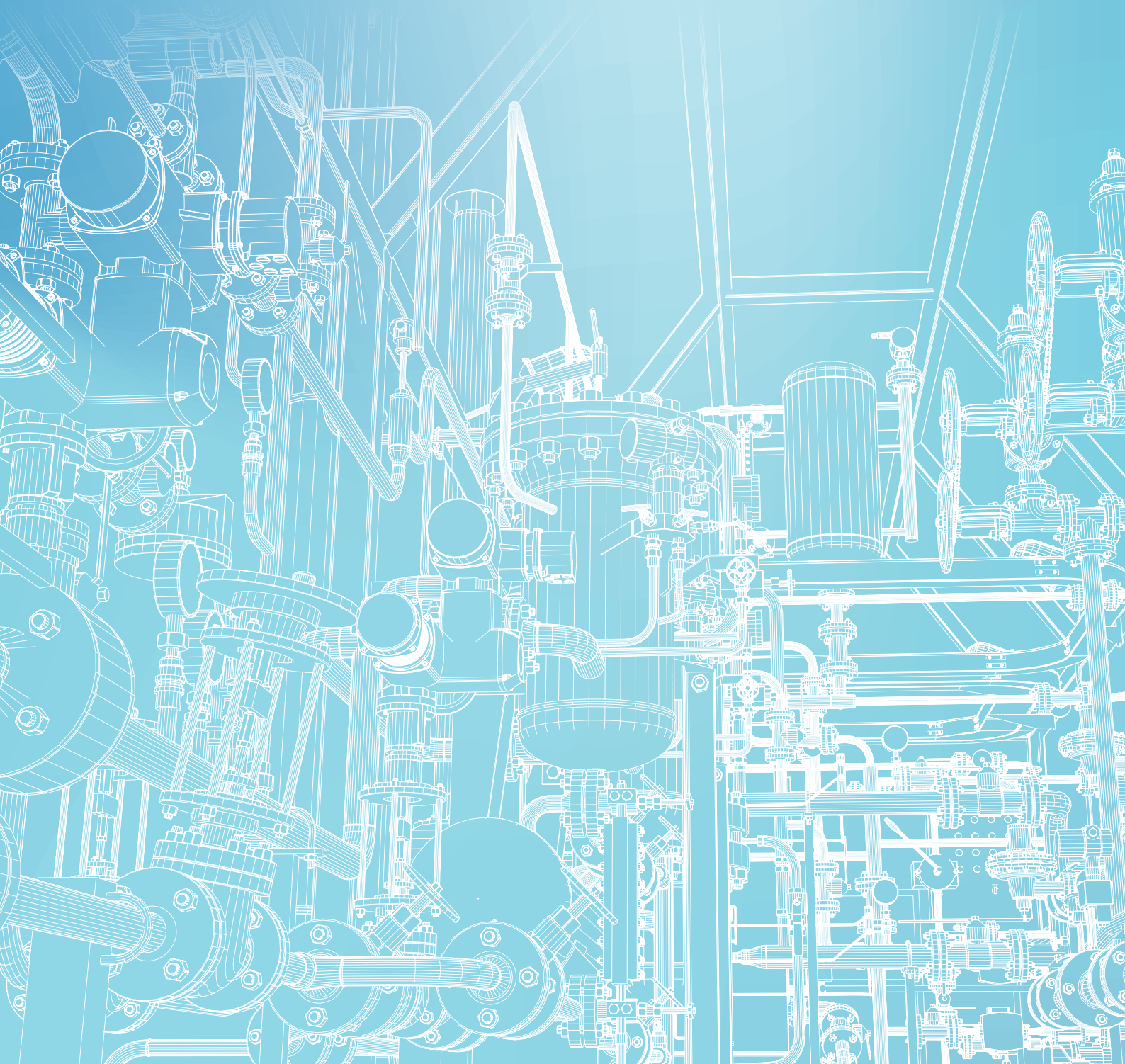


LIVE GREEN
LOVE GREEN
THINK GREEN

ENVIRONMENTAL PROTECTION OF
THE PRESENT IS THE HOPE OF THE FUTURE.



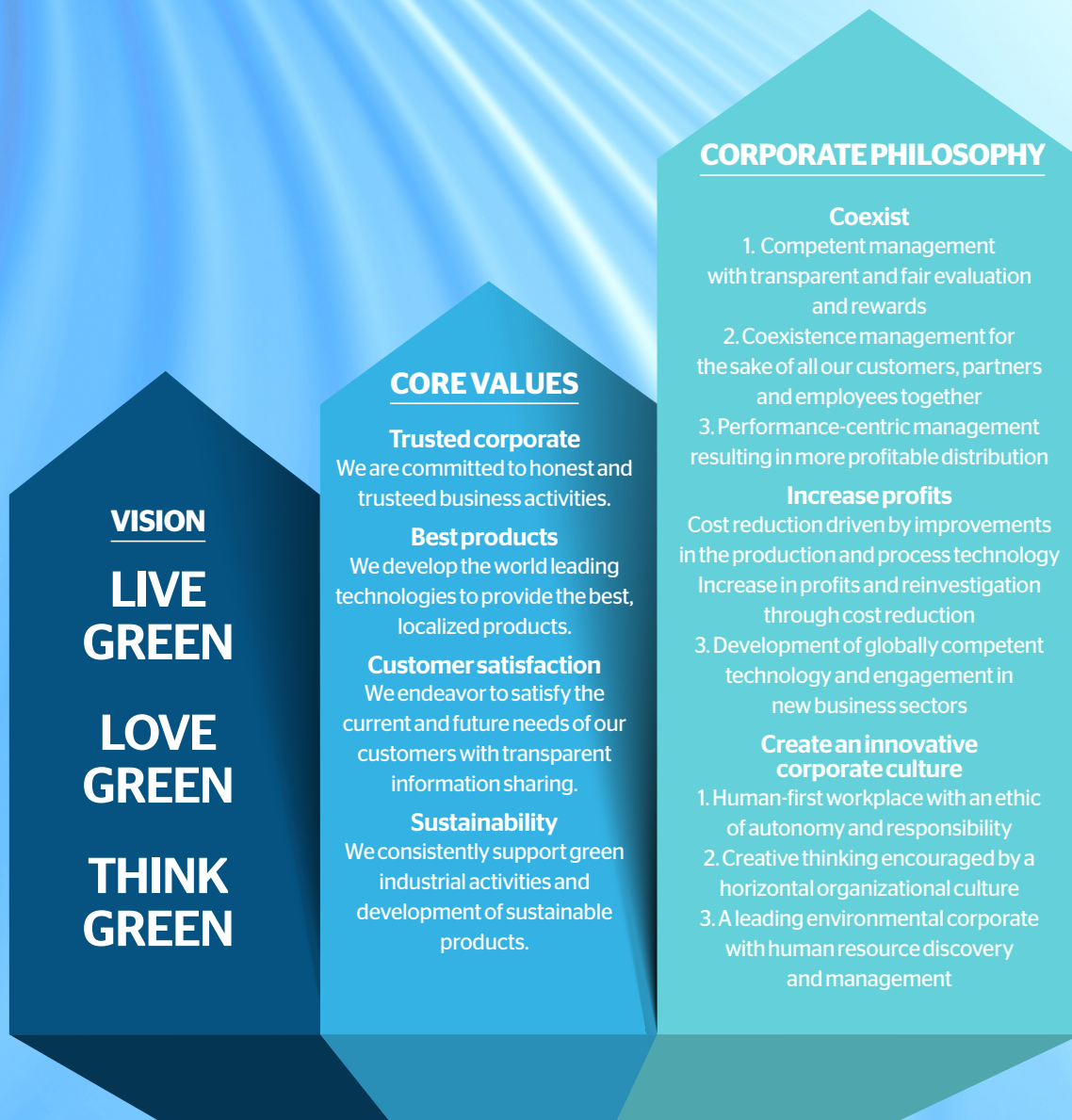
uniens co., LTD.



