LABPARK

Vocational Pharmaceutical Engineering Pilot Plants Catalog

Contact us for more catalogs of Practical Training Unit Operations Pilot Plants, Educational Unit Operations Pilot Plants, etc.

LABPARK

COMPANY PROFILE

>>> About Us

Labpark is a high-tech enterprise serving universities, research institutes, and enterprises in fields such as chemical engineering, biotechnology, and environmental science. Our main product lines are Educational Unit Operations Pilot Plants and Practical Training Unit Operations Pilot Plants, designed to support practical engineering education. Supported by our own R&D platforms and 209 technical patents, we operate a production facility with a planned area of 49,000 square meters, dedicated to helping institutions enhance laboratory infrastructure and practical training capabilities.

Aspirin Api Synthesis Unit Operations Training Pilot Plant

Item Number: LPK-ISPM

Introduction

An integrated pilot plant for aspirin API synthesis training, featuring batch reaction, recrystallization, and packed distillation modules. Offers dual-control operation, transparent vessels, and public utility simulation for safe, hands-on chemical engineering unit operations education. Ideal for university labs.

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Process Module	Core Functional Components	Key Technical Capabilities	Physical Footprint (L × W × H)
Public Utility Module	Softened water reservoir, cooling water circulation, air compressor interface, and vacuum pump.	- Supplies stable utilities to all modules - Centralized touch-screen control - Designed for continuous, unattended operation	$\le$ 2200 mm × 1120 mm × 2050 mm
Reaction Unit	Jacketed reaction kettle, neutralization kettle, charging pumps, and condensation reflux system.	- Quantitative reactant feeding - Acylation and neutralization operations - Vacuum liquid transfer and filtration separation - Fully transparent reaction vessels	$\le$ 2200 mm × 1120 mm × 2800 mm
Recrystallization Unit	Dissolution/crystallization vessel, temperature-controlled jacket, filtration system, and receiver.	- High-purity product recrystallization - Controlled cooling rate crystallization - Condensation reflux and vacuum transfer	$\le$ 2200 mm × 1120 mm × 2200 mm
Packed Distillation Unit	Packed distillation column, reboiler, reflux splitter, condenser, and distillate receivers.	- Batch and continuous distillation modes - Adjustable reflux ratio control - Constant power or self-regulating pressure heating - Enclosed tail-gas exhaust system	$\le$ 2200 mm × 1120 mm × 2285 mm

Core Curriculum	Associated Textbook Reference	Applied Unit Operations & Teaching Concepts
Chemical Reaction Engineering	*Unit Operations of Chemical Engineering*	- Batch reactor kinetics during acylation - Heat transfer in jacketed agitation vessels - Liquid-phase mass transfer and mixing behavior
Mass Transfer Operations	*Transport Processes and Unit Operations*	- Distillation in packed columns (HETP and HTU calculations) - Reflux ratio optimization and its impact on distillate purity - Solid-liquid extraction, washing, and vacuum filtration
Chemical Engineering Design	*Chemical Engineering Design*	- Process flow diagram (PFD) and piping layout analysis - Public utility load calculation and balancing - Process control loops (temperature, pressure, and flow rates)
Pharmaceutical Technology	Relevant Pharmaceutical Process Engineering Literature	- Synthesis, purification, and crystallization of APIs - GMP-aligned operational principles and contamination control

Natural Product Extraction Unit Operations Training Pilot Plant

Item Number: LPK-IGNE

Introduction

Integrated natural product extraction pilot plant for chemical engineering training bridges theory and industrial practice with modular extraction and evaporation/concentration units, hybrid touchscreen and manual control, realistic process simulation, and self-contained softened water and vacuum utilities.

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Module	Key Functions & Components	Technical Specifications
Public Unit	Supplies softened water, cooling water, pressurization, and vacuum systems to support the entire plant operations.	• High-quality aluminum alloy frame with casters • Dimensions: ≤ 2200mm × 1120mm × 2310mm • On-site touchscreen control
Extraction Unit	Performs steam stripping, quantitative solvent feeding, solid-liquid extraction, filtration, and gravity oil-water separation.	• High-quality aluminum alloy frame with casters • Dimensions: ≤ 2200mm × 1120mm × 2310mm • On-site touchscreen + manual hybrid operation
Evaporation and Concentration Unit	Supports external circulation concentration, internal circulation concentration, solvent recovery, and cyclic solvent utilization.	• High-quality aluminum alloy frame with casters • Dimensions: ≤ 2200mm × 1120mm × 2310mm • On-site touchscreen control

Pilot Plant Operation / Module	Associated Unit Operation	Relevant Concepts in Classic Textbooks
Solid-Liquid Extraction	Leaching / Solvent Extraction	Mass transfer theories, solvent selection, equilibrium stages, and extraction kinetics.
Steam Stripping & Solvent Recovery	Distillation & Stripping	Vapor-liquid equilibrium (VLE), boiling point elevation, condensation, and fractional distillation principles.
Internal / External Circulation Concentration	Evaporation	Heat transfer coefficients, boiling-liquid heat transfer, single/multiple-effect evaporation, and thermal efficiency.
Gravity Settling / Phase Separation	Liquid-Liquid Separation	Decantation, density-driven separation, phase equilibrium, and fluid mechanics of immiscible liquids.

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