



## AUTOMATED FLOUR SILO SYSTEM COMPLETE PNEUMATIC STORAGE & CONVEYING SOLUTION

This turnkey flour silo system provides fully automated bulk flour storage and pneumatic conveying from truck delivery through precision batching to dough mixers.

该交钥匙面粉筒仓系统提供从卡车卸料、精准配料到和面机的全自动散装面粉存储和气动输送。

Engineered for high-volume bakery and noodle production, this complete solution eliminates manual flour handling, ensures hygienic material transfer, and delivers precise ingredient batching with zero labor requirements.

专为大产量烘焙和面条生产设计，该完整解决方案消除了手动搬运面粉的需求，确保了物料传输的卫生，并在零人工需求的情况下提供精确的原料配料。

### SYSTEM PERFORMANCE

/ 系统性能

Specification / 规格	Capacity / 参数
Storage Capacity / 存储容量	100 tons (custom capacities available) / 100吨 (可定制)
Truck Unloading Rate / 卸车速率	20 tons/hour / 20吨/小时
Delivery to Mixers / 输送至搅拌机	5 tons/hour / 5吨/小时
Conveying Distance / 输送距离	Up to 100 meters (horizontal equivalent) / 高达100米 (水平当量)
Batch Weighing / 批次称重	350 kg per batch (other capacities available) / 每批350公斤 (可选其他容量)
Power Supply / 电源	380V, 3-phase / 380V, 三相

### COMPLETE SYSTEM COMPONENTS

/ 完整系统组件

#### 1. Air Compressor System (Rotary Type) / 螺杆式空压机系统

- High-efficiency rotary screw compressor provides reliable compressed air. 高效螺杆压缩机提供可靠的压缩空气。
- Buffering tank maintains consistent pressure for truck unloading operations. 缓冲罐在卡车卸料作业中保持压力恒定。
- Supplies pressurized air to pneumatically transfer flour from tank trucks to silo. 提供加压空气，将面粉从罐车气动输送至筒仓。
- Continuous duty design for extended unloading operations. 连续工作设计，适用于长时间卸料作业。

#### 2. Prefabricated Stainless Steel Flour Silo / 预制不锈钢面粉筒仓

- Capacity: 100 tons (other capacities available upon request). 容量：100吨 (可根据需要提供其他容量)。
- Construction: Food-grade stainless steel throughout for hygiene and durability. 结构：通体食品级不锈钢，卫生且耐用。
- Complete Accessories: Integrated uploading and discharge equipment. 完整配件：集成上料和卸料设备。
- Level Monitoring: Sensors for inventory management and low-level alarms. 料位监控：用于库存管理和低位报警的传感器。
- Venting & Dust Collection: Integrated filtration prevents flour dust emissions. 通风与除尘：集成过滤防止面粉粉尘排放。
- Weather Protection: Sealed design protects flour from moisture and contamination. 气候防护：密封设计保护面粉免受潮气和污染。
- Structural Support: Complete framework and foundation components included. 结构支撑：包含完整的框架和基础组件。

#### 3. Air Blower System with Filtration / 带过滤的风机系统

- High-capacity centrifugal blowers generate pneumatic conveying air. 大容量离心风机产生气动输送空气。
- Integrated air filters ensure clean, contaminant-free conveying medium. 集成空气过滤器确保输送介质清洁无污染。
- Variable speed capability for optimized flour transport. 变速功能优化面粉输送。
- Quiet operation with sound attenuation. Quantity: One complete set. 静音运行，带消音装置。数量：一套。

#### 4. Rotary Airlock Feeders / 旋转卸料阀

- Precision rotary valve design maintains air seal while metering flour flow. 精密旋转阀设计在计量面粉流量时保持气密。
- Prevents air loss and maintains system pressure. 防止空气流失并保持系统压力。
- Smooth, continuous flour discharge without pulsation. 平稳、连续的面粉卸料，无脉动。
- Heavy-duty construction for continuous operation. 重型结构，适合连续作业。
- Easy maintenance and cleaning access. Quantity: One complete set. 易于维护和清洁。数量：一套。

#### 5. On-Line Centrifugal Sifter / 在线离心筛

- Construction: Stainless steel contact surfaces (motor and frame carbon steel). 结构：不锈钢接触面 (电机和框架为碳钢)。
- In-line sifting removes foreign particles and agglomerates during conveying. 在线筛分在输送过程中去除异物和结块。
- Ensures only premium-quality flour reaches mixers. 确保只有优质面粉进入搅拌机。
- Self-cleaning design minimizes maintenance. 自清洁设计最大限度减少维护。
- Quick-access screen changes for different mesh sizes. Quantity: One set. 快速更换筛网以适应不同目数。数量：一套。

