



'ONE STOP SHOP'

**Environmental Solutions & Services
For The Distillery, Beverage & Brewery Industries**



Greater water demands and the increasing problems of environmental pollution as well as of industrial and municipal waste disposal call for an integrated approach of total environment management. Ion Exchange Waterleau Ltd., a joint venture of Ion Exchange (India) Ltd. and the Waterleau Group, Belgium offers a complete portfolio of advanced environmental solutions and services for industrial, infrastructure and municipal applications. Technology solutions encompass water, liquid & gaseous effluents, solid waste & bio-solids, and renewable energy, while services include consultancy, turnkey contracting, O&M and BOOT projects.

Ion Exchange Waterleau Ltd. is one of the few global players in the environmental sector with a complete portfolio of environmental solutions and services. Especially for the distillery, beverage and brewery industries we are a 'ONE STOP SHOP'.

We have a proven track record in the design, construction, operation & maintenance of hundreds of treatment plants. With 200 references in anaerobic waste water treatment, we belong to the TOP 3 global players.

In the distillery, beverage and brewery industries we have more than 50 references with multi-national clients such as INBEV, DIAGEO, HEINEKEN, CARLSBERG, SAB MILLER, MALTEUROP, CARGILL, COCA COLA, PEPSICO, MOHAN BREWERIES, EID PARRY, AMIT ALCOHOL, JUBILANT ORGANOSYS...

