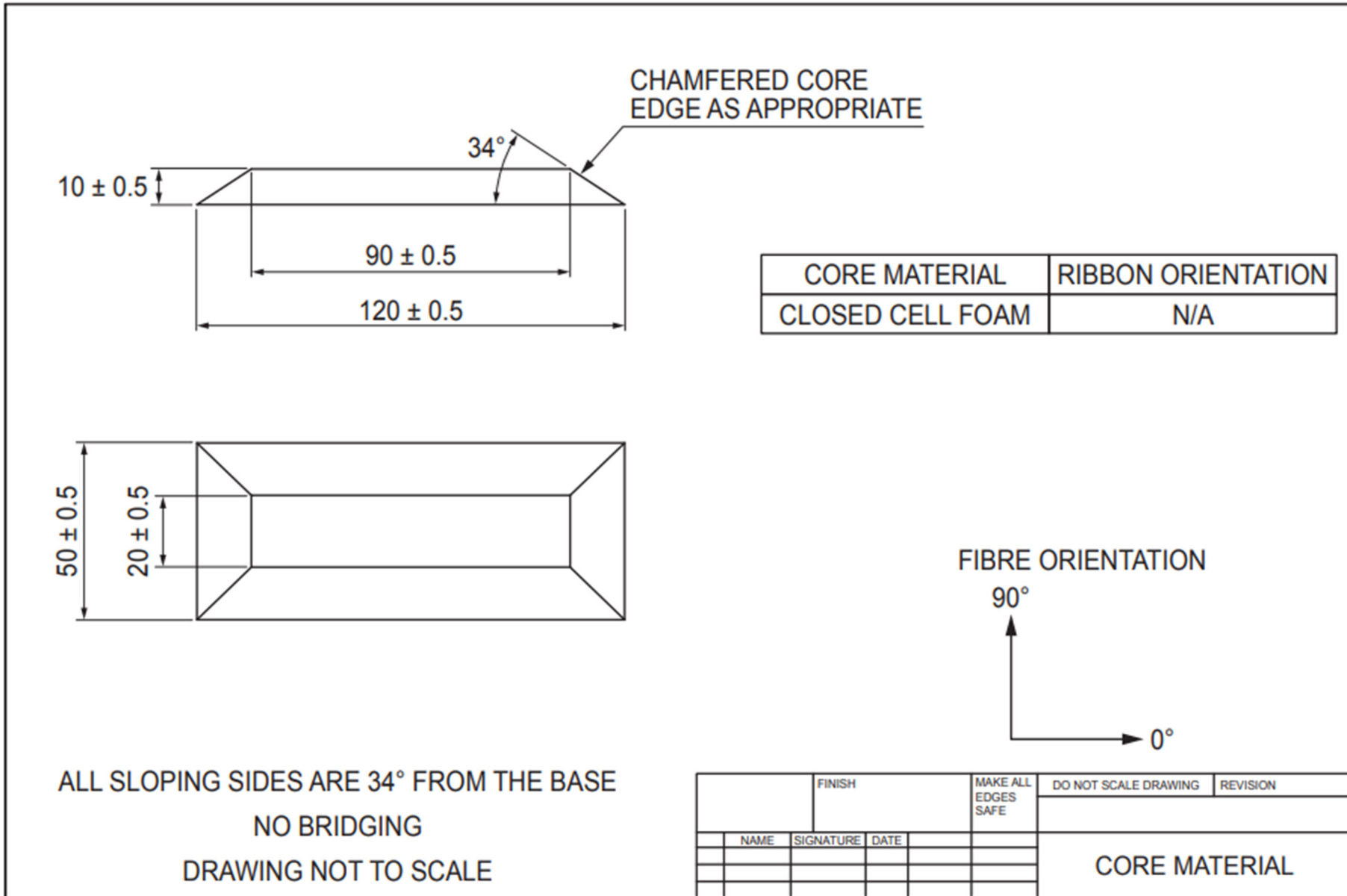
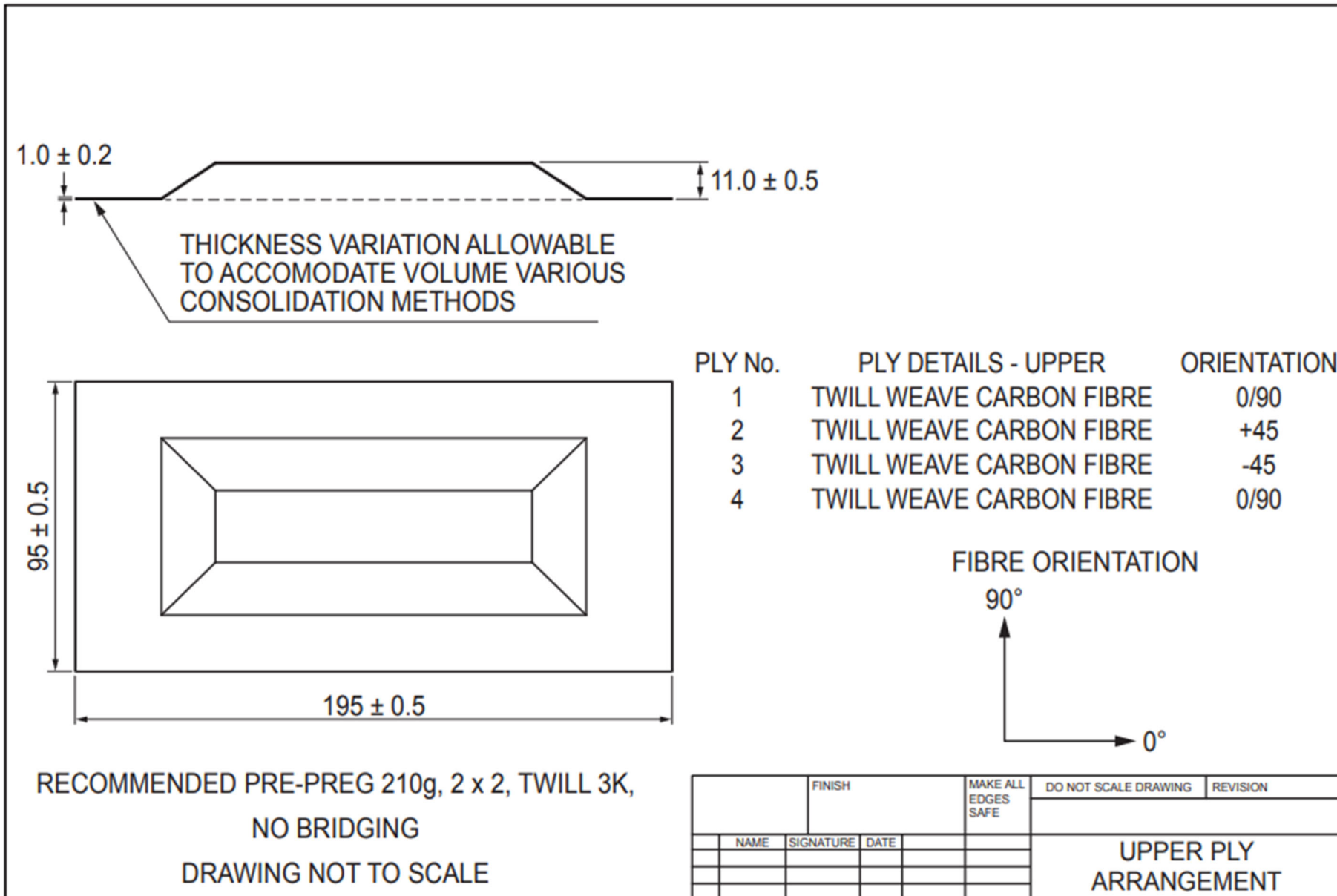


Figure 5 - Upper ply arrangement



3. Tasks

General task guidance

Read **ALL** information carefully before the assessment.

Ensure you have read the following guidance before you undertake the assessment of candidates:

- T level technical qualifications – marking
- T level technical qualifications – moderation (updated annually)
- T level technical qualifications – teaching, learning and assessment
- Technical qualification guides on marking and moderation
- Practical Observation template
- Mark grids following the tasks below
- Feedback guidance for assessors.

All work carried out should be to industry standards, done in a safe manner and compliant with relevant regulations. If a candidate fails to carry out the activities in a safe manner, the assignment should be suspended until this aspect is corrected. Further guidance for assessors can be found in the centre guidance section under health and safety.

Photographs must be used to support the qualitative statements captured on the Practical Observation form. Details of specific photograph requirements are outlined in the task information below. Photographs must have the date and candidate's name attached so that they can be differentiated. The candidate does not need to be in the photograph, the purpose of the photograph is to demonstrate the quality and standards of work of specific activities and of the work throughout various stages of the assignment.

Time

The time allocated for the completion of the tasks and production of evidence for this assessment is **24 hours and 15 minutes**. Timings for completion of specific tasks are outlined below.

- Task 1 – 3 hours
- Task 2 – 16 hours
- Task 3 – 5 hours and 15 minutes.

When working under supervised conditions for longer sessions, breaks can be facilitated outside of the controlled conditions, ensuring the room is locked and all candidates have vacated once the break begins. All materials must be kept securely during the break.

Scheduling assessment sessions

It is the centre's responsibility to arrange how time is managed to fit with timetables and meet the times allocated for each task during the assessment window. Assessment windows are specified in the key date schedule.

