

# CNC Machining Pro

## Exam Preparation Documentation

### Part 2 - Lathe

### 2023

Test Taker first and last name:

Test Taker number:

Test Taker company:

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Final Examination Overview - ICATT CNC Machining Professional			
Final examination: Part 1 Weighting: 40 %		Final examination: Part 2 Weighting: 60 %	
Areas of examination		Areas of examination	
<p><b>Practical task provided by ICATT - Completed in-company, with required documentation prepared prior to test day – exam site testing includes planning, evaluation and inspection, followed by a presentation and oral examination</b></p> <p>Weighting: 50 %</p> <p>Time suggested: does not include conversion and documentation to submit 6 h</p>	<p><b>Written examination</b></p> <p>Weighting: 50 %</p> <p>Time permitted: 1.5 h</p>	<p><b>Practical task provided by ICATT - Completed in-company, with required documentation prepared prior to test day – exam site testing includes planning, evaluation and inspection, followed by a presentation and oral examination</b></p> <p>Weighting: 50 %</p> <p>Time suggested: does not include conversion and pre-documentation to submit 14 h includes pre-fabrication and final</p>	<p><b>Written examination</b></p> <p>– Production Technology – Task and Functional analysis – OSHA and Workers Rights</p> <p>Weighting: 50 %</p> <p>Time permitted: 4 h 15 min</p>
<p><b>– Planning exercise*</b> exam site Weighting: 10 % Time allotted: 30 min</p> <p><b>– Execution**</b> Weighting: 80 % Time allotted (in company): 5-6 h</p> <p><b>– Inspection</b> Exam site Weighting: 10 % Time allotted: 30 min</p>	<p><b>– Part A (50%):</b> 23 multiple choice questions 3 of which can be deselected 6 of which cannot be deselected</p> <p><b>– Part B (50%):</b> 8 short answer questions No deselection possible</p>	<p><b>– Planning exercise*</b> exam site Weighting: 10% Time allotted: 30 min</p> <p><b>– Execution**</b> Weighting: 70% Time allotted (in company): 5-6 h</p> <p><b>– Inspection</b> exam site Weighting: 20% Time allotted: 30 min</p>	<p><b>Project 1 ALL</b> Time permitted: 105 min Weighting 50%</p> <p><b>Production Technology Task and Functional Analysis 2 x Part A:</b> 14 multiple choice questions 3 of which can be deselected</p> <p><b>2 x Part B:</b> 4 short answer questions No deselection possible</p>
<p><b>Presentation and Oral examination:</b></p> <p>Weighting: total % combined with execution</p> <p>Presentation: 10 min</p> <p>Oral examination: 20 min</p>		<p><b>Presentation and Oral examination:</b></p> <p>Weighting: total % combined with execution</p> <p>Presentation: 10 min</p> <p>Oral examination: 20 min</p>	<p><b>Project 2 Turning OR Project 3 Milling</b> Time permitted: 105 min Weighting 50%</p> <p><b>Production Technology Part A:</b> 14 multiple choice questions No deselection possible</p> <p><b>Part B:</b> 4 short answer questions No deselection possible</p> <p><b>Task and functional analysis CNC Program</b></p>
<p>*The planning exercise and inspection protocol takes place after the written exam. Total time permitted for both: 1h</p> <p>**Execution weighting includes</p> <ul style="list-style-type: none"> <li>- Evaluation of final product</li> <li>- Documentation submitted</li> <li>- Presentation</li> <li>- Oral examination</li> </ul>		<p>*The planning exercise and inspection protocol takes place after the written exam. Total time permitted for both: 1h</p> <p>**Execution weighting includes</p> <ul style="list-style-type: none"> <li>- Evaluation of final product</li> <li>- Documentation submitted</li> <li>- Presentation</li> <li>- Oral examination</li> </ul>	<p><b>– OSHA and Worker’s Rights</b></p> <p>Time permitted: 45 min Weighting: 20 %</p> <p>20 multiple choice questions 5 of which can be deselected</p> <p>4 short answer questions 1 of which can be deselected</p>

**AHK**

Final Examination Part 2 – Summer 2023

**Standard Preparation List for  
the Apprenticeship Training Company****CNC Machining Professional  
Lathe Systems**

Instead of the items listed, alternatively comparable customary tools, measuring and auxiliary equipment can be used. **Items marked with a – in the center column are NOT necessary for this examination.**

**I Quality measuring equipment that must be provided by the training company for each test taker:**

1.	1 Caliper gauge, Form A	150 mm	DIN 862
2.	1 Caliper gauge, Form B	150 mm	DIN 862
3.	1 Caliper gauge, Form C	135 mm	DIN 862
4.	1 Outside micrometer	0-25 25-50 50-75mm	
5.	1 Depth micrometer	0-25 25-50 50-75mm	
6.	1 Bevel protractor or universal		
7.	1 Beveled steel square	—	

