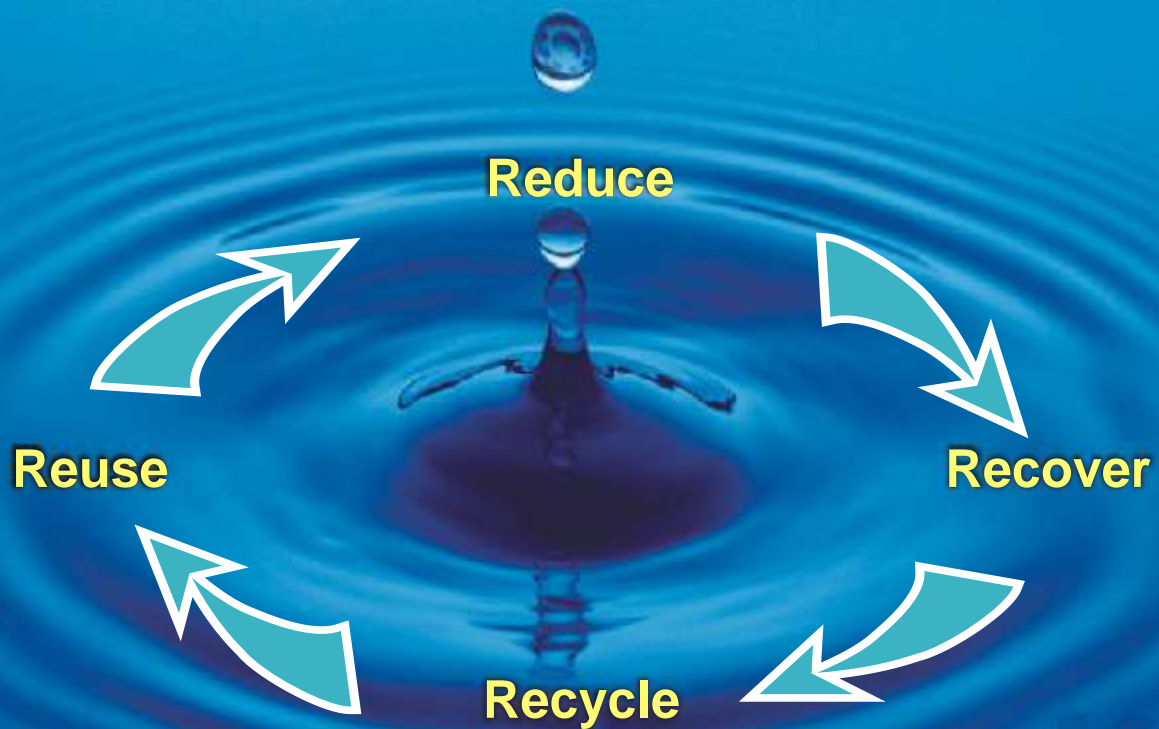


Water and Wastewater Solutions



OUR SOLUTIONS

Water scarcity and environmental issues are creating new challenges in manufacturing processes in various industries and also in the public utilities. This calls for an integrated approach to environmental management. Praj Industries, with a wide experience in treatment of the most challenging wastewater and water related applications in the distillery and brewery industry, now offers solutions that will help sugar ,dairy, chemical, pharmaceutical, power, fertilizer, metal & mining industries, etc. for treatment, reuse and recycle of wastewater efficiently. Praj has a proven track record in design and construction of water and wastewater treatment plants.

