Lead-Acid Battery Manufacturing and Recycling Course: Grids, Pasting, Formation and Lead Recovery

21 – 25 February 2027
Dammam - Eastern Province five-star

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Introduction:

Lead-acid battery manufacturing and recycling, covering grids, pasting, formation and lead recovery, is a 1-week course for process, production, quality and EHS staff in battery plants and secondary lead units, ending with a Battery Plant Improvement and Lead Stewardship Plan. Plants lose plate yield, battery life and worker health when oxide, grid alloy, paste, curing, formation and furnace off-gas are run as separate islands. Nominees already operate, supervise or audit a battery line or recovery unit, and learning is by inspection walkthrough of line stages, furnace records and exposure data. CoreConcept Training Center delivers this lead-acid battery course.

Course Objectives:

- Trace the lead loop from leady oxide production through plate making, assembly, field service, collection and secondary smelting back to refined ingot
- Set grid casting, paste mixing, pasting and curing windows that hold plate weight, paste adhesion and basic lead sulphate structure
- Run tank and container formation, assembly welding, heat sealing and leak testing to release flooded and VRLA batteries without early failures
- Control used-battery breaking, acid neutralisation, paste desulphurisation and rotary or blast furnace charges to raise lead recovery and limit slag
- Apply blood lead surveillance, airborne lead controls, hygiene zoning and stack and fugitive emission checks across production and recovery areas
- Prepare a Battery Plant Improvement and Lead Stewardship Plan with yield, recovery, exposure and take-back actions for a case organisation

Target Audience:

- Process engineers who set oxide, grid casting, pasting, curing and formation parameters on battery lines
- Production supervisors who run plate making, assembly and charging shifts and answer for output and scrap
- Quality engineers who inspect plates and finished batteries and investigate warranty returns
- Recovery unit staff who operate battery breakers, desulphurisation tanks, furnaces and refining kettles
- EHS officers who monitor lead in air and blood, emissions, slag and wastewater at battery and recovery sites

Course Outline:

Day 1: Lead-Acid Battery Types, Plant Flow and the Lead Loop

- Starting, Deep-Cycle and Stationary Battery Duty Profile Comparison
- Flooded Versus VRLA AGM and Gel Construction Review
- Plant Process Map From Leady Oxide to Dispatch
- Closed Lead Loop Map Covering Collection and Secondary Smelting
- Plate Yield, Scrap and Warranty Return Baseline Assessment

Day 2: Leady Oxide, Grid Alloys and Paste Chemistry

- Barton Pot and Ball Mill Oxide Degree and Particle Checks
- Lead-Calcium Versus Lead-Antimony Grid Alloy Selection Matrix
- Gravity Cast, Expanded and Punched Grid Process Comparison
- Paste Recipe Sheet With Acid, Water and Expander Additives
- Paste Density, Penetration and Moisture Testing Routine

Day 3: Pasting, Curing, Formation and Battery Assembly

- Belt Pasting Plate Weight and Flash Drying Control
- Curing Chamber Humidity and Temperature Profile for Basic Sulphates
- Tank Versus Container Formation Charge Profile and Acid Cooling
- Cast-On-Strap, Intercell Welding and Heat Sealing Checks
- Air Leak Test, High-Rate Discharge and Final Release Criteria

Day 4: Battery Breaking, Secondary Smelting and Lead Exposure Control

- Used Battery Collection, Reverse Logistics and Take-Back Records
- Breaker Separation of Paste, Grid Metal and Polypropylene Chips
- Paste Desulphurisation and Spent Electrolyte Neutralisation Options
- Rotary and Blast Furnace Charge, Slag and Refining Kettle Control
- Blood Lead Surveillance, Hygiene Zoning and Fugitive Dust Controls

Day 5: Inspection Walkthrough and Lead Stewardship Plan Build

- Case Plate Line Walkthrough Against Paste and Curing Criteria
- Case Formation and Assembly Reject Pareto Review
- Case Recovery Unit Walkthrough of Breaker and Furnace Records
- Case Exposure, Emission and Producer Take-Back Gap Register
- Battery Plant Improvement and Lead Stewardship Plan Completion

Skills You Will Gain:

- Lead Loop Mapping
- Grid Alloy Selection
- Paste and Curing Control
- Formation Charge Planning
- Battery Release Testing
- Secondary Lead Recovery Control
- Blood Lead Surveillance
- Producer Take-Back Planning

Why Attend This Course:

- Deliver a Battery Plant Improvement and Lead Stewardship Plan to the plant manager, the recovery unit head and the EHS lead
- Decide whether a plate or battery reject trend calls for an oxide, alloy, paste, curing or formation correction
- Avoid soft plates, early sulphation failures, lost furnace lead and rising blood lead results that cost output and staff health
- Coach shift teams on paste checks, curing logs, breaker records and hygiene zone rules using shared templates

Conclusion:

Back at work, the participant presents the Battery Plant Improvement and Lead Stewardship Plan to the plant manager, the recovery unit head and the EHS lead, who use it to choose which plate line, assembly, smelting and exposure actions to fund first. Line and furnace teams apply its control windows and reaction rules to separate oxide, paste, curing, formation and charge causes of loss. After the first full production quarter, the unit should compare plate yield, lead recovery, blood lead trends and take-back volumes against the plan and revise the actions that did not deliver.

Frequently Asked Questions FAQ:

What should participants know before a lead-acid battery manufacturing and recycling course?

Participants should already work on a battery line, in a recovery unit or in EHS support and be able to read process logs. No metallurgy degree is needed. Anonymised plate, formation, furnace or blood lead records from their own site make the walkthroughs more useful.

How does a lead-acid battery manufacturing and recycling course differ from a lithium-ion cell manufacturing course?

It covers lead oxide, cast grids, pasted plates, curing, formation and the secondary lead loop. Lithium-ion courses cover electrode coating, dry rooms and cell grading, which share no process step with lead plate making or lead smelting.

Why is curing so important in lead-acid battery manufacturing?

Curing converts wet paste into basic lead sulphates that bond to the grid. Poor humidity or temperature control leaves soft, cracked or loosely bonded plates that shed active material and shorten battery life after formation.

What do participants take back from the lead-acid battery manufacturing and recycling course?

Participants take back a Battery Plant Improvement and Lead Stewardship Plan, plus a lead loop map, a paste and curing check sheet, a formation reject Pareto, a furnace charge log and an exposure gap register adaptable to their own site.