The tasks must be issued in order, one at a time to candidates by centres in the scheduled assessment times. Candidates are able to refer to the brief and scenario during all of the

scheduled assessment time. Candidates are not permitted to return to tasks after the assessment time for the task has ended and the next task has begun. Candidates must not move on to the next task within the assessment session until instructed to do so by the assessor. It is the assessor's responsibility to ensure that all evidence for a task has been submitted before administering the next task. Candidates are not required to have formal reading time for the scenario and brief, this is included within the duration for Task 1.

When working under supervised conditions for longer sessions, breaks can be facilitated outside of the controlled conditions, ensuring the room is locked and all candidates have vacated once the break begins. All materials must be kept securely during the break.

Centres should aim to schedule tasks in the fewest amount of assessment sessions but ensure that the durations dictated for each task are covered. However, to aid deliverability and manageability of assessment, sessions can be split where there is a requirement. For example, where timetabling of an appropriate location for six hours is not possible, e.g. where centre's access to computer resources is limited, or where candidates are not available for six consecutive hours (e.g. due to work placement commitments). Where this is necessary, sessions should, where possible be timetabled over consecutive days and in as few sessions as possible. All assessment evidence must be stored securely and access to assessment materials and their work only given to candidates during the formal assessment times. All candidates are required to complete a declaration of authenticity along with their evidence submission, and the arrangements must support the assessor in being confident in confirming authenticity.

Where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor. Information and notices should be used to inform other users of the facility that no access will be granted when assessment sessions are in progress. Practical work areas, tools, equipment and systems for the assessment must not be reset until a candidate has completed the full assessment.

Internet access

Where internet access is allowed as part of a task (e.g. for research or report writing purposes) candidates must be advised that this is the case and reminded of the importance of submitting their own work and the seriousness of plagiarism, malpractice and collusion. Candidates should be advised that their browser history can be monitored and checked. Depending on the type of task candidates may be requested to submit their internet search history to be considered as part of the submission of evidence, in order to confirm the authenticity of submitted evidence.

Where candidates are allowed the use of computer equipment, but not the use of the internet for a task, equipment should be provided with internet capability disabled (e.g. Wi-Fi disabled, machine disconnected from network etc.).

Resources

Candidates must have access to a suitable range of resources to carry out the tasks and, where appropriate, to have the opportunity to choose components, tools and equipment that demonstrate their ability to select from a range of appropriate materials.

Where candidates need access to evidence that has been submitted as part of a previous task, this will be provided as a copy of the original evidence and will be given at the start of the relevant task.

The candidate should have access to the following to select and carry out each task:

- writing materials
- access to a computer to produce the report
- measurement and monitoring tools (straight edge, carpenter's level, carpenter's square, callipers, temperature and humidity monitor, calibration certificate)
- clamps or holding devices
- pre-manufactured composites mould
- composite moulding tools
- general hand tools (for example, saws, rotary cutter, knives, cutting blades, files, sanding blocks)
- PPE (eye protection (safety glasses/visor), skin protection, gloves, safety footwear, masks and respiratory systems)
- composite materials moulding and curing equipment
- mould release agents
- bonding agents
- consumables to include peel-ply, breather fabric, tacky tape, bagging film, vacuum breach units
- twill weave carbon epoxy pre-preg composite material (210g/m² 2x2 twill weave carbon epoxy pre-preg recommended)
- closed cell foam sheet
- electronic scale
- vacuum application and consolidation equipment
- curing equipment (oven/heat pad)
- demoulding equipment including demoulding wedges, trimming, finishing and measuring tools
- pre-fabricated defective sample spacer block (for Task 3A)
- cleaning supplies
- engineering technical data references (manufacturer's data sheets, COSHH data sheets)
- technical drawings.

The assessment area must also contain the following:

- workshops must be well ventilated and well lit
- benches or tables for each candidate
- a clock visible to all candidates
- a room temperature and humidity indicator
- storage area for part-done and finished pieces
- first aid kit and eye wash station
- waste disposal area.

Task specific guidance

Each task should be administered separately, and each task should be completed and submitted by all candidates before moving onto the next.

Resources are specified through centre resource list in advance of the assessment but will not be made available to students as this will lead students to know the tools and resources that they must select for themselves in Task 1. Candidates will have access to the workshop/tool cupboard to select resources rather than a list and the required resources are dictated by the guidance and brief.

Task 1

The purpose of this task is for the candidate to plan the process and the work needed to create the components for the spacer block and to enable its final assembly, including the safety measures required to complete the task safely.

Candidates must be provided with the technical drawings and the material manufacturer's data sheets to allow them to complete this task.

Candidates must produce a resources list detailing all the resources they will need, including safety equipment. Candidates must also check measuring equipment for calibration and that it is fit for purpose. This must be recorded on their resources list as checked.

Candidates must produce a risk assessment and method statement including a list of the safety equipment required.

Candidates must produce a quality checklist for use in Task 3B, the checklist should contain the quality checks to be made, dimensions of the components and additional space for the findings of the inspection to be recorded.

Task 2

The purpose of this task is for candidates to laminate a composite component and prepare it for quality assurance. This task is in three parts: A, B and C.

Work area must be representative of normal centre practice prior to any practical activities taking place for candidates to complete their work area preparation.

Candidates must have access to the workshop/tool cupboard for any additional tools, equipment and components not previously selected in Task 1, which candidates are then able to annotate on their method statement with any changes to their original plans.

Candidates must adhere to all relevant health and safety policies and procedures and apply a safe system of work at all times. Candidates must follow their risk assessment and method statement created in Task 1; candidates must be issued with a copy prior to commencing Task 2A.

a) Preparing the mould

Candidates must prepare the work area, all resources and prepare the material for use. Candidates should check that the material is thawed (if frozen).

Candidates must select the correct tools and PPE required for this task.

Candidate must be provided with a mould, suitable composite materials and consumables. The candidate should thoroughly clean and check the mould for potential defects.

Candidates must be able to select release agents and bonding agents from a selection provided. The candidate must check the suitability of each of the agents they select.

Candidates must prepare the mould with a suitable release agent.

b) Production of the spacer block components

Candidates must prepare the work area, all resources and materials.

Patterns and templates to be used to mark out the plies and core.

The laminating process should be applied according to the method statement and cured according to the manufacturer's specification.

Candidates must debulk the laminates according to the process sheets. They must apply consumables and consolidation and check the integrity of the consolidation medium.

The assessor will observe the candidate carrying out the safety critical laminating and curing processes detailed in the method statement document.

Candidates must, once cured, remove the moulding from the mould, finish the moulding by edging and trimming to size, as required for each of the components.

c) Assembly

The laminated components should then be assembled into a completed assembly and finished accordingly.

Candidates will use appropriate equipment to measure the assembly and compare the dimensions to the specification.

Candidates must apply a safe system of work at all times. Candidates must mark out and trim the moulding to the required geometric dimensions and tolerances as specified in the technical drawings.

Candidates must assemble the individual components into an assembly, perform checks for conformity to specification and adjust as required. All components and assembly should be finished to expected industry standards.

The work area must be reinstated, tools and equipment returned to storage and all materials to be disposed of in compliance with the centre procedures.

Note: Task durations do not include curing time. It will be expected that there will be a break in assessment between Task 2B and Task 2C. Where assessments need to be completed in a number of assessment sessions or over consecutive days all practical

work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

Task 3

The purpose of this task is for candidates to quality assure and evaluate their finished composite component assembly. Candidates must evaluate the processes they have utilised to make a composite assembly, suggest justified recommendations as to how the production could be altered to produce better quality components. In addition, to reflect a real life workplace situation, candidates will be asked to also quality check a pre-fabricated spacer block which contains a number of defects caused by the processes and techniques used during the manufacturing. This task is in three parts: a), b) and c).

Work area must be representative of normal centre practice prior to any practical activities taking place for candidates to complete their work area preparation.

Candidates must have access to the workshop/tool cupboard for any additional tools, equipment and components not previously selected in Task 1, which candidates are then able to annotate on their method statement with any changes to their original plans.

a) Defect identification

Candidates will be asked to inspect a pre-fabricated composite assembly that was produced to the same specification but has defects. Providers will need to create this pre-fabricated composite assembly containing the defects listed below. Note: This relates to the spacer block assembly which is manufactured using the specified twill weave carbon epoxy pre-preg composite material.

Candidates must identify defects from the list below, record the defects with an explanation as to why it has occurred and how it could have been avoided. The purpose of this task is for candidates to demonstrate their knowledge and understanding about how defects are identified and attributed to deficiencies in material selection, production or process. The focus is not on the quantity of defects identified but on the quality of the candidate's reasoning in their response.

Defects to be included in the pre-fabricated spacer block assembly:

- bridging of the transition between the top surface and the core
- inclusion of foreign objects between the top and bottom sections
- poor "A" surface finish
- evidence of poor mould preparation resulting in adhesion to the mould and "tear-out" of the laminate.
- incomplete curing
- poor dimensional accuracy (thickness)
- poor dimensional accuracy (squareness of the base and upper section).

b) Quality review and recording

Candidates must perform a quality inspection on their own spacer block assembly. They are required to produce an inspection report containing their quality assurance findings and evaluations.

Candidates must collate the evidence of their process and to evaluate the processes they followed and the methods they used and to analyse the effectiveness of their process and to recommend changes or improvements for future production runs.

