



Water Purification
UVC LED Sterilizer

Innovation Award 2025

Junglin Tsai

2025.01.11

Cristal Materials Corporation



Innovation of the Year



Innovation 2025: 120 GPM UV-C LED solution for waste water

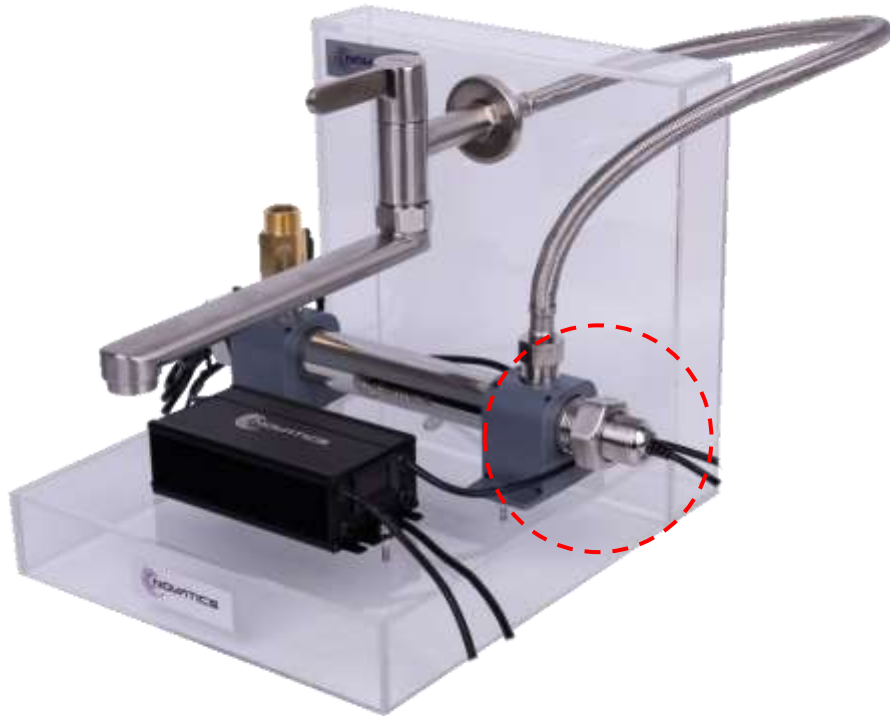


NOVATICS WS Series



NOVATICS WS Series	WS G4	WS T5	WS T30
Max Flow Rate	4 GPM	20 GPM	120 GPM
LED Wavelength	275 nm		
LED Lifespan	10,000 hrs		
Inlet Diameter	½" male	1½" flange	3" flange
Input Voltage	100 – 240 VAC		
System Power	10 W	50 W	360 W
System Weight	1.5 kg	12 kg	75 kg
Applicable Temperature	5 – 45 °C		

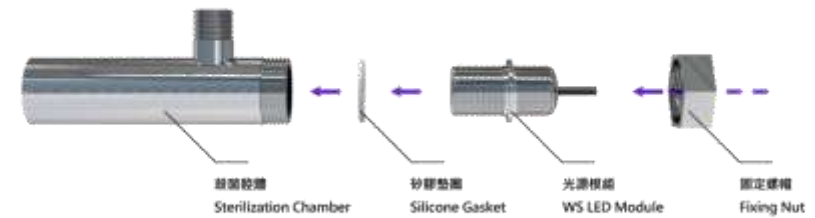




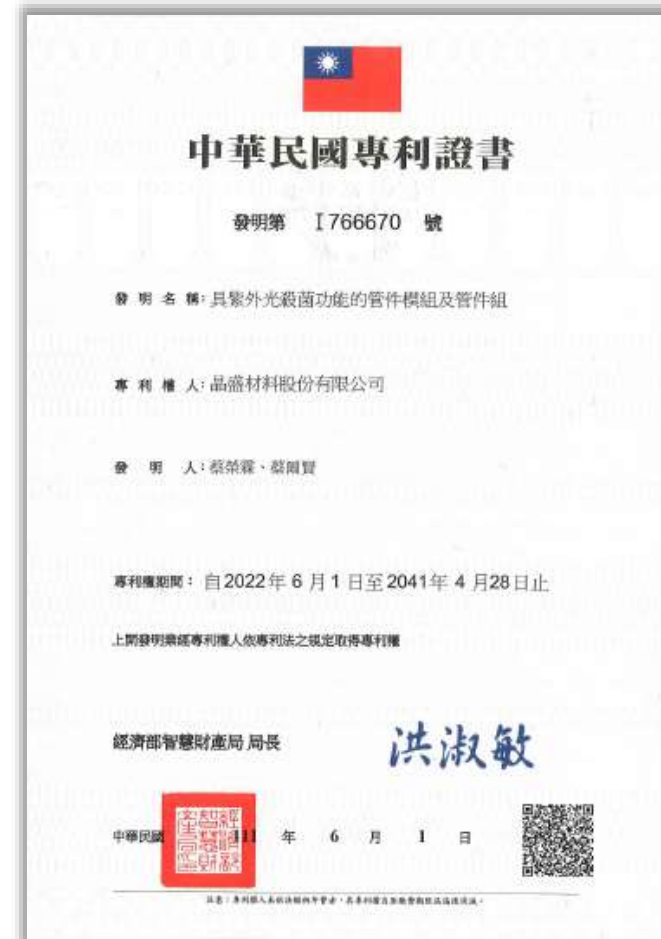
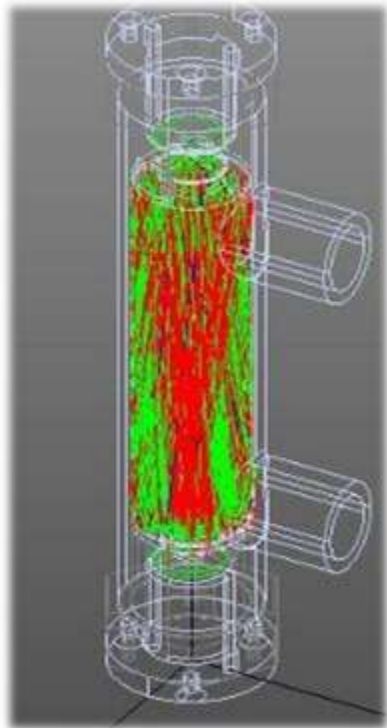
NOVATICS WS G4 for central kitchen



