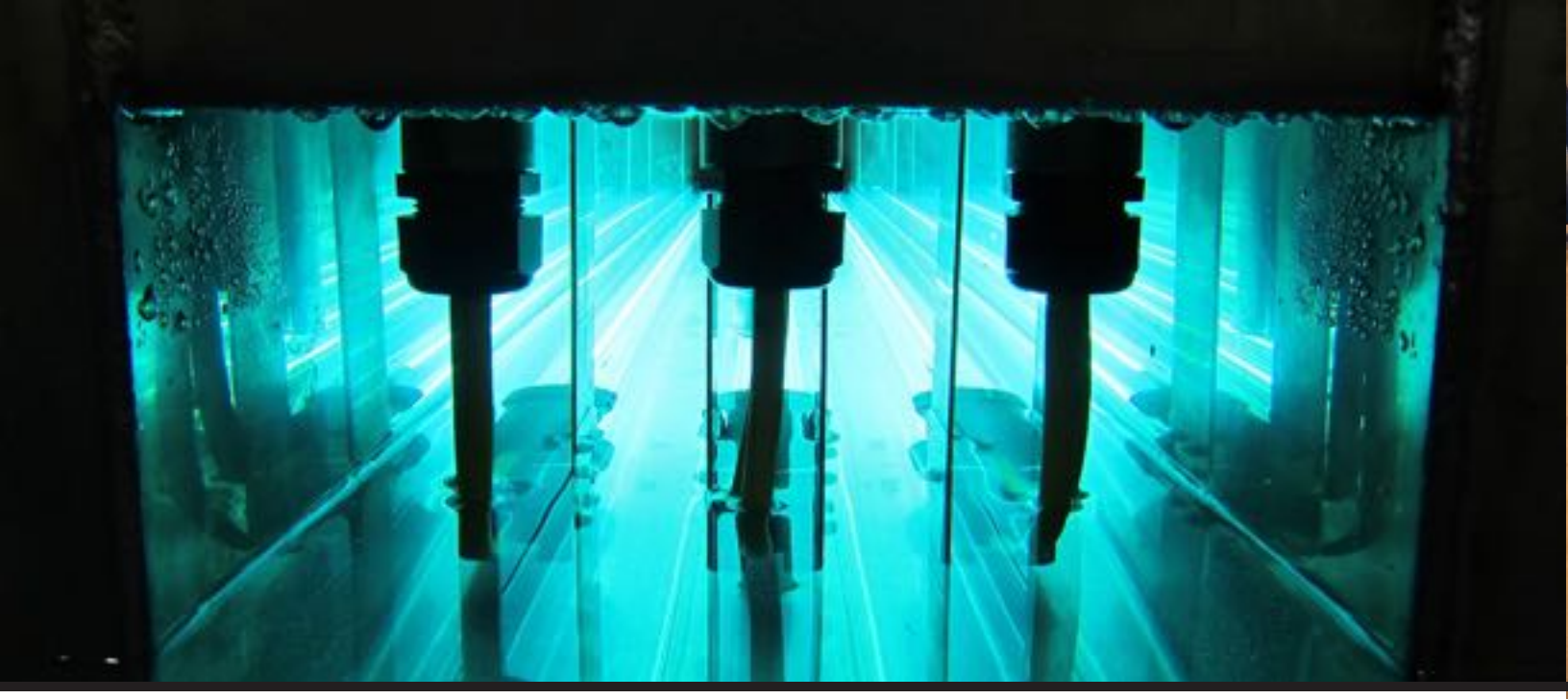
GLOW Series Wastewater

Horizontal Open Channel Ultraviolet Disinfection

GLASCO UV



GLOW Series

Our Company

Glasco has been manufacturing UV disinfection systems for over 50 years. Equipment is manufactured for a variety of markets, industries and applications in our NJ (USA) facility.

Founded in 1922, Glasco began as a New York City based metal equipment fabricator for the food and beverage industries. In the 1940's, the company was committed to supporting other manufacturers during the war effort. Our stated mission was to "*build and design any handling equipment made of metal that will enable you to process or fabricate more expeditiously or more efficiently".*

In the 1960's, Glasco introduced their first chambered UV system for an industrial application. Since then, we have manufactured tens of thousands of UV systems. The UV business developed in the industrial markets and grew into the municipal market in the 1980s.

