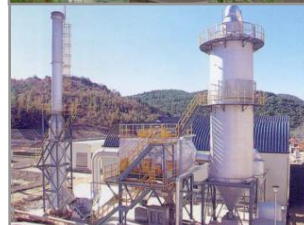


# QUALIFICATION STATEMENT

PT. Win Textile (Indonesia)



Wastewater Treatment System



**DAESAN ENGINEERING CO., LTD**

OFFICE : 185, SEODAEGU-RO, SEO-GU, DAEGU, KOREA

Tel : (053) 562- 5020 Fax : (053) 562-5023

FACTORY : 213, DALSUNG2CHA-RO, KUGI-MYEON, DALSUNG-GUN, DAEGU, KOREA

Tel : (053) 581- 2366 Fax : (053) 581- 2367

E-mail : [daesan1985@hanmail.net](mailto:daesan1985@hanmail.net)

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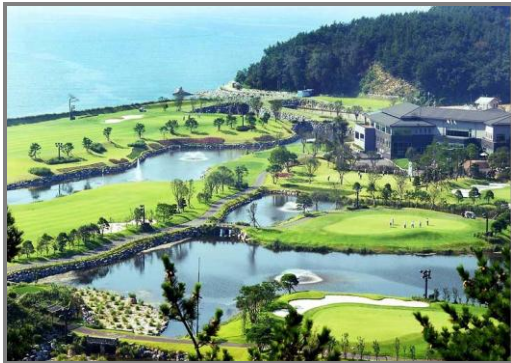
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Gunwi-gun agricultural industrial complex wastewater terminal disposal place



▽ Golf course sewage treatment plant



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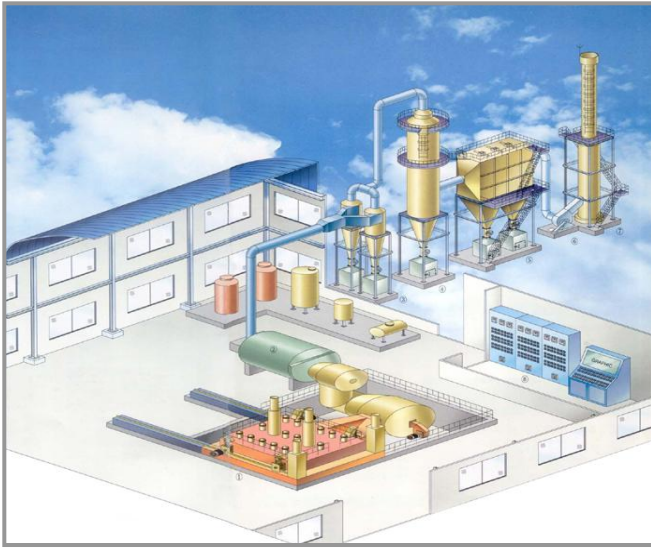
# 01. State Of Company

Section	Corporate Overview	
Firm Name	DAESAN ENGINEERING CO.,LTD.	
President	Representative Director Sang-Ho Hyun	
Main Office	Add : 185, Seodaegu-ro, Seo-gu, Daegu, Korea T e l : +82-53-562-5020 F a x : +82-53-562-5023 E-mail : <a href="mailto:daesan1985@hanmail.net">daesan1985@hanmail.net</a>	
Factory	Add : 213, Dalsung2cha-ro, Kugi-myeon, Dalsung-gun, Daegu, Korea T e l : +82-53-562-5020 F a x : +82-53-562-5023 E-mail : <a href="mailto:daesan1985@hanmail.net">daesan1985@hanmail.net</a>	
License	Water-pollution preventive facility design & build	Daegu Metropolitan City No.2
	Air pollution prevention facility design & build	Daegu Metropolitan City No.2
	Mechanical facility work	Daegu Metropolitan City
Main Item	Waste water treatment system design & build Sewage water treatment system design & build Lake & Pond treatment system design & build Air pollution prevention facilities design & build Plant facilities & Steel structures design & build	
Company Founding	December 11th, 1985	

## 02. History Of Company

Section	History		
1984. 04. 02	Daesan engineering establishment approval 2022, Dalgubeol-daero, Jung-gu, Daegu		
1985. 12. 25	Changed to a corporation registered in accordance with “DAESAN ENGINEERING CO.,LTD” Sang-Ho Hyun appointed CEO		
1986. 01. 20	Business license Registration	Air pollution prevention facility	Daegu Regional Environmental Office No.6
		Water pollution prevention facilities	
		Noise and vibration prevention facility	
1986. 08. 14	Designated of water quality measuring agent		Daegu Regional Environmental Office No.509
1990. 06. 05	Environmental Day citation		The Minister of Environment
1991. 01. 23	Relocation to “185, Seodaegu-ro, Seo-gu, Daegu, Korea”		
1991. 02. 02	License renewal according to the Specialization	Air pollution prevention facility	Daegu Regional Environmental Office No.9
		Water pollution prevention facility	Daegu Regional Environmental Office No.7
1995. 11. 20	Leading technology development agreement		Korea Institute of Science and Technology
1998. 05. 27	Industry-University collaboration agreement		Taekyeung university
1999. 10. 01	Clean production technology business agreement		Korea Institute of Science and Technology
2000. 01. 17	Technical advice agreement signed		Keimyung university Nakdong River Institute of Environment
2001. 05. 02	Industry-academic consortium Agreement		College of Engineering at Kyungpook National University
2005. 09. 01	Prevention facility license renewal	Air pollution prevention facility design & build	Daegu Metropolitan City No.2
		Water-pollution preventive facility design & build	Daegu Metropolitan City No.2
		Water quality measuring agency	Daegu Metropolitan City No.7
2006. 05. 29	Mechanical facility work registration		Daegu Metropolitan City

### 03. Items Of Business



▷ Bird's eye view of  
air pollution prevention facility

Bird's eye view of  
water pollution prevention facilities ▷



- ◆ Air Pollution Preventive Facility Design & Construction
- ◆ Water Pollution Preventive Facility Design & Construction
- ◆ Noise & Vibration Preventive Facility Construction
- ◆ Approval & Permission Agent In Relation With Environmental Facility
- ◆ Manufacture Of Environmental Measurement Tools & Machine
- ◆ General Preventive Facility Design & Technical Supervision Service
- ◆ Measure In Relation With Water Contamination

## 04. Items Of Products

### 1. Air Treatment Part

Kind of Treatment facility
Packed tower
Two body type wet scrubber
Venturi scrubber
Wet cyclone & absorber
Spray & Carbon tower
Bag filter
Dry electrostatic precipitator
Wet electrostatic precipitator
Multi cyclone
Carbon tower
Nozzle, Demist, Palling & Media etc.



