

Your search for **High COD Effluent Treatment** ends here..



About Boson Alchemies

Our team comprises former industry leaders with a shared vision of providing expert insights, value-added products, and specialized solutions to help your business flourish, ensuring long-term profitability and sustainability.

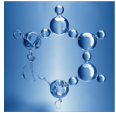
Several of our process technologies have emerged from innovative processes, development, research, and strategic technological collaborations with global companies possessing R&D facilities and expertise in the relevant field. Our company has partnered with numerous industry-leading service providers to deliver a seamless end-to-end solution for all of your requirements.

Boson Alchemies Technologies is a company that specializes in offering innovative technology-based solutions tailored to the process, industrial, and manufacturing industries. Our core competency lies in providing unique expertise, value-added products, services, and solutions that enable our clients to achieve growth, profitability, and sustainability.

As a customer seeking wastewater solutions, you can be confident that we will provide you with a reliable and effective solution. Our extensive experience in customer support enables us to offer exceptional services and value to our clients. We guarantee your satisfaction.

Company Verticals

Boson Alchemies Technologies exclusively focuses on various innovative technology-based solutions for the process, industrial and manufacturing sectors. Our expertise is in bringing specialized knowledge, value added products, services and solutions to our clients which help them grow and be profitable & sustainable.



Water Solutions

- Wastewater Treatment Solutions (ETP & STP)
- Recycle Water for Re-use UF, NF, RO, MBR and MEE / MVRE
- Raw Water and Utility Water Treatment
- Anti-Scaling and Anti-Fouling Solutions
- Manufacture and supply of Water Treatment Chemicals- Color removal, Acrylamides, Coagulants, Flocculants
- Rainwater Harvesting and Ground Water Solutions (RHGS)

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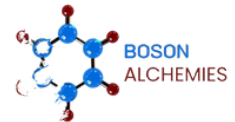
Digital Technologies

- Digital Twins using 3D Laser Scanning Technology
- Revamps and Brownfield Modifications
- Photogrammetry and GIS Mapping Solutions
- VR / AR applications for Manufacturing
- Industry 4.0 and IIOT Applications



Cyber Security & IT Solutions

- IT Applications and Web-based Application Solutions
- Cyber Engineering and Cyber Security Solutions
- Facility Risk Management Applications
- Web / Mobile Applications for Upkeep of Operations and Maintenance of Manufacturing Plants
- Asset Performance Management



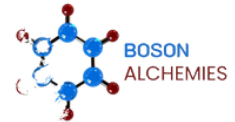
Water Solutions Vertical



Boson Alchemies Technologies was established only to research, develop and build the state of art technologies which will affect and enhance the manufacturers facility reliability, EHS sustainability, productivity, performance, better operation and maintenance and impact the overall life cycle of the installation. As you see, these are the key performance objectives of any manufacturer or owner operator of a facility and ***any impact we create*** by developing a solution affecting these areas, there is ***value for money we can create***.

Water Solutions- Products & Solutions Offered

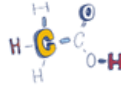
- Raw Water Treatment
- Utility Water Treatment
- Effluent Water Treatment (ETP) & Sewage Water Treatment (STP)
- ZLD Solutions using UF / RO / MEE / MVRE
- Dewatering Screw Press
- Enhanced Dissolved Air Flotation (DAF) Solutions
- Wastewater Solutions Consultancy
- Effluent Treatability Studies
- Basic Process Design and Scheme for Effluent Treatment Facility
- Piloting Trials & Services
- Total Water Management Studies
- O&M and ARC for Boson Alchemies Supplied Plants



Familiar COD Causing Pollutants



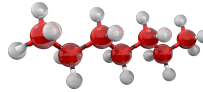
Aromatics / Benzene compounds



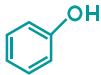
Complex Hydrocarbon chains / Aliphatic chemistries



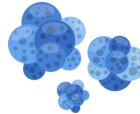
Ammoniacal Nitrogen / Amines / Amides / Nitrates