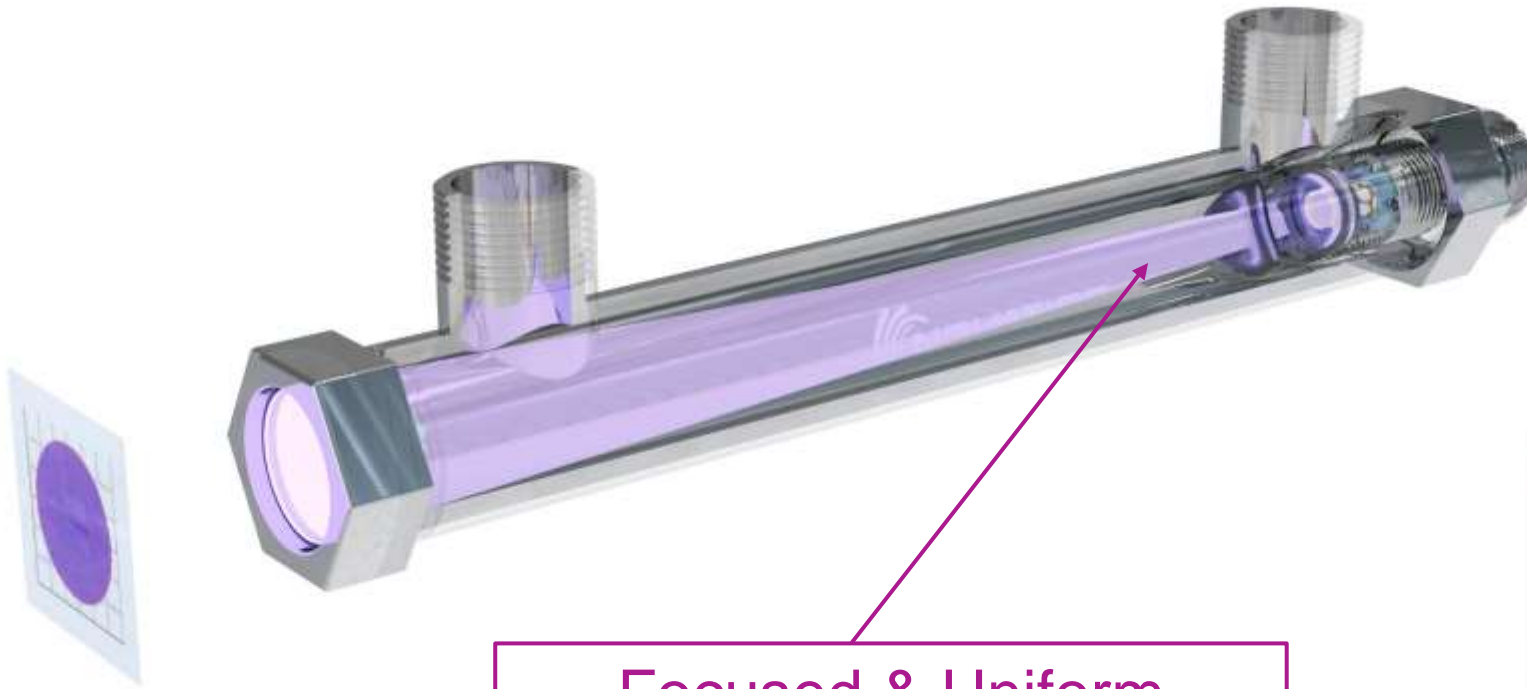
NOVATICS WS CORE
UV-C LED Optical Module



