

CNC Machining Pro

Exam Preparation Documentation

Part 1

2024

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>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</p> <p>Weighting: 50 %</p> <p>Time suggested: does not include conversion and documentation to submit 6 h</p>	<p>Written examination</p> <p>Weighting: 50 %</p> <p>Time permitted: 1.5 h</p>	<p>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</p> <p>Weighting: 50 %</p> <p>Time suggested: does not include conversion and documentation to submit 14 h included pre-fabrication and final</p>	<p>Written examination</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>– Planning exercise* exam site Weighting: 10 % Time allotted: 30 min</p> <p>– Execution** Weighting: 80 % Time allotted (in company): 5-6 h</p> <p>– Inspection* Exam site Weighting: 10 % Time allotted: 30 min</p>	<p>– Part A (50%): 23 multiple choice questions 3 of which can be deselected 6 of which cannot be deselected</p> <p>– Part B (50%): 8 short answer questions No deselection possible</p>	<p>– Planning exercise* exam site Weighting: 10% Time allotted: 30 min</p> <p>– Execution** Weighting: 70% Time allotted (in company): 5-6 h</p> <p>– Inspection* exam site Weighting: 20% Time allotted: 30 min</p>	<p>Project 1 ALL Time permitted: 105 min Weighting 50%</p> <p>Production Technology Task and Functional Analysis 2 x Part A: 14 multiple choice questions 3 of which can be deselected</p> <p>2 x Part B: 4 short answer questions No deselection possible</p>
<p>Presentation and Oral examination:</p> <p>Weighting: total % combined with execution</p> <p>Presentation: 10 min</p> <p>Oral examination: 20 min</p>		<p>Presentation and Oral examination:</p> <p>Weighting: total % combined with execution</p> <p>Presentation: 10 min</p> <p>Oral examination: 20 min</p>	<p>Project 2 Turning OR Project 3 Milling Time permitted: 105 min Weighting 50%</p> <p>Production Technology Part A: 14 multiple choice questions No deselection possible</p> <p>Part B: 4 short answer questions No deselection possible</p> <p>Task and functional analysis CNC Program</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"> - Evaluation of final product - Documentation submitted - Presentation - Oral examination 		<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"> - Evaluation of final product - Documentation submitted - Presentation - Oral examination 	<p>– OSHA and Worker’s Rights</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>

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Final Examination Part 1 – 2024

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

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	200 mm	DIN 862
3.	1 Caliper gauge, Form C	135 mm	DIN 862
4.	1 Outside micrometer	0-25 25-50 50-75 mm	
5.	1 Depth micrometer	0-25 25-50 50-75 mm	
6.	1 Bevel protractor or universal		
7.	1 Beveled steel square	100 x 70 mm	

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	150-3	DIN 7261
6.	1 Triangular file	150-3	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 Safety glasses
- 1 Hair net, or hair pulled back safely so that it does not fall in face or near equipment
- 1 Book of tables (to be provided by the test taker)
- 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 H7 limit gauge | 8 | |
| 2. | 1 Morse taper ring gauge | – | DIN 229-2 |
| 3. | 1 Morse spindle taper plug gauge | – | DIN 229-1 |
| 4. | 1 Inside micrometer with measuring jaws | 5-50 mm | |
| 5. | 1 Three-point inside micrometer or 1 inside fine micrometer
(measuring accuracy .01 for Ø with adjustment accessories) | Ø 32mm | |
| 6. | 1 Block gauge | 0-100 mm | |
| 7. | 1 Lever gauge for alignment with holder
or dial gauge for alignment with holder | | |
| 8. | 1 Threaded ring gauge (go/no-go)
or threaded limit plug gauge | M12 | |
| 9. | 1 Threaded limit plug gauge (go/no-go) | M8 | |

Note: 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 | – | ISO 2380 |
| 4. | 1 Open-end wrench | – | |
| 5. | 1 Machine-tap with tap wrench | M8 | |
| 6. | 1 Die | M12 | |
| 7. | 1 Tongs for circlip | – | DIN 5254 |
| 8. | 1 Split pin drive | – | DIN 6450 |

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 at assigned examination time. The completed practical project must also be prepared and presented. 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.

VI Tools for mechanical material processing that must be provided for each test taker:

Items marked with a – in the center column are NOT necessary for this examination. Alternative tooling may be used.


1.	1 Center drill	A2 A2.5	DIN 333
2.	1 Twist drill	5 6.6 8.0 10 20 mm	
3.	1 Core drill	–	DIN 343
4.	1 Counterbore	11 x 6.6	DIN 373
5.	1 Countersink 90° or NC spot drill	5–10 10–15 15–20 20-25mm	
6.	1 60° countersink	–	
7.	1 Machine reamer H7	8	DIN 212
8.	Lathe tools	Shank max, depends on equipment	
8.1	1 facing tool	–	DIN 4952
8.2	1 boring bar for turning	–	DIN 4953
8.3	1 boring bar for inside diameters and inside facing	for a drill hole Ø32 mm, 22 mm deep	DIN 4954
8.4	1 Offset side lathe tool	–	DIN 4960
8.5	1 Plunge cutting lathe tool	for a cut 12 mm wide, 8 mm deep	DIN 4961
8.6	1 Plunge cutting lathe tool	–	DIN 4961
8.7	1 Bent angled lathe tool for facing	–	DIN 4965
8.8	1 Molded lathe tool for thread undercut outside, thread pitch	A 1.75	DIN 76-A
8.9	1 Molded lathe tool for undercut, inside	–	DIN 509
8.10	1 Molded lathe tool for undercut, outside	–	DIN 509
8.11	1 Molded lathe tool for locknut, inside	–	
8.12	1 Outer thread lathe tool Thread pitch	1.75	
8.13	1 Molded lathe tool	–	
8.14	1 Knurling tool RGE 1	–	DIN82
9	Milling tools		
9.1	1 Cylindrical milling cutter or 1 face mill	Ø63N Ø63 for face milling	DIN 1880
9.2	1 Slot milling cutter	–	DIN 327
9.3	1 T-slot milling cutter with straight shank	16 x 8	DIN 851
9.4	1 End milling cutter for roughing	A6NR A8NR A10NR A12NR A20N A25N	DIN 844
9.5	1 End milling cutter for finishing	A6N A8N A10N A12N A20N A25N	DIN 844
9.6	1 Angular milling cutter with straight shank	D45 x 25N (for chamfer up to 5 mm)	DIN 1833

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****General Information**

The semi-finished products must correspond to the specified standards.¹⁾ 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 ∇ . 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 raw stock down to the proper metric dimensions listed below although the drawings (surface) 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. | 1 flat aluminum | <u>100</u> x <u>100</u> x <u>30</u> | EN 754 | EN-AW AlCu4PbMg |
| 2. | 1 round steel | Ø <u>60</u> x <u>117</u> | DIN 10278 | 11SMn30+C |

In the case that the examination is assigned and performed as an in-company project, the material or equivalent must be prepared according to the attached drawings and fabricated prior to final project distribution April 12th, 2024. If there are no drawings attached then there is no pre-fabrication to be completed prior to doing the final project, only the gathering of tools and properly dimensioned materials.

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 5th. 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.