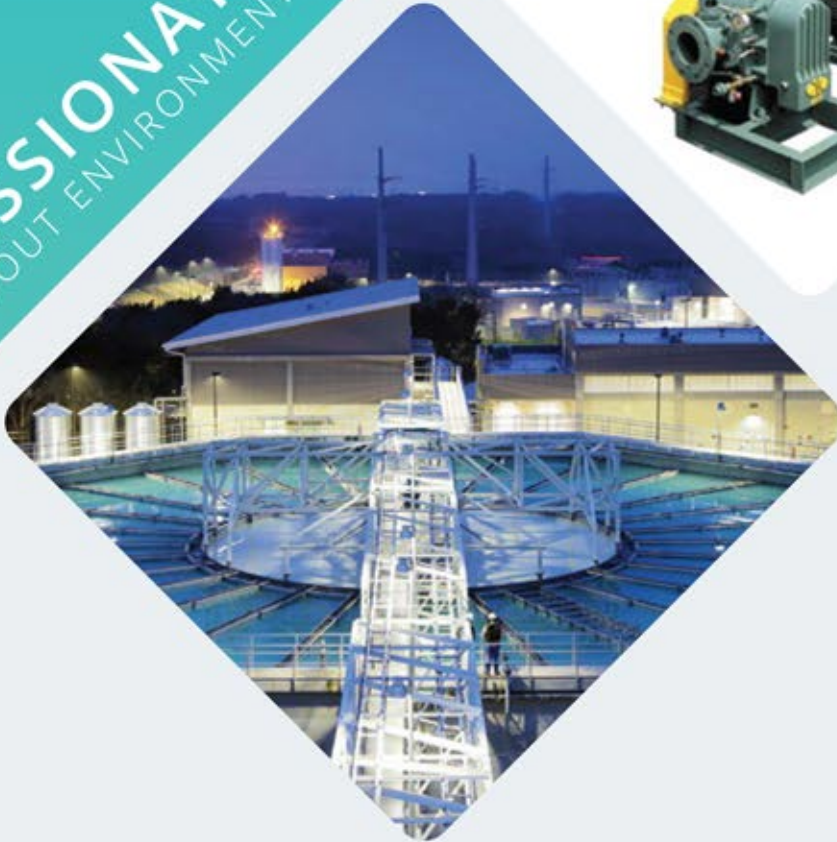


WORLD-CLASS
ENVIRONMENTAL
SOLUTION
In Bangladesh



PASSIONATE
ABOUT ENVIRONMENT




EARTH
SQUAD™



Vision

To be the most respected and valued company in the environmental protection industry in the eyes of its customers, employees, stakeholders and the communities in which we work.

Mission

Earth Squad is devoted to bringing the efficient solutions and providing the best customer experience in meeting environmental needs through innovative technology, solutions, products and services.

Quality

We are committed to meet or exceed our customers' expectations by:

- Continuous development on Idea and Knowledge Management
- Immaculate product quality
- Flawless execution
- Exceptional customer service

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Who We Are

Earth Squad™, a professional company with years of market leading expertise and unmatched customer service focused in one-stop environmental services to industries and municipalities, offers a comprehensive range of environmental services.

It also supports with design, equipment and takes pride in ensuring successful installations and maintenance for long-term solutions to safely maximize efficiency and robustness while minimizing costs and complexity in accordance to international and regional standards. It has successfully rendered services to myriads of sectors in RMG, tannery, dying, real estate, and various ETP projects with automation. The trained specialized team listen to your needs and look for the best sustainable solution; helping customers to continuously meet consent limits, whilst controlling and optimizing processes.

Commitment to ensuring safe, dependable and affordable solution is backed by decades of hands-on design and operational experience at hundreds of treatment facilities around the country and cutting-edge research collaboration with widely regarded and innovative technology brands or companies to accentuate Earth Squad's core value, passionate about environment.





What We Do

Earth Squad offers a large portfolio of environmental management services designed to help industrial and infrastructure organizations to get the most out of the environment treatment systems. Its services include: CETP, ETP, WTP, STP, WWTP, SRP & ZLD.

At Earth Squad, we strive to provide technological leadership and performance superiority and support to customers with service excellence and sustainable solutions.