Main application field	
Life and other garbage incineration plants	Odor emissions of various plant facilities
General and industrial waste incineration plants	Powder transport facilities
Plating and surface treatment plant	Cement-related facilities
Semiconductor manufacturing plant	Mixing and grinding facilities
Chemical and Pharmaceutical Plant	Various dust Facility
Furnaces, incinerators, boilers dust collector	Textile-related and Fired Heater Plant
Sewage, manure, livestock wastewater	Plywood Drying Equipment
Emissions of volatile organic compounds facilities	Steel industry coke oven & Desulfurization unit
Tenter processing plant	Power plant flue gas & Rotary Kiln facilities
High temperature VOC Effluent Plant	Dust, Gas Simultaneous treatment facilities

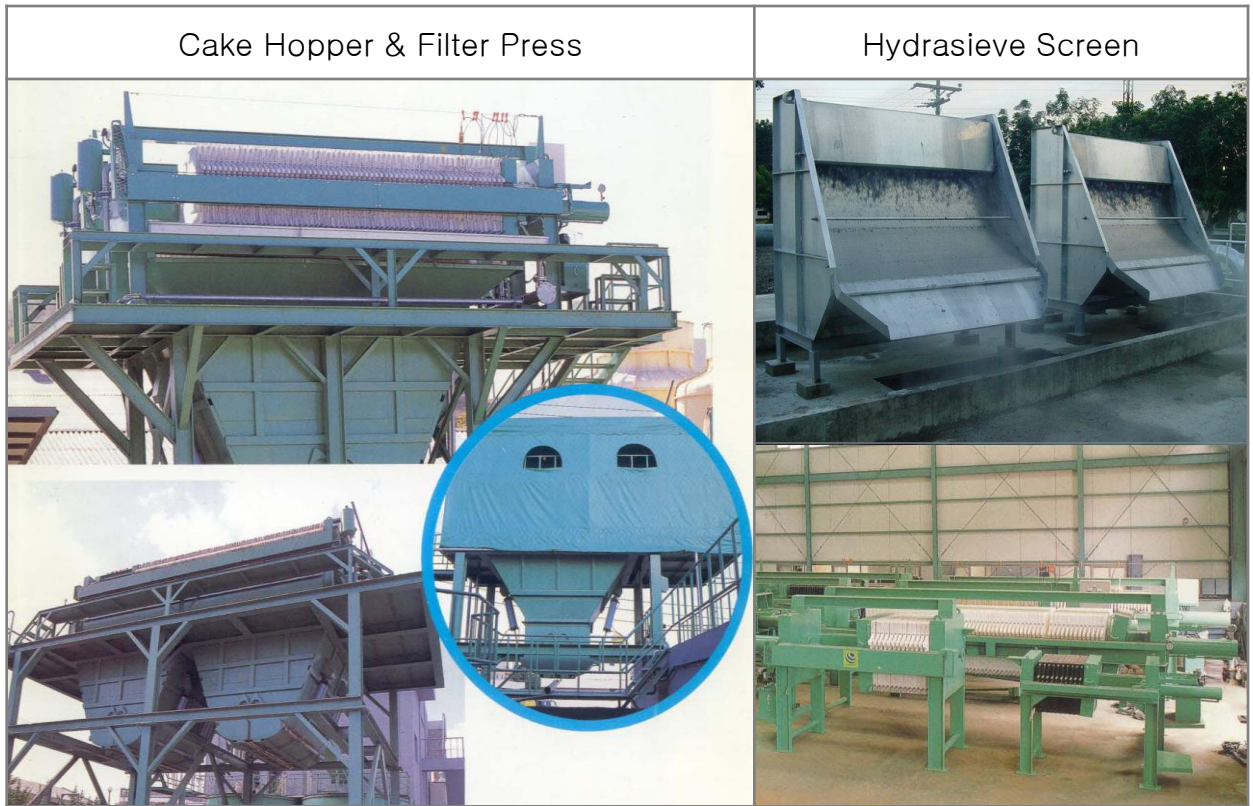
## 2. Water Treatment Part

Kind of Treatment facility
Textile dyeing Industry wastewater
Metal coating & painting Industry wastewater
Food processing Industry wastewater
Paper manufacturing Industry wastewater
Metropolitan sewage treatment system
Sewage treatment system
Country club pond treatment system
N, P treatment process
Ozone treatment & M.B.R system
Water softener & deionizer system
Filter press & Cake Hopper etc.



Main application field	
Textile & Dyeing Wastewater	Wastewater Reclamation and Reusing System
Petroleum, chemical wastewater	High ozone treatment of wastewater, sewage, water
Metal and plating wastewater	Odor deodorization facilities by high concentrations ozone Catalyzed
Food and Paper Wastewater	Graywater Facility by using sewage and waste water
Sewage treatment	Non-biodegradable, T-N, T-P wastewater
Night soil & livestock wastewater	Cooling & Jet Loom water supply
Golf course sewage and wastewater treatment	Dyeing, food, bathroom, boiler water supply
Chemical & Hospital Wastewater	Sheet metal, fabrication, stemming industrial water supply
Agricultural and Marine Products Processing wastewater	Electronics, Photo, Precision Polymerization water supply
Drinks and food processing wastewater	Soft drinks, drinks water supply

### 3. Environmental Machine Part



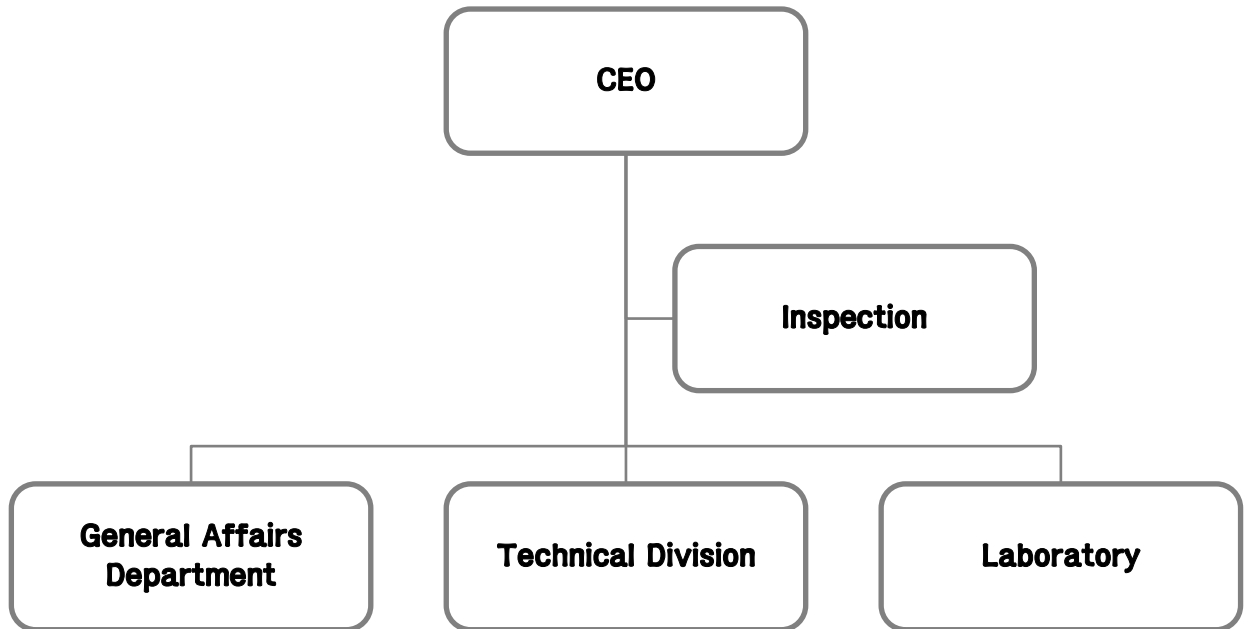
#### Main application field

Printing & Dyeing wastewater treatment	Leather industry wastewater treatment
Paper & Steel wastewater treatment	Slaughterhouse and abattoir wastewater treatment
Metal and plating wastewater treatment	Food industry wastewater treatment
Food and meat wastewater treatment	Textile weaving industry wastewater treatment
Sewage treatment	Chemical industry wastewater treatment
Night soil & livestock wastewater treatment	Fish and meat processing facilities
Slaughter & leather wastewater treatment	Saccharification raw materials, sugarcane bagasse, Various juice liquid dewatering Washing raw fish, brewers grain, distillers dried grains etc. Dewatering of Food & starch plant sludge, etc Other various wastewater sludge dewatering
Chemical and hospitals wastewater treatment	
Agricultural processing wastewater treatment	
Food processing wastewater treatment	