#### 6. Precision Flour Scale Hoppers / 精密面粉称重料斗

- Capacity: 350 kg per batch (other capacities available). 容量：每批350公斤 (可选其他容量)。
- Construction: Food-grade stainless steel throughout. 结构：通体食品级不锈钢。
- Digital Controllers: Programmable batch weights with recipe storage. 数字控制器：可编程批次重量，带配方存储。
- High-Accuracy Load Cells: Precise weighing for consistent recipe formulation. 高精度称重传感器：精确称重确保配方一致性。
- Pneumatic Vibrators: Air-activated vibration cells ensure complete discharge. 气动振动器：气动振动单元确保完全卸料。
- Integrated Air Filter: Clean compressed air for vibrators. 集成空气过滤器：为振动器提供清洁压缩空气。
- Butterfly Discharge Valves: Quick, full-bore flour released to mixers. 蝶式卸料阀：快速、全口径将面粉释放至搅拌机。
- Dust-Tight Design: Sealed construction prevents flour loss. 防尘设计：密封结构防止面粉损失。
- Quantity: Independent weighing stations for multiple mixer feeding. 数量：用于多台搅拌机供料的独立称重站。

#### 7. Stainless Steel Conveying Piping / 不锈钢输送管道

- Material: Food-grade stainless steel throughout. 材质：通体食品级不锈钢。
- Smooth-bore design minimizes flour degradation and pressure drop. 光滑内壁设计最大限度减少面粉降解和压力降。
- Diverting Valves: Automated pneumatic valves route flour to different hoppers. 换向阀：自动气动阀将面粉输送至不同料斗/搅拌机。
- Flanged connections for easy disassembly and cleaning. 法兰连接，便于拆卸和清洁。
- Wear-resistant elbows at direction changes. 变向处采用耐磨弯头。
- Minimal horizontal runs to prevent flour settling. 尽量减少水平管道以防止面粉沉降。
- Complete gasket sets for dust-tight sealing. 完整的密封垫圈套件，实现防尘密封。

#### 8. Piping Support & Hanging System / 管道支撑与悬挂系统

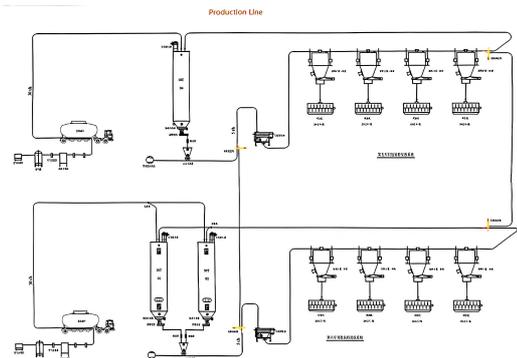
- Structural supports and hangers for entire piping network. 整个管网的结构支撑和吊架。
- Adjustable brackets accommodate building structure variations. 可调节支架适应建筑结构变化。
- Vibration isolation to prevent transmission to building. 隔振设计防止震动传至建筑。
- Allows thermal expansion without stress on connections. 允许热膨胀且不给连接处施加应力。
- Professional installation hardware included. 包含专业安装硬件。

#### 9. Mixer Overhead Support Structures / 搅拌机上方支撑结构

- Robust frameworks position scale hoppers directly over mixer feed openings. 坚固的框架将称重料斗直接定位在搅拌机进料口上方。
- Adjustable positioning for perfect alignment with mixer inlets. 可调节定位以与搅拌机入口完美对齐。
- Tool-free adjustment for mixer changeovers. 搅拌机切换时无需工具调整。
- Heavy-gauge construction handles dynamic loads. 重型结构可承受动态负载。
- Safety railings and access platforms where required. 必要处配备安全栏杆和检修平台。

#### 10. Integrated Control System / 集成控制系统

- Electrical Specification: 380V, 3-phase power distribution. 电气规格：380V，三相配电。
- PLC-Based Control: Programmable logic controller manages entire system. PLC控制：可编程逻辑控制器管理整个系统。
- HMI Touch Screen: User-friendly operator interface with recipe management. HMI触摸屏：用户友好的操作界面，带配方管理。
- Automated Sequencing: Push-button operation from truck unloading through batching. 自动序列：从卡车卸料到配料的一键式操作。
- Recipe Storage: Multiple formulations with one-touch recall. 配方存储：多种配方一键调用。
- Safety Interlocks: Prevents equipment damage and ensures operator safety. 安全联锁：防止设备损坏并确保操作员安全。
- Real-Time Monitoring: System status, silo levels, batch weights displayed. 实时监控：显示系统状态、筒仓料位、批次重量。
- Alarm Management: Visual and audible alerts for maintenance and faults. 报警管理：维护和故障的声光报警。
- Data Logging: Batch records for quality traceability and inventory control. 数据记录：用于质量追溯和库存控制的批次记录。
- Remote Monitoring Ready: Optional connectivity for plant SCADA integration. 远程监控就绪：可选连接以进行工厂SCADA集成。



速冻企业面粉定量输送典型解决方案  
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### 1. TRUCK UNLOADING (AUTOMATED) / 卡车卸料 (自动)

- Tanker truck connects to silo inlet; Air compressor pressurizes compartment. 罐车连接筒仓入口; 空压机为车厢加压。
- Flour pneumatically transfers to silo at 20 tons/hour; Dust collector filters air. 面粉以20吨/小时气动输送至筒仓; 除尘器过滤排出空气。
- System automatically monitors silo level. 系统自动监控筒仓料位。

