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

8713-333 Composites Occupational Specialism Report (Summer 2024)

Version 1.0

Version and date	Change detail	Section
1.0 08/08/24		

Contents

Foreword

Summer 2024 Results

The occupational specialism qualification is made up of one component, which needs to be successfully achieved to attain the T Level Composites Occupational Specialism.

We discussed the approach to standard setting/maintaining with Ofqual and the other awarding organisations before awarding this year. We have agreed to take account of the newness of qualifications in how we award this year to recognise that students and teachers are less familiar with the assessments (grading-arrangements-for-vtqsand-technical-qualifications-within-t-levels-in-the-academic-year-2023-to-2024), whilst also recognising the standards required for these qualifications.

Introduction

This document has been prepared to be used as a feedback tool for providers in order to support and enhance teaching and preparation for assessment. It is advised that this document is referred to when planning delivery and when preparing candidates for the T Level Technical Qualification (TQ) in Engineering and Manufacturing **Occupational Specialisms.**

This report provides general commentary on candidate performance in the occupational specialism assignment. It highlights common themes in relation to the technical aspects explored within the assessment, giving areas of strengths and weakness demonstrated by the cohort of candidates who sat assessments in the summer 2024 assessment series.

The grade boundaries that were used to determine candidate's final summer 2024 results are also provided. **For summer 2024, as per Ofqual guidance, the approach to grading recognises that these are new qualifications.**

8713-333 Composites Occupational Specialism

Task 1 Planning

This task required candidates to produce four written documents; method statement, risk assessment, resource list for use in Task 2, quality check sheet templates for use in Task 3B and to complete and record calibration checks on measuring equipment.

The method statements produced broadly covered all aspects from start to finish; the higher performing candidates provided highly detailed and justified content that included logical approaches to the practical tasks. Lower performing candidates produced brief and superficial method statements and were missing some aspects of the practical tasks.

Higher performing candidates produced risk assessments that included most or all of the potential risks and detailed mitigation statements and featured risk ratings but lower performing candidates had missed some risks and had brief or no mitigations.

The candidates resource lists generally contained most or all PPE items, tools, equipment, consumables using technical terms but the justifications varied in depth – lower performing candidates evidence contained very superficial justifications.

The quality checklists generally contained both dimensions and physical property checks but lower performing candidates were too brief and did not cover all aspects of the drone wing specification.

Actions providers can take to support assessment preparation for future series:

Candidates would benefit from further practice and support on how to produce planning documentation and related templates, specifically how to utilise the technical documentation provided to them e.g. drawings specifications. Candidates would also benefit from further formative assessment practice, specifically writing justifications/rational for resources and methodology.

Task 2A Preparing the mould

Candidates were required to prepare the work area and mould and then re-instate the work area following mould preparation. The candidates all produced fit for purpose plates, but with marks lost for physical property errors such as materials left on plate and supporting tasks like clearing away. Also, for all candidates, failure to reference their method statement and technical documentation during practical tasks impacted the overall performance evidenced.

Actions providers can take to support assessment preparation for future series:

Encourage candidates to better utilise planning and technical documentation e.g. manufacturers specification during practical activities and to maintain a tidy work environment at all times.

Task 2B Production of the wing section component

Candidates were required to prepare the work area for laying up activities, construct the drone wing components (core, upper and lower) demonstrating marking out, cutting, laying up, curing, demoulding and then reinstating of the work area.

Higher performing candidates selected and used their tools, equipment and materials correctly and efficiently, using their templates to check tolerances during production. The correct selection and cutting of foam resulted in less breakages, quicker shaping and less wastage during production. The lower performing candidates selected appropriate tools and equipment but poor selection and cutting of foam resulted in more breakages, slower shaping and more wastage during production.

A common issue was candidates not referring to planning documentation or technical data sheets leading to uncertainty in process and choices during the laminating and curing process. Higher performing candidates demonstrated an understanding of conditions that could lead to imperfections and selected appropriate resin, curing temperature and timings leading to less overall defects, although all candidates' final assembly did contain errors of some type e.g. textured not smooth surfaces, pinholes, divots and dry fibre regions.

Candidates were able to demould using appropriate hand tools and resulted in a positive outcome.

Actions providers can take to support assessment preparation for future series:

Encourage candidate to apply their planning and technical documentation e.g. manufacturer specification to secure a better practical outcome. Increase awareness of tool, equipment and material selection as well as use and how this can increase the likelihood of product defects.

Task 2C Assembly

Candidates were required to prepare the work area and complete the assembly of the components, demonstrating bonding, curing, trimming and finishing processes.

The assembly task consisted of bonding the upper and lower now laminated components together and curing and finishing by trimming. The higher performing candidates used the profile jigs well to ensure component alignment, applied adhesive thoroughly to all areas and understood the vacuum and curing process well; for instance, where a candidate did not use release film led to tufts appearing in the final product. The finishing / trimming process differentiated candidates performances – lower performing candidates failed to do this at all, indicating poor time management and meant the outcome having spare consumables left on core edge. Higher performing candidates demonstrated some finishing and trimming of their final assembly to conform to specification.

Actions providers can take to support assessment preparation for future series:

Candidates must refer to planning documentation and manufacturers guidelines to inform task timing and plan accordingly to ensure they have sufficient time to trim/finish their assembly.

Task 3A Defect identification

Candidates were required to inspect a pre-prepared sample and recording quality defects and provide explanations as to how the defects have occurred and how to prevent them occurring in the future.

