Creating the valuable things beyond water

DS21

DS21 CO.,LTD.

CONTENTS


CREATING THE VALUABLE
THINGS BEYOND WATER

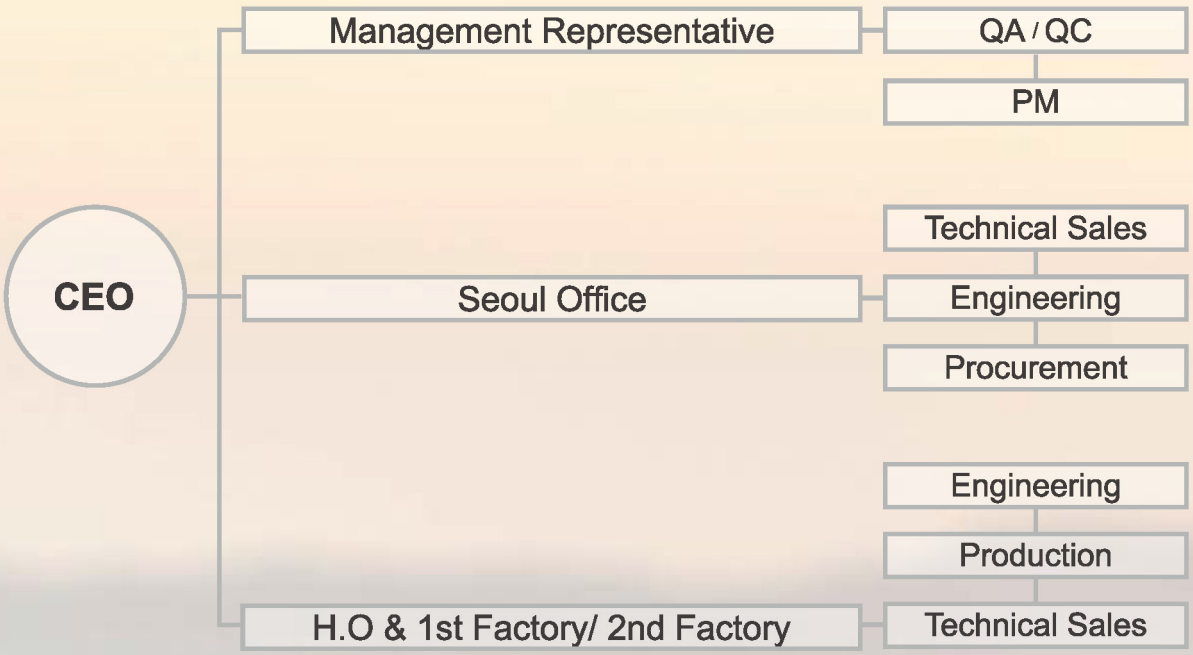
Message from CEO

Creating the valuable things beyond water

DS21 have designed and manufactured wastewater treatment, water treatment with our own innovative technology for more than 20 years. With our own technology and long experience, DS21 have successfully executed more than two hundreds projects. DS21 do our best to meet the client's requirement and make effort to grow DS21 as the world best engineering and manufacturing company based on our philosophies of constant technology development, product completeness and customer first.

CEO Lee, Cheon Eok

Company Organization



Company History

1998~2010: Start of Business

1998
①Company founded

1998~2005
① Started Producing various types of oil water separators and oil skimmers.

2006
② Incheon factory constructed
⑧ Certified for ISO 9001

2007
⑥ Patent : EIP PACK

2008
① Technical Agreement with Dafeng Oilfield in China.
⑤ Vendor Registrationat SABIC
⑩ Incorporation DS21 Co., Ltd.

2009
② Patent : EIP PACK in USA.

2010
⑥ Patent: Micro bubble generator & Pre-treatment
⑧ Certificated research & development center
⑩ INNO-BIZ
⑪ Vendor Registration at Takreer
⑪ Designated as Venture company.

2011~ Current : Expansion of Business

2011
④ Relocation of Seoul office in Gasan Digital Complex

2012
② Patent: EIP PACK in China
⑥ Acquisition ASME "S" & "U" Stamp
⑦ Designation of Excellent Products by Public Procurement Service.

2013
⑤ Selected technical development business from Industry university research in 2013.

2014
① Relocation of factory for Water Treatment in Incheon.
③ Certificated for ISO 14001, OHSAS 18001

2015
⑧ R&D for Nutshell Filter, etc

2016
⑥ Selected as Promising Export Firm.
⑨ Leading Environmental Company.
⑪ Registered at KNP.