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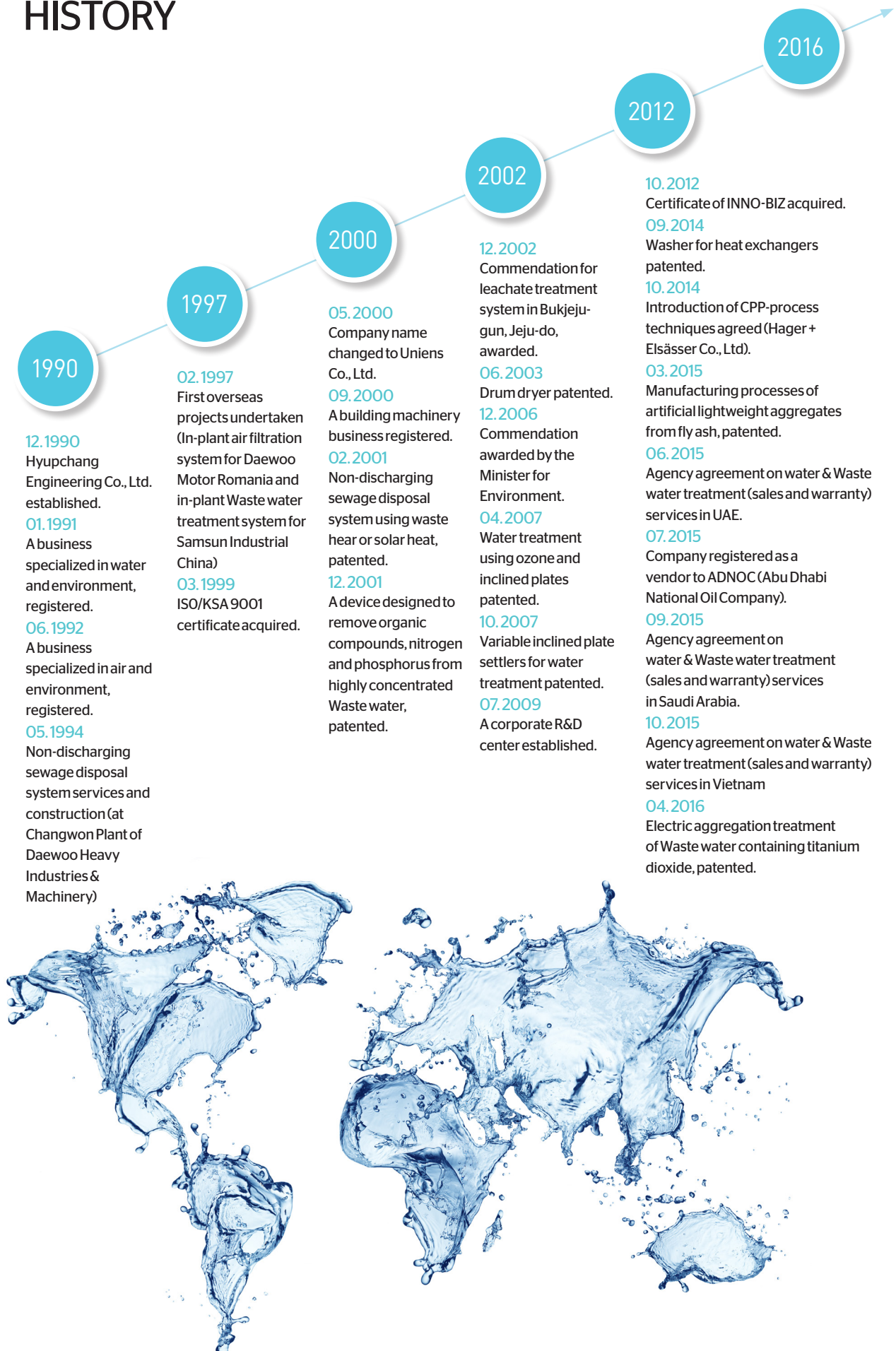




Since 1990 when the environmental industry started to leap in Korea, we, Uniens Co., Ltd., have contributed to the development in the domestic environmental sectors with our growth engines, advanced technology and experience from the continued development of technology and trust of our customers. Our commitment to provide a customer with a quality, economical, efficient system and support is not limited to the environmental sectors only, but our services include total solutions to the design, construction, commissioning, training and maintenance of the industrial plant areas. Furthermore, regards the future growth areas we are expanding our business to the new energy industries, such as carbon capture & storage and development of fuel cell power generation, with wise investment and R&D activities.

We value the great interest, support and opinions of our customers and promise to do our best to become a company that grows together.

HISTORY



BUSINESS AREAS

Water treatment system	Pretreatment
	Demineralization · Ultra-pure water treatment
	Potable water · Seawater electro-hypochlorite · Seawater desalination · Cooling tower
	blow-down reuse · Desalination · Chemical dosing system
Waste Water treatment system	Physical · Chemical treatment
	Biological treatment
	Advanced treatment
	Reuse treatment system
	Evaporative concentration treatment system
	Sewage system using vacuum
Air treatment system	Wet scrubber
	Bag filter
	Flue gas desulfurization
	Flue gas denitrification
Industrial plant facility	Industrial facilities
	Bulk material handling system
Energy	Carbon capture & storage
	Fuel cell power generation

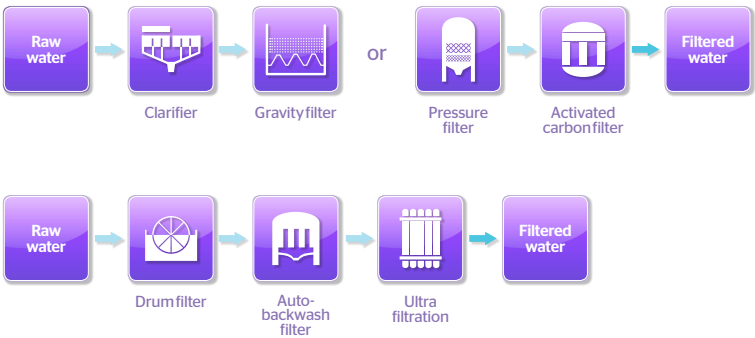


We provide water services in the semiconductor · LCD electronic industries, power plants, petroleum · chemical · pharmaceutical plants and food factories as well as turnkey project services from package product manufacturing and design to building and commissioning.