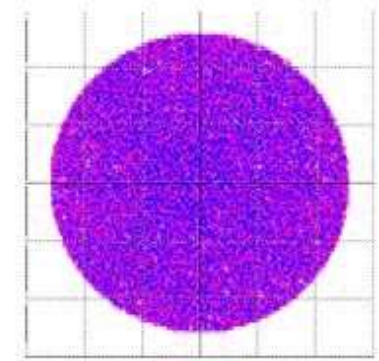
Patented Optical Design



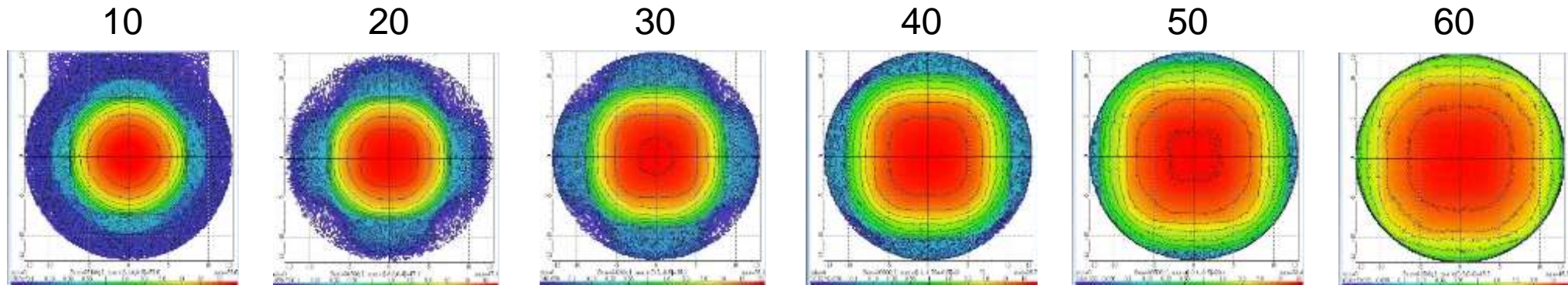
Optimized Optical Design



Focused & Uniform
UV-C LED Beam



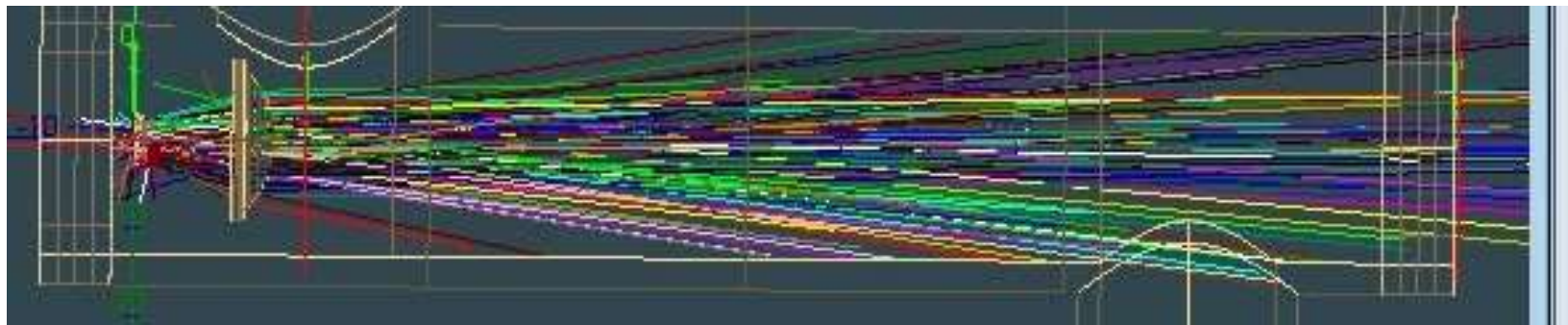
Optimized Optical Design



10 20 30 40 50 60 mm



Optical
Simulation
in
Sterilization
Chamber



Optimized Optical Design



562,400

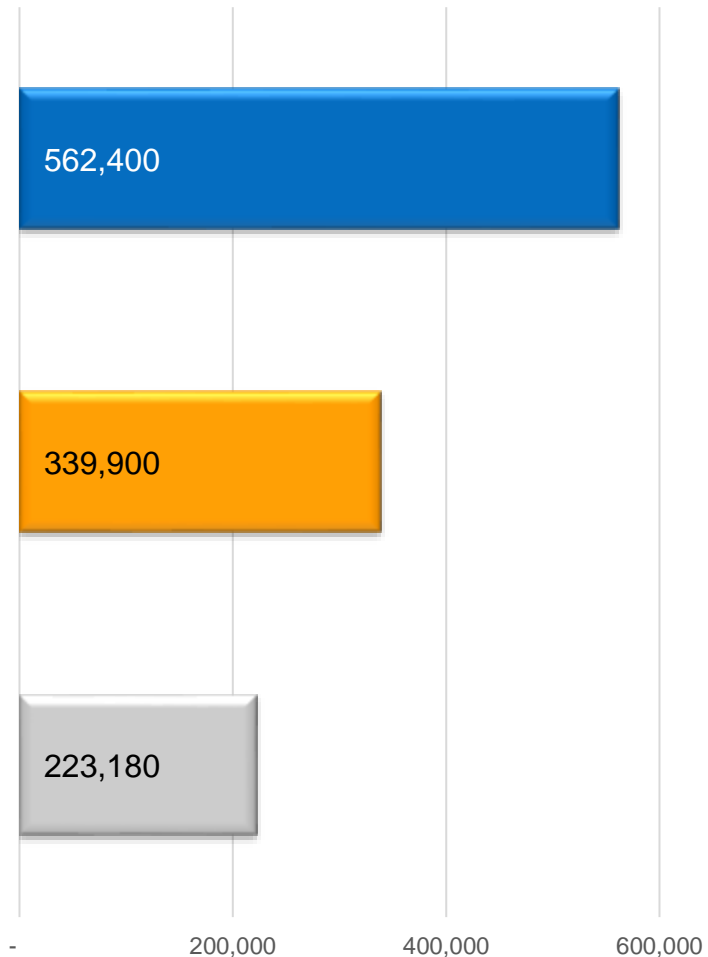


339,900

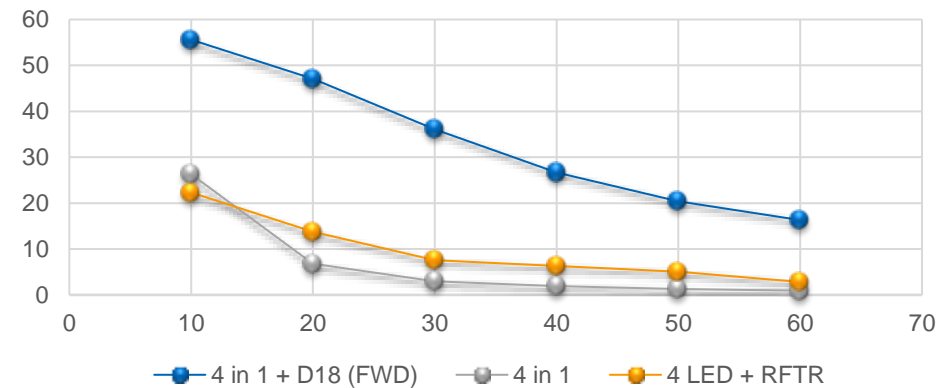


223,180

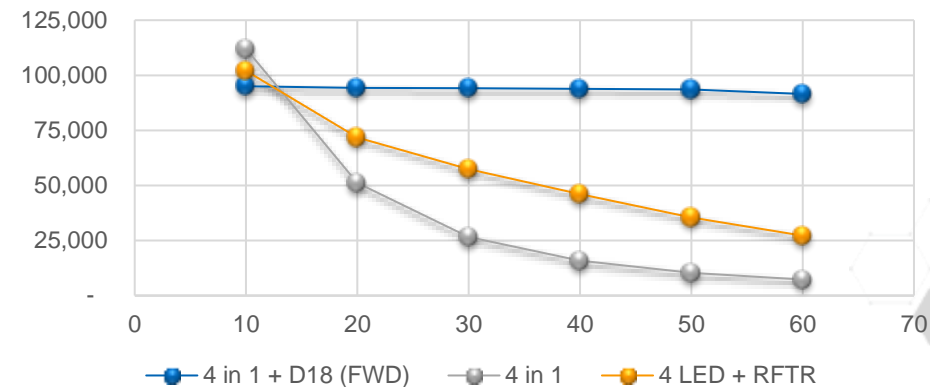
Total Power



Max Power

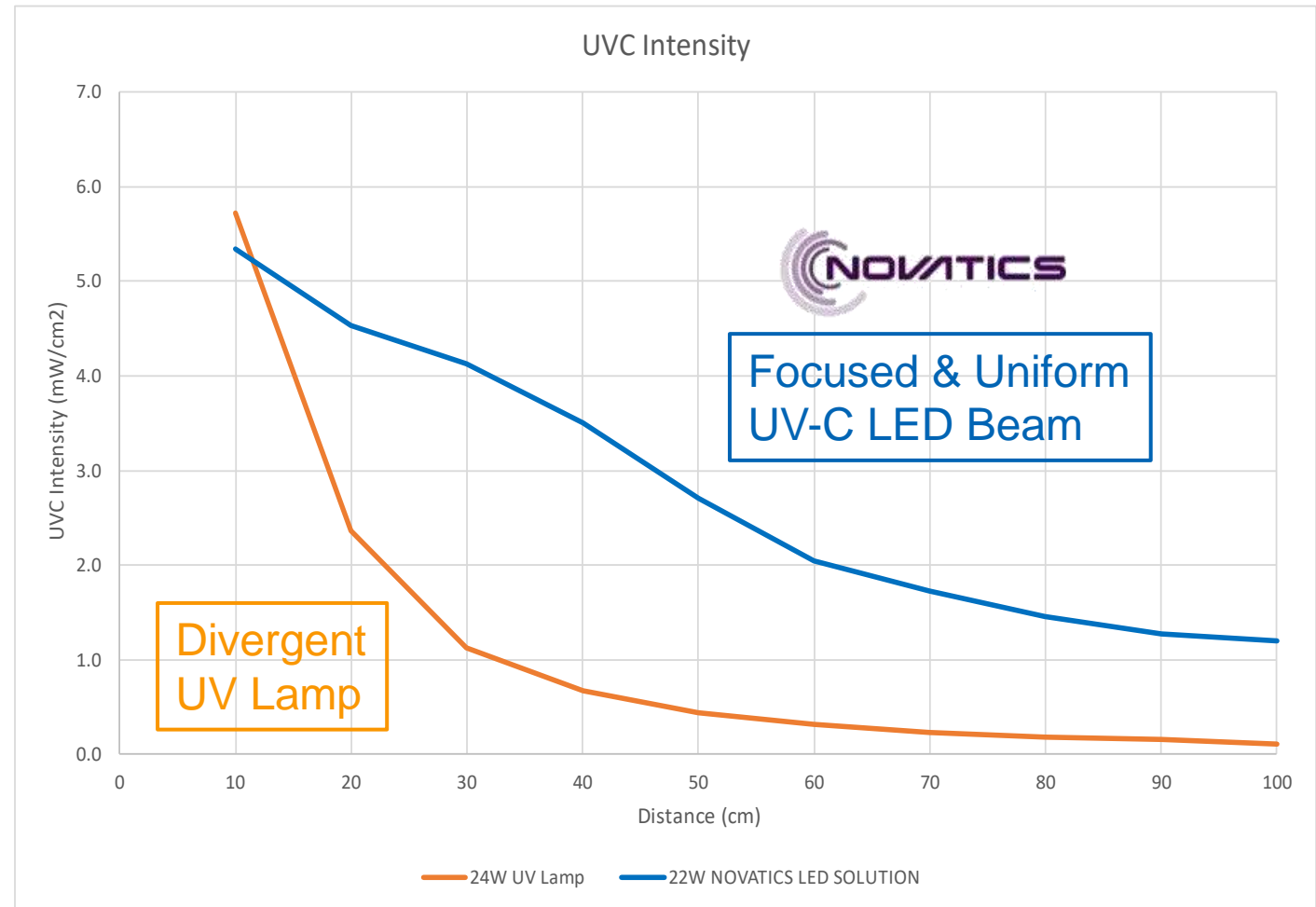


Area Power

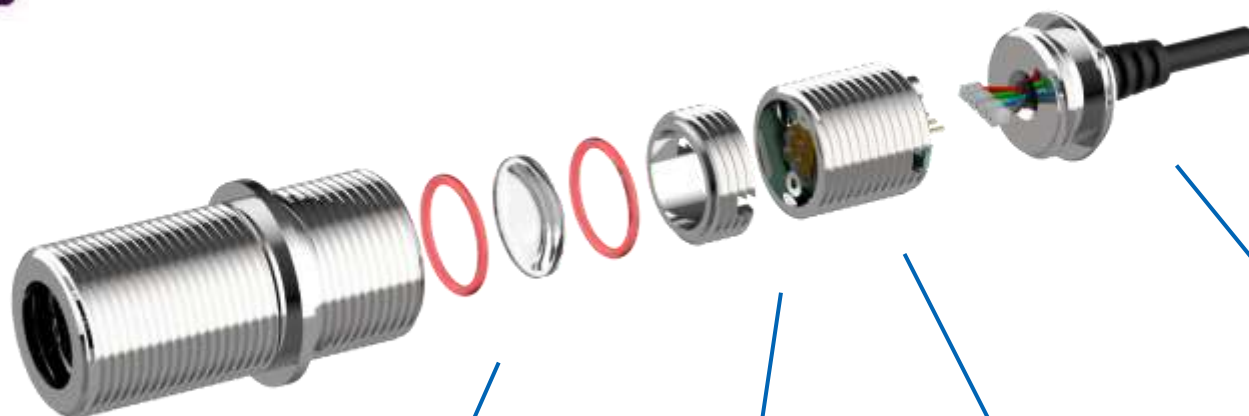




- NOVATICS WS is highly focused UV-C optical solution for long distance projection in limited channel
- Born for fluid system such as water purification and industrial air conditioner



Eco Friendly Design



REUSABLE MATERIALS



Stainless Steel

Silica Lens

UV-C LED

Aluminum

Recyclable Wire