The inspection report should contain as a minimum the following information:

- overall sizes of components
- quality checks made
- method(s) of production used
- confirmation of those dimensions within tolerance and out of tolerance
- an evaluation of the fitness for purpose of the finished assembly
- results of inspection pass/fail with reasoning
- any improvements or adaptations to the assembly or process.

c) Handover

With the assessor present and the assessor (or another staff member) acting as the supervisor, candidates must demonstrate a typical handover. Candidates must present their finished work with the inspection report and give the supervisor a summary of the findings of the report and explain any improvements that they have identified to processes, procedures or product design.

The presentation has been allocated 15 minutes. Assessors will need to schedule candidates time to give their feedback on completion of Task 3b.

This task should take place once Task 3b has ended. No additional preparation time is required as this is a handover exercise and the candidate will have just completed their report and should be able to highlight areas of the report, their findings and their ideas for potential improvements.

The assessor must not ask any questions or prompt the candidate at any point in this meeting. The meeting should be recorded on video for the assessor to refer back to when completing the Practical Observation form and submit as evidence. The video recording should be a maximum of 15 minutes.

Assessors are to record their observations of this presentation on their Practical Observation form.

Task 1 – Planning

Candidates must:

- a) analyse the brief to produce a resources list needed for the production and fabrication of the composite assembly and spacer block
- 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.

Conditions of assessment:

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

Controlled conditions:

- candidates must only work on their 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
- candidates must not share or discuss their work with other candidates
- candidates 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 measuring equipment calibration check recorded
- risk assessment
- method statement with justifications
- quality check sheet.

Resources:

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

Task 2A – Preparing the mould

Candidates 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**
- candidates must carry out the task on their own, under **controlled conditions** while being observed
- correct PPE must be worn at all times and as designated in their risk assessment (if unsafe working occurs the assessment must be stopped immediately).

Controlled conditions:

- candidates must only work on their 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
- candidates must not share or discuss their work with other candidates
- candidates are not permitted to bring any materials into the assessment session
- assessor observations must be carried out within the assessor to candidate ratio stipulated by City & Guilds
- where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

What must be produced for marking:

- prepared mould.

Additional evidence for this task:

- assessor observation that includes:
 - mould preparation
 - preparation of materials
 - 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:

- mould preparation
- preparation of materials
- work area during and on completion of the tasks.

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 components

Candidates 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)
- candidates **must** carry out the task on their own, under **controlled conditions** while being observed
- correct PPE must be worn at all times and as designated in their risk assessment (if unsafe working occurs the assessment must be stopped immediately).

Controlled conditions:

- candidates must only work on their 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
- candidates must not share or discuss their work with other candidates
- candidates are not permitted to bring any materials into the assessment session
- assessor observations must be carried out within the assessor to candidate ratio stipulated by City & Guilds
- where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

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 and video that must be submitted as supporting evidence for each candidate.

Photographic evidence which shows:

- marking out and cutting materials
- the laying up and consolidation process
- the curing process
- the demoulding process and the finished (demoulded and cured) spacer block components
- the work area during and on completion of the task.

Resources:

- writing materials
- twill weave carbon epoxy pre-preg composite material (210g/m² 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

Candidates 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**
- candidates must carry out the task on their own, under **controlled conditions** while being observed
- correct PPE must be worn at all times and as designated in their risk assessment (if unsafe working occurs the assessment must be stopped immediately).

Controlled conditions:

- candidates must only work on their 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
- candidates must not share or discuss their work with other candidates
- candidates are not permitted to bring any materials into the assessment session
- assessor observations must be carried out within the assessor to candidate ratio stipulated by City & Guilds
- where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

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 and video 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/m² 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
- measurement equipment (with calibration certificate)
- 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

Candidates must:

- a) carry out a defect identification inspection of a pre-fabricated 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**
- candidates must carry out the task on their own, under **controlled conditions** while being observed
- correct PPE must be worn at all times and as designated in their risk assessment (if unsafe working occurs the assessment must be stopped immediately).

Controlled conditions:

- candidates must only work on their 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
- candidates must not share or discuss their work with other candidates
- candidates are not permitted to bring any materials into the assessment session
- where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

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.

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 defect identification process being undertaken.

Resources:

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

Task 3B – Quality review and recording

Candidates must:

- a) perform quality assurance checks on their finished assembly
- b) produce an inspection report evaluating the production of their finished 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 their 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**
- candidates must carry out the task on their own, under **controlled conditions** while being observed.

Controlled conditions:

- candidates must only work on their 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
- candidates must not share or discuss their work with other candidates
- candidates are not permitted to bring any materials into the assessment session
- assessor observations must be carried out within the assessor to candidate ratio stipulated by City & Guilds
- where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

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)
- quality check sheet from Task 1
- writing materials
- access to a computer to write the report
- copies of completed documentation from Task 1
- completed spacer block assembly from Task 2C.

Task 3C – Handover

Candidates must:

- a) hold a meeting with the 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**
- candidates must carry out the task on their own, under **controlled conditions** while being observed
- candidates must carry out the handover meeting, with the assessor present and the assessor (or another member of staff) taking the part of the supervisor
- there will be no interaction required or permitted as part of the handover.

Controlled conditions:

- candidates must only work on their 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
- assessor observations must be carried out within the assessor to candidate ratio stipulated by City & Guilds
- candidates must not share or discuss their work with other candidates
- candidates are not permitted to bring any materials into the assessment session
- where assessments need to be completed in a number of assessment sessions or over consecutive days all practical work areas and any evidence produced must be kept secure and must only be accessed by the assessor.

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 evidence 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.

4. Centre guidance

Guidance provided in this document supports the administration of this project.

The following documents, available on the City & Guilds website, provide essential generic guidance for centres delivering Technical qualifications and **must** be referred to alongside this guidance:

- ***T level technical qualifications – marking***
- ***T level technical qualifications – moderation*** (updated annually)
- ***T level technical qualifications – teaching, learning and assessment.***

This assessment is designed to require the candidate to make use of their Core knowledge, understanding and the practical skills they have built up over the course of their learning to tackle tasks/problems/challenges.

This approach to assessment emphasises to candidates the importance and applicability of the full range of their learning to practice in their industry area and supports them in learning to take responsibility for transferring their knowledge, understanding and skills to the practical situation, fostering independence, autonomy and confidence.

Candidates are provided with an assignment brief. They then have to draw on their knowledge and skills and independently select the correct processes, tools, equipment, materials and approaches to take, to complete the brief.

During the learning programme, it is expected that tutors will have taken the opportunity to set shorter, formative tasks that allow candidates to be supported to independently use the learning they have so far covered, drawing this together in a similar way, so they are familiar with the format, conditions and expectations of the assessment.

Candidates should be made aware during learning what the assessment themes are and how they are implemented in marking the assignment, so they will understand the level of performance that will achieve them high marks.

Candidates should not be entered for the assessment until the end of the course of learning for the qualification, so they are in a position to complete the assignment successfully.

Health and safety

Candidates must not be entered for assessment without being clear of the importance of working safely and having attended sufficient practical training to be able to work safely. The assessor must immediately stop an assessment if a candidate works unsafely. At the discretion of the assessor, depending on the severity of the incident, the candidate may be given a warning. If they continue to work unsafely, risking the safety of themselves or others however, their assessment must be ended, and they must retake the assessment in a future series after significant further training has taken place. Any warnings issued to a candidate must be considered as part of the marking process and recorded on the candidate record form (CRF). Any actions that have led to that warning must be detailed on the CRF so they can be considered along with the other evidence when applying the descriptors in the mark scheme.

Compliance with timings

Due to the nature of this assessment, the maximum time allowances provided must be adhered to. They refer directly to assessment time, not any additional setting up times the centre needs to create an appropriate assessment environment.

It is the centre's responsibility to plan sufficient assessment sessions as stated in each of the tasks, under the appropriate conditions, within the assignment window, to allow candidates reasonable time to complete the assessment tasks.

Where candidates are required to plan their work, they should have their plans confirmed for appropriateness in relation to the time allocated for each task, to ensure their planning has not left them with too short a time to complete the tasks safely. Any planning that is not appropriate must be recorded on the Candidate Record Form (CRF) as part of the marking process.

Candidates should be allowed sufficient time to fully demonstrate the range of their skills, however this also needs to be reasonable and practicable. Candidates should be allowed to overrun their own planned timings in order for evidence of a range of their skills to be captured. If, however, the time required exceeds the maximum time allowance for the task, the centre must stop the assessment and base the marking on the evidence up to that point.

Any guidance or feedback relating to timings/planning should follow the guidance provided in section *Guidance and feedback* below.

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.

Assessor candidate ratios

The number of candidates an assessor will be able to observe at one time will vary depending on local conditions relating to:

- monitoring and maintaining safety during assessment
 - any specific hazards related to the task that pose a risk of harm in relation to the competence of the learners
 - availability of supervisory staff to support the assessor
- the practicalities of collecting evidence
 - the complexity of evidence collection for the task
 - whether there are any peak times where there is a lot of evidence to collect that will need additional support or any that are quieter which may be eased through staggered starts etc
 - local conditions e.g.
 - layout of the assessment environment and sufficient assessor line of sight to task activity throughout the assessment period
 - amount of additional support available (e.g. to capture image/video evidence)
 - availability of suitable workspaces/bays or of shared resources and equipment.