# 05. Organization & State Of Equipment

## 1. Organization



## 2. State Of Equipment

Section	Equipment List
CAD System	Auto CAD System Core 2 Duo (Hewlett Packard)
O.A System	O.A System Pentium IV (Samsung)
Print	Laser Jet A3 & Ink Jet A3 (Hewlett Packard), Laser Jet A4 (Samsung)
Scanner	Scanner Jet (Hewlett Packard)
Measuring Apparatus	pH Meter, UV Spectra, BOD Incubator etc.
Testing Apparatus	Jar Test, O <sub>3</sub> Pilot Tester, Air Pump etc.
The Others	Dry Oven, Heating Mantle, Water Bath etc.

## 06. State Of R & D And Cooperation

### 1. State Of Research & Development

Section	R & D present condition
Kyungsung University	Food Industry wastewater treatment of Anaerobic steady phase – 1995. 09
Kyungpook National University	Technology of using clay & adsorbent for harmful organic material disposal – 1995. 09
K I S T	Synthetic treatment system of unresolvent wastewater – 1995. 11
K I T E C H	The platinum compound electrode development for wastewater treatment by electrolytic process, and wastewater treatment equipment R&D – 1999. 10
Kyungpook National University	A low concentration wastewater treatment research using UASB process – 2001. 05

### 2. State Of University & Industry Cooperation

Section	Industry–Academy Cooperation
Keimyung Collage	Industrial–educational cooperation(customized training) agreement signed
Keimyung University	Technical advice cooperation agreement signed
Taekyeung Collage	Industrial–educational cooperation agreement signed
Yeungnam University	Industrial–educational cooperation agreement signed
Yeungnam Collage Of Science & Technology	Industrial–educational cooperation agreement signed
Andong National University	Industrial–educational cooperation agreement signed

# 07. Certificate Of Registration & Patent

## 1. Person Of Enterprise

**사업자등록증**  
(법인사업자)  
등록번호 : 503-81-14002

법인명(단체명) : (주) 대산엔지니어링  
대표자 : 현상호  
개업년월일 : 1985년 12월 11일 법인등록번호 : 170111-0021775  
사업장 소재지 : 대구 서구 경리 1492-34  
본점소재지 : 대구 서구 경리 1492-34  
사업종류 : 설비건설, 서비스 제공, 요소매출  
종류 : 경수처리공사, 환경오염방지, 환경오염방지계

과부사유 : 중복경영  
주류판매신고번호 : \_\_\_\_\_

2000년 9월 2일  
서대구세무서장

## 2. Air Pollution

**방지시설업 등록증**

등록번호  대기  
 수질  
 소음·진동

제2호  소음·진동

①상 호 대산엔지니어링  
②대표자 성명 현 상 호 ③주민등록번호 570719-1691211  
④방지시설업 종류 대기방지시설업  
⑤영업소 소재지 대구광역시 서구 경리5동 1492-34 (☎:053-562-5020)  
⑥등록조건 「환경기술개발 및 지원에 관한 법률」 제18조 제5항의 걸려 사유 발생시 등록을 취소함.

「환경기술개발 및 지원에 관한 법률」 제18조 및 동법시행규칙 제30조 제2항의 규정에 의하여 방지시설업의 등록을 하였음을 증명합니다.

2005년 9월 1일  
대구광역시장

## 3. Water Contamination

**방지시설업 등록증**

등록번호  대기  
 수질  
 소음·진동

①상 호 대산엔지니어링  
②대표자 성명 현 상 호 ③주민등록번호 570719-1691211  
④방지시설업 종류 수질 방지시설업  
⑤영업소 소재지 대구광역시 서구 경리5동 1492-34 (☎:053-562-5020)  
⑥등록조건 「환경기술개발 및 지원에 관한 법률」 제18조 제5항의 걸려 사유 발생시 등록을 취소함.

「환경기술개발 및 지원에 관한 법률」 제18조 및 동법시행규칙 제30조 제2항의 규정에 의하여 방지시설업의 등록을 하였음을 증명합니다.

2005년 9월 1일  
대구광역시장

## 5. Profession Of Construction

## 4. Factory

**공장등록증**  자가공장  
 임대공장  
제 2000 - 377 호

동 회 사 명 (주) 대산엔지니어링  
대표자성명 현 상 호 주민등록번호 170111 - 0021775  
인 대표자주소 대구광역시 달서구 월암동 910-6 (별인등록번호) 전화번호 562 - 5020  
동 공장소재지 상 동 지 목 공장용지  
공정설립승인일 사업시작일 2000. 9. 9 공업원수 15(남:10,여:5)  
내 공장지면적 (㎡) 공장건축면적(㎡) 공장건축면적(㎡)  
용 계획면적(㎡) 1654.7 750.47 601.8 148.67  
등록조건 ※ 등록조건을 이행하지 아니하는 경우에는 공장의 등록이 취소될 수 있습니다.  
등록변경·중실종기재사항변경내용 (변경일자 및 내용)  
공업내지 및 공장설립에 관한 법률 제16조(제1항·제2항·제3항)규정에 따라 위와 같이 등록하였음을 증명합니다.

2000년 12월 15일  
대구광역시산업단지관리공단이사장 (인)

## 6. Certificate Of Patent

**건설업등록증**

업종 : 건설기계사업 등록번호 : 대구 서구 06-22-1  
상호 : 대산엔지니어링 대표자 : 현상호  
영업소소재지 : 대구 서구 월암동 910-6 법인(주민등록번호) : 170111-0021775  
국적 또는 : 한국(22호) 등록일자 : 2006. 5. 29  
소속국가명 : 대한민국

건설산업기본법 제9조의 규정에 의한 건설업자임을 증명합니다.

2006년 5월 29일  
대구광역시 서구청장

변경사항  
변경년월일 변경구분 변경내용 기록년월일 기록지(인)

**특허증**  
CERTIFICATE OF PATENT

특허번호 0520052 호 출원번호 제 2000-003275 호  
(PATENT NUMBER) 등록일자 2005년 04월 30일  
발명명칭 (TITLE OF THE INVENTION) 침유가공 다량원 설비의 회계방지장치  
특허권자 (PATENTEE) 주식회사 대산엔지니어링 (170111-0\*\*\*\*)  
대구광역시 서구 경리동 1492-34  
발명자 (INVENTOR) 현상호 (570719-1\*\*\*\*)  
대구광역시수성구범동1372번지우영청야면선105-1207

위의 발명은 「특허법」에 의하여 특허등록원부에 등록되었음을 증명합니다.  
(THIS IS TO CERTIFY THAT THE PATENT IS REGISTERED ON THE REGISTER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE.)

