APEXIND INNOVATIVE INDUSTRY LLP

FERTILIZER INDUSTRY

BUILT RIGHT. BUILT TO LAST. ENGINEERING YOU CAN RELY ON..!

DESIGN | MANUFACTURING & FABRICATION | SUPPLY | INSTALLATION & COMMISSIONING | ELECTRICAL, INSTRUMENTATION, CONTROL & AUTOMATION INTEGRATION

ENGINEERED SOLUTIONS COVERING RAW MATERIAL HANDLING, ADDITIVE HANDLING, STORAGE, FEEDING, MIXING, SCREENING, BAGGING SUPPORT, DUST CONTROL AND PLANT CONVEYING SYSTEMS, EXECUTED UNDER SINGLE-POINT RESPONSIBILITY.

SINGLE-POINT RESPONSIBILITY

HONEST ENGINEERING

CONTINUOUS-DUTY DESIGN

INTRODUCTION TO CHEMICAL PLANT EQUIPMENT

Fertilizer manufacturing and blending plants require reliable equipment for handling powders, granules, crystals, prills, additives, fillers, and finished products. The system must support accurate dosing, consistent mixing, controlled transfer, dust containment, and safe plant operation.

Fertilizer materials can be dusty, hygroscopic, corrosive, abrasive, sticky, or prone to caking. Poor equipment design can lead to choking, material buildup, inaccurate dosing, dust emission, corrosion, product degradation, and high maintenance. Special attention is required for material compatibility, moisture control, enclosed transfer, clean access, and corrosion-resistant construction.

A well-designed fertilizer handling and processing system must fulfil four fundamental requirements: reliable handling of bulk solids, accurate feeding and batching of ingredients, dust-controlled transfer, and robust construction suitable for corrosive and dusty plant environments.

TYPICAL MATERIALS HANDLED

Typical materials handled in fertilizer plants include urea, DAP, MAP, NPK, SSP, TSP, MOP, ammonium sulphate, ammonium nitrate, rock phosphate, potash, gypsum, limestone, dolomite, bentonite, Sulphur, micronutrients, fillers, additives, recycled fines, oversize granules, dust collector fines, and finished fertilizer granules. Depending on the process, materials may be hygroscopic, dusty, corrosive, sticky, granular, crystalline, or friable.

PROCESS OVERVIEW

Raw materials and additives are received in bags, jumbo bags, trucks, bulk containers, or silos. Materials are transferred to storage hoppers, bins, silos, or day bins through belt conveyors, bucket elevators, screw conveyors, pneumatic conveying systems, or bag unloading stations.

Controlled feeders discharge the required ingredients into weighing hoppers, batching systems, mixers, blenders, granulation sections, or process feed points. Finished granules may be screened to separate oversize, undersize, and product-size fractions. Oversize material may be crushed and recycled, while undersize fines may be returned to the process. Product-size material is transferred to storage, bagging, or dispatch systems.

Dust extraction systems are provided at transfer points, screens, bag unloading stations, mixers, packing points, and silo vents to control dust generation and improve plant housekeeping. The actual plant configuration depends on fertilizer type, production capacity, recipe complexity, material properties, corrosion requirement, layout, and automation level.

EQUIPMENT SUPPLIED FOR STEEL & METAL INDUSTRY

Apexind can design, manufacture, fabricate, supply, install, and commission material handling equipment, storage systems, blending systems, dust collection systems, and associated plant structures for fertilizer industry applications. The principal equipment categories are outlined below.