**II Tools that must be provided by the training company for each test taker:**

1.	1 Marking tool		
2.	1 Center punch		
3.	1 Fitter's hammer	300 g	DIN 1041
4.	1 Rubber or plastic hammer		
5.	1 Flat file	150-1	DIN 7261
6.	1 Triangular file	150-1	DIN 7261
7.	1 File brush or file cleaner		
8.	1 Three square scraper or manual deburrer		
9.	1 sharpening stone or hand lapping		

**III Auxiliary equipment that must be provided by the training company for each test taker:**

1. 1 Safety glasses
2. 1 Hair net, or hair pulled back safely so that it does not fall in face or near equipment
3. 1 Book of tables (to be provided by the test taker)
4. Non-programmable calculator not connected to a network without possibility of communicating with others (to be provided by test taker)

**IV Test equipment that must be provided by the company for 1 to 5 test takers:****Items marked with a – in the center column are NOT necessary for this examination.**

1.	1 Morse taper ring gauge	A4 (if you do not have it, use alternative gauging techniques)	DIN 229/Sheet 2
2.	1 Morse spindle taper plug gauge	4 (if you do not have it, use alternative gauging techniques)	DIN 229/Sheet 1
3.	1 Inside micrometer with measuring jaw	25-30 30-40mm	
4.	1 Three-point inside micrometer <b>OR</b> 1 inside micrometer (measuring accuracy of 0.01mm for Ø28mm, 36H7)	18-50mm with adjustment	
5.	1 Outside micrometer	—	
6.	1 Block gauge set	0-100 mm	
7.	1 Thread limit ring gauge or thread limit roller gauge (go/no-go)	M24 X 1.5	
8.	1 Thread limit plug gauge (go/no-go)	M24 X 1.5	

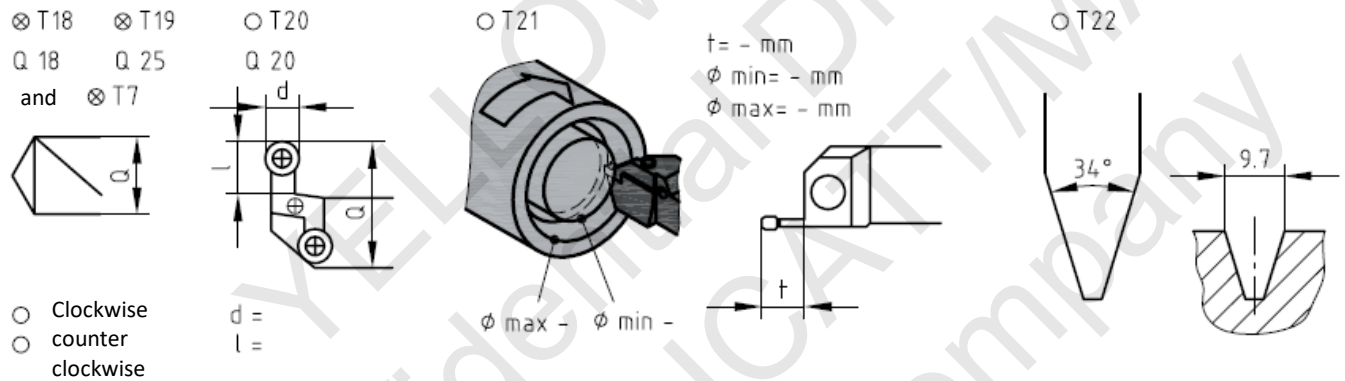
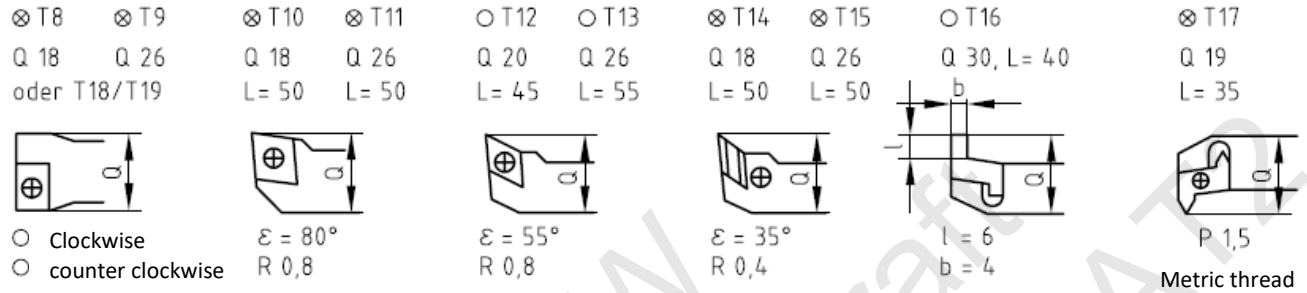
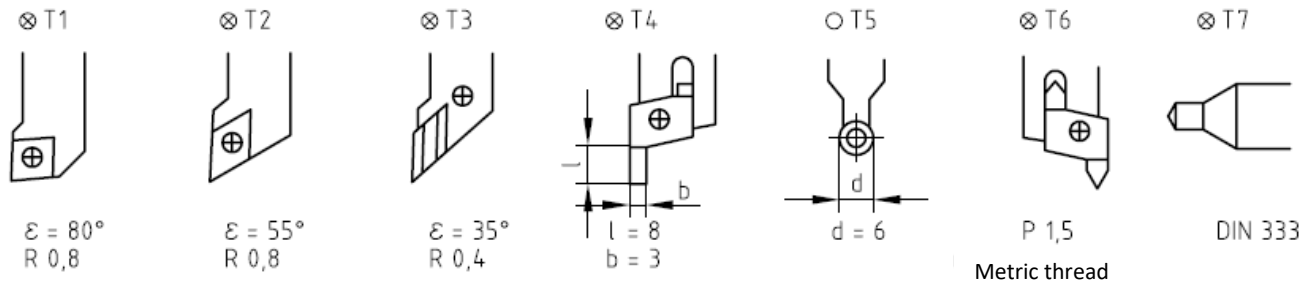
Note: Measuring equipment can be in analog or digital form. Instead of the items listed, alternatively comparable customary tools, measuring and auxiliary equipment can be used.