Today, Glasco manufactures a wide range of UV systems for treating both clean and wastewater for residential, commercial, industrial and municipal marketplaces.

Systems integrate UV light to provide environmentally friendly disinfection. UVC light, defined as light emitted at wavelengths between 200 and 300 (254 is peak) nanometers (nm), is used as a means of disinfection by inactivating microorganisms, including waterborne diseases (pathogens). UV irradiation has been proven to be a fast, reliable, effective, economical, and green disinfection method and has been successfully applied worldwide for decades.

UVC lights targets the microorganisms' DNA. Exposure to UVC light prevents the microorganism from reproducing and cells that cannot reproduce cannot infect and are therefore harmless.

1. UV Disinfection

When wastewater pathogens are exposed to UV light, their cells become damaged and this damage inhibits reproduction. The UV light, produced by a special UV lamp, damages the cell's DNA and RNA and once damaged, they are unable to replicate. This physical process renders them harmless.

2. The Kill

The amount of damage is a result of the lamp's UVC intensity multiplied by residence time. The dosage is commonly referred to as microwatts and is often expressed as mJ/cm2. Dosages of 30,000 uWs/cm2 (30 mJ) are common for meeting a 200/100 ml discharge permit.

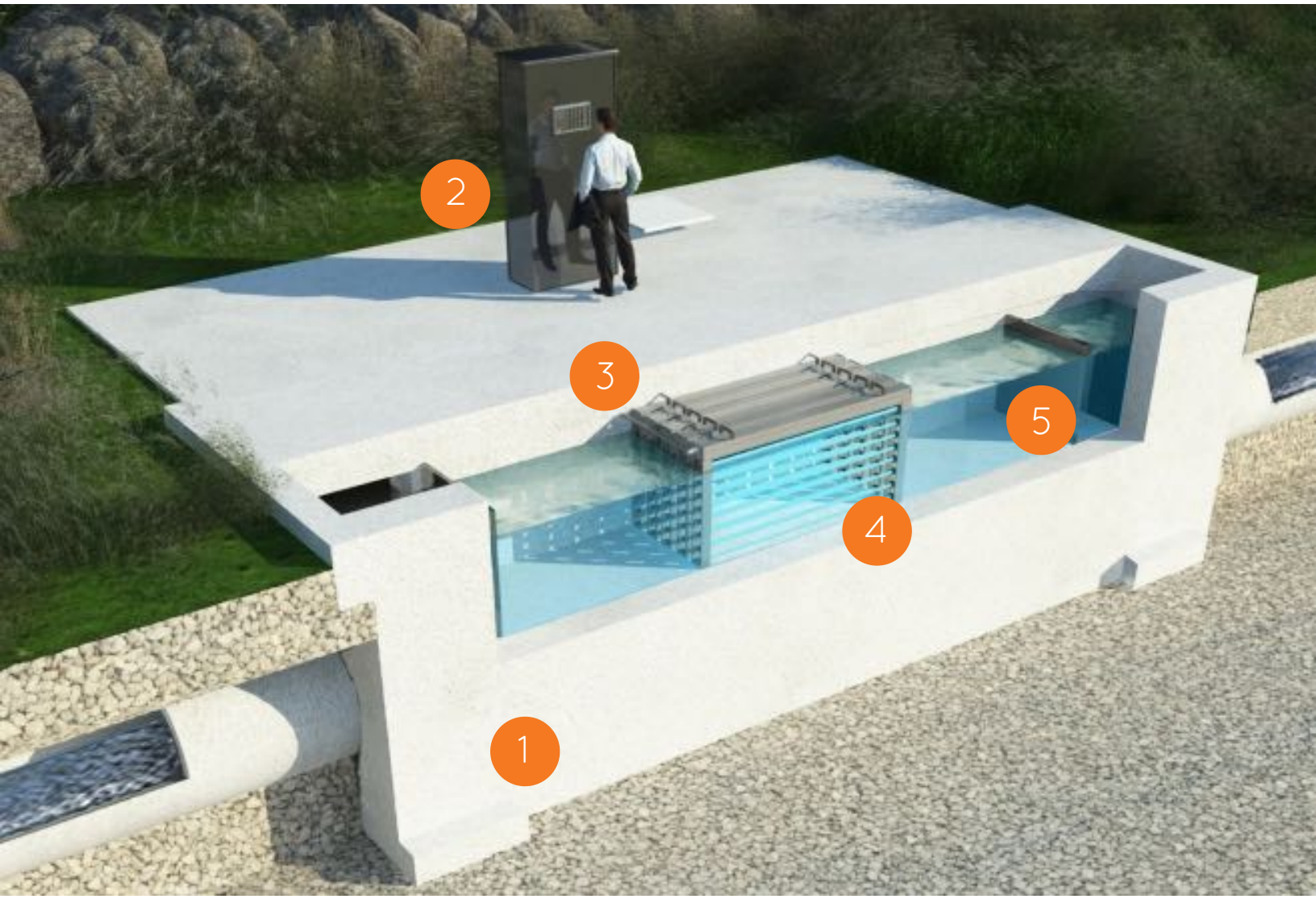
3. Calculating Dose

The two primary methods to calculate dose are biological testing (bioassay) and mathematical calculations using light physics (Point Source Summation Method aka UVDIS). Both offer end-users with information that is important in system sizing. Each method takes into account flow rate, water transmission, lamp type and # of lamps.

4. Why use UV?

UV disinfection is a well accepted method for treating wastewater. The main benefits: a green technology (no chemicals), short residence time and the technology has matured over the last 40 years. UV disinfection produces no harmful by-products and will work on a wide range of effluent quality.

Horizontal Plant Overview



UV channel layout and level control devices

Horizontal open channel UV systems will be installed in a pre-packaged stainless steel or pre-poured concrete channel. Systems need to be designed with level control systems. Level control is necessary to keep the UV lamps submerged regardless of flow (from 0 to peak). There are three (3) types of level control systems: finger weir, counter-balanced level gate and downward opening gate.

