

OCCUPATIONAL QUALIFICATION STANDARD

Mechatronic, EstQF Level 4

An occupational qualification standard is a document which describes the set of skills, knowledge and attitudes, i.e. competence requirements, needed to successfully accomplish duties. Occupational qualification standards are used for compiling curricula and awarding qualifications.

Occupational title	Level of Estonian Qualifications Framework (EstQF)
Mechatronic, EstQF Level 4	4

Part A DESCRIPTION OF WORK

A.1 Description of work <p>Mechatronic, Level 4 constructs, installs, configures and services mechanical, hydraulic, pneumatic, electromechanical and electronic equipment. They perform their duties independently or as part of a team. The work requires basic knowledge in the fields of mechanics, electricity, electronics and information technology. Mechatronic, Level 4 can work in enterprises offering mechanical, automation, electronics industry and maintenance services. A mechatronics engineer working in the clothing, food, plastics, metal or other production industries understands the nature of the respective production process. The duties of a mechatronics engineer may partly overlap with the duties of skilled workers from enterprises in connected fields (e.g. automation engineer or robot operator).</p> <p>Highest level of profession: Mechatronic, Level 5</p>
A.2 Tasks <p>A.2.1 Planning of work</p> <ol style="list-style-type: none"> 1. Finding the necessary information from technical documentation 2. Planning their activities 3. Finding and preparing materials and work equipment <p>A.2.2. Conformity with safety requirements</p> <ol style="list-style-type: none"> 1. Following safety requirements 2. Organising a safe workplace 3. Using safety and personal protective equipment <p>A.2.3 Constructing and installing equipment</p> <ol style="list-style-type: none"> 1. Assembling and installing components 2. Programming equipment 3. Configuring equipment 4. Documentation <p>A.2.4 Planned equipment maintenance</p> <ol style="list-style-type: none"> 1. Conducting checks 2. Conducting maintenance 3. Documentation <p>A.2.5 Maintenance repairs of equipment</p> <ol style="list-style-type: none"> 1. Identifying and resolving faults 2. Repairing and replacing equipment and components

3. Checks and activation 4. Documentation
A.3 Work environment and specific nature of work
The working hours of a mechatronics engineer may be in shifts and include night-time, weekends and public holidays, depending on the employer. The pace of work may periodically be fast and stressful. The work may require performing operations in forced positions. The working environment may be both indoors and outdoors.
A.4 Tools
Equipment, measuring instruments and tools, computer with specialised software.
A.5 Personal qualities required for work: abilities and characteristics
The work requires logical and systematic thinking, concentration, dexterity, spatial imagination, visual memory, coordination and good vision.
A.6 Professional preparation
Professional skills are acquired at an educational institution or in the course of professional work and training.
A.7 Most common occupational titles
Mechatronic, configurator, aircraft mechanic, marine equipment mechanic, mechanic, operator, etc.
A.8 Regulations governing profession
A mechatronic may perform installations and maintenance to an extent that does not infringe the requirements provided for in legislation and in the occupational standards of the field.

Part B COMPETENCY REQUIREMENTS

B.1 Structure of occupation
All competences (B.2.1-B.2.6) must be certified when applying for the qualification of Mechatronic, EstQF Level 4.

B.2 Competences

MANDATORY COMPETENCES

B.2.1 Planning of work	EstQF Level 4
Performance indicators 1. Finds the information necessary for solving their task from technical documentation; 2. Determines the necessary operations and their order based on manuals and technical documentation; 3. Chooses and prepares the materials necessary for the task; 4. Assembles the work equipment necessary for the task; 5. Checks the conformity of work equipment.	
B.2.2 Conformity with safety requirements	EstQF Level 4
Performance indicators 1. Follows work safety requirements at every stage to prevent occupational accidents; 2. Follows the operational and safety requirements of equipment; 3. Prepares a safe workplace and checks its safety in the course of work, keeping the workplace in good order; 4. Follows work environment safety rules and collects waste following procedural and supervisory rules; 5. Reports hazards to the person responsible pursuant to the procedure established in the enterprise; 6. Correctly uses the prescribed safety and personal protective equipment; 7. Regularly checks the functionality of safety and personal protective equipment.	
B.2.3 Constructing and installing equipment	EstQF Level 4
Performance indicators	

1. Assembles components according to technical documentation;
2. Checks the compliance of the installation site with technical requirements based on visual inspection or technical documentation;
3. Installs components according to the manufacturer's instructions and project documentation;
4. Programmes industrial controllers in the appropriate programming language based on the technical task;
5. Makes a back-up copy of the programme by saving and describing the changes in quality control;
6. Configures the parameters of the control systems of the equipment, adhering to technical documentation;
7. Adjusts the parameters of sensors and actuators based on the conditions of the system for the functioning of software and hardware;
8. Checks the performance of equipment and its compliance with the project;
9. Documents the changes made to the system and saves them digitally.

