

Total Brewery Expertise





*Innovate
Integrate
Deliver*



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Praj Partnering your Performance

What started off as an entrepreneurial venture three decades ago is considered to be India's most successful biofuels Company, taking biobased technologies from India to the World. Today, Praj offers innovative solutions for Beverage alcohol and Bioethanol plants, Brewery plants, water & wastewater treatment plants, critical process equipment & systems and bioproducts.

A globally leading Company with over 750 references in more than 75 countries across 5 continents, Praj has acquired an international repute for responsible and reliable solutions.

Brewery at a Glance

Praj supplies world class Brewery plants capable to produce the best quality of beers at the most optimum cost. The breweries supplied by Praj are environment friendly utilizing minimum water, energy and with low carbon foot prints. Right from conceptualization, technology, design, plant engineering up to project installation and commissioning - Praj offers complete solutions backed by expertise and experience.

Providing seamless integration is what the Praj Brewery Technology Solutions has set as its offering principle. Whether it is a Greenfield or a Brownfield project, Praj Brewery Technology Solutions provide total brewery engineering and technology services.

With over 70% of the market share in India and experience of installing projects in Africa and South East Asia, Praj is one stop partner for setting up a world class brewery.

Other Business Verticals

Bioenergy

Solution Provider in ENA/Ethanol plants upto ZLD*
Modernization & upgradation and BioCNG plants



High Purity

High purity applications for pharma, biotech,
cosmetics industry & ZLD



Engineering Businesses

Critical process equipment & systems and
Modular Process Skids
Effluent Recycling & ZLD



Research & Development

Customized Research Services & Solutions and
Bio-Products



Milestones: Corporate and Brewery Business

1983
-
1990

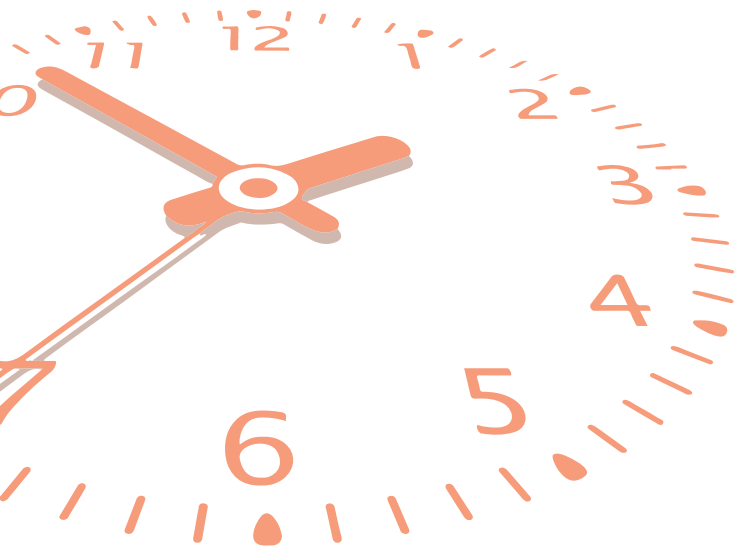
- Established in 1983
- One of the first companies to avail Venture Capital Funding through ICICI
- Set up an R&D Center

1991
-
1995

- Launch of IPO
- Beginning of Brewery Engineering
- Association with Filtrox, Switzerland for Beer Filtration Equipment
- First order from Fosters India (Now SAB Miller)

1996
-
2000

- First Brew taken at Fosters India (100,000 HPLA expandable to 450,000 HPLA)
- First turnkey brewery in Sri Lanka. Commercial production at UB, Lanka (120,000 HPLA expandable to 200,000 HPLA) commences



2001
-
2005

Commissioned Charminar Breweries, Hyderabad, Largest Lauter Tun brew house in India (500 HL)

Commissioned Tripti Alcobrew, Gwalior with 8 brews/day

2006
-
2013

Association with Merua for supply of Mash Filters

Budweiser launched in India through Praj's plant

Commissioned Rochees Brewery, largest Lauter Tun in India

Commissioned Blossom Industries Ltd, first mash filter brewery with 14 brews/day

Commissioned largest site fabricated Unitanks in India

2014
-
2017

Praj Commissioned United Brewery's Bihar, India Plant

Bagged order for 2 Greenfield & 1 Brownfield order from Carlsberg in India

Installed & Commissioned Greenfield breweries for SAB Miller and Heineken in Namibia and Myanmar respectively



Pillars of success

I. One Stop Shop

"One Stop Shop" is the mantra which Praj follows for offering complete turnkey solutions from conceptual stage of the project till commissioning.