There are pros and cons for the three (3) options. The most common and economical is a fixed serpentine finger weir. For higher flow rates, a counter-balanced gate can be considered for its smaller footprint and lower headloss. A downward opening gate requires a level sensing system and is the more complicated of the control systems.

1 Concrete Channel

2 BCC / SCC

3 Junction Box

4 Modules

5 Level Control

Horizontal Operation

Modules are lowered into a stainless steel support system. Once in place, the module's utilities (power, data and air) are connected to the Ballast Control Center (BCC) and System Control Center (SCC) directly or through a junction box.

As wastewater enters the channel, banks of modules will turn ON in relation to a flow signal. To aid in lamp life and energy savings, the system can be designed to dim the UV lamps based on a flow signal.

The quartz sleeves and UV sensor are automatically cleaned on a periodic basis. The sleeves are wiped to prevent build-up from adhering to the quartz.

Throughout the year, operators inspect the system to ensure that the lamps are functioning and that they are still producing actual UV light. Lamp Out and Low UV output indicators and alarms will direct operators to the service issue.

Modules are removed for service, cleaning or for seasonal storage.

Ballast Control Center (BCC)

Modules are connected to a Ballast Control Center (BCC). This remote enclosure houses the ballasts, electronics, electrical devices and controls in a modified NEMA 4x housing.

BCC's come in many configurations and are designed for harsh wastewater environments. These range from smaller thermoplastic with Lexan window kits to free standing stainless steel with air conditioners, PLC controls and touchscreen interface.

All BCCs can be located up and away from the channel. Depending on the requirements, the BCC can be located up to 90 feet from the channel.

Automatic Quartz Cleaning System

Modules may come with an automatic quartz cleaning system. The pneumatically driven piston uses a quick stroke approach to remove materials from the sleeves before they have the ability to build up and foul. System can use a standalone air compressor or plant supplied air.

Ultraviolet Monitoring

Modules incorporate a UV light sensor and monitoring system. The sensor is placed in its own dedicated quartz sleeve, which is cleaned as part of the automatic quartz wiping system. The sensor reads 360 degrees of UVC light and provides an output from 0-100% or uW/cm2.

