



*Alliance for Batteries Technology, Training and Skills*

*2019-2023*

## **Machine Operator in Upstream**

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## Machine Operator in Upstream

A battery upstream operator is responsible for the operation of equipment and processes that happen before the actual manufacturing of batteries, such as mixing and preparing the materials needed to produce batteries. They work in battery manufacturing plants and are responsible for ensuring that the materials needed for the production of batteries are prepared and available in a timely manner. They need to have a strong understanding of chemical engineering and material science, as well as experience with operating and maintaining equipment used in the production of battery materials.

### ESCO Occupations - [ESCO - Occupations - European Commission \(europa.eu\)](http://data.europa.eu/esco/isco/C8)

| ID | NAME                                       | Concept URI                                                                         |
|----|--------------------------------------------|-------------------------------------------------------------------------------------|
| C8 | Plant and machine operators and assemblers | <a href="http://data.europa.eu/esco/isco/C8">http://data.europa.eu/esco/isco/C8</a> |

### Context

|                        |                                                                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Minimum EQF</b>     | 3/4/5                                                                                                                                                                          |
| <b>Value Chain</b>     | Raw Materials and Processing<br>Cell and Components Manufacturing                                                                                                              |
| <b>Departments</b>     | Production and Maintenance<br>Logistics<br>Quality<br>RnD                                                                                                                      |
| <b>Specialisations</b> | Laboratory and validation laboratory operators<br>Production Assembly Operator<br>Automation / Process Operator<br>Process Operator - Upstream<br>Machine Operator<br>Operator |

### Cross-sectoral Specific Competence

| Name      | Type (S/K) | Description/Context                              | Level        | ESCO                |
|-----------|------------|--------------------------------------------------|--------------|---------------------|
| Equipment | S          | - Use of hand tools, electric tools and machines | Practitioner | Equipment and Tools |

|                                                |   |                                                                                                                                                                                                                                                                                                                             |              |                                     |
|------------------------------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------------------------|
| and Tools<br>Handling                          |   | <ul style="list-style-type: none"> <li>- Control the equipment used in production</li> <li>- Set up, use, and maintain machines to fabricate components</li> <li>- responsible for some routine maintenance of the machines</li> </ul>                                                                                      |              | Handling                            |
| Inspect<br>Quality of<br>Product /<br>Sampling | S | <ul style="list-style-type: none"> <li>- Makes visual quality checks</li> <li>- problem identification and minor troubleshooting</li> <li>- Conduct sampling to ensure material is not contaminated</li> <li>- Comply with all company policies, in particular those relating to safety, quality and performance</li> </ul> | Practitioner | inspect quality of product          |
| Analysis<br>Methods                            | K | <ul style="list-style-type: none"> <li>- Conducting root cause analysis on various issues</li> <li>- issue permits according to routines</li> <li>- Analyse the situation and take proper actions when facing failures and deviations affecting the production</li> <li>- Analysis and estimation of workload</li> </ul>    | Expert       | analysis methods                    |
| Hazardous<br>Materials                         | K | <ul style="list-style-type: none"> <li>- Controls the equipment and process materials used in production</li> <li>- Assure safe operations</li> <li>- Take proper actions when handling hazardous material</li> </ul>                                                                                                       | Expert       | handling of dangerous goods         |
| Material<br>Operation &<br>Handling            | S | <ul style="list-style-type: none"> <li>- Handling the materials according to the safety procedures</li> </ul>                                                                                                                                                                                                               | Practitioner | operate material handling equipment |
| Risk<br>Mittigation                            | K | <ul style="list-style-type: none"> <li>- Assure safe operations. Daily safety improvement work to reach in safety for example when doing repairs or inspections of equipment</li> <li>- Perform risk analysis</li> <li>- Actively partake in Safety, Quality, Environment and Improvement work</li> </ul>                   | Expert       | risk management                     |
| Operate<br>Machines                            | S | <ul style="list-style-type: none"> <li>- Operates and drives the machines</li> <li>- Maintenance procedures</li> <li>- Control the equipment and process materials used in production</li> <li>- Observe machine operation for defects and deviations and take appropriate actions</li> </ul>                               | Expert       | work safely with machines           |
| Production<br>Processes                        | K | <ul style="list-style-type: none"> <li>- Control the equipment and process materials used in production</li> <li>- Responsible for putting together many different parts</li> </ul>                                                                                                                                         | Practitioner | production process                  |
| Equipment<br>Maintenance                       | S | <ul style="list-style-type: none"> <li>- Perform visual inspections and equipment maintenance</li> <li>- Responsible for some routine maintenance of the machines</li> </ul>                                                                                                                                                | Practitioner | ensure equipment maintenance        |
| Safety<br>Procedures                           | K | <ul style="list-style-type: none"> <li>- Complying with all company policies, in particular those relating to safety, quality and performance</li> <li>- Assure safe conditions through Lock Out Tag Out Try Out according to routines</li> </ul>                                                                           | Awareness    | safety engineering                  |

