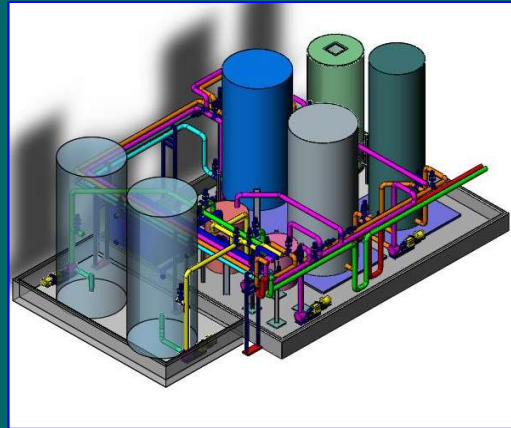


PROU INDIA
ENGINEERING
Private Limited



**Basic & Detailed Engineering Design and
Project Management Services Company**

We Are: “ProU India”

Company Information



- Established in 2006 as a JV with Processes Unlimited Intl. - USA, Manrochem India and Raslan Contracting, Bahrain as partners
- Located in Chennai, India – the engineering hub
- Specialists in Process Design and Detailed Engineering Services
- ProU USA was acquired by Stantec and subsequently not part of the JV

- Project Concepts
- Feasibility studies
- Basic Engineering
- Detailed Engineering
- Process/ Energy/ Safety/GMP and Maintenance audits

Engineering Services

Procurement Construction Support

- Procurement Management
- Expediting & Inspection support
- Construction supervision

ProU India

Core Sectors

- Petrochemicals
- Fine & Specialty
- Pharmaceuticals
- Polymers
- Agrochemicals
- Chlor Alkali

EPC

- ProU India can take up certain portions of the project on EPC basis.
- Non critical areas like utilities package, Distillation packages (Solvent recovery), Clean rooms etc

Quality Systems

- A detailed project procedures manual guides the preparation, checking and delivery of all our engineering designs
- The procedures adopt rigorous document and drawing checking methodology
- The manual has been drafted jointly with our overseas office

Service Offering

Our Service Portfolio

Project Design - Initial Services

- Project Concepts
- Technology sourcing & evaluation
- Site selection support
- Techno economic Feasibility studies
- Detailed Bankable Project reports
- Preliminary plant design for Capital Cost Estimation
- Profitability Calculations and Financial projections to support viability studies

Basic Engineering/ FEED Services

- Process Flow Diagrams & P&ID
- Material & Energy Balances
- Process Simulations using Aspen/Unisim
- Equipment sizing & specifications
- Process control philosophy
- HAZOP study and implement safety recommendations to issue final P&ID
- Equipment Process Data sheets
- Utility sizing and specifications
- Process Plant Layouts
- Preliminary effluent treatment scheme

Design and Detailed Engineering Services

- Multi disciplinary engineering skillset including Civil/Structural, Mechanical/Piping, Electrical and Instrumentation
- 3D Modeling using Autodesk Plant Design Suite
- On-site design and drafting support if required
- As-building
- Project collaboration through cloud servers
 - Communication with remote sites
 - Common secure internet site for all parties
 - Fast delivery of data via internet
 - Redline, review capabilities, etc.

Design and Detailed Engineering Services

- **CIVIL & STRUCTURAL (Outsourced)**
 - General arrangement drawings of all plant buildings
 - Piling and foundation design
 - Structural design calculations using STAAD
 - Issue of “Good for construction drawings” for all RCC & structural works
 - Tender specification for Civil construction
 - Technical Bid evaluation and recommendations
- **MECHANICAL**
 - Equipment layout and GA drawings
 - Detailed equipment specifications
 - Piping Layouts
 - 3D modeling
 - Piping isometrics
 - Specifications for erection, piping and insulation
 - Material take off for pipes, valves, fittings etc
 - Technical review of all vendor drawings prior to fabrication
 - Tender specification for erection, piping and TBE