Lamp and System Maintenance

In order to perform preventive and yearly maintenance, the horizontal module needs to be removed from the channel. Once removed, operators need to undo the quartz o-ring seal, remove the quartz sleeve, remove and then replace the lamp and then re-quartz for return to operation.

Controls and Displays

At a minimum, each horizontal system will display lamp operating status, run time and UV output. PLCs can be integrated for remote monitoring on a lamp by lamp basis, lamp dimming, flow pacing based on a 4-20 mA signal from plant flow meter and automatic operation.

1

GLOW-300 (30” - 80 Watts)

Treats wastewater flows up to **150,000 GPD.** Called packaged plants, systems comes with stainless steel channel, transition boxes and built in weir. Electronics are remote in a NEMA 4x enclosure. Lamp: Low pressure **high output 80 watts**.

2

GLOW-5000 (60” - 155 Watts)

Treats wastewater flows up to **2.0 MGD**. System is biologically validated. Lamp technology: Low pressure **high output 155 watts**.

3

SUNLIGHT4XHO (60” - 155 Watts)

Treats wastewater flows up to **2.0 MGD**. System is biologically validated. Lamp technology: Low pressure **high output 155 watts**.

Validated under US EPA ETV Environmental Tech Verification

4

GLOW-6000 (60” - 320 Watts)

Treats wastewater flows up to **10 MGD**. Using state of the art amalgam UV lamp technology, the system has a 15 year track record and has been biologically tested. Lamp technology: Low pressure high intensity **amalgam 320 watts**.

Horizontal Models

Horizontal UV disinfection systems have been the most widely installed type of UV system in the world.

While wastewater plants have many availabe configurations (vertical open channel, chambered or Telfon tube (FEP), horizontal systems have been our most widely installed product.

While designed for unlimted flows, we believe that larger flows are better suited for vertical amalgam systems.

Glasco has installed hundreds of horizontal systems and continues to be a major supplier for plants < 1 MGD.

Typical Set Up

- Stainless steel or pre poured concrete channel
- Horizontal modules
- Remote NEMA 4x enclosures
- Level control (weir, flap gate or downward gate)
- Optional automatic air driven quartz cleaning
- UV monitoring
- PLC control
- Select models bioassayed at UV Validation and Research Center - Johnstown, NY
- Hydraulically tested and profiled
- Environmental Technology Verification (ETV) test performed for NSF International (NSF) and the US Environmental Protection Agency (US-EPA)

GLOW 300	
Flow rate range	up to 150,000 GPD
Channel	Stainless (optional concrete)
Level Control	Stainless weir with drain
Lamps	Low Pressure HO
Watts per lamp	85
Voltage	120-277 50/60 Hz
Electrical enclosures	Remote NEMA 4x Fiberglass
Ballasts	Electronic
UV Monitoring	0-100% (optional 4-20 mA)
Quartz sleeve cleaning	Optional Automatic

The **GLOW 300** is our offering for lower flow rates (<150,000 US GPD) and is designed to treat a 6" water level. The system has been designed for smaller packaged wastewater treatment plants.

Systems are good for smaller towns, industries, mobile home parks and new developments.

The **GLOW 5000** is our offering for mid sized waste water plants exceeding 150,000 GPD. The system has 15 production years and hundreds of world wide installations.

Systems can be provided with pre-packaged stainless steel channel, but can also be installed in pre-poured concrete channels.

GLOW 5000	
Flow rate range	Up to 2 MGD
Channel	Stainless (optional concrete)
Level Control	Stainless weir with drain
Lamps	Low Pressure HO
Watts per lamp	155
Voltage	120-240 50/60 Hz
Electrical enclosures	Remote NEMA 4x Stainless
Ballasts	Electronic
UV Monitoring	0-100% (optional 4-20 mA)
Quartz sleeve cleaning	Optional Automatic

