

# Environmental FlagShip Companies in Korea



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## Area

Total construction ( ) / water quality ( ) / air quality ( ) / wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) / consulting ( )

## Company Introduction

Since its foundation in 1977, SK E&C has enjoyed sustainable growth and development as a result of successful and satisfactory performance of projects in the areas of civil engineering, construction and power plant to repay customers' trust. Recognized for its expertise and construction capabilities at home and abroad, SK E&C has tightened its grip on the Korean market, by performing projects of the nation's key industries covering road, railway, and port in the civil engineering industry and creating diverse housing space and taking part in a number of large-scale development projects in the area of construction. Also in the power plant business, we have been awarded orders of large petrochemical and power generation plant construction projects around the globe and successfully executed these projects, which has helped us become one of the global leaders in this field.

Never becoming complacent with the growth and development so far, SK E&C is steadily preparing for a better future. With the aim of becoming a world-class urban development and infrastructure construction company, we will secure new growth engines by accelerating our efforts to expand overseas markets now underway and developing new products and successfully completing the construction of advanced infrastructure by means of improving systems and processes across the company and our personnel management system in order to pave the way for future growth as a world-class company with global competitiveness.

Furthermore, we will do our best to fulfill our corporate social responsibilities (CSR) and thereby make our world a better place for the humanity by more systematically performing "CSR activities for the underprivileged" through housing environment improvement, volunteer service for welfare centers, and support for youths from low-income families, expanding our efforts into eco-friendliness relating to neighborhood development and environment education and overseas CSR activities.



Section 20 (T/K) of the Nakdong River Revival Project (Changnyeong Bo, Hapcheon)



Section 20 (T/K) of the Nakdong River Revival Project (Changnyeong Bo, Hapcheon)

## Characteristics of Key Products & Technologies

### 1. SBAF system (SK Biological Aerated Filter system)

: Highly-developed processing technology that applies the back wash and nitrification/denitrification processes by using new filtrating materials and upper level treatment water

### 2. SDPR system (SK Denitrifying Phosphorous Removal system)

: Process of using SBAF that sediments EPP filtration materials in the reaction tank. It is the highly-developed sewage treatment technology that eliminates the organic matter and nitrogen in the water by using biological decomposition action of microorganisms that grows attached to the filtration material and the physical filtration process of the filtration layer

### 3. Wasted Vinyl Recycling Technology Using High-Pressure Water Cutting Equipment and Rotating Turn Table

: Technology to increase the equipment operation ratio by shattering the wasted vinyl without contact with the high-pressure water cutting equipment. It improves economic and equipment operation efficiency by reducing the load of post-treatment equipment while washing and discharging the alien substance attached to the wasted vinyl at the same time of shattering it.

## Projects performed at home and abroad

- 10. 05 ~ 13. 05 2007 Gwangju Sewage System Redevelopment BTL Project
- 06. 11 ~ 09. 10 Ulsan Industrial Water Road Facility Improvement (Phase 1) Project
- 04. 12 ~ 09. 12 Gwangju Stream Purification Project
- 05. 10 ~ 08. 12 Incheon Depot Project

## Certification

- MoGas / Monitoring system for Gas storage(MOST Korean Technology (KT) Authorization No. 665)
  - : Monitoring data analysis system installed in the underground open excavation, high-pressure gas storage Divided
- Multi-step blasting method / SUPEX-Cut (MOCT New Construction Technology No. 14)
  - : In the cutting process of tunnel blasting, the digging filed is blasted in partition by the characteristics of angle and parallel holes. It is the blasting technology that maximizes the blasting efficiency by re-blasting the remained field in the three-dimensional order and by using the rock-bed resistance decrease effects in the burn hole area of the parallel hole for cutting.
- Bridge Scaffold Using Composite Materials (MOST Korean Technology (KT) Authorization No.1774)
  - : Compound materials are applied to the quake isolation base that dissipates the quake force by increasing the bridge cycle, thereby improving corrosion-resistant and chemical-resistant ability and reducing material and processing expenses



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## Company Introduction

For over 40 years since its foundation in 1973, Daewoo E&C has led Korea's construction industry and made a contribution to the economic development of the country. We have built a wide range of social infrastructures like roads, railroads, bridges, ports, and airports and produced eco-friendly housing and non-housing buildings in best design with proven technological excellence. In addition, performing large scale projects for the construction of industrial plants including thermal, nuclear, and tidal power plants and LNG tanks, we have played a pivotal role in driving the nation's growth. Based on successful construction performance of various types of projects including GK tubing tunnel using world-class tubing technology, Nurimaru, a venue of an APEC summit, Walseong Nuclear Power Plant, famous for its shortest completion time in the world thanks to our technical excellence, and upscale luxurious premium apartment, Prugio, we provide best technologies and services in the areas of civil engineering, architecture, housing and plant. We will do our best to become a global leader in the construction industry by creating best corporate values and improving the quality of life.



Malay Telecom



Geoga Bridge

## Characteristics of Key Products & Technologies

### 1. DNR(Daewoo Nutrient Removal)

[MLTM New Technology No. 95 Nutrient Removal Processes for the Low Strength Wastewater] As an effective and stable nitrogen and phosphorous eliminating method, this process strengthens discharge of phosphorous in the aeration tank using sludge denitrifying tank to increase phosphorous elimination efficiency. Applied to 36 sites nationwide.

### 2. DMBR(Daewoo Membrane Bio-Reactor)

[NET No. 76] This technology biologically removes organic matters and nitrogen and phosphorous at the same time and separates solids and liquids and treats colon bacillus by installing a submerged membrane bioreactor in aerobic tank.

### 3. DBS(Daewoo Biogas System)

[One of the 10 new technologies of Korea in 2009] As a method of developing alternative energy using livestock manure, food wastes, sewage sludge, and organic wastewater, this is a highly efficient methane fermentation process that saves energy costs by dividing ioxxygen generating tank and methane generating tank.



Gulpocheon Stream Sewage Treatment Plant



Youngdeungpo Membrane Filtration



Jangsu DBS

## Projects performed at home and abroad

- 2011: El Harrach River Redevelopment Project, Algeria
- 2010: Construction of Geoga Bridge using world's largest and Korea's first automobile exclusive tubing tunnel method
- 2009: Construction of Sihwaho Tidal Power Plant, World's larges and Korea's first tidal power plant
- Performed 416 projects in over 40 countries and having a total of 28 overseas offices and branches

## Certification

- NET No. 288, 289, 308, 351, 355, 368 & 392
- GT No. 13-00092
- Green Building Certificate, Green Building LEED Certificate (Sheraton Incheon Hotel)

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consulting ( )

## Company Introduction

Hyundai Engineering Co., Ltd. is a member of Hyundai Motors Group. Established in 1974, we have been providing general engineering solutions in chemical engineering, power generation, energy, industrial plant, infrastructure, environment and new renewable energy industries. We have core capacities in every field from feasibility study to FEED, PMC Engineering, Procurement, Construction, Management, and Maintenance, and we have successfully completed more than 4,500 projects in 50 countries around the world. As of 2012, we have recorded 4.5 trillion KRW in orders, 2 trillion KRW in sales, and about 2,700 employees as an advanced global engineering company. In ENR USA, we are ranked in 47th place among the world's engineering companies.



Cheongshim HANT Site



Cheonan HANT Site

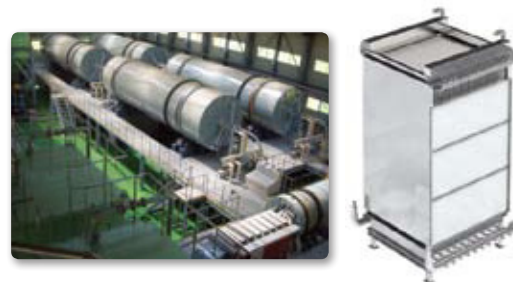


Chilgok HSC

## Characteristics of Key Products & Technologies

### HANT (Hyundai Advanced Nutrients Treatment Process)

HANT method is the sewage/wastewater treatment technology that applies MBR (Membrane Bio Reactor) using a membrane and is simpler than the previous method with innovatively improved efficiency. It can remove e-coli and germs without a separate disinfection system and recycle the entire treated water as reuse water. As it takes significantly less space compared to the previous process, it saves the cost of land purchase and civil works by about 40%. By unifying the system and automating the facilities, it reduces maintenance needs and sludge generation to save maintenance cost. It uses highly durable quality membrane to save repair and replacement cost.



### HSC (Hyundai Sludge Composer)

HSC method is the sewage sludge composting process facility that includes dry, compost, and second compost systems. Sludge is mixed with process product returned from pre-treatment (reduction of water content) and biodegradable organics are decomposed in aerobic conditions to reduce and stabilize sludge for composting. Sewage sludge that generates secondary environmental pollution is reduced by about 80% using this technology to generate odorless and easy-to-handle compost for environmentally-friendly recycling.

## Projects performed at home and abroad

### HANT Method

- Cheonan Sewage Treatment Plant (4 steps), 40,000 tons/day (2012~2014)
- Yeongjong Sky City Sewage Treatment Plant, 24,000 tons/day (2011~2013)
- Cheonan Sewage Treatment Plant (3 steps), 30,000 tons/day (2007~2009)
- Hynix Semiconductor Wastewater Treatment Plant, 4,000 tons/day (2002~2003)

### HSC Method

- Andong-si Sewage Sludge Treatment Plant, 50 tons (2008~2008)
- Chilgok-gun Sewage Sludge Treatment Plant, 50 tons (2008~2009)
- Geoje-si Sewage Sludge Treatment Plant, 30 tons (2007~2008)

## Certification

### HANT Method

- Patents in Korea: 7 patents, including Biological Nitrogen/Phosphorous Removing System & Method Using Submerged Membrane (Feb 2004)
- New Technology: Advanced Sewage Treatment Plant using Anoxic/Anaerobic/Aerobic/Degasifying Tanks and Submerged Membrane (Oct 2001)
- The 2nd Environmental Technology Award (Prime Minister) (Sept 1996)

### HSC Method

- IR52 Jangyeongsil Award (Deputy Prime Minister/Minister of Science and Technology Prize) (Nov 2004)
- New Technology: Grain-shaped Multilevel Sewage Sludge Composting Technology without the Need of Bulking Agent or Microorganisms (Feb 2001)
- US Patent: Apparatus and Method for Manufacturing Barnyard Manure Using Sewage and Sludge (Sept 2000)

## Company Introduction

Clean environment is the most valuable asset for humanity and a country's future value to preserve. Recognizing the importance of humanity and environment as future value, Kolon Global has devoted itself to the development of environmental technologies and capabilities from long ago.

For 28 years since the establishment of the Environment Business Unit in 1985, Kolon Global has made extensive investments and efforts to develop more efficient and economic environment facilities based on long-term experience in design, construction, and commissioning.

Our major environment business areas include sewage and wastewater treatment, incineration and dust collection and treatment, water purification and pure water treatment, waste-to-energy plant, and landfill facilities.

In sewage treatment area, in particular, we have been recognized at home and abroad for our expertise by obtaining New Environment Technology (NET) certification and receiving order of Korea's largest advanced treatment process improvement project. In the area of waste treatment, we have minimized the influence of wastes on our environment by treating them most stably so that noise, vibration, and odors are not generated at all using latest state-of-the-art methods.

We will make every effort to keep our environment clean for the next generation and meet customers' needs and improve the quality of life of humanity.



## Characteristics of Key Products & Technologies

### 1. NPR (Nitrogen & Phosphorus Removal) Process

It is part of A2O process. Biological reactor is composed of anaerobic basin, anoxic basin and oxic basin. Influent wastewater is divided into the anaerobic tank and the anoxic tank. Oxic tank is filled with mobile media (BioCube) that raise biomass and promote nitrification rate even at low temperatures, making it strong enough despite fluctuation of influent loads. In a short hydraulic retention time (HRT), this advanced sewage/wastewater treatment process stably removes nitrogen and phosphorus.

### 2. KIMAS (KOLON Immersed Membrane Advanced System)

Localized immersed membrane module-based water purification and sewage advanced treatment method

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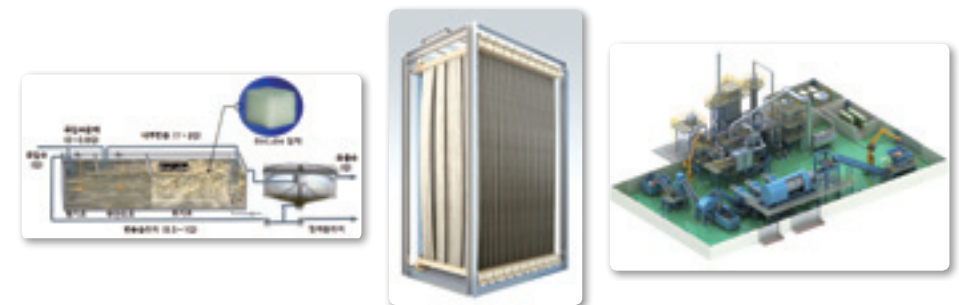
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- Sewage: A sewage advanced treatment process consisting of stabilization tank/anoxic tank/anaerobic tank/aerobic tank/membrane tank. By separating reinforced hollow fiber membrane, it increases maintenance efficiency and air consumption.
- Water purification: Stably operating membrane filtration with a TIP inclined plated sedimentation basin and reducing power consumption up to 40% using a batch filtration.

### 3. K-MeGa (KOLON Mechanical & Gasification) system

A household Waste-to-energy process to selective recollect flammable wastes from household waste and change them into energy. It is Korea's first integrated household waste-to-energy consisting of a mechanical treatment (MT) and a gasification process.



## Projects performed at home and abroad

- Ratchaburi Power Plant Water/Wastewater Treatment Facility in Thailand(1999)
- Dongkuk Steel Mill Dangjin Plant MAIN & MULPIC Water Treatment Facility Project(2010)
- South Amman Wastewater Project, Jordan(2011)
- Mokpo City Environment Energy Center Construction Project(2012)

## Certification

- NET(Ministry of Environment) No. 298 : TIP Inclined Plate and Batch Filtration Based Immersed Membrane Water Purification Method
- NET(Ministry of Environment) No. 308 : Hollow Fiber Membrane System and 2-Level Anoxic Tank-Based Sewage Advanced Treatment Method(I3 System)
- NET(Ministry of Environment) No. 155 : Rotary Kiln-Type Waste-to-Energy Technology Using Direct/Indirect Simultaneous Heating



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consulting ( )

## Company Introduction

Forcebel is an environment plant company having world's best screening technology for waste-to-energy and -resources. As a result of steady research and development efforts in the area of screening landfill wastes and household wastes since 2002, we have developed a unique screening technology fit to Korean situations, different from other countries, and performed over 100 projects at home and abroad using MBT, SLR, MRF, and CWERF-System as a screening technology for landfill wastes, household wastes, reusable wastes, and construction wastes. We continue our efforts to export these waste screening plants to Southeast Asian countries like Japan, China, and Vietnam, Americas including USA and Brazil, and Europe, along with domestic projects.



### B. Circulation-Type Landfill Redevelopment System (FORCEBEL-SLR SYSTEM)

A system to minimize the discharge of secondary environment contaminants resulted from circulative use of landfills and land reclamation by screening and separating landfill wastes under use or not used anymore and reusing flammables as solid fuel (Fluff RDF), selling valuables, or reusing soil and no-flammable substances for landfill restoration or as fill materials.



## Projects performed at home and abroad

- 2010 Mokpo City Environmental Energy Center Construction Project, Preliminary Treatment Work(230 ton/day)
- 2010 Chuncheon City Geunhwan-dong Unsanitary Landfill Redevelopment Project, Earth Work (247,439m<sup>3</sup>)
- 2011 Muju-Jinan-gun Large-Area Preliminary Treatment Facility Construction Project, Preliminary Treatment Facility Work (80 ton/day)
- 2011 KCC Suwon Station Area Infrastructure Development Project, Landfill Soil Screening Work (286,553m<sup>3</sup>)
- 2012 Yecheon-gun Circulation Type Landfill Redevelopment Project, Waste Excavation & Screening Work(165,559m<sup>3</sup>)
- 2012 Japan Tsunami Waste Screening Work for 4 regions (600m<sup>3</sup>/day)

## Characteristics of Key Products & Technologies

### 1. Household Waste Preliminary Treatment System (FORCEBEL-MBT SYSTEM)

A system to minimize landfill and burning and reduce secondary environment contaminants from leachat, odor, and soil contamination, by screening and separating substances which can become resources and energy from household wastes by type and recycling and changing them into energy.

## Certification

- 2002 Venture Biz (KIBO)
- 2004 ISO 9001, 14001(International industrial certification)
- 2006 INNO Biz (KIBO)
- 2007 NET No. 229(Ministry of Environment)
- 2010 NET No. 302(Ministry of Environment)
- 2013 Leading Environmental Company (Ministry of Environment)

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consulting ( )

## Company Introduction

Since its foundation in 1999, ENBIOCONS has been developing new fields of the environment industry. Our goal is to develop technologies to mitigate environment pollution. Entrusted by government offices, we operate facilities like sewage sludge-to-energy plants and food waste-to-feed plant, and manage low-grade coal upgrade projects, as part of clean coal energy development operations. We also provide solutions necessary for the design and installation of waste-to-energy facilities.



## Characteristics of Key Products & Technologies

### 1. Sewage sludge drying and waste-to-energy plant

A sewage sludge-to-energy system using direct heating rotary kiln to evenly dry dehydrated sludge with more than 80% of moisture content into 10% or below. Working for 24 hours nonstop, in simple design, and safe from fire or explosion.

### 2. Low-Grade Coal Upgrade Plant

A system to upgrade low-grade coal with low efficiency for fuel, compared to high-grade coal having high caloric value. Processed in this system to enhance coal efficiency, cheap low-grade coal is upgraded and can be used for power generation.

### 3. Anti-mine damage plant

A system to purify acid mine drainage from abandoned mines. This system uses electrolysis to remove heavy metals from mine drainage having high content of heavy metals, making it possible to treat large amount mine drainage in a short time.

## Projects performed at home and abroad

- Capital Area Landfill Phase 2, Sewage Sludge-to-Energy Plant (1000 ton/day)
- Busan Metropolitan City Sewage Drying and Waste-to-Energy Plant (550 ton/day)
- Capital Area Landfill Phase 3 Working Design Construction Company (1000 ton/day)
- Gijang-gun Food Waste-to-Energy Plant (5 ton/day)
- Najeon Mine Water Purification Plant (3,000 ton/day)
- Hambaek Mine Water Purification Plant (6,700 ton/day)

## Certification

- GT (Effective until Dec. 15, 2014)
- ISO 9001 (Effective until Apr., 23, 2015)
- ISO 14001 (Effective until Apr., 23, 2015)
- NET (Effective until Jan. 23, 2016)

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## Company Introduction

BKT Co., Ltd. is a South Korean water treatment company that provides proprietary technologies and engineering services through its 3 main business divisions: 1) Water, 2) Membrane, and 3) Energy. The Water Division oversees the operation of BBF, the state-of-the-art technology that treats and reuses water and wastewater, and BCS, the advanced technology that processes wastewater from livestock manure. On the other hand, the Membrane Division is responsible for the anti-fouling membrane system, FMX, which specializes in liquid-solid separation for high density, viscosity, and solids applications. Finally, the Energy Division manages the business operations of BKTurbo, an energy-saving turbo blower, that is commonly used for aeration in wastewater treatment plants. This division also deals with the production of renewable energy from sludge treatment facilities. BKT, in cooperation with its United States subsidiary, provides clients with the best technological and engineering services to meet their specific needs. As a global company that has formed various partnerships with many leading companies, BKT has supplied its technology and expertise to the world's environmental market.

