MASSPHOTON LIMITED

Case Summary

MASSPHOTON UVC-LED Water Disinfection Solution for a tourist resort in China

MASSPHOTON LIMITED
Semiconductor Ultraviolet Technology and Applications Expert
www.massphoton.com
info@massphoton.com
Unit 542, 5/F, Building 5W, Hong Kong Science Park

I. Project Overview

As a world-class cultural tourism complex, the tourist resort in China sees a peak daily visitor flow of over 50,000, imposing extremely high requirements on the safety and stability of public drinking water supply. There are more than 120 public drinking water points across the resort, covering core visitor areas. Previously relying on ultraviolet mercury lamps for disinfection, the resort faced prominent pain points: long-term operation led to high energy consumption and the need for annual lamp replacement; moreover, the water temperature could rise to 50-60°C, posing a risk of scalding visitors. Plagued by these issues as well as traditional disinfection limitations—such as potential chemical residues (from auxiliary treatments), cumbersome maintenance, and unstable efficacy under high-flow conditions—the resort partnered with MassPhoton to adopt a customized UVC-LED water disinfection solution, achieving safe, continuous, and low-risk drinking water disinfection.

5000+
Peak daily visitor flow

120+
Public drinking water points

II. Core Challenges

High Visitor Flow

High visitor flow and drastic fluctuations in water demand, requiring the disinfection equipment to adapt to sudden water flow changes while maintaining stable disinfection efficiency.

Regulatory Compliance

Compliance with China's National Drinking Water Hygiene Standard (GB 5749-2022), demanding a microbial sterilization rate of no less than 99.99% without chemical residues, adverse impact on water taste, or safety hazards like overheating.

Harsh Environment

Equipment installed in outdoor/semi-outdoor environments with high temperature, humidity, and dust, requiring long-term stable operation, minimal daily maintenance to control labor costs, and elimination of scald risks caused by water temperature rise.

Complex operation and maintenance

High energy consumption and frequent replacement costs of traditional ultraviolet mercury lamps—annual lamp replacement not only increased operational expenses but also disrupted normal service during maintenance.

III. Customized Solution

Leveraging the advantages of UVC-LED technology, MassPhoton developed a targeted solution:

1. Core Equipment:

Deployed MP-UVC-4LC modules (sterilization wavelength: 270-280nm). With a compact design, they seamlessly integrate into existing equipment for real-time flow-through disinfection. Unlike ultraviolet mercury lamps, the modules require no preheating and start instantly, eliminating water temperature rise and scald risks. They also feature waterproof and dustproof casings to adapt to outdoor conditions.

MP-UVC-4LC

- 270-280nm wavelength
- Compact design
- Real-time disinfection

2. Intelligent Control:

Equipped with a real-time monitoring module to track water flow, disinfection intensity, and other parameters, with automatic alarms for abnormalities. It supports remote data viewing and maintenance reminders, reducing manual inspections.

Track water flow	Disinfection intensity	Automatic alarms	Remote data viewing	Maintenance reminders

3. Installation & Integration:

Modular design enables quick installation without major modifications to existing water pipelines, minimizing operational disruption. The solution significantly saves energy compared to ultraviolet mercury lamps; additionally, the UVC-LED chips have a longer lifespan, extending the replacement cycle from 1 year (for mercury lamps) to 2 years, further reducing maintenance costs and operational downtime. No chemical reagents are needed, aligning with the resort's environmental and cost-control goals.

IV. Implementation Results

The solution has operated stably for 1 year, delivering remarkable outcomes:

Hygiene & Safety

99.99% sterilization rate, compliant with GB 5749-2022. No harmful substances/residues, no water temperature rise or scald risks.

Stable Operation

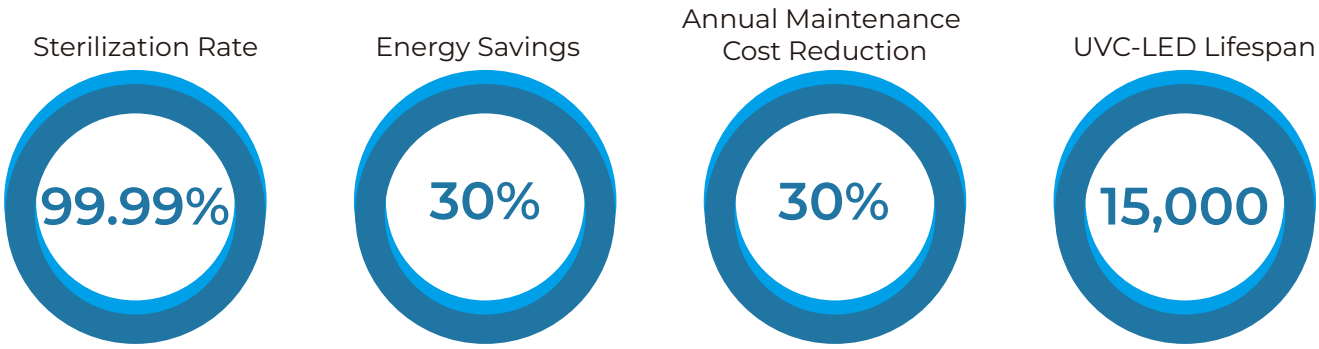
Zero service interruptions, adaptable to harsh outdoor conditions. Instant startup meets sudden water demand.

Cost & Energy Savings

30% energy reduction vs. traditional mercury lamps; 30% lower annual maintenance costs. 2-year lamp replacement cycle, UVC-LED lifespan ≥15,000 hours.

Positive Feedback

No related complaints. Effectively solves traditional mercury lamp pain points (overheating, high energy consumption, frequent maintenance) with low upkeep.



V. Project Significance & Application

This case fully verifies the solution's reliability, safety, and cost-effectiveness in high-traffic public venues. Its core advantages—zero chemical residues, no water temperature rise, instant startup, high efficiency, stability, low energy consumption, and extended replacement cycle—make it applicable to theme parks, malls, hotels, stadiums, and office buildings, especially for public drinking water systems. It sets a benchmark in the cultural tourism industry for safe and efficient water disinfection, providing a valuable reference for public venues looking to upgrade their water safety protection systems while addressing the limitations of traditional ultraviolet mercury lamps.

- Zero chemical residues
- No water temperature rise
- Instant startup

Applicable Venues

- Theme Parks
- Shopping Malls
- Hotels
- Stadiums
- Office Buildings
- Educational Institutions