Effluent Treatment Plant (ETP)



Sewage Treatment Plant (STP)



Water Treatment Plant (WTP)



Salt Recovery Plant (SRP)



Zero Liquid Discharge (ZLD)
Water Recycling

Effluent Treatment Plant (ETP)

ESBDL™ offers the following technologies for industrial wastewater (Effluent) treatment:

- i. Biological Wastewater Treatment Plant (ASP) process
- ii. Anaerobic Baffled Reactor (ABR) process
- iii. Membrane Bioreactor (MBR)
- iv. Moving Bed Biofilm Reactor (MBBR)
- v. Physico-chemical ETP
- vi. Physico-chemical followed by biological (anoxic, anaerobic & aerobic)

Water Treatment Plant (WTP)

ESBDL™ is able to implement the following technologies for industrial water treatment:

- a. Iron Removal Filter (IRF) Plant
- b. Water Softener Plant (WSP)
- c. Demineralized (DM) Plant
- d. Reverse Osmosis (RO) Plant
- e. Rainwater Reuse System

Zero Liquid Discharge (ZLD)

Zero Liquid Discharge (ZLD) is a treatment process designed to Recycle maximum waste water from a system. ESBDL™ is capable of using technology to reduce wastewater economically and produce clean water that is suitable for recycling into the same process, thereby saving money and being beneficial to the environment.

The main principle of “zero discharge” is recycling of all industrial wastewater. This means that wastewater will be treated and used again in the process. Because of the water reuse, wastewater will not be released on the surface water body.

Salt Recovery Plant (SRP)

Salt Recovery Plant is mainly used for knit and yarn dyeing industry. In such plants, salt is used as catalyst for dye fixing. ESBDL™ offers an environment friendly as well as cost effective technology to recover and reuse the salt from any process.

An SRP is really useful as it reduces the major pollution load of the final effluent for the ETP. Moreover, as mentioned in the guidelines of the government or preference of the global buyers, the SRP contributes to a great extent for recycling or reusing the wastewater.

OUR PORTFOLIO





Electro - Mechanical Equipment

Committed to ensuring safe, dependable and affordable solution is backed by decades of hands-on design and operational experience at hundreds of treatment facilities around the country.

Industrial Roots Blower & Turbo Blower

Air blower transfers air from open environment to water in form of bubble (fine bubble, coarse bubble) to meet the oxygen demand of water like BOD, COD, DO and also for homogeneous mixing of particle dissolve in water.

Application Areas

- ETP, STP, CETP, WWTP, WTP
- Power Plant
- Cement Plant
- Fishery
- Refinery Project

A. Roots Blower

1. BK, BKW, BKD

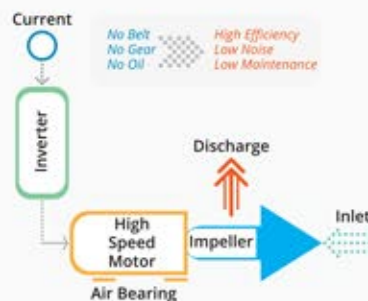
| | |
|----------|---------------------------|
| Capacity | 2-140 m ³ /min |
| Pressure | 0-15 m |
| Brand | B-Tohin |
| | Origin: Japan |
| | Manufacturing: China |

2. TH, THS, THW

| | |
|----------|---------------------------|
| Capacity | 2-100 m ³ /min |
| Pressure | 0-10 m |
| Brand | Trudean |
| | Origin: Taiwan |

B. Turbo Blower (ATB)

| | |
|----------|----------------------------|
| Capacity | 20-250 m ³ /min |
| Pressure | 4-10 m |
| Brand | ACE & B-Tohin |
| | Origin: Korea |
| | Assembling: China |





Air Diffuser

Air diffusers are generally used in water treatment and purification processes where slurries have to be aerated to activate biological organic matter oxidation and nitrification processes.

They are also used in pre-aeration and aeration processes in oxidation tanks and aerobic digestion plants for industrial and civil sludges. There are different shape of diffuser like disk, tube or plate.