2005년 09월 30일

특허청  
COMMISSIONER OF THE KOREAN INTELLECTUAL PROPERTY OFFICE

# 08. Photographs Of Construction

## 1-1. Overseas Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
PT. Win Textile	Indonesia	Cotton, knitted, dyed, Polyester processing	13,000 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Dissolved Air Flotation

Completion Photos



## 1-2. Overseas Construction Photographs

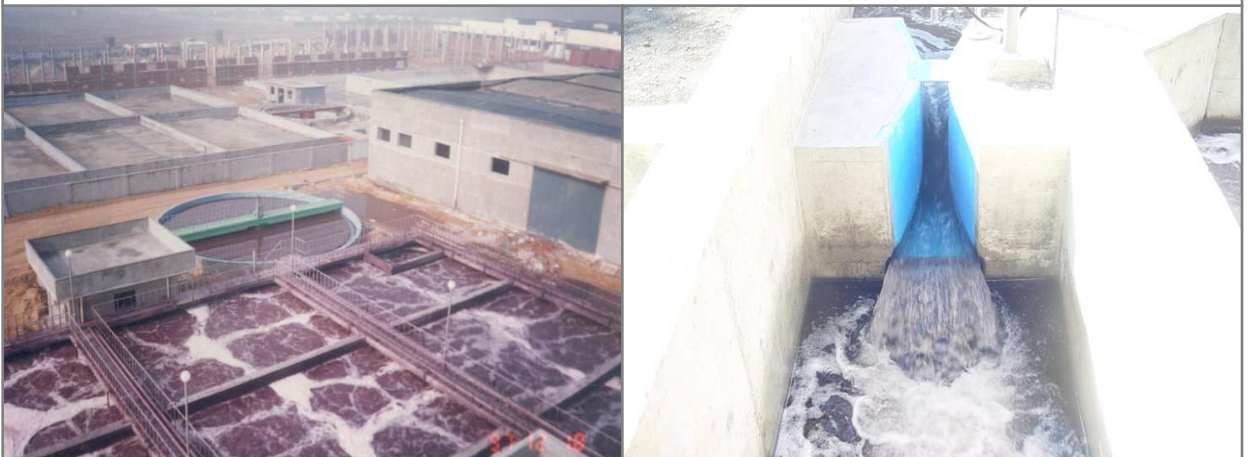
Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Shin Sung Honduras.S.A	Honduras	Cotton, knit Dyeing wastewater	5,000 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Dissolved Air Flotation

Completion Photos



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Myen Hwa Co.,Ltd	China	weight reduction, dyeing, processing wastewater	1,800 m <sup>3</sup> /day	1st Dissolved Air Flotation 2nd Biological treatment

Completion Photos



### 1-3. Overseas Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Woong Chun Honduras.S.A	Honduras	Cotton, knit, Dyeing wastewater	5,000 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Dissolved Air Flotation



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
S.Y VINA	Vietnam	Dyeing, processing wastewater	2,800 m <sup>3</sup> /day	1st Chemical treatment 2nd Biological treatment



## 2-1. Wastewater Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Woongchun textech Co., Ltd.	Paju Gyunggi -do.	Velboa, Polyester processing wastewater	4,500 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Dissolved Air Flotation



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Seong-an synthetics Co., Ltd.	Gumi-si, Gyeongsang buk-do	Yarn manufacturing, processing wastewater	1,000 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Dissolved Air Flotation



## 2-2. Wastewater Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Hanju agricultural Co., Ltd.	Yecheon-gun, Gyeongsang buk-do	Processing of agricultural product wastewater	1,000m <sup>3</sup> /day	1st DSAS(Anaerobic) 2nd Activated sludge treatment

Completion Photos



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Daewoong Co., Ltd.	Geochang-gun, Gyeongsang nam-do	Processing of agricultural product wastewater	400m <sup>3</sup> /day	1st physical & chemical treatment 2nd Biological treatment 3rd High adsorption treatment

Completion Photos



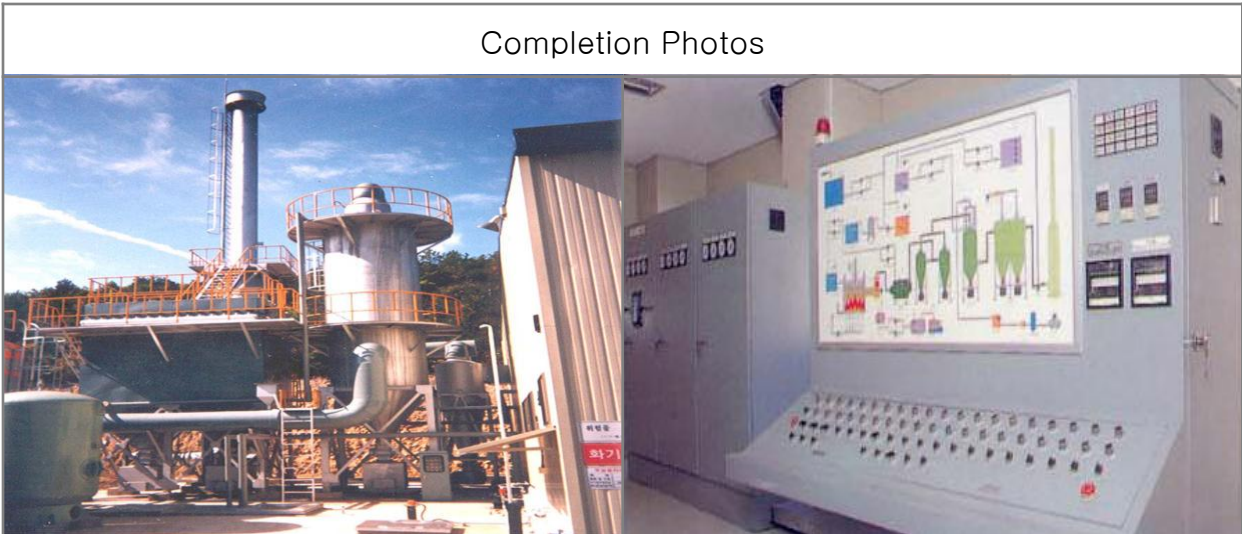


### 3-1. Air Pollution Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Kuk Dong Engineering & Construction Co., Ltd	Uiryeong-gun, Gyeongsang nam-do	Incinerator Facility 1,250Kg/hr Batch input	300m <sup>3</sup> /min	Cyclone Electric precipitator Semi Dry Scrubber



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Kuk Dong Engineering & Construction Co., Ltd	Cheongsong-gun, Gyeongsang buk-do	Incinerator Facility 650Kg/hr Batch input	200m <sup>3</sup> /min	Cyclone Bag Filter Semi Dry Scrubber



### 3-2. Air Pollution Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Woongchun textech Co., Ltd.	Paju Gyunggi-do	TENTER	260m <sup>3</sup> /min x 5Sets	Spray Scrubber

Completion Photos



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
ORIENS CO., LTD.	Gyeongju-si, Gyeongsang buk-do	Melting furnace Holding furnace	600m <sup>3</sup> /min	Cyclone Packed Tower

Completion Photos



### 4-1. Sewage Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Haeundae C.C	Gijang-gun, Busan	BOD : 5ppm SS : 5ppm	250 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Ozone + Activated carbon adsorption