– BKTurbo is the most suitable turbo blower in the wastewater treatment industry since it minimizes energy use and causes less surging due to the air bearing's reverse rotation capability.



## Characteristics of Key Products & Technologies

### 1. BBF (Bio-filtration)

- BBF is an up-flow process system using dual (fixed and floating) media layers composed of semi-permanent media materials.
- In the BBF, suspended solids are filtered by media layers, while nitrogen and biological oxygen demand are removed by the biofilm (microbes) that form on the media surface.

### 2. BCS (Smart SBR)

- BCS is an effective SBR process that minimizes the impact of ammonia and efficiently removes high concentrations of nitrogen.
- BCS specializes in removing organics, nutrients, and non-biodegradable materials through its advanced treatment processes.

### 3. FMX (Anti-fouling Membrane)

- Due to its vortex generator, FMX– an anti-fouling membrane system– prevents fouling.
- FMX specializes in liquid-solid separation for high density, viscosity, and solids applications. This membrane technology provides excellent performance through its recovery of raw materials and valuable metals, refinery of amino acids, and optimal enrichment processes.

### 4. BKTurbo (Turbo Blower)

- BKTurbo is a highly efficient, energy-saving turbo blower that consists of a direct, high-speed motor and a patented dual air foil bearing.

## Projects performed at home and abroad

- BBF (Bio-filtration)
  - Domestic: 23 sewage treatment plants including Junglang Water Reuse Center and 16 livestock manure treatment plants
  - Overseas: Wastewater Treatment Plant of QuFu City, China
- BCS (Smart SBR)
  - Domestic: Dangjin Livestock Manure Treatment Plant and other 31 livestock manure treatment plants & Pocheon Youngjung Sewage Treatment Plant and 25 more sewage and waste water treatment plants
- FMX (Anti-fouling Membrane)
  - Domestic: 12 units including those at Samsung Fine Chemicals and Boeun Livestock Manure Treatment Plant
  - Overseas: 26 units including MTI, Netherlands (BGP Digestate Wastewater Treatment), Bio Star, USA (Bio Gas Plant), CJ cheiljedang, Malaysia (Amino Acid Purification)
- BKTurbo (Turbo Blower)
  - Domestic: 24 units for sewage and waste water treatment and water purification including those at Dong-A Pharmaceutical and Hansol Chemical, and 81 units for water treatment including building parts for Hyundai Mobis.
  - Overseas: 4 units including Stone Brewing, USA and Fushun Huamei Environmental Protection Technology, China

## Certification

- Certificate : 8 NET certificates 2 designations, ISO 9001/14001, CE, UL
- Patent : 62 Korean patents and 36 foreign patents



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consulting ( )

## Company Introduction

- Leading company in water treatment for over 30 years
- Ranked first in domestic market share

YUCHON ENVIRO CO.,LTD specializes in research & development and manufacture of water treatment equipment of high-quality.

In the past 30 years, we have been the leader in the water treatment field, especially placed first in the filtration equipment. With many years of proven success in producing a wide range of belt press, auto jetwet, submersible aerator, CAF, sand filter and fiber discfilter in the domestic and foreign water treatment field, YUCHON ENVIRO CO.,LTD will take the lead in the industry.



Yangju-si, Shincheon STP(70,000m<sup>3</sup>/day)



Jecheon-si, Jecheon STP(70,000m<sup>3</sup>/day)



Gwangju-si, Youngsan-river CSO application(24,000m<sup>3</sup>/day)

- ⇒ Easy to design according to flow rate, water quality and pollutant load.
- 2) Small footprint & low maintenance cost (gravity filtration type)
- 3) Verified many reference lists



Daegu-si, Seobu STP(455,000m<sup>3</sup>/d)



Uijeongbu-si, Uijeongbu STP(200,000m<sup>3</sup>/d)



Fiber Discfilter YDFS-3000 series

## Projects performed at home and abroad

- Sunghnam-si, Sunghnam STP(460,000m<sup>3</sup>/day)
- Daegu-si, Seobu STP(455,000m<sup>3</sup>/day)
- Uijeongbu-si, Uijeongbu STP(200,000m<sup>3</sup>/day)
- Namyangju-si, Jingeon CSO application(200,000m<sup>3</sup>/day)
- Wonju-si, Wonju STP(156,000m<sup>3</sup>/day)
- Goyang-si, Wonneung STP(80,000m<sup>3</sup>/day)
- Jecheon-si, Jecheon STP(70,000m<sup>3</sup>/day)
- Yangju-si, Shincheon STP for the third treatment of effluent(70,000m<sup>3</sup>/day)
- Gwangju-si, Youngsan-river CSO application(24,000m<sup>3</sup>/day) and many others

## Characteristics of Key Products & Technologies

### Fiber Discfilter

High efficiency removal of BOD, COD, SS, T-P etc... by the depth filtration for the tertiary treatment of big/small STP and WWTP and CSO treatment

- 1) A wide range of specifications of fiber media are available, and, flexible and customized design for specific customer needs based on diameter and quantity of disc is possible

## Certification

- ISO9001
- Many patents
- Certificate for the performance of Fiber Discfilter which is developed by small & medium company (Small & Medium Business Administration)

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## Company Introduction

POSCO E&C, established in December 1994, is the best general construction company of Korea that pursues to be the global E&C company with accumulated plant engineering technology and knowhow and experienced manpower by building the worldclass general steelworks. In 2011, we received orders for 14.4 trillion KRW (12,490 million USD) and achieved No. 1 performance among the construction companies in Korea. We have acquired levels BBB and Baa3 from S&P and Moody's, the world-class credit rating institutes, respectively. We have been acknowledged with the highest credit rating among the construction companies in Korea and abroad and currently have about 4,300 experts. We have the largest portfolio in Korea's environmental industry and we are growing into a global E&C group by exploring the markets in the Middle East, Southeast Asia, and South America based on our experience in building water treatment plants for steelworks in China, Indonesia, and Brazil and water treatment plants in Vietnam and UAE.



Gimpo Sewage Facility BTO



Jungrang Sewage Treatment Plant



Goyang-si Environmental Energy Facility

## Characteristics of Key Products & Technologies

### 1. Sewage/Wastewater Treatment

We have built a number of advanced sewage/wastewater treatment plants that can remove both organic matters and nutritive salts based on POSCO E&C's original technology called Bio-SAC BNR method. We have the best technology to apply Hydro J.B pre-treatment method and MBR method to recycle treated boiler feed water as industrial water.

### 2. Seawater Desalination and Water Purification

Apply high-efficiency low-energy SWRO method to use RO Membrane to remove ionotropic materials from seawater for desalination to reuse seawater as drinking water or industrial water. Also, we install water pipes and build water purification plants to supply drinking water to households from water sources.

### 3. Waste Treatment

We use resource recycling technologies to recycle resources and to minimize reckless destruction of nature. We pursue environmental preservation and higher quality of life and contribute to global warming prevention by processing wastewater stably to recycle waste resources and energy.



## Projects performed at home and abroad

- Gimpo-si Sewage Facility Private Investment Project (BTO): Green Gimpo Co., Ltd. (July 2009 ~ Dec 2012)
- Suwon Sewage Sludge Treatment Facility: Suwon-si, 450m<sup>3</sup>/day (June 2007 ~ Nov 2011)
- Pangyo, Seongnam Water Quality Recovery Center: Korea Land & Housing Corporation, 47,000m<sup>3</sup>/day (Feb 2007 ~ May 2009)
- Yangsan Resource Recycling Plant: Yangsan-si (Oct 2004 ~ Jan 2008)
  - Thermal Decomposition Melting Facility: 100 tons/day × 2 units
  - Recycling Plant: 80 tons/day × 1 unit
- Ansan Terminal Sewage Treatment Plant: Ansan-si, 385,000m<sup>3</sup>/day (July 2004 ~ Mar 2009)
- Jungrang Terminal Sewage Treatment Plant: Seoul, 46,000m<sup>3</sup>/day (Feb 2004 ~ Oct 2007)

## Certification

- Sewage Sludge Auxiliary Fuel Production Technology for Thermal Power Plants using Unified Fixed Dryer and Sorter (Aug 2012)
- Sewage Treatment Technology in Rainy Weather using Air Bubble Impregnation High-speed Floatation Separation Process (Nov 2011)
- Advanced Sewage Treatment Technology using Hollow Fiber Separating Membrane System and 2-layer Anoxic Reactor (I3 System) (Mar 2010)
  - Biological Nutrient Removal Bio-SAC Process (Bio-SAC BNR Process) using Bio-SAC (waste tire medium) (May 2001)

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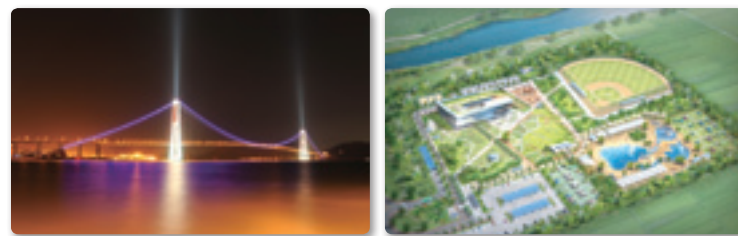
## Area

Total construction ( ) / water quality ( ) / air quality ( ) / wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) / consulting ( )

## Company Introduction

Founded in 1939, Daelim Industrial is a leader in the construction and petrochemical industry of Korea, and the parent company of Daelim Group consisting 13 subsidiaries. Daelim Industrial has provided a wide range of services in the areas of the petrochemical industry and the construction industry like civil engineering, architecture, and plant and achieved 7.7 trillion won of sales and 426.5 billion won of operating profits in 2012.

In the area of the environment industry, we have been awarded orders of and executing a number of water supply and sewage system projects including the Seonam Water Reuse Center Modernization Project of a 1,510,000 ton/day capacity and the Construction Project of the Advanced Water Purification System of Bupyeong Water Purification Station of a capacity of 270,000 ton/day. In addition, based on our know-how built on successful performance of domestic and overseas projects for decades, we are developing overseas contracts and BTL projects.



## Characteristics of Key Products & Technologies

### 1.e-tris (Sludge Reducing Sewage Treatment SBR Process)

An SBR-based next generation eco-friendly advanced sewage treatment process that can reduce redundant sludge not to mention sewage treatment. Able to reduce redundant sludge by 60%, saving sewage treatment costs by 30%.

### 2.e-tris II (Sludge Reducing Sewage Treatment MBR Process)

A compressed MBR-based advanced sewage treatment process combining redundant sludge reduction technology. Compared to existing submerged MBR, high flux, maximally easy maintenance, high efficiency, and reduced redundant sludge, making MBR process economical.

### 3. MBR Advanced Water Purification Hybrid System

By mixing compressed / submerged process (process operation), this system makes MBR process flexible and offers compact pre-treatment process by means of active membrane contamination control, enabling advanced oxidation process optimization that can control whatever new contaminants found in any water systems of Korea.

### 4. Intelligent Water Supply Total Management System

This monitoring-analysis-control system that can monitor the water purification station and pipe network at the same time, equipped with a system to prevent failures of the water purification station and pipe network to take preactive measures. Realizing optimal operation system through water purification process analysis and real time pipe network monitoring.

### 5. BioEner System

A technology maximizing methane gas by increasing activity of microbes in digestion tank. Able to treat digestion solution highly efficiently using membrane filtration and electrolysis.



## Projects performed at home and abroad

- Seonam Water Reuse Center Modernization Project (1,510,000 ton/day)
- Wastewater Treatment Plant Project of Godeok General Industrial Complex (102,000 ton/day)
- Construction Project of the Advanced Water Purification System of Bupyeong Water Purification Station (270,000 ton/day)
- Siheung Bangsan Sewage Treatment BTO Project (68,000 ton/day)

## Certification

- e-tris : NET No. 345, GT No. 12-00027



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## Area

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

Founded in 1973 with a mission statement "Build our air quality plants on our own," KC Cottrell as Korea's leading environmental company has designed and made electrostatic filters for the treatment of dust and gas, desulfurization and denitrification facilities, and ash treatment systems, provided technical advice for related facilities, and expanded operations into photovoltaic power plants. With the help of customers' trust and efforts of our executives and employees, we achieved 332.1 billion won of sales and 14.7 billion won of operating profits in 2012. Fueled by the establishment of the Taiwan office and the award of the Talin/Hsinta project in 1990, KC Cottrell has begun to expand its operations into UK, USA, Taiwan, Japan, Vietnam, and India, strengthening its global competitive edge.



Reduction System) has highest efficiency and stability. This process is to convert nitrogen oxides into harmless N2 and N2O by putting an NH3-series reducing agent in to a solid catalyst. KC Cottrell offers optimal nitrogen oxide removing facilities to meet needs of each industrial site in the areas of power generation, steel works, incineration, and cement.



## Characteristics of Key Products & Technologies

### Electrostatic Filters (Dry, Wet, De-Tar ESP)

Electrostatic filters remove dust in electrostatic dust collection method that electrifies particles in the air through corona generated by high voltage DC power and separates these charged particles from gas by electrostatic force in the electric field. KC Cottrell's electrostatic filter offers a customized system with high dust collection efficiency and durability and in energy-saving design.

### Desulfurization Facility (dry/wet flue gas desulfurizer)

This is a facility to remove sulfur oxides in the process of burning. Our commercial Wet Limestone Gypsum Process with proven performance has been widely used for us to successfully perform large scale projects of Cheongju Branch of Korea District Heating Corp., Dangjin Thermal Power Plant, Samcheonpo Thermal Power Plant, and Hadong Thermal Power Plant, to name a few, and proven its excellence in performance and quality.

### Denitrification Facility (selective catalytic / non-catalytic reduction system)

Among facilities removing nitrogen oxides from flue gas, Selective Catalytic Reduction System (SCR Selective Catalytic

## Projects performed at home and abroad

- Dangjin Thermal Power Plant, Units 1 to 4 Denitrification Facility 500MW X 4 (2006)
- POSCO Gwangyang Steel Works, 5 Sintering Exhaust Gas Cleaning Facility Construction Project worth 62.9 bn won (2009~2011)
- Youngheung Thermal Power Plant, Units 5 & 6 Desulfurization Facility of 870 MW x 2 (2011~2014)
- Taiwan's Hsinta Thermal Power Plant, Desulfurization Facility & Electrostatic Filter Improvement Project worth 114.8 bn won (2011)
- Ash Handling, dust collector, and SCR for Rabigh Power Plant No.2 Project 700MWx4, Saudi Arabia (2011)
- Turkish Tufanbeyli Desulfurization, dust collector, & Limestone Handling Project worth 38.1 bn won (2011)
- Dangjin Thermal Power Plant, Units 9 & 10 dust collector 1000MW X 2 (2012)
- Renault-Samsung Busan Plant, Photovoltaic Power Plant Construction Project worth 54.1 bn won (2012)

## Certification

- Environmental Management System Certification (ISO 14001) – Korean Foundation for Quality (2010)
- "Korean Hidden Champion" Certificate – Korea EXIM Bank (2010)
- NET Certificate (WEPC-030-A~Z, tunnel electrostatic filtration system with 1-level charged blade electrodes) – Minister of Knowledge & Economy (2011)
- Leading Environmental Company– Ministry of Environment (2012)

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

Founded in 2004, TSK Water has devoted itself to continued management innovation and strategy development, emerging as a leading environmental company in Korea. TSK Water has maximized synergy by combining abundant experience and know-how in the construction of water supply, sewage and wastewater treatment systems of Taeyoung Construction and SK Chemical and SK E&C with a best global network, plant construction capability, and water treatment and waste-to-energy R&D capacity with its operation and management capabilities. Currently, we are performing O&M business and making investments in water treatment and waste-to-energy projects to provide total solutions to the environment industry as a whole. We will continue our effort to expand markets around the globe to attain the vision of "Global Total Solution Provider in water treatment and waste-to-energy area.



## Characteristics of Key Products & Technologies

### 1. Sewage treatment project

TSK Water operates over 100 public sewage treatment plants nationwide. Major methods in this field include CSBR, MLE, MSBR, CNR, ACS, 4-Stage BNR, TEC-BNR, MLE, BCF, DNR, MBR, and KIDEA HBR- II. As a BTL project, we operates and manages a 1,130 km sewer.

### 2. Wastewater treatment project

TSK Water performs wastewater treatment and operation projects for customers such as local governments, plants, and industrial complexes. Major methods include Activated Sludge, SBR, and DAF+ coagulated precipitation. As a B2B project, we supply a total capacity of 4,000m<sup>3</sup>/day for the drainage reuse system of SK Chemical Ulsan Plant in the method of DAF and RO and 250m<sup>3</sup>/h for pure water in the method of 2B3T and MBT.

### 3. Waste-to-energy project

TSK Water performs waste-to-energy projects including biogas plants and new and renewable energy. Total capacity of biogas plant is 300m<sup>3</sup>/day, and key method is anaerobic digestion. Major new and renewable energy projects include photovoltaic power generation with 2.478Kw/h of energy.



## Projects performed at home and abroad

- Operation projects
  - 600 basic environment facilities including Jeonju and Ilsan Public Sewage Treatment Plant
- Construction projects
  - BTL projects like Namyangju and Byeokjae Sewage Treatment System and a lot more redevelopment and unit process construction projects including Ilsan Sewage Treatment Plant project.
- Investments:
  - A number of investments in sewage and wastewater treatment system projects like SK Chemical Ulsan Plant and Gyeongju BTL- A number of investments in energy projects like Pocheon Biogas Plant and Gimcheon City Photovoltaic Power Generation project
- R&D activities:
  - 1 phosphorous removal-related NET and 18 water treatment related patents

## Certification

- ISO 14001 (Apr. 26, 2012)
- ISO 9001 (Apr. 26, 2012)
- OHSAS 18001 (Dec. 6, 2012)

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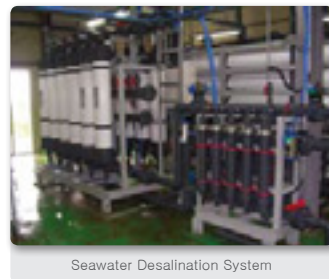
Total construction ( ) / water quality ( v ) / air quality ( ) / wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) / consulting ( )

## Company Introduction

Established in 1985, Synopex Inc. has two independent divisions for IT business and water environment business and each division has achieved rapid growth and development through cooperation and constructive competition.

The water environment business has been focused on membranebased advanced water purification, seawater desalination, and wastewater treatment to develop and produce separating membranes, engineer membrane structures, and supply and service membrane plant systems to provide New Smart Total Solution Services.

Synopex Inc. achieved 367.8 billion KRW annual sales as of 2011 through steadfast technological development and innovation. Also, we have been selected as New Growth Business of Gyeongsangbuk-do in 2009 in the environment division, including the water treatment systems, and achieved Gyeongsangbuk-do Pride Product and Minister of Environment's Award in 2010. The filters we develop and produce have acquired FDA Certification, as well as the ISO 14001 and ISO 9001 certifications, to improve product competitiveness.



