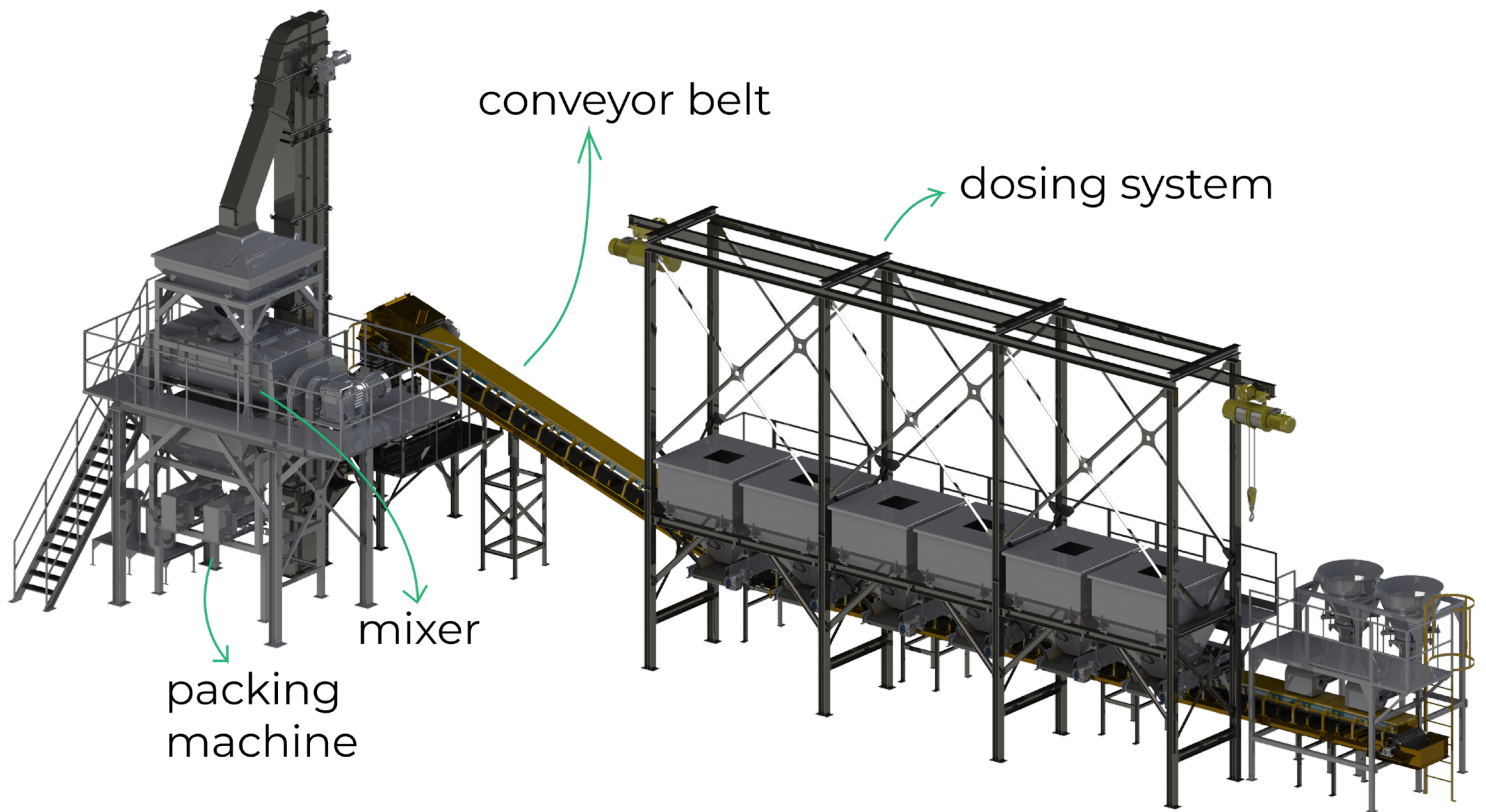


POWDER NPK PRODUCTION PROCESS





CEYLAN Machinery designs and manufactures custom fertilizer production equipment and complete NPK production lines for your process needs. Whether it's a granulation process or a simple bulk blending line, every solution is engineered according to your end product and target capacity, with a focus on durability, safety, and continuity.