Design and Detailed Engineering Services

- **ELECTRICAL**

- Electrical system design – HT & LT
- Plant electrical load details and Single Line Diagram
- Distribution – Power and Lighting
- UPS – Design & Procurement
- Earthing design and specifications
- Lighting plan development / analysis
- PCC, MCC and switchgear specification
- Power generation, transmission and distribution
- Electrical Energy audits
- Troubleshooting, optimization and energy conservation

Design and Detailed Engineering Services (contd.,)

- **INSTRUMENTATION**
 - Process control system design
 - Control Philosophy
 - Cause & effect Matrix
 - HAZOP / SIL Participation
 - Instrument specifications/Data sheets
 - Specifications for DCS, PLC, SCADA, ESD, FGS
 - Plant start-up and commissioning support
 - Selection and recommendation of Instruments/valves/systems
 - Troubleshooting and optimization

Project Management & Other Services

- Client's Engineering Services
- Procurement Services
- Construction Supervision
- Process De-bottlenecking studies
- Project due diligence audit
- Energy & Safety audits
- cGMP & Maintenance audits
- Environment & Statutory Compliances support
- Regulatory and Validation supports

Valuation & Chartered Engineer Certification Services

- Approved Chartered Engineers in Chemical, Mechanical and Civil Engineering Domain
- Approved Plant & Machinery Valuation support (as per new IBBI guidelines)
- Plant assessment and valuation support

INDUSTRIES WE SERVE

Process Industries

- Petrochemicals
 - Brown Field engineering
 - Emergency Shut down systems
 - F&G Detection & Suppression system
 - Upgradation and replacement of equipment
 - Analyser Shelters
- Oil / Gas
 - Early Production Facility
 - Pipeline Systems
- Polymer & Related
 - Basic & Detailed Engineering
 - HAZOP Studies
 - Automation – Concept and implementation
 - Material handling and pneumatic conveying systems
 - Monomer recovery
 - Drying systems
- Water Treatment Plants
 - Basic Design
 - Waste Water System



Process Industries

❖ Specialty & Fine Chemicals

Basic & Detailed Engineering

❖ HAZOP Studies

❖ Pipelines and Piping

❖ Utility design

❖ Steam and Process water

❖ Generation

❖ Distribution

❖ Metering and Control

❖ Energy & Safety Audits

❖ Pharmaceuticals

❖ Multipurpose Plant design

❖ GMP concepts

❖ Documentation support

❖ Basic & Detailed Engineering

❖ Natural Products

❖ Concept to Commissioning

❖ cGMP compliance

SAMPLE PROJECTS (Petrochemicals)

Completed Projects (2010-2012)

- DCW Limited – PVC Expansion (De-bottlenecking)
 - Automation & Expansion of PVC production plant from 90,000 MT to 130,000 MT (Brown field project)
 - Dryer expansion and Product Silo
 - VCM Stripper Project (BEP from Chisso, Japan)
 - Detailed Engineering pertaining to process, mechanical, Piping, Electrical and Instrumentation
 - Procurement Assistance &
 - Site supervision for erection & commissioning
- Project Cost : USD 14.5 Million
- Note : This was implemented as a Process debottlenecking study to increase the capacity from 90 KTA to 130 KTA without addition of any New reactors. This was achieved by reducing batch time by automating the entire process.



Completed projects (2008-2010)

- Up gradation of Fire and Gas Detection System for Compressors at KNPC MAA Refinery, Kuwait
 - Brown field upgrades include
 - Automation of compressor discharge system for 34 large Gas compressor stations
 - Modification and upgrade of ESD
 - Replacement of Halon with Deluge system
 - Piping and Instrumentation
 - Associated Civil and Structural Design
 - Scope
 - Detailed Engineering and Design
 - Procurement and construction support
- Project Cost : KWD 4 Million



Completed projects (2007-2009)