Centres are advised to trial the planned arrangements during formative assessment, reviewing the quality of evidence captured and manageability. It is expected that for straightforward observations, with favourable local conditions and support, (and unless otherwise specified) no more than six candidates will be observed by a single assessor at one time, and the number will usually be fewer than this maximum. The key factors to

consider are the logistics of collecting sufficient evidence and ability to remain working safely in the assessment environment. A timetable of assessments and layout of the workspaces, detailing:

- the students being assessed at each workstation,
- the assessor(s) and
- support staff present

must be available for the moderator on request.

Observation evidence

Observation notes form part of the candidate's evidence and must capture evidence of student performance during the practical tasks describing how well the activity has been carried out, rather than stating the steps/actions, the candidate has taken. The notes must be very descriptive and focus on the quality of the performance that are notable in relation to the quality indicators in the marking grid. They must provide sufficient, appropriate evidence that can be used by the assessor (and moderator) to mark the performance using the marking grid. These descriptions will be used, along with e.g. photographic and video evidence to choose the relevant marking band and mark within the band so that students can be reliably and validly differentiated based on their performance. Evidence captured in the observation form must give the necessary information to enable the final assessment of the task at a later date. This is to allow a holistic judgement to be carried out after all evidence for the task is available, at which point full consideration of how the student has applied both their skills and their knowledge during the practical can be given.

Identifying what it is about the performances that is different between candidates can clarify the qualities that are important to record. Each candidate is likely to carry out the same steps, so a checklist of this information would not help differentiate between them. However, qualitative comments on how well they do it, and quantitative records of accuracy and tolerances would.

The assessor should refer to the marking grid to ensure appropriate aspects of performance are recorded. These notes will be used for marking and moderation purposes and so must be detailed, accurate and differentiating.

Assessors should refer to the **Technical qualifications guides on marking and moderation** and The Guide Standard Exemplification Materials to support with the collection of evidence through observation.

Assessors should ensure that any required additional supporting evidence including e.g. photographs or video can be easily matched to the correct candidate, are clear, well-lit and showing the areas of particular interest in sufficient detail and clarity for assessment (i.e. taken at appropriate points in production, showing accuracy of measurements where appropriate).

Assessor marking and justification is completed on a separate form (CRF) to differentiate this evidence from the judgement, since in some cases the observation form will provide evidence relating to the judgement for more than one assessment theme.

As far as possible, candidates must not be distracted, or their performance affected by the process of observation and evidence collection.

The **Technical qualifications guides on marking and moderation** are essential guidance documents and are available on the City & Guilds website. These provide further information on preparing for assessment, evidence gathering, standardisation, marking and moderation, and **must** be referred to when planning and carrying out assessment.

Video and photographic evidence in T Level Technical qualifications

The assessment materials for each assignment identify the minimum candidate and assessor evidence requirements to support marking and moderation. Where ephemeral evidence (e.g. areas of candidate performance that may be hard to capture with photographs and assessor notes alone) plays a significant part of the practical assessment. If this is the case City & Guilds will prescribe the type/capture where the use of video is necessary for practical assessment components (e.g. specifying exactly which elements of the practical must be videoed, or photographed), and any technical specifications for these forms of evidence e.g. length of videos, maximum file sizes etc will also be supplied. Photographic and video evidence will be submitted along with the written candidate evidence and assessor evidence (PO forms) as described in the additional evidence section of the task.

If this is the case then the video evidence must meet these minimum requirements, in order to be considered by moderators:

- as per the guidance in section 2.3.2 of *The Marking and Moderation Guide for Centres*, assessors must ensure that this evidence can be easily matched to the correct candidate and task, is clearly shot, well-lit and shows the areas of particular interest in sufficient detail and clarity for assessment (i.e. filmed at appropriate points in production, showing accuracy of measurements where appropriate)
- the qualitative written evidence provided by assessors must:
 - clearly identify the parts of the video that are being referred to, when used as supporting evidence. Using a timecode for this is recommended
 - include their judgement on the performance being demonstrated
- Section 6.5 of the *Centre Manual* also contains general information about the requirements for video evidence submission.

Please note that centres must ensure that video evidence is clear and meets the minimum requirements. The ability of the moderators to take this evidence into account may be impaired and delay the moderation process if the requirements are not met.

Minimum evidence requirements for marking and moderation

The sections in the assignment:

- ***What must be produced for marking***, and
- ***Additional evidence for this task***.

These list the minimum requirements of evidence to be submitted for marking and the moderation sample.

Evidence produced during assessment above and beyond this may be submitted, as long as it provides useful information for marking and moderation and has been produced under appropriate conditions.

While technological methods which support the capturing or creating of evidence can be helpful, e.g. pin board style websites for creating mood boards, the final evidence **must** be converted to a suitable format for marking and moderation which cannot be lost/deleted or amended after the end of the assessment period (e.g. screen prints, pdf files).

Considerations around tracking authenticity and potential loss of material hosted on such platforms during assessment is the centre's responsibility.

Note: Combining candidates' individual pieces of evidence into single files or zip files may make evidence management during internal marking more efficient and will greatly simplify the uploading of the moderation sample.

Where the minimum requirements have not been submitted for the moderation sample by the final moderation deadline, or the quality of evidence is insufficient to make a judgement, the moderation, and therefore any subsequent adjustment, will be based on the evidence that *has* been submitted. **Where this is insufficient to provide a mark on moderation, a mark of zero must be given.**

Preparation of candidates

Candidates should be aware of which aspects of their performance will give them good marks in assessment. This is best carried out through routinely pointing out good or poor performance during the learning period, and through formative assessment. Although candidates will not have access to the marking grids during the assessment. Candidates should be made aware of what they need to do to achieve a pass or distinction by referring and formatively being assessed against grade descriptors as part of their formal learning programme.

During the learning programme, direct tutor instruction in how to approach tasks through modelling, support, guidance and feedback are critical. However, gradual removal of this support is necessary in preparation for summative assessment. This supported approach is not valid for summative assessment.

The purpose of summative assessment is to confirm the standard the candidate has reached as a result of participating in the learning process. Candidates should be encouraged to do the best they can and be made aware of the difference between these summative assessments and any formative assessments they have been subject to. Refer to the ***T Level Technical qualifications – teaching, learning and assessment*** centre guidance document, available on the City & Guilds website for further information on preparing candidates for Technical qualification assessment.

Guidance on assessment conditions

The assessment conditions that are in place for this assignment are to:

- ensure the rigour of the assessment process
- provide fairness for candidates
- give confidence in the outcome.

They can be thought of as the rules that ensure that all candidates who take an assessment are being treated fairly, equally and in a manner that ensures their result reflects their true ability.

The conditions outlined below relate to this assignment. These do not affect any formative assessment work that takes place, although it is advised that candidates are prepared for the conditions they will need to work under during summative assessment.

The evidence for the tasks that make up this assignment must be completed under the specified conditions. This is to ensure authenticity and prevent malpractice as well as to assess and record candidate performance for assessment in the practical tasks. It is the centre's responsibility to ensure that local administration and oversight gives the assessor sufficient confidence to be able to confirm the authenticity of the candidate's work.

Security and authentication of candidate work

Candidate evidence must be kept secure to prevent unsupervised access by the candidate or others. Where evidence is produced over a number of sessions, the assessor must ensure candidates and others cannot access the evidence without supervision. This might include storing written work or artefacts in locked cupboards and collecting memory sticks of evidence produced electronically at the end of each session.

Candidates are required to sign declarations of authenticity, as is the assessor. The relevant form is included in this assignment pack and must be signed after the production of all evidence.

Where the candidate or assessor is unable to or does not confirm authenticity through signing the declaration form, the work will not be accepted at moderation and a mark of zero will be given. If any question of authenticity arises e.g. at moderation, the centre may be contacted for justification of authentication.

Accessibility and fairness

Where a candidate has special requirements, assessors should refer to the **Access arrangements and reasonable adjustments** section of the City & Guilds website.

Assessors can support access where necessary by providing clarification to any candidate on the requirements or timings of any aspect of this assignment. Assessors should not provide more guidance than the candidate needs as this may impact on the candidate's grade, see the guidance and feedback section below.

All candidates must be provided with an environment, time frame and resources that allows them reasonable access to the full range of marks available.

Guidance and feedback

To support centre file management, assessors may specify a suitable file format and referencing format for evidence (unless otherwise specified e.g. if file naming is an assessment point for the assignment). Guidance must only support access to the assignment brief and must not provide feedback for improvement. The level and frequency of clarification and guidance must be:

- recorded fully on the Candidate Record Form (CRF)
- taken into account along with the candidate's final evidence during marking
- made available for moderation.

Assessors must not provide feedback on the quality of the performance or how the quality of evidence can be improved. This would be classed as malpractice. However, this does not apply if the assessor asks questions as part of the assessment process. Such requirements will be specifically stated within task centre guidance.

Assessors should however provide general reminders to candidates throughout the assessment period to check their work thoroughly before submitting it, and to be sure that they are happy with their final evidence as it may not be worked on further after submission.

Candidates can rework any evidence that has been produced for each task during the time allowed.

Assessors should check and be aware of the candidates' plans and designs to ensure management of time and resources is appropriate, and so any allowed intervention can take place at an appropriate time.

The information on the guidance given and captured on the CRF is part of the evidence that must be taken into account along with the other evidence for the task when marking. It is up

to the assessor to decide if the guidance the candidate has required suggests they are lacking in any performance outcome and consider the severity of the issue when applying the marking criteria. The assessor must record where and how guidance has had an impact on the marks given, so this is available should queries arise at moderation or appeal.