Complex long-linear polymerized chemistries



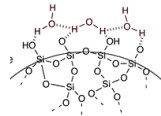
Phenols / Phenolic compounds / Cresols



Non Bio-degradable compounds / Refractory compounds



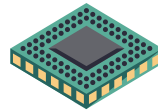
Organic & Inorganic Salts



Colloidal & Reactive Silica



Solvents



Flourides & Flouride Compounds

Our proprietary Catalytic **Hydro-Oxidation** based process treatment systems are being utilized as effluent treatment systems, primarily targeted at the above chemistries

Introducing

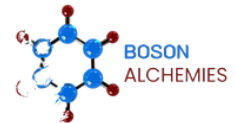
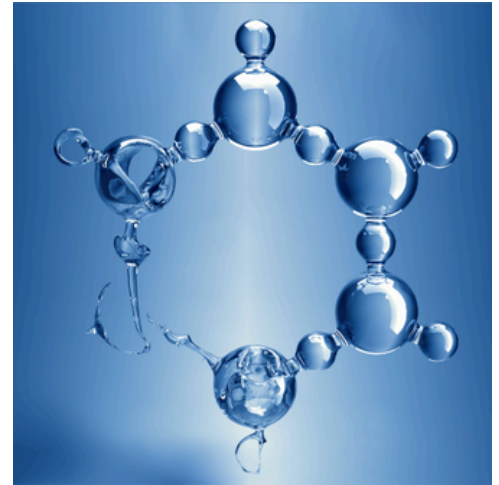
HYDRO-OXIDATION PROCESS TECHNOLOGY

Our team has developed an entirely different approach which addresses almost all the challenges encountered by use of conventional means of effluent water / fluid treatment.

Rather than deploying a complex in-series multi-staged process which treats the effluent in various phases, our developed process system oxidizes a broad spectrum of pollutants within a singular process called Hydro-Oxidation (HO).

This process is currently under patent application.

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How Hydro-Oxidation Process Works

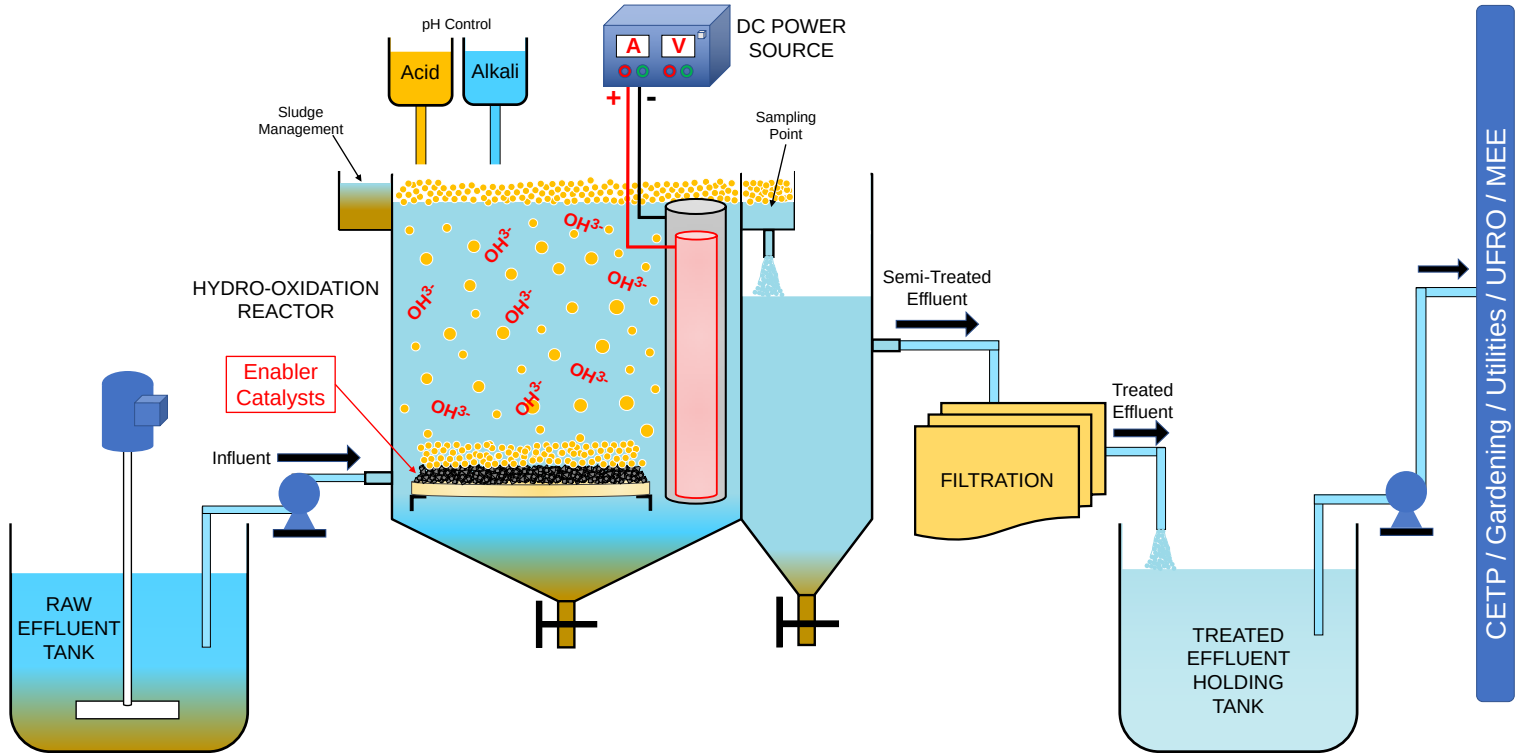
Our process technology involves treating the fluids through Hydro-Oxidation (HO) using its own especially in-house empirically developed metallic based 'enabler' catalysts, which release high potential molecular oxygen forcefully fed to the compounds within effluent fluid.