|               |   |                                                                                                                                                                                                                                                                     |              |  |
|---------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|
|               |   | <ul style="list-style-type: none"> <li>- Partake in Safety, Quality, Environment and Improvement work</li> <li>- Daily safety improvement work to reach world class in safety</li> </ul>                                                                            |              |  |
| Parts Fitting | S | <ul style="list-style-type: none"> <li>- Positioning and fitting parts in a specific relationship to each other</li> <li>- Bonding, clamping, screwing, joining, soldering or other similar activities in order to connect and secure assembled elements</li> </ul> | Practitioner |  |

### Sector Specific Competence

| Name               | Type (S/K) | Description/Context                                                                                                                                                                                | Level        | ESCO              |
|--------------------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|
| Battery Material   | K          | <ul style="list-style-type: none"> <li>- Active and raw material processing and refinement</li> </ul>                                                                                              | Practitioner |                   |
| Battery chemistry  | K          | <ul style="list-style-type: none"> <li>- Understand the chemical processes within the cells and chemical properties of battery cell components such as cathodes, anodes and electrolyte</li> </ul> | Awareness    | battery chemistry |
| Battery Industry   | K          | <ul style="list-style-type: none"> <li>- Understands the importance of battery industry and overall value chain</li> </ul>                                                                         | Awareness    |                   |
| Battery components | K          | <ul style="list-style-type: none"> <li>- Understands the different battery cells components and their functions within the cells, such as anode, cathode, electrolyte, separator</li> </ul>        | Awareness    |                   |

### Soft Competence

| Name                           | Type (S/K) | Description/Context                                                                                                                                                                                                                                               | Level     | ESCO                           |
|--------------------------------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------|
| Communication                  | K          | <ul style="list-style-type: none"> <li>- Support managers and colleagues in creating a good working environment through inclusion, motivation, engagement, creativity, good communication and high ambitions</li> <li>- Report failures and deviations</li> </ul> | Awareness | communication                  |
| problem solving & troubleshoot | S          | <ul style="list-style-type: none"> <li>- problem identification and minor troubleshooting</li> <li>- reporting any problems to supervisor</li> </ul>                                                                                                              | Awareness | problem solving & troubleshoot |

### General Transversal Competence

| Name | Type (S/K) | Description/Context | Level | ESCO |
|------|------------|---------------------|-------|------|
|------|------------|---------------------|-------|------|

|                             |   |                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                                    |
|-----------------------------|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------|
| English                     | K | - Follow written and verbal instructions in a multicultural/international environment                                                                                                                                                                                                                                                                                                                                     | Awareness    | English                            |
| Reporting                   | S | - Report failures and deviations on equipment as well as conducting root cause analysis on various issues.<br>- Reading technical diagrams and drawings                                                                                                                                                                                                                                                                   | Practitioner | follow reporting procedures        |
| Written                     | S | - Perform risk analysis<br>- Report failures and deviations on equipment orally or in written form                                                                                                                                                                                                                                                                                                                        | Practitioner | written skills                     |
| Health and Safety Standards | K | - Assure safe operations. Daily safety improvement work to reach world class in safety for example when doing repairs or inspections of equipment<br>- Perform risk analysis<br>- Actively partake in Safety, Quality, Environment and Improvement work<br>- A safe operation production line is a priority and will therefore be a crucial part of any task<br>- Conduct sampling to ensure material is not contaminated | Expert       | health and safety in the workplace |

### Academic Competence (can be taken from University programme)

| Name | Type (S/K) | Description/Context | Level | ESCO |
|------|------------|---------------------|-------|------|
|      |            | -                   |       |      |