Seawater Desalination System



Mobile Water Purification System

## Characteristics of Key Products & Technologies

### Mobile Water Purification System (SMDT/Water 911)

Mobile Water Purification System, known as SMDT (Synopex Mobile Drinking Water Feeding Trailer), has an independent power generator and a compact water treatment system in the container to quickly provide sanitary drinking water and domestic water to areas affected by disasters or isolated from power supply.

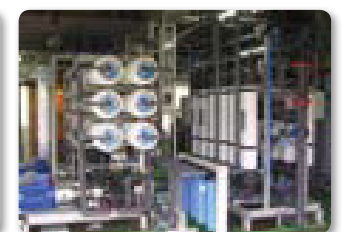
### Fixed Water Purification System (Compact Water System)

Treats groundwater, streams, rivers using the Membrane System to supply sanitary and safe drinking water and domestic water to areas isolated from water supply.

### Seawater Desalination System

A compact system that ensures large quantities of water resources by removing salinity in seawater to supply drinking

water and domestic water. This system applies the RO Membrane System to separate ion materials and pollutants and allows fast construction to supply large quantities of water resources fast.



## Projects performed at home and abroad

- Ministry of Land, Transport, and Maritime Affairs' Seawater Desalination National Project Test Bed Pilot Unit, Gijang, Busan <1,000m<sup>3</sup>/day> (Aug 2012)
- DHT Vietnam Mong Duong 2 CFPP WWTS Engineering/ Fabrication/Supply <2,640m<sup>3</sup>/day> (Dec 2011)
- Moorim Power Tech Co., Ltd. Water Treatment RO System Installation <2,400m<sup>3</sup>/day> (Aug 2011)
- Mobile Water Purification System (SMDT) for Mongolia Water Council <20m<sup>3</sup>/day> (July 2011)
- Doosan Heavy Industries & Construction Ras Az Zawr Project RO Pilot Unit, Saudi Arabia <27m<sup>3</sup>/day> (Jan 2011)
- Groundwater Desalination System for the Government of Senegal <500m<sup>3</sup>/day> (Jan 2011)
- Gonggan General Construction Co., Ltd. Dokdo (West Island) Seawater Desalination System Maintenance/Repair (RO) (Nov 2010)
- Pohang Gyewon-ri UF System Installation for Water Service Management Agency of Pohang City <120m<sup>3</sup>/day> (May 2010)
- \* Many other water treatment systems

## Certification

- Environmental Management System Certification (ISO 14001) – Korean Foundation for Quality (2010)
- "Korean Hidden Champion" Certificate – Korea EXIM Bank (2010)
- NET Certificate (WEPC-030-A~Z, tunnel electrostatic filtration system with 1-level charged blade electrodes) – Minister of Knowledge & Economy (2011)
- Leading Environmental Company– Ministry of Environment (2012)



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consulting ( )

## Company Introduction

J-E TECH Co., Ltd. is the company that produces atmospheric filtration and precipitation facility and for the past 17 years, we have secured 18 domestic and international patents and 6 utility models through continuous R&D for development of new technology, moreover, we are producing fusion-type high efficiency precipitation facility which is differentiated with previous precipitation facility. J-E TECH's various technologies are focusing on development of worksite environmental improvement and prevention of air pollution. We are presenting various technologies in various industrial areas such as various boiler and general exhaust gas treatment such as denitrification, desulfurization and dust collection of incinerator, PM2.5/PM10 level of ultra-fine dust treatment technology of thermal power plant and cement plant, special precipitator for metal machining process such as copper smelting and melting plating process, etc.



CY-BAG Hadong thermal demonstration business



HI-FILTER installation site

## Characteristics of Key Products & Technologies

### CY-BAG FILTRATION SYSTEM

- It is the hybrid-type precipitation equipment of centrifugal force precipitation equipment and filter cloth precipitation equipment and 2 facilities are simplified into 1 facility so it is the high efficiency precipitation equipment with minimized installation area.
- The fatal disadvantage of filter cloth precipitation equipment which is the moist is removed in advance according to centrifugal force so it has the effect of reducing maintenance cost by extending the lifespan of filter cloth
- We hold 2 patents regarding CY-Bag filtration system (Powdered coal complex precipitation equipment, inertial flow complex fine dust collection device), moreover, have acquired NEP (New Excellent Product) certification from Ministry of Knowledge & Economy

### HI-FILTER SYSTEM

- It is the hybrid-type precipitation facility of electrical precipitation technology and filter precipitation technology and its collection efficiency of fine dust (PM10, PM2.5) is high and according to minimized installation area with simplified structure compare to previous facility, initial investment cost and maintenance cost is significantly reduced
- Most of dusts are collected from dust collecting electrode so dust load of filter gets reduced and lengthens the exhaustion interval of filter so it has the strong point of extending the lifespan of filter



## Projects performed at home and abroad

### 1. CY-BAG FILTRATION SYSTEM

- 2.9 billion KRW of supply contract of Yeongheung Thermal Power Plant unit 5,6 dust collection equipment (2012)
- 7 billion KRW of supply contract with Chinese top 5 coal mining company (2011)
- Hadong Thermal Power Plant joint demonstration business (2010), supply of facility (2011)

### 2. HI-FILTER SYSTEM

- Supply of demonstration facility to Seochon Thermal Power Plant (Korea Midland Power) (2011~2013)
- 1.3 billion KRW of technology exportation contract with Xuanhua Metal Environment Protection Equipment Manufacture Co., Ltd. in Beijing, China (2009)

## Certification

- Acquisition of CY-BAG SYSTEM -NEP(New Excellent Product) certification (Aug 2012)
- Selected as Excellent Environment Industry from Ministry of Environment/Korea Environmental Industry & Technology Institute (July 2012)
- Integrated-type filter module and precipitation equipment that contains it (Aug 2011)
- Powdered coal complex precipitation equipment (May 2011)
- Commendation of Minister of the Environment <Merit of green industry and growth> (2010)
- Inertial flow-type complex fine dust collection equipment (Dec 2010)
- Integrated-type precipitation equipment (Mar 2008)

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## Company Introduction

Our operations cover environment energy, water environment, and plant projects. Based on our know-how of environment technology built over 22 years or so in the area of environment energy, we have made advanced achievements in VOC elimination facilities and organic solvent recovery equipment and sped up our efforts for waste-to-energy project, drawing on our proven technologies and excellent performance in the treatment of food wastes and the installation of anaerobic digesters. In the area of water environment project, the IPR™ Process applied in around 45 sewage treatment plants nationwide in an attempt to reduce the inflow of green algae as a pollutant in four major rivers in Korea. Furthermore, new projects including the IPNR™ Process developed as part of the Eco-Innovation Research program have helped us to occupy a firm ground as a construction company. As far as plant business is concerned, we have been dedicated to the areas of advanced water treatment, seawater desalination and hydraulic water treatment and water reuse, on the basis of experience in Membrane pure water of Youngdeungpo Water Purification Plant. In addition, as one of Korea's key players in this field in terms of experience and track record, we are planning to expand into overseas markets.

Based on the market's trust for over 22 years in the past, we at Ilshin Environmental Engineering have continued efforts to maintain our status as a reliable company and put in place staff training of humanism. To ensure sustained shared growth with subcontractors, we also endeavor to strengthen relationships and improve quality control capacity. We continue to do our best "to standardize and proceduralize" our long-time technology first policy and proven technologies and construction performance for the past 22 years or so.



## Characteristics of Key Products & Technologies

### 1. IPR™ Process and IPNR™ Process

- Technology: Elimination of phosphorus in 2nd treated water with a continuous reactive filter (IPR™ Process)
- Technological overview
  - Coating the medium with metal salt (iron salt), reacting it with phosphorus, and absorbing and eliminating it
  - Separating the sludge stuck inside the filter and the medium and discharging it with the sludge
  - The separated medium is re-coated with iron salt inside the reactor to eliminate phosphorus continuously

- Re-suing coagulant remaining in the sludge to remove phosphorus in the shearing process
- Intellectual property right: New Environmental Technology No. 315 / South Korean Patent No. 10-0940829

### 2. Membrane Filtration

- Membrane filtration for advanced water treatment
- Design and construction of water treatment process using membrane
- Know-how to maximize efficiency of membrane
- Abundant experience in designing and installing a variety of membrane water treatment system

### 3. VOC concentration combustion system

- High efficiency
- Easy to respond to change in wind volume and concentration
- Able to treat both nonflammable and flammable gases



## Projects performed at home and abroad

- Membrane Filtration System (pressurized), Youngdeungpo Water Purification Plant(2011\_
- IPR System of Dalseong Waste Water Treatment Plant(2011)
- Edison Project Waste Water Treatment Facilities(2012)
- POSCO Mexico Plant CGL#2 RO(2012)

## Certification

- NET(Ministry of Environment), INNOBIZ Certificate(SMBA), ISO9001(MAS Certification co.,LTD), ISO14001(KMAR), Venture Biz(KIBO), Company Affiliated Research Institute Certificate(KOITA)



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consulting ( v )

## Company Introduction

Founded in 1979 as Walseong Construction specializing in housing development, Woojin Construction has devoted itself to public construction works and the nation's infrastructure construction projects for over 30 years and grown into a company ranked 270th in business volume and having 63.5 billion won worth construction capacity in Korea. Since designated as Leading Construction Company by Daegu City In 1996, Woojin has been recognized for its outstanding construction performance by many organizations and agencies including Seoul City, Gyeongsangbuk-do, Ulsan Metropolitan City, Ministry of Construction, Ministry of National Defense, 8th US Army, government funded agencies, and education offices of all levels and awarded Minister of Environment Prize, which proves its growth in volume and quality.

We have put in place effective process control systems by establishing an R&D lab supervised directly by the Representative Director, quality management systems by obtaining an ISO9001 certificate and green systems by acquiring an ISO14000 certificate, making it possible for us to set up a real comprehensive construction management system systematically. In the area of environment project, in particular, registered as wastewater treatment plant design and construction company in 1988, we have continued to design and build a number of environment related facilities like livestock wastewater and manure treatment plants, sewage treatment plants, water supply systems, and landfills, preparing for the 21st century green environment system with our proven expertise and design and construction capabilities.



## Characteristics of Key Products & Technologies

### 1. Wastewater treatment plants

Purpose: to properly treat sewage and factory wastewater discharged from industrial complex to improve the quality of receiving water and living environment of residents Work Scope: Civil works, construction works, mechanical & electrical works, landscaping works, global commissioning

### 2. Sewage treatment plants

Purpose: to properly treat sewage to improve living conditions of residents and enhance and preserve the quality of receiving rivers Work Scope: Civil works, construction works, mechanical & electrical works, landscaping works, global commissioning

### 3. Water purification plants

Purpose: to purify water from lakes and rivers as water supply sources using innovative water treatment systems in order to supply safe water Work Scope: Civil works, construction works, mechanical & electrical works, landscaping works, global commissioning



## Projects performed at home and abroad

- Wastewater Treatment Plant (Andong Bio General Industrial Complex:1,500 m<sup>3</sup>/day, Gogyeong General Industrial Complex:2,200 m<sup>3</sup>/day)
- Sewage treatment plants (Gyeryong Service Station, Sosa Service Station, Korea Air Force Academy, Gagnpyeong Village Sewage System and more)
- Water purification plants (Youngdeok Water Purification Plant, Yeungnam University Water Purification Plant and more)
- Livestock manure treatment plants (Daegu, Seongju, Youngcheon, Bonghwa, Gimcheon, Mokpo, Boryeong, Youngyang, Cheongdo and more)

## Certification

- ISO 14000 Environmental Management System Certificate
- ISO 9001 Quality Management System Certificate
- Company Affiliated Lab KOITA Certificate No. 20002358
- MAINBIZ Certificate No. 070302-01464





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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

Company Introduction

Founded as a "company respecting the life of nature" in 1986, we have built experience and done research in the area of total water treatment equipment and the bio industry, steadily making efforts for technology development. Along with an ISO9001 certificate, we have obtained patent registrations, utility model registrations, and Performance Certificate for our flagship products, Double Chain Rotary Moving Screen and biofilters, which recognizes the excellence of our technologies and quality. All of our executives and employees promise to do our best to put customer satisfaction first with a pioneering mindset of entrepreneurship.



Characteristics of Key Products & Technologies

- 1. Coarse, and fine screen (sludge remover)  
This system is designed to lift and remove suspended impurities at treatment facilities (sewage, water purification, and relay pumping station, etc.) by mounting screen bars (all-in-one type with rake) to continuous lifting chain links and rotating the driving engine. Having no cavity blocking, head difference, and congestion of impurities. Able to lift and remove impurities of all sizes and any amount at the same time, making maintenance easier.
- 2. Biofilter  
This system aims to deodorize bad smells at basic environment facilities like wastewater and sewage treatment plants, consisting of 1st pre-treatment plant to remove dust and mist and main body of biofilter filled with porous synthetic polymer foaming media containing active carbon and zeolite and showing high efficiency in a short retention time.
- 3. Normal and Reverse Direction Rotary Dewatering Screw Press  
In this system, solids or grit and impurities(sludge) lifted by grit lifting machine are directly sent to the screw and pressed for the 1st dewatering process without a cleaning device. Using a device rotating in the reverse direction at the end, reducing the speed of the transfer for compression and 2-stage dewatering process to reduce volume and moisture. Efficiently working to prevent degradation and bad smell and maintain clean environment of treatment plants.

- 4. Solubilization Plant  
This plant reduces sludge generated in basic environment facilities like wastewater and sewage treatment plants and changes into energy. Realizing high solubilization rate and energy recovery rate using high temperature and pressure thermal expansion technology. In linkage to digestion tank, reducing retention time at digestion tank, increasing the generation of methane gas, and reducing moisture content of final cake.



Projects performed at home and abroad

- Double Chain Rotary Moving Screen  
Buldang Relay Pumping Station Expansion Project, Seongnam 1st & 2nd Sewage Treatment Plant  
Advanced Improvement Project, Grit Basin Fine Screen Manufacturing, Purchase & Installation, Uijeongbu Sewage Treatment Plant, Sihwa MTV Relay Pumping Station Motor-Moving Screen
- Biofilter  
Poseung Sewage Treatment Plant Expansion and Advanced Treatment Plant Construction, Paju Woonjeong Sewage Treatment Plant Construction, Seongnam 1st & 2nd Sewage Treatment Plant  
Advanced Improvement Project, Okjeong Sewage Treatment Plant, Uijeongbu Sewage Treatment Plant

Certification

- ISO 9001
- Performance Certificate\_Double Chain Rotary Moving Screen
- Performance Certificate\_Odorous Gas Deodorization System Using Pous Synthetic Polymer Foaming Media Containing Active Carbon and Zeolite

## Company Introduction

Beginning as an engineering company specializing in civil works and urban planning and growing into a total engineering firm today, Dongho has successfully performed a host of projects covering design, construction, project management, and inspection in the areas of urban planning, complex development, tourism and leisure, road, bridge, railroad and subway, port and water supply development, water supply and sewage system, and environment plant business.

We have provided a wide variety of services ranging from planning of diverse development projects and total engineering services like economy analysis, feasibility study, design, impact assessment, purchase and procurement, project management, inspection, and commissioning to master plan development and design for construction, turn-key, alternative design, and BLT to meet needs of customers.

Our environment plant operations covering water supply and sewage, environment impact assessment, and plant have continued to focus on efforts for sustainable development and environment preservation.

Given the importance of water treatment as a fundamental element for human lives, water supply and sewage unit deals with total plant business to stably supply clean water to prevent water shortage due to rapid urbanization and industrialization and alleviate concerns over water pollution. Since water supply and sewage projects require comprehensive environment expertise integrating water and sewage system, civil work, construction, landscaping, machinery, electricity, and instrumentation and control, we perform projects of various types including master plan development of water supply and sewage system, water purification and industrial water treatment system, and urban sewage and waste water treatment system by making sure that all of these areas can work organically with each other in a seamless manner. Dongho provides quality services to both local and overseas customers of water supply and sewage works by introducing and developing advanced technologies and applying our unrivaled know-how.

In addition, in the area of environment business consisting of environment design and environment assessment, we boast of optimal design covering from master plan to design review and verification for pollutant water quality management, environment pollution prevention facilities and waste treatment facilities, waste-to-energy facilities in environment design, while taking the lead in preserving environment by predicting and presenting solutions to reduce environment impacts likely to take place in natural environment (ecosystem, atmosphere, water, and sol, etc.) and living environment (land use, wastes, noise and vibration, traffic, etc.) of social infrastructure, housing and industrial complex, and tourist attractions, environment impact assessment, and follow-up environment impact assessment in the area of environment assessment.



Master and Working Design of Pangyo Sewage Treatment Plant



Master and Working Design of Water Quality Recovery Center for Multi-functional Administrative City



Master and Working Design of the 2nd Phase Construction Work for Gongchon Water Purification Plant



Bidding Design for Capital Area Food Waste Leachate Biogas Facilities

## Characteristics of Key Products & Technologies

### Projects performed at home and abroad

- Working Design of South Jeonnam Area Water Supply System
- Working Design of Central Chungnam Area Water Supply System
- Master and Working Design of the 2nd Phase Construction Work for Gongchon Water Purification Plant
- Working Design of Advanced Water Purification Plant for Guri City Topyeong Water Purification Plant
- Master and Working Design of Pangyo Sewage Treatment Plant, Seongnam
- Master and Working Design of Water Quality Recovery Center and Clean Energy Center for Multi-functional Administrative City
- Master and Working Design of Expansion of Gongchon Sewage Treatment Facilities and Advanced Treatment Plant
- Master and Working Design of BTL Sewage System Redevelopment pROJECT, Pohang City
- Master and Working Design of Waste Water Treatment Plant Construction for Asan Techno Valley
- Working Design of Sewage Treatment Plant of Arbil, Iraq
- Drinking Water Supply Master Plan of Ahal welayaty, Turkmenistan
- Feasibility Study for Maputo Sewage Treatment Plant Improvement Project, Mozambique
- Feasibility Study for Water Supply & Sewage Infrastructure Improvement Project of Manta City, Ecuador
- Master Plan Development for Sewage Improvement, Peru
- Bidding Design for Capital Area Food Waste Leachate Biogas Facilities
- Master and Working Design of Expansion Work of Public Livestock Manure Treatment Plant, Gimhae
- Master and Working Design of NPS Pollution Reduction Facility of Urban Infrastructure
- Environment Impact Assessment of Saemangeum Free Economic Zone Industrial Complex Development Project
- Environment Impact Assessment of Pyeontaek Internationalization New Town District Housing Development Project

## Certification

- Quality Management System (QMS)-ISO9001:2008 (CERTTECH REGISTRATION INC, 11/2577)

## Company Introduction

Chunghae ENV Inc. is committed to designing wastewater treatment systems and facilities and to performing research projects. One of the projects which we have worked on is to produce methane in biogas from biomass produced by the anaerobic digestion process, including a preliminary treatment system in the electromagnetic field. Also, we have a goal with the Minister of Environment to develop an innovative system to reduce CO2 emissions. We believe that these activities constitute a major investment for our future life that will be worth living.



