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

8713-332 Machining and Toolmaking Technologies

Grade standard exemplification material

Pass - summer 2024

Version 1-0

Version and date	Change detail	Section	Question
v1-0 Oct 2024			

Contents

Introduction **3**

Grade descriptors **5**

Task 1 Planning **6**

Task 2 Production **23**

Task 3A Quality review **41**

Task 3B Evaluation and recording **46**

Task 3C Handover **52**

Introduction

Summer 2024 Results

This document is aimed at providers and learners to help understand the standard that was required in the summer 2024 assessment series to achieve a pass grade for the 8713-332 Machining and Toolmaking Technologies Occupational Specialism (OS)

The grade standard exemplification evidence (Grade SEM) provided for the pass grade displays the holistic standard required across the tasks to achieve the pass grade boundary in the summer 2024 series.

The aim of these materials is to provide examples of knowledge, skills and understanding that attested to **one mark above** pass standard (threshold competence) in summer 2024. It is important to note that in live assessments a candidate's performance is very likely to exhibit a spikey profile and standard of performance will vary across tasks.

The Occupational Specialism is graded Distinction, Merit, Pass or Unclassified.

The pass grade boundary is based on a synoptic mark across all tasks. The materials in this Grade SEM are separated into two sections as described below. Materials are presented against a number of tasks from the assignment.

Tasks

This section details the tasks that the candidate has been asked to carry out. What needs to be submitted for marking and any additional evidence required including any photograph/video evidence. Candidate evidence that was or was not included in this Grade SEM has also been identified within this section.

In this Grade SEM there is candidate evidence from:

Task 1 Planning
Task 2 Production
Task 3A Quality review
Task 3B Evaluation and recording
Task 3C Handover

Candidate evidence

This section includes exemplars of candidate work, photographs of the work in production (or completed) and practical observation records of the assessment completed by provider assessors. This was evidence that was captured as part of the assessment and then internally marked by the provider assessor.

The Occupational Specialism brief and tasks can be downloaded from here.

Important things to note:

- 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.

- The evidence presented, as a whole, was **one mark** above the pass grade. However, performance across the tasks may vary (i.e. some tasks completed to a higher/lower standard than pass grade).

Grade descriptors

To achieve a pass (threshold competence), a candidate will 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 machining materials to produce components and products using a range of manual and automated equipment and machinery, which are in line with industry standards and meet the requirements of the brief.

Demonstrate basic knowledge and understanding of the principles and processes required for machining and toolmaking activities.

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 machining and commissioning activities.

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.

Demonstrate adequate ability to follow procedures to produce or maintain working components.

Task 1 Planning

Assessment number (eg 1234-033)	8713-332
Assessment title	Machining and Toolmaking Technologies Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	1
Evidence title / description	Resource list with justifications Completed risk assessment Method statement with justifications Quality check sheet template
Date submitted by candidate	DD/MM/YY

Task 1

Assessment themes:

- Health and safety
- Planning and preparation
- Production
- Quality review and evaluation

You must:

- produce a resource list with justifications and measuring equipment calibration check results recorded
- produce a risk assessment
- produce a method statement
- produce a quality check sheet

Additional evidence of your performance that must be captured for marking:
N/A

Candidate evidence

Risk assessment

likelihood	Severity
1- very unlikely 2- unlikely 3- very possible 4- likely 5 - very likely	1- very minor injuries 2- mild injuries 3- incapacitable injury 4- chance of death 5- death

Hazard	Risk	How is this being controlled	Likelihood	Severity
Slipping over on the workshop floor	Coolant from machines could potentially leak out onto the floor of the workshop, this creates the chance that	This is currently being controlled through the use of wet floor signs and ensuring that technicians aretrained to look out for any spills or leaks and being trained to perform routine machine maintenance	2/5	2/5

Getting caught in the lathe	Loose clothing or long hair ot tied up could cause the lathes operator to be dragged into the machine.	Training on how to use the machine is provided to all operators and they are not permitted touse the machines until proven that they have an understanding on how it works.	1/5	4/5
Workpeice coming loose from chuck / vice and hitting operator or nearby civillians	If the workpiece is not secured within the chuck/vice securely the billet could comeloose and cause harm to those nearby	The machines undergo routinely maintenance to ensure that they are in suitable working condition.	1/5	4/5

Production Plan

Part : Die Block	**Material : Low carbon steel**	**Machinery : Milling machine , Lathe**		
OP no	**Process**	**Description**	**Tools / Equipment**	
1	Get billet	Gather the billet needed to manufacture Die Block.	N/A	
2	Deburr the billet	Deburr the billet if necessary using hand file and vice to ensure that all corners and sides are safe to handle.	Hand file Vice	
3	Prepare to mark out	Apply a thin layer of engineers blue (dye) to give a suitable surface to mark out on .	Engineers Blue Brush	
4	Marking out	Mark out the dimensions specified on the orthographic drawing using a vernier height gauge.	Vernier height gauge	

5	Set up the lathe	Turn on the isolator and switch on the lathe by using the switch on side	Manual Lathe	
6	Prepare billet in lathe	Put the billet within the 4 jaw chuck and use the live centre on the tailstock to get it centralised as possible to the marking out of 30mm diameter hole	Manual Lathe Live centre Chuck key	
7	Zeroing to the billet	Using a DTI clock gauge zero the billet to ensure that tolerances are met	DTI gauge	
8	Blocking up	Remove any excess material to ensure that the billet is the correct dimensions this being 120mm L, 35mm H, 50mm w (apply coolant)		
9	Drill 30mm diameter hole	Now that the billet is secured within 4 jaw chuck starting with a 8mm drill bit drill then 10mm,	Manual lathe	