ESG compliant product














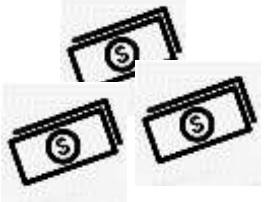
Reusable Materials



Mercury Free



Eco Product

Image	Power Consumption	Size	Lifetime	Toxic Material	Recycling Cost
 NOVATICS WS CORE					
 Mercury UV Lamp					



Laboratory test result

Concentration: 10^5 CFU/100mL

Model	Flow Rate	<i>E.Coli</i>	Staphylococcus	<i>Pseudomonas</i>
WS G4	7.5 LPM	99.99%	99.95%	99.94%
4WS T5	75 LPM	98.85%	N/A	N/A

E.coli



Staphylococcus



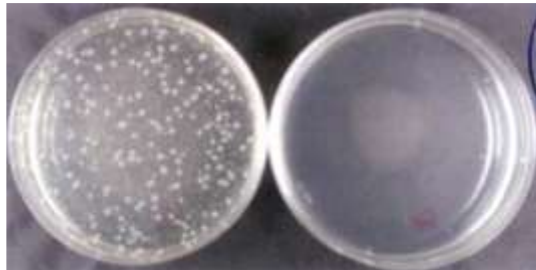
Pseudomonas



Sterilization Report



E. Coli sterilization test



Flow Rate (LPM)	Before Sterilization (CFU/100 mL)	After Sterilization (CFU/100 mL)	Sterilization Efficiency
2.0	4×10^5	<1	99.98%
7.5	2×10^5	60	99.97%

SGS TEST REPORT

Report Number : NPX23A00124001
 Received Date : Oct.18, 2023
 Report Date : Nov.01, 2023
 The number of Page : 1 / OF 1

Client: Crist Materials Corporation
 Product Name: NOVATICS UV-C LED fixtures
 Model/Type: WS G4
 Sample Number: NPX23A00124001-002

Test Item and Method: Performance test

1. The test solution was prepared in SGS laboratories.
 2. The test solution was analyzed before and after processing through the product with stable flow rate of 2.0 L/min for 3 minutes.

Test Result:

Test Item	Unit	Before processing	After processing	Elimination ratio(%)
Coliform	CFU/100mL	3.9×10^5	<1	>99.9
Escherichia coli	CFU/100mL	3.5×10^5	<1	>99.9
Pseudomonas aeruginosa	CFU/mL	3.6×10^5	<1	>99.9

REMARK: 1. This test report is only responsible for supplied sample(s). Any partial copy or use of advertisement will not be permitted.
 2. Unless otherwise stated, the results shown in this test report refer only to the sample(s) tested.
 3. The client retains the product or trademark of the examination, belonging to the client all, or have already get the ownership person's authorization.