## Characteristics of Key Products & Technologies

1. Waster treatment method using super high frequency electromagnetic field generator (CH-EMA)
  - A method to treat with moment high pressure and temperature cavitation using a super high frequency electromagnetic field generator.
  - Resolving disadvantages of biological process subject to hypostatic nature of microbes, this method removes non-biodegradable matters by making electromagnetic field generator in flow control tank destroy membrane of organic matters and non-biodegradable substances. By applying electronic phosphorous removing device in anaerobic and oxygen free tank for phosphorous and nitrogen removal in the next process, it removes organic matters and color degree and discharges no BOD, SS, T-N, T-P and sludge, contributing to the national policy to prevent marine discharge.
  - Treated by cavitation, excellent in treating non-degradable matters and maintaining water quality stable.
  - Easy to control and operate, as it is equipped with a separate control box enabling the operation of super high frequency electromagnetic field generator.
2. Reactor and electromagnetic field generator based method to increase the generation of biogas by means of electromagnetic wave
  - A method of generating electromagnetic wave emitting more than 70% of methane gas in the best possible condition to increase the generation of biogas.

- Stable and integrated treatment of wastewater sludge is possible using electromagnetic wave .
- Safe alternative to anaerobic fermentation system by increasing soluble organic matters using electromagnetic field generator for preliminary treatment of organic wastes (food waste, sludge, and sewage) by increasing biogas emissions.
- Saving facility and operating costs by resources recycling technology based on organic waste treatment of waste sludge.

3. High speed circulation absorption top based domestic food wastes (sewage sludge and livestock manure) biogas purification and harmful gas removing method

- A method of developing a 100Nm3/hr multi-level cyclone absorption top in high speed circulation system for the development of low concentration methane gas separation and purification system
- Removing H2S 20ppm or below, NH3 10ppm or below, and CO2 85% or over, respectively from biogas to enhance the purity of methane gas and thereby create values from heat use, power generation, and gas purification.
- Creating new markets, by using domestic food wastes (sewage sludge and livestock manure) widely for biogas purification projects and encouraging waste disposal service providers to make investments in facilities if they want to buy methane-separated purification.



## Projects performed at home and abroad

- Suwon World Meridian APT Wastewater Treatment Plant Construction Project (15,000TON)
- World Venture Center Wastewater Treatment Plant Construction Project (10,000TON)
- Geumgansan Land Wastewater Treatment Plant Construction Project (3,000TON)
- Malipo Sewage Treatment Plant Construction Project(2,000TON)

## Certification

- SMBA Green Management Biz ("A" Grade) – A Grade Excellent Green Biz
- INNO-BIZ, Venture Biz
- Company Affiliated Research Center – KOITA
- New & Renewable Energy Company Registration – Biogas, wind power
- KSQ ISO 14001:2004 / KSQ ISO9001:2009 – CREBIZ QM



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## Area

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## Company Introduction

Beautiful Environmental Construction Co., Ltd. is the professional environmental service company and started the purification work of contaminated soil/groundwater in 1996, moreover, since the 2000s, the business area has been expanded to environmental business of U.S. Army, asbestos . mine pollution prevention, ecological river restoration business, wastewater treatment, landfill stabilization, and etc. The annual sale in 2011 is 22 billion KRW and since 2007, the sale growth is steadily increasing 30%~50% so that places us in 3rd place in same industry and as of December 2011, we hold the total asset of 10 billion KRW, capital of 2 billion KRW, and 80 permanent employees. From 2012, we are entering into oversea business such as KOC soil purification business in Kuwait and are planning Bio-Mass Power Plant in Indonesia which is the renewable energy business. We also have designated as Excellent Environment Industry from Ministry of Environment.



LPP worksite in Paju



Water treatment plant in station influence area of Yongsan city



FED Bio slurping

## Characteristics of Key Products & Technologies

### Purification of soil / groundwater

Since the 2000s, as the purification and restoration business of soil and groundwater accelerates, we have led the way by developing new technology among the industry which used to rely on the technology of developed country. We also have developed the soil cultivation, soil purification, bio slurping and landfill stabilization technology and followed the large scale soil purification business in domestic as well as with U.S. Army successfully.

### Thermal desorption / Soil washing system

Low-temperature thermal desorption system which acquired major part of patent which are rotary kiln and preheat dryer is effective with contaminated soil of high concentration and it has been applied to LPP, TKP purification business in domestic. The soil washing system has been applied to many purification businesses as variable system which shows the optimized system according to its scale of purification business.

### Landfill stabilization system

Mobile system of liquid-gas recycling process for early stabilization of landfill is the soil purification system developed as part of core environmental technology development business of next generation. Its mobility is excellent and

especially, it is effective in liquidity collection of a floating oil and purification treatment of groundwater (Certification of new technology of Korea #1133)



## Projects performed at home and abroad

- Purification business of former Korea Iron & Steel Land in Changwon city (July 2012)
- Purification business of contaminated area of station influence area of Yongsan city (Oct 2011)
- Environmental purification business of homeland termination pipeline (2009)
- Environmental purification business of returned U.S. base (LPP 1-1 base) (2008)
- Order from U.S. Forces Korea Contract Command BOA (Sept 2008, 5 years)
- Order from U.S. Army FED environmental corporation (Mar 2007, 5 years)
- Contract with U.S. Army FED Direct Push Drilling Service (July 2006, 3 years)
- Design and treatment service of bio slurping of 5 returned bases (Apr 2006, 1 year)
- Purification business of riverside of Keumho River in Gumi (June 2000)

## Certification

- Stabilization treatment system and method of livestock landfill according to ground oxidation (Dec 2011, in process of International Patent Application)
- Gravity concentration purification equipment according to natural gravitational settling of fine soil with heavy metal (Patent Sept 2011)
- Physical treatment system of DNAPL contamination area (Patent Aug 2011)
- Purification of river water and recycling system which applies multiple gas-liquid contact apparatus for odor removal in river and water quality improvement (Patent May 2009)
- Soil purification equipment, method and used rotary kiln and preheat dryer in this process (Patent May 2008)
- Rotary kiln used in soil purification equipment (Patent Jan 2008)
- Soil restoration equipment for driven vehicle (Patent new technology of Korea certification #1133, Aug 2003)

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### Area

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

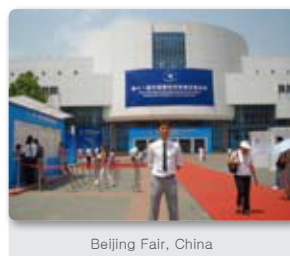
## Company Introduction

Humas Co., Ltd. is the company established by many researchers from Daedeok Science Town, the Mecca of Korea's research and development, and KAIST professors who are devoted to the environment and the future.

Since the early days in 2000, it has concentrated on developing water quality analysis technology to achieve world-class capacities to compete with the world's leaders of water quality analysis technology and localized water quality analyzing meters and reagents to replace imported products to gain competitiveness in Korea's water quality analysis market.

It is developing online automated water quality meters that can constantly monitor water quality and water quality analysis meters and reagents for labs.

We promise to do our best for the efficiency of customer services, safety of humankind, and environmental protection.



Beijing Fair, China



Water & Sewerage Exhibition 2012



International Exhibition on Environmental Technologies & Products 2012

## Characteristics of Key Products & Technologies

### Water Quality Analysis Kit / Drinking Water Analysis Kit

Water quality pollutants are analyzed using the analysis kit that can analyze COD (Cr), COD (Mn), total nitrogen, total phosphorous, and heavy metals. Drinking water analysis kit can analyze Cl<sub>2</sub> (Free), Fe (T), Cu, NH (N), F, Cl, Zn, Mn, Al, and NO<sub>3</sub> (N). It can also analyze seawater for COD (Mn), Tn, NO<sub>3</sub> (N), NO<sub>2</sub> (N), NH<sub>3</sub> (N), Tp, and PO<sub>4</sub> (P).

### Water Quality Analyzer / UV-VIS Spectrophotometer

#### (1) Portable Water Quality Analyzer (HS-1000 Series)

– HS-1000Plus can measure 23 items, including COD, nitrogen, and phosphorous, and may analyze sweater and drinking water.

#### (2) General Water Quality Analyzer (Model: HS-3300)

– Water quality analyzer and UV/Visible spectrophotometer can be combined to analyze any kit provided by Humas.

### Immersed Turbidity Sensor – Turby 2100 (Approved as Environmental Instrument)

Used to measure the turbidity of tap water, purified water, water supply, processed water, etc. It uses 90° diffusing light measuring system (direct light adjustment) and its strength is that it uses automatic wiper cleaning to minimize data hunting by micro bubbles for high accuracy. Its range of measurements is 0 to 5/100/4000 NTU. It has acquired Performance Certificate, CE Certificate, Ministry of Environment Approval, and passed the Korea Water Resources Corporation's performance sharing system.



## Projects performed at home and abroad

- Research centers & colleges: Sold to 25 schools and research centers, including KAIST, KIST, Korea Research Institute of Chemical Technology, and Seoul National University (as of Oct 10 2012)
- Government offices and terminal sewage/wastewater treatment plants: Sold to 30 government offices and terminal sewage/wastewater treatment plants, including Gyeonggi Gwangju Innovation Corporation, Environmental Management Facilities, and Korea Water Resources Corporation (as of Oct 10 2012)
- Companies: Sold to about 20 companies, including Samsung SDI, LG Bioscience and LG affiliates, Hyundai ENG, Kolon Bioscience, and Donga Pharmaceuticals (as of Oct 10 2012)
- Exported 0.15 billion KRW to Japan (T&C, JMS) as of the 3rd quarter of 2012

## Certification

- CE Certificates (HS-R200, HS-1000, HS-2300, HS-3300, July 3 2008)
- New Localized Product Certificate (Korea Industrial Technology Association) (May 27 2004)
- Approved by MC Certificate (HS-1000, HS-2300) in China
- SUCCESS DESIGN Certificate (Korea Institute of Design Promotion)
- ISO9001 (AJA)
- A+ Outstanding Company (Korea Technology Finance Corporation)

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## Area

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## Company Introduction

Established in 2003, Korea Water Technology has been specialized in sludge treatment accumulating years of experience and technology in sewage/wastewater sludge treatment. We were the first in the world to commercialize the new-concept electric charge sludge cake reducer that can dehydrate and reduce the water content in organic sludge down to around 60%. Our major clients are local government offices and large companies in Korea, Japan, Europe, and China and we have a number of partners, including Mitsui Zosen (Japan), Krevox (Poland), and SK China (China). We have achieved 32 billion KRW in sales and 3.9 million USD accumulated exports by the 3rd quarter in 2012.



Electro-Osmosis Dehydrator Apparatus and Control Panel



After Dehydrating Sludge



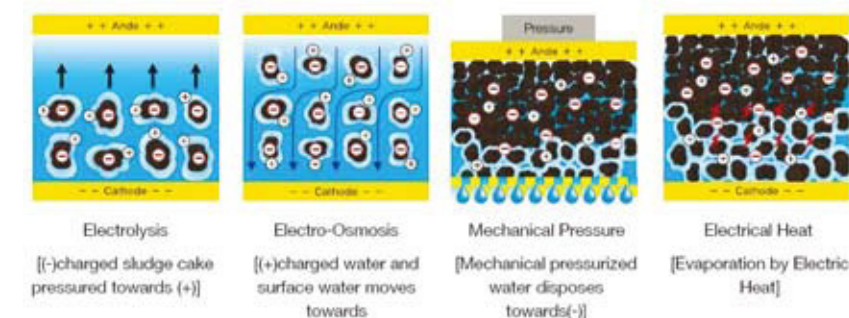
Before Dehydrating Sludge

Water Content

After Dehydrating Sludge

Water Content

Water Content before/after Sewage Sludge Dehydration



## Projects performed at home and abroad

- Krevox (Poland)\_Model: s16, 2 units (2012)
- Yongin Giheung Respia\_Model: s12, 3 units (2012)
- Romet (Romania)\_Model: s08, 1 unit (2012)
- Mitsui Shipbuilding (Japan)\_Model: s16, 3 units (2012)
- Mitsui Shipbuilding (Japan)\_Model: s12, 3 units (2011)
- Krevox (Poland)\_Model: bs16, 1 unit (2010)
- Ecopolymer (Russia)\_Model: selo3000, 3 units (2008)
- Samsung Electronics\_Model: selo3000, 5 units (2008)

## Certification

- Patents
  - Power Supplier for Sludge Dehydrator (Dec 2009)
  - Sludge Treatment System (Sept 2009)
  - Sludge Treatment System with Sludge Conveying Unit (June 2009)
  - Electro-Osmosis Dehydrator using Three-phase Alternating Current (May 2008)
  - Electro-Osmosis Dehydrator (May 2007)
- Certification
  - Japan Environmental Sanitation Center Performance Certificate (Mar 2011)
  - Green Technology Certificate (Dec 2010)
  - NEP New Product Certificate (Jan 2005)

## Characteristics of Key Products & Technologies

### Electroendosmosis Dehydration

Organic sludge has electric charge (-) on the surface of particles and attracts moisture by the electromagnetic forces around the particles. This technology applies direct current electricity and pressure to dehydrate organic sludge. It overcomes the limitations of physical dehydrators and reduces the water content of sludge down to 60% to reduce the quantity of waste by 50%.

Also, it can build an economical sludge fuel system. Compared to previous sludge dryers, it has high energy efficiency (consumes 250-300kWh to remove 1 ton of water, 1/3 of dryer) and requires only 1/4 of investment compared to dryers.





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## Area

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

CLATEC has devoted itself to presenting solutions to current problems such as performance improvement, water content reduction, and system automation and developing services to address solid-liquid separation technology for processes of the mining industry, food and chemical industries and sludge in waste water, sewage, and purified water and provide appropriate services. CLATEC has developed sorting equipment needed across industries including the waste and mining industry and offered new innovative facilities every year.

## Characteristics of Key Products & Technologies

1. We design and produce systems that filter and dehydrate sludge and other raw materials from ordinary and industrial sewage. We suggest systemic solutions that can help optimize overall productivity by designing solutions for specific types of sludge that customers deal with. The specifications of filtering systems that we design and produce are determined by the type, amount, and location of sludge to be processed.
  - Automated operation
  - Minimized cycle time using a continuous cake discharger
  - Improved cake exfoliation with a filter plate oscillator or a filter cloth oscillator (option)
  - Improved production efficiency with a filter cloth auto-cleansing device (option)
  - Additional function of cake dryer
  - Cake cleansing function available
2. Soil Recycling Plant is a facility to recover soil contaminated by heavy metal and oil and can remediate soil and recycle water used for remediation through such processes as sorting, washing, elution, and water treatment. The facility can be designed and made as either a fixed facility or a portable one, and design by source of pollution is offered to customers. We receive an analysis table of the pollution source, compose and design the facility accordingly, and batch-process from manufacturing and purchase to installation of the product. We produce and provide products with outstanding performance to customers through sorting, washing, water treatment, and sludge process technologies built for over 10 years and can apply a product design and structure fit to customer demand.
  - 1) Sorting : A process to divide soil with irregular grading by grading
  - 2) Washing : A process to wash metal mixed on the soil surface and inbetween with water (particle metal can be separated using additional facilities including a surfactant and a water jacket.)
  - 3) Elution : A process to separate metals in soil and washing water from soil by mixing acid chemicals and transfer them to water treatment process with washing water and silty clay for the final stage (for heavy metals only).
  - 4) Water treatment and sludge treatment: Washing water is recycled via water treatment process, and oil, sludge, and heavy metals in water are disposed through deoiling, absorption, and filtering process. Wastes are made into sludge in the form of a cake and dehydrated as much as possible.



## Projects performed at home and abroad

- Singsong Industry – FILTER PRESS
- Korea Zinc – FILTER PRESS
- Sempio Foods Company – FILTER PRESS
- Hyundai E&C – FILTER PRESS

## Certification

- CE certificate
- K Mark
- ISO 14001, ISO 9001
- 5 patents relating to filter press

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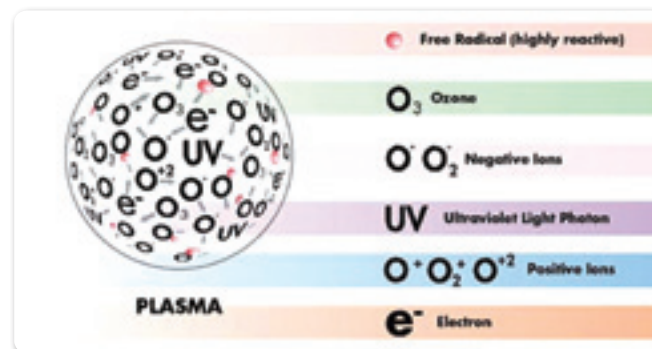
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## Area

Total construction ( ) / water quality ( ) / air quality ( v ) /  
wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

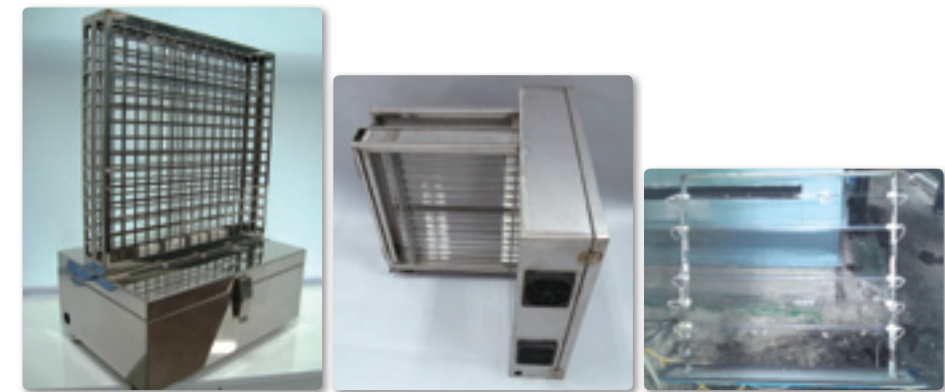
Cleaner Air, Healthier Life is our motto. Although air is indispensable for our life, its importance seems to be neglected often in the field of indoor air and atmosphere. Air pollution spreads to our drinking water, soil, and foods, finally victimizing humans. Among technologies to mitigate air pollution, solutions sought for by the market are producing no secondary environment wastes and using no chemicals causing environment pollution such as counter-agents and oxidizers. Photoplasma, a technology that quickly recovers contaminated air with an extremely small amount of power, was developed in the United States and has been spread by us in Korea since 8 years ago. The core principles of this technology are a scientific understanding of photovoltaic rays and photosynthesis and oxidization and photolysis of contaminants through photochemical reaction. Our goals lie in killing bacteria using artificially generated light in a vacuum UV wavelength and breaking down odors and harmful chemicals.



## Characteristics of Key Products & Technologies

1. Designed to eliminate bad smell at sewage and wastewater treatment plants, this system eliminates bad smell-causing substances like ammonia, hydrogen sulfide, and methyl mercaptan with an excellent effect of decomposing VOCs. This system is made and delivered on the basis of onsite design. The core technology is photoplasma.
2. This device is built in the HVAC system of large buildings to sterilize and purify large-volume indoor air. Used by university hospitals to prevent infection, eliminate smells, and improve indoor air quality, it has been widely used for the purpose of improving indoor air quality at large commercial buildings and multi-purpose facilities. The core technology is photoplasma.