Pretreatment

As demand for water increases in the industrial sector, we provide stabilized water for industrial uses or demineralized water in all regions.

- Clarifier
- Gravity filter
- Pressure filter
- Microfiltration
- Ultra filtration



Hyundai Oilbank
Clarifier
(43,000m³/day)



Kumho Petrochemical
Gravity filter
(16,800m³/day)



Hyundai Steel
Pressure filter
(6,800m³/day)



Shinboryeong combined cycle
thermal power plant
Ultra filtration
(3,300m³/day)

Water treatment system

Demineralization · Ultra-pure water treatment

We supply demineralized water for industrial uses by filtering pretreated water in the reverse osmosis, ion exchange and electro-deionization processes.

Reverse Osmosis
Electro-deionizer
Ion-exchanger
Degasifier
Membrane deaerator
Condensate polisher



▲
Jubail Export Refinery in
Saudi Arabia
Condensate polisher
(28,400m³/day)



▲
Hyundai
Oilbank
Reverse osmosis system
(42,000m³/day)



▲
Shinboryeong combined cycle
thermal power Plant
Electro-deionization
(1,680m³/day)

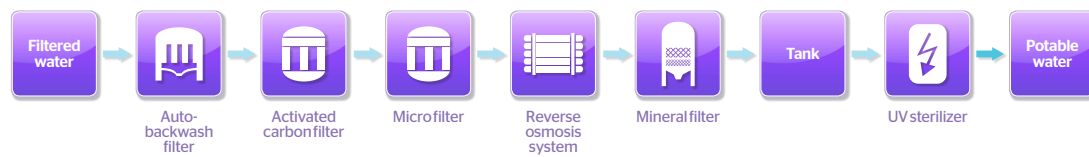


▲
Chuncheon combined cycle
thermal power Plant
Membrane deaerator
(720m³/day)



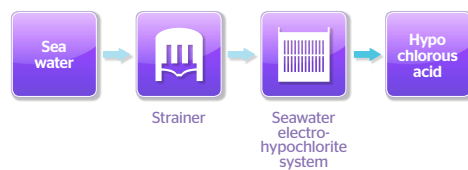
Potable water system

The potable water treatment system is to obtain a portable water.



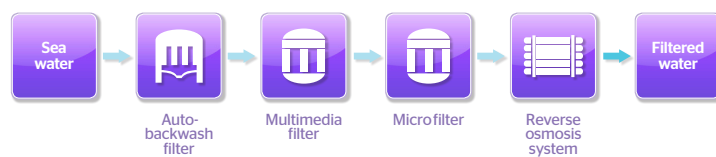
Seawater electro-hypochlorite system

The seawater electro-hypochlorite system is to prevent an adhesion and growth of shellfish and marine plants inside Seawater pipe lines and tubes.



Seawater desalination system

It is a seawater desalination plant for the use of seawater as Industrial water and potable water.



Shinboryeong combined cycle thermal power plant
Seawater electro-hypochlorite system
(1,200kg · Cl₂/day)



Dongwha Pharmaceutical
Reverse osmosis & electro-deionization system
(1,000m³/day)



Yulchon Water Purification Plant
Service water treatment system
(42,000m³/day)

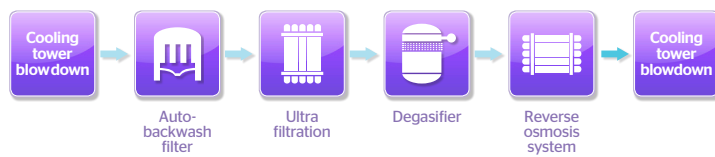


Jangmoon Natural Gas Power Plant
Cooling water treatment system
(5,900m³/day)

Water treatment system

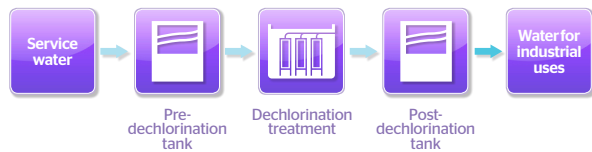
Cooling tower blowdown reuse system

This is a water treatment system for effective reuse of cooling tower make-up water.



Dechlorination system

It is a facility to remove resided chlorine from water for industrial use.



Chemical dosing system

It is a facility to inject chemical into boiler feed water make-up system, potable water treatment system and cooling water cycling system.



▲
Jangmoon Natural Gas Power Plant
Cooling water treatment system
(5,900m³/day)



▲
SK Hynix
Dechlorination system
(20,000m³/day)



▲
SK Hynix
Dechlorination system
(20,000m³/day)

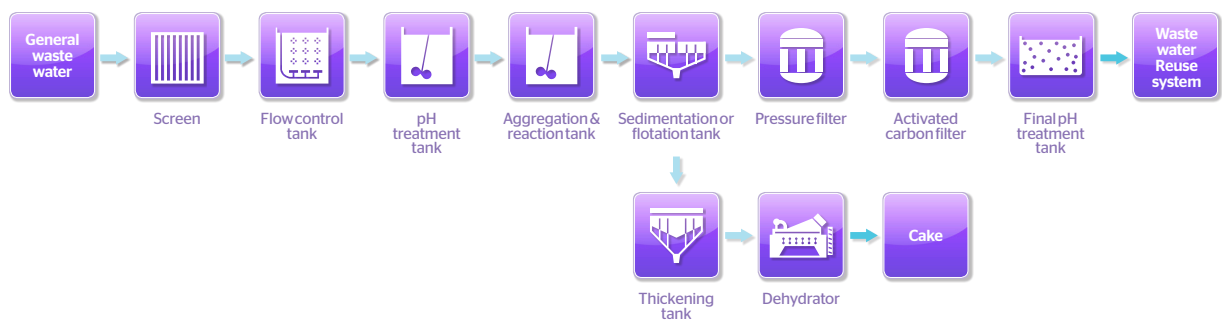


▲
UAE Oil Refinery Plant
Chemical dosing system
(120mL/day)



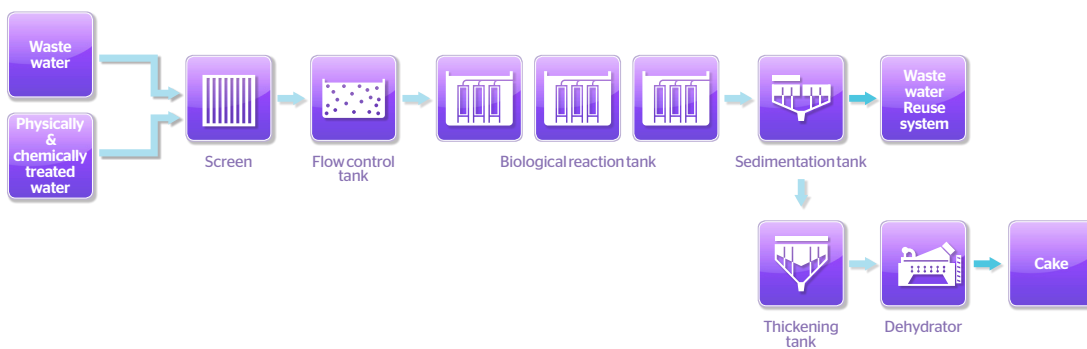
Physical · Chemical treatment

In the physical and chemical treatment, suspended and dissolved organic compounds are removed from the Waste water through physical reactions (screening, precipitation and filtration) and chemical reactions (aggregation, oxidation, reduction and adsorption)



Biological treatment

In the biological treatment, organic compounds in the Waste water are decomposed by microorganisms such as bacteria, protozoa, marine plants, etc.