For achieving these simultaneous reactions, we have integrated **our enablers** within the HO process unit which **create collisional forces** (measured in angstroms) in the fluids to be treated. To support these collisional forces, **certain radical accelerant solutions** are also dosed into the process which are routed through our specially designed and controlled **electrodes**.

Boson Alchemies HO Process = Effluent fluid + Enabler Catalyst + DC Current +/- Accelerants

Our process system not only has greater effect produced in a shorter period of time, but also enables our customers to streamline their water treatment process, expand upstream production capacity (which ultimately generates the effluent) as well as reduce the existing component count, costs, complexity and footprint of their present ETP.

HO Process



HYDRO-OXIDATION SIMPLIFIED PFD

HO Process Steps

Step 1: Raw Effluent enters into our HO process reactor (with or without pH adjustment).

Step 2: With the assistance of the reactions that take place therein, the pollutants (organic and inorganic) in the effluent / process fluid starts to disintegrate out of the fluid molecule and coagulate into heavier particles which collect (depending on the density of the pollutants) either at the bottom of the reactor tank or at top of the fluid as floating sludge solids which are skimmed off or filtered out. For many effluents, during HO reactions, the dissolved solids may get oxidized and come into suspension.

Step 3: The treated effluent is further fed to filtration equipment (either a filter press / screw press) for effective removal of any suspended solids.

Step 4: Further the filtrate is fed to tertiary treatment systems depending upon the end user requirement.

INLET to Boson Alchemies HO Reactor = **Effluent Fluids**

REACTORS inside Boson Alchemies HO System = **Enabler +/- Accelerant + DC current**

OUTLET from Boson Alchemies HO Reactor = **Pollutant Free Fluids + Sludge**

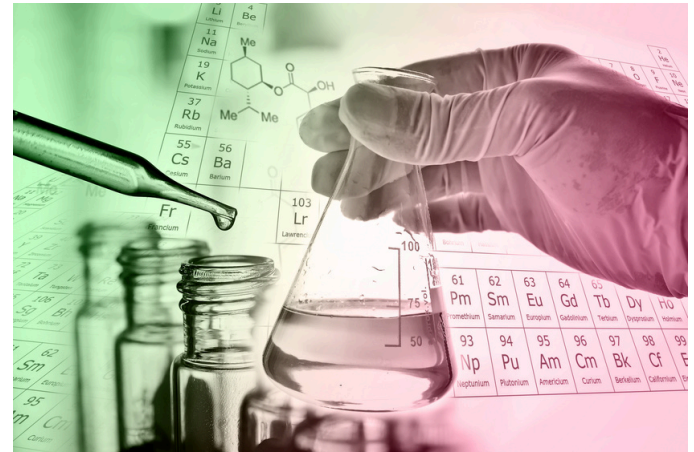
Conventional Systems and HO

Conventional Systems have **multiple phases** designed to treat effluents. Rather than creating a **complex in-series** multi-stage system which **treats the effluent in steps**, our developed process system treats a broad spectrum of contaminants in a single process.