Most candidates performed this in line with expectations and was a good opportunity for many candidates to combine theory with practice. The higher performing candidates identified most or all of the deliberate defects in the pre-prepared sample and good insightful descriptions of possible causes and mitigations. The lower performing candidates missed some defects and had superficial descriptions.

Actions providers can take to support assessment preparation for future series:

Additional exposure to a wider range of defects will help prepare candidates for future assessments, candidates need to understand how the defect occurred and recommend processes that should be introduced to prevent defects reoccurring in future production runs. This in turn, will aid the candidates in evaluating their own product in later tasks.

Task 3B Quality review and recording

Candidates are required to inspect their own final product and recording quality defects for numerical dimensions and physical properties on their quality check sheet template produced in Task 1, providing explanations of their own successes or failures versus specification requirements. Most candidates performed this in line with expectations and were honest in their appraisal, but in some cases defects were missed or if defects were highlighted then explanations or mitigations were superficial. Some of the limitations in effective completion of this task were based on the quality of the quality check sheet produced by the candidate in Task 1. Typical dimensional defects were short core (perhaps broken off or not using jig), physical errors (potentially tool scratches), resin left on the surface or peel ply not smooth texture. Although in cases the candidates had some physical defects and most had some dimensional out of tolerance components in their final assembly, all candidates did produce a completed drone wing broadly in line with requirements.

Actions providers can take to support assessment preparation for future series:

Emphasise the need for candidates to produce a thorough quality checklist in Task 1 which in turn will generate an in depth more complete quality review in Task 3B.

Task 3C Handover

Candidates were required to hold a meeting with their supervisor to complete a handover activity that included confirmation of work completed, overview of findings during quality inspection, suggested improvements to design or process and handover of the finished assembly.

Low performing candidates just read from their report but the higher performing candidates were able to confidently expand their explanations beyond just their reports. The candidates put some good thought into final accounts of their project and recommended improvements such as to the bonding adhesive process, but more detail was required on sequences of vacuum bag actions. Some candidates provided some valid recommendations to improvement to the design, including different material use, but justifications were mostly superficial.

Actions providers can take to support assessment preparation for future series:

Candidates would benefit from more exposure to similar tasks to gain confidence and therefore focus less on their report. Encourage candidates to draw on their knowledge of materials, tools and equipment to aid recommendations for design or process amendments that would mitigate defects.

Best practice and guidance to providers on potential areas for improving performance in assessment

It is recommended that providers utilise and deliver the sample assessments as formative assessment to support candidates in preparation for summative assessment. This will not only help prepare candidates but will be an ideal opportunity for marker training and standardisation.

The centre staff and candidates must thoroughly read the assessment to ensure the work is carried out to the specification required. Moderators will be working to the assessment brief and marking grids and making judgments accordingly.

Appropriate PPE should be worn at all times and assessors should ensure that candidates are working safely and should not come to harm or risks to health from the materials used in the assessment.

Where photographic evidence is requested ensure completed components and the completed assembly are included.

Photographs do not need to be great in number but do need to show everything a moderator would require to be able to perform the remote moderation work. Photographs need to be of sufficient resolution to enable “zooming in” to determine quality. Photographs should be collated into one document, and well labelled, and with commentary if possible.

Videos will need to show specific important points of the assessment, for instance the candidate setting up or using a tools and equipment safely. Utilisation of the Photographic Evidence Guidance Document would support providers to capture relevant and valuable information for marking and moderation purposes to support practical observation feedback.

Providers should ensure that practical observation forms are detailed, accurate and offer differentiating commentary between individual candidate’s performance. They should also identify areas of strength and weakness to distinguish between the different qualities of performance and to facilitate accurate allocation of marks once all evidence has been submitted.

Support materials

Sample and Past Occupational Specialism (OS) Assessments:
It is recommended that Providers utilise and deliver the **sample OS** as well as **past OS** (if available) as formative assessment to support candidates in preparation for summative assessment.

Sample and past OS (if available): T Level Practical Assignment – Composites Manufacturing Technologies: Sample Assessor Pack (cityandguilds.com)

Guide Standard Exemplification Material (GSEM) Assessments:
It is also recommended that Providers utilise the **GSEMs** to help understand the standard required to achieve a Distinction and Pass grade.

8713-333 OS Distinction GSEM: mpc-gsem-composite-manufacturing-technologies-distinction-v2,-d-,0-pdf.ashx (cityandguilds.com)

8713-333 OS Pass GSEM: mpc-gsem-composite-manufacturing-technologies-threshold-competence-v2,-d-,0-pdf.ashx (cityandguilds.com)

TQ Occupational Specialism Assessment Process Guide:
The guide gives support to Providers in preparing for and delivering T Level Occupational Specialism assessments.

Link: TQ Occupational Specialism Assessment process guide (cityandguilds.com)

Events and Webinars:
City & Guilds run free webinars and events throughout the year on preparing for and delivering the T Level Occupational Specialisms. The below link provides details on upcoming in person events, live webinars, on-demand webinars and preparation for the Occupational specialism assessment.

Link: Events and webinars - T Levels | City & Guilds (cityandguilds.com)

Grade boundaries

The table below shows the grade mark ranges for the Occupational Specialism **for the summer 2024 series.**

Grade	Mark range 8713-333
Distinction	67-90
Merit	52-66
Pass	38-51
Unclassified (U)	0-37

Get in touch

The City & Guilds Quality team are here to answer any queries you may have regarding your T Level Technical Qualification delivery.

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

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Web chat available **here**.