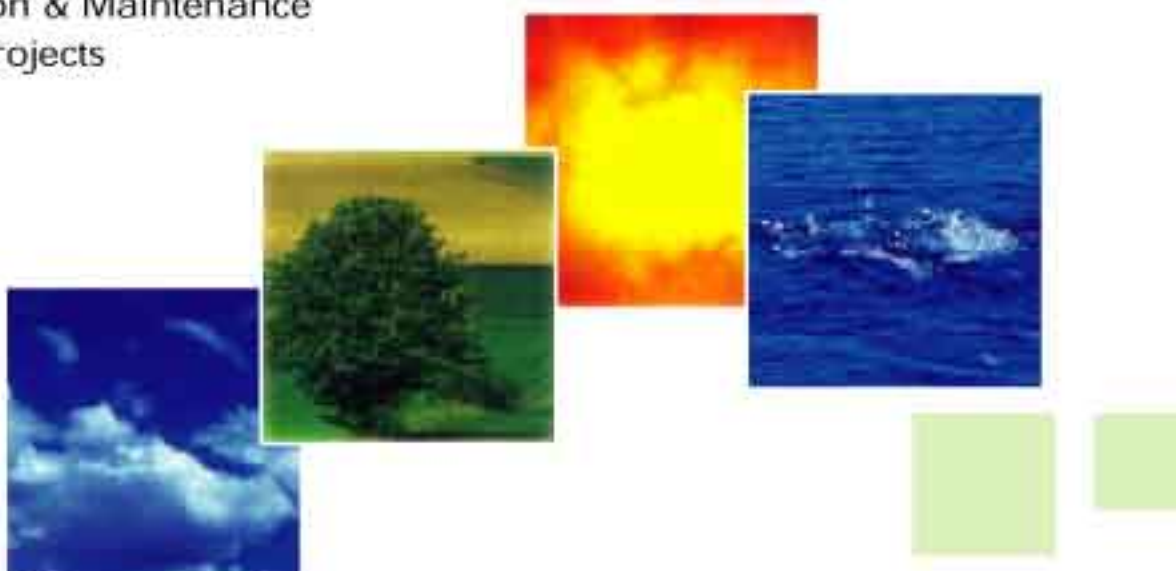
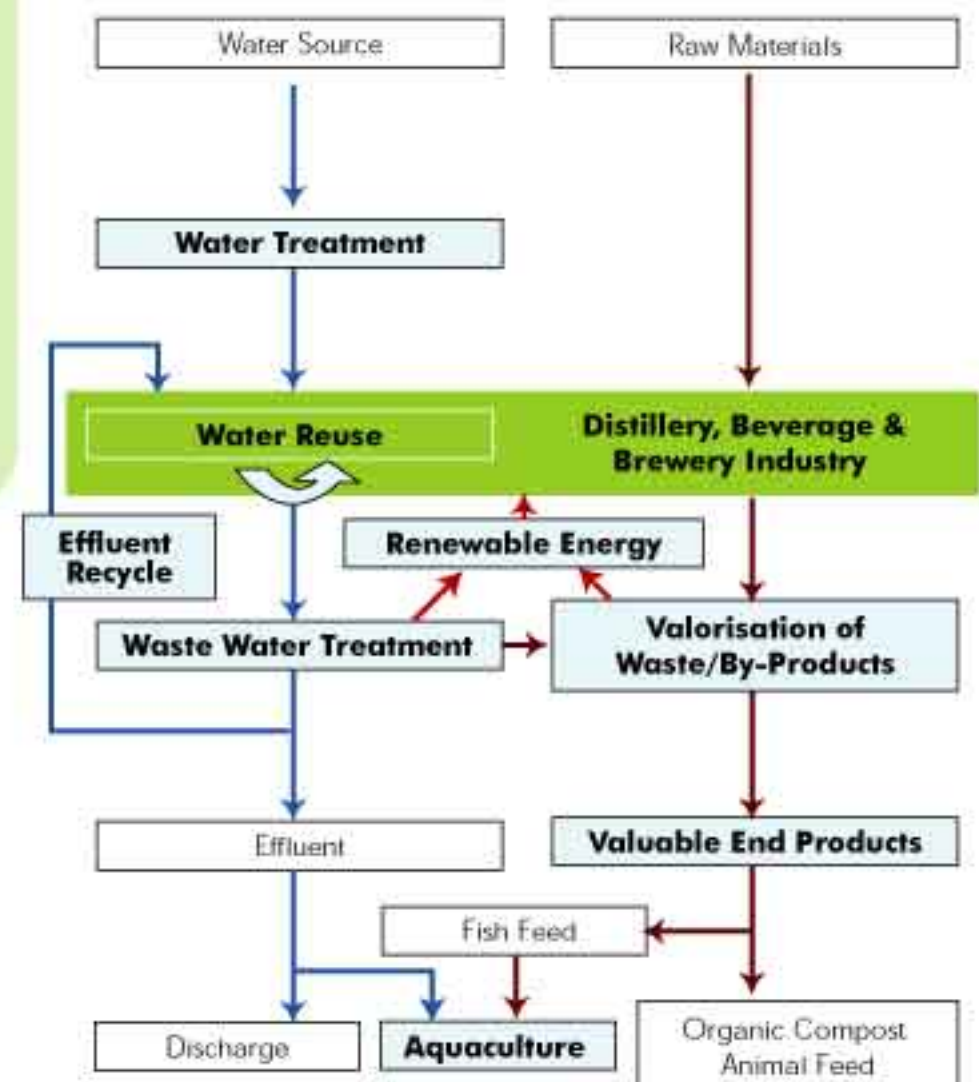
Our Solutions

- Water Conservation & Waste Management
- Process Water
- Ultra-Pure Bottled Water
- Waste Water Treatment
- Water Reuse and Effluent Recycle
- Odour Control, VOC, Flue Gas and Bio-gas Cleaning
- Renewable Energy
- Valorisation of Bio-solids, Waste and By-products

Our Services Include

- Consultancy
- Turnkey Contracting
- Operation & Maintenance
- BOOT Projects

Integrated Approach



Process Water

Starting from any water source, we are able to produce process water with the required quality using the following technologies:

- Softening
- Demineralisation
- Membrane Processes - Reverse Osmosis, Nano Filtration, Micro & Ultra Filtration



INDION Reverse Osmosis System

INDION® Packaged Drinking Water & Natural Mineral Water Plants

Projects are executed on turnkey basis and complete with water treatment, blow moulding and filling machines, labelling and packaging machinery, and standby DG set for electricity generation. A full fledged laboratory is set up with facilities for mineral and bacteriological analysis of the water, to ensure compliance with BIS/international specifications.