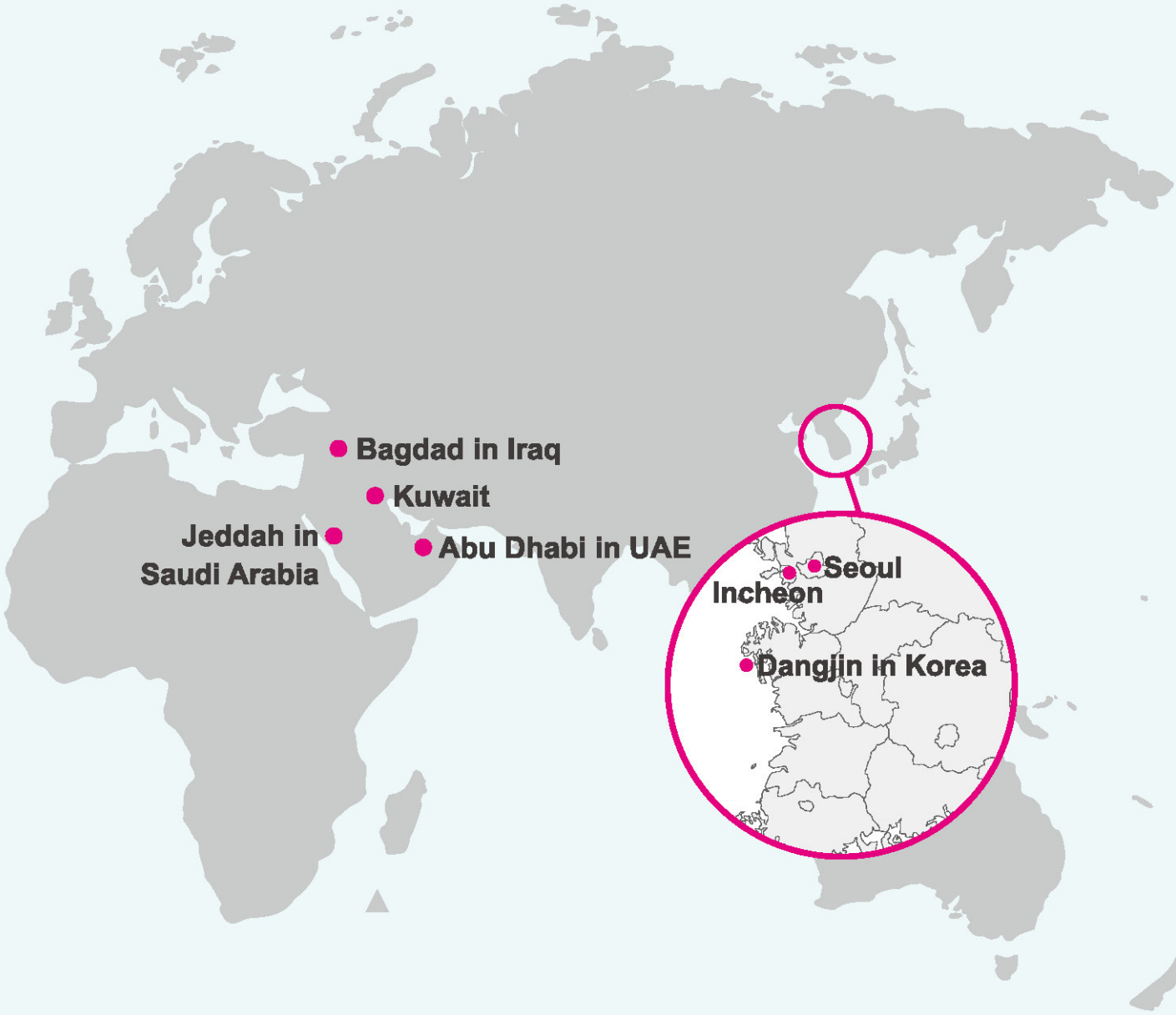
2017
⑪ Vendor Registration at Aramco.
⑪ Renewal of ASME "S" & "U"
⑫ Registered at KOC for Oily Water Treatment/ Separation Packages

2018
⑨ 2nd Work Shop in Bugokgondan.
⑨ Registered at KOC for Filtration Unit.

Vendor Registration

SAUDI ARABIA: ARAMCO,SABIC, SWCC, MA'ADEN
KUWAIT: KNPC, KOC
UAE: TAKREER, GASCO, BOROUGE, ADNOC, ADMA-OPCO, ADCO, EMIRATE LNG
OMAN: OMAN OILAND GAS COMPANY
IRAQ: SCOP

Global Network



Waste Water Treatment

Ⅰ. Waste water Treatment
Ⅱ. Oily Water Treatment
Ⅲ. Produced Water Treatment
Ⅳ. Sewage Treatment

Water Treatment Package

Ⅰ. Pre-Treatment Package
Ⅱ. Demineralization Water Treatment Package
Ⅲ. Filtration Package
Ⅳ. Condensation Polishing Package

Oil & Gas Plant, Refinery, Petrochemical,
Power Plant and etc.

