

UV LED Marketing Primer



This presentation covers the following:

- *Company Overview*
- *Product Portfolio*
- *Target Segments for Applications*
- *Marketing Channels (Conferences/Expos/Etc)*



SEOUL[★]**VIOSYS**



WE AIM FOR BRIGHT FUTURE

We Aim for Bright Future
SEOUL VIOSYS

Table of Contents

1. Company Profile
2. violeds Technology
3. violeds Products
4. Total Solution for UV LED



Company Profile



01

○ We **do not compete** with our customers

02

○ We **provide differentiated value** to our customers

03

○ We provide our customer **one stop shopping**

04

○ We are the **most reliable company**

05

○ We **protect our customers** from IP copy companies

Company Overview

For 26 years, Focused Only on Compound Semiconductor(LED) Biz

1. Overview

	SSC	SVC/SETi	Remark
Established in	1992	2002	
Revenue	1.1 B USD	0.4 B USD	1992
No of Employees	2,150	890	

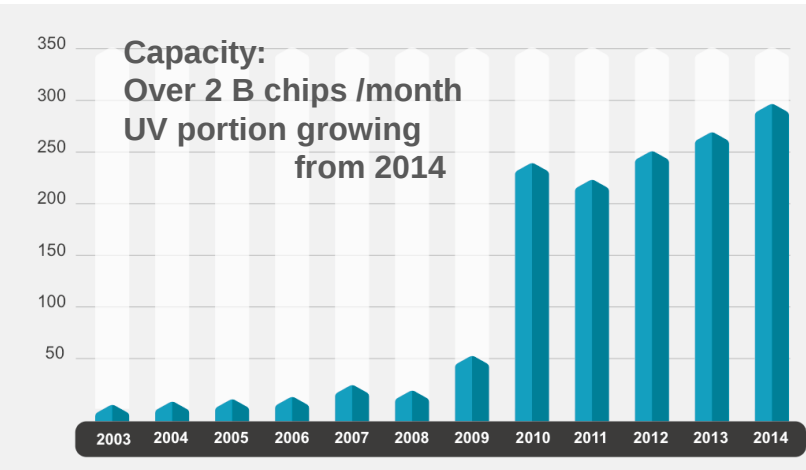
2. M/S on Compound Semiconductor

- UV LED Global No. 1 (2018, LED Inside)
- LED Global No. 4 (2018, IHS Report)
❖ World 2nd if Captive market excluded

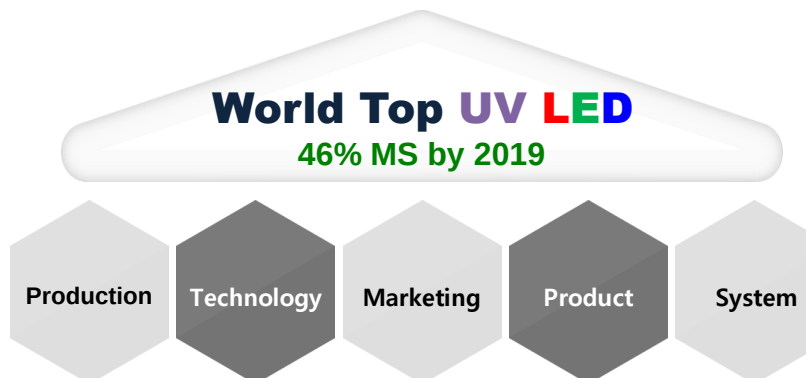
3. Patent and Technology

- Owns about 12,000 patents
- Prof. Shuji Nakamura has been serving as a chief consultant for 11 years (2014 Nobel Prize)

