



Detergent Manufacturing Course: Surfactants, Spray Drying and Liquid Home Care Lines



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Introduction:

Detergent manufacturing, covering surfactants, spray drying and liquid home care lines, is a 1-week course for plant management, process chemistry, production and quality control teams in home care plants, ending with a Plant Improvement and Batch Release Plan for a case plant. Plants lose output and margin when slurry moisture drifts, tower powder fails on bulk density or caking, liquids separate or thin in the bottle, and active matter falls outside specification. Nominees already run, formulate or test laundry and dishwash products and work through case study material drawn from batch records, tower logs and laboratory results. CoreConcept Training Center delivers this detergent manufacturing course.

Course Objectives:

- Select anionic, nonionic, cationic and amphoteric surfactants and builder, enzyme and bleach systems for laundry, dishwash and surface cleaning products
- Explain the sulphonation route to LAS and the ethoxylation and sulphation route to SLES, including impurity and by-product control
- Operate crutcher slurry preparation, spray drying tower settings and post-dosing to reach target moisture and bulk density
- Run liquid laundry and dishwash batches and set filling, capping and checkweighing controls on packing lines
- Release batches on active matter, pH, viscosity and wash performance tests and check hazard labels and safety data sheets
- Produce a Plant Improvement and Batch Release Plan for a case home care plant

Target Audience:

- Plant management staff responsible for output, cost and safety across powder and liquid detergent lines
 - Process chemistry staff responsible for formulations, raw material choice and scale-up of home care products
 - Production supervision staff responsible for spray drying towers, mixing vessels and filling lines
 - Quality control staff responsible for laboratory testing and batch release of finished detergents
 - Plant safety and environmental staff responsible for sulphonation, ethoxylation and powder handling hazards
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Course Outline:

Day 1: Detergent Product Families, Raw Materials and Plant Baseline

- Laundry Powder, Liquid, Dishwash and Surface Cleaner Product Families
- Builder Systems From Carbonate and Silicate to Zeolites and Citrates
- Enzyme, Oxygen Bleach and TAED Activator Functions in Washing
- Raw Material Specification Sheets for Acids, Alkalis and Actives
- Line Baseline Review of Tower Throughput, Rework and Downtime

Day 2: Surfactant Chemistry, Sulphonation and Ethoxylation Routes

- Anionic, Nonionic, Cationic and Amphoteric Surfactant Class Selection
- LAS Production by Sulphur Trioxide Sulphonation and Caustic Neutralisation
- Alcohol Ethoxylate and SLES Sulphation Routes With Dioxane Stripping
- HLB, Krafft Point and Water Hardness Effects on Detergency
- Formulation Worksheet Balancing Active Matter, Builder and Cost

Day 3: Powder Spray Drying, Liquid Batching and Filling Line Operation

- Crutcher Slurry Preparation With Moisture and Viscosity Control
- Spray Drying Tower Atomisation, Inlet Air Temperature and Bulk Density
- Post-Dosing of Enzymes, Percarbonate and Perfume on Base Powder
- Liquid Laundry and Dishwash Batch Sequence With Salt Thickening
- Filling, Capping and Checkweigher Settings on Bottle and Pouch Lines

Day 4: Quality Control Testing, Labelling and Plant Hazard Controls

- Active Matter Titration, pH and Viscosity Release Tests
- Stain Removal and Foam Height Comparison Against Reference Products
- Tower Fines, Powder Caking and Liquid Phase Separation Diagnosis
- Hazard Pictograms, Precautionary Statements and Safety Data Sheet Checks
- Sulphur Trioxide, Ethylene Oxide and Powder Dust Explosion Controls

Day 5: Case Study: Plant Improvement and Batch Release Plan

- Case Plant Batch Records and Tower Log Review
 - Defect Pareto of Off-Specification Powder and Liquid Batches
 - Release Specification Table for Powder, Liquid and Dishwash Grades
 - Changeover and Line Efficiency Actions for Filling Lines
 - Plant Improvement and Batch Release Plan Completion
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Skills You Will Gain:

- Surfactant System Selection
- Sulphonation Process Understanding
- Slurry and Tower Control
- Liquid Detergent Batching
- Packing Line Settings
- Active Matter Testing
- Hazard Label Checking
- Detergent Defect Diagnosis

Why Attend This Course:

- Deliver a Plant Improvement and Batch Release Plan for a case home care plant to the plant manager and the quality lead
- Decide whether a tower powder or liquid batch can be released, reworked or blended on the basis of test results
- Avoid caked powder, separated liquids, underfilled packs and sulphonation or dust incidents that cost output and customer trust
- Share formulation worksheets, release specification tables and tower control checklists with production and laboratory colleagues

Conclusion:

Back at work, the participant gives the Plant Improvement and Batch Release Plan to the plant manager, the quality lead and the production supervisors. They use it to set release limits for each product grade, adjust slurry and tower settings, correct liquid batch sequences and decide which raw material, filling line or safety changes to fund first. After the first month under the plan, the plant should compare rework volume, off-specification batches, line efficiency and safety reports against the baseline and revise the actions that have not delivered.

Frequently Asked Questions FAQ:

What should participants know before the detergent manufacturing course?

Participants should already work in formulation, production, quality control or safety in a detergent or home care plant. Basic chemistry helps. Bringing anonymised formulas, batch records or tower logs lets them apply the case work to their own lines.

How does the detergent manufacturing course differ from a cosmetics or paint manufacturing course?

It covers laundry, dishwash and surface cleaning products: surfactant production, tower powders and liquid detergent lines. Cosmetics courses focus on skin and hair products and their safety files, while paint courses focus on pigment dispersion and coatings.

Why does detergent manufacturing control bulk density in spray-dried powder?

Bulk density decides how much powder fills a pack and how a dose behaves in the wash. It depends on slurry moisture, atomisation and tower air temperature, so drift causes underfilled or overfilled packs and inconsistent cleaning.

What do participants take back from the detergent manufacturing course?

Participants take back a Plant Improvement and Batch Release Plan for a case home care plant, with a formulation worksheet, release specification table, defect Pareto and tower control checklist they can adapt to their own plant.