PLANT


PLANT

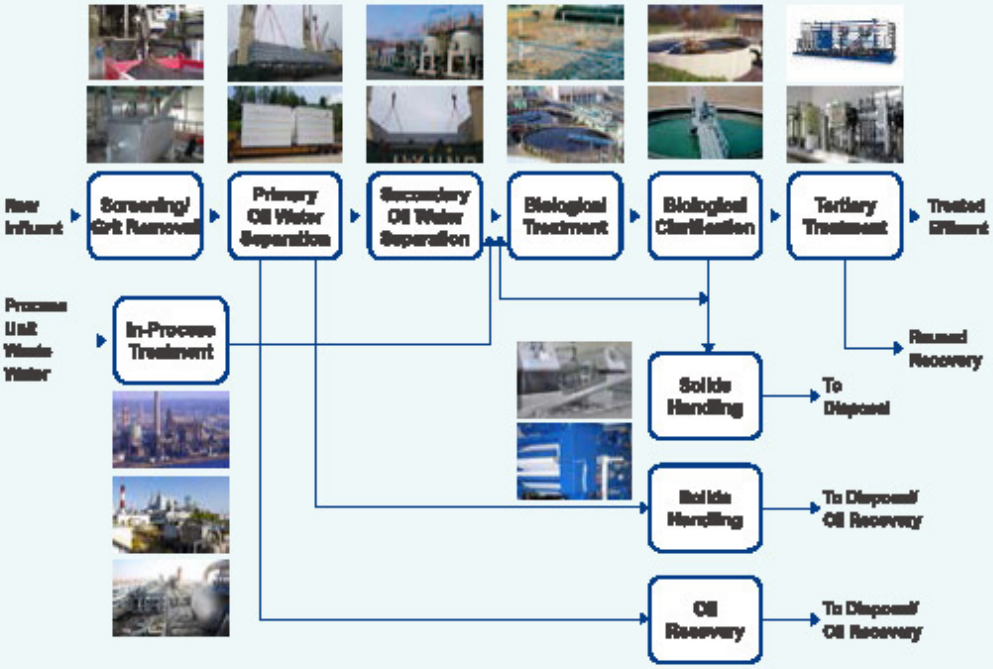
Plant Waste Water Treatment

Waste Water Treatment

I. Waste water Treatment

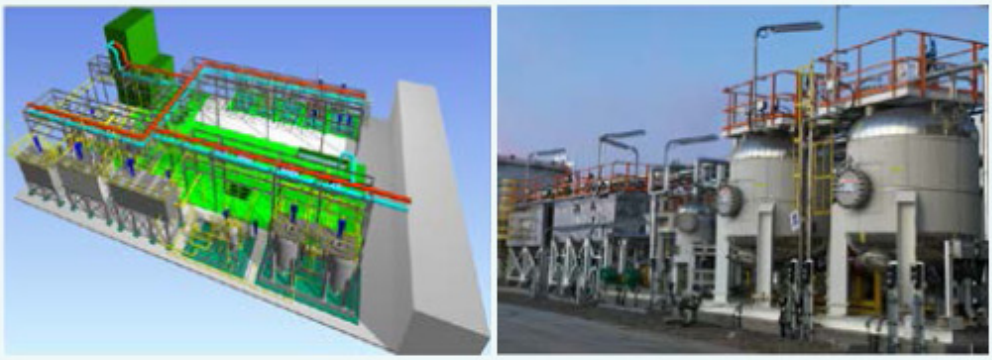
1. Summary

Wastewater Treatment is a process used to convert wastewater into an effluent (outflowing of water to a receiving body of water) that can be returned to the water cycle with minimal impact on the environmental or directly reused.



2. Block Flow Diagram

3. 3D Modeling and Photo



Turkmenistan, GTPOGT Project

Ⅰ.Oily Water Treatment

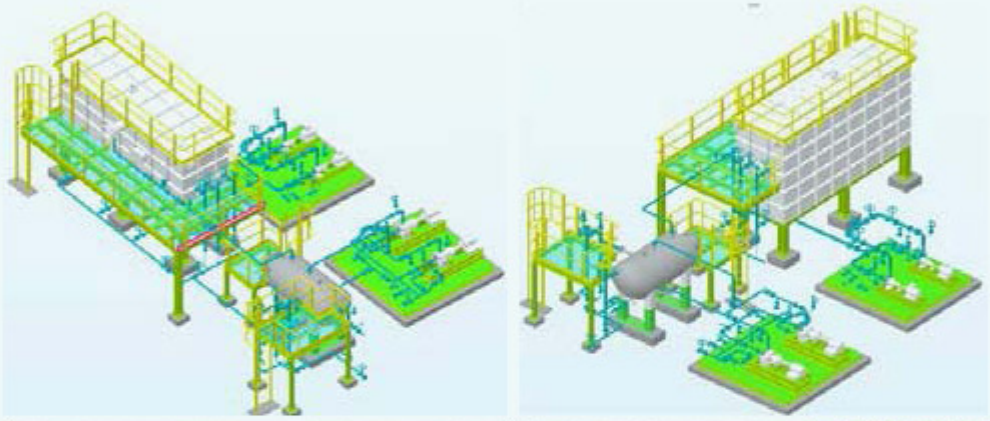
Waste Water Treatment

1. Summary

Wastewater Treatment is a process used to convert wastewater into an effluent (outflowing of water to a receiving body of water) that can be returned to the water cycle with minimal impact on the environmental or directly reused.

2. Block Flow Diagram

3. 3D Modeling& Photo



Iraq, Zubair Project

Thailand, FTPMCS Project

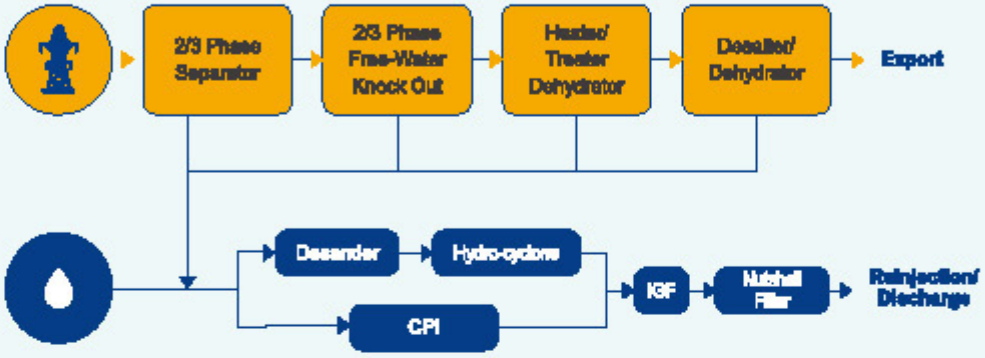
Plant Waste Water Treatment

Waste Water Treatment

Ⅲ. Produced Water Treatment

1. Summary

Produced water is the largest volume by-product or waste stream associated with oil and gas exploration and production. The cost of managing such a large volume of water is a key consideration to oil and gas producers.



2. Block Flow Diagram

3. Photo

CPI OIL SEPARATOR

IGF OIL SEPARATOR

NUTSHELL FILTER

Iraq, West Qurna-2 Project

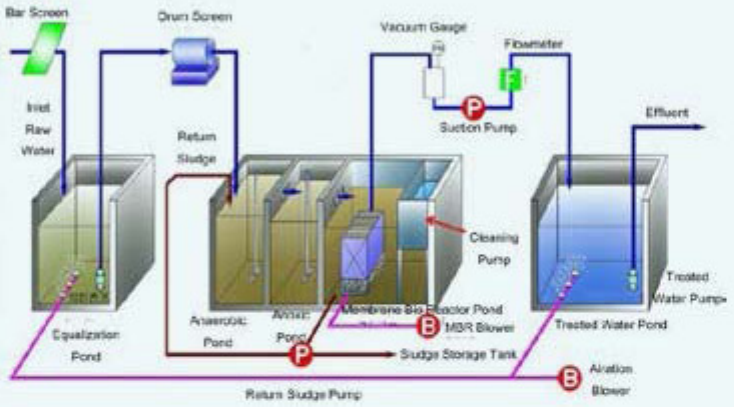
Ⅳ. Sewage Water Treatment

Waste Water Treatment

1. Summary

Sewage treatment is the process of removing contaminants from sewage water, primarily from household sewage. It includes physical, chemical and biological processes to remove these contaminants and produce environmentally safe treated water.