COMPREHENSIVE SUPPORT

Our support spans the entire production cycle — from the initial concept phase to the point where your facility reaches stable, continuous operation:

- Feasibility studies and process design (mass/energy balances, 3D drawing of your desired facility)
- Manufacturing schedule, and project administration
- On-site installation, commissioning, and operator training
- Inspection, spare parts supply, performance optimization

AUTOMATION & CONTROL

We integrate recipe management, data logging systems (historian), and remote diagnostics into Siemens or Rockwell-based PLC/SCADA systems. From single-machine panels to control rooms managing the entire plant, we deliver scalable solutions tailored to your needs.

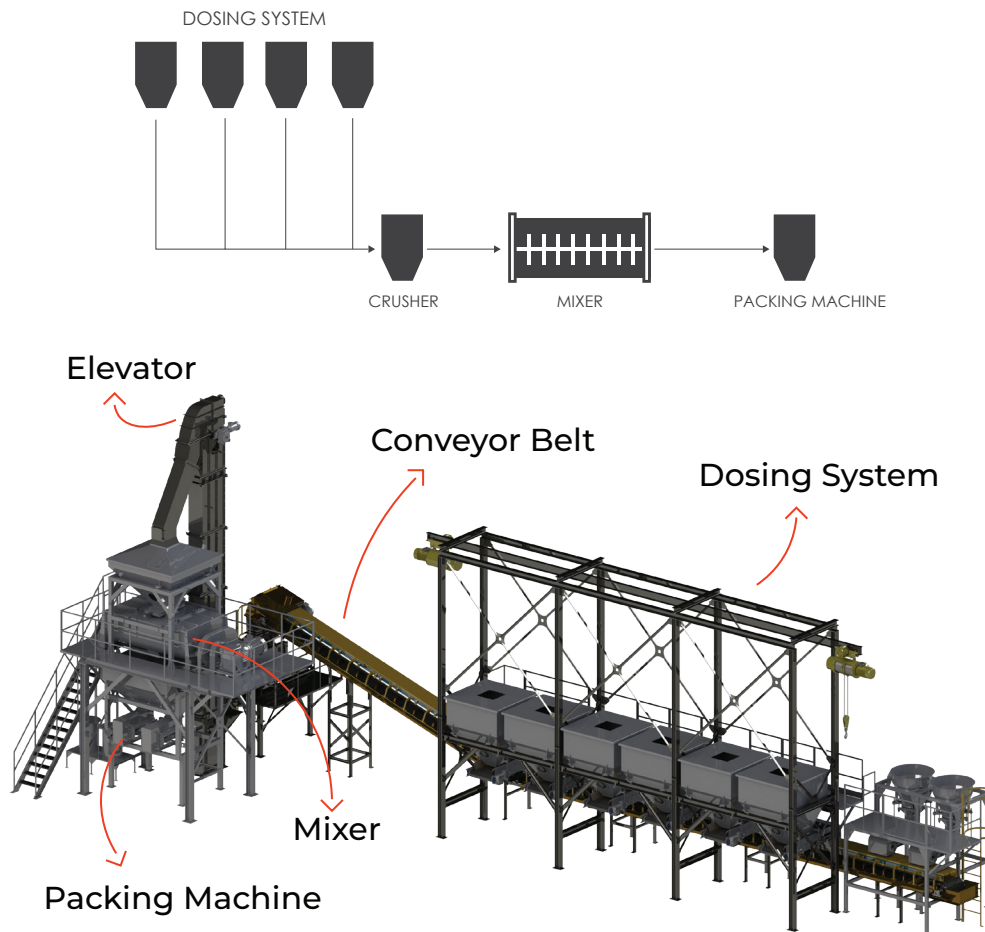
OUR RANGE of EQUIPMENT

Granulators, rotary dryers and coolers, coating drums, gas cleaning systems (scrubber, cyclone, bag filter), screens, crushers&mills, conveyors, elevators, dosing & mixing systems, and semi/fully automatic packaging and palletizing lines.

