

OCCUPATIONAL QUALIFICATION STANDARD

Electronic Equipment Technician, 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) |
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| Electronic Equipment Technician, EstQF Level 4 | 4 |

| Possible partial professional qualifications and titles on occupational qualification certificate | |
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| Title of partial professional qualification | Level of Estonian Qualifications Framework (EstQF) |
| Electronic Equipment Technician, EstQF Level 4 | 4 |
| Electronic Equipment Repairer, EstQF Level 4 | 4 |

Part A DESCRIPTION OF WORK

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| A.1 Description of work <p>The profession of Electronic Equipment Assembler comprises three qualifications: Electronic Equipment Assembler, Level 2, made up of two specialisations; Electronic Equipment Assembler, Level 3, made up of two specialisations; and Electronic Equipment Technician, Level 4, made up of two specialisations.</p> <p>Electronic equipment technicians usually work for industrial companies that assemble and operate electronics or products involving electronics.</p> <p>Electronic Equipment Technician, Level 4 is a skilled worker whose work involves manufacturing electronic assemblies and tuning, repairing and finding errors throughout the production process according to the given documentation, in both serial production and small-scale and prototype production.</p> <p>Electronic Equipment Technician, Level 4 uses different work methods and tools in their work. They guide colleagues and small work groups, where necessary.</p> |
| A.2 Tasks <p>A.2.1 Testing and checking measurement tools</p> <ol style="list-style-type: none"> 1. Measurement 2. Checking and set-up of measurement tools <p>A.2.2 Manufacturing electronic equipment</p> <ol style="list-style-type: none"> 1. Manufacturing electronic and cable assemblies 2. Hand soldering in the manufacturing of electronic devices <p>A.2.3 Identifying visual and functional errors in electronic assemblies</p> <ol style="list-style-type: none"> 1. Identifying errors 2. Identifying causes of errors <p>A.2.4 Repairing electronic devices</p> <ol style="list-style-type: none"> 1. Restoring functionality and standards-compliance 2. Documentation |

A.3 Work environment and specific nature of work

An electronic equipment technician works in indoor rooms with certain special conditions that may require special garments to be worn. The specific nature of the work may involve working with small parts, which requires good eyesight and colour differentiation. The working environment features electricity hazards and may involve contact with chemicals.

A.4 Tools

The main work tools of an electronic equipment technician are computers and computer-guided devices (such as test devices), handheld devices (electric, pneumatic, etc.), measurement tools (electric etc.), tools designed to assist in the manufacturing of assemblies (e.g. assembly fixtures), technical documentation and normative documents (standards and instructions).

A.5 Personal qualities required for work: abilities and characteristics

The work of an electronic equipment technician requires logical thinking skills, analytical skills, flexibility, tolerance of routines and accuracy in movement.

A.6 Professional preparation

Electronic Equipment Technician, Level 4 usually has vocational education or high school education and has gained their professional skills at work or through vocational or further education.

A.7 Most common occupational titles

The most common occupational titles for an electric equipment technician are troubleshooter, tuner, technician, installer and repairer.

Part B COMPETENCY REQUIREMENTS

B.1 Structure of occupation

Mandatory competences B.2.1-B.2.4 and B.2.5 (recurring competence) must be certified when applying for the qualification of Electronic Equipment Technician, Level 4.

Mandatory competences B.2.1-B.2.3 and B.2.5 (recurring competence) must be certified when applying for the qualification of Electronic Equipment Assembler, Level 4.

Mandatory competences B.2.4 and B.2.5 (recurring competence) must be certified when applying for the qualification of Electronic Equipment Repairer, Level 4.

B.2 Competences

MANDATORY COMPETENCES

B.2.1 Testing and checking measurement tools

EstQF Level 4

Performance indicators:

1. makes sure the product matches the documentation using the necessary measurement tools;
2. checks and sets up measurement tools, test devices and systems and, where necessary, tools according to the work instructions.

Knowledge:

- 1) types of measurement tools and test devices, their areas of use and technological requirements;
- 2) electrical and non-electrical measurements (voltage, length, weight, etc.) and units of measurement (volt, ampere, ohm, metre, kilogram, etc.);
- 3) the definitions of calibration, conformity assessment and verification.

B.2.2 Manufacturing electronic equipment

EstQF Level 4

Tegevusnäitajad

1. Koostab elektroonika- ja kaablikoostud vastavalt toote dokumentatsioonile, tuginedes koostule kehtestatud kvaliteedikriteeriumitele ning IPC J-STD-001, IPC-A-610 ja IPC/WHMA-A-620 või samaväärsetele standarditele.