SGS TAIWAN LTD. TAIWAN
 Signed: [Signature]
 SUPER LAB



Lab test results of WS G4

Target	Performance
Coliform	99.9%
E.Coli	99.9%
P.Aeruginosa	99.9%



TEST REPORT

Following Test Sample is provided and confirmed by client

Client: Cristal Materials Corporation
Product Name: NOVATICS UV-C LED Sterilizer
Model/Type : WS G4
Sample Number : NPX23A00124001~002

Test Item and Method: Performance test

1. The test solution was prepared in SGS laboratory.
2. The test solution was analyzed before and after processing through the product at a flow rate of 3.6L/min for 5 minutes.

Test Result :

Test Item	Unit	Before processing	After processing	Elimination ratio(%)
Coliform	CFU/100mL	3.8×10^3	<1	>99.9
<i>Esherichia coli</i>	CFU/100mL	3.5×10^3	<1	>99.9
<i>Pseudomonas Aeruginosa</i>	CFU/mL	5.6×10^3	<5	>99.9

Report
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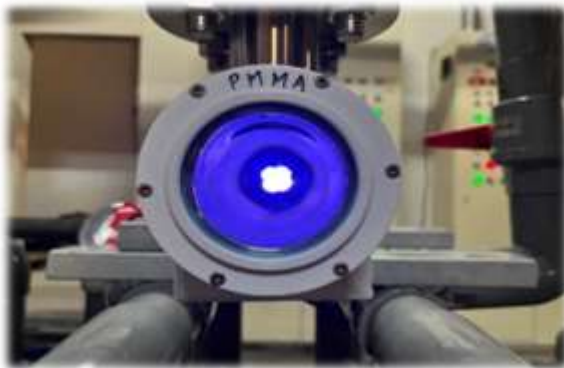
SGS SGS TAIWAN LTD.
Client: Cristal Materials Corporation
Product Name: NOVATICS UV-C LED Sterilizer
Model/Type : WS G4
Sample Number : NPX23A00124001~002



