

Simplifying Technologies

ISO 9001: 2015 CERTIFIED

ETHYL ACETATE PRODUCTION

PLANT





Process Equipment Design and Development With Manufacturing. Installation and Commissioning. Turnkey Projects.



VISION

We will be the most valued solutions provider in terms of process development and design to our customers.

MISSION

To become leading company in designing and manufacturing of equipment, providing services and becoming one stop reliable hub of technical resources for providing complete solution to the requirements of the industry.

To focus on meeting or exceeding customer expectation in terms of product quality and on time delivery

WHY ATTAQUANT?

- Experienced Staff
- Cutthroat pricing
- Client friendly policies
- Quality packaging
- Timely delivery
- Wide distribution reach
- Huge infrastructure
- Quality Service after Sale
- Technically feasible solutions

ATTAQUANT PRODUCT RANGE

| ✓ ZERO LIQUID DISCHARGE SYSTEM | ✓ DISTILLATION COLUMNS |
|--------------------------------|------------------------|
| ✓ SOLVENT RECOVERY SYSTEM | ✓ PRE-HEATERS |
| ✓ EVAPORATORS | ✓ AUTOCLAVES |
| ✓ DRYERS | ✓ EXTRACTORS |
| ✓ CENTRIFUGES | ✓ HEAT PUMP |
| ✓ REACTORS | ✓ STORAGE TANKS |
| ✓ HEAT EXCHANGERS | ✓ SKIDS |



INTRODUCTION

"Attaquant Enterprises Pvt. Ltd.", is a company with the right expertise who have many years of relevant experience in Process Engineering. **Attaquant** is a disciplined, data-driven company who has a right approach and methodology for eliminating defects in any process – from design to manufacturing and from product to good service.

We go out of traditional way not only to offer comprehensive solutions for all your Process; but to also provide you with the information and resources you need to make refined decisions about which solutions are best for you, and your project. We have started doing flawless Engineering in designing & manufacturing of all equipment's required in Chemical, Solvent recovery, Paint industry, Water & Waste water management, Pharmaceutical Industries and in Oil & Gas. We ventured into process engineering market and started offering Energy Saving Solution to various process industries in National & International market.

We are one of the leading manufacturers, traders and exporters of a wide range of the premium quality Process Plant Equipment. Our product range includes Plate Fin Heat Exchanger Set Up, Static Mixer, Demister pads / Mist eliminators, Low pressure vessels, Distillation column trays and related internals and Hot Water System we offer a wide range of products. For manufacturing the offered range as per the industry set norms and regulations, our professionals make use of latest tools and machinery. Their current stability, strong construction, optimum functionality, low maintenance and high performance, makes our products highly demanded in the market of process industries of all sections.

The company now introduces eco-friendly pre-fabricated insulation panel systems in a range of profiles, thicknesses, and finishes. The specialty of these panels is that, they are perfectfor the speedy creation of cold stores of any size at the site due to their precise interlocking design and great insulation properties, and are also eco-friendly both in their material and in their manufacturing process itself. These new eco-friendly panel solutions from Attaquant can be used to create cold storages of any size, from small walkins to very large cold rooms.

Large production capacity has helped us in managing the bulk projects in the most efficient manner. To avoid any damage while transportation, we pack the offered range with tamper- proof packaging before dispatch. Timely delivery of the offered range of products is assured, due to our extensive distribution network.



ETHYL ACETATE PLANT

AEPL offer a wide range of machinery and process equipment on a turn-key basis. An ethyl acetate plant is a facility that produces ethyl acetate, which is a scolorless liquid with a fruity odor.

Production Process: Ethyl acetate is typically produced through the esterification reaction between ethanol and acetic acid. An acid catalyst, such as sulfuric acid or a strong ion exchange resin, catalyzes this reaction. The reaction takes place in a reactor vessel, and the resulting mixture is then subjected to separation processes to obtain pure ethyl acetate.