		12mm,13mm 14mm, 14.5mm and finally 15mm through the billet 35mm deep(apply coolant)		
10	Boring	Bore out the inside of the hole 15mm (apply coolant)	Boring tool	
11	Set up milling machine	Follow the SOP to ensure machine has been set up correctly and safely	N/A	
12	Zeroing the milling machine	Using a wobbler you can set the correct references for the x and y axis	Wobbler Milling machine	
13	Cutting the 15 mm steps	Each step is 25mm in length and 15mm deep to ge the required measurements correct use the cutting tool on the mill and for roughing cuts go down 1mm at a time then for the finishing cuts(within 2mm	Cutting tool Milling machine	

		proceed with 0.5mm cuts)		
14	Drill 8mm hole	Put an 8mm drill bit into the chuck then shrill through the left step 20mm	8mm drill bit Milling machine	
15	Create slot cut	Create a slot cut that is 12mm wide on the right side slot using cutting tool	Cutting tool Milling machine	

Part : Slip ring	**Material : Brass**	**Machinery : manual lathe**		
OP no	**Process**	**Description**	**Tools / Equipment**	
1	Get billet	Gather the billet needed to	N/A	

		manufacture slip ring		
2	Turn on lathe	Turn on the isolator and switch on the lathe by using the switch on side	N/A	
3	Put billet in lathe	Put the billet into the 3 jaw chuck on the lathe, make sure it is fastened within all 3 jaws securely	Chuck key Lathe	
4	Zero the billet	Zero the billet using a DTI to ensure that the tolerances are kept	DTI gauge Lathe	
5	Drill 30mm	Place drill bits into the tailstock and progressively move up in size until the 30mm drilled hole is made it should be 10mm in depth	Drill bits Tailstock Lathe	
6	Add chamfer	Using the chamfer tool add a 1mm chamfer thatd 45 degrees in angle on the front facing side of the slip ring	Chamfering tool Lathe	

7	Cut the slip ring to length	Cut the slip ring to 10mm in length using the parting off tool on th lathe	Parting off tool Lathe	

Part : Press Tool	Material : low carbon steel	Machinery : CNC Lathe		
OP no	Process	Description	Tools / Equipment	
1	Turn on the cnc lathe	Turn on the cnc lathe from both the mains and the isolator .	N/A	
2	Perform startup checks	Using the sop make sure all the safety procedures that the machine has are functional and work as required .	CNC Lathe SOP	
3	Run the cnc code	The next step is to run the pre .programmed code until the code is finshed	CNC Lathe	

	Take out billet	Once the code has completed its cycle remove the billet	CNC Lathe	
5	Turn of machine	Clean down the CNC machine then turn it off by the isolator and the mains.	CNC Lathe	

Resource List

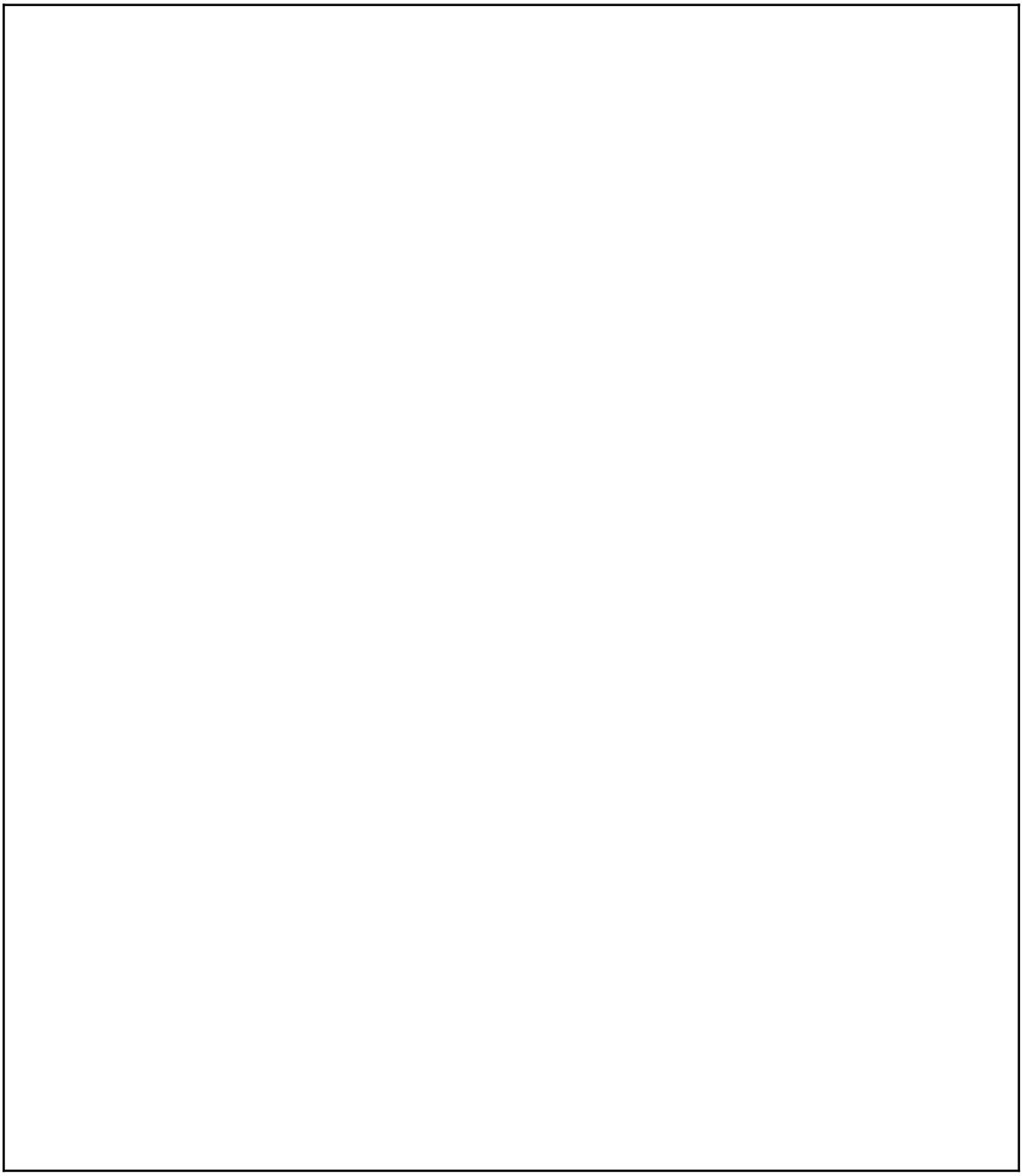
measuring equipment	**Quantity**	
Digital vernier	1	
Telescopic bore gauge set	1	
Micrometer	1	
Plug gauges	1	
Radius gauge	1	
Bore gauge	1	
Protractor	1	
Metric thread gauge	1	
Imperial thread gauge	1	
Small hole gauge set	1	
Drill gauge	1	
Thread plug gauges	1	
Thread gauge/ sizing rings	1	