SUNLIGHT H-4XE-HO (typical 200/100 ml plant)	
Flow rate range	1.0 MGD / Bank
Channel	Stainless steel or concrete
Level Control	Stainless weir with drain
Lamps	Low Pressure HO
Watts per lamp	155
Voltage	120-240 50/60 Hz
Electrical enclosures	Remote NEMA 4x Stainless
Ballasts	Electronic
UV Monitoring	0 - 100% with 4-20 mA
Quartz sleeve cleaning	Optional Automatic

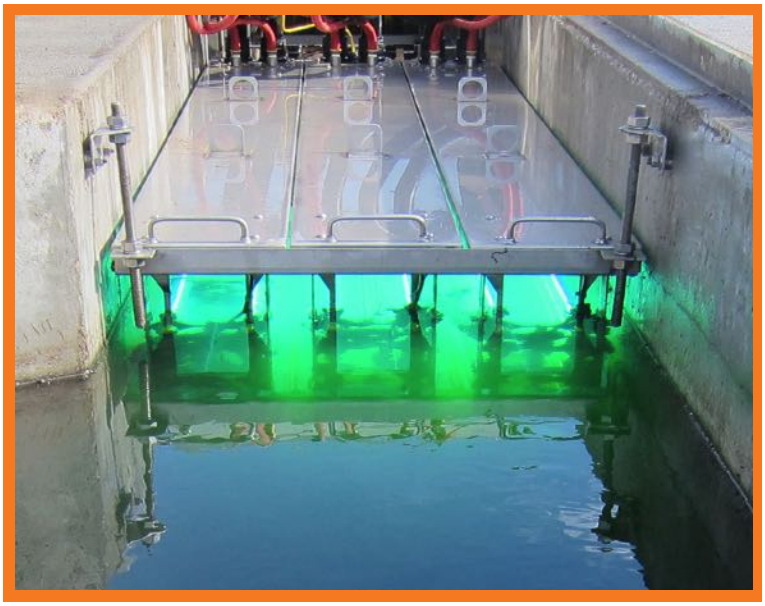
The **SUNLIGHT H-4XE-HO** is a sixteen (16) lamp biologically validated low pressure high output UV disinfection channel system that treats 1 MGD (for a 200/100 ml) and is designed to treat a 12" water level .

The system has been validated in cooperation with the NSF and US EPA's Environmental Technology Verification Program (ETV).

The **GLOW 6000** large flow horizontal amalgam UV disinfection system is designed for large plants.

Using state of the art lamp, ballast and monitoring equipment, the GLOW 6000 is a high tech UV disinfection system.

The system uses various plant parameters to dim the lamps in relationship to the flow. This allows for energy and lamp conservation.



GLOW 6000	
Flow rate range	Up to 10 MGD
Channel	Concrete
Level Control	Weir, Flap Gates, Gate
Lamps	Low Pressure Amalgam
Watts per lamp	320
Voltage	208-240 V 50/60 Hz
Electrical enclosures	Remote NEMA 4x Stainless
Ballasts	Electronic
UV Monitoring	0 - 100% with 4-20 mA
Quartz sleeve cleaning	Automatic