When it comes to delivering brewery projects on a turnkey basis, Praj becomes customer's single point contact for mapping and executing the project needs to the best of customer's expectations.

Through its engagement with the customer from the conceptual stage itself, Praj offers a wide range of equipment, technology and services for building state-of-the-art brewery to produce some of the finest beers. Our customized and value for money offerings are aligned in such a way that it matches with the customers budgeted investments, timelines and future expansion plans.

Critical to the success of a Turnkey Project lies the detail planning and execution in a time bound manner, which ensures earliest start of commercial brewing and bottling.



II. Start to end solutions and Service

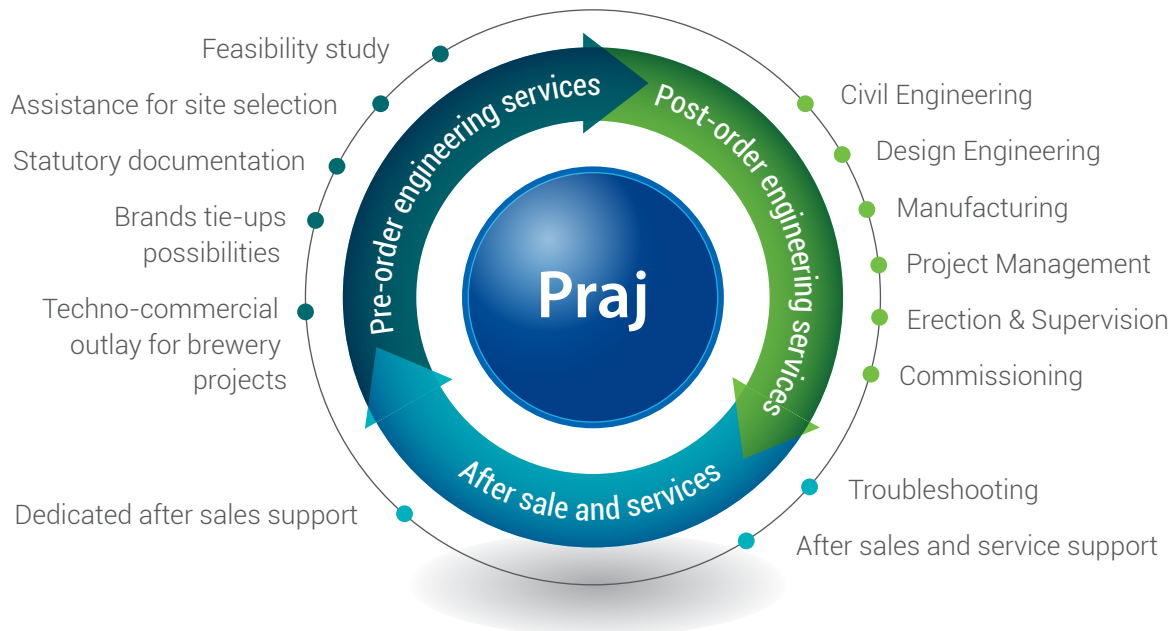
Feasibility & Viability Studies : Involving preparation of a detailed project report covering plant's design basis, capacity calculations, recipes, plant & machinery configuration, provision for expansion, brand tie-up possibilities & overview on market supply gaps & opportunities, project investments, payback calculations and break even analysis.

Technical Assistance : Estimating utility requirements of the plant (steam, power, water, electricity etc.), water balance calculation, ETP scheme & design, Site plot plan selection and plant layout drawing preparation, consultation with Architect and Civil designer, Interacting / meeting on behalf of the customer with statutory & regulatory bodies (like PCB etc.), Technical presentation and assistance in financial tie-ups.

Detailed Engineering & Design : Involving detailing of each and every section & equipment in the plant with preparation of executable drawings and documents.

Project Management & Execution : Involving preparation of detailed execution charts, mobilizing of the contractors team, submission of fund flow statements, onsite plant construction & execution, plant & equipment testing and pre-commissioning trials.

Commissioning and Handing over : Commissioning of the plant & KPI demonstration, co-ordination with the utility vendors on performance demonstration, plant handover, post performance demonstration, trouble shooting/fine tuning the performance, training of plant operators, submission of drawings, operating and maintenance manuals, preparation and signing off the project handover document.





III. Manufacturing

Praj has well equipped manufacturing facilities suitable for manufacturing of brewery process equipment having highest precision and hygienic standards. It houses all modern machineries such as dish pressing machine, dish spinning machine, automatic polishing machine, Plasma Arc Welding machine, shell rolling machine, facility to do glass bead blasting. Our team of well qualified and experienced engineers are totally committed in achieving world class quality resulting in 'Total Customer Satisfaction'.