- **Belt Conveyors:** Used for transfer of urea, DAP, NPK, potash, gypsum, limestone, rock phosphate, fillers, recycled fines, and finished fertilizer granules. Conveyors are designed considering material flowability, dusting tendency, corrosion risk, lump size, product degradation, and maintenance access. Covered conveyors, skirt sealing, transfer chutes, and dust extraction points can be provided wherever required.
- **Bucket Elevators:** Used for vertical lifting of granules, powders, prills, additives, and finished products. Belt or chain type elevators are selected based on duty, capacity, bulk density, abrasiveness, moisture content, and product sensitivity. Elevators can be supplied with inspection doors, boot take-up, casing, buckets, drive system, and safety instruments.
- **Screw Conveyors:** Used for enclosed transfer and dosing of powders, additives, fillers, Sulphur, bentonite, micronutrients, dust collector fines, and other fine materials. U-trough or tubular screw conveyors can be supplied with suitable seals, inspection ports, covers, liners, and corrosion-resistant material options.
- **Ribbon Blenders and Mixers:** Used for fertilizer blending, micronutrient mixing, additive mixing, and dry powder homogenization. Blenders can be supplied with double helical ribbons, paddle arrangements, lump breakers, inspection covers, dust-tight charging, bottom discharge valves, and suitable material of construction based on product characteristics.
- **Feeders and Dosing Systems:** Screw feeders, belt feeders, vibratory feeders, and rotary feeders are used for controlled extraction and dosing of raw materials, additives, fillers, and recycled fines. VFD control and weighing integration can be provided where accurate recipe control is required.
- **Weighing and Batching Systems:** Load-cell based weighing hoppers, batching hoppers, and weigh feeders can be provided for controlled formulation of NPK blends, additives, micronutrients, fillers, and process ingredients. The system can be integrated with PLC-based recipe management for repeatable batch accuracy.
- **Vibratory Screens and Rotary Screens:** Used for classification of finished fertilizer, removal of oversize, separation of fines, and product-size control. Screening systems can be integrated with recycle conveyors, oversize handling, and fines return arrangements.
- **Storage Silos, Hoppers and Bins:** Designed for raw materials, additives, recycled fines, product granules, and finished fertilizers. Storage equipment is engineered considering flowability, moisture sensitivity, caking tendency, corrosion, bridging risk, discharge arrangement, level measurement, and access requirements.
- **Pneumatic Conveying Systems:** Used for enclosed transfer of fine powders, additives, dust collector fines, and selected bulk materials. Pneumatic conveying systems help reduce manual handling, contain dust, and transfer material over longer distances where mechanical conveyors are not practical.

THE APEXIND TURNKEY SCOPE

Apexind undertakes fertilizer industry material handling and process equipment packages on a single-point responsibility basis. Clients engage with one engineering and execution team for the complete agreed scope, reducing the difficulty of coordinating multiple vendors.

- **Concept and Detailed Engineering:** Each project begins with understanding the fertilizer type, material characteristics, plant capacity, recipe requirement, storage requirement, feeding sequence, screening requirement, bagging interface, corrosion risk, dust generation points, and site layout. Apexind develops PFD, equipment sizing, conveyor routing, batching philosophy, chute designs, structural layouts, and automation concept.
- **Manufacturing and Fabrication:** Conveyors, elevators, screw conveyors, feeders, hoppers, bins, blenders, chutes, gates, dust collector housings, ducting, platforms, and support structures are manufactured and fabricated as per approved drawings and project specifications. Material of construction and surface protection are selected based on corrosion risk, product characteristics, and operating environment.
- **Supply, Installation and Commissioning:** Apexind can execute equipment supply, site erection, alignment, structural assembly, conveyor installation, no-load trials, load trials, dust collector trials, and commissioning support. Brownfield modification and integration with existing fertilizer plants can be undertaken after site study and scope finalization.
- **Electrical, Instrumentation, Control and Automation:** Apexind can integrate motor control panels, VFDs, level switches, load cells, weigh controllers, bag filter pulse cleaning controls, field sensors, PLC, HMI, alarms, interlocks, recipe management, batch reporting, and sequence control. The system can be configured for manual, semi-automatic, or fully automatic operation based on client requirement.
- **Equipment Outside Our Manufacturing Scope:** Certain items such as granulators, crushers, dryers, coolers, coating drums, bagging machines, compressors, belt scales, PLC hardware, drives, weighing electronics, specialty valves, and proprietary fertilizer process equipment may fall outside Apexind's direct manufacturing scope. These can be procured from approved vendors and integrated into the overall package, or supplied by the client on a free-issue basis.

WHY APEXIND

More than 2 decades of hands-on engineering experience • Practical understanding of bulk solids and process equipment • In-house design and fabrication capability • Dust control and enclosed handling approach • Strong vendor network • Honest project timelines • Honest costing • Single-point accountability.

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