SK Materials
Waste water treatment system
(1,250m³/day)



Saehan
Waste water treatment system
(7,200m³/day)

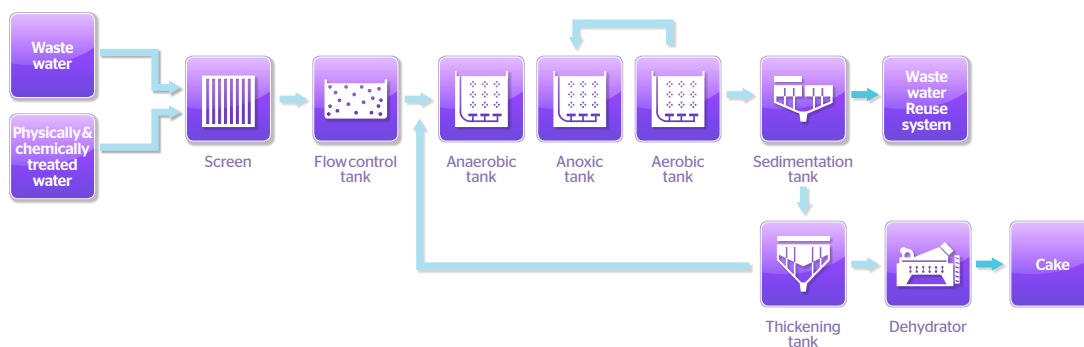


Songtan Industrial Complex
Sewage treatment system
(8,600m³/day)

Waste water treatment system

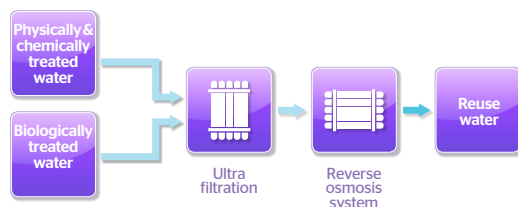
Advanced treatment

In the advanced treatment, traces of organic compounds, inorganic ions and eutrophication-inducing substances such as Nitrogen (N) and Phosphorus (P), which can not be completely removed by the physical, chemical and biological treatment, are filtered so that more purified, treated water can be obtained.



Reuse treatment system

The final Waste water can be reused after various post-treatment processes depending on the intended use. Micro-organic and inorganic compounds, floating matters and nutrient salts contained in the treated water can be reused for various industrial uses after ultra filtration and reverse osmosis.



Yuhan Corporation
Waste water treatment system at
pharmaceutical plant
(1,500m³/day)



Ruwais Oil Refinery Plant in UAE
Waste water treatment system at
oil refinery plant
(1,500m³/day)

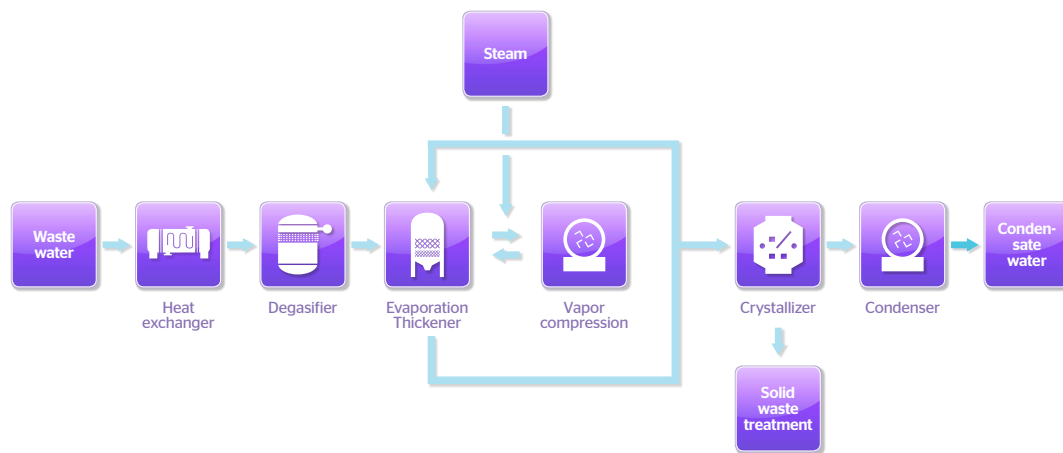


SK Innovation
Petrochemical Reuse treatment system at
petrochemical waste water
(1,000m³/day)



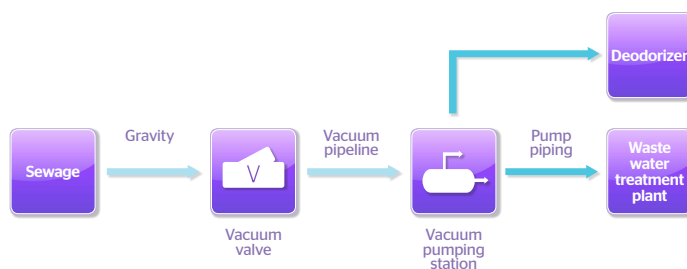
Evaporative concentration treatment system

A system designed to heat up the evaporative concentrator to evaporate and condense pure water from the highly concentrated Waste water and to treat the thickened fouling. This mechanism is applied to highly concentrated Waste water and reverse osmosis water including waste-leachate mixture and desulfurization Waste water.

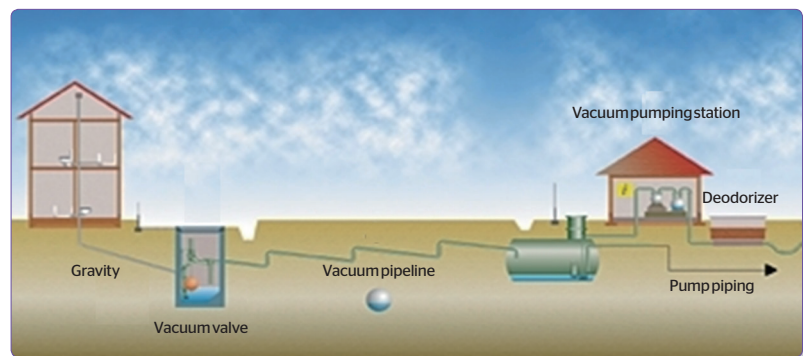


Sewage system using vacuum

A system designed to collect the sewage from different sewage sources to the vacuum pump station and to the final discharge outlet, using the air flow in the closed vacuum pipeline.



Hyundai Elevator
Evaporative condensation treatment
(100m³/day)



Sewage system using vacuum

Air treatment system



Wet scrubber

Wet scrubbing techniques are designed to collect dust particles by imposing forces onto the water droplets which then collide with or come to contact with the dust or polluted gas. This is a device handling harmful gas and dust at the same time.