Some Highlights:

- Well-equipped manufacturing facilities with automatic welding and polishing machines
- Total covered area of 2,00,000 sq. ft. and open area of 3,40,000 sq. ft.
- Accredited with ASME 'U' & 'H' stamp, ISO 9001- 2000 certification & CE marking
- Codes and standards followed include ASME Section VIII, Div.1, BS 5500, ASNI (SNT-TC-IA 1984 & 1988), TEMA, DIN, IS 2825 and AD Merkblatter
- Working in various grades of Stainless Steel, Copper, Carbon steels, Nickel, Titanium, Hastalloy and other exotic materials
- Large pool of approved vendors
Stringent raw material testing methods
- Effective supply chain management
- Well laid out Quality System
- HSE practices in line with international standards



Pune

Domestic Unit Fabrication capacity 6000 MT/year
Covered shop Area:100,000 sq. ft

Kandla

Manufacturing Facilities SEZ Units 1 & 2
Fabrication capacity-5000 MT/year
Covered shop Area:150,000 sq. ft

Wada

US FDA, UK MHRA and WHO compliant high purity water systems and hygienic

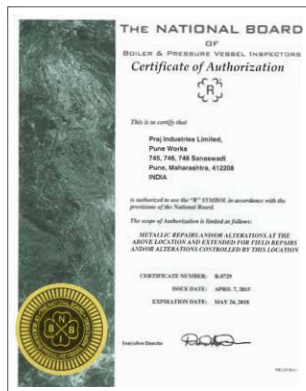
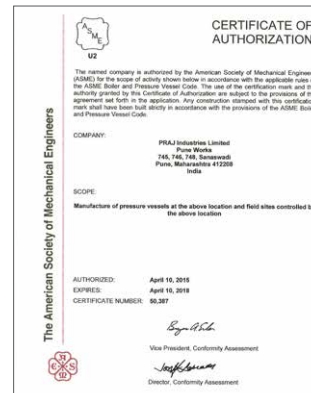


Certificates

- ISO 9001:2008
- Ensures consistency in product quality.
- Ensures customer satisfaction.
- Ensures continual Improvement in output.

QUALITY ASSURANCE

Enlisted with inspection agencies like UHDE India, SGS and TUV, Praj relies on a robust Quality Assurance Plan, drafted right at the conception of any undertaking and stringently adhered to, right till the end. This monitors and controls all aspects of quality right from audit of engineering drawings, vendors, suppliers, site/shop fabricated items and all agencies involved in the process. Raw materials and equipment undergo stringent chemical and mechanical tests including DP testing and NDT methods such as radiography, ultra sonography, magnetic particle testing, penetrate testing and leak testing.





Brewery Expertise

Introduction

Since its inception in 1994, Praj's brewery division has been offering customized plants, equipment & technology solutions to its customers in the brewing Industry.

In the last 33 years, Praj has played a pioneering role in engineering, design & construction of brewery plants & process equipment, strongly backed up by latest technologies & solutions in areas of Wort Production, Fermentation & Beer Filtration.

With the strong technical acumen, engineering base & project execution expertise developed over the years, brand Praj today is synonymous with Trust & Reliability.

The long standing & strong association we share with our technology partners Bucher-Filtrox and Meura further strengthens our credentials of being a reliable partner.

Being a part of the conglomerate which is listed on the Bombay & National Stock Exchange of India, we have a strong overall background and a totally committed top management team.

Some of Our Key Milestones include

- First Greenfield Brewery order from Foster's beer in India in 1995- within 1 year since inception
- First Turnkey Brewery order from United Breweries Lanka Limited (UBLL) in 1998
- First company to construct & commission India's Largest Brewery for SAB Miller Group
- 4 N Consecutive Greenfield projects from United Breweries - Heineken in India between 2006 to 2014

Raw material Section

Good beer is a reflection of the raw material used for Brewing & we make sure that your Beer is best in quality. Praj supplies state of art Raw material handling section for adjuncts, barley & sugar which ensures effective cleaning & storage of raw materials with utmost efficiency. Entire system is dust proof with dust collectors installed at various stages which ensures zero pollution. Equipments & Systems are designed as per ATEX requirement, entire system is fire proof with explosion vents provided at various locations.

Praj offered raw material section is designed to cater to current capacity of plants as well as future envisaged capacity of plants. Our customized design ensures that various raw materials can be handled by same system with minimum change over time.