2. Loeb elektriskeeme ja muud tehnilist dokumentatsiooni.
3. Käsitseb ja valmistab jootmiseks ette elektroonika komponente ja materjale.
4. Teeb käsijootmist, järgides tööjuhendit, toote dokumentatsiooni ja/või IPC J-STD-001, IPC-A-610 või samaväärsete standardite elektroonikakooste puudutavaid kvaliteedikriteeriume ning kasutades erinevaid käsijootmise tööriistu.

Teadmised

- 1) erinevad elektroonika komponendid;
- 2) kaabli- ja juhtmeköidiste või -koostude koostamise protsessid;
- 3) mehhaanilise koostamise protsessid (neetimine, kruvimine, liimimine, pressimine, keevitamine);
- 4) IPC J-STD-001, IPC-A-610 ja IPC/WHMA-A-620 või samaväärsete standardite nõuded;
- 5) jootmisprotsessis kasutatavad materjalid ja nende omadused (IPC J-STD-002 kuni 006 või samaväärsete standardite kohaselt).

B.2.3 Identifying visual and functional errors in electronic equipment

EstQF Level 4

Tegevusnäitajad

1. Hindab visuaalselt elektroonikakoostu komponentide ja koostu vastavust nõuetele.
2. Tuvastab elektroonikakoostu nõuetele mittevastavad ja vigastatud komponendid, kasutades mõõtmistulemusi ja elektriskeemi.
3. Tuvastab vea põhjuse elektroonikakoostus vastavalt elektriskeemi funktsionaalsetele ja visuaalsetele nõuetele.

Knowledge:

- 1) requirements of IPC-A-600, IPC-A-610 and IPC/WHMA-A-620 or another similar standard;
- 2) typical technical diagram methods.

B.2.4 Repairing electronic equipment

EstQF Level 4

Performance indicators:

1. restores the functional and other requirements of electronic assemblies according to the requirements and instructions of IPC 7711/21 or other similar standards;
2. documents the necessary parameters and abnormalities in the work process.

Knowledge:

- 1) requirements and instructions of IPC 7711 and 7721 or other similar standards;
- 2) requirements of production documents;
- 3) documents used in different parts of the production process.

RECURRING COMPETENCES

B.2.5 Recurring competences of Electronic Equipment Technician

EstQF Level 4

Performance indicators:

1. follows the work process and pays attention to quality and efficiency; follows principles of tool maintenance;
2. understands the general organisation of production and their own role in it;
3. uses their work zone for its intended purpose and keeps it organised (5S principles); is guided by production efficiency and effectiveness improvement methods (e.g. LEAN and six sigma); uses materials and tools prudently and economically;
4. follows working environment and safety requirements (including waste sorting) by using work safety equipment and safe and ergonomic work methods;
5. follows ESD and RoHS principles;
6. makes sure that measurement and work tools meet work requirements by checking the labels (labels indicating calibration);
7. uses specialist terminology and understands and follows the requirements of instructional documents; follows documentation requirements set by the organisation;
8. uses circuit diagrams and mechanical and assembly diagrams and understands the importance of archiving technical repair work;
9. participates in teamwork;
10. offers ideas for improvement and innovation; makes use of further training and development opportunities;
11. uses a computer in their work at the Independent User Level on the Digital Competence Self-Assessment Scale (see Annex 1);

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| 12. speaks a foreign language (preferably English) at the A2 level (Annex 2 'Language skills level descriptions'). |
| Assessment method(s): Recurring competences are evaluated as part of the assessment of the other competences listed in the occupational qualification standard. |

Part C

GENERAL INFORMATION AND ANNEXES

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| 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 | 08-10022023-1.3/7k |
| 2. Occupational qualification standard compiled by: | Karin Andressoo, Enics Eesti AS Milko Milatskov, Stoneridge Electronics AS Arno Kolk, Elektroonikatööstuse Liit Mart Ronk, Pärnumaa Kutsehariduskeskus Andres Ojalill, Tallinna Polütehnikum |
| 3. Occupational qualification standard approved by: | Information Technology and Telecommunication |
| 4. No. of decision of Sectoral Council | 21 |
| 5. Date of decision of Sectoral Council | 10.02.2023 |
| 6. Occupational qualification standard valid until | 01.11.2023 |
| 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: | Electronic Equipment Technician, EstQF Level 4 |
| English: | Electronics assembly operator, EstQF level 4 |
| Russian: | Сборщик электронных устройств |
| C.3 Annexes | |
| Lisa 1 Scale of self-assessment in digital competence | |
| Lisa 2 Language skills level descriptions | |