What is, and is not, an appropriate level of guidance

- The assessor should intervene with caution if a candidate has taken a course of action that will result in them not being able to submit the full range of evidence for assessment. However, this should only take place once the assessor has prompted the candidate to check that they have covered all the requirements. Where the assessor has to be explicit as to what the issue is, this is likely to demonstrate a lack of understanding on the part of the candidate rather than a simple error, and full details should be recorded on the CRF.
- The assessor should not provide guidance if the candidate is thought to be able to correct the issue without it, and a prompt would suffice. In other words, only the minimum support the candidate actually needs should be given, since the more assessor guidance provided, the less of the candidate's own performance is being demonstrated and therefore the larger the impact on the marks awarded.
- The assessor must not provide guidance that the candidate's work is not at the required standard or how to improve their work. In this way, candidates are given the chance to identify and correct any errors on their own, providing valid evidence of knowledge and skills that will be credited during marking.
- The assessor must not produce any templates, pro-formas, work logs etc., unless instructed to in the assignment guidance. Where instructed to do so, these materials must be produced as specified and contain no additional guidance. If templates are provided as part of the assignment, these should not be adapted but can be provided to candidates either electronically or as paper based. Compliance of this requirement will be checked at moderation.

All specific prompts and details of the nature of any further guidance must be recorded on the relevant form and reviewed during marking and moderation.

5. Marking guidance

Guidance on marking

Please refer to the *T Level Technical qualifications – marking and moderation* centre guidance documents for further information on gathering evidence suitable for marking and moderation, and on using the marking grid and forms.

The Candidate Record Form (CRF) is used to record:

- details of any guidance or the level of prompting the candidate has received during the assessment period
- rough notes bringing together relevant evidence from across tasks during marking
- summary justifications when holistically coming to an overall judgement of the mark for each performance objective and overall
- if an assessment has to be stopped on the grounds of Health and Safety or if a candidate has been working in an unsafe manner.

The Practical Observation form (PO) is used to record:

- descriptive information and evidence of candidate performance during an observation.

Carrying out marking using assessment themes

The process of marking each assessment theme is iterative and should follow the process below which will become more spontaneous over time as the descriptors become familiar. It is recommended to refer back to these frequently however, so the standard does not unintentionally drift over the marking period.

The indicative content gives an indication of the expected content parameters the responses are likely to cover, and which aspects of the evidence are relevant. It is not exhaustive, and an acceptable answer may concentrate more on depth rather than fully cover the range indicated or deviate into relevant topics not listed.

The specific task evidence listed within the assessor guide and marking grid must be used to make a judgement on performance in relation the specific assessment theme.

The assessment tasks guide the production of valid evidence under appropriate conditions for assessment. Candidate evidence from a range of tasks may contribute to the marking of a single assessment theme, or from a single task to more than one assessment theme. In this case different aspects of the evidence are being considered for each theme and need to be judged against the marking descriptors specified in the assessment themes independently of each other.

In some cases, the quality indicators looked for in the judgement may naturally be more strongly evidenced in one piece of evidence than another. For instance, more formulaic or prescriptive forms of evidence may not be able to generate evidence of higher levels of performance, so this evidence would need to be looked for in the other forms of evidence. This means that where a range of evidence is to be assessed, it should be treated as a single package of evidence for the purposes of marking even if generated through different tasks.

Timing of marking

As some assessment themes require the triangulation of a number of pieces of evidence, marking cannot take place until after all of these are available. This does not however mean that all marking needs to take place after all candidates have completed the whole assessment.

Also, it is possible to begin recording the notes that will justify the marking for some assessment themes as evidence is produced, with the final mark only being decided once the complete array of evidence is available. This is particularly the case if later evidence is more confirmatory, and the earlier evidence is sufficiently informative for the qualities being assessed to make this a useful exercise.

Through planning, it should be possible to identify any evidence that can start being reviewed earlier, and the assessment themes which could be scheduled for earlier completion of marking e.g. while observation evidence is fresh in the mind should this be helpful. Care must of course be taken to ensure any evidence required by candidates to progress with another task are available for that task to take place. In addition, a sense check must take place across marking for each assessment theme, and across assessors, at the end to ensure marking has not drifted during the period. This may take the form of comparing candidate work to check that the ranking of quality of evidence matches the ranking of marks – where there are discrepancies marking should be checked for accuracy. These checks should be the responsibility of the Internal Quality Assurer and undertaken as part of the centre's Internal Quality Assurance strategy.

Process for each assessment theme:

- Select the range of evidence relevant for making the judgement – this is indicated in the mark scheme for each assessment theme. However, should relevant evidence for any candidate be found elsewhere amongst the rest of their evidence, this may also be taken into consideration when making the marking judgement as long as it is:
 - valid in relation to the assessment theme
 - is produced under appropriate conditions
 - and the marker is confident that it is authentic.
- Scan/read the candidate evidence, any notes on the CRF e.g. regarding level of support/ guidance recorded, evidence captured by the assessor and the indicative content and band descriptors in the mark scheme.
- Note: for any warnings given during the assessment the actions that have led to that warning must be detailed on the CRF so they can be considered along with the other evidence when applying the descriptors in the mark scheme.
- Note: the evidence contained on the CRF must be considered and a judgement made on the level of performance the candidate has independently demonstrated – this will vary depending on the level of support detailed on the CRF – i.e. consider all relevant evidence and then judge the appropriate mark following the process below.
- Make an initial assessment of the required evidence as a whole, considering each band in turn and considering the level of performance described in the context of the knowledge and skills in the indicative content to make a balanced judgement of the best band to use as a starting point.
- Read the evidence and review it against the band descriptor in more detail, deciding if the response is securely sitting within the band; i.e. all quality characteristics described by the band descriptor are seen, and strongly meets the level of performance described by the descriptor holistically (i.e. across the range of relevant evidence):
 - check the descriptor for the level above

- if the evidence clearly shows some of the characteristics of the higher band, select a suitable mark at the bottom of that band
- if *not* showing characteristics of the higher band revert to the original band, select a mark at the higher end of that mark range.

If the response is not securely in the band, but *is partially* showing the characteristics of the band:

- check the descriptor of the level below
- decide on a suitable mark either at the bottom of the original band as some characteristics shown, or top of the lower band if it better describes the quality of the characteristics being shown.

If the response is largely meeting the band, with only a few concerns, and is not showing characteristics aligning with the higher or lower bands, the appropriate mark is likely to be in the middle range.

If there is no alignment with the descriptor, reassess the starting band, and begin again.

- Based on the level of alignment with the descriptor, confirm the final mark within the band, bearing in mind that the available marks form an *evenly distributed scale*:
 - if the quality of response *fully* aligns with the performance described by the descriptor – assign a high mark within the band
If the quality of the response *partially* aligns with the performance described by the descriptor – assign a low to medium mark within the band
 - consider the quality compared to a range of similar responses (e.g. relevant annotated training material exemplars, responses reviewed during standardisation, and through experience) choose a mark on the point on the scale that would give an appropriate ranking for the assessed piece of evidence in relation to this information and in comparison, with that of the rest of the cohort for that assessment theme.

Marking grids

There is a marking grid for each assessment theme that must be assessed as part of this occupational specialism assessment. The individual statements within the band descriptors should be treated together to make one whole descriptor and not separately.

Assessment theme – Health and safety

Guidance for assessors

Evidence from Tasks 1, 2a, 2b, and 2c should be used to assess performance against this assessment theme.

Task 1

- resources list with measuring equipment calibration check recorded
- risk assessment
- method statement with justifications.

Task 2a

- assessor observation:
 - work area during and on completion of the tasks
 - the handling and application of composite materials
 - the application and use of tools and equipment
- photographic evidence showing:
 - work area during and on completion of the tasks
 - the application and use of tools and equipment.

Task 2b

- assessor observation:
 - work area during and on completion of the tasks
 - the handling and application of composite materials
 - the application and use of tools and equipment

- photographic evidence showing:
 - the handling and application of composite materials
 - work area during and on completion of the tasks.

Task 2c

- assessor observation:
 - work area during and on completion of the tasks
 - the handling and application of composite materials
 - the application and use of tools and equipment
- photographic evidence showing:
 - work area during and on completion of the tasks.