4WS T5 Lab Performance



4WS T5 Concept designed for industrial applications

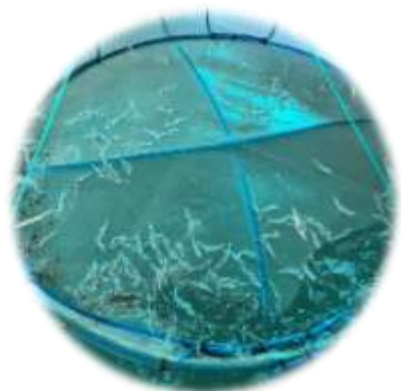


Lab test results of 4WS T5

Flow Rate	Performance
20 GPM	98.85%



Shrimp Farm Test

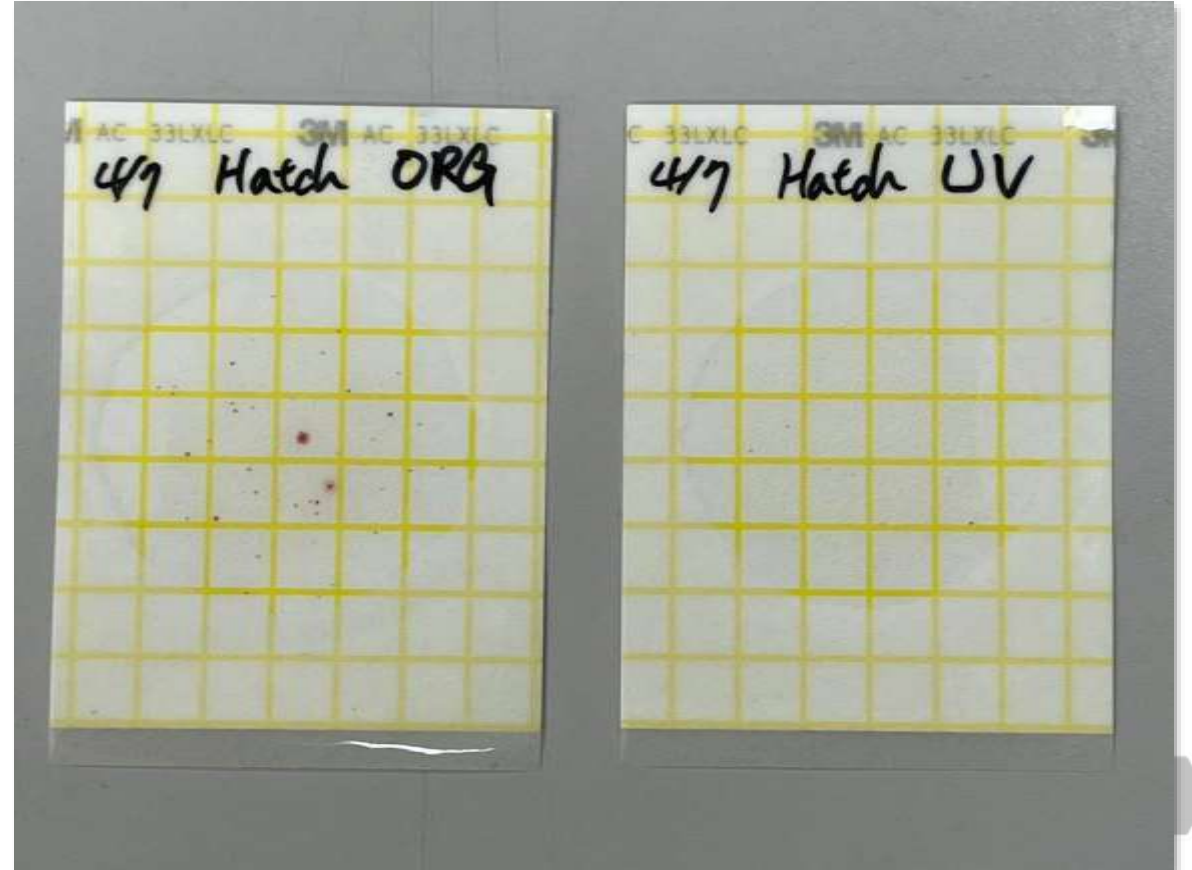


Model: WS T10 Matrix

Flow Rate: 5 m³/hr



Murry Cod Hatchery Test



Murry Cod Hatchery Test



Murry Cod Hatchery

Flow Rate: 5 m³ / hr



Model: 4WS T5 Concept
Flow Rate: 3.5 m³/hr

YEAR	CONDITION	EGGS	HATCHES	HATCH RATE	PERFORMANCE
2022	NO UV TREATMENT	10,000 (rough)	353	3.5%	
2023	NOVATICS 4WS TEST	10,000 (rough)	1,178	11.8%	

NOVATICS 4WS Concept enhances hatch rate by 3 times

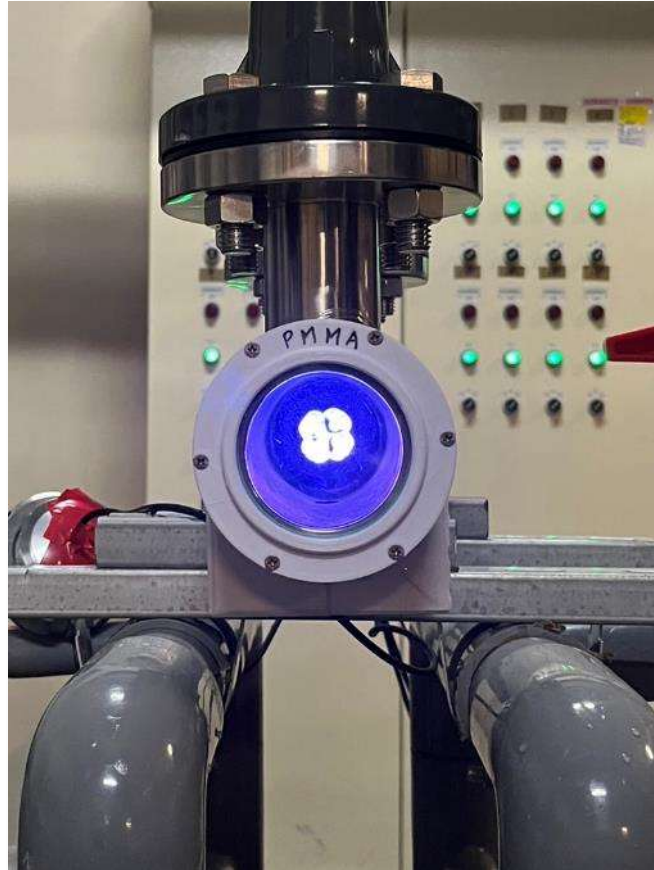


SPA Pool Test



Model: WS T10 Matrix

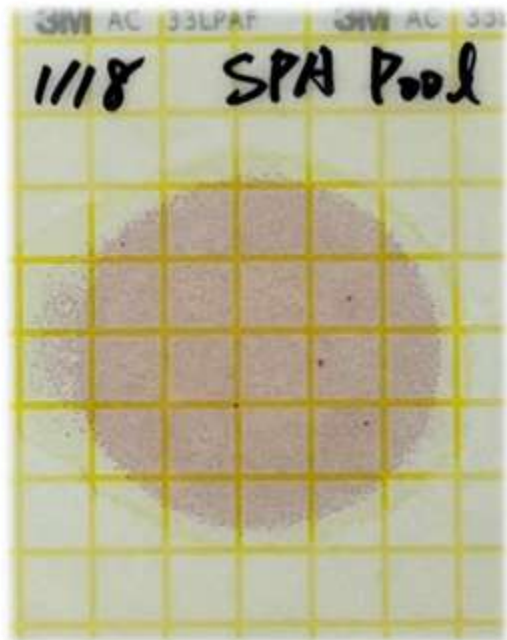
Flow Rate: 9 m³/hr



SPA Pool Test Comparison



No treatment in water for 12 hrs



3×10^6 CFU/mL



UV circulation only for 24 hrs



146 CFU/mL



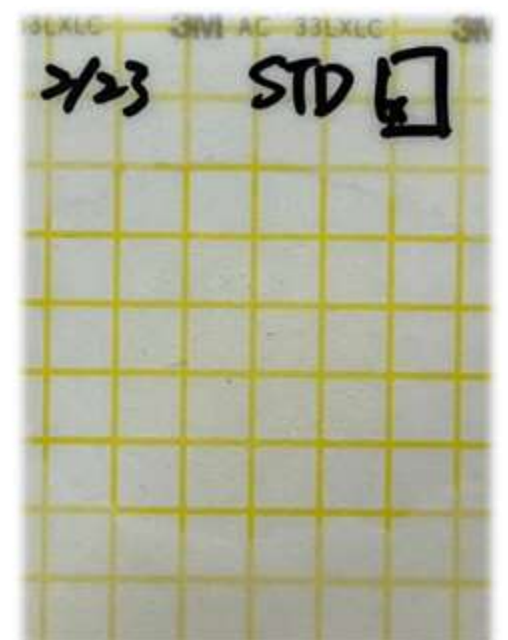
UV circulation + 0.5 ppm Cl



1 CFU/mL

(Reference)

