# Ethylbenzene Dehydrogenation Educational Unit Operations Pilot Plant

### Item Number: LPK-SREB

## Introduction

Ethylbenzene dehydrogenation educational pilot plant replicates industrial styrene production, offering hands-on experience with fixed-bed reactors, catalyst activation, regeneration, automated process control. Designed for university chemical engineering labs, it enables study of gas-solid catalysis, catalyst deactivation, steam regeneration, and safety interlocks.

Learn More

| Equipment Feature / Component | Specifications & Capabilities | Key Academic Concepts & Textbook Reference |
|---|---|---|
| **Reactor Configuration** | Fixed-bed tubular reactor; open-type programmable heating furnace with rapid disassembly mechanisms. | Heterogeneous Catalysis, Gas-Solid Reactions, Catalyst Deactivation (*Unit Operations of Chemical Engineering*) |
| **Control & Interface System** | Industrial-grade all-in-one PC; real-time PID temperature control, flow monitoring, and safety interlocks. | Process Control, System Dynamics, Automated Data Acquisition (*Chemical Engineering Design*) |
| **Reactant Feed & Preheating** | High-precision liquid metering pumps, integrated steam generator, and vaporizing preheater. | Mass Balance, Vapor-Liquid Equilibrium, Multiphase Flow ( *Transport Processes and Unit Operations*) |
| **Product Recovery & Separation** | High-efficiency condenser and gas-liquid separator for sampling and mass balance calculations. | Fractional Condensation, Phase Separation, Material Balances ( *Unit Operations of Chemical Engineering*) |
| **Structure & Dimensions** | Heavy-duty anodized aluminum alloy frame on lockable casters; dimensions $\le 1480 \text{ mm} \times 580 \text{ mm} \times 1780 \text{ mm}$. | Pilot Plant Layout, Industrial Safety Standards, Mechanical Design (*Chemical Engineering Design*) |