### 2. STORAGE & INVENTORY / 存储与库存

- Stored in sealed, climate-controlled silo; Level sensors provide real-time data. 存储在密封恒温筒仓中; 传感器提供实时数据。
- FIFO flow pattern; Low-level alarms prompt reordering. 先进先出流动模式; 低位报警提示补货。

### 3. PNEUMATIC CONVEYING (AUTOMATED) / 气动输送 (自动)

- Operator selects recipe; Rotary airlock meters flour; Blower transports through piping. 操作员选择配方; 旋转闸计量面粉; 鼓风机通过管道输送。
- Diverting valves route to scale hopper; In-line sifters remove particles. 换向阀路由至称重料斗; 在线筛分去除颗粒。

### 4. PRECISION BATCHING (AUTOMATED) / 精密配料 (自动)

- Scale hopper fills to weight; Load cells monitor real-time; Stops within tolerance. 料斗充填至重量; 传感器实时监控; 公差范围内停止。
- Operator verifies batch weight on display. 操作员在显示屏上确认批次重量。

### 5. DISCHARGE TO MIXER (AUTOMATED) / 卸料至搅拌机 (自动)

- Butterfly valve opens; Vibrators ensure emptying; Flows directly into mixer. 蝶阀打开; 振动器确保排空; 直接流入搅拌机。
- Ready for next batch immediately; Data logged. 立即准备下一批次; 数据已记录。

### Pneumatic Conveying Benefits / 气动输送优势

- Gentle handling preserves flour quality and gluten structure. 温和处理保留面粉品质和面筋结构。
- Flexible routing accommodates complex plant layouts. 灵活路由适应复杂工厂布局。
- Minimal maintenance; Hygienic enclosed transfer. 维护极少; 卫生封闭输送。

### Dual Scale Hopper Design / 双称重料斗设计

- Independent weighing for multi-mixers; Continuous operation. 多搅拌机独立称重; 连续作业。
- Backup capability; Flexibility for different batch sizes. 备用能力; 适应不同批次大小。

### Food Safety Compliance / 食品安全合规

- Stainless steel meets FDA/USDA; Sealed system prevents pests. 不锈钢符合FDA/USDA; 密封系统防虫害。
- Easy cleaning access; Documentation for traceability. 易于清洁; 提供追溯文件。

### Customization Options / 定制选项

- Alternative Silos (50-200 ton); Multiple Silos for different flours. 可选筒仓(50-200吨); 多筒仓存不同面粉。
- Extended Distance (50m+); Additional Scale Hoppers (3-4+). 延长距离(50米+); 增加称重料斗(3-4+)。
- Ingredient Blending; Micro-Ingredient Addition; Advanced Controls. 成分混合; 微量成分添加; 高级控制。

### IDEAL APPLICATIONS

/ 理想应用

- Industrial bread bakeries. 工业面包房。
- Cracker/Biscuit mfg. 饼干制造。
- Dumpling/Frozen dough. 水饺/冷冻面团。
- High-volume/24-7 ops. 大产量/24-7作业。
- Noodle and pasta plants. 面条和意面厂。
- Pizza/Tortilla production. 披萨/薄饼生产。
- Bun and roll lines. 小圆面包生产线。



### SYSTEM ADVANTAGES SUMMARY

/ 系统优势总结

Feature / 特性	Traditional Manual System / 传统人工系统	Automated Silo System / 自动化筒仓系统
Labor Required / 人工需求	3-5 workers per shift / 每班3-5人	<b>Zero manual handling</b> / 零人工搬运
Flour Storage / 面粉存储	Bags on pallets (space-intensive) / 托盘袋装(占地大)	Compact vertical silo / 紧凑垂直筒仓
Hygiene Level / 卫生等级	Bag dust, spillage, contamination risk / 扬尘、洒漏、污染风险	<b>Sealed, dust-free, food-grade</b> / 密封、无尘、食品级
Batching Accuracy / 配料精度	±2-5% (manual weighing) / ±2-5% (人工称重)	<b>±0.1% (digital precision)</b> / ±0.1% (数字精度)
Material Waste / 物料浪费	2-3% (spillage, damaged bags) / 2-3% (洒漏、破袋)	<b>&lt;0.1% (closed system)</b> / <0.1% (封闭系统)
Workplace Safety / 工作场所安全	Heavy lifting injuries common / 常见搬运工伤	Ergonomic, injury-free / 人体工学, 无伤害
Truck Unloading Time / 卸车时间	2-4 hours (manual) / 2-4小时(人工)	1 hour (automated) / 1小时(自动)
Recipe Consistency / 配方一致性	Variable (human error) / 波动(人为误差)	<b>Repeatable (automated)</b> / 可重复(自动)

Note: System design customized to specific production requirements, plant layout, mixer configurations, and local electrical codes. Site survey and engineering consultation provided. Installation, commissioning, and operator training included.

注: 系统设计可根据具体生产要求、工厂布局、搅拌机配置和当地电气规范进行定制。提供现场勘查和工程咨询。包含安装、调试和操作人员培训。

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