Coagulation
Flocculation
Anaerobic
Aeration
Flotation
Reduction
Deposition
Disinfection



Through our **Hydro-Oxidation (HO)** process technology, **within a singular process**, produces the combined effects of all these processes used in conventional systems.



Key Strengths and Capabilities

- ✔ **Packaged & Containerized Designs**
On request, we can design or supply as standard
- ✔ **Substantially Removes Colour, Odour, BOD, COD, Suspended / Colloidal Solids & Silica**
- ✔ **Modular Design - Expand Capacity Only When You Need It**
Incur OPEX for what you generate
- ✔ **Less Than 35% Solids as compared to Conventional Physical-Chemical & Biological treatment systems**
Sludge volume is minimal and can be dewatered easily. Produced sludge is non-leachable oxides, easily land-filled
- ✔ **Removes Heavy Metals, Phosphates, Fats, Oil & Grease, Hydrocarbons & Breaks up the Emulsions in effluent**
Can remove Zinc, Arsenic and Lead
- ✔ **Breaks Complex Compounds & Culprit High COD Streams- Converts them to Simpler Compounds**
Even partial oxidation in HO can make effluent streams bio-degradable for further treatment in conventional systems
- ✔ **pH of treated water swings towards neutral**
In most cases no major chemically assisted pH adjustments needed
- ✔ **Significantly reduce salts of Calcium, Iron, Manganese, Nitrates, Fluorides and Sulphates**
- ✔ **Destruction & Removal of Bacteria, Viruses, E-Coliforms, and Cysts**
Automatic disinfection in the treated effluents
- ✔ **Oxidising Difficult to Treat Pollutants such as Pesticides and Herbicides**