3. In order to prevent fire at the kitchen due to grease built onto kitchen hood, this device removes smell and smoke by decomposing grease ingrained in hood and duct. Simultaneously removes oil, smoke, and smell generated at combustion device real time. The core technology is photoplasma.



## Projects performed at home and abroad

- Yonsei University Medical Center (Severance Hospital), Seoul St. Mary's Hospital, Kangdong Sacred Heart Hospital, Ewha
- Womans University Hospital, Chung-Ang University Hospital, etc.
- Seoul Square Center, LG Twin Towers, GS Home Shopping, Kyobo Life Insurance, CJ E&M Bldg. etc.
- Shinsegae Food, Grand Hilton Seoul Hotel, Ritz-Carlton Hotel, etc.
- Armed Forces Seoul Hospital, Navy ships, etc.

## Certification

- CE, NSF, ETL, IEC, HACCP, GS, UL etc.

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wastes ( v ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

In its 13 years' history, Ecotech Engineering has been dedicated to CO2 reduction and zero emission by managing projects to reduce organic sludges through Torrefaction and electrolysis.

In good faith as engineer and with open mind-set, we will do our best to exchange technologies and work together with companies which endeavor to preserve our environment in this planet, hoping to contribute to sustainable development of the humanity.

## Characteristics of Key Products & Technologies

### 1. TFM

- A system to produce solid fuel from various organic wastes (food wastes, sewage sludge, livestock manure, agricultural byproducts, etc.)
- Innovative fuel making system that can maintain caloric value of solid fuel consistently to 5,000~5,500kcal/kg, similar to coal in any condition.
- Almost odorless, requiring no deodorizing system in the process.

### 2. ECOLYZER-ES

- Energy saving sludge reducer based on electrolysis
- Sharply reducing redundant sludge at sewage and wastewater treatment systems up to 40~50%
- Reducing moisture content of dewatering sludge by 2~3%, generation by 10~15%, and odor
- Improving digestion efficiency, reducing digestion period from 25 days to 15 days.
- Reducing energy use by around 20% and CO2 emission by 40% or so.

### 3. High Concentration Non-biodegradable Waste Treatment System

- Establish unit technologies like Electro-flotation(ECOLYZER-EF), Electrochemical Oxidation(ECOLYZER-ED), and Electro-winning(ECOLYZER-EW)
- Meet discharge water quality standards by treating wastewater and sewage using a single unit technology or combined ones.
- Easy to apply even in case of sharp change in flow and load.



## Projects performed at home and abroad

- 2011. 4 Sludge Solubilization-Based Dehydration Efficiency Improvement Technology Development (Keco)
- 2011. 5 Next Generation Eco-Innovation Technology Development Project (KEITI)
- 2012. 6 Global Joint Environment Industry Business Support Project(KEITI)
- 2012. 9 Global Joint Environment Technology Localization Support Project (KEITI)
- 2013. 5 Jinjeop Green Water Center Sludge Reducing Facility Project (TSK Water)
- 2013. 5 Samcheok Thermal Power Plant T-N Removal Electrolysis Tank Construction (Hanseong Crean Tech)

## Certification

- 2003. 4 Utility Model Registration (Korean Intellectual Property Office)
- 2011. 6 Company Affiliated Research Center
- 2012. 3 Environment Construction Business
- 2012. 6 ISO 9001, ISO 14001
- 2012. 9 Trademark Registration (Korean Intellectual Property Office)
- 2012. 9 Venture Biz Certificate
- 2012. 10 INNO BIZ Certificate



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## Company Introduction

Since we established Omni Pure Pacific Co., Ltd. with Omni Pure Filter (USA) in 1996 through technology collaboration, we started business as a specialized filter manufacturer and finally established Micro Filter Co., Ltd. when our technology collaboration with Omni Pure ended in 2002.

We are specialized in producing filters installed on various environmental/health products, such as water-purifying filters for homes, refrigerators, ionizers, water softeners, and bidets, and various industrial facilities as the key part and we are devoting our fullest efforts in R&D and HR development to provide the best quality and services.

All of our 100 employees are dedicated to 'providing only the most reliable and the most advanced products' to focus on technological and product development and have worked hard together to achieve 44.8 billion KRW sales in 2011. In terms of overseas exports, we were awarded the 1 million USD Export Tower in 2009 and the 5 million USD Export Tower in 2010. In 2011, we exported more than 6.2 million USD.



RO Membrane Automation Line



Automated Production Line



Injection Line

## Characteristics of Key Products & Technologies

### RO Membrane Element

- The 0.0001 $\mu$ m pores remove various heavy metals, bacteria, viruses, and other organic compounds dissolved in water.
- We use DOW Filmtec membrane, the first membrane discovered, to produce products that deliver outstanding properties and durability.
- We can manufacture flawless products through automated production lines and vacuum testing on all products.
- We have acquired NSF 58 certificate for products with stable materials.

### M9 Quick Change System

- The DIY water-purifying filter system that comes in three sizes of filters - 8", 11", and 12" - and is easily installed and replaced by anyone.
- The 3-stage and 4-stage UF and RO Membranes can be customized to fit various needs of customers to provide clean and pure water.

### Carbon Block Filter

- Attaches to the residual chlorine and organic matters and deodorizes.
- NSF 42 Certificate: Able to remove Chlorine and Particulate Class 1~3 (0.5~5 $\mu$ m).
- NSF 53 Certificate: Able to remove Lead, Mercury, Cyst, Benzene, Lindane, and Atrazine.
- We are supplying refrigerator filters to many electronics manufacturers and our filters are used for water treatment for under-sink disposers and coffee makers.
- The High Flow filter ensures 1GPM or greater capacity and NSF 42-grade performance as a commercial filter.



## Projects performed at home and abroad

- Supplied under-sink system to C Company in USA (2012)
- Supplying under-sink system to H Company in England (2011~present)
- Supplying under-sink system to A Company in Australia (2009~present)
- Established Micro Media Filter Limited Joint Company in Foshan city, China (2007)
- Supplying filters to Samsung Electronics and LG Electronics (2005~present)
- Supplying filters to Chungho Nais Water Purifier (1996~present)

## Certification

- Innovative Technology Small/Medium Company (INNO-BIZ) (2012)
- Selected for Small Yet Powerful Global Company Nurturing Project (2011)
- ISO 9001 / 14001 Certificates (2011)
- Water Mark Certificate (2010)
- NSF/ANSI 42, 53, 58 Certificates (2006~present)
- 8 patents, 1 utility design, and 28 registered designs



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consulting ( )

## Company Introduction

Since its establishment in September 1991, Dong Il International has introduced, made, and supplied waste treatment equipment with the aim of developing and spreading resources recycling systems. For the first time in Korea, we installed "Automatic Foreign Substance Removing and Crushing Machine." In 1998, signed a MAC Crusher Agent contract and sold 8 clients including Hyundai and supplied waste-to-energy equipment for the first time in Korea from 2000. We also started the supply in Korea of WARREN's RDF press in 2006. Dong Il International was the first supplier of '1st Crusher,' 'Inertia-Powered Crusher,' 'Solid Fuel Press' and 'Wind Force Separator' fit for the production of solid fuels pursuant to the regulations of the Ministry of Environment, and delivered RDF press to Dongbu ENT in 2011. Facilities we supplied more than 20 years ago have been running up to now nationwide.



### 2. Crusher (Grizzly) : for SRF / RDF

- Able to crush at a medium speed (300RPM) of inertia and cutting force.
- Arranging cutters in the form of wave at a rotor with a 9-ton dead load.
- Usable semi-permanently with double thermal coated rotor.
- No need for ram installation, causing no breakdown.
- Tetrahedral cutter used four times and ground twice or more, minimizing cost for consumables.
- Equipped with a specially designed roller bearing. Eliminating causes for failure by dust.
- Having a special bearing and gear box, delivering 400% of moment power.
- Able to crush up to 12mm /even wasted vinyl, wood, tires, and e-scrap.
- Installed and operated in Gunsan, Iljuk, Anseong, and Geochang,



## Characteristics of Key Products & Technologies

### 1. Press (Cuber 300) for RDF / RPF

- Durable for more than 15 years of operation.
- Ideal to produce solid fuels of 30~50mm diameter.
- Able to heat and compress materials containing plastic up to 90%
- Excellently mixing wastes with an elaborate metering bin making quality uniformed.
- Able to crush materials up to a grading of 40mm, dramatically saving crushing cost.
- Using locally made consumables for thorough follow-up management
- over 300 units made by WARREN of USA operated worldwide.
- Installed and operated in Geochang, Icheon, Gunsan, Jaechon, and Anseong.

## Projects performed at home and abroad

- MAC Crushers: Sold to 20 clients including Hyundai Heavy Industries, Samsung Heavy Industries, Samsung Engineering, Jindo, Shinho Environment, AMICO, KRS, and NIT.
- Press: Sold to 6 clients including Dongbu ENT.

## Certification

- ISO 9001:2000/KS A 9001:2001

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consulting ( )

## Company Introduction

KS ENVIRO CO., LTD. has been a leading supplier of environmental equipment and water treatment plane such as ozone generators, U.V systems, CMF systems, MBR systems, U.F systems, softeners, and chemical pumps. We promise you that we will do our best to provide support to the highest level and best services fit to needs of customers.



## Characteristics of Key Products & Technologies

### <Ozone Generator>

1. AIR COOLING
  - NO NEED OF PIPING FOR COOLING WATER
2. LOWEST VOLTAGE (FROM HIGH VOLTAGE SYSTEM)
  - LONG LIFE TIME OF OZONE QUARTZ SLEEVE
3. AIR PREPARATION SYSTEM
  - OILLESS AIR COMPRESSOR
4. SPECIAL FUNCTION
  - 6STEPS OUT PUT CONTROLLER
  - MALFUNCTION LAMPS ON FRONT PANEL
  - OPERATION STOP DEVICE AT OZONE LEAKAGE



### <UV Sterilizer>

1. COMPACT INSTALLATION DIMENSION
2. MOST EFFICIENT AND RELIABLE DISINFECTION
3. ALL OF U.V SYSTEM ARE BASED ON HIGH-EFFICIENCY LOW-PRESSURE AMALGAM LAMPS AND HAVE ALL COMPONENTS INTEGRATED IN A COMPACT STAINLESS STEEL MODULE OR CHAMBER

4. AUTO-CLEANING DEVICE BY NON-ELECTRIC POWER PROVIDES EFFECTIVE REMOVAL OF FOULING FROM QUARTZ SLEEVES AND INNER WALLS OF THE DISINFECTION CHAMBER AND REQUIRES MINIMUM LABOUR AND MATERIAL RESOURCES



## Projects performed at home and abroad

- Overseas
  - Landmark Tower of Vietnam, supplied to overseas customers including Thailand, Philippines, and Fuji Electric of Japan.
- Water Parks
  - Ilsan Won Mount Water Park, Tongdo Pantasion Water Park, Bucheon Woongjiin Play City, Cheonan Tedin Water Park, Yeosu Sun Valley, Youngdeungpo Sea Leisure, Yeecheon Termeden Water Park, Pocheon Spring Fall
- Swimming Pools
  - Swimming Stadium of the Incheon Asian Games, Seongnam 2nd Stadium and other 200 sites
- Sewage & wastewater treatment plants
  - Gimpo Heavy Water Processing Plant, IBK Training Center in Chungju, TESCO Training Center in Mueuido Island, Ilsan Won Mount Ground Water Treatment Plant, Swage disposal tank treatment of G.S Tower and other 100 sites

## Certification

- Member of Korea UV & Ozone Association
- ISO 9001:2008
- Consturction Company Registration (Water Supply & Sewage System Construction Company)
- Patents
  - UV Sterilizer (non-powered automatic cleaning) Utility Model (No. 20-0435974)
  - Precision Leakage Inspection Device of Aqueduct Tunnel with Concrete Lining and Groundwater Pressure Controller (No. 10-0838759)
  - Advanced Wastewater Treatment Process and Devices for Each Unit Processes (No. 10-0653676)



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## Company Introduction

With the founding principles of best quality, eco-friendly management, safety first, and differentiated technology, Keosong Construction has continued its efforts to take the lead in all the areas of the construction industry including civil engineering, architecture, environment, and landscaping with the help of customers' trust and technical advantages. Driven by brave pioneering spirit and creative way of thinking, we have witnessed steady growth with the aim of inheriting safe and clean nature to our offsprings on the strength of technologies and know-how built on our experience. Since its foundation in 1994, Keosong Construction has been dedicated to long-term academic-industrial cooperation to develop economic and easy-to-apply technologies for the purpose of faithfully and responsibly executing construction projects and mitigating ever growing environment pollution and successfully developed the NBS method, most appropriate and efficient sewage treatment process in Korea, which led to the development of the MTBF method in which organic matters and suspended matters are treated at the same time on which we have applied for a patent. Based on our accumulated project performance experience in Korea, we are preparing for the market expansion in the global arena. As a hardworking technology leader that aims at the happiness of the next generation and the creation of a future construction culture, we will never stop our effort.



## 2. Network-Type Tube Filter Based Method of Removing Suspended Matters and Phosphorous (MTBF method)

This method can be applied to multi-purpose sewage/wastewater treatment facilities and water cycle systems of new towns since it can remove suspended matters and dissolved organic matters at the same time as a third treatment facility used at the end of a sewage/wastewater treatment plant, saves initial construction cost by reducing hydraulic detention time, and can automatically work, reducing maintenance cost.



## Projects performed at home and abroad

- Advanced Treatment Facility Construction Project for Changnyeong Sewage Treatment Plant (6,000 m<sup>3</sup>/d)
- Advanced Treatment Facility Construction Project for Deoksung Mountain Sewage Treatment Plant (1,360 m<sup>3</sup>/d)
- Jincheok Shincheok Sewage Treatment Plant (13,500 m<sup>3</sup>/d)
- Advanced Treatment Facility Construction Project for Dongmyeon Agricultural-Industrial Complex Sewage Treatment Plant (600 m<sup>3</sup>/d)

## Characteristics of Key Products & Technologies

### 1. Bio-absorption of Microbes & Sludge Re-aeration Based Removal of Nitrogen and Phosphorous in Sewage (NBS method)

This method is an economic technology that is easy to operate during a change in inflow load by characterizing functions of each reactor as sewage/wastewater treatment facilities, saves cost thanks to reduced retention time, and uses no media, membrane, and chemicals.

## Certification

- Technology Verification No. 97 / NET Authorization No. 199
- NET Authorization No.328

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## Company Introduction

Established in 1999, OHK Co., Ltd. is a venture business specialized in environmental facilities and we have made steadfast efforts to develop new technologies and quality products related to water treatment and sludge treatment. Our technologies have acquired a number of new technology (NET) certificates and verifications from the Ministry of Environment and we have patented all of our technologies. We have also received the EM and EEC marks from the Ministry of Commerce, Industry and Energy, the KT mark from the Ministry of Science and Technology, outstanding product selection from the Public Procurement Service, and the energy-saving product selection from Korea Energy Management Corporation. Currently, we are developing new technologies to treat muddy water generated from dredging and solidify sludge, and have patented them. We are also developing technologies to treat wastewater from shale gas development.



Busan Spoil Solidification



Spoil Dehydrator



Jeongnam Sewage Treatment Plant

## Characteristics of Key Products & Technologies

### Muddy Water and Spoil Treatment System (Solidifying Agent)

Muddy water from dredging is physiochemically collected and deposited for treatment and our concentrating dehydrator is used to dehydrate sludge and solidify sludge using our eco-friendly solidifying agent to use it as earth fill, land cover material, and soil conditioner. We have applied it to soft ground for many projects.

### ACS Advanced Sewage/Wastewater Treatment Method and Phosphorous Treatment Technology

ACS (ASRT Control System) method is an efficient sewage treatment method that maintains microorganism detention time and alternates anaerobic/aerobic treatment to remove nitrogen and phosphorous. It ensures high treatment efficiency with low initial investment and may be maintained with lowest cost. Active carbon is chemically coated (DAC-Filter, patented technology) to enhance phosphorous removal and discharge water with 0.2ppm or lower phosphorous content.

### Fluid Plate Concentration/Dehydration System (SQUEEZALL & U-Trench)

This high-efficiency concentrator and dehydrator for sewage sludge and spoil (inorganic materials) (registered trademark: SQUEEZALL) has acquired KT, EM, EEC, outstanding product certificate of the Public Procurement Service, energy-saving product, and new local technology of the Ministry of Environment, and comes in various forms: air-tight, U-shaped, and disk. It can be designed according to the form of sludge and purpose of discharge. The dehydrator can reduce water content down to  $78 \pm 3\%$  and the concentrator can reduce it to  $92 \pm 2\%$ .



## Projects performed at home and abroad

- Advanced Treatment Facility Construction Project for Changnyeong Sewage Treatment Plant ( $6,000 \text{ m}^3/\text{d}$ )
- Advanced Treatment Facility Construction Project for Deoksung Mountain Sewage Treatment Plant ( $1,360 \text{ m}^3/\text{d}$ )
- Jincheok Shincheok Sewage Treatment Plant ( $13,500 \text{ m}^3/\text{d}$ )
- Advanced Treatment Facility Construction Project for Dongmyeon Agricultural-Industrial Complex Sewage Treatment Plant ( $600 \text{ m}^3/\text{d}$ )

## Certification

- Technology Verification No. 97 / NET Authorization No. 199
- NET Authorization No.328

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consulting ( )

## Company Introduction

As a medium-sized company founded in January 1980 that manufactures and exports automation equipment and wastewater treatment systems, KEST ENG has developed and manufactured KISTHYDROMAT, a latest wastewater treatment system exported to environmentally advanced countries like Germany, Switzerland, Japan, and the United States and Southeast Asian countries, compressed air moisture eliminating filter SUN-DRAIN (patented and made globally), VACUEASYLIFT, and eco-friendly green growth non-discharge wastewater treatment system H2O by putting domestic and overseas technologies together. We also have developed technologies important for new environment industries and make and export and import materials necessary for water treatment plants. Our industrial wastewater treatment plants indispensable for small and medium sized enterprises, in particular, are patented around the globe, and over 180 units have been installed in Korea, along with some plants put in place in China, Japan, and Switzerland. Among automation systems, Vacuum Lift and SUN-DRAIN have been exported as many units as 350,000 to 23 countries in the world with a favorable review. New innovative material Lauramid has been imported and sold in technical cooperation with German company Handtman. Furthermore, we operates Shanghai Office in China as part of our effort to keep pace with rapid changes of the times in the era of globalization and adopt new and innovative technologies and business.



## Characteristics of Key Products & Technologies

1. KISTHYDROMAT 100VE is designed to enrich organism, solvents, wastewater, and waste fluids. This system distills non-degradable high concentration complex waste fluids / wastewater in a vacuum without pre-treatment, reducing wastes up to 95% by enriching to 5~10% and distilling 90~95% for condensed discharge.
  - reuse or discharge 90% of clean water
  - Only 10% of wastewater enriched
  - Distilled and enriched during low temperature operation as wastes are treated in a vacuum.
  - Environmentally safe
  - Fully automatic for 24 hours a day
  - Auto cleaning
  - Low operating cost
2. Compressed Air Moisture Eliminating Filter (SUN-DRAIN)
  - Compressed air from a compressor contains moisture, foreign substances, oxidized oils, and carbons, causing

failure of many air devices. Specially designed to supply clean air all the time, SUN-DRAIN can solve this problem completely. Once installed, this system requires no repair and replacement of parts.

