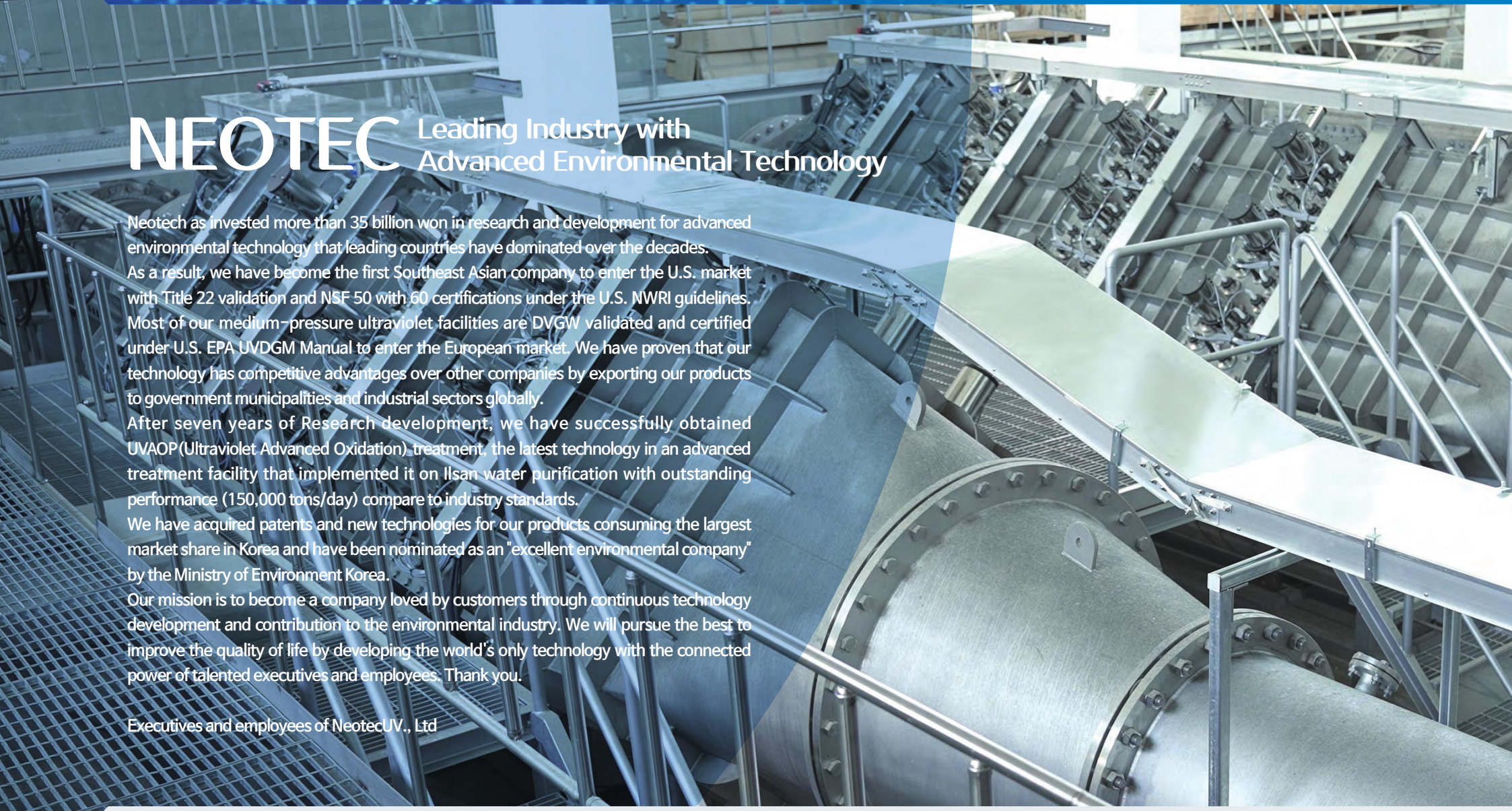


NEOTEC

LOW & MEDIUM PRESSURE
UV ADVANCED OXIDATION PROCESS



NEOTEC Leading Industry with Advanced Environmental Technology

Neotech as invested more than 35 billion won in research and development for advanced environmental technology that leading countries have dominated over the decades.
As a result, we have become the first Southeast Asian company to enter the U.S. market with Title 22 validation and NSF 50 with 60 certifications under the U.S. NWRI guidelines.
Most of our medium-pressure ultraviolet facilities are DVGW validated and certified under U.S. EPA UVDGM Manual to enter the European market. We have proven that our technology has competitive advantages over other companies by exporting our products to government municipalities and industrial sectors globally.
After seven years of Research development, we have successfully obtained UVAOP(Ultraviolet Advanced Oxidation) treatment, the latest technology in an advanced treatment facility that implemented it on Ilsan water purification with outstanding performance (150,000 tons/day) compare to industry standards.
We have acquired patents and new technologies for our products consuming the largest market share in Korea and have been nominated as an "excellent environmental company" by the Ministry of Environment Korea.
Our mission is to become a company loved by customers through continuous technology development and contribution to the environmental industry. We will pursue the best to improve the quality of life by developing the world's only technology with the connected power of talented executives and employees. Thank you.