Benefits and Advantages

Ultra-Compact & Portable Plant

Less Than 10% Floor Space
Compared to Conventional
Systems

NO Civil Works Needed

Only PCC and Footings
Required

8-10 Weeks Delivery of Commercial Plant

10 Days for Installation &
Commissioning

Least Manpower Requirement

Simple Switch ON / Switch
OFF Operation

100% Modular Skid Based Plants

Install Anywhere. Go
vertical to save floor space

No Operational Skills Required

No MLSS / No FM Ratio
Calculations

Modular Unit Easily Add Capacity

Modular Units- No Need to
Install Full Capacity at Once

Less than 40% Sludge Generated

Compared to Sludge in
Conventional Systems

Complete ZLD Recycle & Reuse Water

With Use of UF / RO / MEE /
MVR

Benefits and Advantages

OPEX and CAPEX of Actual Generation

Don't Pay Now for Future Capacity

Fully Automated Plants with IIOT

PLC / Microcontroller Based Operation

Effluent HRT in Minutes & Hours

Not in Number of Days like Conventional Systems

Scientific Approach to each effluent

Step by step approach to a feasible outcome

Pipeline Reactors Installation Possible

For Low HRT (<10 min)
Entire ETP Plant in Pipeline

Destroys Bacteria, Viruses & Cysts

Removes all Fecal Coliform / Algae / Biological Growth.
Automatic Disinfection

Treated Effluent pH Tends to Swing Neutral

Lesser Chemicals Required.
Simpler Downstream Systems

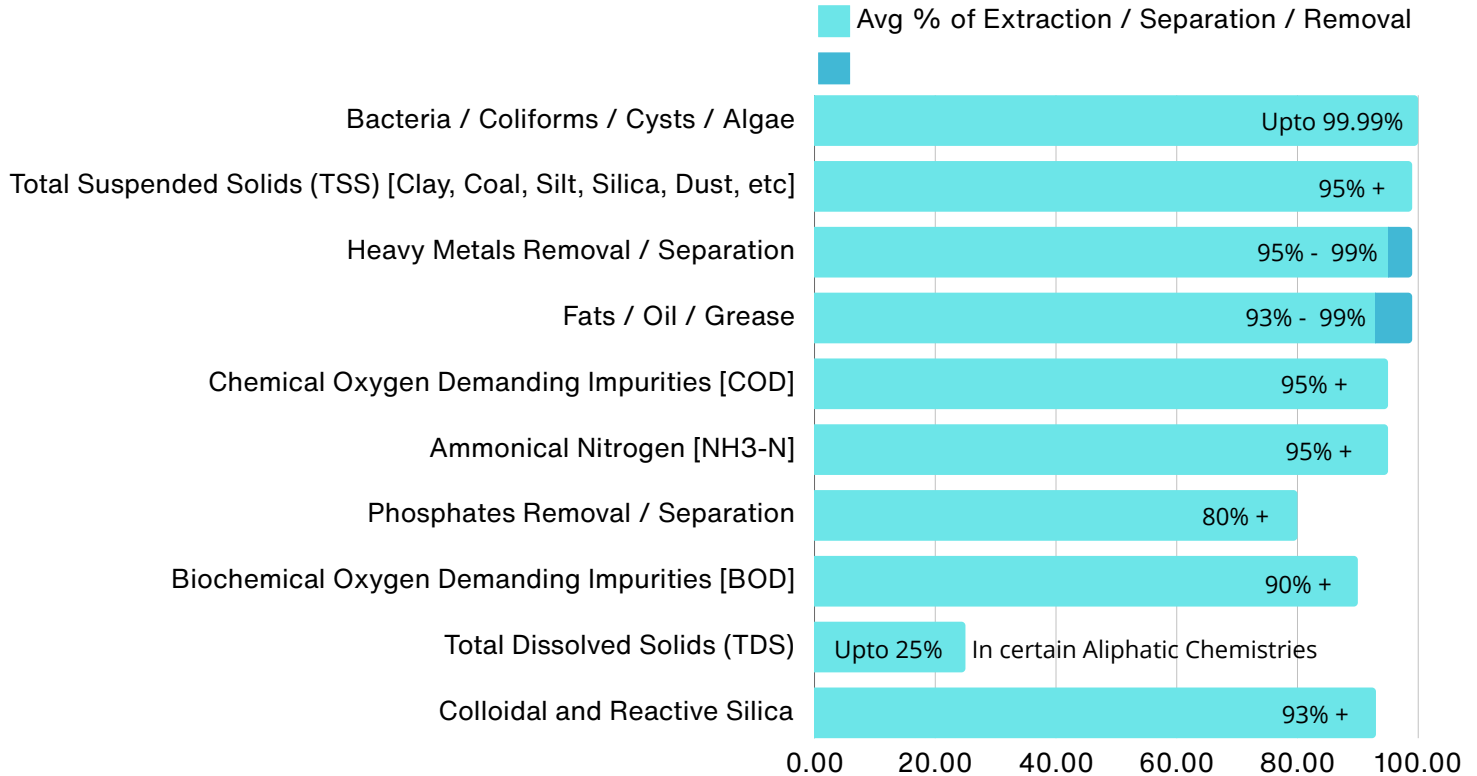
Polishing of Treated Effluent before UF NF RO

Removes Silica, Hardness, Turbidity and TSS easily

HO Enabler Catalysts Have Very Long Life

No Frequent Adjustments or Replacements Needed

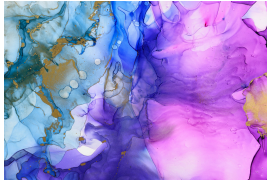
Pollutants Removal Values



Industry Applications



Chemicals & Specialty
Chemicals



Dyes, Paints,
Pigments and Inks



Plastics & Polymers



Agrochemicals



Leather & Tanneries



Pharmaceuticals and
Bulk Drugs



Food & Beverage



Pulp & Paper



Metals & Mining



Textiles & Textile
Dyes



Coal Washing / Handling



Common Effluent
Treatment Plants (CETPs)



Produced Water (Oil &
Gas)