- Burren Energy - Turkmenistan Field Development
 - Brown field upgrades include
 - Water Treatment Expansion
 - Oil Dehydration Expansion
 - Substation Replacement
 - Utility Expansion
 - Flare Knockout Drum Installation
 - Heater Installation
 - Scope (Support to US Office)
 - Detailed Engineering and Design
 - Procurement Support
- Project Cost : USD 12 Million

Completed Projects (2012-2014)

- Cetex Petrochemicals Limited, Chennai
 - Expansion project for sec Butyl Alcohol and Methyl Ethyl Ketone (Brown field to introduce Line 2)
 - Residual Basic & Detailed Engineering
 - 3D Modeling
 - Procurement Support
 - Supervision of erection
 - and commissioning
- Project Cost : USD 10 Million



Completed projects (2008-2009)

- EPF for Kuwait Oil Company – EPF – 120 MBOPD
- 10,000 Man hours
 - Green field project
 - Supporting the EPC (Al-Rashed) for this green field project
 - Scope (support to ProU, USA)
 - Detailed Engineering and Design
 - Deputation of technical personnel
- Project Cost : USD 9.1 Million



Completed projects (2012-13)

- Peroxide Warehouse as per NFPA regulations – Arkema Peroxides India
- - 3,000 Man hours
- Construction of 3 Nos. product warehouse in the existing site.
- Scope
 - Detailed engineering (Civil/Structural/Electrical)
- Project Cost : USD 3 Million

Completed Projects

- Arkema Peroxides India - Cuddalore
 - Diluted Product Manufacturing Plant
(Fast Track brown field project)
 - Process design verification
 - Equipment Layout
 - Detailed Structural Design
 - MTO & construction support

Completed Projects (2014-2016)

- Kharafi National, Kuwait
 - Mechanical Upgradation projects at MAB Refinery, KNPC.(Brown field project)
 - Detailed Engineering
 - 3D Modeling
 - Procurement Support
 - Supervision of erection and commissioning
- Project Cost : USD 6.25 Million

Completed projects

- Arkema Peroxides India Ltd (2016)
 - Brown field project for manufacture of Cross linked Solid peroxides
 - Basic Engineering
 - Detailed Engineering
 - Procurement Support

Completed Project (2018)

- Chemplast Sanmar Ltd, Mettur
 - Hydrogen Peroxide Project (Acquired from Asian Peroxides and relocated)
 - As-building in old site (Layouts, Data sheets, P&IDs, E&I systems, Utilities etc)
 - Tagging concepts
 - Dismantling supervision
 - Transportation plan
 - New Site – Development of Layout plans
 - Detailed engineering of all disciplines for new location
 - Balancing equipment identification
 - Procurement & construction support
 - Project Cost : USD 12 Million

Completed projects (2019)

- Arkema Peroxides, Cuddalore
- - Safety Study (Domino effect) using CFD analysis for expansion
 - Line 2 expansion – Design basis
 - Software based CFD modeling and analysis
 - Conceptual safety design

Completed Projects (2019)

- Musashi Paints India Ltd, Chennai
 - Detailed engineering for expansion
 - Basic and detailed Engineering
 - IFC drawings for all disciplines

Completed Project (2019)

- Carbon Clean Solutions (Mabel Engineers)
- - Detailed engineering services for a CO₂ capture project for Tata Iron & Steel
 - Detailed Engineering (including skidding design)
 - Procurement assistance

Completed Project (2019)

- TCI Sanmar, Egypt
 - Process simulation studies and engineering services for various process/mechanical related projects
 - Simulation using Aspen software
 - Engineering design and drawings
 - Distillation column design and heat exchanger sizing verification through simulation

Completed Project (2019)

- ITC, Bhadrachalam (Paper Division)
- - Corrosion study for White liquor tanks
 - Design of New tanks
 - Detailed engineering for new White Liquor tanks
(3 x 1500 cu.m.)