Executives and employees of NeotecUV., Ltd

FACTORY & RESEARCH LAB









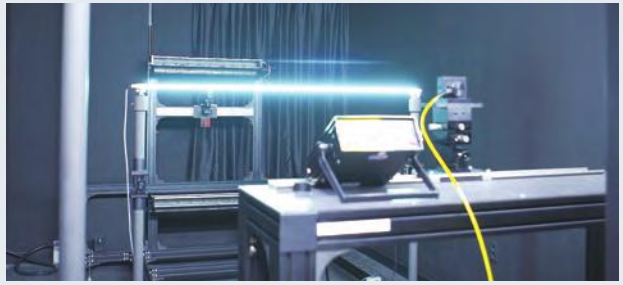




Ansan Factory and Laboratory

Dangjin Factory







Research Laboratory

01

Advanced Oxidation Process

Technology development with K-Water, UV-AOP system has been completed with R&D funding from the Korea Institute of Environmental Industry and Technology under the Ministry of Environment

AOP technology?

UV disinfection was introduced for the decontamination of industrial wastewater and contaminated groundwater. Adding hydrogen peroxide to water generates hydroxyl radicals, which attack and oxidize the organic contaminants. More recently, the UV/H2O2 process has been applied to the treatment of micropollutants (e.g., pesticides, herbicides, endocrine-disrupting compounds, pharmaceuticals, etc.) in major drinking water plants.

OH Radical Formation | $UV + H_2O_2$ | $UV + O_3$ | $UV + Cl_2$ | Etc.

NEOTEC's UV-AOP?

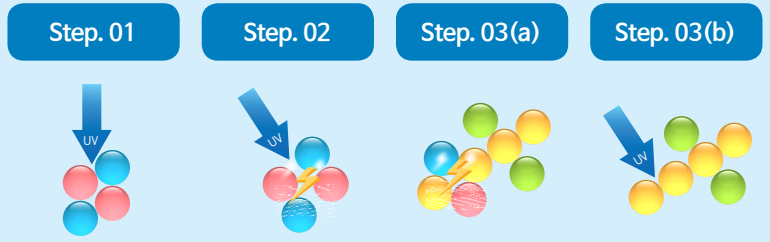
UV-AOP is a nationally recognized technology developed as one of the national research and development (R&D) projects in Korea. Through bioassay testing and CFD modeling, Neotec have developed design optimization tools and operations control system.

Oxidation Power Comparison

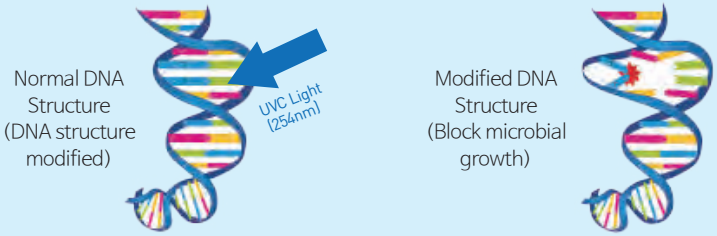
OH radical 〉〉 O_3 〉 Clorine

- **OH radical :** 2000 times more powerful than Ozone, and 180 times than solar Ultraviolet rays.
- **O_3 :** 3600 times faster oxidation speed and 7 times more oxidation power of chlorine
- **Clorine :** Sterilization and oxidation power are significantly lower than OH radicals and ozone

Oxidation Process



Disinfection Process



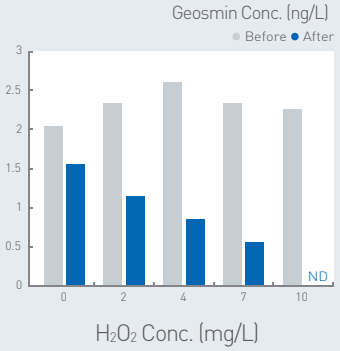
Application

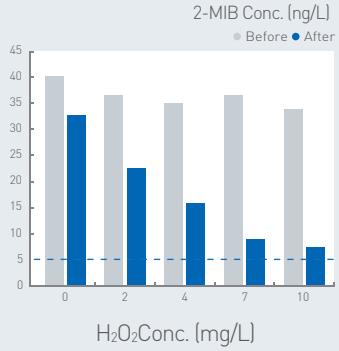


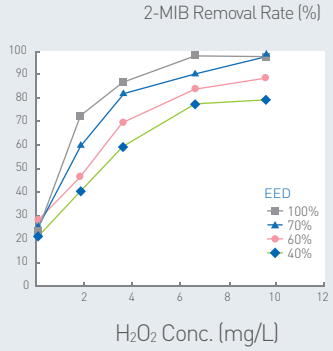
Removal

Substances	Contaminants
• Geosmin, MIB (2-Methylisoborneol), etc.	• Microcystin, Neurotoxins
Micropollutants	
• NDMA	• EDCs
• PPCPs	• 1,4 Dioxane, PCE, TCE
• Other Contaminants (cyanide, etc.)	• Pesticide
• MTBE, BTEX	• Surfactants
Organic Pollutants	
• Organic waste liquid (Oxalate)	• Plating Waste

Efficiency













02

LOW-PRESSURE UV AOP CERTIFIED



Ilsan Diamond Type



Chilseo UV-AOP



Topaz Type UV-AOP

International Cerification

- CE(COC)
- CE(DOC)
- NSF60 (Cleaning System)
- UL

Domestic Certicication

- Outstanding R&D Innovation
- Environmental Assurance
- Certified Green Product
- Certified Green Technology

Entrepreneur Certification

- Korea Enviromental Awards
- Innovative SMEs (INNO-BIZ)
- Leading Environmental Company

