



CNC MILLING

CzechSkills 2024

Rules and Instructions

Czech Republic is looking for the Champion in CNC Milling 2024!



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I. Foreword

Computer Numerical Control (CNC) technology has become omnipresent. CNC milling machines are machine tools used for the shaping of metal and other solid materials.

To achieve the finished product, the CNC milling machinist undertakes a sequence of essential activities, from interpreting engineering drawings to optimizing the machining process:

- Interpreting engineering drawings and following the specifications
- Generating the processes and programs with the CAD/CAM system and/or G and M-codes
- Setting up the tools, work holding devices, and work pieces on the CNC milling centre
- Manipulating cutting conditions, based on the properties of the material and tools
- Operating, inspecting, and maintaining the accuracy of dimensions within the specified tolerances
- Optimizing the process, taking into account the production type: whether large quantities of one part, small batches, or one-of-a-kind items.

CNC Milling is a competition skill for:

- WorldSkills International Nr. 07 – CNC Milling
- EuroSkills (Europe only) Nr. 07 – CNC Milling

II. Competition rules and instructions

Qualification round - TASK A

Only participants who complete both the qualification and final rounds will meet the competition requirements of prestigious international contests such as WorldSkills.

- Prior to the national round qualification round takes place. The qualification can be arranged upon this documentation. The difference between the national round and qualification consists in the remote format of preparation and assessment process. During the qualification, according to the rules and organiser's instructions, competitor must produce, send or deliver produced workpieces to assigned partner (company) by a given date. This process is fully in charge of the competition professional guarant and organiser, to follow the highest WorldSkills International standards and rules.
- Each project is evaluated by an examination committee. The submitted workpieces are measured using a assigned partner company, coordinate measuring machine, which is designed for dimensional inspection of parts after removal from the machine..
- Competitors will be personally informed of the committee's evaluation and will also present their work in a discussion format. This part of the evaluation will be conducted individually, with the date arranged in agreement with each participant.

National Championship in CNC Milling - TASK B

- Based on personal qualification interviews, the expert committee will select the 5 best candidates. Selected candidates were nominated to the **finale round**.
- Finalists will prepare for the final competition together, in cooperation with the partners of CNC Skills Czech Republic. The 2-day finale will take place on assigned venue and date as part of the CzechSkills Finales.
- The preparation for the finalists includes also a 2-day training session provided by technologists from *ad the xxxxx name of your partner companies*.
- **Points from the previous qualification round were added to the score achieved in the final round. The title goes to the candidate with the highest total score.**

EuroSkills competition requirements

All participants who complete both the qualification and final rounds will meet the competition requirements of prestigious international contests such as WorldSkills.

CNC Skills Czech Republic z.ú. will award the winner the title of „Champion in CNC Milling“ and offer the opportunity to participate in CNC milling training camps in Austria and Germany.

III. Competitor requirements

Candidates are expected to be able to independently produce the submitted workpiece on a CNC machine tool (milling machine).

Basic required knowledge:

- a) Creating a work plan and plan of the technological procedure (process planning) according to the specified technical drawing
- b) Creating a tool list with information about cutting conditions (cutting speed and feed rate)
- c) Creating of CNC programu (on the machine, Programming station or in CAD CAM systém)
- d) Inspection and measurement of selected tools/metrology
- e) Machine setting
- f) Definition of workpiece zero points
- g) Manufacture of the part
- h) Establishment of a measurement protocol

IV. Technical requirements

- a) Min.requirement: 3-axis milling machine with a tool magazine of approximately 20 slots,
- b) Clamping devices – setup on the machine
- c) Material 6061T6 or other aluminium alloy (Dural), dimensions 100*50*150 mm, tolerance $\pm 1\text{mm}$
- d) Measuring tools for inspecting shapes, threads and precision holes
- e) Hand tools for deburring
- f) Workstation for planning and programming
- g) Workstation for measurement