Separation Processes: The separation processes involved in ethyl acetate production include distillation and purification steps. Distillation is used to separate the ethyl acetate from the reaction mixture, as well as to remove any impurities. Purification techniques, such as molecular sieves or activated carbon, may be employed to further refine the ethyl acetate and remove any remaining impurities.

Plant Design and Equipment: Ethyl acetate plants are typically designed with various process units, including reactors, distillation columns, heat exchangers, and storage tanks. The plant may also include utilities such as boilers, cooling towers, and wastewater treatment systems. The equipment used in the plant is designed to handle the specific requirements of the ethyl acetate production process.

Safety Considerations: Safety is a crucial aspect of operating an ethyl acetate plant. Ethyl acetate is flammable and can form explosive mixtures with air. Therefore, proper safety measures, including fire prevention systems, ventilation systems, and safety protocols, are implemented to ensure the safe operation of the plant.

Environmental Impact: Ethyl acetate production plants need to comply with environmental regulations and implement measures to minimize their environmental impact. This includes proper waste management, emissions control, and energy efficiency measures.



Applications: Ethyl acetate is widely used as a solvent in various industries, including coatings, adhesives, pharmaceuticals, and cosmetics. It is also used as a flavoring agent in food and beverages.

These are some general aspects of an ethyl acetate plant. The specific design, capacity, and operational details may vary depending on the specific plant and its production requirements.

ETHYL ACETATE PLANT EQUIPMENTS

FEED TANKS

A feed tank is a container or reservoir used to store and supply a liquid or material to a process or system. It can be found in industries such as chemical processing, oil and gas, water treatment, and many others.

FEED TANK

- 1. Capacity: The volume or capacity of the feed tank, typically measured in liters, gallons, or cubic meters.
- 2. Material: The construction material of the tank, which can be stainless steel, plastic, or other suitable materials depending on the nature of the liquid being stored.
- 3. Inlet and Outlet: The locations and specifications of the inlet and outlet connections for the tank, which allow for the supply and withdrawal of the liquid or material.
- 4. Level Control: The method or mechanism used to monitor and control the level of the liquid within the tank, such as float switches, level sensors, or manual controls.
- 5. Safety Features: Any safety features or devices incorporated into the tank design, such as pressure relief valves, overflow protection, or venting systems.



6. Integration: How the feed tank is integrated into the overall process or system, including any connections to pumps, pipelines, or other equipment.



HEAT EXHANGER





A heat exchanger is a system used to transfer heat between a source and a working fluid. Heat exchangers are used in both cooling and heating processes. The fluids may be separated by a solid wall to help mixing or they may be in direct contact.



They're extensively used in space heating, refrigeration, air exertion, power stations, chemical industries, petrochemical industries, petroleum refineries, natural- gas processing, and sewage treatment. The classic illustration of a heat exchanger is set up in an internal combustion machine in which a circulating fluid known as machine coolant flows through radiator coils and air flows past the coils, which cools the coolant and heats the incoming air.

Types

- Double Pipe Heat Exchanger
- Shell and Tube Heat Exchanger
- Plate Heat Exchanger

REACTION VESSEL

A reaction vessel is an enclosed volume in which a chemical reaction takes place. In chemical engineering, it is generally understood to be a process vessel used to carry out a chemical reaction, which is one of the classic unit operations in chemical process analysis.

Types

Reaction Vessel is one of the most important equipment of any chemical, food, drugs, dyes and allied industries. There are various types of reaction vessel viz jacketed, Limpet coil in Body flange or Welded Types, Top open type, Top dish type etc.





KETTLE REBOILER

Attaquant have technical team for Designing and Manufacturing of Different types of cGMP Kettle Reboiler ranges from 50 lit to 1,00,000 Liters for the Pharmaceutical, Chemical, Biotech, Personal Care, API, Food & Beverages Industry. Attaquant Design & Manufacture Kettle Reboiler such a way that you can easily remove tubes for cleaning and all.

