



LABPARK

Educational 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.



High-Gravity Emulsification And Mass Transfer Educational Pilot Plant

Item Number: LPK-HGES



Introduction

This integrated educational pilot plant utilizes rotating packed bed technology to demonstrate high-gravity emulsification and mass transfer, providing engineering students with hands-on experience in process intensification and unit operations through a modular, customizable design with digital monitoring.

[Learn More](#)

System Component / Parameter	Technical Specification	Associated Unit Operation / Textbook Concept
High-Gravity Rotor Unit	Variable speed drive, stainless steel SUS304/316 construction	Centrifugal separation, fluid dynamics, shear-induced mixing
Feed Delivery System	Integrated dual-channel liquid metering pumps with flow control	Material balance, fluid flow measurement, continuous phase dosing
Instrumentation & Control	15.6" Touchscreen panel, wireless cloud logging, real-time tracking	Process dynamics, automated control loops, data acquisition
Safety Features	Dual over-pressure and over-temperature automated cut-offs	Process safety management, thermal runaway prevention
Frame & Mobility	Ergonomic industrial aluminum profile skid with lockable casters	Pilot plant design, spatial footprint optimization

Educational Rotary Disc Liquid-Liquid Extraction Pilot Plant

Item Number: LPK-BEXT



Introduction

A transparent rotary disc column for educational liquid-liquid extraction experiments. This pilot plant enables students to study mass transfer, droplet dynamics, and flooding behavior, bridging theory and practice in chemical engineering unit operations education. Features variable-speed agitation and PLC control.

[Learn More](#)

Parameter	Specification
Column Configuration	Rotary disc extraction column with alternating stator rings and rotor discs
Column Material	High-borosilicate transparent glass
Frame Material	Industrial-grade anodized aluminum alloy with lockable casters
Physical Dimensions	≤ 1480 mm × 580 mm × 1800 mm (Length × Width × Height)
Agitation Control	Variable-speed rotor motor with digital speed display and adjustment
Process Control Interface	Integrated PLC workstation with a color digital display for process variable monitoring

Laboratory Module	Core Teaching Focus	Textbook Concepts & Unit Operations
Hydrodynamic Characterization	Direct observation of droplet breakup, phase distribution, and determination of the flooding velocity.	Continuous and dispersed phases, phase holdup, and flooding limits in agitated columns (<i>Unit Operations of Chemical Engineering</i>).
Mass Transfer Performance	Calculation of mass transfer coefficients, solute concentration profiles, and overall extraction efficiency.	Liquid-liquid equilibria, solute distribution coefficients, and extraction stage efficiency (<i>Transport Processes and Unit Operations</i>).
System Modeling & Scaling	Determination of the Height of a Transfer Unit (HTU) and Number of Transfer Units (NTU) under variable rotor speeds and feed ratios.	Design equations for continuous-contact equipment, operating lines, and mass transfer correlation (<i>Chemical Engineering Design</i>).

Comprehensive Liquid-Liquid Extraction Pilot Plant For Engineering Education

Item Number: LPK-CDJC



Introduction

Comprehensive liquid-liquid extraction pilot plant for engineering education, integrating rotary and vibratory columns for hands-on observation of phase behavior, flooding limits, and mass transfer efficiency, enabling precise HTU and mass transfer coefficient calculations.

[Learn More](#)

Parameter / Feature	Technical Details	Associated Academic Concept / Unit Operation
Rotary Extraction Column	High-transparency glass column with adjustable-speed rotary agitator drive	Liquid-Liquid Extraction, Dispersed Phase Holdup, Rotor Speed Effects
Vibratory Extraction Column	High-transparency glass column with variable-frequency reciprocating plates	Reciprocating Plate Columns, Mechanical Agitation, Droplet Breakup
Fluid Delivery System	Precision chemical-resistant pumps with digital flow rate monitoring	Flow Rate Ratio, Mass Balance, Phase Ratio Control
Process Control Interface	Integrated industrial touchscreen monitor, real-time data display	Process Dynamics, Industrial Instrumentation, Data Acquisition
Visual Diagnostic Capability	Clear view of phase boundary, droplet size distribution, and flooding points	Flooding Velocity, Phase Inversion, Column Capacity Limits
Structural Frame	Anodized aluminum alloy profile on heavy-duty casters ($\leq 2200\text{mm} \times 580\text{mm} \times 1800\text{mm}$)	Industrial Pilot Plant Layout, Laboratory Space Utilization

Ion Exchange Water Purification Educational Pilot Plant For Engineering Unit Operations

Item Number: LPK-SIX



Introduction

This bench-scale ion exchange pilot plant trains engineering students in water purification. Dual transparent columns simulate industrial softening and demineralization. Students observe fluid dynamics, perform resin regeneration, and analyze breakthrough curves. The corrosion-resistant frame ensures durability in unit operations experiments.

[Learn More](#)

Parameter / Experimental Module	Technical Details & Features	Associated Academic Concepts
Physical Footprint	Max 2200 mm × 580 mm × 1920 mm (L × W × H)	Laboratory space planning, plant layout
Frame Material	Industrial-grade aluminum alloy with locking casters	Structural design, pilot plant mobility
Separation Columns	Dual transparent columns with composite bed piping	Multistage separation, column hydraulics
Water Production Process	Demineralization and softening operations	Ion exchange capacity, chemical equilibrium
Regeneration & Maintenance	Backwashing, chemical regeneration, rinsing	Resin activation, fluidization, bed expansion
Process Monitoring	Flowmeters, conductivity indicators, pressure gauges	Mass balance, sensor calibration, process control

Hot Filtration Educational Unit Operations Pilot Plant Laboratory System

Item Number: LPK-CHFT



Introduction

This integrated laboratory bench-scale hot filtration pilot plant enables students to study solid-liquid separation under thermal conditions, featuring a stainless steel vessel, removable heating jacket, and multi-layer filter plates for unit operations education, ideal for chemical engineering laboratory curriculum.