Petrochemicals



Glass &
Ceramics

Alternate Applications of HO

- ➔ Polishing and Pre-Treatment for RO, UF, NF and to reduce filter clogging and enhanced / extended membrane life
- ➔ Treating Partially by identifying the culprit stream from multiple effluent streams to avoid MLSS shock loads. After HO the treated streams are generally simpler compounds and bio-degradable
- ➔ Pre-treatment before MEE Feed- To reduce overall Kg-COD load of High TDS High COD effluent streams for better % recovery from MEE and lesser residue of concentrate.
- ➔ Recovery of metals from metal processing industry effluents; Recovery of product and valuable components from effluent streams
- ➔ Integration in Closed Loop Systems resulting in Zero Liquid Discharge
- ➔ Harvesting of Proteins, Fats and Fibres from Food Processing Waste Streams
- ➔ Hygienic throughput, HO Process System lowers microbial count and disinfects just like UV, Chlorination, and Ozonation
- ➔ Raw Water, Surface & Ground Water cleanup- Water reservoir / Lagoons / River / Ponds / Lakes cleanup
- ➔ Pre-conditioning & Re-conditioning of Boiler Feed Make- up / Boiler Blow Down Water
- ➔ Conditioning and Polishing of Drinking / Potable Water, Removes Hardness, Chlorine, Algae and Bacteria
- ➔ Throughput Water can be Reused in Process / Utility / Cooling water thereby reducing purchase of fresh water

Customization Possibilities

Our HO process can be easily customized / modified / expanded to meet customized objectives & targets. Depending on the intended end use of the ETP treated water, this can be a variety of requirements as listed below

- ➔ Discharge to CETP / Common Effluent Treatment Plant
- ➔ Integration in closed loop systems resulting in Zero Liquid Discharge (ZLD)
- ➔ Make-up / Integration with existing utility-Cooling water systems
- ➔ For use in Gardening and Irrigation
- ➔ Recycle / Re-use for Toilet Flushing and general Facility Washing
- ➔ For Storage in Artificial Lagoon / Pond within the plant
- ➔ Make-up / Integration with Fire Fighting System water requirement
- ➔ Re-use and integration into Main Stream Process
- ➔ Reuse of Treated Water for Potable / Drinking use
- ➔ Extraction of De-Contaminated Sugars, Starches and / or Carbohydrates from the reject of downstream RO system

As well as other uses which may be desired by the end user..

Our Scientific Approach to Effluents

We approach every effluent case in a methodical and a scientific manner. Before submitting a price quote, we require the client to provide us with a sample of their effluent, which we then run through our laboratory to ensure we can treat it effectively. Moreover, for Greenfield projects, we emphasize that the client must supply a synthetically produced effluent sample that is representative of their R&D.

Feasibility Study – A questionnaire is first received where we review the effluent characteristics, compounds present, problems statement and the purpose very well with subsequent calls.

Treatability Study – Once we are convinced, only after we will request for effluent representative samples to be sent to our lab. Your effluent is subjected to multiple treatability studies and protocols to practically evaluate the best possible outcome and most optimized treatment protocol. A detailed report is tables with complete basic design- PFD, Water Balance, Lab Test Results with budgetary CAPEX and OPEX numbers.

Pilot Plant Study – In cases where the client wants to gain further confidence, we also offer on premise pilot trials for your effluent runs. Our pilot plants range from 1 KLD to 5 KLD capacity.

Commercial Quote – Finally a price quote is submitted after completing the treatability studies on your representative sample of effluent, along with PFD/Schematic, Water Balance, best possible commercially viable scheme, with firm CAPEX, OPEX, plant footprint with overall dimensions of key equipment.

Facilities- Lab and Pilot Equipment

Lab Facility & Staffing

- Effluent Treatment & Testing Laboratory at Vadodara, Gujarat
- Three (3) Full Time Chemists
- Three (3) Full Time Process Engineer and Analyst



Lab Setup Available

- 10 Ltr, 5 Ltr and 2 Ltr Reactors for Hydro-Oxidation Process
- Solid-Liquid Separation for Salts, Low boilers and High Boilers
- Jar Test Apparatus for Flocculation
- Membrane Filtration- UF, NF, RO and MBR
- Vacuum Filtration