Offerings :

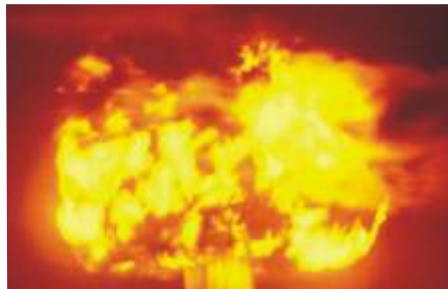
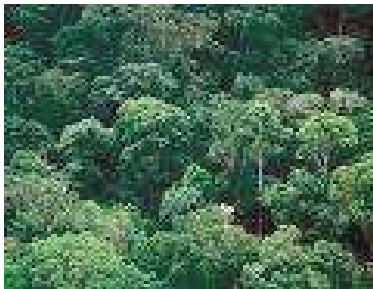
- Water and wastewater solutions
 - Various treatment schemes
 - Water reuse and recycle
 - Zero liquid discharge schemes
- Concentration using energy efficient evaporation
- Solvent recovery plants

Highlights :

- Integrated solutions for water, wastewater and energy.
- Well-equipped manufacturing facilities
- State-of-the-art R & D facilities
- Proven EPC capabilities
- Solutions under one roof

Services :

- Design and Engineering
- Equipment supply
- Project Management
- Erection and Commissioning
- Turnkey Contracting
- Audit Services



• WATER • WASTEWATER • ENERGY

BIOLOGICAL SOLUTIONS UNDER ONE ROOF

INTEGRATED ANAEROBIC AND AEROBIC TREATMENT PROCESS FOR LOW AND HIGH STRENGTH WASTEWATER.

ANAEROBIC TREATMENT :

ECOMET-XT is suitable for treatment of high strength wastewaters. The technology is based on CSTR principle and designed for high BOD reduction. The process offers trouble free continuous operation with maximum possible biogas yield. Special geometry of reactor and unique design of mixing system ensures optimum reaction rate.



ECOMET-SB is most suitable for low strength wastewater and operates on Up Flow Anaerobic Sludge Blanket (UASB) principle. Special design of Gas Liquid Separator ensures very high biomass concentration in reactor and advanced distribution network for uniform distribution of effluent. Depending on effluent characteristics removal efficiency of 80-90% of organic matter is achieved.



AEROBIC TREATMENT :

ECOSAP-CE is the conventional Activated Sludge Process (ASP) suitable for low to medium strength wastewater from industrial and municipal sources. The system is composed of aeration tank and clarifier. The aeration is provided either by surface aerators or diffused membrane aeration systems. Higher removal efficiency of organic matter is achieved.



ECOSAP-FB is based on the biofilm principle with an active biofilm growing on small specially designed plastic elements that are kept suspended in the reactors. The technology utilizes the advantages of both activated sludge and other biofilm systems without being restrained by their disadvantages. We offer Lower footprints and compact plants with high organic removal efficiency.

ECOTOWER

ECOTower is based on non-submerged fixed film principle with an active biofilm growing on specially designed plastic media. Technology is suitable for low to medium strength wastewater. Higher organic and nutrient removal efficiency is up to 95%. Lower footprint and higher energy efficiency relative to conventional systems.



WATER TREATMENT SOLUTIONS UNDER ONE ROOF

- For treating water through Desalination process, Praj offers customized and turnkey systems to suit your requirements of removing salts.
PRAJ Membrane separation system is reliable and cost effective answer to a wide range of wastewaters from process industries. The system consists of state-of-the-art reverse osmosis membranes to suit wide range applications.
- Our High Purity Water Plants comply with increasingly stringent requirements for quality within shorter lead time. The applicable standards and guidelines, together with the customer-specific requirements, form the basis of all our Project Design.
- PRAJ provides plant and equipment for De Mineralized water, Water Softener, Mixed Bed Unit and Condensate Polishing for all types of industries.
- PRAJ offers end-to-end solutions with focus on technical performance in compliance with environmental requirements and long-term profitability.



DESALINATION PLANT



RO/UF/NF/EDI PLANTS



DM/MB/SOFTNER/
CONDENSATE
POLISHING PLANT

PHYSICO-CHEMICAL TREATMENT TECHNOLOGIES

PRAJ OFFERS PHYSICO-CHEMICAL SOLUTIONS FOR PRETREATMENT AND POLISHING OF WASTEWATER.

