Training - Battery Manufacturing

EBAFAB-EN-P

Face-to-face only

5 days
Asynchronous part to be completed before the face-to-face part

This training course aims to improve skills in battery manufacturing

Level
Skilled

Public
Engineers and technicians who wish to design, develop, model, simulate or use storage systems integrated into electric and hybrid electric vehicles, taking into account the technical, economic and industrial constraints of the transport sector

Objectives
Attendees will be able to implement the following skills:

- Understand and explain the challenges of strategic battery materials,
- Understand and explain the main stages of battery manufacturing,
- Understand the digitization of battery manufacturing processes,
- Understand and explain the synthesis of active battery materials.

Pedagogical & technical resources
Teaching activities.

Assessment of achievements

- Trainees are assessed throughout the training through practical application phases and interactions with the trainer
- A final on-the-spot evaluation may also be carried out at the end of the course and/or at the end of each module using tests designed to verify the learners' understanding and assimilation of the knowledge linked to the training objectives

Prerequisites
No prerequisites are necessary to follow this course.

Responsable
IFP Training instructors, with expertise in the field and trained in modern teaching methods adapted to the specific needs of learners from the professional world

Program

ASYNCHRONOUS PROGRAM TO BE COMPLETED BEFORE THE SYNCHRONOUS/IN-PERSON COURSE

VIDEOS

Video 1 - Atoms Li-ions.
Video 2 - How batteries work.

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Video 3 - Introduction to Lithium.
Video 4 - Composition of Li-ion batteries.
Video 5 - How Li-ion batteries work.

SYNCHRONIZED/IN-PERSON PROGRAM

RAW MATERIALS. STRATEGIC MATERIALS — 0.5 day

Strategic materials and geopolitics.
Materials for batteries: graphite (anode), aluminum (cell casing, cathode, collectors), nickel (cathode), copper (collectors), manganese (cathode), cobalt (cathode), lithium (cathode), iron (cathode), steel (cell casing).
New families of disruptive active materials.
Lithium insertion materials.
Synthesis of lithium insertion materials.

CELL MANUFACTURING AND MODULE ASSEMBLY — 1.5 days

Overall process and environmental conditions.
Process.
Components introduced.
Focus on ATEX risks.
Steps.
Characteristics.
Things to keep in mind.
Mixing; Coating; Calendering and slitting; Cutting; Cell assembly; Electrolyte filling; SEI formation/degassing; Electrolyte filling; Cell assembly within the module.

DIGITALISATION OF BATTERY MANUFACTURING PROCESSES — 1 day

Part one:

- Definitions.
- Models.
- State of the art in physical process models.
- Focus on each step of the battery manufacturing process: mixing electrode inks, coating, drying, calendering.
- Generative methods for microstructured electrodes.
- Educational models for electrode manufacturing.

Part two:

- Electrolyte infiltration.
- Electrochemical performance.
- Cell optimization.
- Human/machine interfaces.

CHEMISTRY OF LI-ION CELL CORE MATERIALS AND DEVELOPMENTS — 1 day

Atomistics and electrochemistry: fundamentals and applications to the physical and chemical properties of materials used in Li-ion cell cores.
Synthesis of active materials: different approaches, key players, challenges, and avenues for improvement.
Comparison of the electrochemical and physicochemical properties of different active materials.
Tutorial: comparisons of mass/material balances for Li-ion batteries with different chemistries.

CORYS MANUFACTURING MODELING OF LI-ION CELLS (WORKSHOP) — 0.75 day

General principles of battery manufacturing processes.
Presentation and introduction to the simulator.
Presentation of the positions considered.

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Simulator-based scenario exercises.

EXAM **0.25 day**

Verification of acquired skills.

Sessions

Rueil-Malmaison - From 06/01/2026 to 06/05/2026 **3040 €/HT**

To French entities : IFP Training is referenced to DataDock ; you may contact your OPCO about potential funding.
Please contact our disabled persons referent to check the accessibility of this training program : referent.handicap@ifptraining.com

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