



INNOVATIVE CHEMICAL TECHNOLOGIES LLP

*SPECIALISTS IN DISTILLATION
TECHNOLOGIES*



ABOUT US

Ever since 1992, Innovative Chemical Technologies LLP has been at the forefront of delivering comprehensive solutions to the requirements of the chemical industry. We take pride in having served numerous prestigious clients, both in India and abroad. They span the agrochemical, pharmaceutical, dyes, pigments, intermediates, petrochemicals, biochemicals, bulk chemicals, specialty chemicals, and other segments.

Our areas of expertise include process design, design and engineering packages, supply of process equipment, turnkey plants, plant audits, consulting services, troubleshooting, and upgradation. We have completed over 500 projects in the past 33 years. Whether you are installing a new greenfield project or upgrading an existing plant, we bring cutting-edge simulation and engineering tools and a deep understanding of practical challenges to provide lasting solutions.

Every project is built to last, rigorously designed and tested, so that your business stays ahead today and tomorrow. Our innovative approach helps reduce your costs and meet regulations while achieving high efficiency at all times.

Our aim is to provide cost-effective solutions that reduce environmental impact and promote sustainability. By leveraging our expertise and advanced technologies, we ensure that your operations are both economically and environmentally sustainable, helping you stay competitive in a dynamic industry.

AREAS OF EXPERTISE

- Consultancy services
- Feasibility study
- Process Audit
- Design and Engineering
- Process Simulation and Modeling
- Turnkey Projects
- Process Equipment Supply
- Plant Upgradation and Troubleshooting

INDUSTRY SEGMENTS

- Agrochemical
- Aroma Chemicals
- Bulk Chemicals
- Biochemicals
- Dyes and Pigments
- Pharmaceuticals
- Polymers and Plastics
- Petrochemicals
- Speciality Chemicals

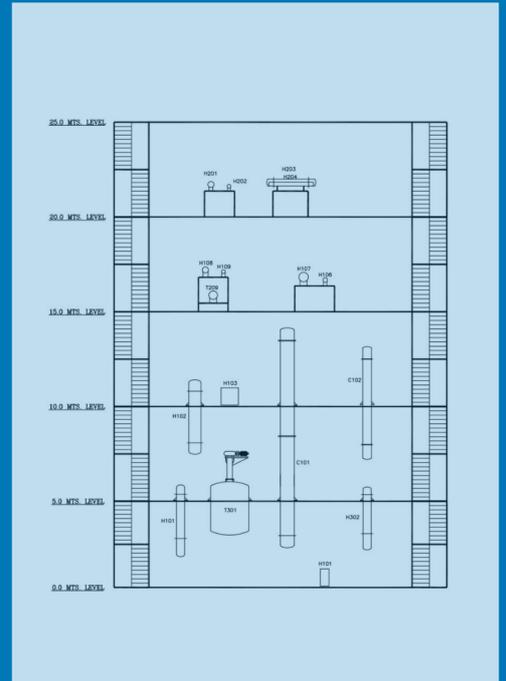
CHEMICALS HANDLED

- Acids
- Alcohols
- Aliphatic
- Aromatics
- Aldehydes
- Alkoxides
- Esters
- Ethers
- Heterocyclics
- Halocarbons
- Isomer
- Ketones

DESIGN AND ENGINEERING

Our Design and Engineering packages cover the entire range from process development to commissioning. Every aspect of the plant is designed using advanced design software and engineering databases, guaranteeing smooth and optimal operation from day one.

The whole package begins with Process Design, where an ideal combination of unit processes and operations is devised for maximum efficiency. Basic Engineering includes mass-energy balances, PI diagrams, equipment sizing, process datasheets and instrumentation and control philosophy. Mechanical design, procurement datasheets and layout are provided in the Detailed Engineering phase. Finally, we provide operating instructions for startup, normal operation, and normal/emergency shutdown. On-site assistance for commissioning is also provided.



UPGRADATION AND TROUBLESHOOTING

Existing plants could perform unsatisfactorily for various reasons. Our troubleshooting team identifies errors, proposes solutions, and can undertake implementation to improve your profitability. Elimination of issues ensures smooth operation at highest efficiency.

Errors can occur at design stage, during installation of equipment, piping, or instruments or during operation. Wrong specification of feed or design algorithm, incorrect detailing of internals, errors during erection, high pressure drop, excess holdup or inefficient heat exchangers are common mistakes. Troubleshooting identifies and solves these problems.