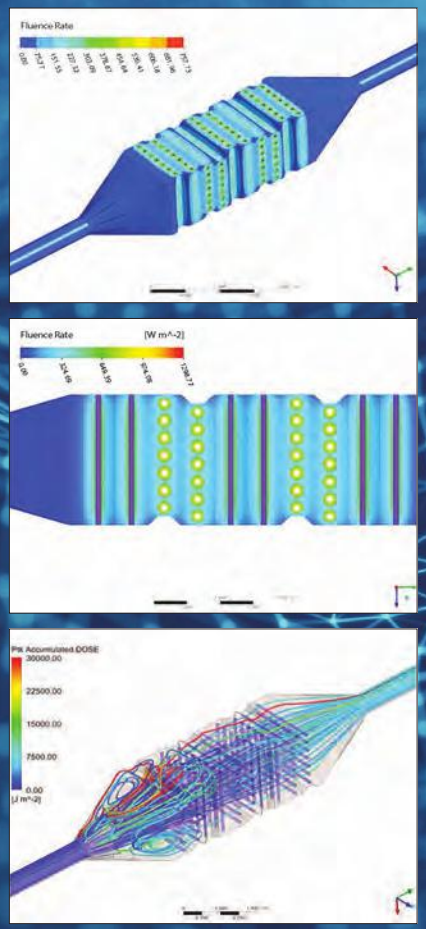
Patent

- Optimum design method of an ultraviolet reactor for an advanced oxidation process (AOP)
- Device and process for improving mixing in the uv disinfection of liquids
- Apparatus for cleaning Quartztube
- Ultraviolet lamp and apparatus including the same for sterilizing and purifying fluid
- Ultraviolet light emitting device and water treatment device comprising it
- Quartz tube cleaning apparatus
- Chamber type ultra violet disinfection units for submersed cleaning cylinder
- Closed type inline medium pressure uv sterilizer
- Chemical Cleaning System of UV Disinfection System and Method thereof

LOW PRESSURE UV SYSTEM FOR

ADVANCED OXIDATION PROCESS

CFD Modeling



❶ Oxidant Storage Tank

❷ Oxidant Dosing Control Panel

Standard : Oxidant dosing pump (Real-time dose control with SCP)

Option : Online UV transmittance monitor (Real-time status of UV transmittance with SCP)

Option : Monitoring the concentration of injected oxidant (The actual injected oxidant concentration update with SCP)

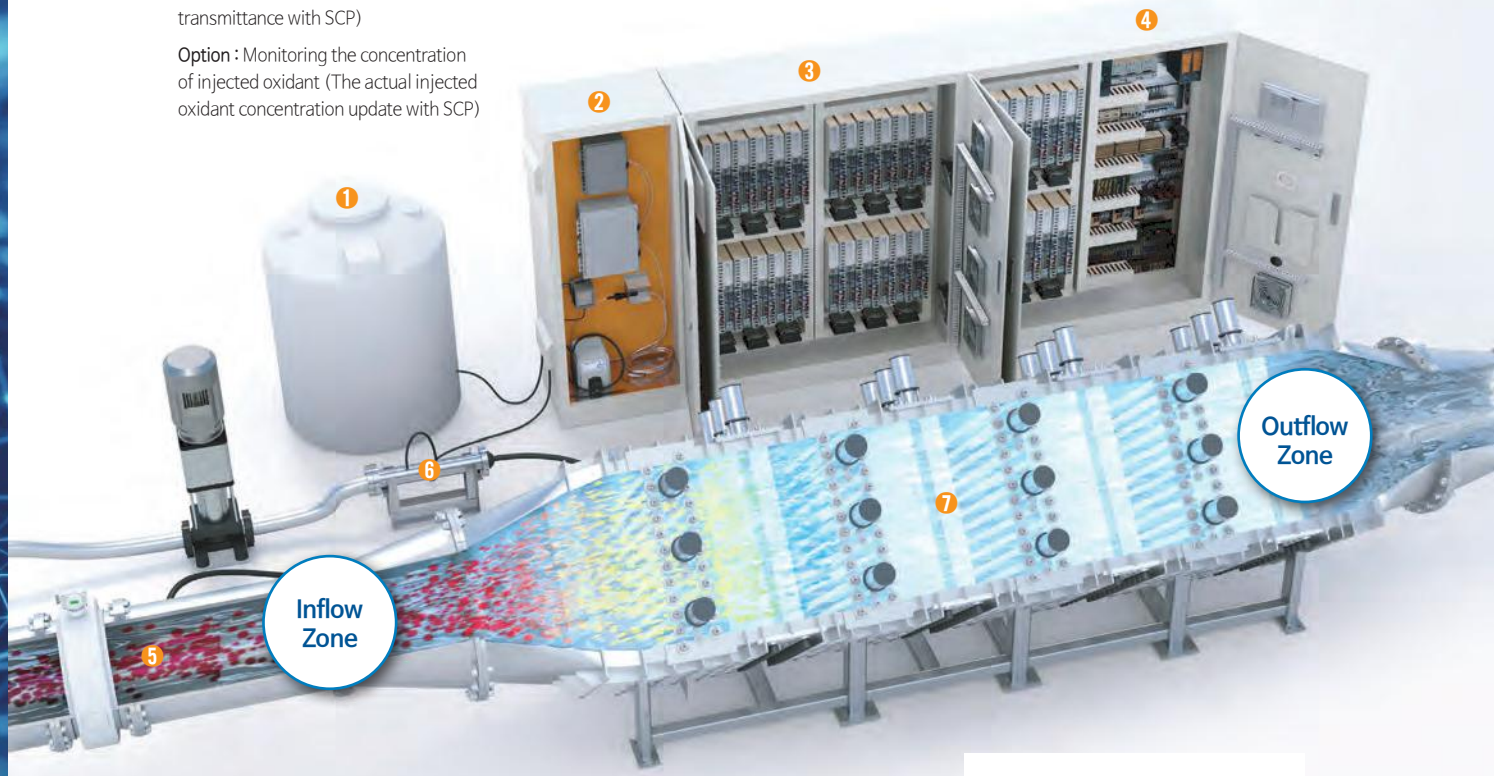
❸ Power Supply Panel (PSP)

