ESF program "Development of the system of qualifications'

OCCUPATIONAL QUALIFICATION STANDARDS

CNC machine operator, level 5

The Occupational Qualification Standards are documents that describe the work, a set of skills, knowledge and attitudes or competency requirements for successful performance of the work.

Occupational Title	Estonian Qualifications Framework (EQF) level
CNC machine operator, level 5	5

Part A
DESCRIPTION OF WORK

A.1 Description of work

The **CNC machine operator, level 5**, is an experienced specialist who works in the furniture industry and in wood processing companies. His or her work is the machining of wood and wood-based materials on CNC machines, including planning and organizing the technology of the work and analyzing the production process.

The tasks of the Level 5 CNC machine operator include preparing CNC programs and changing the program parameters, recognition of error messages, production of more complex products and supervision of co-workers. He or she knows thoroughly the construction and the working principles of machine tools and equipment, the machining modes and details, and the features of used wood and wood-based materials and quality requirements set for the products. Monitors the productivity and compliance with the work process. The CNC machine operator level 5 uses industry-specific knowledge and detailed technical experience, offers well-functioning innovations and shares his or her knowledge and the specifics of the area with co-workers. He or she adapts his or her communication style to different situations and people and helps shape the team spirit.

The Level 5 CNC machine operator evaluates risk factors in production and takes steps to mitigate the risks. In the case of an accident calls for professional help and behaves in accordance with the organization's internal regulations. In the work uses a computer at the level AO1 and AO2 (see Annex 2 “Computer skills”) and has general knowledge of CAD/CAM programs. Uses in his or her work the Estonian language at level B2 and English or Russian at level B1 (see Annex 3 “Descriptions of the language skill levels”).

A.2 Work Units

The occupational qualification of Level 5 CNC machine operator consists of one work unit.

A.2.1 Machining of wood and wood-based materials on CNC machines.

A.3 Working environment and the specificity of the work

Depending on the employer, the working time can be in shifts, on the basis of timesheets, including night time, weekends and public holidays. The work pace can be periodic, fast and intense. The work environment is located indoors and can be noisy.

The work environment contains wood dust, which can cause allergic reactions. Failure to comply with occupational safety requirements could lead to an accident at work.

A.4 Work equipment

The main tools are various measuring instruments (calipers, tape measures, angle meters, etc.), and electric and pneumatic hand tools.

A.5 Personal characteristics necessary for the work: aptitude and personality traits

The occupational qualification requires mathematical-logic ability and analytical skills, spatial imagination, precision of movements, coordination, and the ability to physical exertion, technical intelligence and a sense of responsibility. It is helpful to have correctness, accuracy, learning ability and accountability.
A.6 Professional training
Generally, CNC machine operators are persons with at least secondary education who have acquired the necessary skills for their job in vocational education, in the course of continuing education or on-the-job training.
A.7 The most common job titles
CNC operator

Part B
COMPETENCY REQUIREMENTS

B.1. Structure of the occupational qualification
For certification of the occupational qualification, certification is required for the competency B.2.1.

B.2 Competencies

B.2.1 Machining of wood and wood-based materials on CNC machines	**ECT Level 5**
Performance indicators 1) plans his or her future activities taking into account the initial task, the drawing and the program prepared for manufacture of a product, the quality of blanks, complexity of the work and the facilities of the machine; 2) uses the information on the work drawings and technology maps for finding the blanks; 3) selects and installs the correct cutting tool, considering the work drawings of the detail; 4) starts and configures the CNC machine according to the manufacturer's instructions (technological documentation), and selects the appropriate program from the existing programs and in accordance with the instructions configures his work bed; 5) selects or prepares the appropriate program for the detail on the basis of work drawings and the specific nature of the work bench, and configures the work bed accordingly; 6) designs and uses jigs and templates, based on the production tasks and work drawings; 7) places and fixes blanks on the bench, starts the work program and monitors the course of processing; in the event of anomalies in the bench work process, interrupts the process and eliminates the cause of the anomaly, or decides on the future action; 8) based on work drawings, enters the values needed for the variables; 9) prepares the drivers for machining wood and wood-based materials, based on the work drawings and the specificity of the work bench; 10) distinguishes error messages and determines the cause of the error; if possible, eliminates the error or notifies the appropriate parties in accordance with the work instructions; 11) records the error messages and technical repair work by filling in the necessary documents; 12) stops the CNC machine according to the manufacturer's instructions; 13) tidies and cleans the machine on a daily basis in accordance with the requirements; 14) uses his or her work zone for its intended use and keeps it organized; uses materials and tools prudently and economically; 15) follows the work environment and safety requirements, using work protection equipment and safe working practices; 16) supervises co-workers in the work process as needed.	
Knowledge: 1) CNC machines and their technological capabilities; 2) cutting tools used in the CNC machines and their configuration requirements; 3) principles of CNC machine drives; 4) measurement and control instruments; 5) principles of the use of calibration and reference details; 6) wood machining principles; 7) basics of technical drawings and the specificity of furniture and wood products; 8) SI system for units of measurement; 9) mechanical and physical properties of wood and wood defects.	

Assessment method(s):
Written task, supervision of a practical task in the work process and an oral interview.