Attaquant Design & Manufacture Kettle Reboiler for various applications like

- Pharmaceutical
- **4** Chemical
- **4** Biotech
- **♣** Food & Beverages
- Lube Oil
- ♣ Paints, Dyes & Pigment



MOC: - SS 316L, SS 304, Monel, Inconel, Hastelloy, Titanium, Zirconium etc.







DISTILLATION COLUMN

A distillation column is a tube that provides surfaces on which condensations and vaporizations can occur before the gas enters the condenser in order to concentrate the more volatile liquid in the first fractions and the less volatile components in the later fractions.

A distillation column is a vertical vessel used in the distillation of liquid mixtures to separate the mixture into its individual components based on their boiling points. The mixture is heated to produce vapours, which are then cooled and condensed back into a liquid form

Steps of Distillation Column

- **4** Evaporation
- Condensation
- Collection







CONDENSER





A condenser is a system used to transfer heat between a source and a working fluid. Heat exchangers are used in both cooling and heating processes. The fluids may be separated by a solid wall to help mixing or they may be in direct contact. They're extensively used in space heating, refrigeration, air exertion, power stations, chemical industries, petrochemical industries, petroleum refineries, natural- gas processing, and sewage treatment. The classic illustration of a heat exchanger is set up in an internal combustion machine in which a circulating fluid known as machine coolant flows through radiator coils and air flows past the coils, which cools the coolant and heats the incoming air.

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- Double Pipe Heat Exchanger
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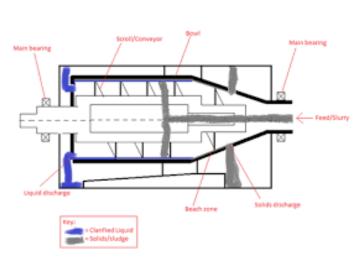


DECANTER

A decanter is a vessel or container used for the separation of liquids or the clarification of liquids by sedimentation. It typically consists of a wide, flat-bottomed container with a narrow neck and a stopper or lid.

Decanters are commonly used in various industries and applications, including:

- 1. Wine and Spirits: In the context of wine and spirits, a decanter is used to separate the sediment from aged wines or to aerate and enhance the flavors and aromas of younger wines. It allows for the separation of the clear liquid from any sediment that may have formed during the aging process.
- 2. Laboratory and Scientific Applications: Decanters are used in laboratories for the separation of mixtures, such as the separation of immiscible liquids or the removal of precipitates or solids from a liquid solution. They are also used in chemical processes for the separation of different components based on their densities.
- 3. Oil and Gas Industry: In the oil and gas industry, decanters are used for the separation of oil, water, and solids in various processes, such as crude oil refining, wastewater treatment, and drilling mud separation. They help in the efficient separation and removal of impurities from the oil or water.
- 4. Food and Beverage Industry: Decanters are used in the food and beverage industry for the separation and clarification of liquids, such as fruit juices, oils, and syrups. They help remove any impurities or sediments, resulting in a clearer and more refined product.
- 5. Environmental Applications: Decanters are utilized in environmental applications, such as wastewater treatment plants, to separate solids from liquids. They aid in the removal of sludge or sediment from the wastewater, allowing for cleaner water to be discharged or reused.







COOLING TOWER

A cooling tower is a specialized heat exchanger in which air and water are brought into direct contact with each other in order to reduce the water's temperature. As this occurs, a small volume of water is evaporated, reducing the temperature of the water being circulated through the tower.

Water, which has been heated by an industrial process or in an air-conditioning condenser, is pumped to the cooling tower through pipes. The water sprays through nozzles onto banks of material called "fill," which slows the flow of water through the cooling tower, and exposes as much water surface area as possible for maximum air-water contact. As the water flows through the cooling tower, it is exposed to air, which is being pulled through the tower by the electric motor-driven fan.

When the water and air meet, a small amount of water is evaporated, creating a cooling action. The cooled water is then pumped back to the condenser or process equipment where it absorbs heat. It will then be pumped back to the cooling tower to be cooled once again.







COMPRESSOR

A compressor is a mechanical device that increases the pressure of a gas by reducing its volume. An air compressor is a specific type of gas compressor.

