Praj Matrix - R&D Center

Praj Matrix - R&D Center (division of Praj Industries) is designed along the principles of sustainability and innovation with the goal of providing environmentally friendly solutions for a future-perfect world. Praj Matrix applies multi-disciplinary experience and expertise, deploying world class laboratory, pilot and scale up facilities to accelerate the development of bio-based technologies. These facilities ensure development of robust technology packages that exceed customer expectations of performance, cost and quality.

Located in Pune (India), Praj Matrix is built on a 5 acre expanse with a built-up area of about 85,000 square feet.

So far, the total number of patents granted stands at 16. Number of Indian and Foreign Patents filed by Praj stands at 63*

The department of Scientific and Industrial Research, Government of India has certified Praj Matrix - R&D Center as an In-House R&D laboratory unit. The R&D Campus has received status of Private Sector BioTech Park by the Government of Maharashtra.

* (as on Date)

Vision

To be a global leader in break-through sustainable & commercializable technologies for renewable energy & biobased chemicals & materials, environment and health solutions while enhancing societal & stakeholder value.
Focus Area

Growth Drivers

**Health and Wellness products such as**
- Cosmetic Ingredients
- Functional Food Ingredients and Nutraceuticals
- Probiotics and Prebiotics
- Dietary Supplements
- Phytochemicals

**Advanced Strain Development**
Pathway Engineering and Genetic Modification of micro-organisms for the production of BioFuels and BioChemicals

**BioFuels**
- Ethanol
- Advanced Jet Fuels
- Drop in Fuels

**BioChemicals based on**
- Pentose Sugars
- Hexose Sugars
- Lignin
- Glycerol

Centres of Excellence (CoE)

- Praj Matrix employs a Centre of Excellence (CoE) model as its operating mechanism
- Each of the CoEs brings a particular technology specialization to the fore
- Technology programs utilize resources from various CoEs any given time
Facilities

**Analytical Facility**
- ISO 9001: 2008 Certified
- Analytical facility for analysis of wide range of samples including Biomass, Oleochemicals, nutraceuticals and other specialty Chemicals
- Dedicated laboratories for wet chemistry, Instrumentation, Organoleptic and Microbiological analysis with processing capacity upto 300 samples per day
- Fully equipped facility with multiple HPLC, GC, GC-MS, Ion Chromatography, ICP, TGA, DSC, FTIR, FTNIR, UV-VIS spectrophotometer, Rheometer, Cloud & Flash point Apparatus, Rapid acid digestion units, Anton parr, Lyophilizer, Flash Chromatograph and COD Digester

**Bioprocess Development Facility**
- State-of-the-art sterile fermentation facility for bioprocess development
- Fully automated fermentors 2 L to 100 L scale under one roof for rapid process scale up and validation
- Multipurpose facility flexible for various downstream processing configurations
- Fully equipped to generate commercial grade samples for various applications
- Balancing equipment/systems for producing different grades of alcohol
- Downstream processing facility equipped with S/L separators, membrane separation units, chromatography columns, Liquid-Liquid extractors, Crystallizer, Vacuum evaporators, Dryer and leaching apparatus
Clean Room Facility

- 9000 sq ft of Clean Room Facility housing 6 research laboratories for conducting microbiology and molecular biology research

- Isolation and screening of microbes for novel activities which have resulted in the development of engineered strains for Biofuels and Biochemicals. Enzyme characterization and Assay development are also carried out in this facility

- Infrastructure and expertise for handling Aerobic, Microaerobic and strictly Anaerobic microorganisms

- Well equipped with PCR, Real time PCR, Electrophoresis and Electroblotting units, Gel Documentation systems, Electroporation and Cell Fusion Systems, Chromatography systems, Ultra Centrifuges, Spectrophotometers, Biosafety cabinets, Anaerobic glove box, Lyophilizers, and Ultra deep freezers to carry out strain development work

Chemical Process Development Facility

- High Pressure Stirred tank reactors from 700 mL to 25 L scale under one roof for rapid process scale up and validation

- SCADA controlled Dual Fix Bed Reactor system

- Catalyst forming machines such as Granulator, Fluidized Bed Drier and Hydraulic Press

- Research activities in the domain of Biofuels, Biochemicals, Nutraceuticals, Livestock health and wellness products

- Downstream processing expertise and equipments for Continuous Distillation, Liquid-Liquid extraction and Crystallization

- Fully equipped to generate commercial grade samples for various applications
ECOPHOTOx®

- Ecophotox is advanced technology used for the removal of organic and inorganic compounds from effluents and water. It is based on advanced oxidation process.
- Performed Bench Scale testing from 1 LPH to 250 LPH.

Pilot/Demo plants

**MSDH**

- Molecular Sieve Dehydration (MSDH) technology is used for removing moisture from hydrous alcohol
- Fully automated MSDH Pilot Plant
- Capacity: 500 Liters/day anhydrous alcohol production
- Application: For testing and validating various grades of molecular sieves applicable for pharma, beverage and cosmetic grade alcohol.

**ATFD (Agitated Thin Film Dryer)**

- ATFD (Agitated Thin Film Dryer) is based on advanced drying technology used for drying of difficult and unique materials.
- Application: To test and validate data emanating from various streams like distillery effluents (raw spent wash and biomethanated spent wash) and other complex effluent from textile, pharmaceutical, chemical plants.

**ECOPHOTOx®**
Recent Awards & Recognition

Praj Matrix is a recognized research centre by Department of Scientific and Industrial Research (DSIR), Government of India

**PRAJ Matrix bestowed with the ABLE Tenth Anniversary Award**
under the BioIndustrial category for its efforts and dedication towards Biotechnology  

**Bio-Excellence Award**
Praj matrix awarded the Bio-Excellence Award 2012 for its outstanding contribution to BioIndustrial Sector  

**IGCW Green Innovation Award**
Praj was awarded by Industrial Green Chemistry World organization for outstanding research in the field of Green Chemistry and Engineering  

**Bioexcellence Award- Industrial Biotechnology**
Praj was awarded with Bioexcellence award for its brilliant performance in Industrial Biotech Sector at international conference, Bangalore Bio 2009  

**The Innovation Award IIT Bombay/ Tie Pune Chapter**
Praj was awarded by The Innovation Award for development of technology for Production of Ethanol from alternate feedstock; Sweet Sorghum  

**National Award for outstanding In-House R&D Achievements by DSIR, Govt. of India,**
Praj was given this award for its contribution in the field of Multi feed ethanol production technology - Smart Distillery
Praj Worldwide
Argentina I India I South Africa
Thailand I UAE I USA