Completion Photos



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Jsseaside C.C	Gyeongju-si, Gyeongsang buk-do	BOD : 5ppm SS : 5ppm	300 m <sup>3</sup> /day	1st Advanced biological treatment 2nd Ozone + Activated carbon adsorption

Completion Photos



### 4-2. Sewage Construction Photographs

Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Zenith songra C.C	Pohang-si, Gyeongsang buk-do	BOD : 5ppm SS : 5ppm	200m <sup>3</sup> /day	1st Advanced biological treatment 2nd Ozone + Activated carbon adsorption

Completion Photos



Ordering organization	Location	Wastewater characteristic	Project scale	Process design
Gasam C.C	Chilgok-gun, Gyeongsang buk-do	BOD : 10ppm SS : 10ppm	100m <sup>3</sup> /day	1st Advanced biological treatment 2nd Filtration + Activated carbon adsorption

Completion Photos



### 5-1. Stock Raising Construction Photographs

Ordering organization	Location	Effluence waterquality	Project scale	Process design
Jinan Agricultural Co., Ltd.	Jinan-gun, Jeollabuk-do	BOD : 50 TN : 250	50 m <sup>3</sup> /day	1st Physical & chemical treatment 2nd A/O advanced treatment

Completion Photos



Ordering organization	Location	Effluence waterquality	Project scale	Process design
Jirisan Hypor GP Agricultural Co., Ltd.	Sancheong-gun, Gyeongsang nam-do	BOD : 50 TN : 250	80 m <sup>3</sup> /day	1st Physical & chemical treatment 2nd A/O advanced treatment

Completion Photos



### 5-2. Stock Raising Construction Photographs

Ordering organization	Location	Effluence waterquality	Project scale	Process design
Dodram Agricultural Co., Ltd.	Jincheon-gun, Chungcheong buk-do	BOD:150 TN : 850	50m <sup>3</sup> /day	1st Physical & chemical treatment 2nd A/Oadvanced treatment

Completion Photos



### 6. Water Reusing Construction Photographs

Ordering organization	Location	Effluence waterquality	Project scale	Process design
HOTEL INTER-BURGO EXCO	Buk-gu, Daegu	BOD : 5ppm COD : 5ppm	100m <sup>3</sup> /day	1st Biological treatment 2nd Membrane process

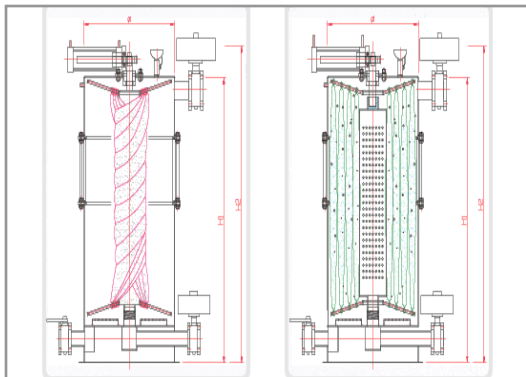
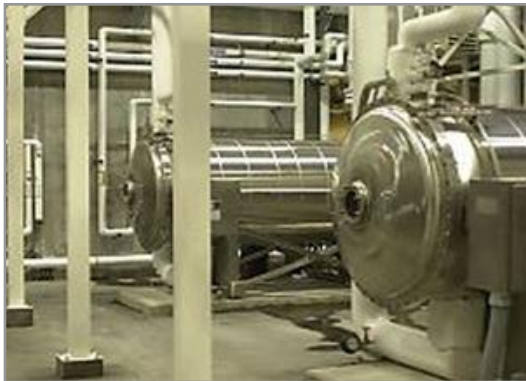
Completion Photos



# 09. Goal Of Design For Clean Water

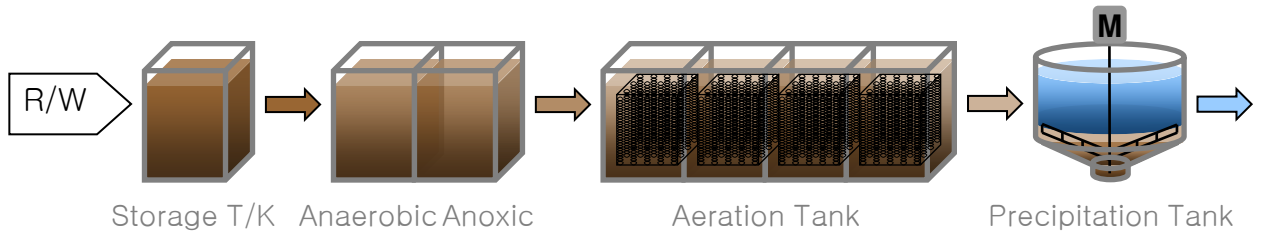
## ◆. Design of goal & focus

Design goals	Design focus
<ul style="list-style-type: none"> <li>⦿ Selection of the appropriate method on local environmental</li> <li>⦿ Reduce maintenance costs of sewage treatment facilities</li> <li>⦿ Minimization of management personnel by automating</li> <li>⦿ Selected the design, possible to operate amateur</li> </ul>	<ul style="list-style-type: none"> <li>⦿ Stabilization of water on introduction of high-tech environmental new technology</li> <li>⦿ Advanced treatment process, prepared for strengthen environmental standards</li> <li>⦿ strong process of high concentrations of organic matter and shock loads</li> <li>⦿ Applying the latest equipment and automation to Unit process</li> </ul>

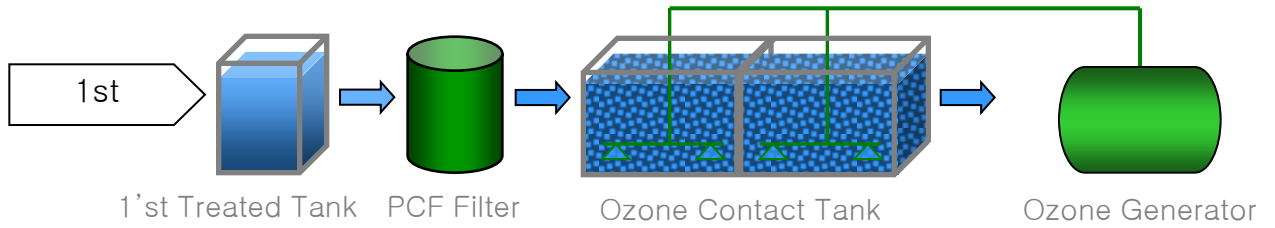


# 10. Wastewater Treatment For Reuse

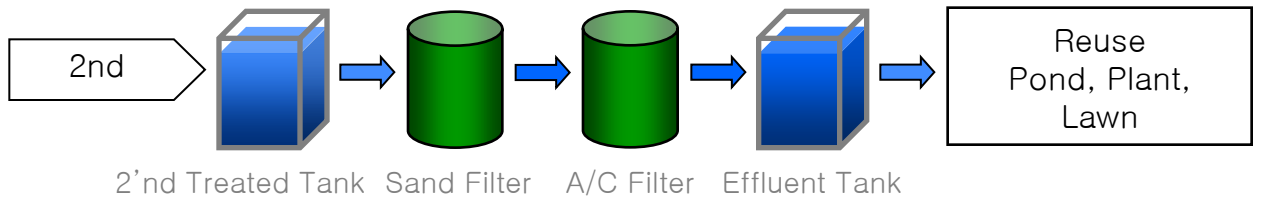
## 1. Biological treatment system (Contact oxidation method)