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per sub assessment theme | Total marks for assessment theme |
|---|--|--------------------------|--------------------------|---|---|
| | <p>Indicative content: Completion of a comprehensive assessment of risk and risk management including risks associated with tools and equipment, work area and others safety. Risk assessment to include the moulding, laying-up/laminating, consolidation, curing and demoulding processes and final assembly of the spacer block assembly:</p> <ul style="list-style-type: none"> • Identification of low, medium and high risks that may include: <ul style="list-style-type: none"> ○ high risk: airborne dust, fumes (solvents), chemicals (handling of, mixing and combining effects, vapours, reactions, health – allergic reactions and exposure (skin, eye, respiratory irritants), routes of exposure (absorption, inhalation, ingestion, injection). ○ medium risk: fire hazards (flashpoints/scalds/burns), handling composite materials (allergic reactions, sensitivity, exposure, fibre particle transfer, manual handling, minor physical injuries), equipment (freezer/heat sources blisters/scalds and burns). ○ low risk: slip, trip and falls, disposal of waste (materials, solvents, loose fibres, remnants, mixing equipment, used containers), work environment. | | | | |

| | |
|--|--|
| | <ul style="list-style-type: none"> • Analysis of the risk occurring, including who could be affected and the likelihood of them being affected. • Identification of control measures using hierarchy of control, including PPE (eye protection, skin protection, gloves, safety footwear, masks and respiratory systems, managing long hair/loose clothing), isolation, ventilation. <p>Preparation and production of spacer block:</p> <ul style="list-style-type: none"> • correct checks, preparation and handling of resources; including tools and equipment, PPE (eye protection, skin protection, gloves, safety footwear, masks and respiratory systems) • safe isolation procedures for tool/machinery maintenance (power tools, air tools, curing equipment (ovens, heat sources/drying rooms) vacuum equipment) for replacement or adjustment, completed accurately and safely. (Failure to complete safe isolation as specified and leading to an unsafe situation, will require the assessment to be stopped immediately) • work area to be kept tidy throughout the tasks and reinstated after completion of the spacer block assembly. • work environment must be prepared for working with composite materials (well ventilated, have first aid and eye wash station, cleaning materials (to enable a clean area), working clock, room thermometer and humidity indicator(s), segregated disposal of waste • wearing the correct PPE (eye protection, skin protection, gloves, safety footwear, masks and respiratory systems) at all times, as identified in their risk assessment and/or materials list • following safe systems of work throughout all practical activities, especially when working tools and equipment (moulds, measurement and inspection tools (electronic scale, straight edge, carpenter's level, carpenter's square), clamps and holding devices, hand tools (saws, rotary cutter, knives, cutting blades, files, sanding blocks, moulding tools (wedges, trimming and finishing tools), vacuum and consolidation equipment, curing equipment, handling and working with materials and consumables (prepreg composite material, mould release agents, solvents, resins, peel-ply, breather fabric, tacky tape, bagging film). <p>Completion of an evaluation and implementation report including details of:</p> <ul style="list-style-type: none"> • health and safety regulations (HASAWA, COSHH, PUWER, Manual Handling, Waste) • Safety Data Sheets relating to terminology and guidance/instructions provided by the manufacturers • workplace procedures relating to safe use of tools and equipment, materials, consumables, maintenance and disposal of waste • measures required for ventilation, dust and fume management • measures required for dealing with emergencies • implications of incorrect construction, assembly and overall performance of the spacer block. |
|--|--|

| Marks per band | 1 - 4 | 5 - 8 | 9 - 12 | n/a | 12 |
|----------------|--|--|---|-----|----|
| | <p>Risk assessment is mostly complete and covers some of the major risk factors. Risk mitigation measures methods are limited. Likelihood, severity or probability has been taken into account but not for all risks and hazards.</p> <p>Safety issues taken into account as part of preparatory checks and planning activities, including safe isolation some of the time.</p> <p>Health and safety is followed during preparation and throughout the tasks so that all work is completed safely but when working, some low risk hazards were missed.</p> <p>Work area left in safe condition, some tools and equipment not</p> | <p>Risk assessment is complete and covers all of the major risk factors and a good range of other associated risks. Risk mitigation methods have been identified for some of the potential risks, but not all. Likelihood, severity or probability has been taken into account for most risks and hazards.</p> <p>Safety issues taken into account as part of preparatory checks and planning activities, including safe isolation most of the time.</p> <p>Health and safety is followed during preparation and throughout tasks and all work completed safely. Most risks and hazards that occur during the tasks are correctly mitigated against as they arise.</p> <p>Work area left safe, clean and tidy, with most tools</p> | <p>Risk assessment identifies all of the major risk factors and all other associated risks. Risk mitigation methods are detailed and have been clearly identified for all potential risks. Potential for harm and probability factors have been identified throughout.</p> <p>Safety issues taken into account as part of preparatory checks and planning activities, including safe isolation all of the time.</p> <p>Health and safety is followed during preparation and throughout tasks and all work completed safely. All risks and hazards that occur during the tasks are correctly mitigated against as they are arise.</p> <p>Work area returned to original condition with all tools and equipment</p> | | |

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| | returned to correct storage facilities, disposal of waste was carried out but with limited reference to disposal requirements and waste regulations. | and equipment returned to correct storage facilities, disposal of waste was carried out but with some reference to disposal requirements and waste regulations. | returned to correct storage facilities, disposal of waste was carried out taking into account all of the disposal requirements and waste regulations. | | |
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Assessment theme – Planning and preparation

Guidance for assessors

Evidence from Task 1 and 2a should be used to assess performance against this assessment theme.

Task 1

- resources list with measuring equipment calibration check recorded
- risk assessment
- method statement with justifications.

Task 2a

- completed mould preparation
- assessor observations:
 - preparation of composite materials
 - the prepared work area
- photographic evidence showing:
 - mould preparation
 - material preparation
 - work area during and on completion of the tasks.

| Note: where there is insufficient evidence to award a mark, a zero mark must be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per sub assessment theme | Total marks per assessment theme |
|--|---|--------------------------|--------------------------|---|---|
| | Indicative content: Planning: <ul style="list-style-type: none"> • analysis and interpretation of technical documentation including the assignment brief, diagrams/drawings, specification, and requirements, using information gathered in the brief provided to plan all activities | | | | |

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| | <ul style="list-style-type: none"> • an understanding of correctly interpreting safety/data COSHH sheets and manufacturer’s information in relation to materials (Twill weave carbon epoxy pre-preg composite material (210g/m² 2x2 twill weave carbon epoxy pre-preg recommended) and consumables (solvents, peel-ply, breather fabric, tacky tape, bagging film, vacuum breach units) used throughout the tasks • completion of a method statement of how the tasks will be carried out in a safe and logical manner with reasoning to support methods given, identifying a sequence of activities and using correct technical terminology. • preparing the mould for moulding activities, including identification of defects or impurities that need rectification or reporting (repair, cleaning) • list of appropriate requirements and resources needed to carry out the tasks, with justifications for selection of components and tools, materials and equipment for different aspects of the assignment, wastage and disposal requirements • type, size and quantities of resources needed to complete the tasks in a timely manner • checking of documentation for discrepancies or issues. <p>Preparation:</p> <ul style="list-style-type: none"> • implementation of plans (standard operating procedures, safe systems of work, sequence of activities) • preparation of resources to ensure safety and efficiency in completing all tasks: <ul style="list-style-type: none"> ○ tools and equipment (moulds, measurement and inspection tools (calibrated) (electronic scale, straight edge, carpenter’s level, carpenter’s square)), clamps and holding devices, hand tools (saws, rotary cutter, knives, cutting blades, files, sanding blocks, moulding tools (wedges, trimming and finishing tools), vacuum and consolidation equipment, curing equipment) ○ work area and environment (well ventilated, have first aid and eye wash station, cleaning materials (to enable a clean area), working clock, room thermometer and humidity indicator(s), segregated disposal of waste) to ensure efficiency in completing tasks ○ materials and consumables (prepreg composite material, mould release agents, solvents, peel-ply, breather fabric, tacky tape, bagging film), including thawing, storage and handling uncured material and consumables • application of isolation methods prior to pre-use checks, basic maintenance and cleaning. | | | | |
| Marks per band | 1 - 3 | 4 - 6 | 7 - 9 | 9 | 18 |
| Planning | Limited analysis and justifications covering some factors relevant to | Good analysis covering most factors relevant to the brief with justifications provided in | Thorough analysis covering all factors relevant to the brief with all justifications provided. | | |

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| | <p>the brief. Basic method statement contains limited information of the scope, processes, tools and equipment.</p> <p>Limited resources and requirements listed, including relevant technical documentation, with limited justifications.</p> <p>Limited use of relevant technical terminology and some reference to industry standards.</p> <p>Planning does not fully take into account the implications of potential issues with the moulding, laminating and finishing processes, resulting in potential failures and defects in the finished product.</p> | <p>some detail. Logical method statement contains some detailed information of the scope, processes, tools and equipment.</p> <p>Most resources and requirements listed, including technical documentation, with some justifications for most, or full justifications for some.</p> <p>Some use of relevant and industry standard technical terminology and good reference to industry standards.</p> <p>Planning is good, processes described, most implications have been taken into account as resulting in reduced potential of failures and defects in the finished product.</p> | <p>Well-structured method statement contains fully detailed information of the scope, processes, tools and equipment.</p> <p>Comprehensive list of all resources and requirements, including technical documentation, with full justifications for all.</p> <p>Relevant and industry standard technical terminology consistently used throughout, very good referencing of industry standards.</p> <p>Planning is comprehensive, all processes are described in detail, all possible implications are taken into account, resulting in limited defects in the finished product.</p> | | |
| Marks per band | 1 - 3 | 4 - 6 | 7 - 9 | 9 | |
| Preparation | Limited range of relevant technical documentation has been prepared but may not include the | A good range of relevant technical documentation has been prepared for some tasks, with quality, accuracy and | A comprehensive range of technical relevant documentation has been prepared for all tasks, quality, | | |

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| | <p>quality, accuracy or completeness.</p> <p>Selection of tools, equipment and processes is appropriate to the task some of the time. Limited preparatory checks completed. Materials preparation is completed with some reference to manufacturer's handling and storage requirements and recommendations.</p> <p>Work area prepared safely, sometimes referencing the prepared method statement and workflow. Limited tool calibration checks undertaken.</p> | <p>completeness taken into account.</p> <p>Selection of tools, equipment and processes is appropriate to the task most of the time. A good range of preparatory checks have been completed. Materials preparation is completed with good reference to manufacturer's handling and storage requirements and recommendations.</p> <p>Work area prepared safely with good referencing of the prepared method statement and workflow, with safe isolation and calibration checks on a range of tools and equipment.</p> | <p>accuracy and completeness are fully taken into account.</p> <p>Selection of tools, equipment and processes is appropriate to the task all of the time. A comprehensive range of preparatory checks have been completed. Materials preparation is completed with comprehensive reference to manufacturer's handling and storage requirements and recommendations.</p> <p>Work area prepared safely with comprehensive referencing of the prepared method statement and workflow, with safe isolation and calibration checks on all listed tools and equipment.</p> | | |
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Assessment theme – Production

Guidance for assessors

Evidence from Tasks 1, 2a, 2b and 2c should be used to assess performance against this assessment theme.