All custom-designed to match your capacity and product specifications. From a single machine to a turnkey NPK production line: tell us your product, capacity, and constraints, and we will design the fastest route to stable and efficient production.



POWDER BLENDING PROCESS GENERAL ARRANGEMENT



MAIN STEPS

1- DOSING SYSTEM†

- Raw materials are stored in required number of feeding hoppers.
- Each hopper consists 4 loadcells to enable reduce weighing system for a continuous feed.

2- CRUSHING

- Some granules and lumps are crushed to have a homogenous size of mixture.
- Crushing is made by a full circle sieve and stainless steel blades for optimum size consistency and long service life.

3- MIXING

- 6 min mixing to achieve homogenous mixtures.
- Stainless steel pedals with large contact surface.
- Strong drive engine to start operation while being full.
- Pneumatic discharge for ease of operation.

4- PACKAGING

- Mixture is packed to desired bagging options
- Whether its 5kg - 10kg - 25kg bags

EQUIPMENT

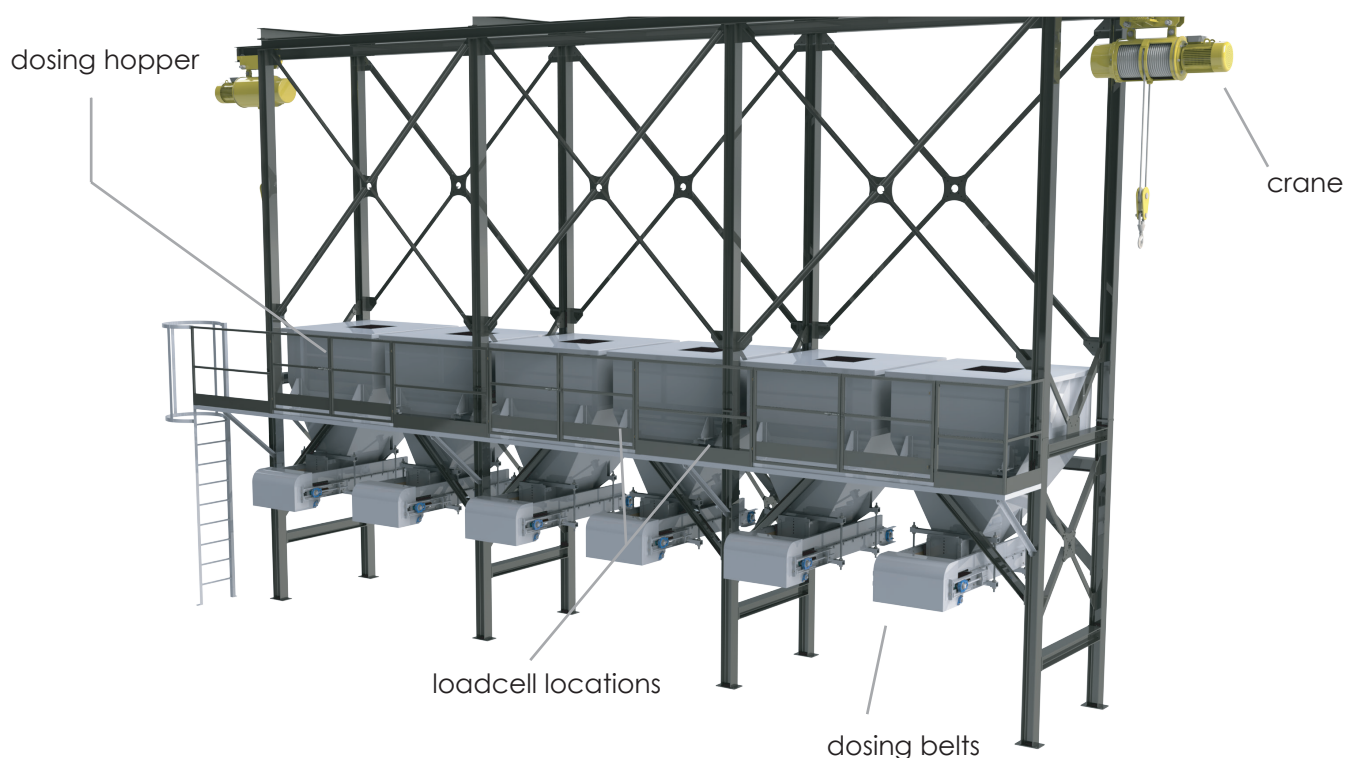
EQUIPMENT OVERVIEW | MIXING EQUIPMENT



DOSING of the RAW MATERIALS

Accurate dosing is the foundation of stable product quality and plant throughput. In our lines, each solid and liquid component—base fertilizers, fillers, micronutrients, colorants, and binders—is transferred from storage to dedicated dosing hoppers and delivered by gravimetric feeders (loss-in-weight, weigh-belt, or screw) under VFD control. The system maintains recipe setpoints with high precision while compensating for density and flow variations.

Hoppers are designed for reliable flow (steep walls, liners, aeration pads/bin activators) to prevent bridging and segregation. For liquids, metering pumps or flowmeters ensure accurate addition. Integrated load cells, belt scales, and automatic zero/tare routines support quick verification and calibration.



FEATURES

- Loss-in-weight / weigh-belt / screw feeders with VFD control
- Reliable flow: steep-wall hoppers, liners, bin activators/aeration
- Enclosed transfer with dust extraction/screens