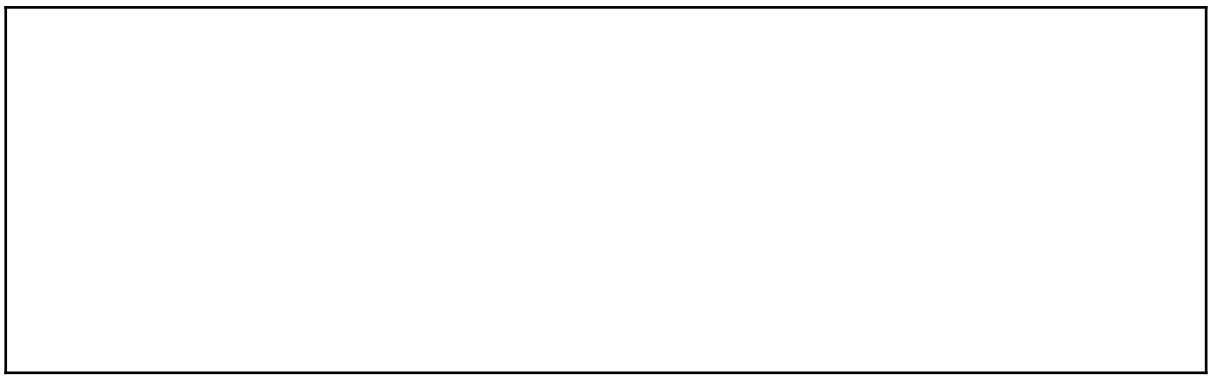
Surface roughness finish chart	1	
Steel Rule	1	
PPE	**Quantity**	
Overcoat	1	
Steel toe capped boots	1	
Goggles	1	
Gloves	1	
H&S	**Quantity**	
CNC Lathe SOP	1	
Milling Machine SOP	1	
First aid kit	2	
Eye wash kit	1	
Speed and feeds sheet	1	
Lathe Tools / Equipment	**Quantity**	
Lathe	1	
Parting off tool	1	
Boring tool	1	
Chamfering tool	1	
Cutting tool	1	
Live centre	1	
Tailstock	1	
Coolant	1	
Equipment	**Quantity**	
Vice	1	

Files	3	
Pens	2	
Pencils	2	
Scribe	2	
Engineers blue	1	
Barrier cream	1	
Drill bits	1	
Cleaning brush	1	