## 2. Ozone treatment system



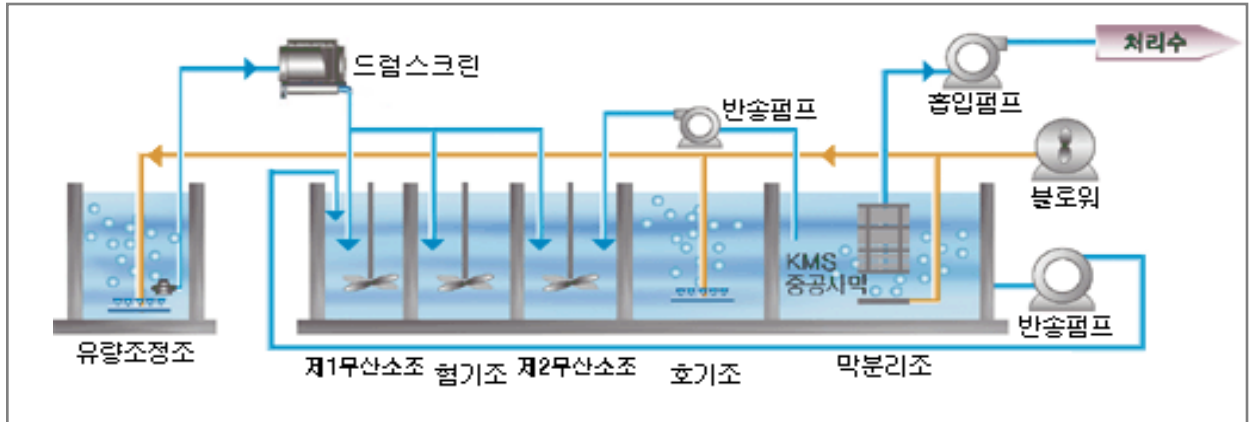
## 3. Recycling system for reuse





# 11. Membrane Separation Technology Of Wastewater

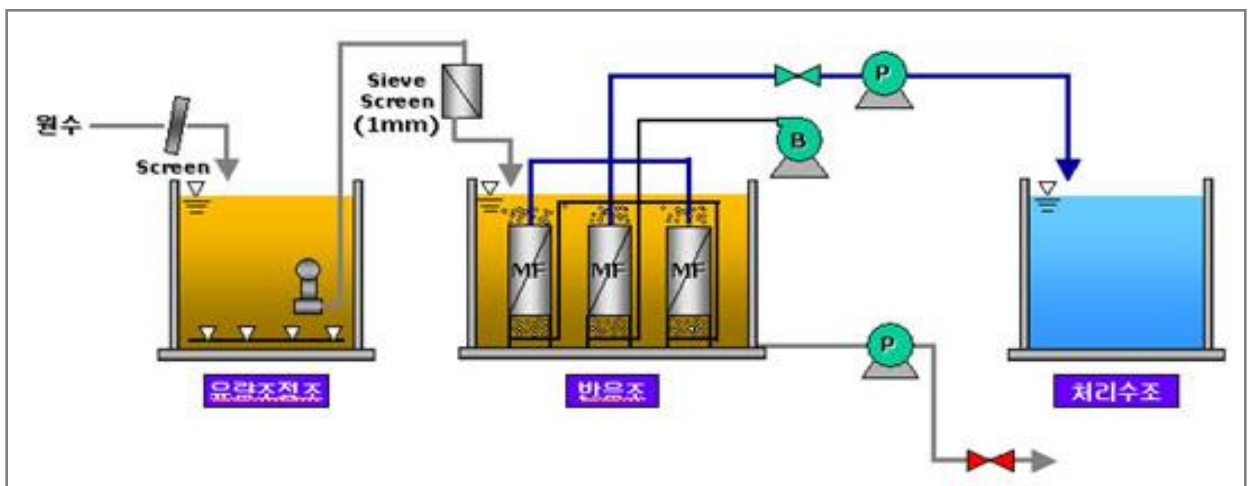
## 1. Hollow fiber membrane separation system for wastewater



## 2. Merit of hollow fiber membrane separation system

<ul style="list-style-type: none"> <li>● Stability high removal efficiency for suspended solids maintained</li> <li>● Cost cutting by waste sludge reduction of emissions</li> <li>● Easy to purchase by using domestic production membrane</li> <li>● Reclaimed water use after advanced treatment on a little wastewater</li> </ul>	<ul style="list-style-type: none"> <li>● In the High C/N ratio of nitrogen and phosphorus high removal efficiency</li> <li>● Nitrification in winter to maintain low concentrations of biomass</li> <li>● Simply facilities by unnecessary precipitation &amp; filtration process</li> <li>● Can be maintained at a stable water even in bulking</li> </ul>
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## 3. Submerged flat sheet membrane system for recycling



# 12. Merit Of High Degree Wastewater Treatment System

## 1. Merit of high degree treatment system

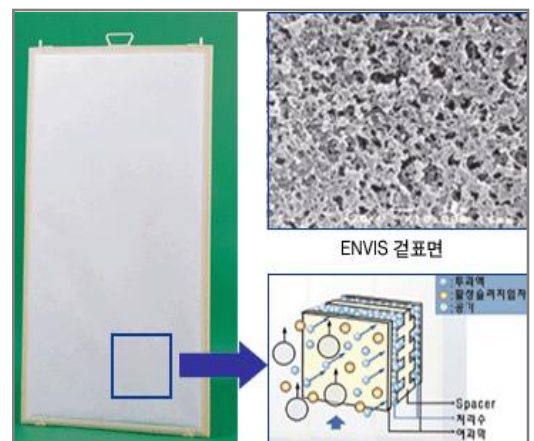
Superior to the latest method of removing Organic pollutants(BOD), T-N, T-P  
Applied to a variety of operate and proven stable method in Sewage & Wastewater Treatment

- ⊙ Maintained stable water quality under stringent water quality standards
- ⊙ Be strong on Influent load fluctuation and shock
- ⊙ Minimize maintenance costs by simplification of the system
- ⊙ Easy to manage by automated operating the facility

## 2. Membrane system

Suitable for advanced treatment method of a small sewage treatment facilities in the strict water quality standards

- ⊙ State-of-the-art method of small facilities
- ⊙ Available water management in microbial bulking
- ⊙ Automation of operation and facilities management
- ⊙ Be maintain a stable water quality in load variation



### 13. Amount Of Sewage Generated Standard

1. Golf courses wastewater generation amount by usage of the buildings take golf course characteristics into consideration basic unit is calculated on the basis of ministry of environment notice No. 2012-144

Item	Golf course	Public bath	Foodservice facility
Swage generation	30 L/m <sup>2</sup>	46 L/m <sup>2</sup>	30 L/person
BOD	100 mg/L	100 mg/L	330 mg/L

2. Design inflow concentration is by use buildings Sewage inflow concentration of average with consideration for percentage of allowance. process method select with consideration for the water quality standard

Item	Unit	In Let	Out Let #1	Out Let #2	Removal Rate (%)
BOD	mg/L	200	10	5	95 ~ 98
SS	mg/L	200	10	5	95 ~ 98