5 KLD Pilot Plant



1 KLD Pilot Plant



Vadodara (India) Lab



Cincinnati (US) Lab

Key Clients



PRIVI SPECIALITY CHEMICALS LIMITED



Color & Comfort



JUBILANT
LIFESCIENCES



PODDAR
PIGMENTS



BEST VALUE CHEM
PRIVATE LIMITED

HUNTSMAN

Enriching lives through innovation



VIDHI
SPECIALTY FOOD
INGREDIENTS LIMITED
COLOURS You Can Trust For Your Food



SUDARSHAN



** Above is a partial list of clients who have witnessed the benefits of our process technology

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Leading Bio-Diesel Refinery

Location: Kakinada, Andhra Pradesh

Capacity: 110 KLD ETP

Objective: Treated ETP water for gardening and reuse in toilet flushing

Throughput / ETP Treated Water Characteristics

POLLUTANT PARAMETERS	INLET	OUTLET
COD (ppm)	42000	< 300
BOD (ppm)	6500 - 9000	< 100
TDS (ppm)	5000 - 6000	< 2000
Oil & Grease (ppm)	8000	< 10
pH	2.00 - 11.00	6.50 - 8.50



Leading Pigmented Masterbatch Manufacturer

Location: Near Jaipur, Rajasthan

Capacity: 30 KLD ETP with 2 stage UF and RO ; 20 KLD STP

Objective: Treated sewage for gardening and reuse in toilet flushing;
Treated ETP water for reuse in plant process and utilities

Throughput / ETP Treated Water Characteristics

POLLUTANT PARAMETERS	INLET	OUTLET
COD (ppm)	< 18000	< 100
BOD (ppm)	6500 - 9000	< 30
TDS (ppm)	< 6000	< 300
Ammonical Nitrogen (ppm)	< 50	< 1
Colour (ptco)	200 - 350	< 5



Solvent & Water Based Inks Manufacturer

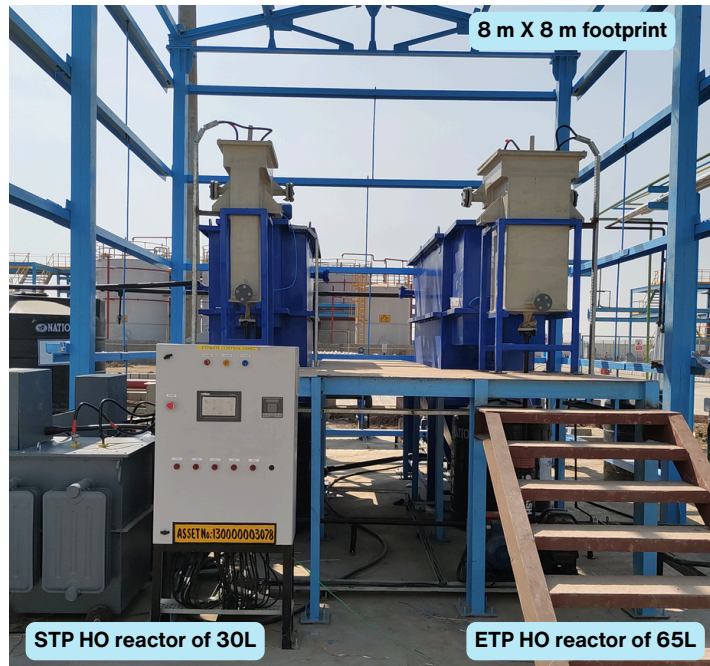
Location: Saykha, Bharuch, Gujarat

Capacity: 35 KLD ETP with 3000 LPH Ultra-Filtration (UF); 10 KLD STP

Objective: ETP treated effluent re-use of plant washing, toilet flushing and plant utilities

Throughput / ETP Treated Water Characteristics

POLLUTANT PARAMETERS	INLET	OUTLET
COD (ppm)	< 8000	< 100
BOD (ppm)	1500 - 3500	< 30
TDS (ppm)	< 2000	+/- 20% of feed TDS
Ammonical Nitrogen (ppm)	< 50	< 1
Colour (ptco)	180 - 300	< 5