Bag filter

A device designed to filter out dust particles from the exhaust gas and cleaning out the collected dust.

Flue gas desulfurization

As techniques to remove sulfur oxides (SO_x) from the exhaust gas, there are wet, dry and semi-dry desulfurization processes. In the wet desulfurization, lime and limestone slurries are injected into a reaction tower for sulfur oxides collection, and the lime sludge produced in the course of this process is collected as a form of plaster (CaSO₄). In the semi-dry desulfurization, the limestone slurries are sprayed into the reaction tower from the top. In this process, sulfur oxides are absorbed and dried; then they are removed via the bag filter placed at the back.

Flue gas denitrification

As techniques to remove nitrogenous compounds (NO_x) from the exhaust gas, there are selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR). In SCR, a reducing agent (NH₃) is injected with various catalysts (V₂O₅, TiO₂, etc.) to turn nitrogenous compounds into harmless nitrogen and water. In SNCR, a reducing agent is injected directly into the exhaust gas at high temperature to reduce the concentration of the nitrogenous compounds.



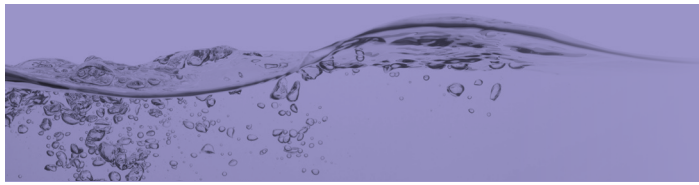
▲
Daewoo Motor
Bag filter
(2,000CMM)



▲
Waste water treatment plant in
HoChiMinh, Vietnam
3-stage liquid deodorizer tower
(3,000CMM)



▲
Dangjin Thermal Power Plant
Desulfurization system
(500MW x 27)



Industrial plant facility

Industrial facilities

We provide support through manufacturing, installing and operating industrial facilities including air conditioning, piping, organic solvent recovery facility and reaction tower which are required in the chemical, oil refining, Iron manufacture, electricity generation, pharmaceutical, food, electronic and many other industries.

Heavy loads installation
Machine installation
Steel frame
Steelworks manufacturing & installation
Pressure vessel, reaction tower and storage manufacturing & installation
Steel & industrial facility installation
Pipe manufacturing & installation
Other pipeline construction



Concrete docks at Pyeongtaek Port
Storage facility



SK Materials
Organic solvent recovery facility



LG LCD
Piping

Bulk material handling system

We manufacture various raw materials for the cement, Iron manufacture, electricity station, chemical, incineration and many other plants and provide services for the transport and storage of them in the eco-friendly and economical conditions.

Mechanical handling system
Pneumatic handling system



Yeongheung Thermal Power Plant
Belt & pipe conveyor



Yeongjin Global
Air levitation conveyor & bucket elevator



Gunjang Energy
Limestone storage & pneumatic handling system

Energy

Carbon capture & storage

A technology to collect, compress and store liquid carbon dioxide, generated from most industrial processes of the electricity, petrochemical and steel making plants, before emitting into the air.

Wet capture techniques The wet capture process is to collect carbon dioxide from the general exhaust gas by absorbing it with wet-type absorbents.

Dry capture techniques The dry capture process is to collect carbon dioxide by absorbing it with dry-type absorbents instead of wet-type ones.

Fuel cell power generation

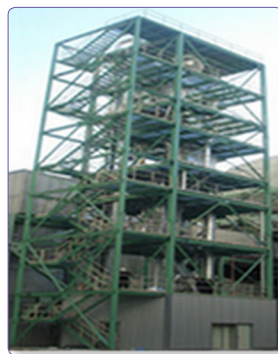
A fuel cell is used to convert the chemical energy, generated by chemical reactions of hydrogen and oxygen, into electricity.

A Phosphoric Acid Fuel Cell (PAFC) uses phosphoric acid (H_3PO_4) as electrolytes and is operated at a low temperature of about 150-200°C. It enables water cooling and can be manufactured to be compact in size. And, it uses distributed power sources from hospitals, hotels and buildings.

A Molten Carbonate Fuel Cell (MCFC) uses molten carbonate ($\text{Li}_2\text{CO}_3, \text{K}_2\text{CO}_3$) as electrolytes and is operated at a high temperature of about 600-700°C. No electro catalyst is required, and it is high in power generation efficiency. And, it uses distributed power sources from apartments and large buildings.



▲
Thermal plant
Wet capture



▲
Thermal plant
Dry capture



▲
Fuel cell plant
Phosphoric Acid Fuel Cell



▲
Fuel cell plant
Molten Carbonate Fuel Cell

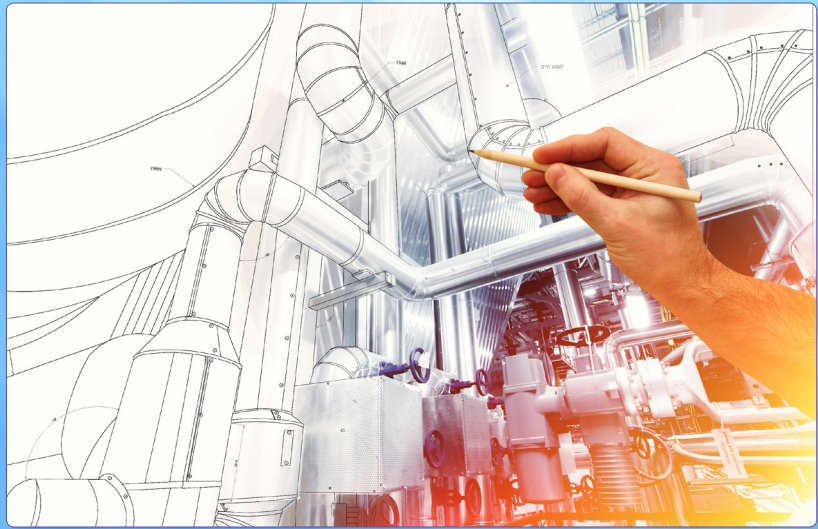
R&D

In 2009, the Uniens Research and Development Center was approved as a corporate research institution by the Korea Industrial Technology Promotion Association.

With its aim for sustainable products and customer satisfaction, it is committed to the development of economical and cutting-edge technologies in the seawater desalination and high-temperature dust collection system for highly condensed exhaust gas treatment.

Tasks

- Development of seawater desalination system: Development of a desalination system using the reverse osmosis membrane and development of an optimum system to improve the recovery rate
- Development of organic waste energy: Development of an anaerobic energy generation system using the livestock excreta and food waste
- Development of dust collection system for condensed exhaust gas
- Development of techniques recycling waste plastic as a clean fuel source
- Development of high-temperature dust collection system for highly condensed exhaust gas
- Development of water-based nanomaterials (TiO_2 , ZnO) risk assessment and reduction techniques
- Development of optimum carbon dioxide (CO_2) capture technology.