B.2.4 Planned equipment maintenance

EstQF Level 4

Performance indicators

1. Checks the compliance of equipment performance with the manual visually and using measuring instruments and identifies the location of possible failures or errors;
2. Forwards information to the employee responsible;
3. Lubricates, cleans, tightens, configures and aligns equipment and components according to the maintenance plan, using the appropriate work equipment;
4. Documents the results of checks and maintenance pursuant to the established procedure;
5. Can use and understand instruction and maintenance manuals, diagrams, technical drawings and other documentation.

B.2.5 Maintenance repairs of equipment

EstQF Level 4

Performance indicators

1. Identifies the cause of the error visually or by taking measurements, utilising electrical and mechanical expertise;
2. Eliminates equipment errors according to the manual and within the limits of their competence;
3. Eliminates errors and malfunctions and replaces malfunctioning equipment and their components according to the repair plan;
4. Configures the equipment according to the given parameters;
5. Checks the performance of the installed components visually, mechanically and using software;
6. Performs measurements of automatics and electricity using the appropriate measuring instruments to ensure that the device meets all requirements;
7. Checks the elimination of error messages in the repaired device and its readiness to restart via the control unit, then restarts the device;
8. Documents the repair results pursuant to the established procedure;
9. Can use and understand the documents pertaining to repairs and maintenance (instruction manuals for installation, use and maintenance, diagrams and technical drawings (content and symbols)).

RECURRING COMPETENCES

B.2.6 Recurring competences of Mechatronic, Level 4

EstQF Level 5

Performance indicators

1. Can read and understand drawings, manuals and other technical documentation and uses technical terminology;
2. Acts in a purposeful and responsible way, following the requirements set out in professional legislation;
3. Takes part in teamwork, shares all necessary and useful information with others and works towards achieving the best common result;
4. Communicates with colleagues, clients and specialists from connected fields in a polite and proper manner and presents information in a clear and comprehensible way;
5. Develops themselves professionally and keeps up to date with technological innovations;
6. Uses professional ICT hardware and application software, following the data protection requirements and rules of the enterprise;
7. Uses a computer at the Basic user level for safety and content creation and at the Independent user level for problem-solving, information-processing and communication, Annex 1 – Scale of self-assessment in digital competence;

8. Uses English at least at the B1 level to obtain specialised information, working with materials and professional communication, Annex 2 – Language skills level descriptions.

Knowledge:

1. classification, purpose, construction and assembly requirements of mechanical, hydraulic, pneumatic, electromechanical and electrical equipment and software apparatus;
2. the principles of information-processing and transmission and signal conversion;
3. the most common mechatronic and hydraulic components (sensors, actuators, PLC controllers, etc.) and their functions, operating principles and product markings;
4. the principles of safe use for lifting apparatus (winches and lifts) and appliances (ropes, slings, etc.).

Part C

GENERAL INFORMATION AND ANNEXES

C.1 Information concerning compilation and certification of occupational qualification standard and reference to classification of occupations

1. ID of occupational qualification standard in register of occupational qualifications	24-03122019-2.2.1/7k
2. Occupational qualification standard compiled by:	Eduard Brindfeldt, Tallinna Tööstushariduskeskus Kristo Vaher, Tallinna Tehnikakõrgkool Jüri Riives, IMECC OÜ Ene Krimpus, Magnetic MRO AS Frid Kaljas, Festo
3. Occupational qualification standard approved by:	Engineering, Manufacturing and Processing
4. No. of decision of Sectoral Council	13
5. Date of decision of Sectoral Council	03.12.2019
6. Occupational qualification standard valid until	05.11.2024
7. Occupational qualification standard version no.	7
8. Reference to International Standard Classification of Occupations (ISCO 08)	7421 Electronics Mechanics and Servicers
9. Reference to European Qualifications Framework (EQF)	4

C.2 Occupational title in foreign language

English:	Mechatronic, EstQF Level 4
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C.3 Annexes

Lisa 1 [Scale of self-assessment in digital competence](#)

Lisa 2 [Language skills level descriptions](#)