Filtration Technology : Depending on the application and feed characteristics, pressure sand filters, multi grade filters, dual media filters, activated carbon filters and Iron removal filters are used for treatment of water. These are recommended and proven products for removal of suspended solids present in the water and wastewater.



Disinfection Technologies :

PRAJ offers Ultra violet, Ozonation and Chlorination technologies for disinfection of water and wastewater.

Chlorination is relatively inexpensive and highly effective disinfectant over wide range of biological agents.

Ozonation technology along with disinfection also eliminate

colors, phenolics, cyanides, and odours, reduce oxygen demanding matter, turbidity and surfactants etc.

Clarifiers, Flocculators and Parallel Plate Clarifiers :

PRAJ range of Clarifiers and parallel plate clarifiers are having less maintenance, faster sludge removal and higher efficiency. These are applicable for pretreatment as well as post-treatment of water and wastewater.



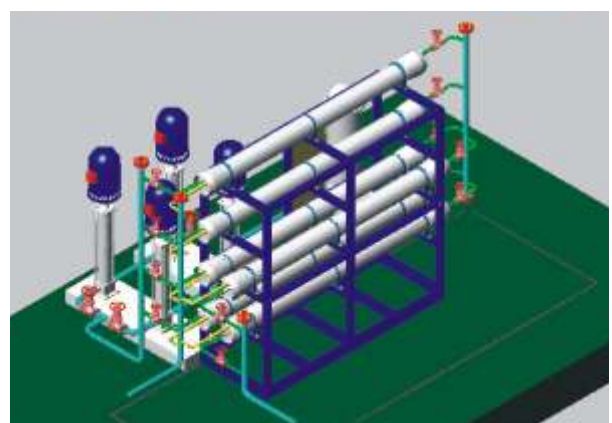
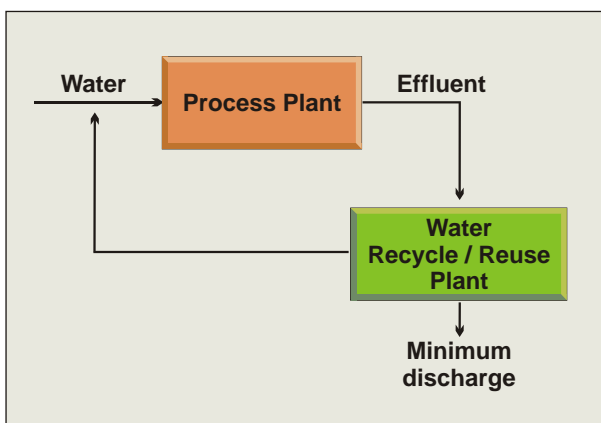
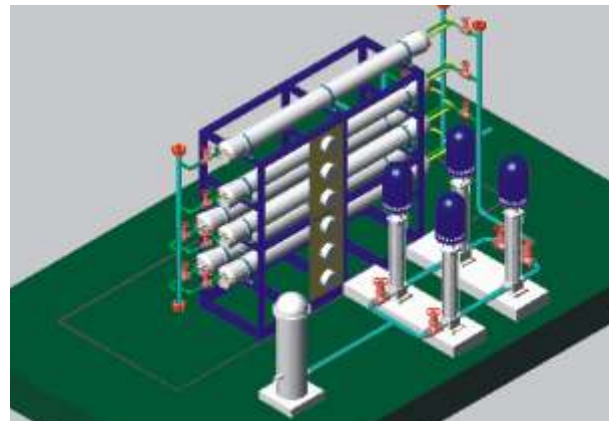
PRAJ offers a wide range of water treatment equipments including Clarifiers, Filters (PSF, ACF, DMF, MGF, Cartridge Filter and IRON Removal Filter); Disinfectant (Ultra Violet, Chlorination and Ozonation).