Properties of Air Diffuser

- high quality, good elasticity with long life time
- high oxygenate efficiency
- sufficient coarse & fine bubble diameter
- maximum pressure supports up to 15m depth
- installation convenient including clamps & fittings

Application Areas

- ETP, STP, CETP, WWTP, WTP
- Fisheries Project

Materials

Membrane: EPDM, Silicon Rubber
 Plastic Tray & Lining Pipe: ABS/UPVC/PP

MOC

- EPDM Rubber (Ethylene Propylene diene Monomer [M-clas] Rubber): a type of synthetic rubber, is an elastomer characterized by a wide range of applications.

- The M-class refers to its classification in ASTM Standard D-1418; the M class includes rubbers having a saturated chain of the polyethylene type.

Types of Diffuser

| | |
|----------------------|-------------------------------|
| 1. Disk type | |
| Dimension | Φ200mm, Φ250mm & Φ300mm |
| Bubble dia | 1-3 mm |
| Working airflow | 2-8 m ³ /hr |
| Oxygenate capability | 0.25-0.5 kgO ₂ /hr |

| | |
|----------------------|---------------------------|
| 2. Tube type | |
| Dimension | Φ67 mm X 1000 mm |
| Bubble dia | 1-3 mm |
| Working airflow | 1-12 m ³ /hr |
| Oxygenate capability | 0.65 kgO ₂ /hr |

| | |
|-----------------------|---------------------------|
| 3. Coarse Bubble type | |
| Dimension | 144 mm |
| Working airflow | 1.2-27 m ³ /hr |



Electromagnetic Flow Meter

Magnetic flow meter, also technically an electromagnetic flow meter or more commonly just called a mag meter. A magnetic field is applied to the metering tube, which results in a potential difference proportional to the flow velocity perpendicular to the flux lines. The physical principle at work is electromagnetic induction. The magnetic flow meter requires a conducting fluid, for example, water that contains ions, and an electrical insulating pipe surface, for example, a rubber-lined steel tube.

Types of Meter

- Electro- magnetic flow meter
- Ultra sonic flow meter
- Open channel flow meter.

Size DN 25 - 300 mm/1" - 12" inch

Advantages of Flow Meter

- unobstructed flow passage without projecting parts
- no moving parts
- no additional pressure drop
- essential flow profile insensitive, only short inlet and outlet sections required
- unaffected by changes in temperature, density, viscosity concentration and electrical conductivity
- favorable choice of materials for chemically aggressive or abrasive measuring media
- unaffected by contamination and deposits
- especially suitable for hydraulic solids transport
- linear relationship between flow rate and measured variable
- operates in both flow directions (forward and reverse)

Dosing Pump/Coagulator

A dosing pump is a small, positive displacement pump. It is designed to pump at a very precise flow rate of a chemical or substance into either water, steam or gas flow. A dosing pump will deliver this precise flow rate of chemical or other product by a number of different methods but it generally involves drawing a measured amount into a chamber and then injecting this volume of chemical into the pipe or tank being dosed. Dosing pumps are used in a variety of applications from agriculture, industry & pharmaceuticals.

Properties of Dosing Pump

- mechanically actuated diaphragm, leakage proof structure
- PVC, PTFE, PVDF, 304, 316 is available as the liquid end
- it is good for corrosion resistant medicine
- can be mounted on chemical tank
- easy installation and maintenance
- enclosed power end for safety
- capacity adjust during operation, the range is 0~100%
- automatic control which can accept 4~20mA



Automatic Dosing Device/Coagulator

Automatic Dosing Device/Coagulator is widely used as the auxiliary equipment of wastewater technology and sludge treatment.

- jet-flow mixed is used & the high-speed hydraulic disperses the chemicals or powders
- increases the fineness & contact with penetration area between powder or chemical
- reduces solution time
- consist 3 tanks: preparation, curing & batching
- low speed agitator is used for increasing uniformity of the solution

Properties of Automatic Dosing Device/Coagulator

- continuous & integrated preparation, simple operation and maintenance
- dry powder or liquid polymer can be input for meeting different demands
- full automatic PLC system operation and manpower saving
- screw or metering pump can be used for chemical dosing which can be adjusted

Submersible Pump

Submersible, End Suction, Self Priming, Centrifugal pump for Effluent & Fresh water for various application.