Compressors are similar to pumps: both increase the pressure on a fluid and both can transport the fluid through a pipe. The main distinction is that the focus of a compressor is to change the density or volume of the fluid, which is mostly only achievable on gases. Gases are compressible, while liquids are relatively incompressible, so compressors are rarely used for liquids. The main action of a pump is to pressurize and transport liquids.





AEPL PROCESS PLANT SOLUTION

AEPL is excellent in developing a process concept into an installed plant solution operating with a guaranteed plant performance.

AEPL is a full-service provider for key equipment and process plant solutions. Our excellent position comprises an extensive know-how and long-standing experience in developing process concepts into installed plant solutions operating with a guaranteed performance.

Basic Engineering

A soon as the customer has agreed upon the conceptual design it can be further developed into a basic engineering package for a commercial size plant. At this stage we bring in our expertise and capabilities in scaling-up pilot and demonstration plants into commercial size process units. A basic engineering Package typically consists of:

- ✓ Process Flow Diagrams (PFD)
- ✓ Heat & Mass Balance
- ✓ Piping & Instrumentation Diagrams (P&ID's)
- Equipment specifications
- ✓ Instrument specifications
- ✓ Functional design specifications for plant control and safeguarding
- ✓ Preliminary equipment layout
- ✓ Capital cost calculation for skid mounted units
- Capital cost estimate based on factors when the total project scope consists of a basic engineering package plus key equipment only



Detail Engineering

For skid mounted units, upon approval of the basic engineering package, the project moves into the detail engineering phase, resulting in:

- ✓ P&ID's final for construction
- Equipment and instrument specifications final for construction
- ✓ Mechanical drawings for key equipment
- ✓ 3-D plant model
- ✓ Piping isometrics
- ✓ Plant automation concept

Project Management

All of the above activities are performed by highly qualified and experienced inhouse staff. We rely upon our people and strive for business excellence. Project teams work under the guidance of the project manager who has overall responsibility for the project budget, schedule and quality. Throughout the entire project, the project manager remains in close contact with the customer.

In all its activities our employs an efficient Quality Assurance System which is accredited in accordance with the latest standards of ISO9001 for Quality, Safety, Health and Environment. Standard procedures, protocols and test documentation are used from initial design to the final plant performance test and ensure a continued high-quality result.



Proprietary Equipment

All proprietary and key process equipment is produced either in our modern workshop or sourced from approved and certified sub-suppliers. Our in-house fabrication fulfils all applicable requirements and design codes. The range of construction materials includes stainless steel, special alloys as well as titanium, zirconium and tantalum.

Skid Mounted Plants

Skids are assembled in our modern, purpose-built workshop or at selected, certified sub- contractors. Larger plants consist of more than one module.

The modular assembly includes the installation of:

- ✓ Steel structure Equipment
- Piping and valves
- ✓ Instrumentation
- ✓ Cabling and junction boxes
- ✓ Insulation

Advantages of skid mounted; turn-key plants are:

- ✓ Short delivery time through an integrated fast track execution
- ✓ Low overall investment costs
- ✓ Reduced on-site erection and hook-up time and thus minimal site disruption Manufacture of the complete plant under workshop conditions ensuring the highest quality
- ✓ Completion of the Factory Acceptance Test (FAT) prior to delivery
- ✓ Qualification tests prior to plant delivery



Transport and Installation

AEPL has a team of highly experienced installation supervisors, who provide construction support services for site-built plants, and for the off-loading and installation of skid mounted plants. These supervisors liaise closely with the customer's construction manager, safety officer and mechanical contractor, to ensure a safe and trouble-free installation.

Commissioning and Start-up

Following completion of all mechanical and electrical tie-ins to the plant, process engineers are mobilized to undertake plant commissioning. The commissioning team is usually headed by the process engineer responsible for the plant design. Plant commissioning follows a structured plan and ends with the start-up of the process unit followed by a Site Acceptance Test (SAT). Training of customer's operators often takes place in parallel.





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