A power supply to UV lamps

Electronic Ballast automatically control lamp output

❹ System Control Panel (SCP)

Automatic control of lamp output and oxidant dosage in response to of changing flow rate or water quality



❺ Flow Meter

Real-time measurement of flow rates to SCP

❻ Oxidant Dosing System (Option)

Oxidant injection into a pipeline using a static mixer or diffuser

❼ UV Chamber

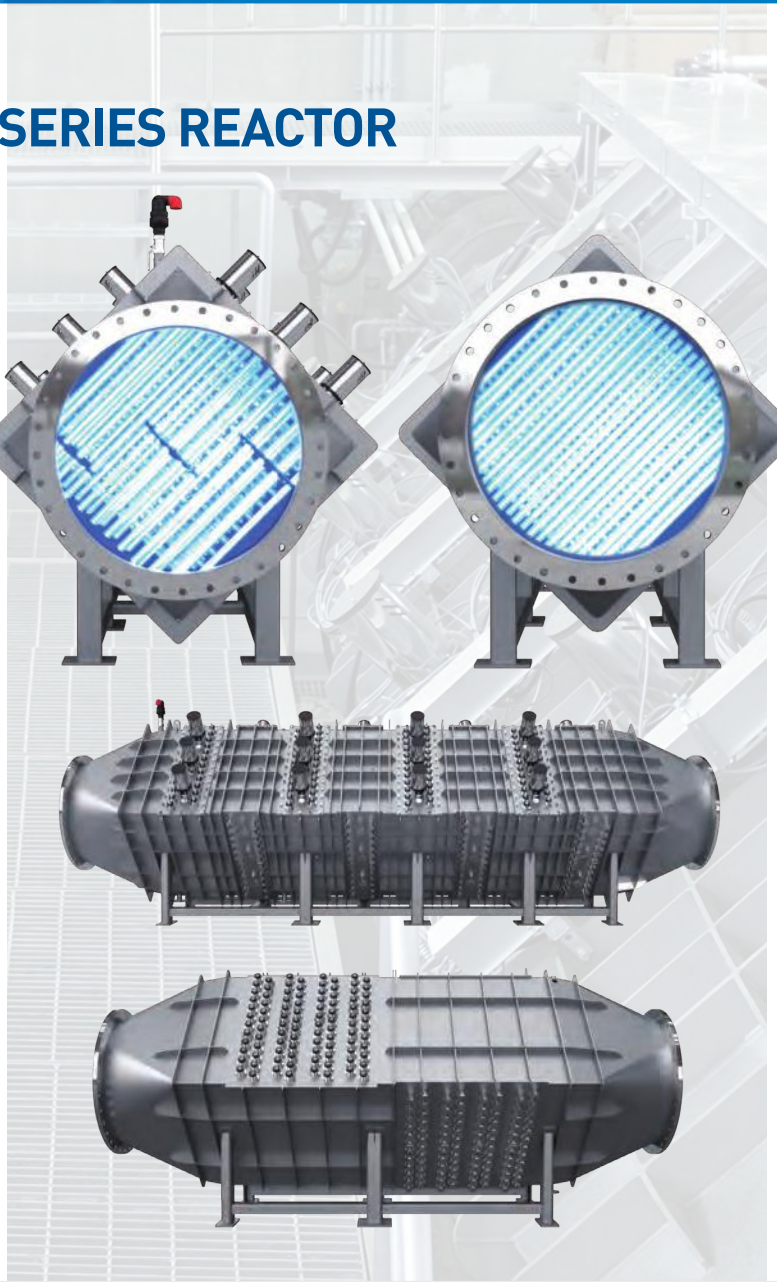
Material : SS316L
Option : Wiper System
Option : Temperature Sensor
Option : UV Intensity Sensor System

LOW - PRESSURE DIAMOND TYPE AOP LM(LN) SERIES REACTOR

LM – Cleaning System / LN - Non-Cleaning System

SYSTEM GENERAL FEATURES	
Model No.	NAOP-5(6)LM(LN)-D series
Chamber Configuration	Diamond type
Module Configuration	24 lamps per module
Cleaning System	Mechanical wiper, Manual
Material	STS 316 / 316L or Duplex STS 2205
Lamp Type	Low-Pressure High Output
Pressure Rating	130 psi (9 bar), 87 psi (6 bar)
Input Power Per Lamp	550w, 600w
Operating Water Temperature	5°C~45°C (41°F~113°F)

SYSTEM CONTROL PANEL (SCP)	
Meterial	Painted Steel / STS 304 Available
Contorller	Programmable Logic Controller (PLC)
Inputs	4-20mA, Ethernet, RS-485
Outputs	Ethernet, RS-485
Voltage / Frequency	360 ~ 480 ±10% / 50/60 Hz
Operating Temperature	0°C~50°C (32°F~120°F)
Location	Indoor and Outdoor
Ballast Type	Variable output electronic ballast



