



13

CHEMICAL PREPARATION VESSEL

Precision Sizing. Consistent Performance. Industrial Control.



Stage 1 — Pre-Mixing & Dispersion Vessel Controlled Slurry Formation and Thermal Conditioning

This vessel ensures accurate dispersion of sizing chemicals & pre-heating prior to cooking.

Design & Process Features

- » Vertical cylindrical vessel with dished ends for optimized internal flow
- » High-efficiency, top-mounted anchor agitator with VFD control
- » Steam-jacketed or electric pre-heating system
- » Load-cell-based weight measurement for precise ingredient dosing
- » Prevents agglomeration and ensures uniform pre-cook viscosity

Stage 2 — Pressure Cooking Vessel Controlled Gelatinization Under Defined Pressure Conditions

The pressure cooking vessel performs complete gelatinization of sizing components under precisely controlled pressure and temperature.

Design & Process Features

- » Pressure-rated SS 304 / SS 316L construction for continuous operation
- » Bottom-entry propeller agitator for uniform heat distribution
- » High-efficiency steam jacket or direct steam injection
- » Optional vacuum degassing to remove entrapped air
- » Integrated CIP system for hygienic cleaning

Stage 3 — Storage & Feeding Vessel Homogenized Holding and Consistent Supply

This vessel maintains cooked size under controlled temperature and agitation until application.

Design & Process Features

- » Stainless steel with mirror-polished interior
- » Conical bottom design for complete drainage
- » Low-shear agitation to prevent sedimentation
- » Jacketed temperature maintenance with sensor-controlled steam valves
- » Multiple outlet connections with flow control

Centralized Control & Automation

The entire system is governed by a centralized PLC + SCADA architecture, ensuring precise control, safety, and traceability.

- » Integrated PLC with real-time feedback loops
- » HMI touchscreen interface for recipe management and process visualization
- » Batch memory and data logging for audit and quality compliance
- » IoT-ready remote diagnostics for proactive maintenance
- » Safety interlocks and alarms for pressure, temperature, and overfill protection

Integrated Process Architecture

The Dhara Chemical Preparation Vessel operates on a three-stage process concept, with each vessel optimized for a specific function and synchronized through a centralized PLC-based control system. This architecture ensures controlled material flow, precise parameter regulation, and full process traceability.

Applications

Ideal for preparation of sizing slurries used for:

- » Cotton
- » Viscose
- » Polyester
- » Blended yarns

End-Use Segments

- » Apparel weaving
- » Technical textiles
- » Industrial fabric production

The system supports high-speed weaving lines as well as demanding technical fabric applications, ensuring stable performance under continuous operation.

Key Technical Advantages


- » **Repeatable Batch Quality**
Controlled gelatinization and precise viscosity development ensure consistent sizing results.
- » **Energy Optimization**
Intelligent pre-heating logic and regulated steam usage reduce energy consumption.
- » **Minimal Operator Dependency**
Fully automated sequencing with alerts minimizes manual intervention.
- » **Modular Scalability**
Configurable from single-vessel installations to large-scale chemical kitchens.
- » **Clean & Safe Operation**
Hygienic, pressure-certified, CIP-enabled vessels ensure contamination-free processing.


Construction & Capacity Range


- » Material of Construction: SS 304 / SS 316L
- » Insulation: Double-layer construction with industrial thermal cladding
- » Capacity Options (Litres): 750 / 1000 / 1500 / 2000 / 3000 / 5000 Litres
- » Sanitation: Fully CIP-compatible design



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