PROJECT EXPERIENCES

Water & Waste water treatment system(in Korea)

YEAR	CUSTOMER	PROJECT	REGION
2015	Chuncheon Group Energy	Water & Waste water treatment at Combined cycle thermal Power Plant	Chuncheon
	SK E&S	Water & Waste water treatment at Jang moon Natural Gas Plant	Paju
	SK Materials	NF ₃ Waste water treatment at Yeongju Plant	Yeongju
	SK Innovation	Waste water treatment at Seosan Plant	Seosan
	Hyundai Steel	Water treatment at Cold Rolling Mill No. 2	Dangjin
2014	Korea Midland Power	Water & Waste water treatment at Sinboryeong Thermal Power Plant and Wonju RDF Power Plant	Boryeong & Wonju
	SK Innovation	Waste water reuse treatment at Incheon Petrochem	Incheon
	Gunjang Energy	Water & Waste water treatment at Coal-fired Thermal Power Plant (No. 4)	Gunsan
	Asia Cement	Water & Waste water treatment at Waste Heat Recovery Plant	Jecheon
	Hankuk University of Foreign Studies	Waste water treatment system at the Global Campus	Yongin
2013	POSCO	Water treatment for continuous cating process at Gwangyang Steel Mill	Gwangyang
	Gunjang Energy	Water treatment at Coal-fired Thermal Power Plant (No. 3)	Gunsan
	Kumho Petrochemical	Water & condensate water treatment at Combined Heat & Power Plant	Yeosu
	Samkwang Glass	Waste water treatment at Nonsan Plant	Nonsan
	Changwon-si	Water treatment at Changwon Incineration Plant	Changwon
2012 - 2000	Korea South-East Power	Seawater treatment at Thermal Power Plant	Yeongheung
	Korea Southern Power	Waste water treatment at Combined Thermal Power Plant	Yeongwol
	USA Gail Co., Ltd.	Seawater purification at Songdo International Business Complex	Song-do
	Gyeonggi Provincial Government	Reuse treatment at Yongin Waste water Treatment Plant	Yongin
	Incheon Metropolitan City	Waste water Treatment at Resource Collection Center	Song-do
	Pyeongtaek-si	Waste water disposal treatment at Songtan Industrial Complex	Songtan
	Bukjeju-gun	Non-discharge Waste water treatment at Bukjeju Landfill	Bukjeju
	Uiseong-gun & Andong-si	Sewage treatment at Kumseong & Andong Public Sewage Treatment Plant	Uiseong & Andong
	Seoul Agro-Fisheries & Food Corporation	Waste water treatment at Garak-dong Agricultural & Marine Products Market	Seoul
	National Agricultural Cooperative Federation	Waste water treatment at Seoul Joint Market (Slaughterhouse)	Seoul
	Yulchon Industrial Complex	Service water treatment at Yulchon Filtration Plant	Yeosu
	Seoul Metropolitan City	Leachate treatment at Nanjido Landfill	Seoul
	Hyundai Asan	Leachate treatment at Gaeseong Industrial Complex Landfill	Gaeseong
	POSCO	Water & Waste water treatment at Busaeng Gas Plant & Gwangyang Steel Mill	Pohang & Gwangyang
	POSCO PowerTec	Waste water treatment at Seoincheon Combined Thermal Power Plant	Incheon
	LGLCD	Waste water at P4, P6 and P7	Gumi & Paju
	Hyundai Oilbank	Water treatment at Daesan Plant	Seosan
	Hyundai Steel	Water & Waste water treatment at Dangjin Cold Rolling Mill No. 2	Dangjin
	Namhae Chemical	Waste water treatment at Yeosu Plant	Yeosu
	OCI	Waste water treatment at Gunsan Plant (DAF)	Gunsan
1999 - 1990	Commerce & Industry Energy	Water & Waste water treatment at Combined Heat and Power Plant, Iksan Industrial Complex No. 2	Iksan
	Korea Cold Storage	Waste water treatment (N & P) at Central Plant, Noryangjin Fist Market	Seoul & Cheongwon
	Saehan	Waste water treatment at Gumi Plant	Gumi
	Donghwa Pharmaceutical and Yuhan Corporation	Water & Waste water treatment at Plant and R&D Center	Chungju, Ochang and Giheung
	University of Ulsan	Waste water treatment at Ulsan University Hospital	Ulsan
	Korea District Heating Corporation	Water & Waste water treatment at Combined Heat and Power Plant Cheongju	Cheongju
	Incheon Metropolitan City	Water & Waste water treatment at the New Airport Incineration Plant and Gyeongseo Incineration Plant	Yeongjongdo, Incheon
	Changwon-si	Waste water treatment at Food Waste Treatment Facility	Changwon
	Gure-gun & Hadong-gun	Non-discharge Waste water treatment at Landfill	Gure & Hadong
	Hyundai Elevator	Non-discharge Waste water treatment at Icheon Plant	Icheon
	LG Industrial System	Waste water treatment at Cheongju Plant	Cheongju
	Dongbu Iron	Waste water treatment at Incheon Plant	Incheon
	Daewoo Heavy Industries & Machinery	Waste water treatment at Sacheon Plant	Sacheon

Water & Waste water treatment system (in Korea)

YEAR	CUSTOMER	PROJECT	REGION
2015	Gasam SCPC	Water & Waste water treatment of SCPC Project	Saudi Arabia
	Iraq ENI b.v.	Sewage treatment of Zubair Oil Field Development Project	Iraq
2014	Electrica Cochran Co.	Water treatment at Cochran Thermal Power Station	Chile
2013	Ma'aden Base Metal Co.	Desalination and sewage treatment for Ad Duwayhi Gravity-CIL Gold Project	Saudi Arabia
2012	KRAKATAU POSCO	Waste water treatment at Coke Steel Mill	Indonesia
	POSCO Mahashtra	Water treatment at Cold Rolling Steel Mill	India
	POSCO Assan	Water treatment at TST Plant	Turkey
2011	NWC(WASIA)	Seawater desalination system design	Saudi Arabia
	ENERSUR	Seawater treatment at Chica Uno Combined cycle Thermal Plant	Peru
	TAKREER	Waste water treatment at Ruwais Oil Refinery Plant	United Arab Emirate
2010	HoChiMinh City	3-stage liquid deodorizer system at HoChiMinh City Waste water treatment plant	Vietnam
1990	Par Oil and Gas Co.	Desalination system at South Pars	Iran
	Daewoo Motor	Air treatment system at Radae Plant	Romania
	Samsun co., LTD.	Waste water treatment at Weihai	China

Water, Waste water and air treatment system (Overseas)