Profitability can be greatly improved by Plant Upgradation – by achieving higher capacity, better product purity, improved recovery, and reduced energy consumption. Methods such as conversion of a batch plant to continuous (or vice versa), use of appropriate contact devices, repairing or replacing inefficient equipment and providing a good instrumentation system are used.

PROCESS AUDIT

Process plants often suffer from an excessive consumption of solvents, reactants, and utilities. This is due to losses through vents, drains, and effluent, sub-stoichiometric conversion of reactants, side reactions and process waste. These can flip the plant economics from profit to loss. We conduct comprehensive audits to identify and eliminate these losses in order to improve your plant profitability.

During the audit, we examine existing equipment and operating procedures. All input and output flows are studied to locate points of abnormal loss. Reaction stoichiometry is analysed to compare ideal versus actual conversions. Equipment are inspected to evaluate their condition and efficiency.

Our final recommendations include ways of reducing the losses which include retrofitting / repair / replacement of inefficient equipment, installing additional modern equipment, modifications to reactions, processes or operations, optimising energy recovery and reduction of downtime in the operating cycle.



AUDIT

PROCESS EQUIPMENT

Our equipment are custom-designed as per your requirements and manufactured to rigorous quality control plans. We employ modern techniques including laser cutting, welding and CNC machining, and supply in all types of steels, high performance alloys and non-ferrous metals. The equipment conform to Good Engineering Practice, American Society of Mechanical Engineers, and Tubular Exchangers Manufacturers Association.

- Columns - For distillation, extraction, and absorption processes; under vacuum, atmospheric or high pressures; with trays, random or structured packings.
- Trays - Bubble-cap, sieve, and valve trays custom designed to your process and hydrodynamic specifications; welded, removable and bolted trays; tray stacks.
- Packings - Random and structured packings in different materials of construction and in steel sheet and wire-mesh; High efficiency packings for laboratory applications.
- Heat exchangers – For reboiler, condenser and cooling applications, with single and multi-pass designs and special designs like falling film and forced or natural circulation.
- Distillation stills - Vertical stills with/without jacket and agitators, Horizontal kettles with tube bundles.



PACKING & INTERNALS

We manufacture premium-grade mass transfer products engineered for distillation systems, including trays, columns, packing, and internals, all rigorously compliant with global quality certifications.

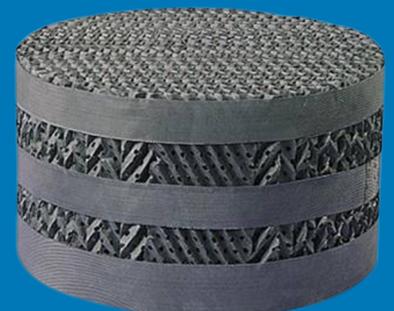
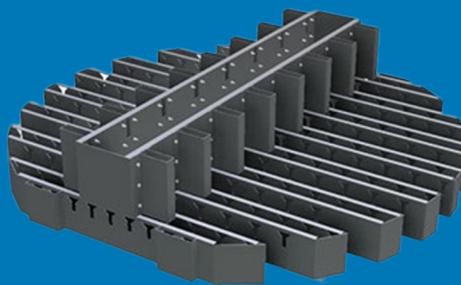
Our structured packings optimize separation efficiency with minimal pressure loss - ideal for demanding distillation applications. For other cases, we offer trays or random packing tailored to your specific process needs. In addition, we provide end-to-end distillation column design and supply, integrating critical elements such as:

- Packed columns: Distributors, support plates, and structured/random packings.
- Tray columns: Customizable bubble-cap, sieve, or valve trays.

Every solution is precision-crafted to enhance throughput, reduce energy costs, and ensure reliability across industries.

TYPES OF STRUCTURED PACKING

| TYPE | Surface Area m ² /m ³ volume | Voidage % | Bulk Density kg/m ³ | Pressure Drop ~ mbar/m | NTSM |
|------|---|--------------|-----------------------------------|---------------------------|------|
| BX | 830 | 95.7% | 265 | 1 | 6.6 |
| CY | 1250 | 94.0 | 396 | 2 | 10 |
| 750 | 750 | 95.2 | 285 | 2.5 | 6 |
| 500 | 500 | 96.5 | 190 | 2 | 4 |
| 350 | 350 | 97.2 | 133 | 1.5 | 2.8 |
| 250 | 250 | 97.7 | 95 | 1 | 2 |





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