- Existing filters require exchanges of expensive filters on a regular basis, removing moisture 40 to 50% only. While factories where air dryers are installed replace chemicals regularly, SUN-DRAIN fully removes moisture generated in onsite air supply line.
- Protection of all kinds of automation air systems
- This system fully eliminates moisture from automation systems, robots, air cylinders, air presses, and coating systems at factories, protecting expensive facilities and preventing their failure.

### 3.KISTENERGYTEC Solvent Reuse System

This system eliminates contaminants in solvent using the distillation method and treats them into a reusable clean solvent.

- Fully automatic operation for 24 hours
- Usable for ex-proof flammable/non-flammable solvents
- Stably designed with 25 years' know-how
- Easy to use
- High solvent recovery factor

Problems suffered by solvent using companies

- Growing purchases and prices due to continuous buying of solvents
- Management and warehousing issue for solvents in stock
- Increasing costs for treatment of hazardous materials and wastes
- Cumbersome paper work for receiving and discharging hazardous materials

KESTENERGYTEC Distillation Plant

- Reusing solvents directly in lines
- Saving solvent purchase costs
- Saving solvent management costs due to decreasing solvent inventory
- Decreasing costs for management & treatment of hazardous materials



## Projects performed at home and abroad

- Hyundai Motors
- Samsung Electronics
- POSCO
- Doosan Infracore



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## Area

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## Company Introduction

DH-M Co., Ltd. has the company ideology of "We contribute to humanity with best service and excellent technology in air and water environmental area," and we are building the infra internally and externally by taking the laboratory, new technology, and new product development as an axis for a vision of existing as the competitive company continuously. We hold 12.4 billion KRW of total asset, 1.2 billion KRW of capital, and 45 permanent employees. We have domestically commercialized the high pressure fan and wash water pump, etc in high pressure sector for the 1st time in domestic and have achieve the 1st goal of import substitution to domestic, moreover, as the 2nd goal, we have secured the original technology that received recognition domestically and internationally in area of high pressure pump and ventilator with the teamwork and bond of sympathy of company members and cooperative company. By applying this technology, 100% of domestic commercialization of biogas plant which is the low-carbon green business of organic waste, is researched and developed since 2004 and the 3rd goal which is the research assignment and planning research assignment of Ministry for Food, Agriculture, Forestry and Fisheries, is successfully accomplished for 6 years, lastly, we are trying our best for company goal which are the increase in sale and revenue generation.



Wanju-gun energization worksite



Gwangju green town worksite



Namyangju, Jingeon sewage treatment plant

## Characteristics of Key Products & Technologies

### Ring blower

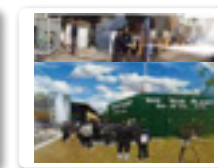
Ring blower used to be relied on the developed countries of Siemens Germany, Fuji Japan, Hita, etc entirely, however, 22 types of 0.4kw~55kw have been 100% domestically commercialized from 1996 and the characteristics of this high pressure ventilator, is the pressured air from stage 1 impeller transits the middle casing to stage 2 impeller and repressured and as of inhalation and discharging function, strong air is being used in 2 kinds.

### High-pressure plunger pump / Washing system (Power production of 2.2kw~500kw)

It is the high efficient product that is used in a various usage of high pressure water by pressuring the inhaled water in pump by piston and it is used in washing process that requires the high pressure effect, moreover, it is the product that can acquire the high effect in fast time, furthermore, reduces the water as well.

Bio gas plant / Energization of livestock excretions, food waste, etc

We have researched the bio gas plant using organic waste, we have acquired anaerobic digestion, gas purification, gas development, waste heat energization, odor power plant and soil deodorization treatment system, facility management, etc and it is the energy system process that optimized with 100% localized material.



## Projects performed at home and abroad

- Selected as development business of low-carbon green town in Gwangsan-gu, Gwangju (Sept 1 2012 ~ Apr 1 2013, Gwangsan-gu, Gwangju) under supervision of Ministry of environment / Korea Environment Corporation, 30 Tons of livestock excrement treatment
- Selected as energization business of livestock excrement (May 30 2012 ~ June 30 2013, Wanju-gun, Jeollabukdo) under supervision of Ministry for Food, Agriculture, Forestry and Fisheries, 100 Tons of livestock excrement treatment
- Ministry for Food, Agriculture, Forestry and Fisheries, Agriculture and forestry technology development business (May 30 2007~May 29 2010 / Anseong, Gyeonggi-do) Development project: Bio gas production process connection farmhouse type livestock excrement integrated recycling process system development and commercialization)
- Ministry for Food, Agriculture, Forestry and Fisheries, Agriculture and forestry technology development business (Apr 25 2005~Apr 24 2008 / Hongseong-gun, Chungcheongnam-do) Development project: Bio gas of 20kWh and fuel supply and system development and livestock commercialization development technology of diesel mixed firing type power plant

## Certification

- NET new technology certification (10-3 torr roots type vacuum pump commercialization technology): Ministry of Knowledge & Economy (Aug 23 2012)
- Green technology certification: Ministry for Food, Agriculture, Forestry and Fisheries #GT-10-00175 (Dec 16 2010)
- Design and production of livestock excrement treatment facility: Seo-gu Office, Incheon #2010-1 (Mar 29 2010)
- Professional company of new renewable energy: Ministry of Knowledge & Economy #2009-5387 (Dec 16 2009)

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## Company Introduction

Sam Young E & T is an environmental company that designs, makes and builds customized water treatment and air quality control systems used for water purification stations, sewage and wastewater treatment plants, human waste and livestock manure treatment plants, and flood pumping and drainage pump stations. All of our products have been made in optimal efficiency, minimal energy consumption, and eco-friendly green technology via technology development. Putting our customers first, we have provided new and innovative products and technologies to the market as a result of ceaseless R&D efforts. With over 30 years' experience in the industry, advanced management system (ISO9001/14001) and the largest number of "New Excellent Products" in the industry, we promise to do our best to unite all the employees through continued development of creativity and self-reform and become an e-company taking the lead in the water industry, as a promising area in the 21st century.



## Projects performed at home and abroad

- Rotary Screen: Daegu Metropolitan City, Youngcheon City in Gyeongbuk, Gumi City in Gyeongbuk, Korea Rural Community Corp. and more.
- Bio filter: Daegu Metropolitan City, Chilgok-gun in Gyeongbuk, Pohang City in Gyeongbuk, Korea Hydro & Nuclear Power and more.
- Circular Clarifier: Daegu Metropolitan City, Ulsan-gun in Gyeongbuk, Miryang City in Gyeongnam, Samsung Petrochemical and more.
- Underwater Bogies Sludge Collector: Daegu Metropolitan City, Ulsan Metropolitan City, Andong City in Gyeongbuk, Korea Water Resources Corp. and more.

## Characteristics of Key Products & Technologies

1. SY-TRS Rotary Screen is a water treatment system for stable operation of 2nd process equipment of screen (such as pumps and valves) by quickly lifting suspended impurities and sedimentary impurities and taking them out. This system aims to prevent accidents using specially designed "L-shape" flow guiding plate and horizontal potential screen and buckling main screen.
2. SY-BF Biofilter is a eco-friendly deodorizing technology which eliminates the kinds of odor and VOCs from sewage disposal plants and factories discharging contaminants by means of biological treatment. Microbes fixed to a porous material and activated microbes inside the biomass phase degrade the absorbed contaminants into H<sub>2</sub>O, CO<sub>2</sub> and other harmless substances as they pass through the reactor.
3. SY-CSC Circular Clarifier is used in enriched sedimentation or final sedimentation basins in the process of water and sewage treatment. Designed in consideration of stability of equipment and flow of sludge in the course of final enrichment of high concentration sludge, this system enhances sedimentation efficiency of sludge by stimulating circular flow of sewage particles and thereby increasing reaction time.

## Certification

- SMBA Performance Certificate: Rotary Screen, Biofilter, Inclined Plate Clarifier
- Public Procurement Service Good Procurement Shared Mark: Screen, biofilter, dewatering and drainage system
- Korea Water Resources Corp. Water supply equipment supplier registration: Underwater Bogies Sludge Collector, Circular Clarifier, aggregator
- ISO9001, ISO14001, Public Procurement Service Overseas Procurement Market PQ Biz, Venture Biz, INNO BIZ and more.

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consulting ( )

## Company Introduction

CERACOMB Co., Ltd. is the environmental material company that is established in 1987 and we hold the annual sales of 24 billion KRW in 2011. Our total asset is 20.1 billion KRW, 1.3 billion KRW of paid-in capital with 60 permanent employees. We have produced and supplied the honey comb of ceramic material solely in domestic, moreover, have supplied the catalyst that removes the poisonous gas caused from industrial production worksite by coating the jewelry material such as platinum, palladium, etc as the catalyst material. Furthermore, we have developed CP-DOC which is the oxidation catalyst for diesel automobile as well as PDPF and DPF system which removes the particulate matter and poisonous gas of diesel engine, and we are participating as diesel exhaust gas reduction company under supervision of Ministry of Environment. We have developed the PAR equipment and catalyst to remove the hydrogen which is the reason of Fukushima Nuclear Power Plant Explosion in 2011 and we are selected as a supplier of entire quantity of PAR equipment to 17 power plants in domestic which shows the excellence of our catalyst technology.



Company foreground



Three way catalyst



DPF (Diesel Particulate Filter)

## Characteristics of Key Products & Technologies

### VOC catalyst

By coating jewelry (Platinum, palladium, etc) that removes the odor substance in ceramic honeycomb carrier of high specific surface area and removes and decomposes the poisonous gas in relatively low temperature area of 200~400°C.

### Diesel exhaust reduction equipment

It is the reduction equipment that reduces the exhaust discharge from diesel engine and it shows more than 80% PM reduction rate, moreover, it is the reduction equipment that optimizes the dispersion of the jewelry to realize the high efficiency of catalyst.

### PAR (Passive Autocatalytic Recombiner)

Air that is combined with hydrogen in room temperature by responding with catalyst and recombines to H<sub>2</sub>O without other separate power supply. It is the equipment that removes the hydrogen that forms the natural convection of combination gas of hydrogen-air using heat of reaction caused in case of catalyst response.



## Projects performed at home and abroad

- Supply of PAR equipment and catalyst for hydrogen removal to 17 domestic Nuclear Power Plant Korea Hydro & Nuclear Power Co., Ltd. (Aug 2012~)
- Supply of exhaust reduction equipment of air quality reduction business of Seoul metropolitan region

## Certification

- Certification
  - Hydrogen removal catalyst and PAR equipment grade Q acquisition (Korea Hydro and Nuclear Power)
  - CC-PDPF product certification (National Environmental Scientific Director) (Dec 2010)
  - CH-PDPF-1 product certification (National Environmental Scientific Director) (Dec 2010)
  - ISO 9001 system certification (System Korea Certification) (Dec 2009)
  - CP-DOC product certification (Minister of Environment) (Sept 2009)
  - CM-PDPF product certification (Minister of Environment) (June 2008)
- Patent
  - Manufacturing method of Pt/TiO<sub>2</sub> catalyst for hydrogen removal and its method of removing hydrogen (Mar 2012)
  - Palladium/titania catalyst that possesses removing function of hydrogen, carbon monoxide, and formaldehyde which are contained in air in room temperature (Oct 2011)
  - Platinum/titania catalyst manufacturing method and its catalyst and method of removing formaldehyde using this catalyst (Sept 2009)
  - Masking apparatus to selectively recharge the honeycomb structure (Oct 2007)
  - Honeycomb filter for exhaust gas purification that includes nano-scale composite and its manufacturing method (Mar 2007)
  - Catalyst filter for diesel automobile exhaust gas purification and its manufacturing method (Sept 2006)
  - Catalyst for diesel automobile exhaust gas purification and its manufacturing method and catalyst that is manufactured according to this (June 2006)
  - Ceramic honeycomb of high specific surface area raw material and its manufacturing method (Dec 2005)
  - Catalyst for simultaneous remove of exhaust poisonous gas of chemical treatment and odor removal and its manufacturing method and usage (Aug 2005)



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## Company Introduction

Established in 1989, Gentro Co., Ltd. has participated in the environmental industry to develop critical technologies and products and performed engineering, construction, and test drive to accumulate technologies and experience. Through ceaseless R&D, we have developed a service system to satisfy the various needs of customers and realize customer satisfaction. In 2011, we recorded 33.9 billion KRW sales. As of 2012, our total equity is 29,121 million KRW, paid-in capital is 3,893 million KRW, and we have 101 full-time employees. We are making efforts to improve technology by acquiring new environmental technologies, patents, and environmental marks.

technologies and has been known as an economical technology by reducing construction period. It is more popular abroad than it is in Korea and it is expected to grow in Korea. It can be used for coastal sedimentation prevention and cofferdam methods. This product has infinite possibilities in terms of variation and application.



Gangbuk Water Purification Site



Jeongneung Water Reservoir Site



Taeon White Sand Beach Site



## Characteristics of Key Products & Technologies

### PDF Perforated Baffle Wall/PDF Baffle Wall/PDF Partition Wall

PDF (perforated) baffle wall (partition wall) refers to the baffle installed inside pure water reservoirs (water reservoirs) to improve the contact time of pure water reservoirs (water reservoirs) in appropriate concentration contact time (CT) using PDF (Polyethylene Double Frame) panels made of HDPE (High Density Polyethylene). It is a new clean and durable product that reduces construction time, ensures durability, and generates no environmentally harmful materials.

### PE LINING

This indoor/outdoor waterproof method uses PE (Polyethylene) material for semipermanent performance, durability, acid resistance, alkaline resistance, no harmful materials, and recyclability. Unlike waterproof paint, it does not need regular touchup for easy maintenance and its long lifespan delivers economical value and workability.

### Geotextile Tube

Geotextile tube has achieved environmentally-friendly and structurally stable product through investment in new

## Projects performed at home and abroad

- Ulsan HQ Water Purification Center Discharge Tank PE Lining Installation (Korea Hydro & Nuclear Power, Sept 2012)
- PDF baffle walls for Ulaanbaatar City Yarmag Pressurizing Center and Reservoir, Mongolia (Korea International Cooperation Agency, May 2012)
- Embankment for Nakdonggang (River) Restoration 34 Zone Pumping Station (Gyeongsangbuk-do County Office, Mar 2011)
- Guui Water Purification Center Rebuilding and Baffle Wall for Advanced Water Purification Facility (Seoul city, Dec 2010)
- Taeon White Sand Beach Coastal Improvement (Taeon County Office, Mar 2010)
- Structural repair at 4 sites, including Jeongneung Reservoir 2 (The Office of Waterworks Seoul Metropolitan Government, Nov 2008)
- Gangbuk Water Purification Center Perforated Baffle Wall (The Office of Waterworks Seoul Metropolitan Government, May 2005)

## Certification

- Gentro PE waterproof sheet environmental mark, No. 9840 (July 2012)
- New technology for PE sheet wall waterproof method, No. 520 (Nov 2009)
- New environmental technology, advanced sewage treatment technology using RPS-SBR, No. 141 (Oct 2005)
- New GTR baffle wall technology, No. 397 (Oct 2003)
- New bottom-reducing perforated baffle wall technology, No. 306 (Nov 2001)

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## Area

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

ECONITY is a membrane expertise company, developing various high quality membranes with its own technology and manufacturing those membranes in the automated assembly line. Also we provide water/wastewater treatment equipment/system associated its application and maintenance service. we provide comprehensive services such as optimized technology research corresponding to various needs of customers, production of high quality membrane, exhaustive quality control, ideal customized design, integrity construction, and quick & complete technical support thanks to wide experience and know-how accumulated over the years.

We have variety of achievements from the small size to the medium & largest size in the sewerage treatment plant industry. The significantly large quantity of wastewater treatment plants demonstrates its reliability and acceptance of ECONITY membrane technology.



Daegu Dalseong Industrial Complex WWTP  
(25,000m<sup>3</sup>/day)



Incheon Chongna Gongchon STP  
(65,000m<sup>3</sup>/day)



Econity Property

## Characteristics of Key Products & Technologies

### ECONITY CF Series (Submerged Type Module)

- World's First HDPE Hollow-fiber Membrane by Stretching Method
- Highly Efficient Pore Structure
- Asymmetric Structure
- Operator-friendly Design, The Patented Cartridge Module
- Customized Cassette Design
- Optimized Diffuser
- High Packing Density of Module

### ECONITY PF Series (Pressurized Type Module)

- World's First PVDF Hollow-fiber Membrane by Stretching Method
- World's Best Permeability and Tensile Strength

- Larger Capacity Module
- Highly Efficient Hydraulic Module Design

### KSMBR Process

- Certified advance wastewater treatment MBR process proven by the largest performance in Korea
- Maximize using the influent carbon source through shifting inflow and tri-sectional aeration in the parallel reactor
- Improvement of inhibition factor for denitrification by residual DO from the existing- intermittent aeration tank
- Stable nutrients removal by maximum use of organic matter despite of the low C/N ratio condition
- Low sludge recirculation rate (1Q~2Q)



## Projects performed at home and abroad

- Incheon Chongna Gongchon STP (65,000m<sup>3</sup>/day) (Commissioned Date 2012)
- Daegu Dalseong Industrial Complex WWTP (25,000m<sup>3</sup>/day) (Operating Start Nov 2008)
- Okcheon Municipal WWTP (18,000m<sup>3</sup>/day) (Operating Start Oct 2008)
- Jinhae Ungdong STP (10,000m<sup>3</sup>/day) (Commissioned Date 2011)

## Certification

- Local Patents 10, International Patents 4
- ISO (Feb 2009)
- KSMBR New Environmental Technology (Sept 2008)
- KSMBR Certificate of Green Technology (Mar 2011)
- e-MBR New Environmental Technology (May 2011)
- PVDF Membrane NSF (June 2012)

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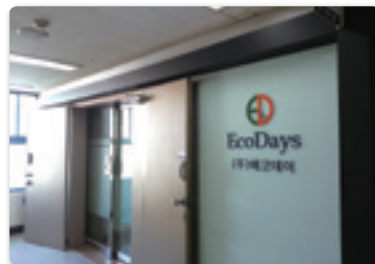
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## Area

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

Since its foundation in 2003, Ecoday's has devoted itself to the process in which high concentration organic wastes (food wastewater, livestock manure, and sewage sludge, etc.) are converted to biogas and treated effectively using a multi-level vertical method of new concept including gas hold-up space. After long research via many trials and errors to overcome limits of existing CSTR method, we have successfully developed an organic waste water treatment method based on PFR flow. In recognition of uniqueness and excellence of this technology, we have awarded innovative technology and green technology certificates by government agencies and been designated as the 1st Leading Environment Company lately. Recognizing our know-how built on many years' experience in works of the public and private sector, a growing number of construction companies are applying our method for the construction of anaerobic digestion facilities and high concentration wastewater treatment plants today. Ecoday's continues its effort to develop overseas markets with proven technologies and experience in the Korean market.