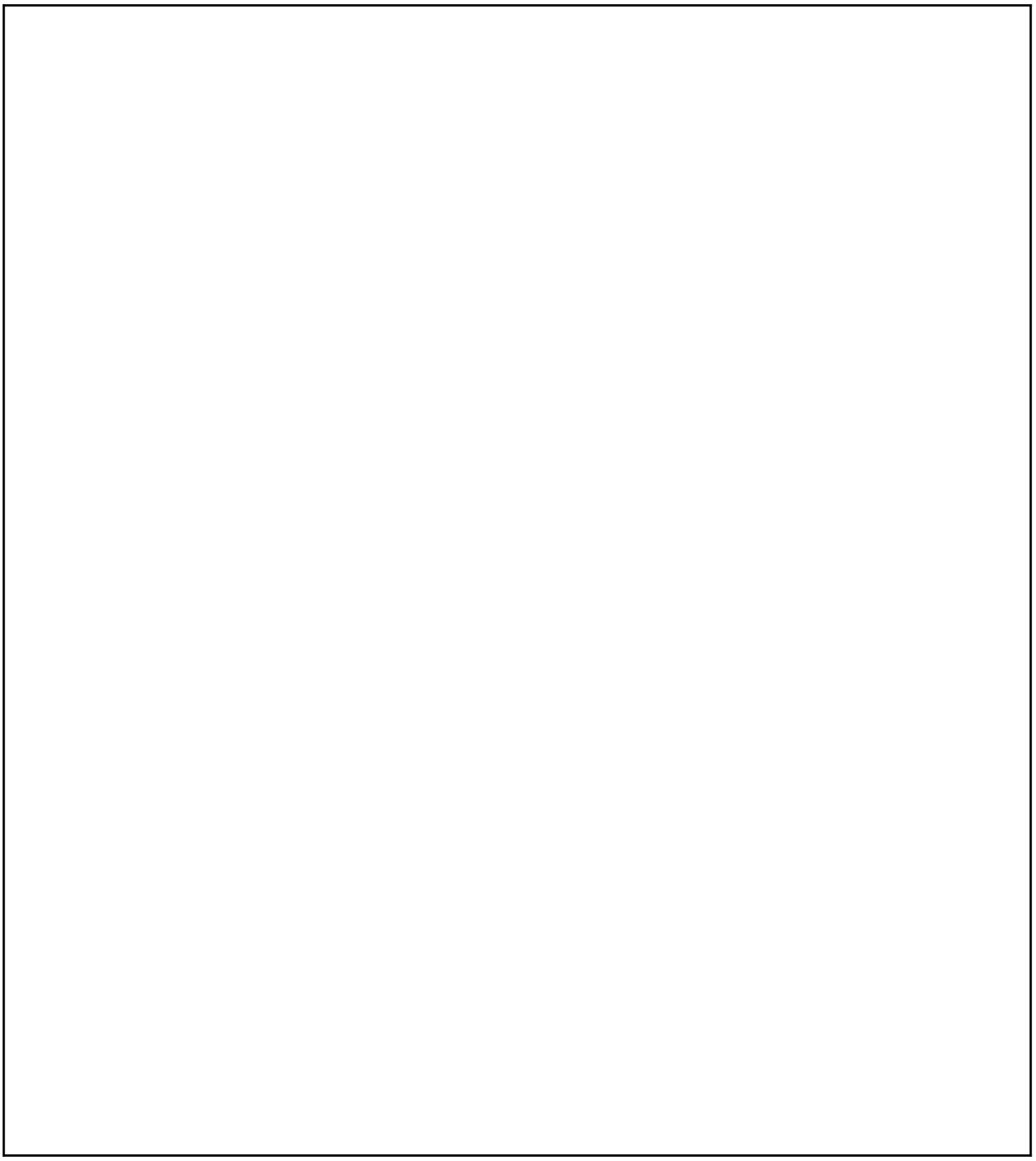
Inspection Sheet

Visual inspection





Features inspection



Task 2 Production

Assessment number (eg 1234-033)	8713-332
Assessment title	Machining and Toolmaking Technologies Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	2
Evidence title / description	Press die tool
Date submitted by candidate	DD/MM/YY

Task 2

Assessment themes:

- Health and safety
- Planning and preparation
- Production
- Quality review and evaluation

You must:

- prepare the work area
- produce the press die tool components using both manual and pre-programmed computer numerical control (CNC) machinery to specification
- apply a suitable surface treatment to the finished components
- assemble the press die using the finished components
- reinstate the work area following the production of the press die tool.

Additional evidence of your performance that must be captured for marking:

- assessor observation to include:
    - set up and use of manual and pre-programmed CNC workshop machinery
    - the production of the individual press die tool components
    - tool skills, application and usage
    - application of hand skills
    - checks carried out before, during and after production
    - work area prior to, during and on completion of tasks.

Candidate evidence

Production

Photographic Evidence

The work area prior to, during and on completion of tasks

- safe isolation procedures whilst wearing the correct PPE for each machine used
- pre-use checks of appropriately selected tools and equipment/preparation of resources

Tools checked. Isolation, speeds and feeds etc, coolant, autofeed, tail stock and tool post checked, guards close and isolated when up, light works.

Student ensured that emergency stops and brakes work, all axis work, speeds set ready, work secured on parallels. Used mallet to knock down and tighten.

- the condition of the work area after the production activity has been completed, to include the checking and returning of tools and equipment to the correct storage area and waste disposed of correctly

Checked isolation and coolant off, checked engagement of levels etc.

Correct bin used for waste.

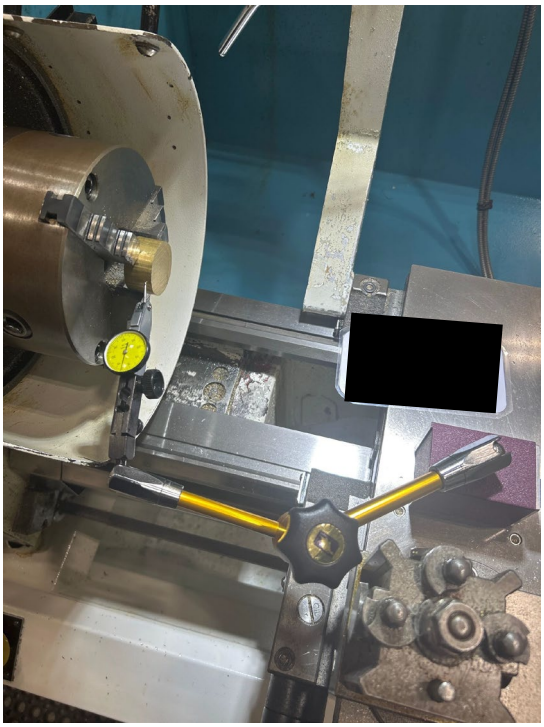
Mill cleaned and returned to original condition.

Tools checked and correct waste disposed.