**V Tools for manual material processing that must be provided for 1 to 5 test takers:****Items marked with a — in the center column are NOT necessary for this examination.**

1.	1 Set of marking stamps (Arabic numerals)	3 mm	
2.	1 Allen key	—	ISO 2936
3.	1 Screwdriver for slotted screws	—	
4.	1 Tongs for circlip	—	DIN 5254

**VI Tools for material processing that must be provided for each test taker:****Items marked with a – or sizes crossed out in the center column are NOT necessary for this examination.**

1.	1 Center drill	A2.5	DIN 333
2.	1 Twist drill	—	
3.	1 Countersink 90° or NC spot drill	—	
4.	<b>Lathe tool: Lathe tool, shank depends on equipment</b>		
4.1	1 Molded lathe tool for thread undercut DIN 76-A outside, thread pitch	1.5 mm	DIN 76 – A
4.2	Molded lathe tool for thread undercut DIN 76-C inside, thread pitch	—	DIN 76 – C
4.3	1 Molded lathe tool for outside relief groove	E 0.8 X 0.3	DIN 509
4.4	1 Molded lathe tool for inside relief groove	—	DIN 509
4.5	1 Molded lathe tool for outside lock groove	—	



Items marked with an ⊗ above are expected to be needed for the manufacturing of the parts.


In the case that the examination is assigned and performed as an in-company project, extensive planning and implementation documentation will be provided by the GACC Midwest as the administering organization and must be thoroughly completed to present to the exam board prior to assigned examination time. As an in-company project, tooling may vary significantly from tooling listed in the yellow preparation documentation provided here and alternative tooling must be documented in the planning and implementation documentation. The tools may not be pre-set in the tool holder. The completed practical project must also be prepared and presented. You will also inspect your project with your own measuring tools according to the exam requirements on exam day.

The DIN specifications of the tool refer to the HSS, as an alternative carbide can also be used. It is possible to use comparable standard tools, inspection equipment and work equipment as an alternative to the listed items.

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**Material provision list****CNC Machining Professional  
Lathe Systems****General Information**

The semi-finished products must correspond to the specified standards.<sup>1)</sup> During preparation, the adjacent general tolerances must be complied with. Non-underlined dimensions are final dimensions ( surface  $\sqrt{Rz 16}$ ). Underlined dimensions are raw dimensions, which are subject to change during the test. For the surfaces with an asterisk (\*), the labeled dimensions apply  $\nabla$ . Projection method 1 applies to drawings (  ).

General tolerance per ISO 2768

Tolerance class	from 0.5 to 3	over 3 to 6	over 6 to 30	over 30 to 120	over 120 to 400
Avg.	±0.1	±0.1	±0.2	±0.3	±0.5

**Note:** In the United States, it is acceptable to use US equivalent material to what is listed. It is also acceptable to mill or turn a part down to the proper metric dimensions listed although the drawings may indicate that it should not be. Tolerances should still be followed, and the equivalent material must be used.

**I Semi-finished products that every test taker must supply and prepare to the following specifications:**

- 1 Round material 60 x 82 EN 10278 EN AW - AlMgSiPb
- 1 Round material 60 x 45 EN 754-2 CuZn40Pb2
- 1 Round material 50 x 42 EN 12164 11SMn30+C

In the case that the examination is assigned and performed as an in-company project, the material or equivalent must be purchased and prepared according to any drawings attached to this document. If there are no drawings attached then there is no pre-fabrication to be completed prior to doing the final project.

This yellow preparation documentation is a resource for material, hardware, expected tooling, and measuring equipment for your final exam project. Extensive planning and implementation documentation can be found on the ICATT Apprentice resource page by the GACC Midwest as the administering organization and must be thoroughly completed to present along with your project to the exam board at your assigned written examination time on June 7<sup>th</sup>. On your written exam day, you will also inspect your project with your own measuring tools according to the exam requirements. Be sure to also have tools for disassembly if necessary.