CAPACITY

5 TPH - 50 + TPH

SIZE

Hopper volumes: 0.5–15 m³ standard
Weigh-belts 400–1400 mm

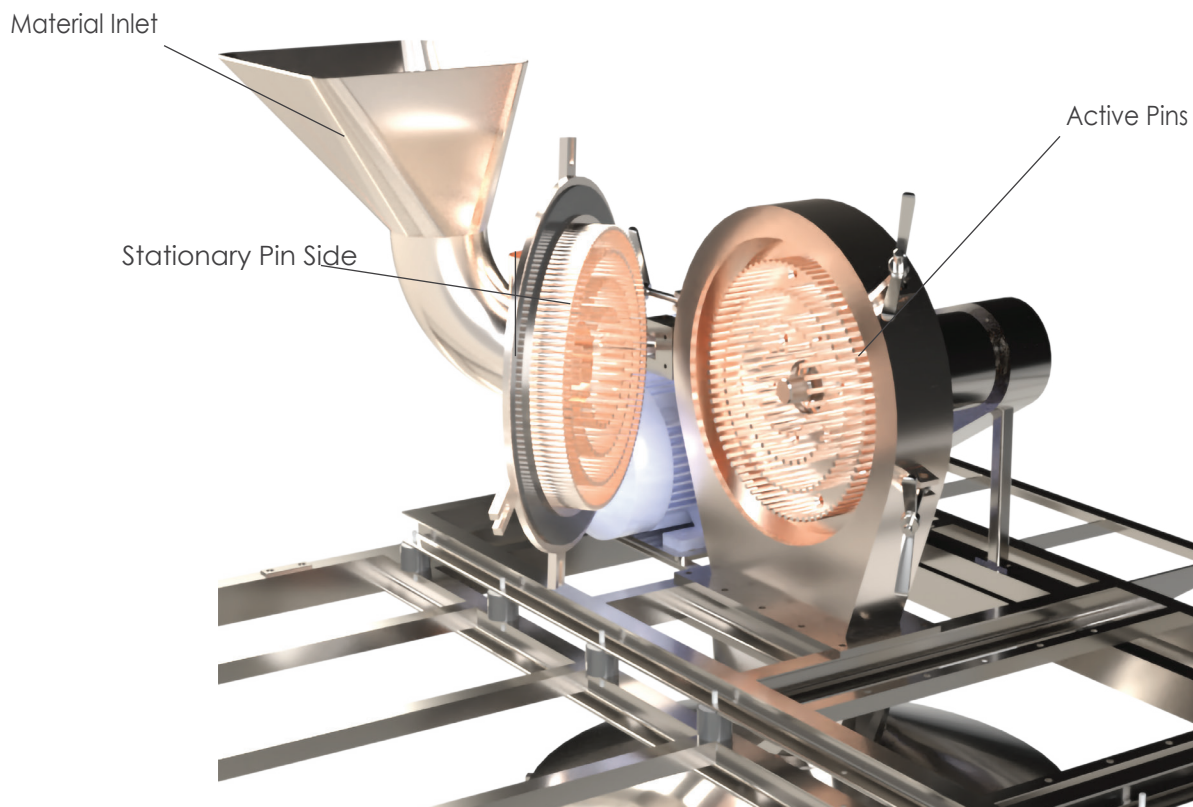
OPTIONAL COMPONENTS

- SS316L/duplex contact parts; UHMW-PE/PTFE/Hardox liners
- Quick-clean design, wash-down/CIP/-flush skid
- Screw Conveyor Feeder

CRUSHING

Industrial crushers are the first step in preparing raw materials for fertilizer production. Built for heavy-duty service, they deliver high throughput, consistent particle size, and continuous operation. By eliminating lumps and oversized pieces, crushers stabilize downstream flow to mixers, granulators, and dryers—improving efficiency and reducing unplanned stops.

A pin mill uses two discs fitted with rows of pins—one rotating against a stationary or counter-rotating disc. Material enters at the center, is accelerated outward, and is reduced by repeated impact and mild attrition between opposing pins. Because reduction is achieved by tip speed and pin geometry (not screens), the mill resists clogging and delivers a narrow particle-size distribution.



CAPACITY 2 – 75 TPH

DIAMETER Ø 300 – 1,200 mm

FEATURES

- Dual-disc pin mill (counter-rotating or rotating vs. stationary disc)
- Replaceable wear parts: pins & liners in hardened alloy, 304/316L SS
- Dust-tight enclosure with aspiration port; optional magnet at inlet