Task 1

- resources list with measuring equipment calibration check recorded
- risk assessment
- method statement with justifications.

Task 2a

- prepared mould
- assessor observations:
 - mould preparation
 - preparation of materials
 - work area during and on completion of the tasks
- photographic evidence:
 - mould preparation
 - preparation of materials
 - work area during and on completion of the tasks.

Task 2b

- the completed spacer block components
- 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.
- photographic evidence:

- marking out and cutting materials
- the laying up and consolidation process
- the curing process
- the demoulding process and the finished (demoulded and cured) spacer block components
- the work area during and on completion of the tasks.

Task 2c

- the completed spacer block assembly
- assessor observations:
 - 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.
- photographic evidence:
 - assembly of the spacer block in stages, including bonding, curing, trimming and finishing processes
 - the completed spacer block assembly.

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per sub assessment theme | Total marks for assessment theme |
|---|---|--------------------------|--------------------------|---|---|
| | Indicative content: Moulding: <ul style="list-style-type: none"> ● correct preparation of the mould including checking for mould defects ● correct selection and application of release agents ● cutting of all materials to size, according to plan and technical drawings | | | | |

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| | <ul style="list-style-type: none"> • application of pre-preg layers onto the mould (platen); plies are laid-up in the correct orientation during the laminating process, subsequent plies are laid-up onto the core and mould according to the plan and technical drawings. <p>Laminating:</p> <ul style="list-style-type: none"> • identification of the correct orientation of the fibres prior to laminating • application of pre-preg layers onto the mould (platen); plies are laid-up in the correct orientation during the laminating process, subsequent plies are laid-up onto the core and mould • laying up process and procedures including, the knowledge and understanding of potential defects that can occur if process and procedures are not followed • understanding of Foreign Object Debris (FOD) procedures and prevention of FOD occurring • application of ply backing material count-back procedures. <p>Consolidation, curing and demoulding:</p> <ul style="list-style-type: none"> • application of consumables in the correct order prior to consolidation • application of consolidation pressure to the vacuum bag and check for vacuum integrity • curing of the laminates according to the manufacturer's specifications • removal of the consumables and demoulding the moulding. <p>Assembly:</p> <ul style="list-style-type: none"> • correct application of final bonding agent to affix all components to form the final assembly • alignment of the components to meet the specification • curing and finishing of the final spacer block assembly. <p>Tools and equipment:</p> <ul style="list-style-type: none"> • application of correct tool for the job (moulding, laminating, consolidation, curing, demoulding) • application of tool skills, techniques to avoid causing damage and defects to mould, materials or equipment (bridging of the transition between the top surface and the core, inclusion of foreign objects between the top and bottom sections, poor surface finish, adhesion to the mould and "tear-out" of the laminate, incomplete curing) • use of tools to safe-edge the moulding ready for assembly • identification of operating modes of equipment (parameters – temperature/pressure) and implications of incorrect settings • monitoring performance of equipment and workshop conditions (temperature/pressure/humidity) during consolidation and curing including checking parameters – temperature/pressure are sustained |
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| | <ul style="list-style-type: none"> requirements for and monitoring of work area conditions and implications for the activities (ventilation, humidity, room temperatures) cleaning, maintaining and storing tools and equipment on completion of all activities. | | | | |
| Marks per band | 1 – 2 | 3 – 4 | 5 – 6 | 6 | 45 |
| Moulding | <p>A brief assessment of the mould is carried out, mould cleaned, some minor defects missed resulting in a lower quality moulding.</p> <p>Release agent is applied to the mould according to the manufacturer's specification but application is uneven resulting in a poor release.</p> <p>The marking out process is followed some of the time, but with some inaccuracies noted. The material is not cut to net shape utilising the most efficient layout and waste reduction techniques.</p> | <p>A careful assessment of the mould is carried out, mould is cleaned, no defects identified resulting in a good quality moulding.</p> <p>Release agent is applied to the mould according to the manufacturer's specification, application is mostly even resulting in a good release.</p> <p>The marking out process is followed most of the time and where followed is accurate. Process takes into account ply-orientation and utilisation of material and waste reduction techniques.</p> | <p>A thorough assessment of the mould is carried out, mould is cleaned and a process is used to check for surface defects resulting in a high quality moulding.</p> <p>Release agent is applied according to the manufacturer's specification, is applied evenly resulting in a very clean release.</p> <p>The marking out process is followed all of the time and is accurate. Process takes into account the implications of ply orientation and material utilisation, and material waste is effectively minimised.</p> | | |
| Marks per band | 1 – 4 | 5 – 8 | 9 – 12 | 12 | |
| Laminating | The laminating plan is referred to some of the | The laminating plan is referred to most of the | The laminating plan is referred to at all times in | | |

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| | <p>time in order to support some parts of the activity.</p> <p>Material is consistently applied to the mould some of the time.</p> <p>Some understanding shown of contamination risk during the laminating task. FOD remedial action is taken but is not consistent in approach resulting in some FOD in the finished component/assembly.</p> <p>The plies are placed with regular reference to the ply orientation chart in the plan and the technical drawings some of the time.</p> | <p>time in order to support most parts of the activity.</p> <p>Material is consistently applied to the mould most of time.</p> <p>Good understanding shown of contamination risk during the laminating task. FOD remedial action is mostly consistent in approach resulting in minimal FOD in the finished component/assembly.</p> <p>The plies are placed with regular reference to the ply orientation chart in the plan and the technical drawings most of the time.</p> | <p>order to effectively support all parts of the activity.</p> <p>Material is consistently applied to the mould all of the time.</p> <p>Comprehensive understanding shown of contamination risk during the laminating task. FOD remedial action is very effective and consistent resulting in no FOD present in the finished component/assembly.</p> <p>The plies are placed with regular reference to the ply orientation chart in the plan and the technical drawings all of the time.</p> | | |
| Marks per band | 1 – 4 | 5 – 8 | 9 – 12 | 12 | |
| Consolidation, curing and demoulding | <p>Consolidation plan is referred to some of the time in order to support some parts of the activity. Consumables are laid out on the moulding and utilised to reduce wastage and make best use of their properties some of the time.</p> | <p>Consolidation plan is referred to most of the time in order to support most parts of the activity. Consumables are laid out on the moulding and utilised to reduce wastage and make best use of their properties most of the time.</p> | <p>Consolidation plan is referred to all of the time to effectively support all of the activity. Consumables are laid out on the moulding and utilised to reduce wastage and make best use of their properties all of the time.</p> | | |

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| | <p>Some understanding shown of the consolidation process, with minor breaching and minimal checks made on the consolidation conditions resulting in a defect.</p> <p>Some understanding shown of the curing process, but insufficient data is gathered relating to the curing process. Limited reference made to manufacturer's specification and data sheets.</p> <p>Moulding is removed safely from the mould and ensuring mould and moulding are undamaged some of the time.</p> | <p>Good understanding shown of the consolidation process, with some monitoring checks of the consolidation conditions ensuring a good consolidation.</p> <p>Good understanding shown of the curing process. Records of curing temperature and duration are taken. Good reference to manufacturer's specification and data sheets.</p> <p>Moulding is removed safely from the mould and ensuring mould and moulding are undamaged most of the time.</p> | <p>Comprehensive understanding shown of the consolidation process and consolidation conditions, monitoring the temperature and pressure applied during the process to ensure effective consolidation.</p> <p>Comprehensive understanding of the curing process. Careful records of curing are kept and these are compared to manufacturer's specification and discrepancies are noted and communicated.</p> <p>Moulding is removed safely from the mould and ensuring mould and moulding are undamaged all of the time.</p> | | |
| Marks per band | 1 – 2 | 3 – 4 | 5 – 6 | 6 | |
| Assembly | <p>The components are assembled with a compatible bonding agent for the materials but the consolidation process not effective resulting in poor quality consolidation of the final assembly with areas of</p> | <p>The components are assembled with a compatible bonding agent for the materials. Consolidation process was mostly effective resulting in a good quality consolidation of the final assembly with minimal</p> | <p>The components are assembled with a compatible bonding agent for the materials. Consolidation process was highly effective resulting in very good quality consolidation of the final assembly with no visible</p> | | |

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| | lifting and some poor rigidity. Bonding results in accurate alignment of the assembled components some of the time. | areas of lifting and some loss of rigidity. Bonding results in accurate alignment of the assembled components most of the time. | areas of lifting and no loss of rigidity. Bonding results in accurate alignment of the assembled components all of the time. | | |
| Marks per band | 1 – 3 | 4 – 6 | 7 – 9 | 9 | |
| Tools and equipment | <p>The correct tools are used in the manner which it was designed for. All tools checked prior to, and after use, cleaned and stored correctly after use some of the time.</p> <p>Use of tools, equipment and processes is basic, resulting in a finish that is of poor quality, with marks from tool usage.</p> <p>Performance of equipment is sometimes recorded and monitored, minimising possible implications in terms of the quality and performance of mouldings produced.</p> | <p>The correct tools are used in the manner which it was designed for. All tools checked prior to, and after use, cleaned and stored correctly after use most of the time.</p> <p>Use of tools, equipment and processes is good resulting in a finish that is of adequate quality, with minimal marks from tool usage.</p> <p>Performance of equipment is mostly recorded, and monitored, minimising possible implications in terms of the quality and performance of mouldings produced.</p> | <p>The correct tools are used in the manner which it was designed for. All tools checked prior to, and after use, cleaned and stored correctly after use all of the time.</p> <p>Use of tools, equipment and processes is comprehensive, resulting in a finish that is of high-quality, with no marks from tool usage.</p> <p>Performance of equipment is always recorded and monitored, minimising possible implications in terms of the quality and performance of mouldings produced.</p> | | |

Assessment theme – Quality review and evaluation

Guidance for assessors

Evidence from Tasks 1, 2b, 2c, 3a, 3b and 3c should be used to assess performance against this assessment theme.