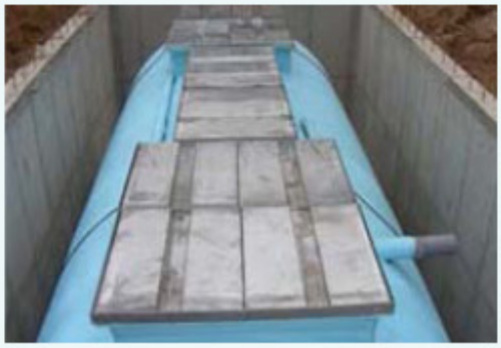
2. Flow Diagram



3. Photo

Sewage Water Treatment Package

MBR Module



Egypt, Egyptian Polyethylene Project

Plant Water Treatment

Water Treatment

Ⅰ .Pre-Treatment Package

1. Summary

It is to remove SS (Suspended Solids) from raw water by Clarifier and Filter with use of chemicals.

2. Block Flow Diagram

Clarifier **Inside of Clarifier** **MMF**

Kuwait, KLNG Project

Ⅱ .Demineralization Water Treatment Pkacage

1. Summary

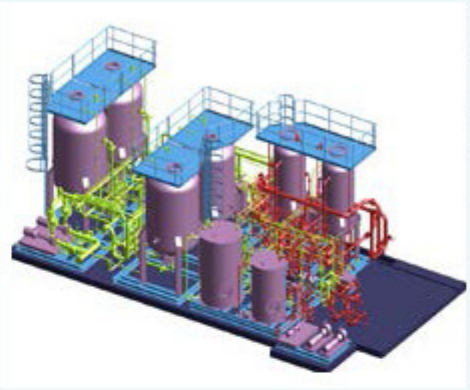
Demineralized water is specially purified water that has had most or all of its mineral and salt ions removed. There are two type such as Ion-Exchanger and Membrane - EDI.

2. Classification of Demineralization Package

2.1. 2B3T + MBP Type

2.1.1) Block Flow Diagram.

2.1.2) 3D Modeling & Photo.



UAE, Green Diesel Project

Mixed Bed Polisher

Regeneration 1

Activated Carbon Filter

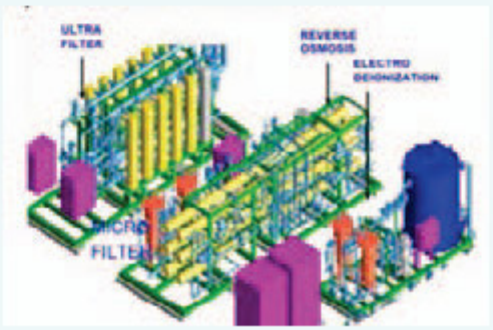
Regeneration 2

Korea, V-Project

2.2. Membrane-EDI Type

2.2.1) Block Flow Diagram.

2.2.2) 3D Modeling & Photo.



Water Treatment

Ⅱ.Filtration Package

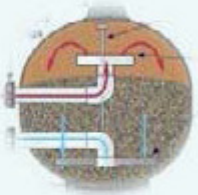
1. Summary

Filtration Package is any of various mechanical, physical or biological operation that separate solids from fluids (liquids or gases) by adding a medium through which only the fluid can pass.

There are many different methods of filtration; all aim to attain the separation of substances. Separation is achieved by some form of interaction between the substance or objects to be removed and the filter.

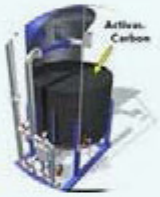
2. Description

Pressure Sand Filter



Sand filtration is used for the removal of suspended matter, as well as floating and sinkable particles.Sand filters are constructed beds of sand or other suitable granular material usually two to three feet deep. The filter materials (called media) are contained in a liner made of concrete, plastic, or other impermeable material.

Activated Carbon Filter



Activated carbon is a natural product made from carbon, wood, or coconuts. An activated carbon filter can remove free chlorine, chloramine, chlorine dioxide, phenols, organic solvents, and pesticides.Carbon filtration has great capabilities in industry, waterworks, and wastewater treatment.

Micro Filter

Microfiltration usually serves as a pre-treatment for other separation processes such as ultrafiltration, and a post-treatment for granular media filtration. Also the typical particle size used for microfiltration ranges from about 0.1 to 10 μm.

Ultra Filter (UF)

UF is a variety of membrane filtration in which forces like pressure or concentration gradients lead to a separation through a semipermeable membrane. Suspended solids and solutes of high molecular weight are retained in the so-called retentate, while water and low molecular weight solutes pass through the membrane in the permeate.

Reverse Osmosis (RO)

RO has been proven to be the most economical technology not only for the desalination of water containing salts, but also for purifying water contaminated with heavy metals, pesticided and other contaminants.