Regular Cl 1.5 ppm



2 CFU/mL

Effective Algae Control



Before Treatment



24 hours



48 hours



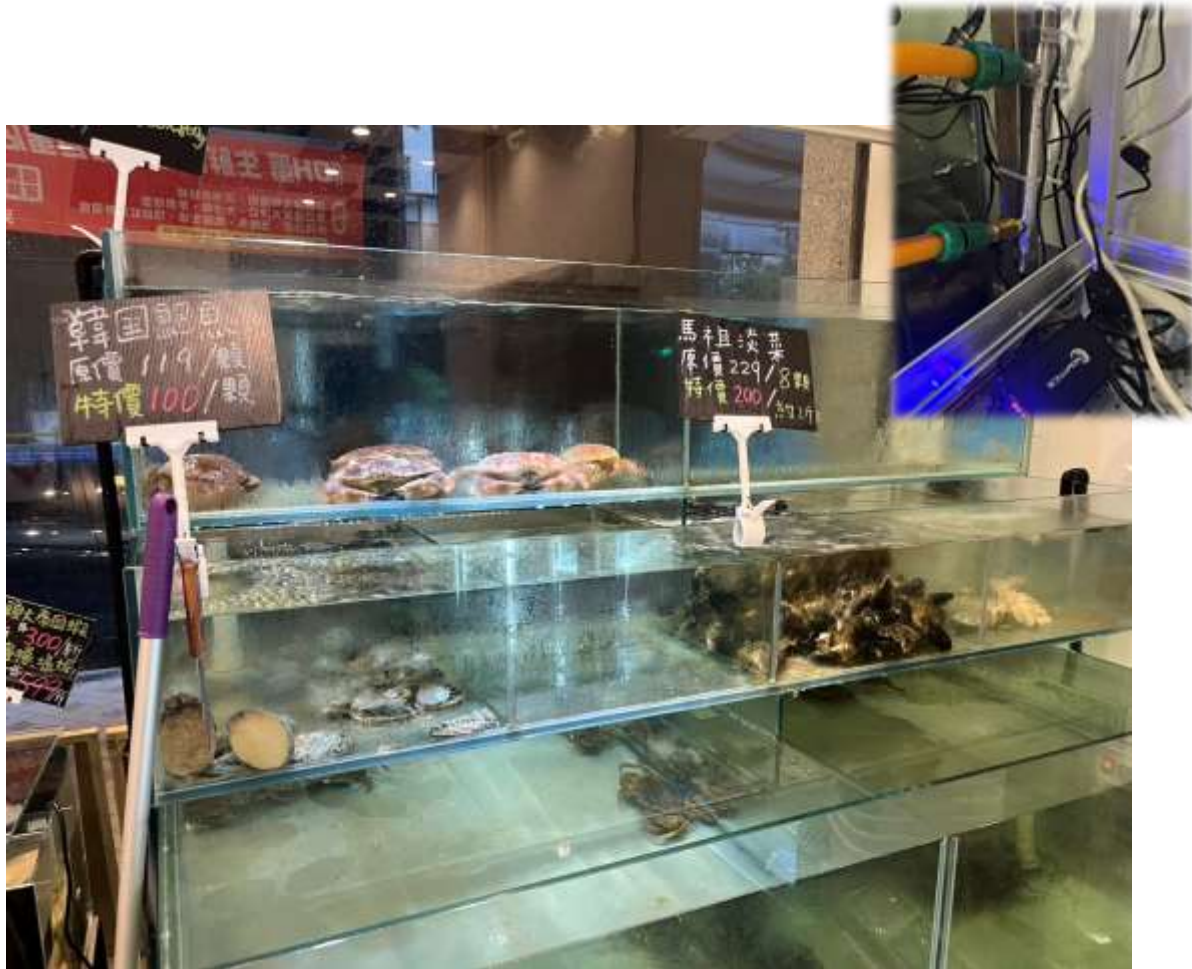
72 hours



96 hours



Seafood Tank



Household Drinking Water



Arowana Aquatank



Chicken Farm Drinking Water



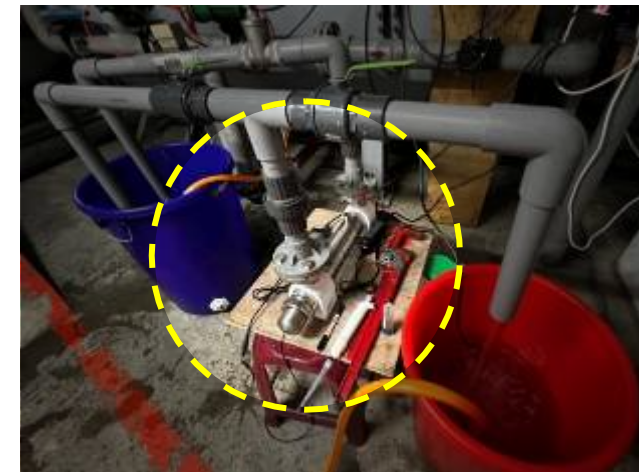
Sturgeon Farm (WS T5)



Hospital Waste Water



Waste Water treatment in Far Eastern Hospital



Hospital Waste Water





CRISTAL

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