Part C
GENERAL INFORMATION AND ANNEXES

C.1 Information for the preparation and approval of the occupational standard, the awarding body, and a reference to the location of the occupational standard in the classifications	
1. The marking of the occupational standard in the occupational qualification register	16-17102012-3.5/4k
2. The occupational qualification standard compiled by the names of people and organizations	Aulika Riisenberg, *SA Innove* Harri Karjane, *AS Hapval* Jaanus Sults, *OÜ Wisecraft* Jüri Minjajev, Union of Estonian Furniture Manufacturers Tarmo Kalmann, Astangu Vocational Rehabilitation Centre Üllar Luga, Tallinn University of Technology Zigmontas Strepaitis, *OÜ Balteco Mööbel*
3. Occupational qualification standard approved by	Professional Council of Forestry
4. Professional Council Decision No.	10
5. Date of Professional Council Decision.	17.10.2012
6. Occupational Standard valid until (date)	16.10.2017
7. Occupational Standard version number (1-n)	4
8. Reference to the Classification of Occupations (ISCO 08)	7523 Machine tool setters and operators
9. Reference to the European Qualifications Framework (EQF)	4
C.2 Occupational title in a foreign language	
English - CNC machine operator	
Russian Оператор обрабатывающего центра ЦПУ (цифровым програмным управлением)	
C.3 Annexes	
Annex 1 Work units and work tasks Annex 2 Computer skills (ECDL/ICDL) Annex 3 Language skill levels descriptions	

Annex 1

Work units and work tasks

The CNC machine operator, level 5, is an experienced specialist who works in the furniture industry and in wood processing companies. His or her work is the machining of wood and wood-based materials on CNC machines, including planning and organizing the technology of the work and analyzing the production process.

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1	**Machining of wood and wood-based materials on CNC machines**	**CNC machine operator, level 4**	**CNC machine operator, level 5**
1.1	Planning of further activities	Plans his or her future activities taking into account the initial task, the drawings and the program prepared for manufacture of a product, the quality of blanks, complexity of the work and the facilities of the machine	Plans his or her future activities taking into account the initial task, the drawings and the program prepared for manufacture of a product, the quality of blanks, complexity of the work and the facilities of the machine
1.2	Using the information on the work drawings and technology maps	Uses the information on the work drawings and technology maps for finding the blanks	Uses the information on the work drawings and technology maps for finding the blanks
1.3	Checking the state of cutting tools	Checks the condition of the cutting tools and compliance with the work operation	
1.4	Selection and installation of the right cutting tool		Selects and installs the correct cutting tool, considering the work drawings and the detail

1.5	Starting and configuring the CNC machine	Starts and configures the CNC machine according to the manufacturer's instructions (technological documentation), and selects the appropriate program from the existing programs and in accordance with the instructions, configures his or her work bed	Starts and configures the CNC machine according to the manufacturer's instructions (technological documentation), and selects the appropriate program from the existing programs and in accordance with the instructions configures his or her work bed
1.6	Manufacturing details	Manufactures the details, if necessary, using the tools and templates according to the given instructions (including technological documentation)	
1.7	Preparation or selection of the necessary program for the detail		Selects or prepares the appropriate program for the detail on the basis of work drawings and the specific nature of the work bench, and configures the work bed accordingly
1.8	Assessment of the compliance of the detail with the quality requirements provided in the work task	Evaluates compliance of the detail with the quality requirements provided in the work task, measuring, marking and using calibrators and reference details	
1.9	Construction and use of stencils and jigs		Designs and uses jigs and templates, based on the production task and work drawings
1.10	Placing and fixation of blanks on the bench tool, starting the work program and monitoring the course of the process		Places and fixes blanks on the bench, starts the work program and monitors the course of the processing; in the event of anomalies in the bench work process, interrupts the process and eliminates the cause of the anomaly, or decides on the future action
1.11	Entering into the program the values needed to the needed variables		Based on work drawings, enters the values needed for the variables

1.12	Preparation of the drivers for machining of wood and wood-based materials		Prepares the drivers for machining of wood and wood-based materials, based on the work drawings and the specificity of the work bench
1.13	Distinguishing of and response to the error messages of the machine	Distinguishes the error messages of the machine tool and responds to them, taking into account the given instructions of the manufacturer	Distinguishes the error messages and determines the cause of the error; if possible, eliminates the error or notifies the appropriate parties in accordance with the work instructions
1.14	Recording of error messages and technical work	Records the error messages and technical repair work by filling in the necessary documents	Records the error messages and technical repair work by filling in the necessary documents
1.15	Stopping of the CNC machine	Stops the CNC machine according to the manufacturer's instructions	Stops the CNC machine according to the manufacturer's instructions
1.16	Tidying and cleaning of the machine	Tidies and cleans the machine on a daily basis in accordance with the requirements	Tidies and cleans the machine on a daily basis in accordance with the requirements
1.17	Use of the workspace for its intended purposes	Uses his or her workspace for its intended purposes and keeps it organized; uses materials and tools prudently and economically	Uses his or her workspace for its intended purposes and keeps it organized; uses materials and tools prudently and economically
1.18	Compliance with the work environment and safety requirements	Complies with the work environment and safety requirements, using work protection equipment and safe work practices	Complies with the work environment and safety requirements, using work protection equipment and safe work practices
1.19	Supervision of co-workers		Supervises co-workers in the work process as needed