Hallmark Features

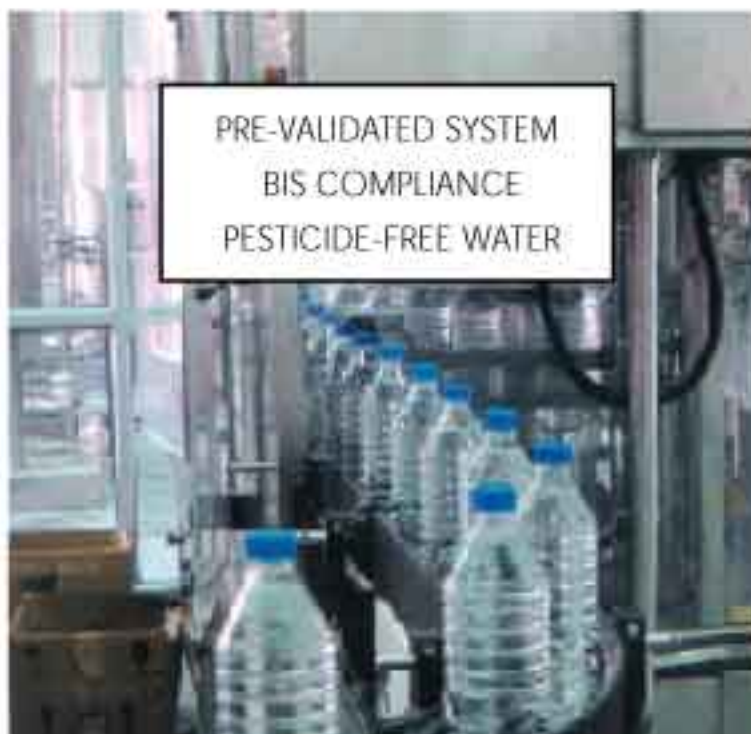
- Consistent treated water quality
- PLC based automated operation
- Pre-validated system to industry accepted standards
- Compliance with latest BIS/international specifications
- Complete O&M and lab testing facility with trained manpower

Single Point Responsibility

- Turnkey project management
- Assured compliance with standards
- Operation, maintenance and monitoring of plant
- Comprehensive service maintenance contracts
- Daily water analysis tests/weekly reports
- Company trained, experienced manpower
- Ex-stock, genuine spares and consumables
- Regular quality and operational audits



INDION Demineralisation System



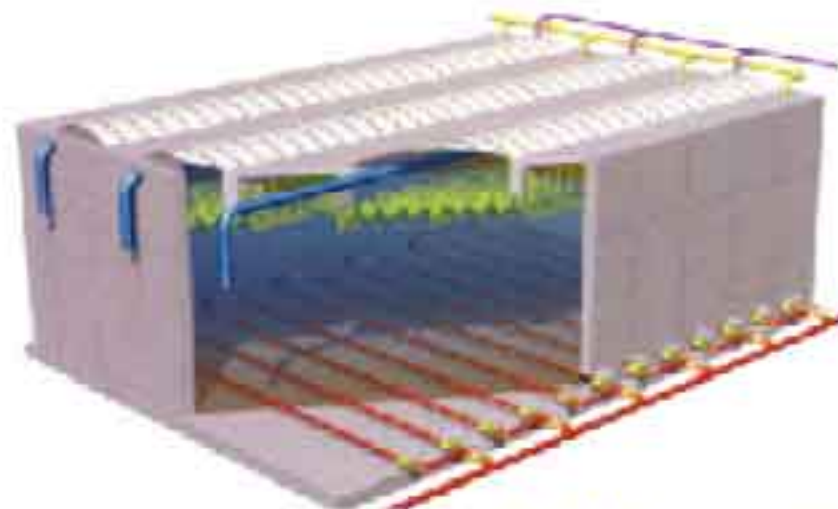
PRE-VALIDATED SYSTEM
BIS COMPLIANCE
PESTICIDE-FREE WATER

Waste Water Treatment

Today, the distillery, beverage and brewery industries increasingly strive towards an improved environmental policy with regard to water conservation and waste water treatment. The driving forces behind this movement are new environmental regulations on consumption and discharge limits, stricter enforcement and anticipated introduction of effluent charges corresponding to defined discharge limits. As breweries, beverage and distillery industries in general need high amounts of water in their production processes, they especially pay high effluent charges. Apart from effluent charges, discharge of raw waste water into a sewer or into surface water is completely prohibited by local governments.