[Learn More](#)

System Component / Feature	Technical Specification	Associated Unit Operation / Academic Concept	Aligned Classic Textbooks
Filtration Vessel	304 Stainless Steel, quick-disassembly upper clamp plate, lower head structure.	Solid-liquid separation; Cake resistance; Filter medium resistance.	<i>Unit Operations of Chemical Engineering</i>
Filter Assembly	Integrated three-layer internal filter plates.	Multi-stage particulate separation; Clarification; Porous media flow.	<i>Transport Processes and Separation Process Principles</i>
Thermal Jacket	Removable heating jacket with integrated temperature controller.	Heat transfer in jacketed vessels; Viscosity-temperature relationship.	<i>Transport Processes and Separation Process Principles</i>
Pressure Monitoring	Dual dial pressure gauges (inlet/outlet monitoring).	Pressure drop across filter cake; Constant pressure filtration.	<i>Unit Operations of Chemical Engineering</i>
Support Structure	Industrial aluminum profile frame with heavy-duty locking casters.	Pilot plant design; Equipment layout; Scale-up considerations.	<i>Chemical Engineering Design</i>

Hollow Fiber Ultrafiltration Membrane Separation Educational Pilot Plant

Item Number: LPK-SUF



Introduction

Explore our hollow fiber ultrafiltration membrane separation educational pilot plant for hands-on learning of industrial ultrafiltration processes, flux analysis, fouling mitigation, and process control. Compact, customizable, and built for engineering labs.

[Learn More](#)

Parameter / Component	Specification
Membrane Module	Hollow fiber ultrafiltration (UF) membrane module
Feed System	Polyvinyl Alcohol (PVA) test solution capabilities
Analytical Equipment	Spectrophotometer integration for concentration determination
Piping & Valves	High-transparency piping for flow visualization; chemical-resistant valves
Support Structure	Anodized aluminum alloy frame with heavy-duty lockable casters
Overall Dimensions	≤ 2200 mm × 580 mm × 1740 mm (L × W × H)
Customization Scope	Adaptable hardware components and software data logging integration

Experimental Module	Key Educational Objectives	Relevant Disciplines	Associated Textbook Concepts & Terminology
Ultrafiltration Flow Mechanics	Understanding co-current/cross-flow filtration, transmembrane pressure (TMP), and hydrodynamic resistance.	Chemical Engineering, Environmental Engineering, Water Treatment	Unit Operations of Chemical Engineering: Membrane separations, ultrafiltration, microfiltration, gel polarization, and mass transfer.
Separation Efficiency & Rejection Analysis	Calculating volumetric flux, solute rejection rates (PVA), and product recovery ratios under varying feed pressures.	Food Engineering, Biotechnology, Chemical Engineering	Transport Processes and Unit Operations: Concentration polarization, membrane transport equations, solute rejection, and physical separation processes.
Fouling Mitigation & Clean-in-Place (CIP)	Executing physical backwashing and chemical cleaning protocols to recover flux; learning preservation techniques.	Environmental Engineering, Process Design, Biotechnology	Chemical Engineering Design: Equipment fouling considerations, piping and instrumentation diagrams (P&ID), and operational safety in filtration systems.

Multi Functional Membrane Crystallization Educational Unit

Operations Pilot Plant

Item Number: LPK-SMC



Introduction

Integrated bench-scale membrane crystallization pilot plant for engineering education. Provides hands-on training in advanced separation technologies, combining membrane distillation crystallization and process intensification. Features variable scaling vessels, industrial-grade flow control, and interactive digital data acquisition. Customizable for university labs.

[Learn More](#)

Experimental Module	Key Process Parameters	Core Unit Operations & Textbook Correlation
Membrane Distillation & Concentration	Transmembrane temperature gradient, feed flux, permeate mass accumulation	Membrane separation processes, vapor-liquid equilibria, mass transfer resistance (<i>Unit Operations of Chemical Engineering</i>)
Controlled Temperature Crystallization	Cool-down trajectory, jacket heat transfer coefficient, crystallization induction time	Solid-liquid phase equilibria, nucleation and crystal growth kinetics, heat transfer in agitated vessels (<i>Transport Processes and Unit Operations</i>)
Process Piping & Automation	Pump calibration curves, pressure drop, solenoid valve sequencing	Process flow-sheet development, instrumentation and control, fluid transport system design (<i>Chemical Engineering Design</i>)

Feature	Specification Details
Crystallizer Vessels	Three double-layer jacketed glass crystallizers: 100 mL, 250 mL, and 500 mL
Fluid Circulation	6 remote peristaltic pumps (operating range: 0.1 to 300 rpm)
Valving System	17 high-durability PTFE solenoid valves
Wetted Materials	316L Stainless Steel, PTFE, Borosilicate Glass
Sensors & Instrumentation	Real-time temperature RTDs, inline pressure transducers, and electronic weighing sensors
User Interface	10-inch industrial-grade touchscreen with real-time data logging and export
Frame & Enclosure	Carbon steel spray-coated protective housing
Physical Dimensions	≤ 900 mm × 500 mm × 680 mm



LABPARK

No. 116 Wenzhu Street, Gouzhao Township, Zhongyuan
District, Zhengzhou City, Henan Province, China