Installations

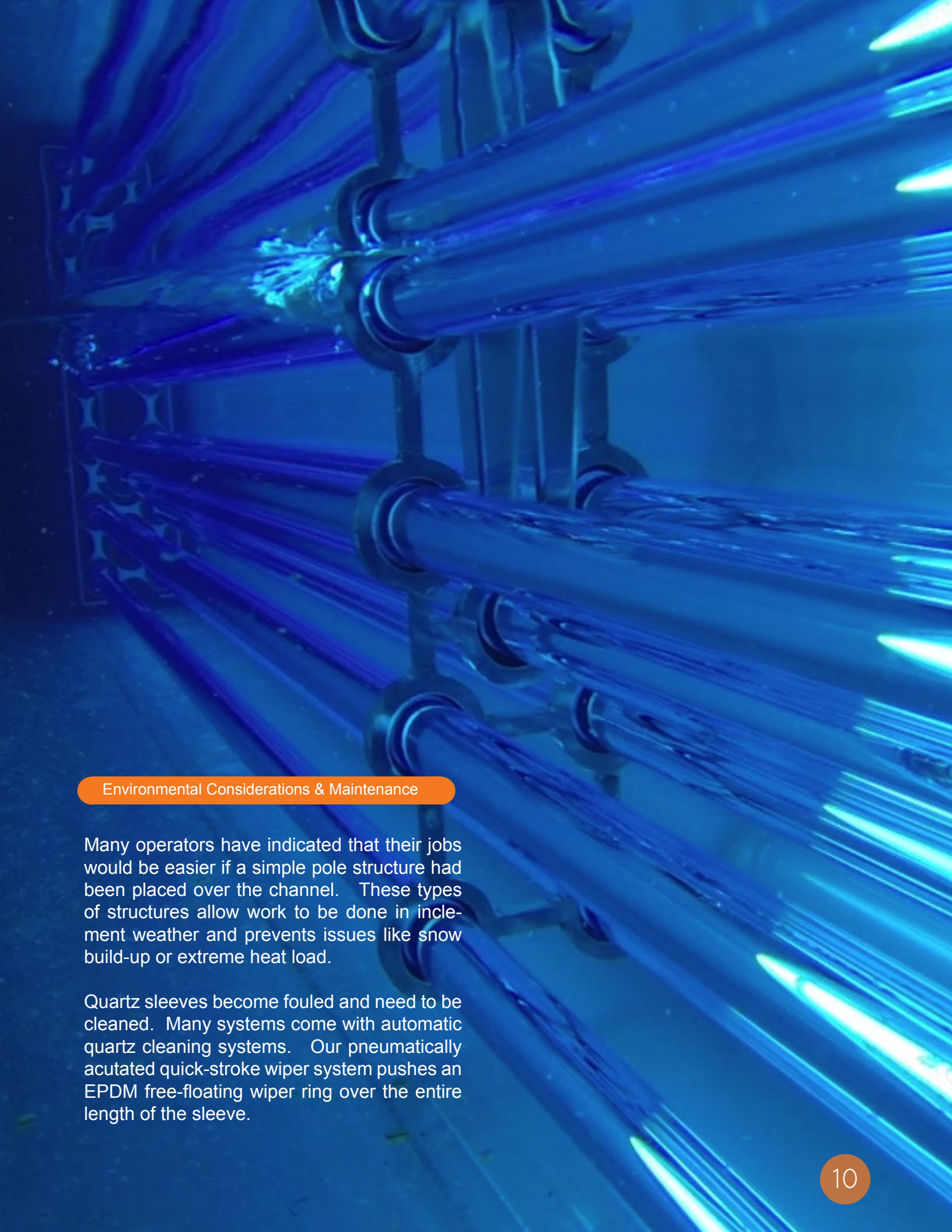
Depending on the Horizontal model, the ballasts and other electronics will be remotely located in a stainless steel or thermoplastic electrical enclosure.

For the higher powered 320 watt amalgam systems, the sophisticated electronics are maintained in remote stainless steel air-conditioned enclosures. For projects that are concerned about flooding, remote ballasts can be beneficial.

A dedicated air compressor may be provided to run the automatic quartz cleaning. A hoist may be incorporated to remove the modules for seasonal disinfection or for servicing.

Experience

- 1999 installed first low pressure high output system.
- 2001 installed first 320 watt horizontal amalgam
- 2004 installed 36 MGD amalgam system.
- 2005 installed 100th wastewater system
- 2007 installed first 450 watt horizontal amalgam.
- 2009 NSF - EPA - ETV Bioassays conducted.
- Worldwide installation base with horizontal systems installed in North and South America, Europe and Asia.



Environmental Considerations & Maintenance

Many operators have indicated that their jobs would be easier if a simple pole structure had been placed over the channel. These types of structures allow work to be done in inclement weather and prevents issues like snow build-up or extreme heat load.

Quartz sleeves become fouled and need to be cleaned. Many systems come with automatic quartz cleaning systems. Our pneumatically acutated quick-stroke wiper system pushes an EPDM free-floating wiper ring over the entire length of the sleeve.

Glasco Ultraviolet, LLC
126 Christie Avenue
Mahwah, NJ 07430 USA
(201) 934-3348 Fax (201) 934-3388
info@glascouv.com glascouv.com

MADE IN THE USA

GLASCO UV