Praj system comprises of three main sections:

- Raw material loading section with bucket elevators & silos
- Raw material unloading section with screw conveyors
- Cleaning & Milling section which includes Classifier, De-stoner, Drum Magnets, Mill and conveyors etc.



Brew House : Blend of Art & Science





Praj today has a rich experience and strong expertise in designing & delivering state-of-the-art Brewhouse, capable of processing different variety of raw materials & batch sizes. Our Brewhouse delivers the wort clarity, efficiency, extract yields and productivity (with shorter brewing cycles) at par with globally acceptable brewing standards ensuring highest wort quality.

Wort kettle is regarded as the turning point in the brewing of beer. Any change in boiling practice is to be monitored carefully and thoroughly to ensure they do not affect the quality and flavour of the final beer. Generally boiling wort at or near normal atmospheric pressure gives the most acceptable results.

The Praj Lauter Tun is uniquely designed to achieve highest extract yield with different types of grist and adjuncts. The design provides higher filtration areas, greater first wort concentration, optimum use of sparging water and higher bed loading.

The strong automation levels enables defining of accurate set points & differential pressure logic which enables achievement of perfect lautering speeds.



Unique Features of Praj Wort Kettle

- Options of External as well as Internal wort boiling system (Praj-e-COMBOILER).
- Variable speed control of wort circulation pump provides gentle handling of wort & helps in maintaining hot break together.
- The special design fountain entry of wort provides the large surface for the volatiles removal.
- Low pressure steam and hence lower temperature difference reduces the thermal stress exerted on wort.
- Lower heat flux and Optimum heat transfer area ensures more number of brews between cleaning.
- Less energy consumption





Yeast management : Because we care for smallest of the things

Praj Offerings Includes :

- Yeast Propagation systems with 2 stage and 3 stage propagation facility
- Yeast storage section with hygienic design agitator
- Yeast Drying Plants- double drum / Fluidized Bed dryer which ensures no spillage of liquid yeast and hence does not require any yeast recycling system



Fermentation and Bright Beer Section



Praj offers Fermentation & Lagering tank, Bright Beer tanks, yeast, CIP tanks, which are fabricated in Praj's own hygienic manufacturing facility.

Utmost care is taken during fabrication and inspection to ensure tanks have the best in class internal surface finish. This is well complimented with Praj's precision engineering and execution capability in installing the required pipe works, testing & insulating the tank, automation of the process cycles along with highest hygiene levels through customized CIP solutions.

Praj's Fermentation system is also characterized by specially designed fast chilling jackets for varying duties. The tanks are designed as per ASME/ AD Merkblatter standards. Most optimum and consistent cooling duties are achieved with both Glycol and Ammonia as cooling media with Praj designed cooling jackets.

Embossed type cooling jackets of the Fermentors :

- High heat transfer coefficients
- Parallel Coolant flow and lower pressure drops
- Low Coolant hold up
- Pulse TIG welding technique for less heat input and hence less distortion.
- Spot radiography of all weld joints full radiography of weld joints covered by the jacket and dished end.
- Tank design facilitates proper Yeast settlement and Yeast cropping



Automation for Your comfort



Automation:

- PRAJBREW' tailor made automation software
- Recipe controller batch processes
- Data collection and reporting
- Various automation levels available
- Provision for future upgrades
- Siemens - Braumat or Proleit
- Brewmaxx also offered
- Remote troubleshooting assistance



Utilities

The most critical aspect of any Project is optimum designing for Process block & Utilities. With solid engineering background and years of experience we make sure that Process block is completely in sync with Utilities which is a result of our precise engineering.



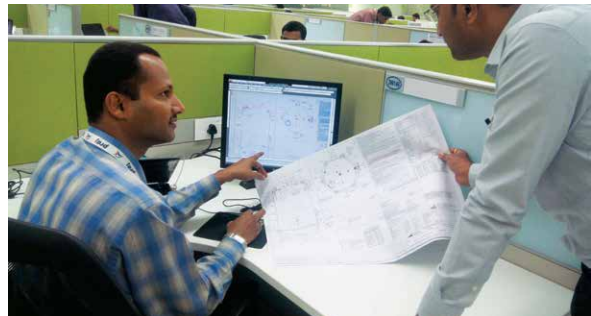
Project Management



Total Project Management and timely execution has been always the key strength of Praj. The Project Managers are well trained with many of them Certified as Project Management Associate (CPMA), who have passed International Project Management Association - Level D Examination, Switzerland.

Key Highlights

- Strong project management team with global experience
- Specially focused 'Task Force' for the project wherein Project Manager is given the empowerment to drive the team of Process Engineers, Designers, Instrument and Electrical Engineers, Manufacturing and Site Supervision.
- An exclusive team of various experts work with PMA and IPMA certified Project Managers.