Praj offers water treatment solutions for Power, Steel, Sugar, Distillery & Breweries, Dairy, Pulp & Paper, Process & Chemicals, Textile & Tannery, Petrochemical, Fertilizers, Oil & Gas, Pharmaceutical & Bioscience industrial verticals.

RECYCLE AND REUSE OF WATER

We invest considerable efforts in understanding the needs of our customer. Challenge of processing effluent for reuse to meet the world's increasing need of water never ends. We are helping to meet the demand with a basket of proven technologies, innovation and years of experience. Our recycle solutions integrate physico-chemical, biological and membrane separation process for efficient wastewater recycle and reuse. Solutions include advanced effluent treatment processes like - Micro filtration, Ultra filtration, Nano filtration, Reverse Osmosis Systems, and Membrane Bioreactors etc. Praj membrane filtration systems consist of ECOFIL-RO, ECOFIL-UF and ECOFIL-MF technologies.

To convert effluent into extremely pure and suitable water for immediate reuse, we offer two different membrane based bio-reactors (MBR). The ECOBrane-SB is submerged MBR technology to treat wastewater in a very compact Bio-reactor. ECOBrane-XT is external type MBR based on cross flow and air lift technologies. The concentration of biomass inside the bioreactor can be kept maximum thereby reducing the overall foot prints by a factor of 3-4 compared to conventional systems. These are used in combination of PRAJ biological systems to yield better results.



REDUCTION & RECOVERY THROUGH CONCENTRATION AND SEPARATION TECHNOLOGIES

CONCENTRATION AND SEPARATION TECHNOLOGIES

We deliver high end solutions for concentration and separation by evaporation, distillation and adsorption technologies with deep understanding of various industrial processes. We have substantially contributed to concentration and separation technologies over last 25 years.

ECOVAP* is the environment friendly, energy efficient range of evaporators. Evaporation is a process of vaporization of solvent from solution in order to increase the concentration of the solute. We offer a range of solutions including Falling Film, Forced Circulation, Rising Film, Special Falling Film, Thin Film and Patented Fluidized Bed Evaporators. The systems are integrated with high steam economy and effective combination of pressures.



ECOFINE* DISTILLATION SYSTEMS



ECOFINE distillation systems are designed to have minimum moisture content in product and better separation of low boiling impurities to meet the required standards. We have incorporated highly efficient column internals like bubble cap trays and hyper stat grid trays for more effective separation of impurities along with reduced scaling and down-time. We offer energy

integrated solvent recovery plants based on azeotropic distillation, extractive distillation, liquid-liquid separation technologies and adsorption technologies. The plants can be fully automated and deliver consistent product quality with high energy efficiency.

ECOMOL Molecular Sieve Plants

The **Molecular Sieve** plant offered by Praj is state of art pressure swing adsorption technology designed for gentle movement ensuring longer desiccant life, high product dryness and lowest energy consumption. More than hundred plants of varying capacities across the globe meeting most stringent quality norms are operating and delivering desired performance. Depending on the requirement, Praj can supply fully automated skid mounted units for smaller capacities which are easy to install.



SERVICES

Comprehensive, multi-disciplinary services eliminate split of responsibilities and ensure in time project completion within budget.



*It is not the strongest of the species who survives,
not the most intelligent, but most responsive to change.*

- Charles Darwin

KEY REFERENCES

- Balrampur Chini Mills Ltd. (BHL)
- Daya Engg Works Ltd.
- HSB Agro Industries (P) Ltd.
- Sovereign Distilleries Ltd.
- SPY Agro Ind. Ltd.
- AADL (Nigeria)
- DICSA (Mexico)
- KKA (Thailand)
- Korach (Thailand)
- British Sugars (UK)
- Konya Seker (Turkey)
- Agribiotech Ind. Ltd.
- EID Parry (I) Ltd.
- Shaw Wallace Gelatines Ltd.
- Orchid Pharmaceuticals
- Cadburys India Ltd.
- Gujarat Ambuja
- Bhatia Wines Merchants (P) Ltd.
- and many more





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