| | |
|----------|---------------------------|
| Capacity | 1-1500 m ³ /hr |
| Pressure | 1 - 150 m |
| Brand | |

Lanshen, Tsurumi & Zenit
Origin: China, Japan & Italy

Properties of Pump

- cast iron structure (stainless steel on request)
- class H electric motor from 3kW to 355kW in efficiency class IE3
- thermal protection devices incorporated in stator
- long life bearings (100,000 hours)
- AISI 431 drive shaft (AISI 329 on request)
- leakage detection system in seal chamber (standard) and motor (on request)
- two silicon carbide mechanical seals in large oil chamber and V-rings
- Patented closed jacket cooling system with internal recirculation
- operating temperature up to 60°C (up to 80°C on request)
- ATEX II 2G Ex db k IIB T4/ II 2D Ex tb IIIC T135°C certification



Submersible Mixer/Propeller

A submersible mixer is a mechanical device that is used to mix sludge tanks and other liquid volumes. Submersible mixers are often used in effluent treatment plant & sewage treatment plants to keep solids in suspension in the various process tanks and/or sludge holding tanks.

The submersible mixer is operated by an electric motor, which is coupled to the mixer's propeller, either direct-coupled or via a planetary gear reducer. The propeller rotates and creates liquid flow in the tank, which in turn keeps the solids in suspension. Used in Anoxic/anaerobic tanks and oxidation basins (activated sludge) at effluent treatment plants.

Application Area

- anoxic/anaerobic tanks and oxidation basins (activated sludge) at effluent treatment plants
- MBBR and other fixed film biocarrier processes



V-Notch

V-notch weirs are just a thin plate weir with a 'V' notch cut into it. The weir is placed to obstruct open channel flow and allow water to flow over the notch. This enables accurate measurement of the flow, by measuring the head upstream of the V notch.

Rectangular weirs and triangular or v-notch weirs are often used in water supply, wastewater and sewage systems. They consist of a sharp-edged plate with a rectangular, triangular or v-notch profile for the water flow. The head over the v-notch is measured and correlated with flow rate through the open channel.

| | |
|-----------|--------|
| MOC | SS304 |
| Thickness | 2-3 mm |
| Height | 6 inch |



Gear Motor

The electric motor used in most cranes is a type of gear motor that uses the basic principles of speed reduction to increase torque or force. The output speed of the rotor is reduced through a series of large gears until the rotating, RPM speed, of the final gear is very low.

Advantages of Gear Motor

- compact size and low weight - as much as 50% reduction with same torque output
- high power density - several planets share the load rather than one gear, the more planets the more sharing
- longer gear life at similar loads
- gearing can be very accurate with virtually no backlash
- high efficiency ~95% per stage is common
- typical ratio per stage is 9:1, 4 stages 9000:1
- coaxial arrangement - no offset output shaft
- modular, most planetary stages can be stacked

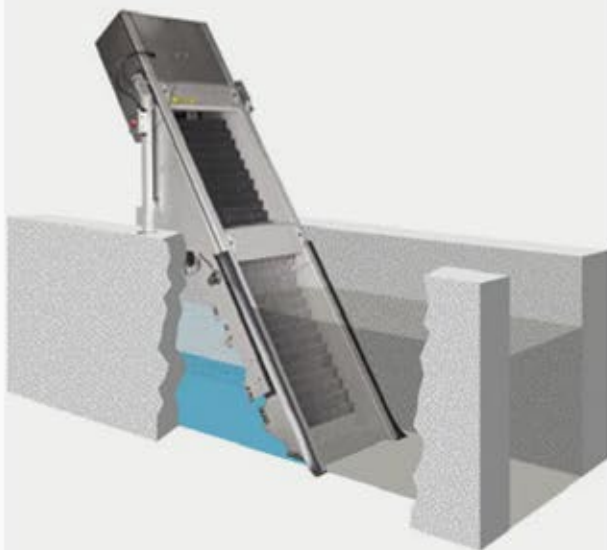


Automatic Rotary Screen

Automatic Rotary screens are very well matched for removing suspended and floating coarse from wastewater such as weed, reed and rags. Rotary screen is the first step of ETP's - effluent water treatment process.