YEAR	CUSTOMER	PROJECT	REGION
2015	SK Materials	NF ₃ Organic Compounds Recovery Facility	Yeongju
	Marafiq	Yanbu II Power & Water Project Stop gate	Saudi Arabia
2014	Gunjang Energy	Limestone storage & transport handling system	Gunsan
	SK Hynix	Dechlorination system	Icheon
2013	Korea South-East Power	Gypsum & limestone transfer facility at Yeongheung Thermal Power Plant	Yeongheung
	SK Hynix	Dechlorination system	Icheon
2012	Hyundai Steel	Storage tank installation	Dangjin
	Hyoseong	TC-1, TC-2 utility construction	Oksan
2011	ENERSUR	Plant utility construction	Peru
	POSCO PowerTec	Seoincheon Combined Thermal Power Plant	Incheon
	Pohang-si	Waste water & sludge treatment	Pohang
	Yeongjin Global	Cement storage and shipping facility	Pyeongtaek
2010 - 1990	Hyundai Oilbank	Piping at Daesan Plant	Seosan
	POSCO	New BETP at Gwangyang Steel 5 Coke	Gwangyang
	Taeon Beach CC	Mechanical facility construction & steel structure bridging	Taeon

Air treatment system (in Korea)

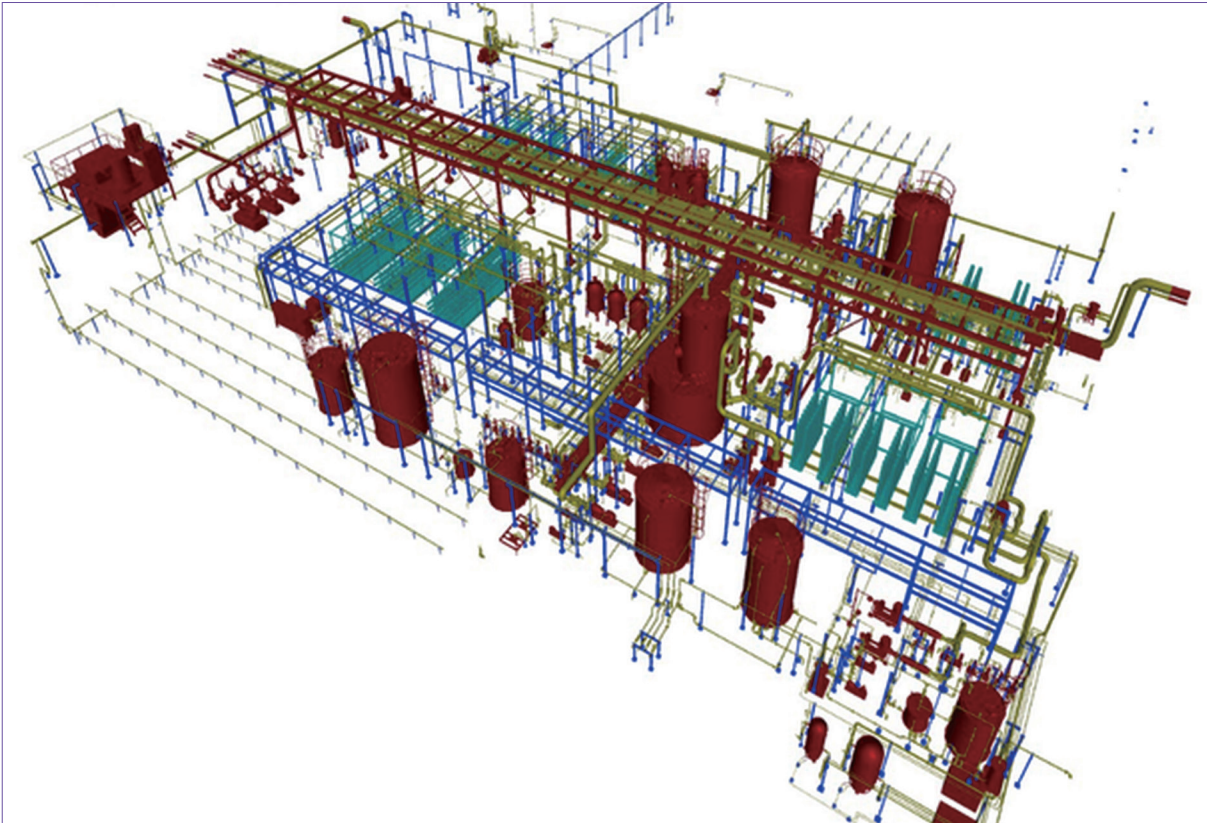
YEAR	CUSTOMER	PROJECT	REGION
2015 - 2000	Seoul Metropolitan City	Deodorizer tower at Nanjido Landfill	Seoul
	Goyang-si	Deodorizer tower at Agricultural and Marine Products Center	Ilsan
	Incheon Metropolitan City	Scrubber at Songdo Food Waste Composting Facility	Incheon
	Changwon-si	3-stage liquid scrubber at Food Waste Treatment Plant	Changwon
	Bukjeju-gun	Bag filter, scrubber & deodorizer tower at Bukjeju Landfill	Bukjeju
	Hadong-gun	Deodorizer tower at Landfill	Hadong
	Korea South-East Power	Bag filter at Yeongheung Thermal Power Plant	Yeongheung
	Namhae Chemical	Scrubber at Yeosu Plant	Yeosu
	Gunjang Energy	Ammonia scrubber & Bag filter at Thermal Power Plant	Gunsan
	SK Materials	Ammonia scrubber at NF ₃ Plant	Yeongju
	High-tech Electronics	Scrubber at Namdong Plant	Incheon
	Daedeok Electronics	Deodorizing system & scrubber	Ansan
	Yeongjin Global	Bag filter at Pyeongtaek Cement Dock	Pyeongtaek
	Baemyung Metal	Lamella scrubber & Bag filter at Plant No. 2	Ansan
	Fine Circuit	Scrubber at Namdong Plant	Incheon
	Wonil System	Scrubber at Incheon Plant	Incheon
	National Agricultural Cooperative Federation	Scrubber at Seoul Joint Market	Seoul
1999 - 1990	Hwasun-gun	Deodorizer tower at Waste water treatment plant	Hwasun
	Seoul Metro	Bag filter	Seoul
	Seoul Metropolitan City	Bag filter & absorption tower at Gangnam Incineration Plant	Seoul
	Daewoo motor, Daewoo Electronics	Scrubber, Bag filter and deodorizer tower at Bupyeong Plant Electric precipitation at Yeosu Plant	Incheon, Yeosu
	Daewoo Electronic Components	Deodorizer tower & scrubber at Jeong-eup Plant	Jeong-eup
	Daewoo Heavy Industries & Machinery	Bag filter at Incheon Plant	Incheon
	Isu Electronics	Activated carbon absorption tower & scrubber at Dalseong Plant	Dalseong

Note: Performed more than 500 projects

REFERENCES

Jangmoon Natural Gas Power Plant Project

Demineralization · Waste water treatment · Cooling tower blowdown reuse
(Design, procurement, manufacturing, construction and Commissioning)