3. 3D Modeling and Photo




Water Treatment

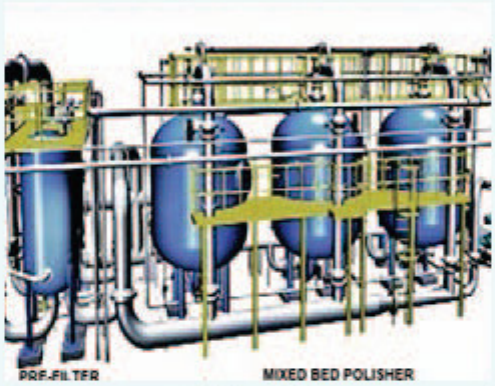
Ⅳ. Condensation Polishing Package

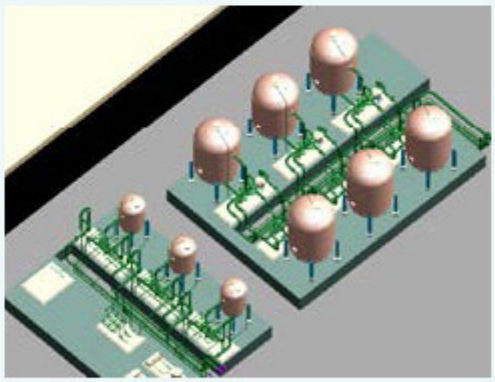
1. Summary

The condensation polishing package reduces the risk of damage to the main system caused by the concentration of soluble impurities that corrode internals which contribute to insoluble impurities such as copper, iron and silica in the re-circulating stream.

2. Block Flow Diagram

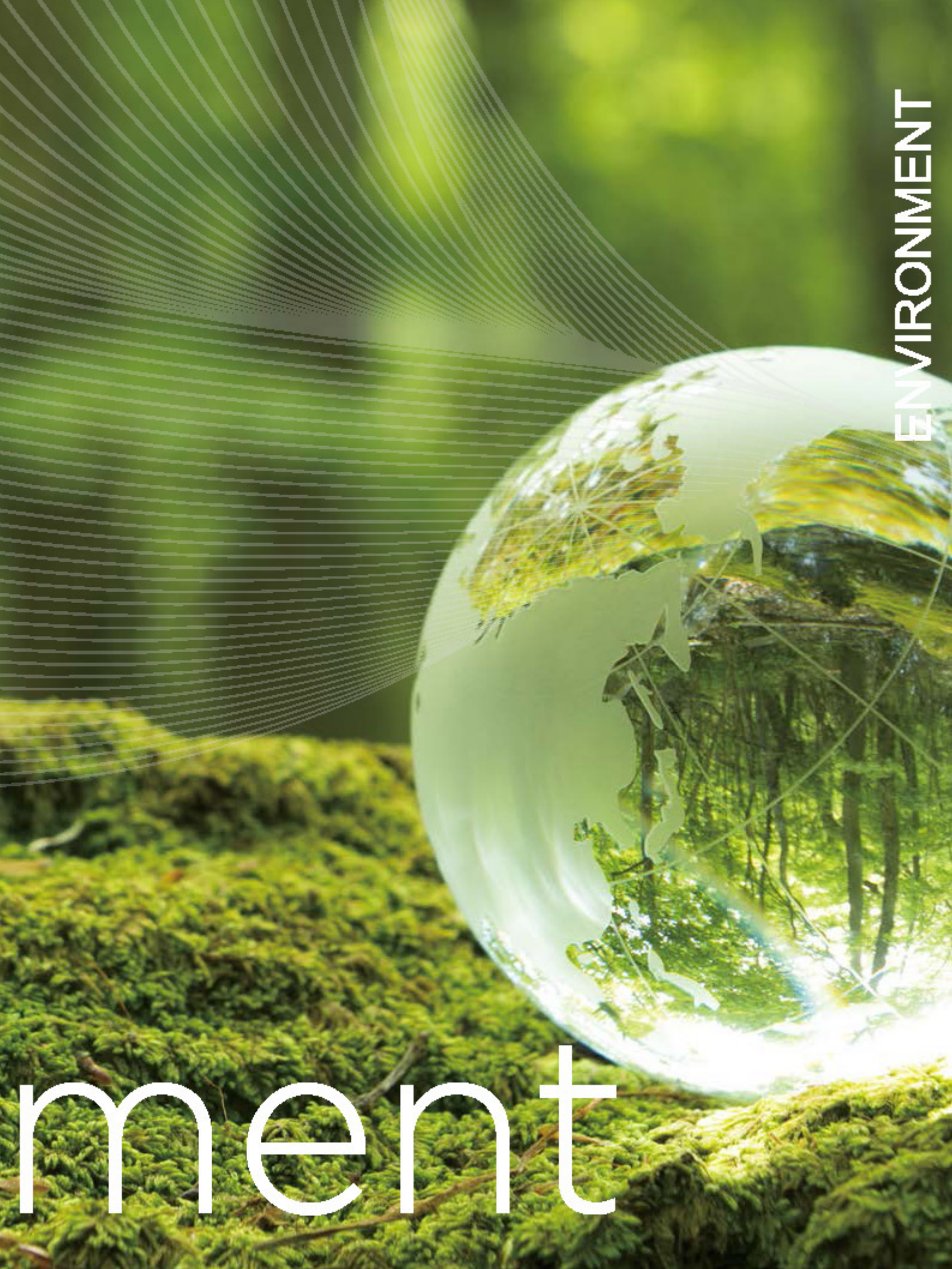
3. 3D Modeling and Photo





Korea, BK MDI Expansion Project


Ⅰ. Clarifier
Ⅱ. Dissolved Air Flotation
Ⅲ. Oil Separator/ Oil Skimmer
Ⅳ. Sewage Water Treatment
Ⅴ. Storm Water
Environ


ENVIRONMENT
ment

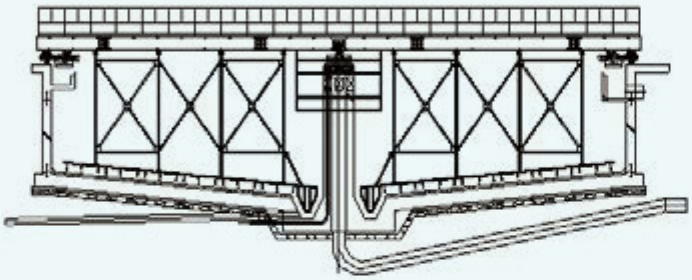
Environment

Ⅰ. Clarifier

1. Summary

Clarifiers are settling tanks built with mechanical means for continuous removal of solids being deposited by sedimentation. A clarifier is generally used to remove solid particulates or suspended solids from liquid for clarification and (or) thickening. Concentrated impurities, discharged from the bottom of the tank are known as sludge, while the particles that float to the surface of the liquid are called scum.