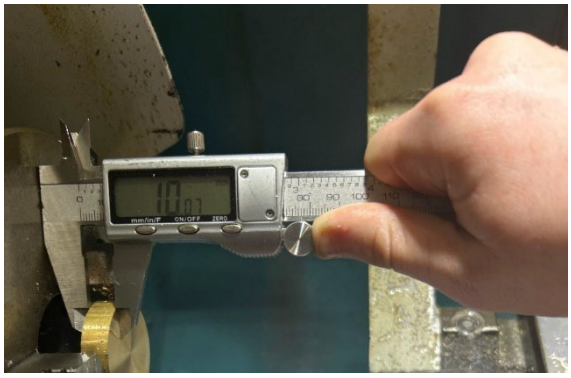
All checks completed

Accuracy and use of appropriate methods in marking out of materials

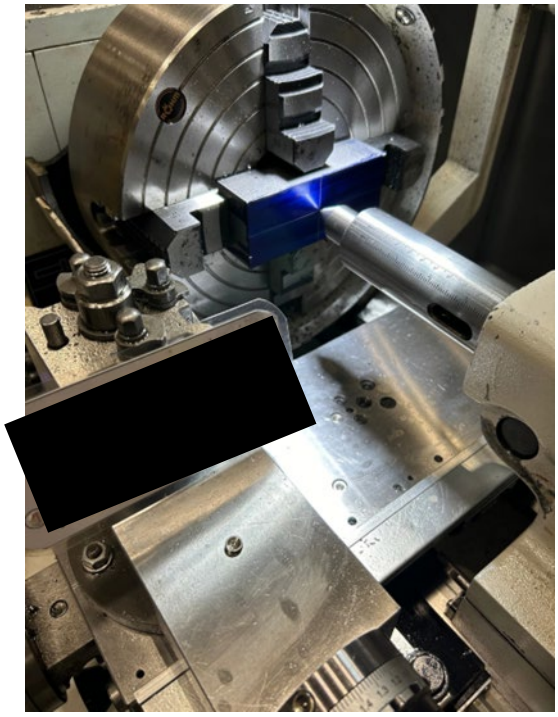
- correct use of appropriate measuring equipment, including calibration checks



Clocked using DTI to within 0.07.



Set datum from faced off side. Opposite side already faced off and squared up. Parted off to 14mm to ensure cutting tool did not foul chuck then faced off to 10.04 using VDU to determine how much more can come off the verniers to finalise last measurements.



Student marked out using VDU to measure material then halved measurements to ensure marking out of centre.

Workpiece was initially centred in 4 jaw chuck using dead centre prior to clocking.

- materials selected for production
- the candidate taking measures to avoid excess material waste

See evidence across photos for selecting materials and reducing excess waste.

Setting up and application of machinery to remove material

- production methods and techniques (machining, fitting, assembly, testing) demonstrating industry standard eg deburring, datum edge.
-

Some opportunity for photos here mya have been missed but inspection points show results of each process.

Final finish removal of material and result of tool section for accuracy and the finish of the component parts

- in-production checks undertaken (checking for accuracy, faults, machine performance)

Used verniers to initially check diameter and then bore gauge when close to 30mm until achieving tolerance.

Checked with verniers. Within tolerance. Created a datum edge. Manually marked out 120mm then rough cut up to about 10mm and in steps of 0.15 as it was very noisy any larger. Preferred to using steps. Verified when with 1mm for final roughing and then finishing cut. 0.05 Final Cut on higher speed. 1260.

Clocking process was a struggle and candidate was verbally able to explain the process but struggle to measurements within tolerance but determined that he would move on/Verified by assessor to within 0.5mm on both sides.

Slightly out of tolerance 0.28.

Inspected using depth gauge.

● production methods and techniques (machining, fitting, assembly, testing) demonstrating industry standard eg deburring, datum edge

Evidence of chamfer. Used boring tool set to 45 degree and clearance ensured. This was due to chamfer tool fouling internal ring.

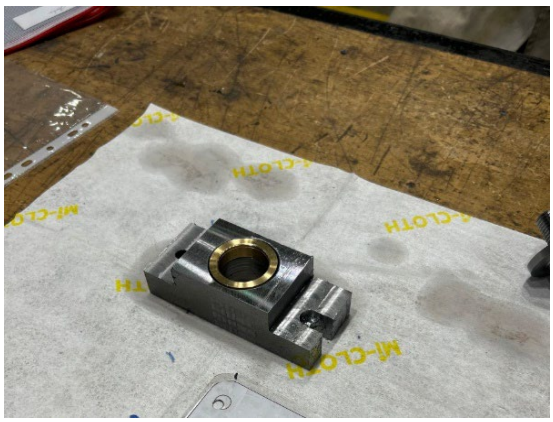
Application of the surface treatment to component parts

● application of surface treatment

Student ran out of time to fully clean and debur edges but was able to apply oil onto the parts.

Completed assembly

- showing full assembly
- quality of completed assembly



Production Commentary

Health and Safety

(Safety issues/ Prep checks/ Safe isolation)

Candidate diligently performed safety and preparation checks before operating each machine, ensuring they were fully isolated and safe to use. He consistently checked all tools, equipment parameters, and machine operations to guarantee safe operation.

(Health and Safety, Risks and Hazards Mitigated)

Candidate endeavoured to adhere to health and safety protocols but occasionally became flustered during operation and asked for verification although he was correct in his set up safety. He consistently wore full PPE and promptly reported any issues as they arose.

(Work area tidied, Equipment checked, returned and waste removal)

Candidate consistently maintained a tidy work area, ensuring all machines were returned to their original state and ready for the next user. He also ensured proper waste removal.

Planning and Preparation

(Selection of equipment and checks)

Candidate generally selected appropriate tools for their intended purpose and checked them before use. While he made good choices for turning and milling, he struggled with clocking in the 4-jaw chuck. He was able to explain the process verbally

and when checked by assessor had got both sides to within 0.5mm but was unable to verify this properly himself due to some inconsistencies in how he was applying the process.

However, he demonstrated good decision-making skills by adjusting tools or changing plans when necessary.

(Work area prepared, referencing of plan, safe isolation)

Candidate thoroughly prepared his work areas and carefully planned processes, constantly adjusting his plans as needed. All machines were isolated after use.

Production

(Marking out)

Candidate generally performed well in marking out work when using manual methods, demonstrating good use of tools such as the vernier height gauge.

(Terminology and Units of measurement)

Candidate generally used appropriate terminology and understood standard units of measurement. However, he struggled with interpreting measurements on the DTI clock but accurately billet into the CNC at the correct length.

(Cutting, cleaning, deburring and datum edge preparation)

Initially, candidate excelled at deburring and setting datum on machines, but errors started to occur as he became flustered. Cutting techniques were good, and he consistently operated the machines, although he missed confirming the datum on the slip ring by clocking and also failed to cut both sides of the slip ring leaving one side as the original cut finish.