3. Construction results for advanced sewage treatment facility of golf course Appropriate to Stringent water quality standards and the latest technology has been applied advanced sewage treatment facilities of performance and Design Process

Item	HAEUNDAE Country Club	HAEUNDAE Tea House	J'S SEASIDE Country Club
Capacity	250 m <sup>3</sup> /day	10 m <sup>3</sup> /day x 3	300 m <sup>3</sup> /day
Hole	27	-	18
In Let (BOD)	200 mg/L	200 mg/L	200 mg/L
Out Let (BOD)	5 mg/L	5 mg/L	5 mg/L
Actual Effluent	1 ~ 3	1 ~ 3	1 ~ 3
Removal Rate (%)	98.5 ~ 99.5	98.5 ~ 99.5	98.5 ~ 99.5

# 14. Clean Water Management Of Resort & Spa

## 1. Clean water management



## 2. Life sewage basic unit

Design criteria is calculated on the basis of the MoE notice No. 2012-144

Item	Unit	BOD	Estimate
Gymnasium	10 L/m <sup>2</sup>	260 mg/L	N=0.050A
Apartment	200 L/person	200 mg/L	N=2.7+(R-2)x0.5
Villa, General House	200 L/person	200 mg/L	N=2.7+(R-2)x0.5
Hotel, Motel	20 L/m <sup>2</sup>	70 mg/L	N=0.080A
Youth Hostel	35 L/m <sup>2</sup>	140 mg/L	N=0.140A
Condominium	20 L/m <sup>2</sup>	140 mg/L	N=P
N : Number(person)    R : Room Number    A : Area(m <sup>2</sup> )    P : Quota(person)			

# 15. Stock Raising Of Design For Sewage Disposal & Resourcesize

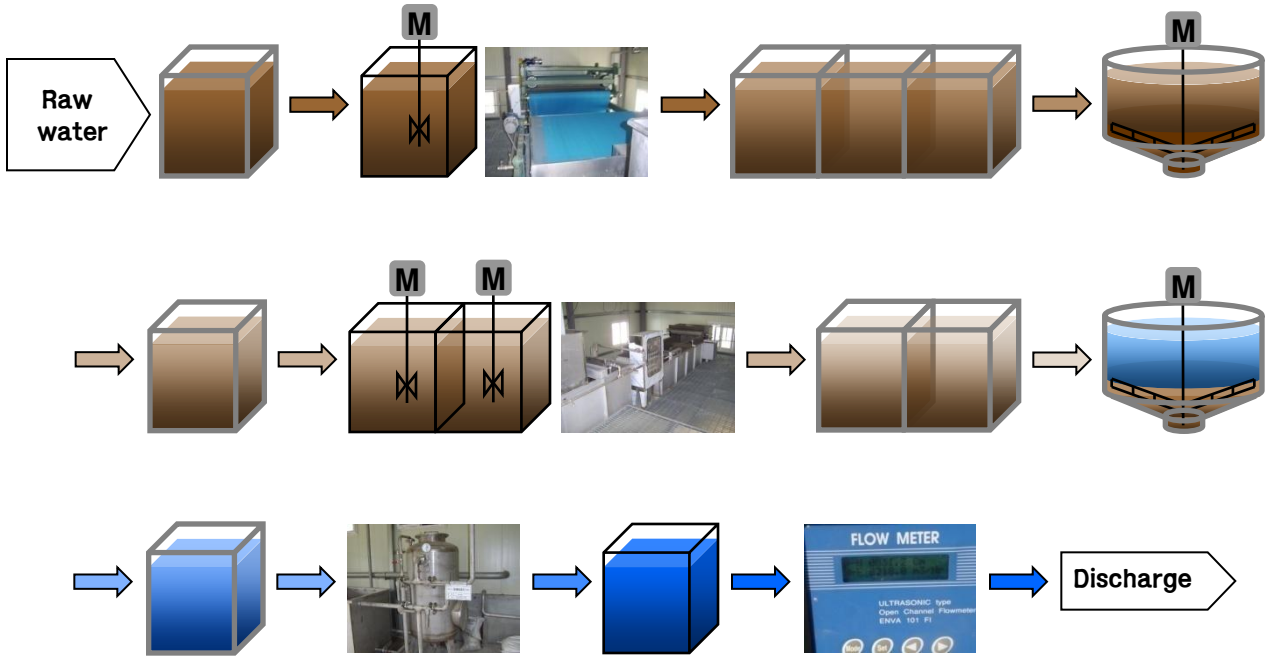
## 1. Livestock excretions of recycling technology

reality that are needed to Livestock excretions treatment facilities and recycling technologies Applying in accordance with Livestock excretions treatment method that has been used as a marine emissions the limited

- Containing various trace element large amounts that required for the agricultural production
- Circulating of living resources inhibits destruction action of the ecosystem
- Contribute to the revitalization and stabilization of soil ecosystem
- The solid is produced manure through composting process
- Liquid used as liquid fertilizer consider the regional and seasonal
- Off-season purified meet the effluent standards



## 2. Stock raising of sewage disposal system



## 16. Results Of Construction

### 1. Overseas construction part

CILIENT	NATIONAL	DESCRIPTION	TREATMENT PROCESS
Myen Hwa Co., Ltd	China	Wastewater treatment (new) 1,800 m <sup>3</sup> /day	1st Floatation 2nd Biological
Ko Hap Textile	Mexico	Wastewater treatment (new) 2,600 m <sup>3</sup> /day	1st Physical–Chemical 2nd Biological
Gangnam fiber	Vietnam	Wastewater treatment (new) 1,000 m <sup>3</sup> /day	Water softening apparatus
Woong Chun Honduras. SA.	Honduras	Wastewater treatment (new) 5,000 m <sup>3</sup> /day	1st Biological 2nd Physical–Chemical
D.Y.C (M) Sdn. Bhd	Malaysia	Wastewater treatment (new) 6,000 m <sup>3</sup> /day	1st Biological 2nd Physical–Chemical 3rd Advanced treatment
S.Y Vina Co., Ltd	Vietnam	Wastewater treatment (new) 2,800 m <sup>3</sup> /day	1st Physical–Chemical 2nd Biological
Sam Woo Vina Co., Ltd	Vietnam	Wastewater treatment (new) 700 m <sup>3</sup> /day	1st Physical–Chemical 2nd Biological
Beijing Hwa Shin Automobile Parts Co., Ltd	China	Wastewater treatment (new) 80 m <sup>3</sup> /day	1st Biological 2nd Physical–Chemical 3rd Advanced treatment
Shin Sung Honduras. SA.	Honduras	Wastewater treatment (new) 5,000 m <sup>3</sup> /day	1st Advanced Biological 2nd Pressure flotation
Zona France Grupo Popular	Nicaragua	Wastewater treatment (new) 4,000 m <sup>3</sup> /day	1st Advanced Biological 2nd Pressure flotation
PT. Win Textile	Indonesia	Wastewater treatment (new) 13,000 m <sup>3</sup> /day	1st Advanced Biological 2nd Pressure flotation