Task 1

- method statement
- quality check sheet.

Task 2b

- the completed spacer block components
- photographic evidence:
 - the demoulding process and the finished (demoulded and cured) spacer block components.

Task 2c

- the completed spacer block assembly
- photographic evidence:
 - assembly process of the spacer block (incorporating evidence of bonding, curing and trimming).

Task 3a

- list of identified defects with cause and prevention indicated
- assessor observation:
 - defect identification process
- photographic evidence showing:
 - the defect identification process being undertaken.

Task 3b

- completed quality check sheet

- quality inspection report.
- assessor observation:
 - quality checking process being undertaken
 - application and use of measuring equipment
- photographic evidence:
 - the quality checking process being undertaken and the use of the quality check sheet.

Task 3c

- assessor observation:
 - the handover meeting
- video evidence which shows:
 - the handover meeting.

| Note: where there is insufficient evidence to award a mark, a zero mark may be given | Band 1 descriptor | Band 2 descriptor | Band 3 descriptor | Total marks per sub assessment theme | Total marks for assessment theme |
|---|--|--------------------------|--------------------------|---|---|
| | <p>Indicative content:</p> <p>Quality review:</p> <p>Perform quality inspection on completed spacer block assembly:</p> <ul style="list-style-type: none"> • correct use of appropriate measuring equipment tools (straight edge, carpenter’s level, carpenter’s square) • materials and consumables used conform to specification • checking the final product conforms to brief, specification, dimensions and design • defect identification, cause, prevention and rectification process • detectable defects are identified and attributed to deficiencies in material selection, production or process. <p>Reporting, recording and handover:</p> <p>Completion of a Quality inspection report to include:</p> <ul style="list-style-type: none"> • finished sizes of components and confirmation the assembly conforms to the dimensional requirements of the specification | | | | |

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|-----------------------|--|---|---|----------|-----------|
| | <ul style="list-style-type: none"> • an explanation of the quality checks undertaken and the reasons for their use • an evaluation of the fitness for purpose of the finished assembly and method of production used with reasoning and justifications • problems encountered during the production and assembly, including reasoning and solutions. • a concessions list for every facet of the assembly that does not conform to the specification, reasons for occurrence and how to prevent reoccurrence • any amendments needed to their 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 • recording documentation captures key data (time, dimensions, temperature, pressure, humidity) and conforms the level of quality achieved • information and terminology accurate throughout and presented clearly • records of waste disposal and recycling of waste. <p>Handover to include:</p> <ul style="list-style-type: none"> • use of technical communication and vocabulary during meeting • summary of findings and outcome of activities, problems incurred/resolved • summary of potential improvements to assembly or process for future production • handover procedures and requirements, presenting finished report and completed assembly. | | | | |
| Marks per band | 1 – 2 | 3 - 4 | 5 - 6 | 6 | 15 |
| Quality review | <p>Processes to identify and rectify defects are suggested with limited reasoning demonstrating some gaps in understanding.</p> <p>Final dimensions meet the specification some of the time.</p> | <p>Processes to identify and rectify defects are described with some reasoning and the implications for repair are understood and articulated.</p> <p>Final dimensions meet the specification most of the time.</p> | <p>Processes to identify and rectify defects are thoroughly explained and the implications for repair are understood and articulated.</p> <p>Final dimensions meet the specification all of the time.</p> | | |

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| | Evaluation is basic and identifies a list of improvements with brief justification. Where no improvements/adaptions are needed, this is supported with brief reasoning and justifications to why. | Evaluation is good and identifies a range of improvements with good justification. Where no improvements/adaptions are needed, this is supported with good reasoning and justifications to why. | Evaluation is thorough and identifies a comprehensive range of improvements with clear and detailed justification. Where no improvements/adaptions are needed, this is supported with detailed and thorough reasoning and justifications to why. | | |
| Marks per band | 1 – 3 | 4 – 6 | 7 – 9 | 9 | |
| Reporting, recording and handover | <p>Reporting contains the appropriate information and uses correct technical terminology some of the time.</p> <p>Handover meeting is brief, some explanation given to the findings of the report. Basic level of terminology used throughout. Terminology used may have inaccuracies may include inconsistencies and not clear to the targeted audience.</p> | <p>Reporting contains the appropriate information and uses correct technical terminology most of the time.</p> <p>Handover meeting is good, clear explanation given to the findings of the report. Correct industry terminology throughout. Terminology used is mostly accurate with minor errors but does not always take into account the target audience.</p> | <p>Reporting contains the appropriate information and uses correct technical terminology all of the time.</p> <p>Handover meeting is very good, detailed explanation given to the findings. Correct industry terminology used throughout to the targeted audience.</p> | | |

6. Links to Maths, English and Digital Skills

The table below indicates where each of the General Maths, English and Digital Competencies have been integrated into the assignment tasks.

| Task | Skills |
|-------------|---|
| 1 | MC2, MC3, MC8, MC10, EC1, EC2, EC3, EC5, DC1, DC2 |
| 2 | MC1, MC3, MC10, EC1 |
| 3 | MC10, EC1, EC2, EC3, EC4, EC5, EC6, DC1, DC2 |

7. Declaration of authenticity

| | |
|-----------------------|-----------------------------|
| Assessment ID | Qualification number |
| | |
| Candidate name | Candidate number |
| | |
| Centre name | Centre number |
| | |

Additional Support

Has the candidate received any additional support in the production of this work?

No **Yes** (Please tick appropriate)

If yes, give details below (and on a separate sheet if necessary).

| |
|--|
| |
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Candidate:

I confirm that all work submitted is my own, and that I have acknowledged all sources I have used.

| | |
|----------------------------|-------------|
| Candidate signature | Date |
| | |

Assessor:

I confirm that all work was conducted under conditions designed to assure the authenticity of the candidate's work, and am satisfied that, to the best of my knowledge, the work produced is solely that of the candidate.

| | |
|---------------------------|-------------|
| Assessor signature | Date |
| | |

Note: Where the candidate and/or assessor is unable to or does **not** confirm authenticity through signing this declaration form, the work will be returned to the centre, and this will delay the moderation process. If any question of authenticity arises, the assessor may be contacted for justification of authentication.

8. Candidate Record Form (CRF) – Exemplar

T level technical qualifications

(T level technical qualification – Composites manufacturing occupational specialism)

| | |
|-----------------------|-------------------------|
| Candidate name | Candidate number |
| | |
| Centre name | Centre number |
| | |

Marker Notes – Please always refer to the relevant marking grid for guidance on allocating marks and make notes which describe the quality of the evidence and justification of marks.

Please record any guidance, intervention (including Health and Safety) or feedback that is given to a candidate.

Expand boxes as required.

| Health and safety | | | | | | | | | | | | |
|-------------------|-------------------------|---|---|---|---|---|---|---|---|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Mark | Notes and justification | | | | | | | | | | | |

| Planning and preparation | | | | | | | | | | | | |
|--------------------------|-------------------------|---|---|---|---|---|---|---|---|----|----|----|
| Planning | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Mark | Notes and justification | | | | | | | | | | | |
| Preparation | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Mark | Notes and justification | | | | | | | | | | | |

| Production | | | | | | | | | | | | |
|---|-------------------------|---|---|---|---|---|---|---|---|----|----|----|
| Moulding | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | | |
| Mark | Notes and justification | | | | | | | | | | | |
| Laminating | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | |
| Mark | Notes and justification | | | | | | | | | | | |
| Consolidation, curing and demoulding | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Mark | Notes and justification | | | | | | | | | | | |
| Assembly | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | |
| Mark | Notes and justification | | | | | | | | | | | |
| Tools and equipment | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Mark | Notes and justification | | | | | | | | | | | |

| Quality review and evaluation | | | | | | | | | | | | |
|--|-------------------------|---|---|---|---|---|--|--|--|--|--|--|
| Quality review | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | |
| Mark | Notes and justification | | | | | | | | | | | |
| Reporting, recording and handover | | | | | | | | | | | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | |

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| Mark | Notes and justification |
|------|-------------------------|

| Internal assessor signature | Date |
|-----------------------------|------|
| | |

| Total |
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| |

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