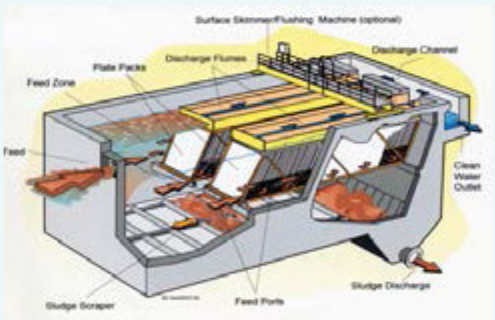
Conventional Type



Lamella Type

Remove sediment from wastewater reliably and effectively, using up to 90% less footprint than conventional technologies.

The Lamella Plate Clarifier is a primary clarification device used to treat sewage and industrial waste streams and requires up to 90% less space when compared to a traditional settling tank.



Uzbekistan, UZGTL Project

Ⅱ. DAF (Dissolved Air Flotation)

1. Summary

Dissolved air flotation (DAF) is a water treatment process that clarifies wastewaters (or other waters) by the removal of suspended matter such as oil or solids. The removal is achieved by dissolving air in the water or wastewater under pressure and then releasing the air at atmospheric pressure in a flotation tank basin. The released air forms tiny bubbles which adhere to the suspended matter causing the suspended matter to float to the surface of the water where it may then be removed by a skimming device.

Korea, S-Oil RUC Project

Kuwait, ZOR Project

Environment

Ⅱ. Oil Separators/ Oil Skimmers

An **oil water separator** (OWS) is a piece of equipment used to separate oil from oily water mixtures. There are many different types of oil-water separator. Each has different oil separation capability and are used in different industries.
Oil water separators can be designed to treat a variety of contaminants in water including free oil, emulsified oil, dissolved oil and suspended solids. Not all oil separator types are capable of separating all contaminants.
API Oil Separator, CPI Separator and EIP Separator are for removing free oil. DAF/DGF and IAF/IGF Separator are for removing emulsified oil and dissolved oil with use of chemicals.

API

CPI

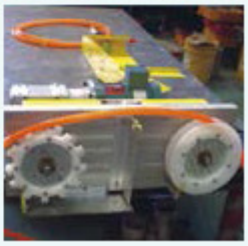
EIP

DAF/DGF

IAF/IGF

An **oil skimmer** is a device that is designed to remove oil floating on a liquid surface. Depending on the specific design they are used for a variety of applications such as oil spill response, as a part of oily water treatment systems, removing oil from machine tool coolant and aqueous parts washers, and collecting fats oils and greases in wastewater treatment in food manufacturing industries.

BELT	FLOATING	PIPE
 	 	 

HOSE	DISK / DRUM	SCRAPING
 	 	 

Environment

Ⅳ. Sewage Water Treatment

Sewage treatment is the process of removing contaminants from sewage water, primarily from household sewage. It includes physical, chemical and biological processes to remove these contaminants and produce environmentally safe treated water.



Korea, Restoration of Hwasung Dongtan Water Quality

Korea, SK Hynix

Ⅴ.Storm Water Treatment

1. Summary

Storm Water occurs from storm water which mostly contains free Oil & SS.
DS21's Oily Waste Storm Water System is to remove the free oil and SS from the wastewater. After CPI oil adsorbent absorbs the remaining oil.
If emulsified oil is included in oily waste storm water, extra equipment is required.

2. Block Flow Diagram

3. Oil Adsorbent

Oil adsorbent is non-woven fabric made of oil-friendly polypropylene. It can absorb more than twenty (20) times as much as oil quantity. It can be used for oil-spill in the sea or river.

Dice Type | Stick Type | Mat Type

Type	Model NO.	Size (cm)	Weight	Box Size (cm) (LXWXH)
Dice Type	DSOA-D	1.5×1.5×1.5	10kg	60×60×60
			20kg	75×75×75
Stick Type	DSOA-N	1×1.5×48	10kg	50×50×52
			20kg	63×63×65
Mat Type	DSOA-M	0.4×48×48	10kg	50×50×52

4. Photo

Kumho CHP-S1 Project

Ⅰ. API
Ⅱ. CPI
Ⅲ. EPI
Ⅳ. IGF/IAF
Ⅴ. NUTSHELLFILTER
Ⅵ. CHEMICAL INJECTION PACKAGE

Product


PRODUCT

Product

API Oil Separator

Ⅰ. API (American Petroleum Institutes)

UAE, SARB4 Project

API oil–water separator is a device designed to separate gross amounts of oil and suspended solids from the wastewater effluents of oil refineries, petrochemical plants, chemical plants, natural gas processing plants and other industrial oily water sources. The name is derived from the fact that such separators are designed according to standards published by the American Petroleum Institute. Applicable design code: API421

API Separators are frequently used in the pre-treatment of refinery waste water that has been contaminated by oil and oily sludge. API removes free oil more than 150 microns as a pre-treatment.

API Separators can be equipped with VOC containment covers. Both fixed and floating styles are available.