## Characteristics of Key Products & Technologies

### 1. ECOPAT

- High concentration organic waste treatment: COD 80,000mg/L possible
- Site area: 60% lower than existing methods
- Operating cost: 50% lower than existing methods
- Easy maintenance and stable treatment
  - High oxygen transfer rate leading to less power cost
  - High concentration of microbes in aeration tank, making it possible to respond to shock load
- Fluid flow: PFR
- HRT: 0.5~4 days

### 2. ECOPAD

- High concentration organic waste treatment: TS 15% possible
  - Longer solids retention time (SRT)
- high organic removal efficiency: VS 80% reduced, organic load COD 9kg/m<sup>3</sup>·d

- High rate of biogas generation: 90~120N m<sup>3</sup>/ton (for food wastes)
- Easy maintenance and stable treatment
  - High rate of biogas generation, making it fit for waste-to-energy facilities
  - Based on gas agitation, causing no mechanical failure.
- HRT: 20 days or less



## Projects performed at home and abroad

- ECOPAD
  - Organic Waste-to-Energy Facility Construction Work of Jaechon City(52m<sup>3</sup>/day), Organic Waste-to-Energy Facility Construction Work of Cheongju City(200m<sup>3</sup>/day) and 5 other sites Sewage ECOPAT
- ECOPAD
  - Organic Waste-to-Bio Methane Fuel Energy Facility of Wonju City(195m<sup>3</sup>/day). Organic Waste-to-Energy Facility of Cheongju City(200m<sup>3</sup>/day) and 5 other sites
- Food waste leachate
  - Wastewater Treatment Plant Construction Work of Food-to-Energy Facility of Samcheok City, Gangwon(30m<sup>3</sup>/day) and 7 other sites
- Livestock manure
  - Livestock Manure-to-Energy (Liquid Fertilizer) Facility Water Quality Environment Work of Public Livestock Manure Treatment Plant Improvement Work for Deunggok District, Cheongwon-gun(15m<sup>3</sup>/day) and 13 other sites

## Certification

- Registered as Company Specializing in Parts & Materials (02.10, 2011~02.09, 2014)
- Certified as Venture Business (10.21, 2011~10.20, 2013)
- NET (effective from 12.04.03 to 16.04.02)
- Green Technology Certificate (Multi-Level Vertical E.PFR-2 Digestion Tank-Based Methane Gas Generation Technology) (12.10.14~14.10.13)(Ref. Code:T010610)
- Quality Management System (KS Q ISO 9001 : 2009 / ISO 9001 : 2008) Certificate (13.05.28~16.05.27)



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## Company Introduction

The most advanced waterproof new material company, Re-New System Co., Ltd. is the global and green new material company that is trying the best to solve the waterproof problem of domestic and international construction structure. We have realized the complete waterproof of water leaking structure of KT Communication, Korea Electric Power, underpass, subway, culvert, tunnel, underground parking and etc, that entire waterproof companies gave up and we also have applied our technology to Big Deal which is located in Boston USA, Bart in San Francisco, and costal expressway in Marina Singapore, and are spreading the global marketing globally. We hold our goal as perfect waterproof in Korea as well as global market with our new material and technology through continuous technology development and innovation and promise to value the asset and value of people.



## Characteristics of Key Products & Technologies

### Poly-as method (Turbo-seal GT + Turbo sheet)

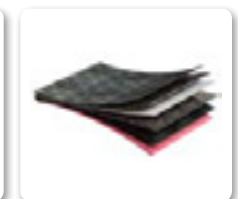
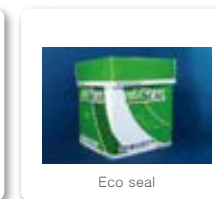
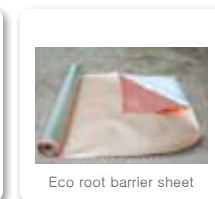
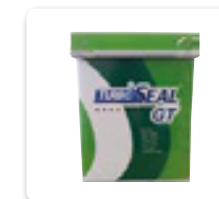
We build the complete waterproof system in waterproofing method of painting turbo seal which is the adhesive and flexible type material on the base surface and attaching the turbo sheet to form dual composite waterproofing layer. Turbo seal is the elastic gel type waterproof material that possesses the characteristics of adhesion and flexibility and it is created after combining special adhesive, synthetic polymer resin, and asphalt after creating the rubber waste as a liquid. Turbo seal holds lower than 0.002% of volatile organic compound and treated as eco-friendly product, moreover, its adhesiveness is excellent with heterogeneous material as well as concrete and its execution of works is easy.

### Green roofing system (Eco seal + Eco root barrier sheet)

It is the low management type green roofing system that copper root barrier sheet which holds excellent root penetration resistance combined with eco seal which is the adhesive and flexible type of waterproof material. It allows the complete green roofing system without a punching phenomenon according to planting and it also solves the structural instability according to a leakage and lengthens the durability of structure, moreover, innovatively reduces the post maintenance cost.

### Turbo sheet GTR

It is the self adhesion sheet that has integrated eco-friendly high adhesive reclaimed rubber with membrane sheet. According to adhesive type of attachment of adhesive and flexible material, interfacial fallen does not occur in case of occurrence of a crack so its responsiveness towards a crack is excellent. It also has the strong point of shortening the period of execution of work because it is the method that sticks directly on the surface of concrete.



## Projects performed at home and abroad

- Astana Kazakhstan, waterproof construction of pumping station of City Hall (2012)
- Waterproof construction of NTT cable tunnel Japan (Dec 2010)
- Marina Bay Expressway Singapore, waterproofing construction of 482 and 486 section (May 2010)
- Bart subway San Francisco USA, waterproof construction of extended section (34.58Km section) (Jan 2009)
- Big Dig Boston USA, waterproof construction of underpass (June 2007)
- Incheon International Airport, step 2 construction of boarding tower B,C and mooring area facility construction (2A-6 Section) waterproof construction (June 2005)

## Certification

- Eco-label certification (Korea Environmental Industry & Technology Institute) (Jan 25 2012)
- Green technology certification (Ministry of Education, Science and Technology) (Apr 28 2011)
- NET new technology certification (New technology #560 of Ministry of Land, Transport and Maritime Affairs) (Oct 13 2008)
- ISO 14001 (Dec 2006)
- NET new technology certification (New technology #376 of Ministry of Construction and Transportation) (Apr 12 2006)
- ISO 9001 (June 2003)



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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

Established in 1985, Taset Inc. has been focused on water treatment industry and has achieved technological development and advancement for the past decades as a specialized water treatment machinery maker and a water treatment equipment and plant exporter.

We have fabricated and installed various water treatment machines in almost 1,000 plants in Korea and abroad, including urban water purification, sewage/desalination treatment, and discharge pump treatment plants, and industrial water purification/wastewater treatment plants. We have gained trust by providing prompt and accurate services. Taset has grown into a company that can provide One Stop Services for engineering, purchasing, and fabrication altogether for customer satisfaction. We have worked on Yeongjongdo New Airport Complex Sewage Treatment Plant, Equatorial Guinea Eviveyin/Evinayong Water Purification Center in Africa, ICAD Sewage Treatment Plant in Saudi Arabia, Harbin 1st/2nd Water Purification Centers in China, Jeaddah and Ras Azzawr Desalination Wastewater Treatment Plant in Saudi Arabia, and TAKREER Chemical Engineering Plant Wastewater Treatment Plant in Saudi Arabia to clarify and purify the environment and water resources in the world for more people to live better lives.



Harbin 2nd Water Purification Center, China



Equatorial Guinea Project Site



UAE ICAD Project Site

## Characteristics of Key Products & Technologies

### Non-metal Sludge Collector

Taset's non-metal sludge collector is used in the rectangular settling tanks of water purification, sewage and wastewater treatment plants and collects settled sludge into hoppers. It uses engineering plastic to resist corrosion and ensures long lifespan with lightweight parts to reduce power consumption. Also, the parts are standardized and held in stock to supply spare parts promptly for easy maintenance.

### Spiral Flow Grit Remover

It is installed at the inflow channel of sewage/wastewater treatment plants to deposit sand through spiral flow and discharge it through air lifting to reduce the replacement needs or clogging of pipes caused by worn pump in processing. With high efficiency, it is suitable for large-capacity sewage/wastewater treatment plants. Our independently developed and patented tornado block maximizes the efficiency of air lifting for many sites.

### Portable R/O & Membrane Bio Reactor System

This is the MBR system that uses R/O and settling membrane and made portable. With the steel tank in package system, it does not require civil works for installation, saves initial investment cost, and is easy to maintain and repair. It does not take much space as the previous wastewater treatment facilities and it is simple to install, prevents odors, reduces energy consumption, and is space-efficient.



## Projects performed at home and abroad

- USA/Saskatchewan Rehabilitation PJT Non-metal Sludge Collector (Sept 2012)
- Korea/Samsung Fine Chemicals Wastewater Treatment Plant Round Sludge Collector (July 2012)
- Japan/Sakaigawa WWTP Non-metal Sludge Collector (June 2012)
- Australia/Cronulla WWTP Sludge Collector Improvement (Apr 2012)
- Saudi Arabia/Yanbu SWTP Sewage Treatment Plant (47,000m<sup>3</sup>/day) (Jan 2012)
- Bahrain/Muharraq STP Sewage Treatment Plant (110,000m<sup>3</sup>/day) (Dec 2011)
- Saudi Arabia/Jeddah SWRO-3 WWTP Desalination Wastewater Treatment Plant (Aug 2011)

## Certification

- ASME: Manufacture and assembly of power boilers("S" STEMP, Certificate number 39,572, May 18 2010)
- ASME: Manufacture of pressure vessels ("U" STEMP, Certificate number 39,573, May 18 2010)
- Automatic Back-wash Filter (Patent No. 689855, Feb 26 2007)
- ISO 9001 Certificate: BS EN ISO 9001:2000/KS A 9001:2001 (Aug 30 2006)
- Settled Sand Removal and General Pretreatment System for Water, Sewage, and Wastewater (Patent No. 555142, Feb 18 2006)
- General Concomitant Treatment System for Sewage and Wastewater Treatment Plants (No. 465870, Dec 31 2004)

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

We, HYUNDAI Wacortec Co., Ltd, are the specialized manufacturer and exporter of Water purifiers for household and Water purification systems for Commercial and Industrial use based on our continuous study and investment for the products. And we have secured the superior competitive power while exporting our goods to over 50 countries since established.

In addition, we are the enterprise of "KOTRA Global Brand Company" by KOTRA and "Hi Seoul Brand" who is selected by Seoul Metropolitan Government and has the most advanced technology and the quality certificates for the goods. And we are trying to open the healthy cultural life for our worldwide customers with the high quality and the advanced technology. The worldwide customers acknowledge that HYUNDAI Wacortec Co., Ltd. is the symbol of Korea in the field of Water purifiers and Water purification systems.



## Characteristics of Key Products & Technologies

### 1. INDUSTRIAL R.O WATER TREATMENT EQUIPMENT-INRO

It could be operated by the low maintenance cost and the R/O water treatment system can connect to the raw water sources directly. And the equipped R/O membranes effectively remove Bacteria, Germs, Heavy metals, Radioactivity and others considering the capacity of the treated water & each regional character. People can drink safe water that the mentioned contaminants are removed by the system.

### 2. WATER TREATMENT SYSTEM FOR EMERGENCY USE-EMRO

The product is designed to use where the electricity can't be supplied such as outdoors, warfares, natural disasters and others. And it is easy to move and use by everyone. The equipped R/O membrane effectively eliminates Germs, Bacteria, Heavy metals and even Radioactivity. So users can drink safe water in those emergency situations.

### 3. PORTABLE WATER PURIFIER-LIFE WATER FITLER

Life membrane filter is specially designed to get the clean and safe water from the outdoor raw water while doing outdoor activities such as climbing, Leisure activities. It is easy to carry due to its compact design. And it effectively eliminates Germs, Bacteria, Virus and other contaminants that we can easily find outdoors.



## Projects performed at home and abroad

- INDUSTRIAL R.O WATER TREATMENT EQUIPMENT : MINISTRY OF ENVIRONMENT OF AZERBAIJAN, MEXICO, MONGOLIA AND OTHER COUNTRIES
- WATER TREATMENT SYSTEM FOR EMERGENCY USE : INDONESIA, JAPAN, MONGOLIA, REUNION, RUSSIA AND OTHER COUNTRIES
- PORTABLE WATER PURIFIER : HONGKONG, CZECH REPUBLIC, ROMANIA, MALAYSIA, SINGAPORE, VIETNAM AND OTHER COUNTRIES

## Certification

- ISO9001, ISO14001
- PATENT OF WATER TREATMENT SYSTEM FOR EMERGENCY USE



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consulting ( )

## Company Introduction

Based on 30 years' experience and know-how of the CEO specializing in water quality, KOREA Envi-Tech has devoted itself to the area of water treatment with a motto of "Like the first time" since its foundation in October 1999. With proven technologies and passion of all staff members, we have continued R&D efforts and become a leader in AUTO STRAINER for water treatment, playing a role in the preservation of water quality.

In the 21st century of globalization, we have tried our best to satisfy our customers with excellent technologies and quality products, under the principle of "Putting my heart and soul into products." Never becoming complacent with now, we promise to better meet your needs by means of product development, trust, and thorough follow-up measures.



## Characteristics of Key Products & Technologies

1. AUTO STRAINER is installed in a pipeline to selectively filter foreign substances (SS content) in a fluid using a WEDGE WIRE TYPE screen with diverse slots (SLOT: thin and long opening) and to automatically discharge filtered foreign substances. Used for preliminary treatment process of precision filtration, nozzle head of sprays, MBR system of water purification stations, and 1st and 2nd treatment water recycling process of sewage or wastewater treatment plants.
2. Any model of AUTO STRAINER is a closed type, so easy to use and maintain. Small and compact in size, making it possible to install at a narrow space.
3. AUTO STRAINER is generally installed at the discharge pipe of a pump, that is, the pressurized pipe, but thanks to our long experience and patented technologies, it is installed at pump inlet or non-pressurized pipes as well.

## Projects performed at home and abroad

- SSL Pjt. - Ultrapure system, China,(2012)
- West quana field 2nd phase Pjt.-Pre-treatment of UF, Iraq(2012)
- Chlorine injection facility for seawater facility, Indonesia(2012)
- S3 IPP Project - UF pre-filter, UAE(2012)
- Cooling water system for LLP POSUK titanium, Kazakhstan(2012)
- Posco Cold rolling wastewater treatment facility, India(2012)
- SIPCO pretreatment system, Thailand(2011)
- GM KOREA Uzbekistan Project, Uzbekistan(2011)
- Chicauno Power Station Add-on Project Desalination system, PERU(2011)
- RUSSIA Water supply pumps for Kalinin NPP unit 4(2009)
- GMUZ M300 PROJECT, Uzbekistan(2009)
- 1×660MW Cirebon Coal Fired Power Plant, Indonesia(2009)
- Shuwaikh RO desalination plant, Kuwait(2009)
- SHUAIBA NORTH CO Generation plant Pjt, Kuwait(2009)
- SIPCO-BELT PRESS RECYCLE system, Thailand(2009)
- SEBU 103MW×2UNIT Pjt, Philippines(2009)

## Certification

- I.S.O 9001:2000

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consulting ( )

## Company Introduction

Hyorim Industries Co., Ltd. is an environmental company.

It was established in August 1986 as Choongil Precision & Ind. Co., Ltd. to manufacture and install water and sewage and wastewater treatment equipment and changed its name in April 1990. As of 2011, its annual sales recorded 60 billion KRW, total assets were 74,544 million KRW, equity capital was 44,309 million KRW, and number of full-time employees was 190. It has an independent technology institute specialized in engineering and development for flawless products and processes and adopted ERP system, groupware, and other information systems for efficient resource management.

Also, it has acquired ASME 'U', 'PP' STAMP, and ISO 9001/ ISO 14001 certificates for quality assurance and customer satisfaction.



Saudi Arabia Site



UAE Site



Shingo-ri Nuclear Site

## Characteristics of Key Products & Technologies

### Wastewater Treatment Facilities / Wastewater Recycling Facilities

Based on the past decades of accumulated technology, we are supplying facilities to treat wastewater from various industrial plants, such as thermal/nuclear power plants and petrochemical plants. We are also securing technology and competitiveness through steadfast development in technical partnerships with global companies. We have the technology to reuse treated water for climate changes and water shortage and we are increasing supplies in Korea and abroad.

### Sluice Gates

We produce and supply sluice gates to collect/discharge/block water resources for power plants, water collection, dams, reservoirs, and other waterways effectively. Sluice gates consist of roller gate, radial gate, and winch.

### PICAF Precipitation System

Packaged Inclined Clarifier with Accelerating Flocculation (PICAF) is an upflow-type precipitation system that naturally mixes source water and cohesive agents using the multiple levels of sliding cone and baffle plate in the reaction chamber for agglutination. The reaction water moves from the bottom of settling pond to the top for precipitation.



## Projects performed at home and abroad

- KALLPA 830MW CCPP Wastewater Treatment Facility (15 million USD) (by Sept 2012)
- Chile Lithium Extraction Facility Building & Installation Project (Aug 2012)
- UAE Taker RRE#3 U&O PJT Sea Water Intake (75 million USD) (by May 2012)
- Seawater Collecting Facility for Indonesia Saprophytism Thermal Power Plant Project (Feb 2012)
- Water Collecting Facility for OMAN SUR IPP Project (Dec 2011)
- Samcheok Production Base Level 1 Seawater Collecting Facility (Aug 2011)
- Shin-Uljin #1,2 Wastewater Treatment Plant (May 2011)

## Certification

- Promising Small/Medium Exporter (Gyeonggi-do Regional Small/Medium Business Administration, June 2012)
- ASME "U", "PP", "S" Stamp (Sept 2010: Asan Factory)
- Safety Certificate OHSAS 18001 (Aug 2010)
- ASME "U", "PP" Stamp (Nov 2009: Cheonan Factory)
- Quality Certificate KWWA (Oct 2009)
- 7 Registrations including patents (19 cases, including No. 0435621) and utility designs (15 cases, including No. 0169463)

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consulting ( )

## Company Introduction

### Customer Satisfaction First

Based on advanced technologies and thorough quality control practices since its foundation in 1986, Royal Precision Industry has enjoyed steady growth into a leading environment-related equipment maker and supplied quality environment systems to the nation's key infrastructure and various domestic and overseas industrial facilities.

Through continued R&D activity and abundant experience in design, manufacturing, commissioning and after-sale service to best satisfy customers, we have obtained a variety of certifications like a Venture Biz, EC, EEC, and NEP certificate for the excellence of our products as well as tens of patents at home and abroad.

We will continue our R&D activities to develop diverse products and take special care in handling a smallest part from cutting of materials and finishing goods. With a quick delivery and seamless service network, we put customer satisfaction first and do our best to reward your support.



### 3. Separating Decanter Centrifuge

This centrifuge selectively responds to particle separation and dewatering based on the characteristics of the treated materials, and through linkage control movement with the treated materials, it continuously performs input-sedimentation-dewatering-drainage transfer until the particles of the materials become mm-sized. This centrifuge can maximize large-volume treatment and separation efficiency.