LOW - PRESSURE TOPAZ TYPE AOP LM(LN) SERIES REACTOR

LM – Cleaning System / LN - Non-Cleaning System

SYSTEM GENERAL FEATURES	
Model No.	NAOP-5(6)LM(LN)-T series
Chamber Configuration	Topaz type
Module Configuration	24 lamps per module
Cleaning System	Mechanical wiper, Manual
Material	STS 316 / 316L or Duplex SUS 2205
Lamp Type	Low Pressure High Output
Pressure Rating	130 psi (9 bar), 87 psi (6 bar)
Input Power Per Lamp	550w, 600w, 960w
Operating Water Temperature	5°C~45°C (41°F~113°F)

SYSTEM CONTROL PANEL (SCP)	
Meterial	Painted Steel / STS 304 Available
Contorller	Programmable Logic Controller (PLC)
Inputs	4-20mA, Ethernet, RS-485
Outputs	Ethernet, RS-485 Communication
Voltage / Frequency	360 ~ 480 ±10% / 50/60 Hz
Operating Temperature	0°C~50°C (32°F~120°F)
Location	Indoor and Outdoor
Ballast Type	Variable output electronic ballast



03

MEDIUM-PRESSURE UV AOP CERTIFIED

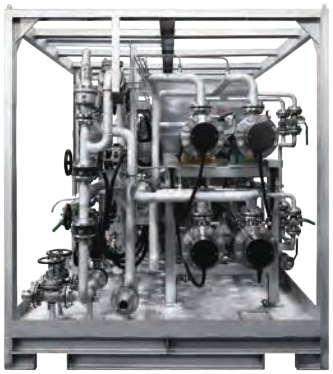


U-Type



In-Line Type





Decontamination System

International Certification

CE(COC)	**DVGW / UVDGM Certification** • 300A 4kW x 3 Lamp (12kW) In Process • 450A 4kW x 6 Lamp (24kW) In Process • 600A 6kW x 6 Lamp (36kW) In Process • 750A 8kW x 6 Lamp (48kW) In Process • 800A 8kW x 8 Lamp (64kW) In Process • 800A 8kW x 12 Lamp (96kW) In Process • 800A 10kW x 12 Lamp (120kW) In Process
CE(DOC)	
NSF50	
NSF61 (In process)	

Domestic Certification

- Outstanding R&D Innovation
- Certified Green Product & Technology
- Environmental Assurance

Overseas Certification

- Korea Enviromental Awards
- Innovative SMEs (INNO-BIZ)
- Leading Environmental Company

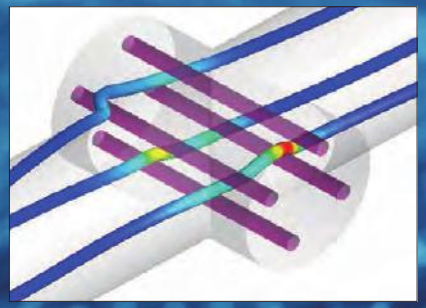


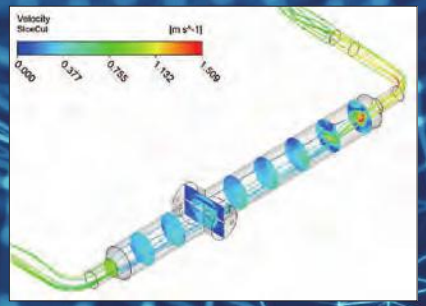
NSF Validated Facilities

MEDIUM PRESSURE UV SYSTEM FOR

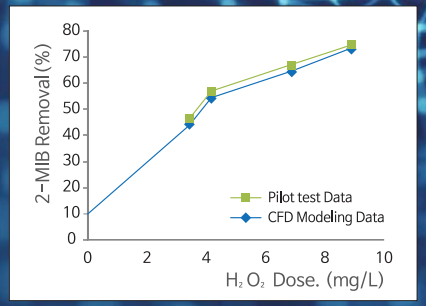
ADVANCED OXIDATION PROCESS

CFD Modeling





CFD VS Test Data



❶ Oxidant Storage Tank

❷ Oxidant Dosing Control Panel

Standard : Oxidant dosing pump (Real-time dose control with SCP)

Option : Online UV transmittance monitor (Real-time status of UV transmittance with SCP)

Option : Monitoring the concentration of injected oxidant (The actual injected oxidant concentration update with SCP)