Completed Project

- Cetex Petrochemicals Ltd, Chennai
 - Methyl Iso Butyl Ketone Project (Acquired from Shell Houston and relocated)
 - Data collection at US site
 - Dismantling contractor finalization and supervision
 - Loading and Shipping plan
 - Detailed engineering of all disciplines for new location
 - Balancing equipment identification
 - Procurement assistance
 - Construction supervision (Project on HOLD at new site due to fund constraints)
 - Project Cost : USD 25 Million

Completed Project

- Tagros Chemicals India Pvt Ltd, Cuddalore
- - Detailed engineering design for a new Agrochemical plant
 - All disciplines detailed engineering, Procurement assistance and Construction supervision.
 - Total Project Outlay : INR 60 Crores

SAMPLE PROJECTS

(Food, Pharma & Specialty
Chemicals)

Completed projects (2009-2010)

- Natural Remedies, Bangalore – 7,500 Man-hours
 - Green field project for Natural herbal extracts
 - Detailed Project Layouts
 - Detailed engineering for Mechanical, Piping, Electrical and instrumentation
 - Engineering to suit GMP compliance
 - Procurement support & Supervision of erection and commissioning
 - Project Cost : USD 2 Million



Completed projects (2012-2013)

- Finlay's Extracts Limited, UK
 - Feasibility Study & Capex estimation for an Instant Tea plant at Sri Lanka
 - Technology evaluation and finalization
 - Preparation of Technology document
 - Equipment specifications
 - Detailed Project Report, Site evaluation and selection
 - Estimated Project Cost : USD 30 Million

Completed Projects (2006)

- Organica Aromatics, Dobaspet, Bangalore
 - Detailed Engineering and procurement support for a green field aromatic chemicals project
 - Detailed Project Layouts
 - Detailed engineering for Process, Mechanical, Piping, Electrical and instrumentation
 - Design to suit best engineering practices
 - Procurement support & Supervision of construction
 - Project Cost : Rs. 10 Crores (without land)



Completed Projects (2012-2013)

- Finlay Extracts Limited, UK –
 - 5,000 Man-hours
 - Basic Engineering for an Instant Tea project
 - Process study at existing site and finalisation of optimum process for the new project
 - Process design and PFD
 - Materials and energy balance
 - P&ID
 - Equipment specifications
 - Equipment Layout
 - Site selection and preliminary factory Layout

Completed projects (2016-17)

- Kumar Organics Limited, Bangalore
- - API Project
 - Green field project
 - Manufacture of a specialty API with cGMP design
 - Scope
 - Detailed Engineering
 - Procurement assistance and Documentation support

Completed projects

- Mane SA, Switzerland (2017)
- - Front End Engineering Design for setting up a Global R&D Centre in Bangalore
 - Site selection
 - Basic Design
 - FEED
 - Capex Estimation and Project detailed plan commissioning

Completed Projects (2018)

- Mane Aroma Chemical India Pvt Ltd, AP
- - 12,000 Man-hours
 - Green field project for manufacture of Aroma Chemicals (Fully automated plant)
 - Basic Engineering
 - Detailed Engineering
 - Procurement Support
 - Supervision of erection and commissioning
- Project Cost : Euro 5.5 Million

Completed Project (2019)

- Kancor Ingredients Limited, Cochin
- - Basic & Detailed engineering services for a Herbal extraction project (GMP compliant)
 - Site revamp plan
 - Basic engineering
 - Detailed Engineering of all disciplines
 - Procurement assistance
 - Construction supervision

Completed projects

- EICL, Yamunanagar (2017)
- - Engineering feasibility study for revamp of Starch manufacturing facility
 - Existing plant audit (GMP/Safety)
 - Process revamp plan
 - Front End engineering preliminary design
 - Capex Estimation and Revamp plan

Completed Projects

- Some of our earlier projects include
 - Fluorine based Pharmaceutical intermediates, Speciality fluorides etc for Tanfac Industries Limited
 - Bulk drug intermediates for Amrutanjan Limited, Sanmar Specialty Chemicals etc
 - API plants and formulation plants for American Remedies, Proventus Life sciences, Adithya Alkaloids etc