(Material removal techniques and efficient machining)

Candidate identified when speed settings were too high and adjusted them accordingly, but he was not always consistent with depths of cut especially when transferring to finishing cuts. When cutting the slot candidate really struggled with the working out of the wobbler and made an error in calculation resulting in not being centred correctly. Due to rushing he also made a mistake then changing the depths of the cuts and opted instead to leave it as he worried he would work unsafely if he continued to rush it. This left an incomplete step in the slot with a 3 tier depth of cut.The hole was correctly drilled

with an 8 mm drill but he again miscalculated using the wobbler so this was off centre too.

(In production checks and industrial standards)

Candidate generally used the VDU well to determine cut increments but occasionally omitted double-checking measurements, leading to errors. He struggled initially with the VDU and wobbler, opting for manual measuring processes for cutting the shoulder. he was able to identify when he had not correctly cut to the centre of the die block but due to time constraints was unable to correct in time.

(Machine set up and settings)

Candidate identified correct speeds for each drill size for the slip ring and generally set up tools well for tasks using manual machinery, adapting speeds as necessary for different materials. However, he ran out of time to identify correct speeds for Task 1, although he did so for the drilling on the mill.

(CNC Set up and operation)

CNC Preprogrammed Task checking sheet

Assessor notes: Explain the following based on what operations have been completed.
If a student is trying his own program you will need to let them know they will need to complete a dry run. If pre-programmed you may let them know a dry run has already taken place but they will still need to show an awareness of checking exact parameters and speeds during cutting as this may have not been checked.

When ready ensure the machine is fully on and the program is highlighted at top and **auto** and **coolant auto (or off)** are selected as necessary and there is not a billet or tool inserted and the machine is left as the last user left it.

No	Task	Performance Banding and relevant comments		
1	**Assessor Question:** Explanation of the safe turning on and activation of the CNC lathe including pressing and depressing both power switches	☐ No evidence	☐ Prompted	☑ Explained
		Referred to SOP		
2	**Assessor to ask to set up billet and first tool.** Machine and tools checked for defects and cleanliness before beginning processes. Reports issues to employer. (assessor).	☐ No checks	☐ Some checks	☑ Most Checked
		visual checked tools, tool post and saddle		
3	Gloves worn. Dry run	☐ Needed intervention	☐ Prompted	☑ Independently selected gloves
		well explained		
4	Secured billet into chuck using 2 chuck key positions and centralised bar and ensured it was protruding accurately to correct length. **(Check!)**	☐ Poor	☐ Either secure or accurately 30mm	☑ Secure and accurate
		45.07mm		
5	Selected correct cutting tool and secured into tool post. (Check for swarf etc).	☐ Needed intervention	☐ Prompted	☑ Selected and Secured
		positioned coolant hose		
6	**Assessor asks student to operate CNC Lathe.** Controlled feed rate observation during cutting processes and made appropriate checks. Eg Starts on 0, then slow when checking accuracy of parameters. Steps up to 100% through cutting processes.	☐ No evidence	☐ Prompted	☑ Good control of speed, observation and checks.
		Note: This part of the assessment to be given a slightly larger weighting than other assessments. was unsure about safely start so asked assessor Asked assessor to verify flip billet process		
7	Independently complete tool change when prompted. Checked/ cleaned used tool and checked/ cleaned new tool and tool post as necessary.	☐ Needed intervention	☐ Prompted	☑ Independent and correct
		checked tools prior to using cleaned tools and toolpost after every tool change		
8	Issues such as broken tool bits, incorrect operations were dealt with or students were able to answer how they could deal with a chipped bit.	☐ Needed intervention	☐ Prompted	☑ Independent and correct
		would tell teacher or supervisor and would not attempt to run program		
9	Correct Handover procedure - tools removed and placed back, work retrieved, machine cleaned and settings returned. **Assessor - watch or ask how the machine would be turned off. (Door closed, off at machine first then isolated?)**	☐ Needed intervention	☑ Prompted	☐ Independent and correct
		Referred to SOP Prompted to clean more		

took tool out when flipping billet prompted to not hold tool by collet

Candidate was quite competent with his operation of the CNC following SOP instructions and checking tools and processes well throughout the task.

(Machinery longevity e.g. pre checks and post use)

Candidate conducted thorough checks on all equipment both before and after use, ensuring that damage was unlikely to occur. However, he did sometimes take inappropriate cut sizes or take a while to respond to noise feedback when operating the lathe nad mill.

(Return of machine state)

After each use, machines were consistently returned to their correct state. Candidate demonstrated competency in this aspect.

(Tool skills, High Quality, No defects, Assembly)

Overall, candidate displayed basic proficiency in using tools. While carrying out general machining techniques such as milling and turning with confidence, some misinterpretations led to defects, such as not fully cutting both sides of the slip ring and incomplete and inaccurate cutting of the slot and hole off centre. Heavy marks were left by the 4 jaw chuck where it is evident that it was too tight whilst doing the clocking process. Evidence of markings due to handling and a deep mark from the vernier height gauge were also evident.

(Assembly sequence)

Candidate successfully interpreted the drawings correctly for assembling the product according to the specifications.

(Component fit/ no adjustments required)

The slip ring fitted into the die block, and the press tool fitted into the slip ring as expected, although the slip ring sat proud of the die block due to not cutting to exactly 10mm and on both sides. However, due to running out of time the slot was incomplete so would not perform as expected and the 8mm hole was off centre. The part was not fully deburred or cleaned and so would not be suitable for handling by a user.

(Surface treatment applied evenly)

The surface treatment was evenly applied, and a cloth was used to ensure there was no excess. However, old marking out fluid had not been fully removed, which was attributed to time constraints rather than a lack of understanding of the importance of doing so.

Task 3A Quality review

Assessment number (eg 1234-033)	8713-332
Assessment title	Machining and Toolmaking Technologies Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3A
Evidence title / description	Completed quality check sheet
Date submitted by candidate	DD/MM/YY

Task 3A

Assessment themes:

- Planning and preparation
- Quality review and evaluation

You must:

- carry out a full quality inspection of the completed press die tool
- record findings using the quality check sheet.