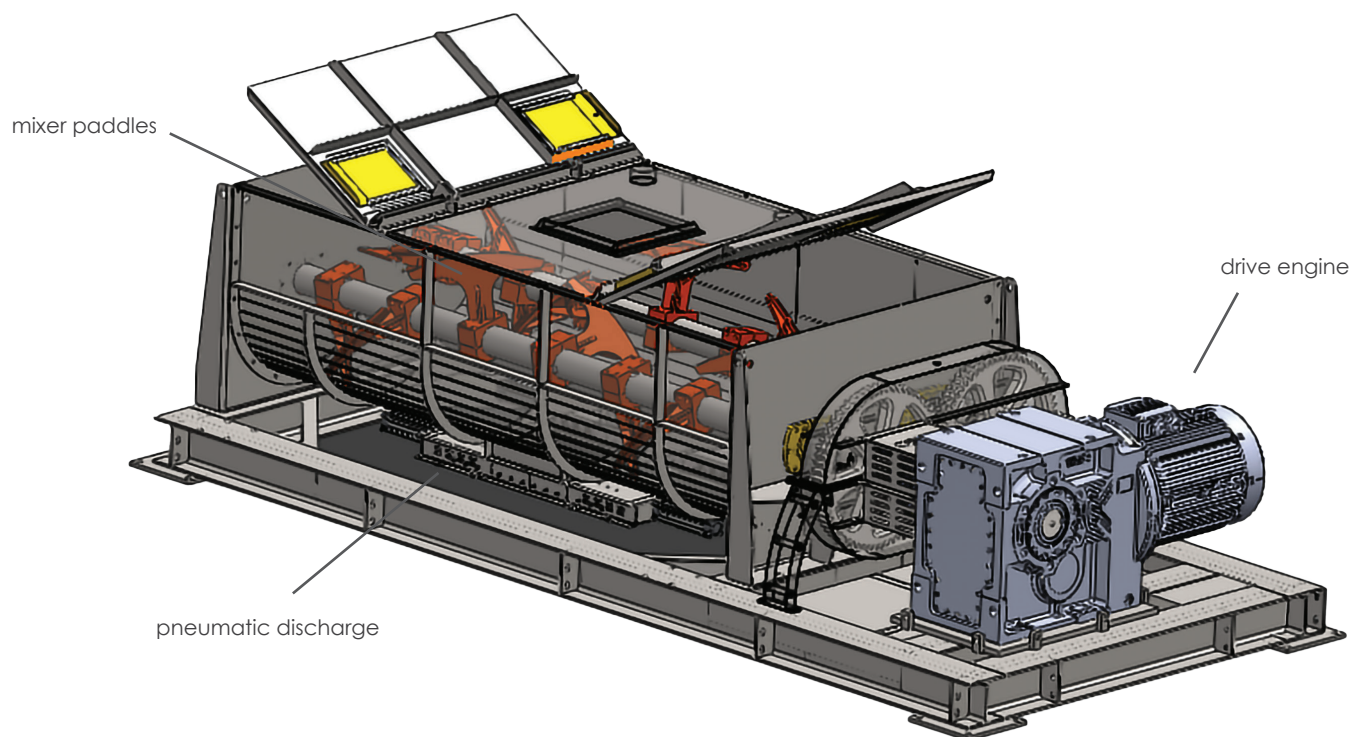
OPTIONAL COMPONENTS

- Variable Frequency Drive (VFD) and soft-starter
- Feed screw with gravimetric (LIW) feeder; rotary airlock discharge
- Wear packages (hardfacing, 316L contact parts), quick-clean design

MIXING

The mixing unit is a core piece of equipment that determines blend uniformity before granulation. Plough-share, ribbon, or paddle mixers—built for heavy-duty service—provide fast, gentle, and repeatable mixing of powder raw materials. A dust-tight body, wear-resistant liners, modular shaft/paddle design, and quick-access doors make the system reliable and easy to maintain. Options such as liquid-addition lances, high-speed choppers for de-agglomeration, jacketed barrels for temperature control, and ATEX-compliant drives enable continuous or batch operation at high throughput with stable performance.

In the production line, dosed powders from the feeders enter the mixer where major and minor ingredients—and, if required, sprayed liquids or binders—are combined to a target homogeneity. Sequence control (majors first, minors and micro-additions later), real-time torque/load-cell feedback, and recipe-based PLC control ensure short mixing times and consistent results.



FEATURES

- Configuration: Twin counter-rotating shafts with adjustable paddles/ploughs; overlapping mixing zones for full-volume agitation.
- Drives & control: Helical-bevel gearmotors with VFD; torque and power monitoring; PLC recipe control (majors/minors, steps, timers).
- Liquid addition: Spray lances with atomizing nozzles; flow-metered and interlocked to shaft speed for uniform wetting/binder dosing.
- Access & cleaning: Large hinged/assisted doors with safety interlocks, inspection windows, easy paddle replacement.

