



APEXIND INNOVATIVE INDUSTRY LLP

PHARMA 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 POWDER
HANDLING, LIQUID HANDLING, MIXING, BLENDING,
REACTION, FILTRATION, DRYING, STORAGE AND
CLEAN PROCESS EQUIPMENT, EXECUTED UNDER
SINGLE-POINT RESPONSIBILITY.**

**SINGLE-POINT
RESPONSIBILITY**

**HONEST ENGINEERING
CONTINUOUS-DUTY DESIGN**

INTRODUCTION TO PHARMA PROCESS EQUIPMENT

Pharmaceutical manufacturing requires equipment that is reliable, cleanable, hygienic, safe, and suitable for controlled production environments. Whether the application involves API manufacturing, formulation, powder handling, blending, filtration, drying, or liquid processing, the equipment must support product quality, batch consistency, operator safety, and documentation requirements.

Pharma equipment design demands careful attention to material of construction, surface finish, contamination control, dead-leg reduction, cleanability, sealing, dust containment, and ease of inspection. The plant may handle fine powders, active ingredients, excipients, solvents, slurries, granules, wet cakes, and finished products, each with different process and safety requirements.

A well-designed pharma equipment package must fulfil four fundamental requirements: hygienic and contamination-controlled handling, consistent process performance, operator-safe operation, and maintainable equipment construction suitable for regulated manufacturing environments.

TYPICAL MATERIALS HANDLED

Typical materials handled in pharmaceutical plants include APIs, excipients, powders, granules, crystals, solvents, slurries, wet cake, dry product, coating ingredients, process liquids, purified water, intermediates, and finished formulations. Depending on the process, materials may be hygroscopic, toxic, potent, flammable, corrosive, or sensitive to temperature and moisture.

PROCESS OVERVIEW

Raw materials are received in bags, drums, containers, IBCs, or bulk storage systems. Powders and excipients are transferred to intermediate hoppers, blenders, reactors, or processing vessels using controlled charging systems, screw conveyors, vacuum transfer systems, or enclosed transfer arrangements.

In API and chemical-pharma applications, materials may be charged into reactors, filtered, washed, dried, and transferred for further processing. In formulation applications, powders are blended, granulated, dried, sieved, stored, and packed. Liquids and solvents are stored in tanks and transferred through pumps, pipelines, valves, and dosing systems.

The actual configuration depends on product type, batch size, process flow, hygiene requirement, containment level, cleanability requirement, regulatory expectation, and available plant layout.

EQUIPMENT SUPPLIED FOR PHARMA INDUSTRY

Apexind can design, manufacture, fabricate, supply, install, and commission selected process equipment and MH systems for pharmaceutical applications adhering to GMP (Good Manufacturing Practices) compliant systems. The principal equipment categories are outlined below.

- Reactors, Agitators and Process Vessels:** SS 304 and SS 316 process vessels, reactors, preparation tanks, holding tanks, and receiver vessels can be supplied for pharma and API applications. Designs can include jackets, limpet coils, agitators, nozzles, manholes, CIP provisions, venting, drainability, and instrumentation connections. Agitators are selected based on blending, dissolution, suspension, heat transfer, or reaction requirements. Hygienic construction, suitable seals, proper impeller selection, and maintainability are considered during design.