Additional evidence of your performance that must be captured for marking:

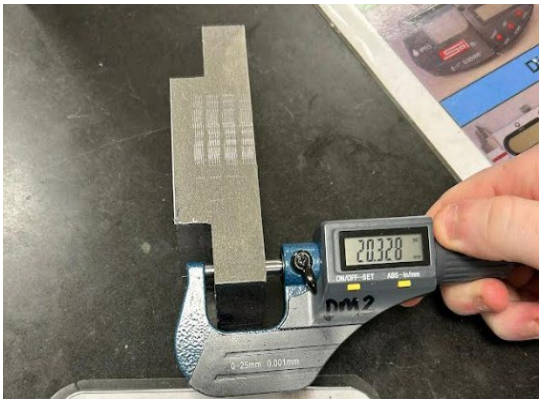
- completed press die tool
- assessor observation to include:
    - use of measuring equipment
    - checks for tolerances and accuracy.

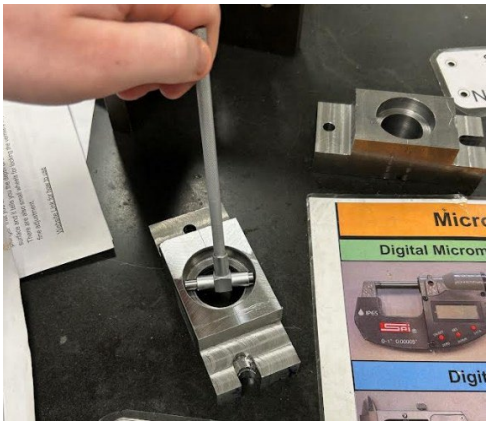
Candidate evidence

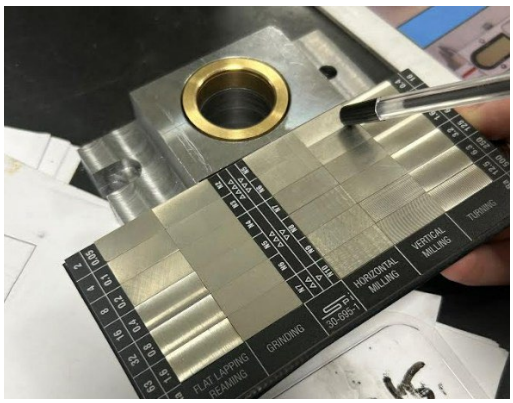
3A Quality review

Checking of tolerances and application and use of appropriate measuring tools and equipment

- use of appropriate measuring equipment
- assembly conforms to specification eg dimensions and design
- defect identification (where appropriate)







Assembly components and fully assembled assembly

(photographs from task 2 can be used to cover this – please cross reference).

- showing the components and full assembly
- quality of completed assembly

See photos of quality of assembly in task 2.

Quality Review Commentary

(Dimensions checked for accuracy and tolerances met)

Candidate utilised a variety of inspection tools to check the final parts, although not always was the most appropriate tool used or in the best way - eg vernier height gauge used to measure the die block without leaning it against the angle plate. Although in his inspection report it appears as though a lot of tolerances were met there were a number of measurements not taken which were out of tolerance such

as the thickness of the 10mm ring, depth of the 12mm slot.

(Defects are identified and attributed to deficiencies in material selection, production, or process.)

Candidate identified a range of defects, primarily attributing them to human error, although he failed to fully work out why the defects were caused - mainly just suggested he hadn't done them accurately enough without reflecting enough on the how and why, The majority of defects were linked to calculation errors or inadequate inspection when nearing desired dimensions. One significant error was caused by miscalculating using the wobbler and not being able to correctly move the cutter on the mill in both the Y and Z access correctly.

(Defect rectification strategy and expected outcomes suggested.)

Not all of candidate's suggestions would be possible to be learned from enough to be able to carry them out to ensure success thus demonstrating there is still a level of understanding missing.

(Methods and techniques well reasoned. Inconsistencies listed with reasoned future prevention suggested)

Candidate demonstrated a sound understanding of his chosen techniques, particularly for drilling and boring, and showed awareness of a need to inspect through the cutting process to ensure depths and diameters etc are accurate. Most errors occurred in the setting up stage and poor planning rather than specifically in his machining. However, gaps in his knowledge led to incomplete projects and inaccuracies. His reflections on manual machine operation were generally appropriate.

(Thorough evaluation, range of improvements justified. Note: If none required - justified!!!!)

Candidate provided a range of suggestions for improvements, supported by sound reasoning regarding how they could enhance method performance or outcomes. While his reflections on manual machine operation were quite thorough. Not all suggested improvements would guarantee success.

Task 3B Evaluation and recording

Assessment number (eg 1234-033)	8713-332
Assessment title	Machining and Toolmaking Technologies Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3B
Evidence title / description	Quality inspection report
Date submitted by candidate	DD/MM/YY

Task 3B

Assessment themes:

- Quality review and evaluation

You must:

- produce a quality inspection report evaluating the production of their finished press die tool. The report should typically be 800 words. This must include:
    - finished sizes of components and confirmation the press die tool 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 press die tool and method of production used with reasoning and justifications
    - a concessions list for every facet of the press die tool that does not conform to the specification, reasons for occurrence and how to prevent reoccurrence
    - any improvements or adaptions required to the press die tool, including any reasoning and justifications if adaptions or improvements are not required.

Additional evidence of your performance that must be captured for marking:

- completed press die tool.