Hence, for these industries it is one of the top priorities to continuously look for solutions to lower these costs. There are two ways to achieve this:

- Water conservation: reduce the amount of water needed for each litre of beverage produced (currently about 8 litres of water for 1 litre of beverage).
- Decrease the organic and inorganic loads in the waste water by the use of the most appropriate biological waste water treatment.



LUCAS[®] anaerobic

LUCAS[®] Anaerobic is the brand name for an anaerobic wastewater treatment system making use of UASB technology (Upflow Anaerobic Sludge Blanket) treating raw waste water. Depending on the characteristics of the brewery or softdrink waste water, a high removal efficiency of 80-90% of organic matter is achieved.

LUCAS[®] Aerobic with nutrient removal offers a compact and modular design. It combines the advantages of the conventional and the Sequencing Batch Reactor (SBR) technologies. Like in the conventional system, the reactor volume and the level in the tanks is always constant. It is a continuous system for both influent feed and effluent discharge. Like the fill-and-draw system, the reactor operates according to a time controlled process cycle that allows for the alteration of all essential processes in a single compartment.

Advantages

LUCAS[®] anaerobic-aerobic with nutrient removal

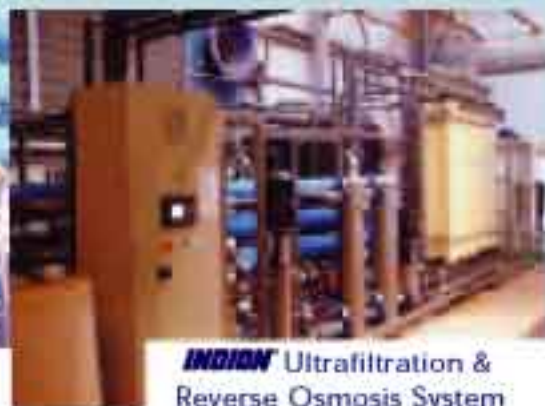
- High COD removal efficiency (up to 90%) in UASB reactor
- High biogas production which can be converted into heat and/or electricity (0,3-4,4 Nm³ biogas/kg COD)
- Low sludge production (0,02 kg SS/kg COD converted)
- Robust and proven technology
- Very compact design
- Cost effective technology (ROI between 2 and 5 years)
- High effluent quality with complete nutrient (N&P) removal.

Waste Reuse and Effluent Recycle

Our recycle solutions integrate physico-chemical, biological and membrane separation processes for optimum water recovery. They include advanced effluent treatment processes, micro filtration, ultra filtration, nano filtration and reverse osmosis systems, membrane bio-reactors and advanced photo-chemical oxidation.