- ❑ **Ribbon Blenders and Powder Mixers:** Used for dry powder and granule blending applications. Blenders can be supplied with stainless steel construction, dust-tight covers, inspection ports, bottom discharge valves, and easy-clean arrangements depending on client requirement.
- ❑ **Vacuum Tray Dryers, Rotary Dryers and Custom Drying Equipment:** Drying equipment can be supplied for wet cake, crystals, powders, and intermediates where controlled moisture reduction is required. Design is based on drying temperature, vacuum requirement, batch size, product sensitivity, and cleaning requirement.
- ❑ **Storage Tanks and Liquid Handling Systems:** Stainless steel storage tanks, day tanks, solvent tanks, purified water tanks, and intermediate tanks can be supplied with appropriate nozzles, vents, drains, level instruments, manholes, supports, and access systems.
- ❑ **Screw Conveyors and Enclosed Powder Transfer Systems:** Used for controlled and enclosed transfer of powders and granules. Designs may include tubular or U-trough construction, dust-tight covers, easy inspection, and cleanable arrangements.
- ❑ **Hoppers, Intermediate Bins and Charging Systems:** Hoppers and bins are designed for powder receiving, intermediate holding, controlled discharge, and charging to process equipment. Geometry is selected based on flowability, bridging tendency, cleanability, and containment requirement.
- ❑ **Pneumatic and Vacuum Transfer Systems:** Used for enclosed transfer of powders where dust control and operator safety are important. Systems can include receivers, filters, rotary valves, pipelines, vacuum pumps, blowers, and control panels.
- ❑ **Skid-Mounted Process Assemblies:** Custom skids can be supplied for dosing, transfer, utility integration, filtration, solvent handling, or small process modules. Skid-mounted construction helps reduce site work and improves installation efficiency.
- ❑ **Access Platforms and Support Structures:** Stainless steel or painted MS platforms, equipment supports, ladders, walkways, and maintenance structures can be supplied to suit equipment layout and operator access requirements.
- ❑ **CIP and SIP Provisions:** For pharmaceutical process equipment, Apexind can provide suitable CIP and SIP provisions wherever required by the process and hygiene standards. CIP arrangements help clean the internal surfaces of tanks, vessels, transfer lines, filters, hoppers, and connected equipment without complete dismantling, using properly located spray balls, cleaning nozzles, drain points, recirculation lines, and cleanable internal geometry. SIP provisions can be incorporated for equipment and piping sections requiring sterilization by steam, with suitable steam inlet points, condensate drain arrangements, temperature monitoring provisions, pressure-rated components, and hygienic design considerations. These systems help reduce manual cleaning effort, improve batch-to-batch hygiene, minimize contamination risk, and support consistent operation in regulated pharma manufacturing environments.



THE APEXIND TURNKEY SCOPE

Apexind undertakes pharma process equipment and material handling packages on a single-point responsibility basis. Clients engage with one team for design, fabrication, supply, installation, and integration of the agreed equipment scope.

- ❑ **Concept and Detailed Engineering:** Each project begins with understanding the product, process flow, batch size, operating conditions, cleanability expectation, area classification, material compatibility, and site layout. Apexind develops equipment sizing, mechanical design, fabrication drawings, support structures, and integration details.
- ❑ **Manufacturing and Fabrication:** Equipment is manufactured with attention to material selection, fabrication quality, surface finish, welding quality, cleanability, and inspection access. Stainless steel equipment is fabricated as per application requirement and approved project drawings.
- ❑ **Supply, Installation and Commissioning:** Apexind can support equipment supply, site installation, alignment, trial operation, and commissioning assistance. Site integration with client utilities, process lines, and instrumentation can be undertaken as per agreed scope.
- ❑ **Electrical, Instrumentation, Control and Automation:** Apexind can integrate motor control, VFDs, field instrumentation, temperature sensors, pressure transmitters, level instruments, load cells, PLC, HMI, alarms, interlocks, batch sequence logic, and operator interface systems as required.
- ❑ **Equipment Outside Our Manufacturing Scope:** Certain pharma-specific items such as high-end proprietary mixers, certified sterile equipment, cleanroom systems, HVAC systems, isolators, lyophilizers, high-containment systems, flameproof instruments, PLC hardware, drives, specialty valves, and validation documentation may fall outside our direct manufacturing range. These can be procured from approved vendors and integrated into the system, or supplied by the client on a free-issue basis.

WHY APEXIND

More than 2 decades of engineering experience • Strong understanding of bulk material handling • In-house design and fabrication capability • Practical solutions for dusty and abrasive applications • Strong vendor network • Honest timelines • Honest costing • Single-point accountability.



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