On-Site fabrication & installation

Onsite Tank Fabrication

When it comes fabricating tanks having larger diameter and which possess problems in single piece transportation (due to road conditions, etc.), Praj prefers the option of fabricating and installing the tanks onsite itself.

Praj has its own dedicated teams from the manufacturing unit who along with our team of certified contractors undertake the onsite fabrication and installation job. They are duly supported by the quality control team which is deputed at the site for stage wise inspection of the tanks as per the defined quality assurance plan.

The tank components are usually prefabricated at the manufacturing units, checked for quality and finally dispatched to the site location.

Praj today has earned a unique distinction of the constructing and installing India's largest size Unitanks – 5000 HL gross volume with 6 mtr internal diameter for United Breweries at Aurangabad, Maharashtra. The fact that 8 Nos. of such tanks were constructed and installed in a record time frame of 6 months itself is a testimony of Praj's strong capability and resource base when it comes to onsite fabrication.



Partners in Technology



MEURA

Meura Mash Filter

PRAJ & Meura inked an exclusive partnership for India & sub-continent in 2006 to supply highly efficient Mash Filters in the Brewhouse.

Meura is the world leader when it comes to wort separation technology using Mash Filtration equipment.

Since inception, Praj – Meura has successfully commissioned 11 N mash filters across India. Offering the global best technology at a most competitive price to the Indian customers has been the partnership's key to success.

Through Praj's local infrastructure base in India & skilled resources, the partnership has been successful in localizing most of the Mash Filter peripheral equipment. With Meura's assistance, Praj also has been able to locally develop the electrical and automation hardware /software. The partnership today is the most successful one in delivering the best technology to the brewing industry at the most affordable price.

Praj engineers are also well versed with installation and electro-mechanical integration of the mash filter with rest of the Brewhouse equipment. Whether it is a new Greenfield or an existing brewery, Praj seamlessly integrates the mash filter within a least possible time frame. This is accompanied with an on-time performance demonstration. The installations are also well backed up by Praj's strong after sales service and support teams who support the customer by providing round the clock services & spares.

Meura Mash Filter Advantages

- High Productivity (at least 12 brews/day & higher)
- High extract yields (practical equal to lab yield)
- Low solids content < 5ml/ltr
- High gravity wort: $\geq 17.5^\circ\text{P}$ cold wort

11 Nos. Mash Filter Brew house commissioned and are in operation successfully; Highest so far by any company in India!

1 No. Mash Filter Brew house Under Execution

3 Nos. Mash Filter Brewhouse will be executed within one year.

Bucher-Filtrox

In the inception year itself, Praj inked partnership with global number one company in beer filtration equipment, M/s Filtrox (now Bucher Unipektin AG).

Since its association Praj & Bucher-Unipektin has successfully commissioned over 56 nos. of filtration plants in India. Today, these reference installations account for more than 85% of the beer which is produced in India.

This long and successful association itself is a testimony of Praj's credentials as a trustworthy and reliable business partner.

Today apart from main candle filters for beer filtration,, Praj & Bucher Unipektin has also introduced India's first beer recovery plant from surplus yeast.



BUCHER
filtrox



Craft Brewery Solutions



Crafted To Brew Your Perfect Recipe

Praj offers range of customized solutions & process equipment when it comes to construction of craft breweries.

Praj offers craft brewers the flexibility to develop & brew their own recipes & batch sizes using different varieties of raw materials.

We offer:

Brewhouse:

- Customized , modular design
- Batch sizes :
 - Compact - module : 15 HL to 50 HL
 - Industrial module : 50 HL to 100 HL
- Annual Capacities upto 250,000 HL/year
- Upto 12 Brews/day with flexibility

Fermenters:

- Fermenters/Tanks as per capacity planning
- Flexible & modular concept with simple design
- Equipment specifications like cooling rates, dimensioning and material of construction as per Brewer's Requirements

Craft Brewery Solutions- Praj Advantages:

- Solutions from Brewhouse to Bright Beer Tanks –Crafted for the Brewers requirement
- Simple modular design with vessel configurations-- to enable easy future expansions
- Designed to meet minimum space and installation requirements
- Pre-designed & pre-assembled systems allow optimized site installation & commissioning time
- Highly experienced and professional team for projects and after sales support



Technology Delivered : References

Largest Project Reference Base in India



Our Marquee Customers...



Praj Worldwide

India | South Africa | Thailand | UAE | USA



Innovate • Integrate • Deliver

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