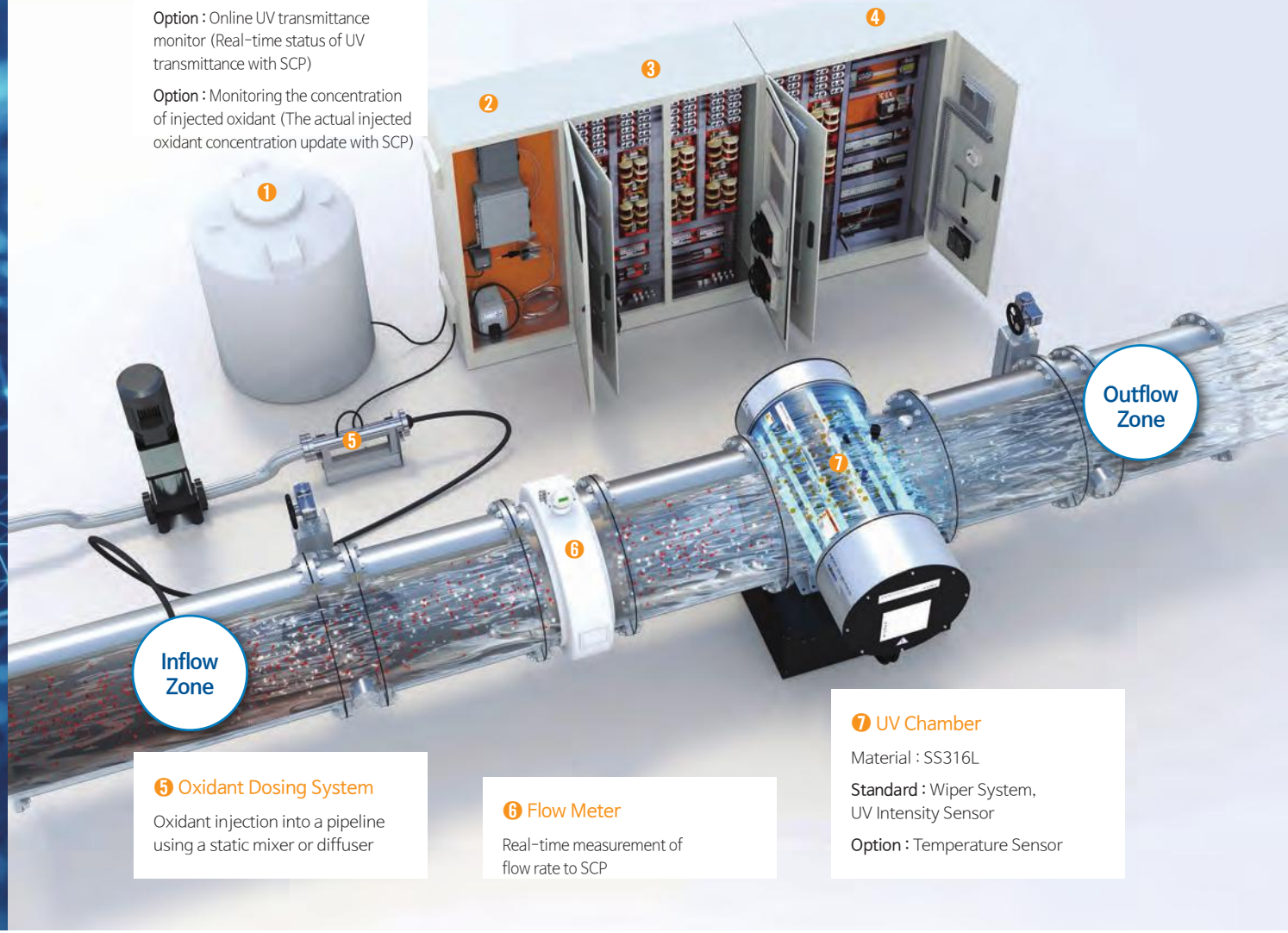
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❻ Flow Meter

Real-time measurement of flow rate to SCP

❼ UV Chamber

Material : SS316L

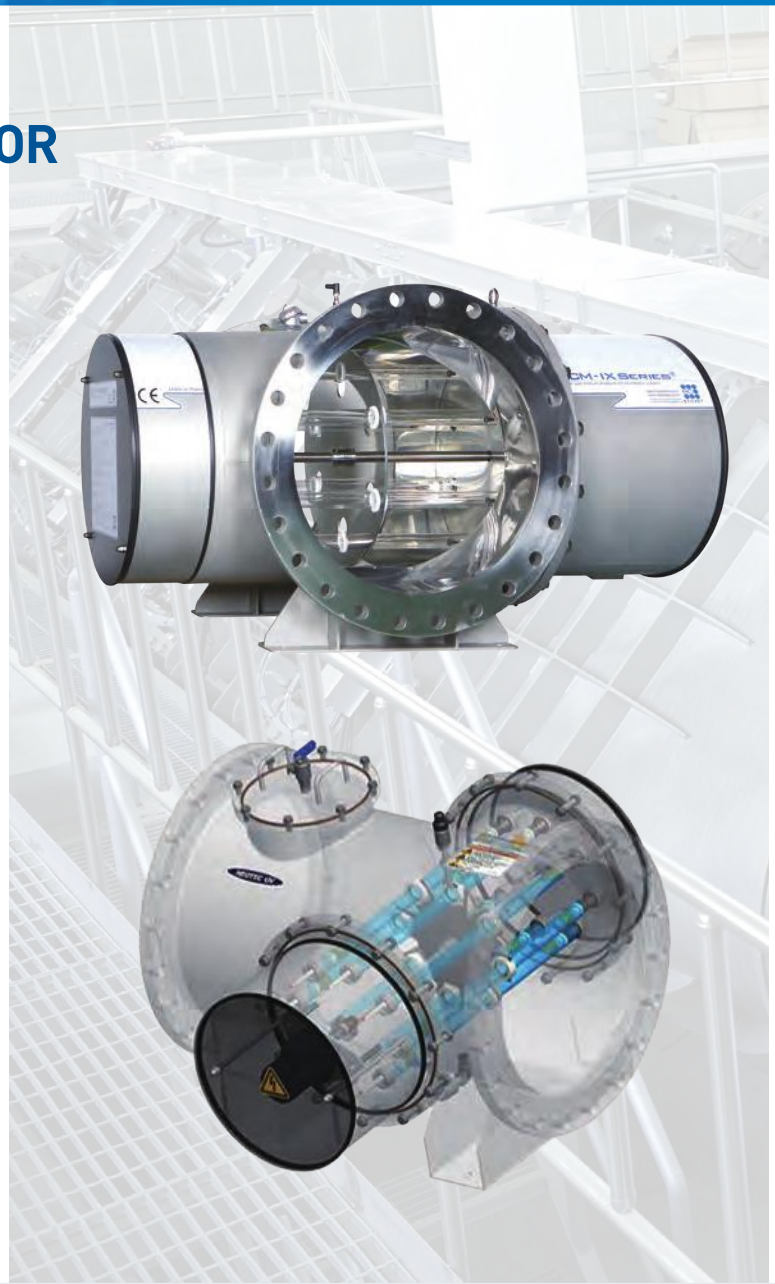
Standard : Wiper System, UV Intensity Sensor