Pharmaceutical API Manufacturer

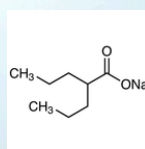
Location: Nandesari, Vadodara, Gujarat

Capacity: 20 KLD ETP with product recovery before Oxidation

Objective: Treated ETP water for CETP discharge

Throughput / ETP Treated Water Characteristics

POLLUTANT PARAMETERS	INLET	OUTLET
COD (ppm)	< 350000	< 1500
TDS (ppm)	< 20000	+/- 20% of inlet
pH	0.50 - 4.00	6.50 - 8.50
Product Recovery Feature	About 4% of client's product is recovered and extracted in the ETP from the effluent before oxidation treatment (ROI is less than 9 months)	



Vertical Installation in 6 m X 3 m floor space



Largest Animal Food Manufacturer in India

Location: Bhimavaram, Andhra Pradesh

Capacity: 120 KLD ETP (Vertical installation in a RCC building with Solar Panel)

Objective: Treated sewage for gardening and reuse in toilet flushing ; Treated ETP water for reuse in plant process and utilities

Throughput / ETP Treated Water Characteristics		
POLLUTANT PARAMETERS	INLET	OUTLET
COD (ppm)	8000 - 9000	< 250
BOD (ppm)	2500 - 3000	< 30
TDS (ppm)	< 2500	< 2100
Oil & Grease (ppm)	200 - 300	BDL
pH	3.00 - 5.00	7.00 - 7.50



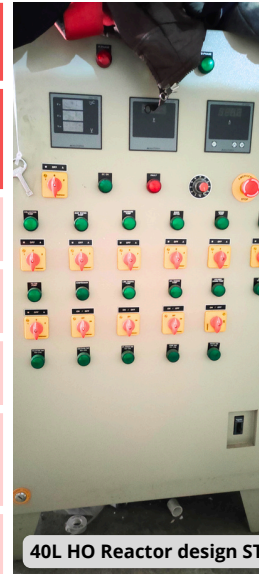
Agro-Products Formulation Manufacturer (Pesticide & Herbicides)

Location: Ankleshwar, Bharuch, Gujarat

Capacity: 15 KLD STP (sewage from workers wash has traces of the product)

Objective: Treated sewage partially re-used for toilet flushing, balance is discharged as per CETP norms

Throughput / STP Treated Water Characteristics		
POLLUTANT PARAMETERS	INLET	OUTLET
COD (ppm)	1900 - 2000	< 100
BOD (ppm)	50 - 150	< 30
TDS (ppm)	< 2500	+/- 10% of inlet
Fecal Coliform MNP/100 ml	2000 -5000	< 5
Colour	150 - 200	< 5



40L HO Reactor design STP plant with high COD

Commercial Applications



Commercial Buildings



Hotels & Resorts



Hospitals & Health Centers

ETP and STP plants using our process technology can be ultra-compact and fully skid based. This makes us a first choice supplier not only for the industries but also for other commercial and residential facilities.

- Commercial Buildings and Corporate Offices
- IT Parks & Commercial Complexes
- Industrial Parks & Zones- Chemical Parks / Food Parks / Engineering Parks
- Industrial SEZ Zones / PCIPR zones
- Automotive Garages & Automotive Workshops
- Multiplexes, Cinema Theaters and Shopping Malls
- Hospitals, Healthcare Centers and Health Research Centers
- Laundries, Hotels & Resorts, Recreational Clubs and Swimming Pools
- Residential Complexes and Gated Communities
- Railway Stations, Airports & Religious Sites (Temples / Churches / Mosques)
- Fish Farms, Shrimp Farms, Poultrys and Slaughter Houses
- Schools, Colleges, Hostels & Other Educational Institutions
- Chemical & Biological Laboratories
- Ware Houses and Distribution Centers (like Amazon, Flipkart etc)

About Us

Boson Alchemies as the name implicates- technologies and advancements of the future. We are ex-industry stalwarts with the purpose and vision of bringing specialized knowledge, value added products, services and solutions to you which will help your businesses grow and be profitable & sustainable.

Many of our process technologies are a result of Innovation, Process Development, Research and Strategic Technology Tie-ups with International Companies with R&D facilities having core expertise in the subject field. We have associations with many industry leading solutions and service providers to provide and end-to-end and seamless delivery for your needs.

Why Us

Having already supported over 100+ customers long term, we specialize in what we do. All our core capabilities, products and solutions are backed by our own knowledge and are developed inhouse and hence we are not dependent on any vendor or service provider to commit and deliver.

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