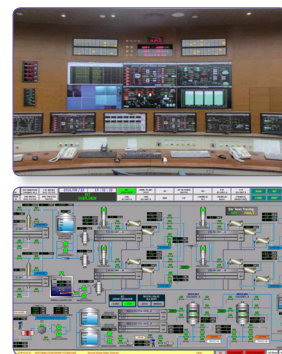
▲
Ultra filter



▲
Reverse osmosis system



▲
Mixed bed

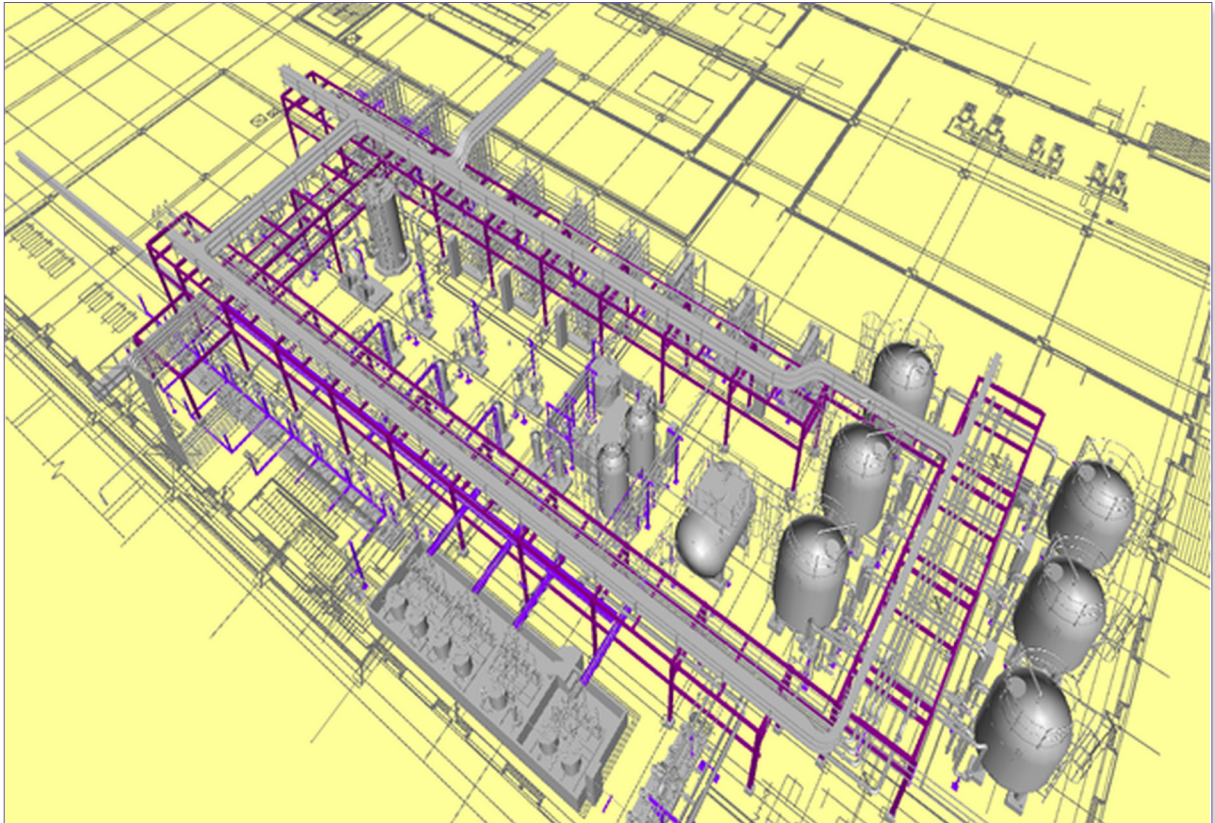


▲
Control system

REFERENCES

Shinboryeong Combined Cycle Thermal Power Plant Project

Demineralization · Condensate polishing system · Sea water electro-hypochlorite system (Design, procurement, manufacturing, construction and Commissioning)



▲
Prefilter



▲
Mixed bed



▲
Seawater electro-
hypochlorite system

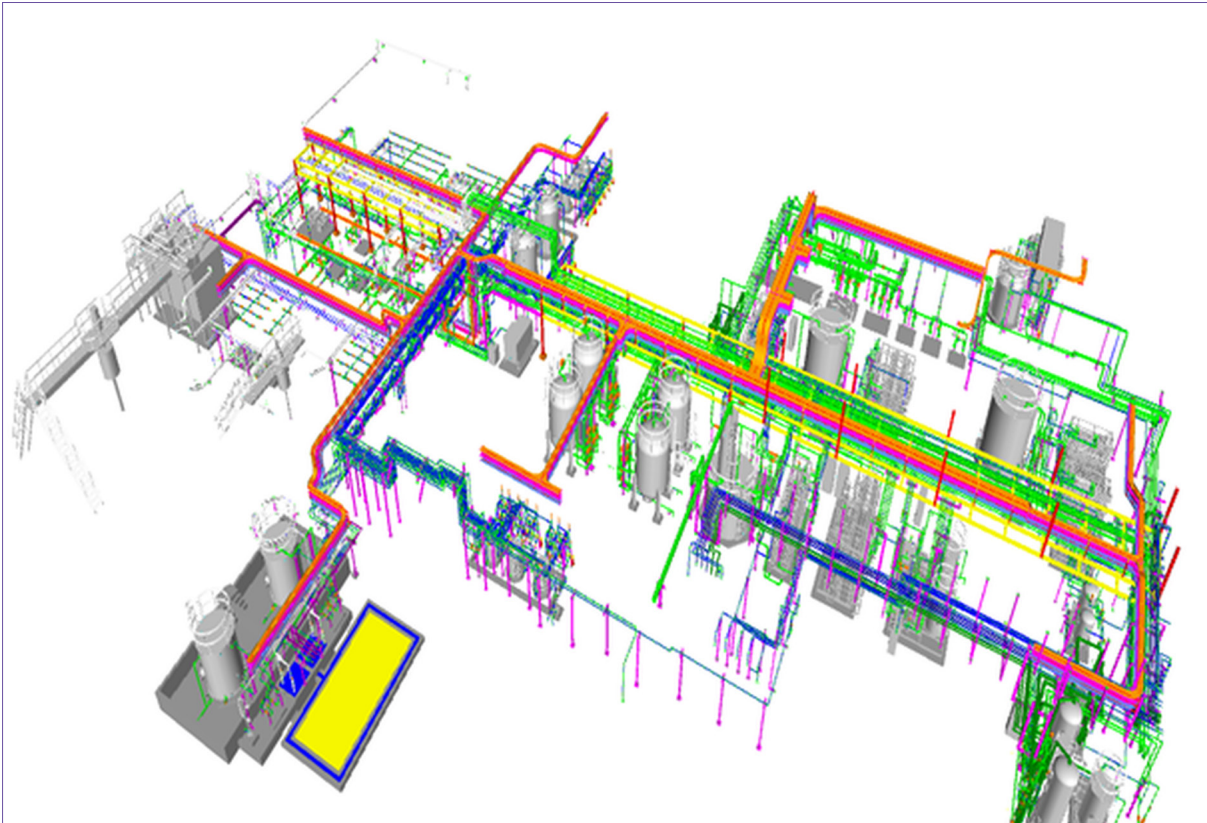


▲
Sampling panel

REFERENCES

Hyundai Oilbank Project

Water · Waste water treatment (Design, procurement, manufacturing, construction and Commissioning)



Rapid sedimentation tank



Pressure filter



Reverse osmosis system



Mixed bed

Commitment of Uniens to the human and
environment together will never change.



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