Current Assignments

Current Assignments

- Tagros Chemicals Ltd, Cuddalore
- - Design and engineering of a Pilot Plant
 - Automated, Batch reactors with distillation and solid handling facilities
 - Vertical process flow concept with multiple floors
 - Augmentation of Utilities including power
 - Civil and Structural design

Current Assignments

- Solara Actives, Vishakapatnam
 - Detailed engineering design for a new API Intermediate plant
 - FEED verification
 - Equipment Data sheets
 - Storage bullets and Flare design
 - Equipment Layout
 - 3D Modeling & Piping
 - Electrical & Instrumentation Detailing

Current Assignments

- Turnkey Project for Jabel Aly Chem, Egypt
 - Design, Supply and installation of a 20 TPD Ethyl acetate plant
 - Basic Engineering
 - Detailed Engineering
 - Supply of all equipment including Control system
 - Erection and commissioning at site

Current Assignments

- Kawman Pharma, Cuddalore
 - Detailed engineering design for a new API Block and a Pilot Plant
 - Equipment Data sheets
 - Equipment Layout
 - 3D Modeling & Piping
 - Civil & Structural design
 - Clean room design
 - Electrical & Instrumentation Detailing

Current Assignments

- Sthree Chemicals (Nuray), Ranipet
 - Detailed engineering design for a new API plant
 - FEED preparation
 - Process and mechanical design
 - Civil design
 - Factory and Equipment Layout
 - 3D Modeling & Piping
 - Electrical & Instrumentation Detailing

Current Assignments

- TCI Sanmar, Egypt (3 concurrent projects are underway)
 - Detailed engineering design for VCM2 Debottlenecking
 - Procurement assistance and design for VCM 3 debottlenecking
 - FEED and detailed engineering for Liquid Calcium chloride project

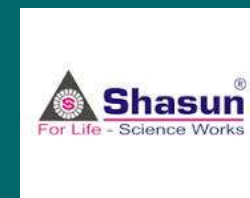
Current Assignments

- Chemplast Sanmar Ltd, Berigai
 - Detailed engineering design for a new **Specialty chemical** plant
 - Basic Engineering from Pilot data
 - Layout conceptualisation (5 Floor process flow) including solid handling facilities
 - Detailed engineering of all disciplines except civil engineering
 - 3D Modeling & Piping
 - Procurement assistance
 - Construction supervision

Current Assignments

- Anadach / Ernst & Young - Nigeria
 - Domain expert services for setting up of new API project in Nigeria (Funded by NSIA (Govt body))
 - Product evaluation
 - Project conceptualization
 - Project and product costing support
 - Capex estimation
 - Feasibility study
 - Existing plant