Candidate evidence

Task 3B Evaluation and Recording

Report

The press die tool as a hole fits together and functions as specified a protective coating of WD40 has been applied to all pieces of the tool to ensure they meet the brief of being corrosion resistant, off all three pieces of the tool only the die block had tolerance issues, these issues were found on one of the steps , length of block and the 12mm slot being off centre, these are the only parts of the tool that are outside the tolerances specified, the slip ring fits securely and snug within the hole of the die block so they function together correctly and then the press tool slots in to the slip ring flush, this verifies that all of the internal tolerances were kept as all parts fit together and function as specified by the brief of the task.

Due to the tolerance issues on the die block there may be some issues when the tool is in use therefore potentially affecting the tools fitness, however this could be altered if the die block is replaced or remachine some processes.

As a summary we can see that other than a few minor tolerance issues with the die block all other components conform with the tolerances and measurements on the drawings provided within the task.

Slip ring manufacturing issues:

When manufacturing the press die tool some issues occured, the first of these issues was a power issue on my lathe, once I had run my start up checks on the machine the power suddenly cut. Once I had reported this issue it took 20 minutes to fix, this meant that I was now behind schedule, infuture to prevent this from happening there could be an increase in machine maintenance. The next issue I had come across when manufacturing the slip ring was a parting off issue, I needed to cut the ring down to the 10mm length that is required but due to the size of the tool if I was to cut straight to the 10mm there would be a collision between the tool and chuck which could lead to catastrophic damage to the workpiece, tools and machinery, to prevent this from happening I diverted from my production plan slightly and parted off 6mm and used a facing off tool to remove the last 4mm which worked well .

Die block manufacturing issues:

The first issue that I came across when manufacturing the die block was at the setup of the 41mm/30mm diameter hole stage. The issue that I faced was that when I tried to use the DTI clock to centre my billet I was struggling to get it centralised, it got to the point where it began

taking to long so instead I used a dead centre in the tailstock of the lathe to line it up with my marking out to centralise the billet which worked well. The next issue that I then faced was when I was cutting the 12mm slot on the mill. The issue is that when zeroing my measurements must have been off because the slot that I cut was off centred, the only explanation I have that could have caused this is when setting the axis on the machine they must have been zeroed wrong, so next time when doing this I would need to ensure that greater care is taking when zeroing the machine in

Features inspection

Die block	Drawing Dimensions	Finished Manufacture Dimensions	Within Tolerance
Length of block	120.00mm	120.39mm	No
Step height	20.00mm	20.17mm	Yes
Width of block	50.00mm	50.24mm	Yes
41mm Diameter Bored hole size	41mm	40.77mm	Yes
30mm Diameter Bored hole size	30mm	29.83mm	Yes
8mm Diameter hole size	8.00mm	8.13mm	Yes
12mm slot hole size	12.00mm	12.01mm	Yes
Step Length	25.00mm	25.31mm	No
Depth of 41mm Diameter Bored hole	10.00mm	10.10mm	Yes
Surface finish top		N5	
Surface finish step		N8	

slip ring	Drawing Dimensions	Finished Manufacture Dimensions	Within tolerance
Width of Slip ring	10.00mm	10.15mm	Yes
40mm Diameter size	40.00mm	39.95mm	Yes
Internal chamfer	1mm	Cannot check due to no specialist tool	

Press tool	Drawing Dimensions	Finished Manufacture Dimensions	Within tolerance
Width of press tool	28.00mm	28.00mm	Yes
Shoulder width	5.00mm	5.01mm	Yes
Shoulder size	48.00mm	48.04mm	Yes
Thread length	22.00mm	22.01mm	Yes
Thread size	16.00mm	16.00mm	Yes
Length of press tool	65.00mm	65.02mm	Yes

Visual inspection

Die block:

Upon visual inspection the die block falls short in a few aspects in comparason to its drawing, the first noticiable issue that can be spotted with this part is the 12mm slot is off centred, the second visual flaw that can be spotted with the die block is the finish on both sides of the block have teeth marks from jaw of lathe, and the third is one corner has a chip from beng dropped, however what stands out about the die block visually is the quality of the central hole, both the internal finish and external visually appear to be good with both parts being smooth allowing fot the slip ring and press tool to fit snug within. A protective coating of WD40 is also present

Press tool:

The visual inspection of the press tool is superb, all finishes are good and smooth to touch, and no burrs are present on the piece. The threads quality is also good with no left over swarf within the gaps. The reason for such great quality on the press tool is entirely down to the fact that the cnc lathe which the press tool was manufactured on was ran at appropriate speeds for the processes that took place and high quality tools were used. A protective coating of WD40 is also present

Slip ring

On the slip ring the 1mm chamfer can be found and by eye looks to eb 45 degrees, unfortunately there was no tool to confirm this. The finish on the slip ring was also extremely smooth and no burrs were present. The inside of the slip ring also was smooth, meaning when full assembled it sits flush. A protective coating of WD40 is also present

Task 3C Handover

Assessment number (eg 1234-033)	8713-332
Assessment title	Machining and Toolmaking Technologies Occupational Specialism

Candidate name	<first name> <surname>
City & Guilds candidate No.	ABC1234

Provider name	<provider name>
City & Guilds provider No.	999999a

Task(s)	3C
Evidence title / description	Assessor observation of handover meeting
Date submitted by candidate	DD/MM/YY

Task 3C

Assessment themes:

- Quality review and evaluation

You must:

- 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 production process
    - handover of completed press die tool and quality inspection report.

Additional evidence of your performance that must be captured for marking:

- handover materials consisting of:
    - quality inspection report (from Task 3b)
    - the completed press die tool (from Task 2).

Candidate evidence

(Handover meeting quality with detailed explanation of findings)

The handover meeting conducted by candidate was generally satisfactory. He discussed the majority of his processes but provided somewhat generic findings. However, he attempted to explain the production issues and offered suggestions for resolution.

(Industry Terminology)

Candidate used a reasonable level of industry terminology and communicated with confidence appropriate to the audience, making reference to his written evaluation.

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**.