INDION Reverse Osmosis



INDION Ultrafiltration & Reverse Osmosis System



X-TRACTOR[®] Cross Flow MBR



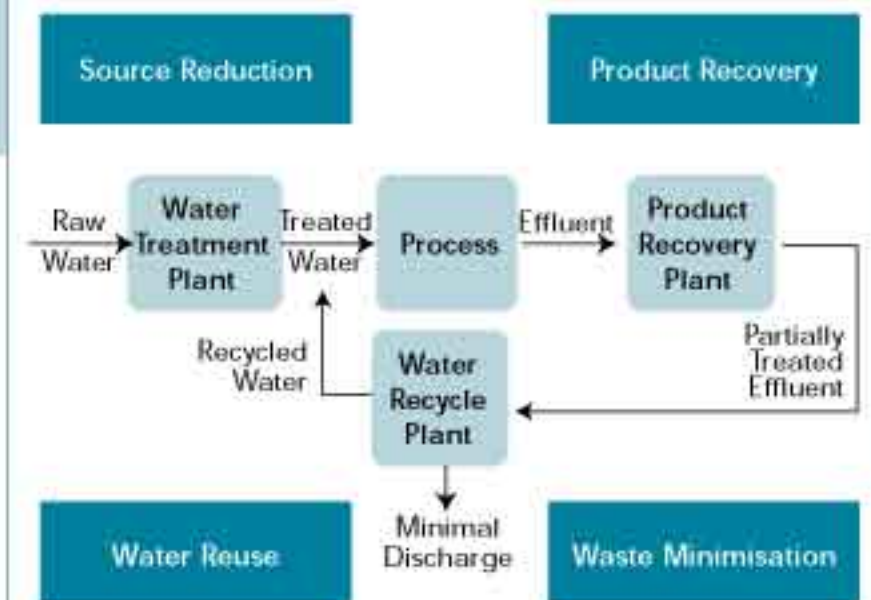
INDION Submerged MBR

Experience the Gains of Total Water Management

Conventional Treatment



Total Water Management



To produce an effluent that is extremely pure and appropriate for immediate reuse, we offer two different membrane bio-reactor (MBR) concepts. The **INDION**[®] Submerged MBR is a technology to treat waste water in a very compact bio-reactor. With this concept, the higher biomass concentrations can be kept in the reactor causing a decrease of the bio-reactor volume with a 3-4 factor compared to a conventional sludge system. Furthermore, the energy consumption is kept to a minimum by placing the hollow fibre membranes inside the reactor. In the **X-TRACTOR**[®] Cross Flow MBR, tubular membranes are placed outside in an external loop of the bioreactor. Due to the higher energy consumption caused by the high speed circulation, this Cross Flow MBR is used to treat smaller but more difficult waste water flows.

Odour Control

Our Technologies

- BEL-AIR® biofilter and BIOTON® biofilter
- BIOWAVE® biowashfilter
- CALVERT® collision scrubber for flue gas cleaning (dry or wet scrubbing)
- DYNACYCLE VOC® oxidation
- BEL-GAS® gas cleaning with biological scrubber system



Renewable Energy

Production of heat and electricity out of biogas.
Biogas can be used in:

- Biogas engines to produce electricity
- Brewery boiler system (steam production)
- Hot water producing boiler

Valorisation of Bio-solids Waste and By-Products

- dot.comPOST® bio-solids treatment of organic compost
- HYDROGONE® drying technology for production of animal and fish feed from waste and by-products.



Services

Comprehensive, multi-disciplinary services eliminate split of responsibilities and ensure projects deliver agreed solutions on time and within budget.

Research & Development
Audits & Consultancy
Pilot Testing and Demonstration Tests
Feasibility Studies
Technology Selection

Process Design
Mechanical Design
E&I Design
Basic Engineering
Detailed Engineering

Vast Experience
Proprietary Technologies

Standardised Project
Management Process

Start-up and Commissioning
Training
Operation and Maintenance
Project Development
Financing
BO(O)T Projects

Procurement
Equipment Supply
Site Supervision
General Contracting
Construction & Erection
Electricity, Instrumentation & Controls



More Than 50 References

INBEV (Belgium, UK, Hungary), COCA COLA (India, Belgium, China), HEINEKEN (Netherlands, Spain, Vietnam, China, Indonesia, Nigeria), PEPSICO (India, UK, Thailand), CARLSBERG (Malaysia, Romania), MOHAN BREWERIES (India), MANAV BREWERIES (India), SHAW WALLACE (India), UNITED BREWERIES (India), SAN MIGUEL (Hong Kong, Phillipines, China), BALRAMPUR CHINNI (India), DENZONG BREWERIES (India), BUDWEISER (China), DIAGEO (Uganda, Kenya, Nigeria, Jamaica), FOSTER (India, China), TSINGTAO SHENZHEN, HUIZHOU, WAN TAI (China), PALM (Belgium), MALTEUROP (France, Germany).



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