Major Clients



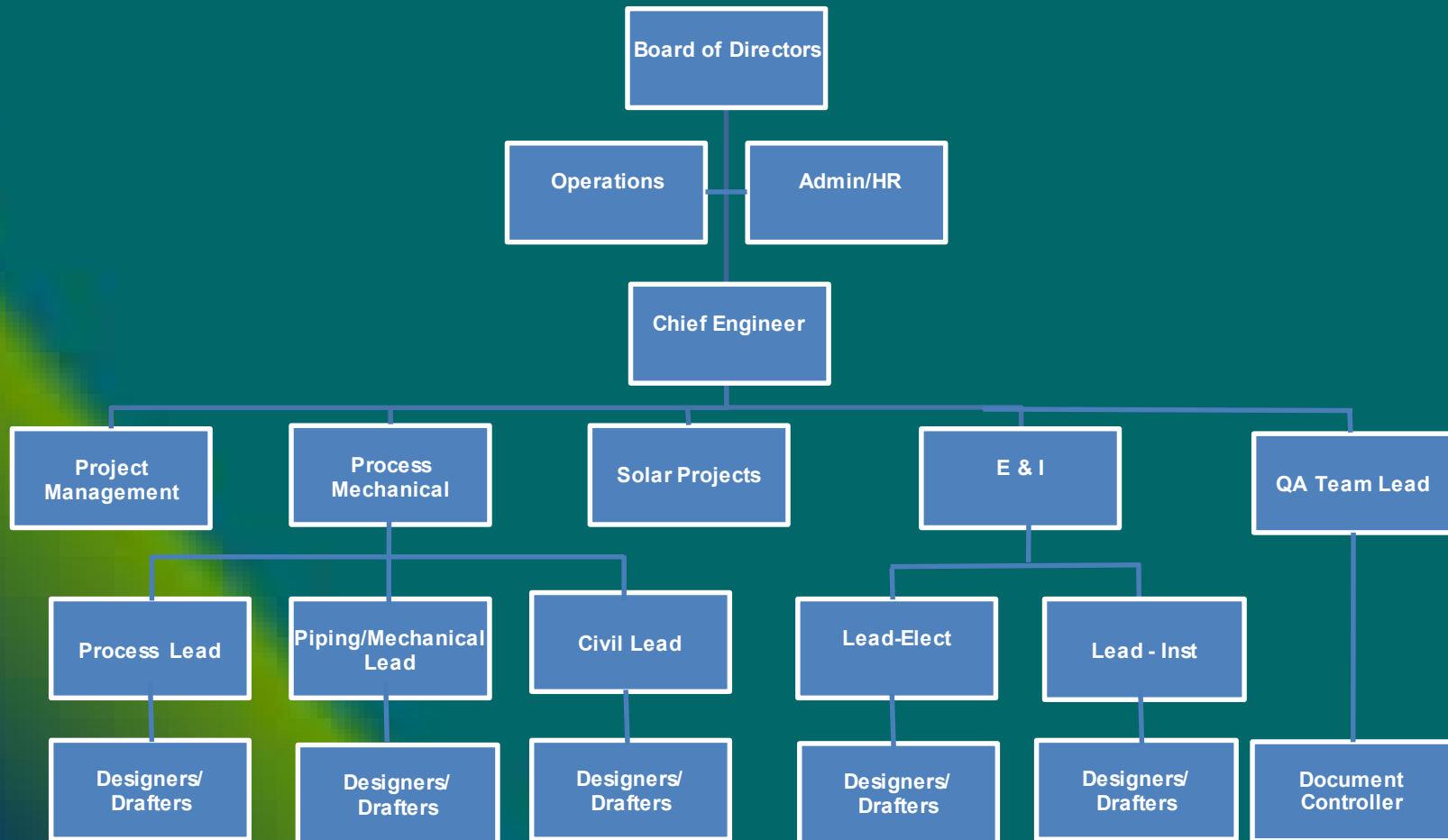
Major Clients





Organogram

COMPANY ORGANIZATION CHART



Refer Manpower List for designer/drafter details

Associates

- **Frost & Sullivan, India & UAE**
 - ProU works with Frost on many Feasibility studies and detailed project report assignments related to Chemical sector projects
- **Asia Pacific Risk Management Services, Chennai**
 - ProU works exclusively with APRMS on all safety related aspects of the project starting from Layout and P&ID HAZOP, QRA, Fire water system design, safety audits etc. We also partner with them for all CFD simulation and analysis related jobs
- **Manrochem Ltd., UK**
 - Manrochem UK was an earlier investor partner in ProU and work share between the two offices on related projects happen regularly. Any resource requirement in Europe can be sourced from this associate
- **Chemsys, Chennai**
 - ProU works exclusively with Chemsys for all simulation related support on Unisim / HTRI / Flarenet

Differentiating Factors

- Understanding Customer's Requirements and developing scope document along with the client (especially in brown field projects)
- Established overseas alliances
- Stress on safety in all designs
- Continuous Improvement of work procedures & practices
- Use latest versions of all Design software
- Project management practices
 - Scope Development
 - Schedule & cost monitoring
 - Communication and progress reporting
- International Resources and Relationships leading to expert competencies and experience being readily available
- **International Quality at an affordable price**

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