◆ **Applicable Capacity**

1 m3/hr ~ 1000 m3/hr

◆ **Applications**

- Reduce Waste Treatment load
- Bilge Water
- Desalter Waste
- Ballast Water
- Reduce Slop Oil Water
- Recover Free Oil
- Improve Process Treatment
- Refinery Waste Water
- Storm runoff Water

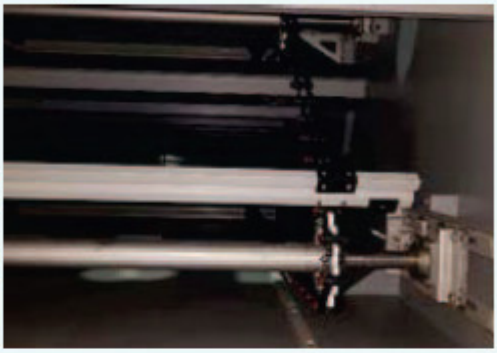
UAE, SARB4 Project

API Oil Separator

- **Internals**

Scraper

Scraper



Auger for Sludge

Pipe Oil Skimmer

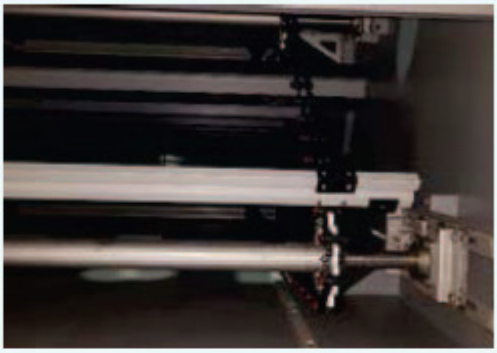
Kuwait, ZOR Project

API Oil Separator

- **Internals**

Scraper

Scraper



Auger for Sludge

Pipe Oil Skimmer

Kuwait, ZOR Project

Product

CPI Separator

I . CPI (Corrugated Plate Interceptor)

◆ Description

CPI is the most widely used oil water separator.
It separates oil and sludge from the oily waste water using the specific gravity difference seperation method. With multiple pieces of slate plates or corrugated plates or improved efficiency of oil separation plates installed being slanted at a 45° angle, or horizontally, the flows are induced to go from the top portion to the bottom portion.
CPI provide an increase in the separator's effective horizontal surface area without requiring an increase in the size of the separator basin.
CPI create more uniform, less turbulent flow characteristics, thus providing more favorable conditions for separation of free.

Kuwait, ZOR Project

◆ Applicable Capacity

1 m3/hr ~ 1000 m3/hr

◆ Applications

- First and second stage separators for extraction sites
- Ballast Water and Slop Oil Treatment Facilities
- Oil Refineries
- LNG Plants
- Down Stream Plants
- Off shore rings

◆ Internals

◆ CPI Pack

Product

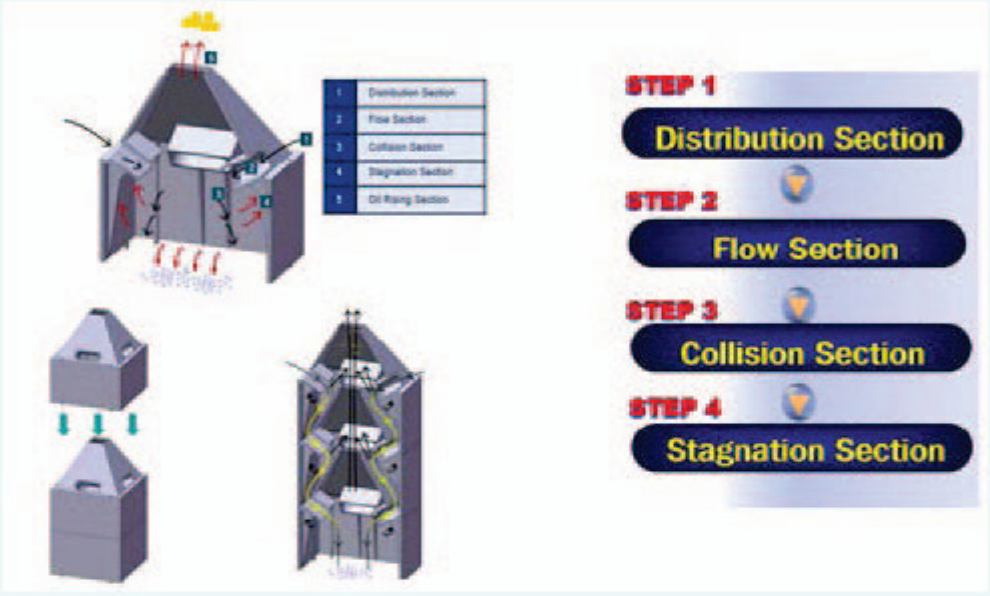
EIP Separator

Ⅲ. EIP (Effective Interceptor Plate)

◆ **Description**

EIP is called as a new CPI type, and installed to remove the free oil (more than 30~60um) and TSS in the wastewater.
EIP Pack is developed considering industrial improvement requirement.
Petent: Korea 10-0732052 , China 912245 , USA US7,484,672 B2.

◆ **Feature of EIP Pack**



Thailand, PTT FTPMCS

Product

IAF/ IGF Separator

Ⅳ. IAF/ IGF (Induced Air/ Gas Floatation)

1. Eductor Type

KSA, Yanpet, BMP Project

Eductor Type is a water treatment process that clarifies wastewaters (or other waters) by the removal of suspended matter such as oil or solids. The removal is achieved by injecting gas bubbles into the water or wastewater in a flotation tank or basin. The small bubbles adhere to the suspended matter causing the suspended matter to float to the surface of the water where it may then be removed by a skimming device.
It is very widely used in treating the industrial wastewater effluent from oil refineries, petrochemical and chemical plants, natural gas processing plants and similar industrial facilities.