## 2-1. Air pollution construction part

NO	PROJECT	DESCRIPTION	TREATMENT PROCESS	CAPACITY
1	Hanbo Synthetic Corporation	Annealing furnace	Desulfurization & Wet Scrubber(S/T)	580m <sup>3</sup> /min
2	Gyoungju-beobju Co., Ltd.	Corn grinding facility	Bag House	150m <sup>3</sup> /min
3	Dae-hyun metal	Heat treating furnace CN Gas	Wet Scrubber	180m <sup>3</sup> /min
4	Jo-il Industry	Cement Mixer	Bag Filter	150m <sup>3</sup> /min
5	Sehan Industry	Organic solvent & Acryl	Packed Tower	500m <sup>3</sup> /min
6	Samsung Industry	Plating, Acid Treatment facility	Venturi Scrubber	230m <sup>3</sup> /min
7	Pyeong Hwa Automotive Co., Ltd.	Facing process line	Single Cyclone	200m <sup>3</sup> /min
8	Daewoo Motor Company	Pickling & film treating	Spray Scrubber	300m <sup>3</sup> /min
9	Dong-yang Electric Glass Co., Ltd.	Glass smelting furnace dust collection	Multi Cyclone	430m <sup>3</sup> /min
10	Korea Minting & Security Printing Corporation	Plating facility	Wet Scrubber	100m <sup>3</sup> /min
		Electrotyping room waste gas	Wet Scrubber	161m <sup>3</sup> /min
11	Dong-bu Remicon	Batcher Plant	Bag House	180m <sup>3</sup> /min
12	Gyung-Hee steel	Static electro plating painting	Bag House	150m <sup>3</sup> /min
13	Young-shin Co., Ltd.	PVC manufacturing gas	Packed Tower	350m <sup>3</sup> /min
		PVC Dust	Bag House	90m <sup>3</sup> /min
14	LG Information & Communications Co., Ltd.	Semiconductor Manufacturing	Carbon Filter	280m <sup>3</sup> /min
15	Haegang metal	Electric induction furnace	Bag Filter	130m <sup>3</sup> /min
16	Hwashin Co.,Ltd.	Electroplating, film Line	Packed Tower	500m <sup>3</sup> /min
		Electroplating, film Line	Carbon Tower	270m <sup>3</sup> /min
17	Taihan textile Co.,Ltd.	Fluid boiler	Packed Tower	210m <sup>3</sup> /min
18	Gum-gu Industry	Electroplating painting Line	Carbon Tower	660m <sup>3</sup> /min x 2
		Paint Booth	Carbon Tower	320m <sup>3</sup> /min
19	KTG Co.,Ltd.	LED Glass washing	Scrubber	130m <sup>3</sup> /min
20	Taihan textile Co.,Ltd.	Tenter	Scrubber	520m <sup>3</sup> /min
21	Gasan Country Club	Swage facility Odor	Scrubber	60m <sup>3</sup> /min
22	Orienc Co.,Ltd.	Printing	Carbon Tower	100m <sup>3</sup> /min
		Smelting furnace, Lagging furnace	Packed Tower	600m <sup>3</sup> /min
23	Il-heung EMT Co.,Ltd.	Fiber plating facility	Spary Tower	250m <sup>3</sup> /min x 2
24	Shinsungsa	Plating facility	Spary Tower	310m <sup>3</sup> /min
25	Shinhan Precision Co.,Ltd.	Grinding facility	Cartridge bag filter	180m <sup>3</sup> /min
26	Taekwang Co.,Ltd.	Tenter	Packed Tower	250m <sup>3</sup> /min x 3
27	The above companies and the other 200 companies			



### 3-1. Wastewater construction part

NO	PROJECT	DESCRIPTION	TREATMENT PROCESS	CAPACITY
1	Jeil remicon Co.,Ltd.	Ready-mixed concrete	Chemical coagulation and Settlement process	100 m <sup>3</sup> /day
2	Hansung Briquet Co.,Ltd.	Briquet Manufacturing	Sprinkling & tire wash facility	360 m <sup>3</sup> /day
3	Hyundai color photo lab	Photographic developers	Water softening apparatus	50 m <sup>3</sup> /day
4	Korean Tobacco Company Kimcheon	Tobacco Manufacturing	Standard activated sludge process	50 m <sup>3</sup> /day
5	Daegu Takju	Raw rice wine manufacturing	Step Aeration	200 m <sup>3</sup> /day
6	Daesin alloy	Sn,Cu,Pb alloy	1,2nd absorption process	50 m <sup>3</sup> /day
7	Daehan paper Co.,Ltd.	Paper manufacture	1,2nd Step Aeration	1,200 m <sup>3</sup> /day
8	Jinro comprehensive food Co.,Ltd.	Articles of food process	1,2nd activated sludge process	480 m <sup>3</sup> /day
9	Kyungpook National University Hospital	Hospital wastewater	A/C & Sand Filter	1,200 m <sup>3</sup> /day
10	hyosung daegu Co.,Ltd.	Weight reduction, Dyeing	1,2nd activated sludge process	2,000 m <sup>3</sup> /day
11	Ungcheon fiber Co.,Ltd.	Dyeing, Poly	1st Biological & 2nd Flotation	4,500 m <sup>3</sup> /day
12	Gunwi agricultural industrial complex	Terminal disposal plant	1st Biological & 2nd Flotation	1,000 m <sup>3</sup> /day
13	Kumbokju Co.,Ltd.	Washing bottles	Biological process	1,000 m <sup>3</sup> /day
14	Il-heung EMT Co.,Ltd.	Fiber Plating	1st Chemical , A/C absorption	50 m <sup>3</sup> /day
15	Changwon Specialty Steel Co.,Ltd.	Wire process	Physical & chemical process	216 m <sup>3</sup> /day
16	Haeundae Country Club	Sewage treatment Design & construction	1,2,3rd Biological, Advanced ozone	250 m <sup>3</sup> /day
			Submerged membrane separation	10 m <sup>3</sup> /dayx3
17	Cheonbuk Industrial Complex	Terminal disposal plant design	Chemical, Biological, Advanced treatment	2,000 m <sup>3</sup> /day
18	Purmil Co.,Ltd.	Milk process	Biological process	400 m <sup>3</sup> /day
19	KTG Co.,Ltd.	Glass Grinding	Physical chemical process	650 m <sup>3</sup> /day
20	Dalseong 2nd industrial complex	Terminal disposal plant	Biological, chemical, Advanced treatment	4,500 m <sup>3</sup> /day
21	HOTEL INTER-BURGO EXCO	Treated water supply	Biological, M.B.R	100 m <sup>3</sup> /day
22	Ace digitech Co.,Ltd. ENTECH E&C	Semiconductor process	Chemical , Biological, Advanced treatment Carrier screen	1,000 m <sup>3</sup> /day
23	Wooil beverage Co.,Ltd.	Beverage Manufacturing process	1st Chemical + Biological 2nd D.A.F	350 m <sup>3</sup> /day
24	NT Solar Glass Co.,Ltd.	Glass & Metal coating	M.M.F + R.O treatment	200 m <sup>3</sup> /day
			Physical-Chemical treatment	190 m <sup>3</sup> /day
25	Star Chemicals Co.,Ltd.	Polyester yarn Manufacturing	1st Chemical, 2nd Biological	500 m <sup>3</sup> /day
26	Jirisan Hypor GP	piggery wastewater	Physical-Chemical, A/O Advanced treatment, Fenton Oxidation	80 m <sup>3</sup> /day
27	The above companies and the other 150 companies			