Properties of Automatic Rotary Screen

- heavy accumulation of screening
- permanent removal of moving parts under waste water
- location : installed ahead of grit chamber and pumps



Electrical Control Panel Board

Electrical panel board serves as a central controller for ETP, WTP, STP facilities, whose main purpose is to control the mutual switching of all motors for treatment plants, which makes it possible for a round-the-clock operation of the plant equipment.

- major component used: Mitsubishi/ABB/LS equivalent
- can be fully automated through PLC system
- including Powder Coated Box, Busbar, MCCB, MCB, Timer, Overload, Relay, Volt and Ampere Meter etc.



Activated Carbon

Activated carbon is used to remove pollutants from water streams, both in the field and in industrial processes.

Most activated carbon is made of bituminous coal or lignite & coconut shell, a low-sulfur coal with high moisture content.

Application Area

- spill cleanup
- waste water treatment
- groundwater remediation
- drinking water filtration
- activated carbon filters and activated carbon filter media are also used in odor control and reverse osmosis applications

Pipes & Fittings

| | |
|-----------------------------|----------------------------|
| MS pipe & fittings | Korea/China/BD |
| UPVC & CPVC pipe & fittings | China/Thailand/Malaysia/BD |
| Size | 0-12 inch |

Tube Settler

Properties of Tube Settler

- sturdiness
- high durability
- precise dimension

| | |
|-----------|---------------|
| Dimension | 65 mm & 80 mm |
| Thickness | 0.8 ~ 1 mm |
| Length | 1m |

Advantages

- laminar flow ensures excellent treated water quality
- wide choice of materials of construction
- tubes can be lifted easily for cleaning without shutdown
- clarifying media have no moving parts - so no loss of energy
- no maintenance cost
- the efficient design minimizes space requirements

Applications

- Industrial Effluent Treatment Plant
- Municipal Sewage Treatment Plant



MBBR Media

Advanced high rate wastewater treatment process utilizing free-floating media.

Design features

- optimize protection for the biomass
- increased surface area
- highest quantity in per square meter
- lowest density to avoid deep submerge
- extremely robust & reliable

Applications

- Industrial Effluent Treatment Plant
- Municipal Sewage Treatment Plant

Specification

| Specs | Y1 | Y2 | Y3 | Y4 | Y5 |
|---------------------------------|------------------------------------|--------------------------------------|------------------------------------|------------------------------------|--------------------------------------|
| Number of Holes | 4 | 5 | 19 | 6 | 64 |
| Effective Specific Surface Area | 900 m ² /m ³ | 1,000 m ² /m ³ | 500 m ² /m ³ | 800 m ² /m ³ | 1,200 m ² /m ³ |
| Gravity | 0.95±0.02 g/cm ³ | 0.95±0.02 g/cm ³ | 0.95±0.02 g/cm ³ | 0.95±0.02 g/cm ³ | 0.95±0.02 g/cm ³ |
| Packing Number | >830,000 pcs/m ³ | >850,000 pcs/m ³ | >97,000 pcs/m ³ | >260,000 pcs/m ³ | >210,000 pcs/m ³ |
| Packing Weight | 135 kg | 145 kg | 95 kg | 120 kg | 135 kg |
| Porosity | >85 | >85 | >90 | >85 | >85 |
| Recommended Dosing Ratio | 15-68% | 15-70% | 15-65% | 15-67% | 15-65% |
| Nitrification Efficiency | 400-1200 | 400-1200 | 400-1200 | 400-1200 | 500-1400 |
| Applicable Temperature | 5-60°C | 5-60°C | 5-60°C | 5-60°C | 5-60°C |
| Service Life | >20 Years | >20 Years | >20 Years | >20 Years | >20 Years |

UV Sterilizer

Application Area

- sterilization of domestic water (such as well water, kitchen used water, tap water treatment), secondary water supply, direct drinking water, purified water and mineral water plant
- sterilization of swimming pools, landscape water and circulating cooling water
- sterilization of industrial water such as in food, cosmetic and pharmaceutical industry, etc.
- sterilization before sewage discharge
- sterilization of aquatic products and aquatic breeding industry

Mild Steel & Stainless Steel Vessel

Customized product.