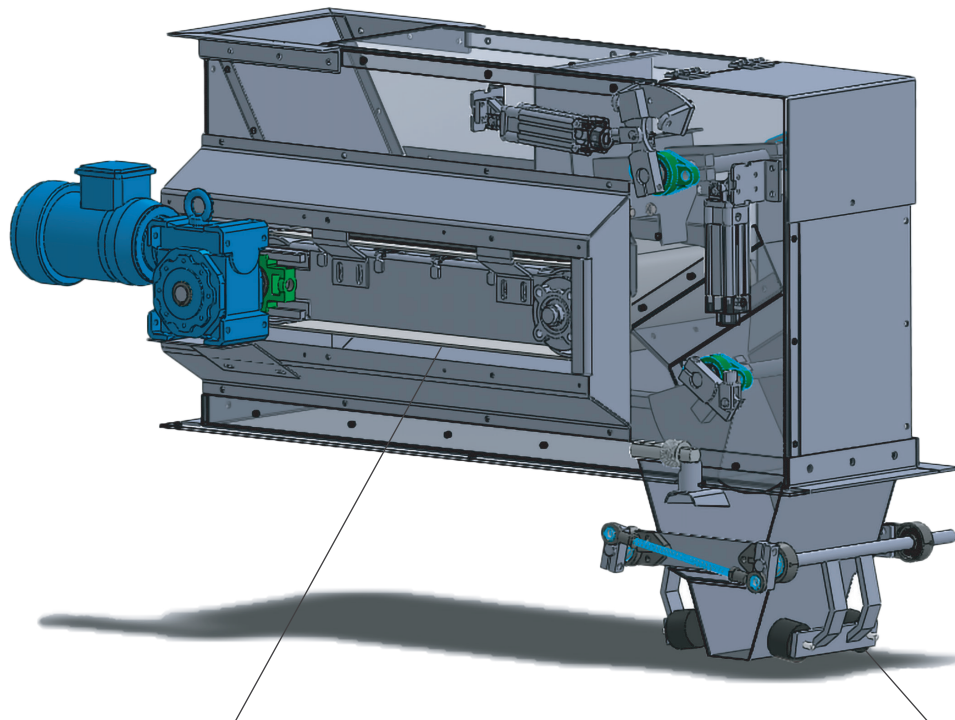
ADVANTAGES

- Fast, repeatable homogeneity: Twin counter-rotating paddles generate 3D mechanical fluidization, achieving target CoV in short cycles.
- Clean, low dust: Enclosed, aspiratable body with sealed doors and air-purged end seals reduces emissions and housekeeping.
- Process flexible: Works with majors/minors/micro-dosing, pigments, anti-caking agents, and liquid additives; batch or continuous.
- Quality & traceability: PLC recipes, torque/energy signatures, and batch reports improve consistency.

PACKING MACHINERY

The volumetric belt feeder is a high-throughput dosing module used with the bagging spout to meter powders and granules by volume. Its heavy-duty 316L frame, wear-resistant belt and liners, dust-tight covers, and VFD-controlled drive deliver stable, repeatable flow for fertilizer, salt, and mineral products. Its water resistant to create an ease of maintenance.

During packing, product from the surge hopper is regulated by a slide gate, then forms a controlled layer on the dosing belt. The target fill is achieved by setting belt speed and run time (fast fill + dribble), synchronized with the bag clamp cycle. The filled bag transfers to sealing while the next bag is clamped.



Volumetric belt feeder

Pneumatic Bag Holders

FEATURES

- Volumetric dosing by belt speed/time (fast fill + dribble modes), VFD-controlled gearmotor
- Wear-resistant dosing belt with automatic tension & tracking; quick-release belt change and primary/secondary scrapers
- PLC/ HMI recipe control (belt speed, fill time, gate positions), I/O for bagger/ sealer/conveyor
- Enclosed, dust-tight body with aspiration stub, inspection doors, and interlocked access covers

ADVANTAGES

- Stable high throughput: Continuous, even layer on the belt gives smooth, surge-free feeding to the bagging spout
- Good accuracy for free-flowing products: Repeatable volume fill with short cycles; can be trimmed by time or optional checkweigher feedback
- Low dust, clean operation: Enclosed housing, aspiration port, and tight spout connection minimize emissions and house-keeping
- Fast changeovers: Recipe presets, quick belt release, and wide access doors reduce downtime between products
- Reliable in tough environments: Heavy-duty frame, sealed bearings, and abrasion-resistant belt/liners ensure long service life



general layout photo of a powder fertilizer facility



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ABOUT CEYLAN

CEYLAN Machine & Process was founded with a commitment to excellence in the design and manufacturing of high-quality machinery for the fertilizer production industry. As an expert in providing customized equipment solutions, we are recognized for our advanced process design, engineering expertise, and equipment innovation. Our capabilities extend from process development and feasibility studies to detailed plant engineering and full system integration.