Option : Temperature Sensor

MEDIUM - PRESSURE AOP MM –I SERIES REACTOR IN-LINE TYPE WITH CLEANING SYSTEM

SYSTEM GENERAL FEATURES	
Model No.	NAOP-4(6, 8, 10)MM-I series
Chamber Configuration	In-Line type
Module Configuration	4 to 12 lamps
Cleaning System	Mechanical wiper
Material	STS 316 / 316L
Lamp Type	Medium Pressure
Pressure Rating	Up to 145 psi (10 bar)
Input Power Per Lamp	4kW, 6kW, 8kW, 10kW
Operating Water Temperature	5°C~45°C (41°F~113°F)

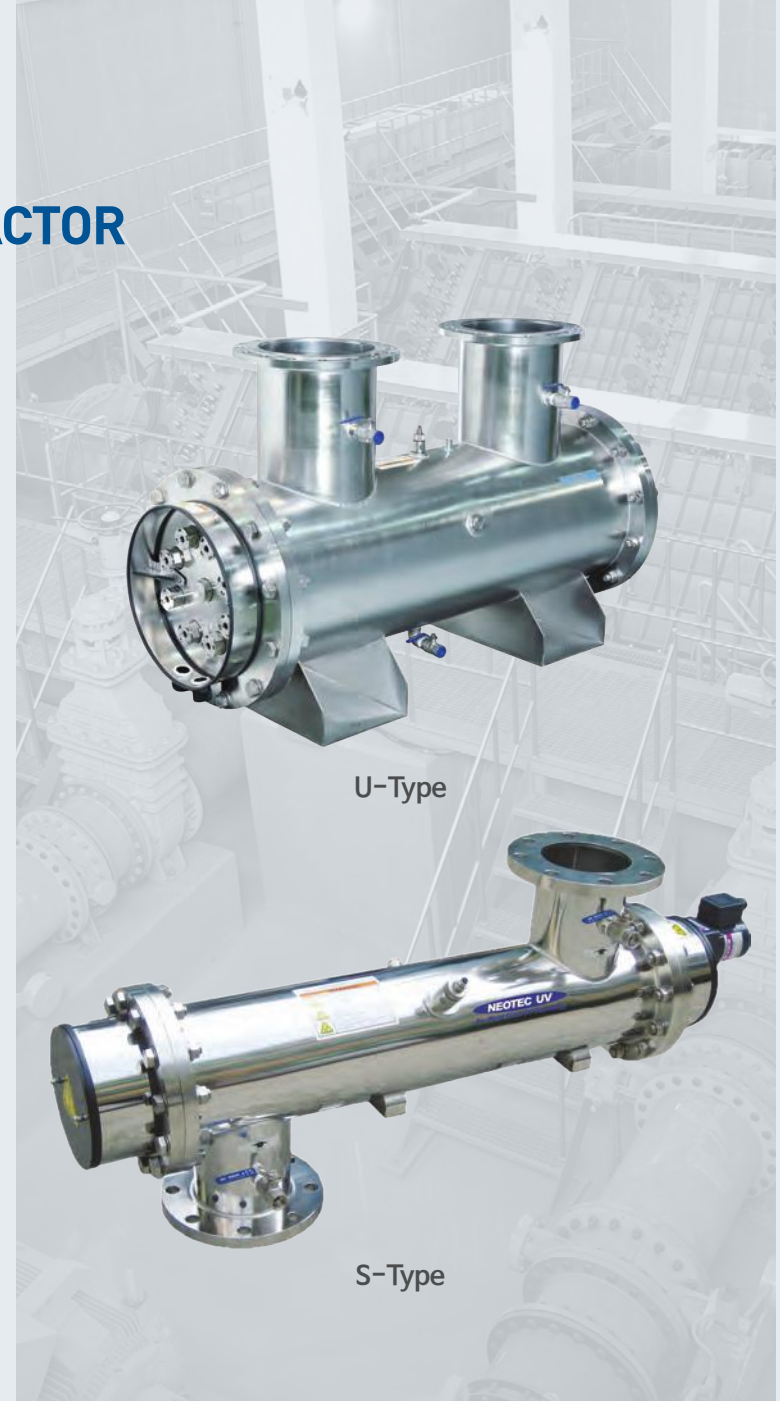
SYSTEM CONTROL PANEL (SCP)	
Meterial	Painted Steel / STS 304 Available
Contorller	Programmable Logic Controller (PLC)
Inputs	4-20mA, Ethernet, RS-485
Outputs	Ethernet, RS-485
Voltage / Frequency	360 ~ 480 ±10% / 50/60 Hz
Operating Temperature	0°C~50°C (32°F~120°F)
Location	Indoor and Outdoor
Ballast Type	Variable output electronic ballast