- MS plate thickness 3-10 mm
- SS 304 plate thickness 2-5 mm
- Hydraulic disk size 300-3600 mm

Ozone Generator

Application

Ozone Generator is mainly used for medical water, pure water, mineral water, secondary water supply, swimming pool water, culture water and food & Beverage industries using water to disinfect and purify. And the derosination, decolorization, albifaction in chemical industry, paper making industry get the sewage treatment compliance (disinfection, removal BOD, COD, color, etc) in life, industry and hospital. Besides, reuse of sewage industrial cooling water.



Filter Press

Properties of Filter Press

- large coverage of sludge density which may vary from 2000mg/l to 50,000 mg/l
- deal with oily sludge effectively, easy to separate, not prone to be blocked
- clean and environmental, no odor, no noise, no high pressure washing, no secondary pollution
- small area, low water and energy consumption
- easy to maintain, available for continuous operation, unattended operation, unnecessary to change engine oil
- filter press feed pump: diaphragm (air operated)

Types of Filter Press

- Screw press filter
- Belt press filter
- Plate press filter



Reverse Osmosis

Reverse osmosis is most commonly known for its use in drinking water purification from salt water, removing the salt and other impurities. RO can remove many types of molecules and ions from solutions and is used in both industrial processes and in producing potable water.



Online Monitoring Device

a. Industrial pH Meter

Industrial pH meter is an online pH analyzer which applied in a variety of textile industry, environment protection, food, agriculture and so on. With 4-20mA analog signal, RS-485 digital signal and relay output. It can be used for industrial processes and waste water treatment processes pH control, and supports remote data transmission, etc.

| | |
|------------------|----------------------------------|
| Measuring range | 0-14 pH, ± 0.02 pH |
| Input Resistance | $\geq 10 \sim 12 \Omega$ |
| Power supply | 220V $\pm 10\%$, 50Hz/60Hz |
| Output | 4-20mA, RS485, Modbus-RTU, Relay |

b. Dissolved Oxygen Meter (DO Meter)

Dissolved oxygen is the measure of oxygen dissolved in an aqueous solution. Polarographic measurement principle, the dissolution value depends on the temperature of the aqueous solution, pressure and salinity in solution. The meter uses a liquid crystal display for measuring and displaying DO and medium temperature values, with analog and digital signal outputs and control functions.

| | |
|---------------|-------------------------------|
| Range | 0-20mg/L, 0-200%, 0-400hPa |
| Resolution | 0.01mg/L, 0.1%, 1hPa |
| Output signal | 4~20mA; Relay; RS485 |
| Power supply | AC220V $\pm 10\%$; 50Hz/60Hz |

Sewage Treatment Plant (STP)

Sewage treatment is the process of removing pollutants from domestic and municipal sewage water, containing mainly household sewage plus some industrial sewage water. Whereas, the self-contained sewage treatment is covered, single piece packaged treatment system for onsite sewage water treatment. These can be configured for BOD reduction, suspended solids reduction, Ammoniacal, total Nitrogen reduction and Phosphorus reduction.

Properties of STP

- leading edge package sewage treatment plant
- high removal efficiency for nitrogen, BOD & COD
- fewer process to achieve comparable effluent quality
- eliminate sludge ability issues
- small foot prints & non-occupation of surface land
- less odor & sludge yield
- stable and reliable technologies
- cost-effectiveness & easy maintenance
- automated operation
- no civil structures or buildings required as well as no heating or insulation required



SERVICES

Apart from turnkey projects, the following environmental services are offered by Earth Squad in accordance of international and local standards:



Equipment Supply & Solutions
(ETP, STP & WTP)



Designing, Fabrication
Erection of ETP, STP, WTP etc.



Environment Monitoring
& Analysis (Air, Water & Noise)



Initial Environmental
Examination (IEE)



Environmental Impact
Assesment (EIA)



Environmental Management
Plan (EMP)



Environmental & Social
Impact Assesment (ESIA)



Environmental Due
Dilligence Report



Reduce, Reuse & Recycle (3R)
& ZDHC



ETP Audit & Assesment



Training & Consultancy



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