## Projects performed at home and abroad

- Over 450 units of water supply & sewage treatment plants at 180 or more sites
- Over 220 units of sanitation & human waste treatment plants at 100 or more sites
- Over 150 units of livestock waste water treatment plants at 80 or more sites
- Over 40 units of food waste treatment plants at 20 or more sites
- Over 160 units of industrial & plant treatment plants at 80 or more sites

## Characteristics of Key Products & Technologies

### 1. Dewatering Decanter Centrifuge

This dewatering decanter centrifuge rapidly and wholly dewateres the fluid in the bowl to make dried sludge by dividing solids and moisture using specific gravity. The solids are discharged as low water content cake by shear force and binding post-tensioning force.

### 2. Tikening Centrifuge

This centrifuge automatically controls the speed, although the input sludge concentration varies periodically in the auto-control mode, which enables the constant value of the concentrated fluid to be discharged. Accordingly, it is possible to continuously process the fluid with the present concentration value and to discharge highly concentrated sludge. In addition, 90% of the solids can be removed without using a coagulant.

## Certification

- ISO 9001
- ISO 14001
- SMBA-Designated Venture Biz Certificate
- KT Certificate
- EM Certificate
- EEC Certificate
- NEP(New Excellent Product) Certificate
- KC Safety Mark





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**Area**

Total construction ( ) / water quality ( ) / air quality ( v ) /  
wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

**Company Introduction**

Dae Yang Environment, also known as ARECA has made and installed over 300 units of RTO for the last 23 years and presented best solutions via ceaseless passion and R&D efforts. We also have developed FRTO that can effectively remove VOCs and bad odors to save energy and provided customers with waste heat recovery system to create values.



**Characteristics of Key Products & Technologies**

1. FRTO: FRTO with no burner flame during oxidation of VOCs
  - Less supporting fuel used (over 30% of fuel cost reduced), RTO heat efficiency increased
  - Burner standby design possible
  - Life of heat storage materials increased. No thermal NOx generated.
2. Waste heat recovery technology: It is a technology to use energy of waste gas of oxidation in high concentration process
  - saving fuel cost
  - 1) Heating medium boiler
  - 2) Steam boiler
  - 3) Waste heat recovery system

**Projects performed at home and abroad**

- Samsung Electronics Tangjung 7 Line, Module Block, Cheonan 5,6 Line
- Hankook Tire Daejeon Plant 9,000m<sup>3</sup>/min(largest in Korea) / Jiaxing, Jiangsu, and Chongqing Plant in China
- Hyundai Mobis: 3,140m<sup>3</sup>/min, Youl Chon Chemical: 4,000m<sup>3</sup>/min, CJ Development: 4,000m<sup>3</sup>/min
- Daesung MPC : 5,200m<sup>3</sup>/min and 302 more made and installed

**Certification**

- Rotary Rotor Based VOCs Regenerative Combustion Technology Patent registered in Korea, China, and Japan.
- FRTO Patent registered
- KS Q ISO 9001:2009 / ISO 9001:2008
- KS Q ISO 14001:2009 / ISO 14001:2008
- K-OHSMS 18001:2007 / OHSAS 18001:2007

## Company Introduction

Established in November 1999, Sseng Co., Ltd. has focused its capacities on researching and developing water treatment technologies for almost 13 years and registered about 100 patents in Korea and abroad. We have also achieved two New Environmental Technology Certificates, 14 National R&D Projects, 1,700 new technology product supplies, and 9 major awards, including the Presidential Jang Young Shil Awards' Patented Technology Prize. Recently, we have achieved a new technology to supply 12,000 tons of purified water a day for a city with 100,000 populations with one standard 45ft container.



Jangnim Wastewater Treatment Plant



Yangsan Wastewater Treatment Plant



Posco Donghoan

## Characteristics of Key Products & Technologies

### PCF (Pore Control Fiber) Filter

PCF (Pore Control Fiber) Filter pulls the microfilaments surrounding the perforated pipe up and compresses them to reduce the size of pores for filtering or releases them to enlarge the pores to use back-washing water and air for fast flow back wash. It adds back-washing function to cartridge filter.

### GFF (Gravity Flow Fiber) Filter

GFF (Gravity Flow Fiber) Filter compresses unwoven microfilaments onto a perforated board to reduce the size of pores and filter using 30cm difference in water level or releases them to enlarge the pores to use back-washing water and air for fast flow. When multiple units are installed, it forms an upflow to automatically supply adjacent filtered water as back-washing water.

### Purifying Drinking Water

DCoF (Double Coagulation Filtration) applies two-step direct filtration system using PCF filter to collect river water and purify drinking water. It offers 1/30 detention time (facility size) compared to the traditional process of collection/precipitation/filtration for 99.9% (300→0.3NTU) efficiency and 3.0 or lower SDI. Operation cost is 1/3 lower and construction cost is also lower. One standard 45ft container can produce up to 12,000m<sup>3</sup> a day and greater capacities are built in the form of a plant.



## Projects performed at home and abroad

- Ordered to build phosphorous treatment facility for Gulpo Wastewater Treatment Plant (900,000m<sup>3</sup>/day, 15.5 billion KRW) (Sept 2013)
- Installed tertiary treatment facilities for Guri City Wastewater Treatment Plant Improvement Project (160,000m<sup>3</sup>/day, 3.5 billion KRW) (Apr 2012)
- Installed phosphorous treatment facility in Yangsan Wastewater Treatment Plant (146,000m<sup>3</sup>/day, 5.26 billion KRW) (Dec 2011)
- Supplied wastewater treatment plant to Vladivostok (10,000m<sup>3</sup>/day, 180 million KRW) (Aug 2010)
- Supplied treatment facility for Able, Japan (150m<sup>3</sup>/day, 3,600 KRW) (Jan 2010)
- Installed Posco Donghoan Filtering Facility (30,000m<sup>3</sup>/day, 0.5 billion KRW) (Dec 2008)
- Installed Jangnim Wastewater Treatment Plant Discharge Water Treatment Facility (450,000m<sup>3</sup>/day, 4.5 billion KRW) (Sept 2008)

## Certification

- Quality Management System Certificate – ISO9001/ISO14001 (Feb 2007)
- New Technology Certificate/Technology Certificate (GFF Filter) – Ministry of Environment (June 2006)
- New Technology Certificate/Technology Certificate (PCF Filter) – Ministry of Environment (May 2004)
- Registered 71 patents in Korea/abroad and 33 pending

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consulting ( )

## Company Introduction

SHENTECH Co., Ltd is the professional environmental plant company that focuses more on exportation than domestic demand based on the strengthened solid technology of 20 years after entering into the environmental industry with recycling compressor in 1992 and holds 24 permanent employees. There are 3,500 compressors in operation throughout the country including Jeju Island and as of 2002, we are exporting the environmental facilities such as large automatic compressor, conveyor and wind power selector for construction waste, etc, to Japan annually. We have completed the construction of various material recovery facilities in Ansan city, Cheonan city, Gimpo city, etc, for several years, moreover, we have won the contract of household pre-treatment facility of 800 Tons in Vladivostok, Russia in 2010 and have completed the construction of 2 years which showed the excellent environmental technology of Korea. We also have developed the new construction method of refuse derived fuel which meets the waste recycling policy of government and have applied to MBT Gapyeong-gun, Gyeonggi-do, moreover, have successfully completed the construction in 2012.

We hold 7.3 billion KRW of annual sales and 2.5 billion KRW of exportation performance in 2011.



Material recovery facility in Cheonan city



MSW pre-treatment facility in Vladivostok, Russia



Construction waste middle pre-treatment facility in Japan

## Characteristics of Key Products & Technologies

### Material recovery facility system

We have successfully practiced the environmental plant in overseas such as Japan, Russia (Vladivostok, Scale of MSW 800 tons/day), etc, based on the various scale of MRF (5 tons/day~92 tons/day) construction performance in domestic and currently, we are receiving the inquiries of a demand of introduction of SHENTECH's advanced MRF technology from Ukraine, USA, Argentina, China, etc

### Manufacturing method of Refuse Derived Fuel

We have developed the new construction method of refuse derived fuel which is suitable with domestic household waste and have successfully applied to MBT in Gapyeong-gun, Gyeonggi-do, moreover, are actively using MBT facility in overseas exportation

### Recycling compressor

We are the leading company of domestic recycling compressor which produces the various types such as compressor for standard plastic garbage bag which is developed for the 1<sup>st</sup> time in domestic in 1995, multi-purpose

compressor, landfill compressor, can compressor, PP band 2-axis compressor, 6-sided compression package machine, special compressor which are used in distributors and factory, etc, moreover, 3,500 facilities are currently in operation throughout the country



## Projects performed at home and abroad

- Pohang city, Construction of public material recovery facility (40 tons/day, 2012)
- Gapyeong-gun, Household waste pre-treatment facility (RDF) (65 tons/day, 2011~2012)
- Vladivostok, Russia, Installation construction of household waste pre-treatment facility (800 tons/day, 2010~2011)
- Chuncheon city, Material recovery facility (52 tons/day, 2010)
- Gwangmyeong city, RPF manufacturing facility (1 ton/hour, 2009)
- Anseong city, Material recovery facility (35 tons/day, 2008)
- Cheonan city, Material recovery facility (72 tons/day, 2007)
- Ansan city, Material recovery facility (92 tons/day, 2006)

## Certification

- Selected as Promising Export Company (2011)
- INNO-BIZ (2011)
- Certification of environmental management system (ISO14001), certification of quality management system (ISO9001) Patent
- Recycling plastic selector using wind power (2011)
- Household waste RDF equipment (2011)
- Manufacturing method of RDF combustible waste (2011)
- Recycling plastic selector (2010)
- Garbage selector (2009)
- Plastic waste wet selecting method using gravity difference (2009)
- Recycling waste selector using wind power (2007)
- Environmental new technology certification: Household waste pre-treatment technology (#373)





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## Area

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wastes ( ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

## Company Introduction

DONGLIM ENG was established in April 1999 as a company specialized in waste treatment and environment plant, and it has its own technology which takes full charge of design of product and process by setting up an affiliated laboratory and possessing cooperative companies for waste treatment facilities and environmental equipments.

This company also owns DONGLIM ENE Ltd., which E.P.C such as facilities for energy recovery from waste (destructor station, CHP through anaerobic digestion) and CDM business is possible, as a subsidiary company and production is always available at their factory. They established a branch in Thailand in June 2011, and registered for machine equipments in August 2012. Currently, the number of regular employees is 60, and the total sales as of December 2011 are KRW 10 billion.



System for electricity generation from waste



Combustion gas treatment system



RTO

## Characteristics of Key Products & Technologies

### System for electricity generation from waste

It is a facility that uses steam from incineration of energy from waste (waste matters, RDF/RPF, lignum kinds and etc.) to produce heat, electricity, and it consists of incinerator, exhaust gas boiler, steam turbine, and facilities for preventing air pollution.

It is possible to service all such as feasibility study, design, purchase, supply, construction, trial test, and operation.

### Regenerative (RTO), Catalytic (RCO) treatment facility

It is a facility that performs oxidation treatment on VOCs gas, and it improves heat recovery efficiency by applying CERAMIC thermal storage system that has high heat recovery ventilation.

It has high heat efficiency and throughput efficiency, high adaptability of air flow and concentration, and low cost for maintenance.

### Environmental Industry

- Equipment for preventing air pollution (BAG FILTER, DR, SDR, CYCLON and etc.)
- Odor removing equipment (A/C TOWER, SCRUBBER, BIO FILTER and etc.)

- Dioxin removing equipment
- VOC removing equipment (RTO, CTO and etc.)
- Flue Gas Desulfurizer (FGD), Denitrification equipment (SCR, SNCR)



## Projects performed at home and abroad

- Thailand: System for electricity generation from waste
- Japan: CTO facility for VOC decrease
- Iksan city: combustion gas in incinerator treatment facility
- Hallastackpole: RTO facility
- Oman: Daewoo Shipbuilding & Marine Engineering combustion gas treatment facility
- Busan city: RDF incineration facility combustion gas treatment facility
- Ulsan city: Basic and execution design for gasification fusion facility for industrial waste plasma
- Goyang city: Basic and execution design for biomass energy
- Ulsan city: Execution design for bio gasification of organic waste

## Certification

- Certification of INNO-BIZ (2011)
- Certificate of affiliated laboratory (2010)
- Quality Management System (ISO 9001:2008)
- Environment Management System (ISO14001:2004)
- Registration of Environment Specialist (1999)
- Patent sewage treatment apparatus (Patent No. 10-1010053)
- Certification of utility model for Pressurization Water layer Type of Cleaning Dust Collector (No. 20-0413227) and 1 more
- Stocker apparatus for combustion in incinerator (Holding No. 10-2002-0055205)
- Auto Circle Turbulence Semi Dry Reactor System (Patent No. 10-0966736)



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**Area**  
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wastes ( v ) / soil ( ) / noise ( ) / eco-friendly products ( ) /  
consulting ( )

Company Introduction

Founded as an incinerator design and manufacturing company in 1985, KRICO has installed over 2,000 incinerators at home and abroad with a focus on medical waste incinerators, which have been installed at more than 300 hospitals including the Inha University Hospital, the Yonsei University Medical Center, and the St. Vincent's Hospital. Recognized for our contribution to eco-friendliness through the construction of waste treatment incinerators, we have been awarded a Korea Environmental Technology Award (1996), a Chosun Ilbo Environmental Technology & Science Award (1997), an Incheon Science & Technology Award (1999), and a Korea Society of Waste Management Award (2007).

In 2010, we have succeeded in developing small-sized medical incinerators for export and exported medical waste incinerators to the MCM Hospital and the Gabriel Hospital in Ethiopia and other hospitals in Afghanistan and Iraq. After installing an incinerator, the MCM Hospital of Ethiopia received an eco-friendliness award from the Ethiopian government. Specializing in medical waste incinerator manufacturing, we will continue efforts to grow into a world-class medical waste incinerator maker.



Chosun Ilbo Environmental Technology & Science Award



Korea Environmental Technology Award

Characteristics of Key Products & Technologies

- 1. Medical Waste Thermal Decomposition Small Incinerator (capacity: 30 ~ 200 kg/hr)
  - Batch-input system, which is easy to use and adopts highly efficient thermal decomposition method.
  - Smokeless and odorless, effectively preventing pollution.
  - In simple design, highly durable, and economical by using less supprting fuel
- 2. Vertical Cylinder Stoker Incinerator
  - With no operator in the furnace, in simple design, having less breakdowns, and easy to maintain
  - Since it requires less space for installation, wastes, once inputted, pass high temperature section at 900℃ and are burned for 3 to 4 hours before discharge, making fire-retardant matters completely burned and ignition loss close to zero.

- Thickness direct fired incineration used, generating less dioxines and making it possible to burn diverse wastes.
3. Bogie Cremator
- As a gear furnace bogie cremator, easy to use, fully burning and highly durable thanks to uniformed temperature distribution in reheating chamber. (Patent No. 10-0747110)
  - Highly efficient with no dead zone in reheating furnace due to regenerative thermal cremation plate, reducing cremation time (Utility Model No.0387996)



Projects performed at home and abroad

- Installation in Korea: over 2,000 units for the past 28 years
- Exports
  - Iraq: 2 units of 90kg/hr incinerators exported
  - Micronesia (30kg/hr)
  - Afghanistan: 200kg/hr incinerator exported
  - Indonesia: 100kg/hr-capacity medical waste incinerator exported
  - Ethiopia: Medical incinerators for MCM(100kg/hr), Gabriel(50kg/hr), and Bethzatha Hospital (30kg/hr) exported

Certification

- Ministry of Environment Environmental Exporter Voluntary Agreement (2011)
- SMBA Designated Promising Exporter (2013)
- ISO9001(2012)

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## Area

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## Company Introduction

DOHWA Engineering Co., Ltd., established in August 15, 1957, is Korea's No. 1 general engineering consulting company specialized in planning, validity survey, engineering, analysis, testing, supervision, test drive, evaluation, advising and instructions in every field of engineering, including water/sewer, water resource development, urban planning, road/traffic, structure, port, railroad, and environment. We have recorded 282.1 billion KRW in sales in 2011 as the No. 1 company in Korea and currently have 2,000 employees. In the environmental field, we are specialized in general environmental plants and new renewable energy facilities, including water/sewer, water resources, landfill sites, incineration facilities, recycling sorting facilities, MBT (RDF) facilities, LFG processing and power generation facilities, solar power generation, wind power generation, biomass power generation, and hydro-power generation. We are promoting various projects in Korea and abroad based on our eight overseas offices in Vietnam, Indonesia, etc. We are by far the first and the best global company that flies toward the future by expanding our engineering business to EPC.



New Renewable Energy in Mongolia



Landfill Gas in Daegu



Landfill Site in Vietnam

## Characteristics of Key Products & Technologies

### Engineering Services

Based on our years of experience in the environment industry, we are performing validity survey, engineering, and CDM for environmental infrastructures, such as water/ sewer, wastewater, waste, incineration, and energy recovery organic waste facilities, and have grown into a global company by participating in public development projects of local public development aid organizations, such as KOICA and K-EXIM Bank, and global organizations, such as Worldbank, ADB, and AfDB.

### EPC (Engineering, Procurement, Construction)

The scope of EPC projects includes consulting for environmental/ power generation plants, validity survey, EPC and operation. Starting with EPC for the Biomass Power Generation Facility in Indonesia, we have promoted EPC for engineering, building, and operating power generation plants, including solar, wind, gas and flaming coal power generation plants.

### Supervision & Construction Management

We are providing engineering documents/drawings, problem-solving for construction/ maintenance, and safety and environmental management to build the best facilities in CM, water/sewer, roads, bridges, complexes, subways, rivers, and environmental facilities.

We also manage the entire process of construction projects efficiently, from planning and validity survey to selecting engineers, engineering management, and selecting contractors.



## Projects performed at home and abroad

- Consulting Services for Quang Binh Solar Cell Power Project (Aug 2012)
- Building service water facilities for Hlaing Thar Yar Township in Yangon, Myanmar (July 2012)
- Design and Supervision Consultants Services Issyk-Kul Sustainable Development (June 2012)
- Maintaining landfill sites/excavating landfill gas energy in Portillo Grande and Ancun, Peru (Mar 2012)
- Wastewater treatment plant for 130,000 tons/day in Columbia (Dec 2011)
- PMC for solar power generation plant in the Galapagos Islands, Ecuador (Dec 2011)
- EPC of KTH Biomass(Wood chip) Fired Power Plant, Indonesia (7.5MW) (July 2011)
- Sanitary waste landfill site in Benguet, Philippines (Apr 2009)

## Certification

- Landfill site with organic wastewater pond (Dec 2011)
- Sorting combustible wastes from construction wastes (Jan 2011): Patented in China (Oct 2012)
- Backside wind-cooled high-efficiency new renewable energy solar power generation facility (Sept 2009)
- Organic waste circulating landfill site with vertical injection well and pond (Aug 2009)
- Anaerobic digester for semi-liquid organic wastes (June 2008)



# ABC List

Beautiful Environmental Construction Co., Ltd.	40	Ilsin Environmental Engineering Co., Ltd.	30
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