MEDIUM-PRESSURE AOP MM –U(S) SERIES REACTOR
U-TYPE & S-TYPE WITH CLEANING SYSTEM

SYSTEM GENERAL FEATURES	
Model No.	NAOP-4(6, 8, 10)MM-U(S) series
Chamber Configuration	U-type, S-type
Module Configuration	1 to 12 lamps
Cleaning System	Mechanical wiper
Material	STS 316 / 316L
Lamp Type	Medium Pressure
Pressure Rating	Up to 145 psi (10 bar)
Input Power Per Lamp	4kW, 6kW, 8kW, 10kW
Operating Water Temperature	5°C~45°C (41°F~113°F)

SYSTEM CONTROL PANEL (SCP)	
Meterial	Painted Steel / STS 304 Available
Contorller	Programmable Logic Controller (PLC)
Inputs	4-20mA, Ethernet, RS-485
Outputs	Ethernet, RS-485
Voltage / Frequency	360 ~ 480 ±10% / 50/60 Hz
Operating Temperature	0°C~50°C (32°F~120°F)
Location	Indoor and Outdoor
Ballast Type	Variable output electronic ballast



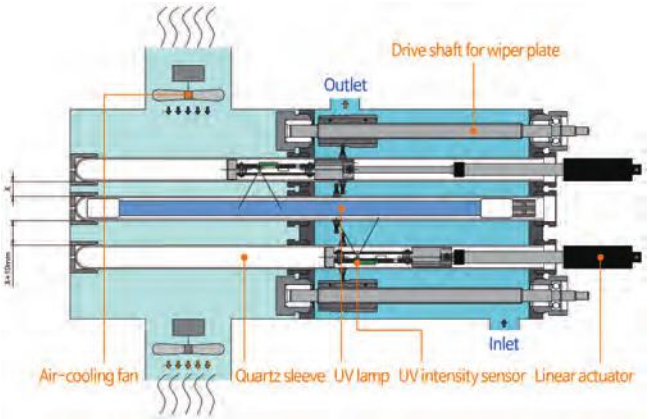
U-Type

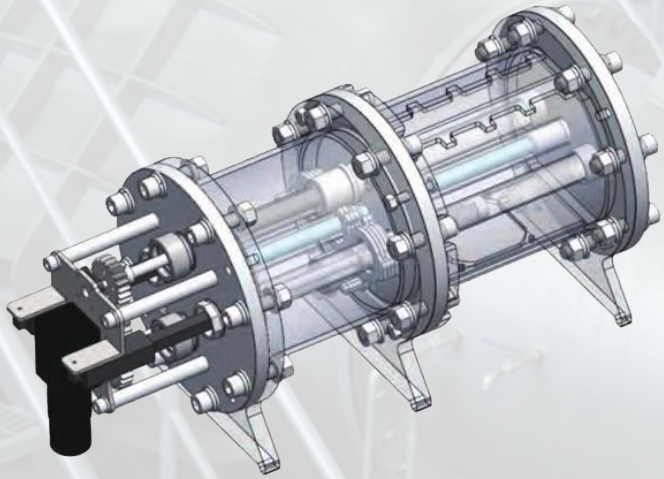
S-Type

ONLINE UVT METER (OPTION)

UV Transmittance Measuring System

SYSTEM GENERAL FEATURES	
UVT Measuring range	10~100%
Light Source	LP UV lamp
Operation	Connection to SCP
Self-diagnostic	Detect fault and send alarms to SCP
Measuring time	Initial : ~ 1min Continuous : ~ 10sec
Measuring Type	Dual-sensor detection
Maintenance (Cleaning system)	OMC or Bubble clean (optional)
Cleaing time	5mins / cycle
Calibaration type	Automatic contnuous calibration
Output	0 - 5V
Size (mm)	800 x 350 x 250 (L x W x H)
Lamp life	2 years
Water Temp.	0 ~ 60°C





Features of Online UVT Meter

- Based on real-time UVT measurement, controls lamp output for energy consumption saving.
- Automatic and continuous calibration allows UVT self-calculation and check with maintaining accuracy
- Measures UVT without problem in case of 1 of sensors malfunction
- Easy maintenance with OMC system (optional Bubbleclean system)
- In case of applying OMCC system, it shares Bubble clean system with UV reactor

BUBBLE CLEAN SYSTEM (OPTION)
CLEANING SYSTEM

SYSTEM GENERAL FEATURES	
Notification System	Automatic
Cleaning method	OMCC + Microbubble + Rapid Circulating Cleaning Solution
Leak detection	Automatic Alarm system
Refill system	Easy to replace without drainage

Features of Bubble Clean System

- One aboveground cleaning solution tank supplies many UV modules.
- No Drainage or refill of cleaning solution is required when replacing quartz sleeves and UV lamps
- Easy to replenish or replace chemical cleaning solution.
- No decrease in cleaning efficiency due to loss of solution.
- Automatic notification system to replace cleaning solution.
- The recovery of entire cleaning solution in the wiper collars when cleaning system stops.
- Easy to check the contamination level of cleaning solution.
- No decrease in cleaning efficiency due to contamination.
- No concern of solution leakage contaminating the water to be treated.
- Cleaning solution leakage alarm system with the automatic leak detection system.
- Cleaning solution made from food additive ingredient (NSF 60 certified)





NEOTEC
World Class UV Technology

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