Product

Nutshell Filter

Ⅴ.Nutshell Filter Package

It removes free oil and suspended solids from oil field produced water, refinery, wastewater and any water source. It is very effective for the treatment of suspended solids, oily residues, ash and metallic hydroxides from industrial liquids generated by petrochemical industries and others.
Nut shell media are not affected by heavy oil surges, therefore, the nut shell media fouling is much less than other media. The media is also easily cleaned and rarely needs replenishing. (normally only 5% per year)

◆ **Advantage**

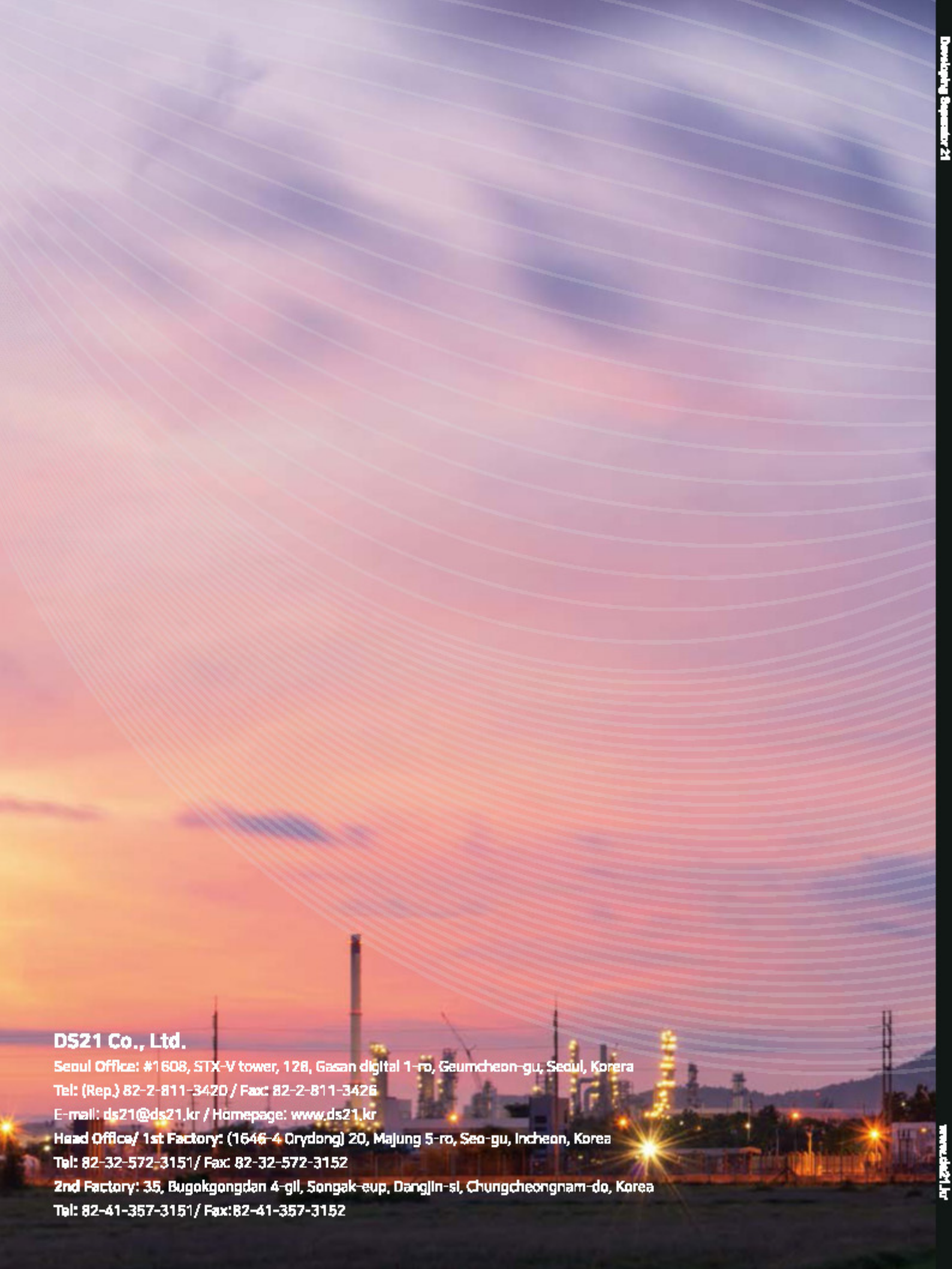
- 98% Removal of Suspended Solids and Oil more than five (5) microns.
- Media Recovery Rate: 95%
- Media Replenishing Rate:
  a) Air/Gas Scouring: 5% per year
  b) Agitator: 10% per year
- Low energy Design
- Reduced footprint
- Simple Control Philosophy
- Low energy Design
- No rotating equipment or external device

◆ **Applications**

- Downstream process line of oil separator
- For low oil content
- Typically used in facilities with strict oil discharge requirement
- Sometimes used with systems that have downstream membrane process

Ⅵ.Chemical Injection Package

DS21 can develop a customized chemical injection package, adapted for your requirements.
Chemical injection systems are commonly used in production facilities in the oil & gas industry. They prevent or mitigate a wide range of problems that might negatively affect the production flow and/or process completion. DS21 designs, manufactures and supplies custom-built injection systems for a broad range of process applications, including production processes, (produced) water treatment and the various field industries.



DS21 Co., Ltd.

Seoul Office: #1608, STX-V tower, 128, Gasan digital 1-ro, Geumcheon-gu, Seoul, Korera

Tel: (Rep.) 82-2-811-3420 / Fax: 82-2-811-3426

E-mail: ds21@ds21.kr / Homepage: www.ds21.kr

Head Office/ 1st Factory: (1646-4 Orydong) 20, Majung 5-ro, Seo-gu, Incheon, Korea

Tel: 82-32-572-3151/ Fax: 82-32-572-3152

2nd Factory: 35, Bugokgongdan 4-gil, Songak-eup, Dangjin-si, Chungcheongnam-do, Korea

Tel: 82-41-357-3151/ Fax:82-41-357-3152