4. Growth History ('03 ~ '14)



5. Vision



SSC: Seoul semiconductor, SVC: Seoul Viosys

Global Network

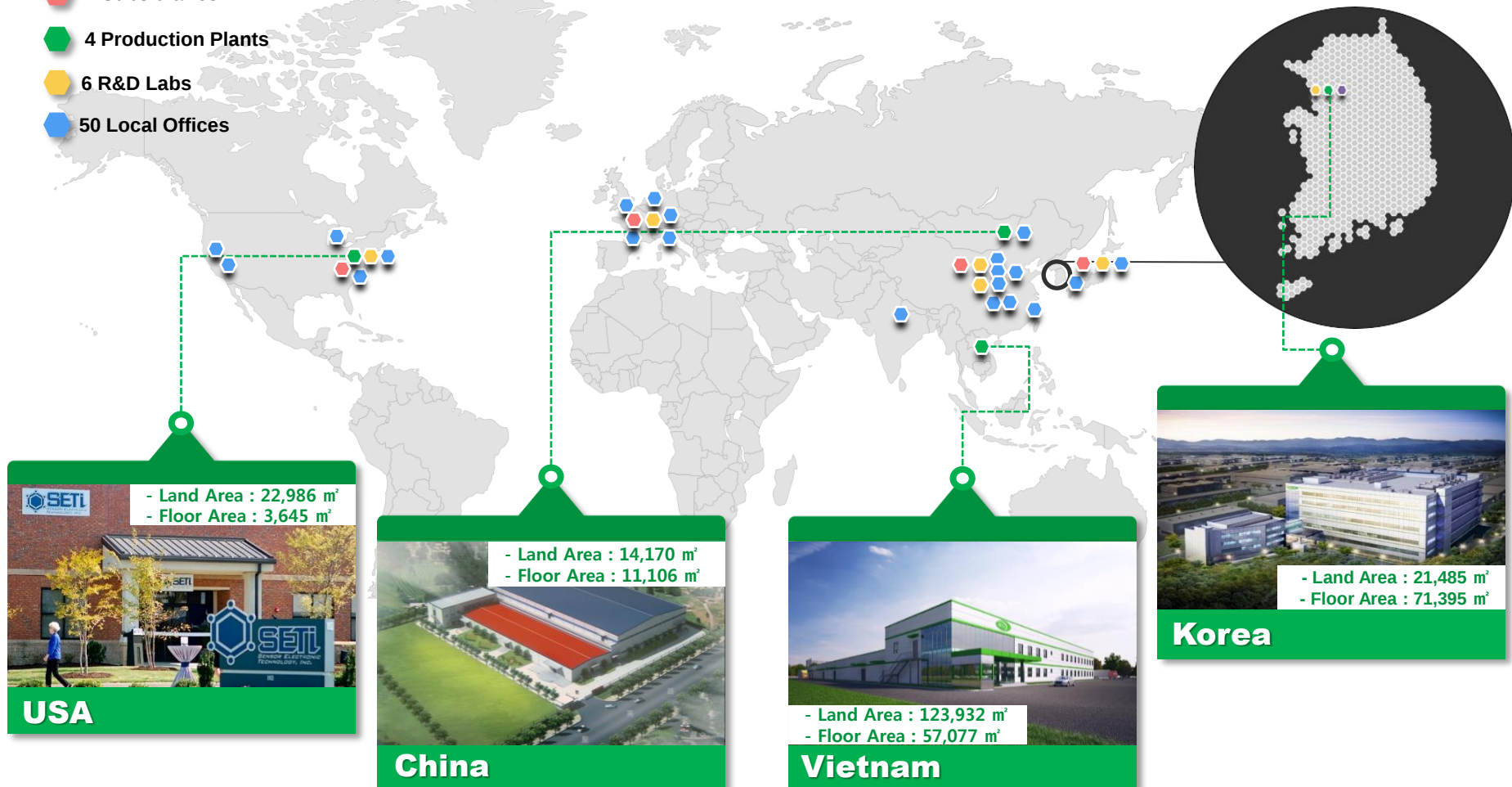
4 Production Platforms, 6 R&D Labs

4 Subsidiaries

4 Production Plants

6 R&D Labs

50 Local Offices



Business Segments

Select & Focus on 5 Segments Related to LEDs

Lighting



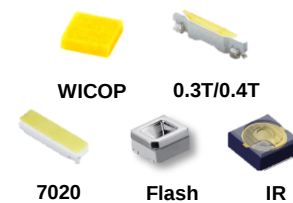
- Compact Design
- Energy Savings
- Custom Modules



Blu & Mobile



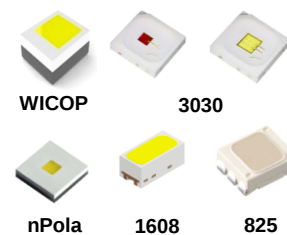
- Slim Design
- Excellent Image Quality
- Custom Modules



Automotive



- High Reliability
- Custom Color
- Custom Modules



UV



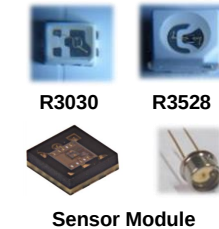
- Full range wavelength
- World 1'st UVB/C
- Various applications



NB



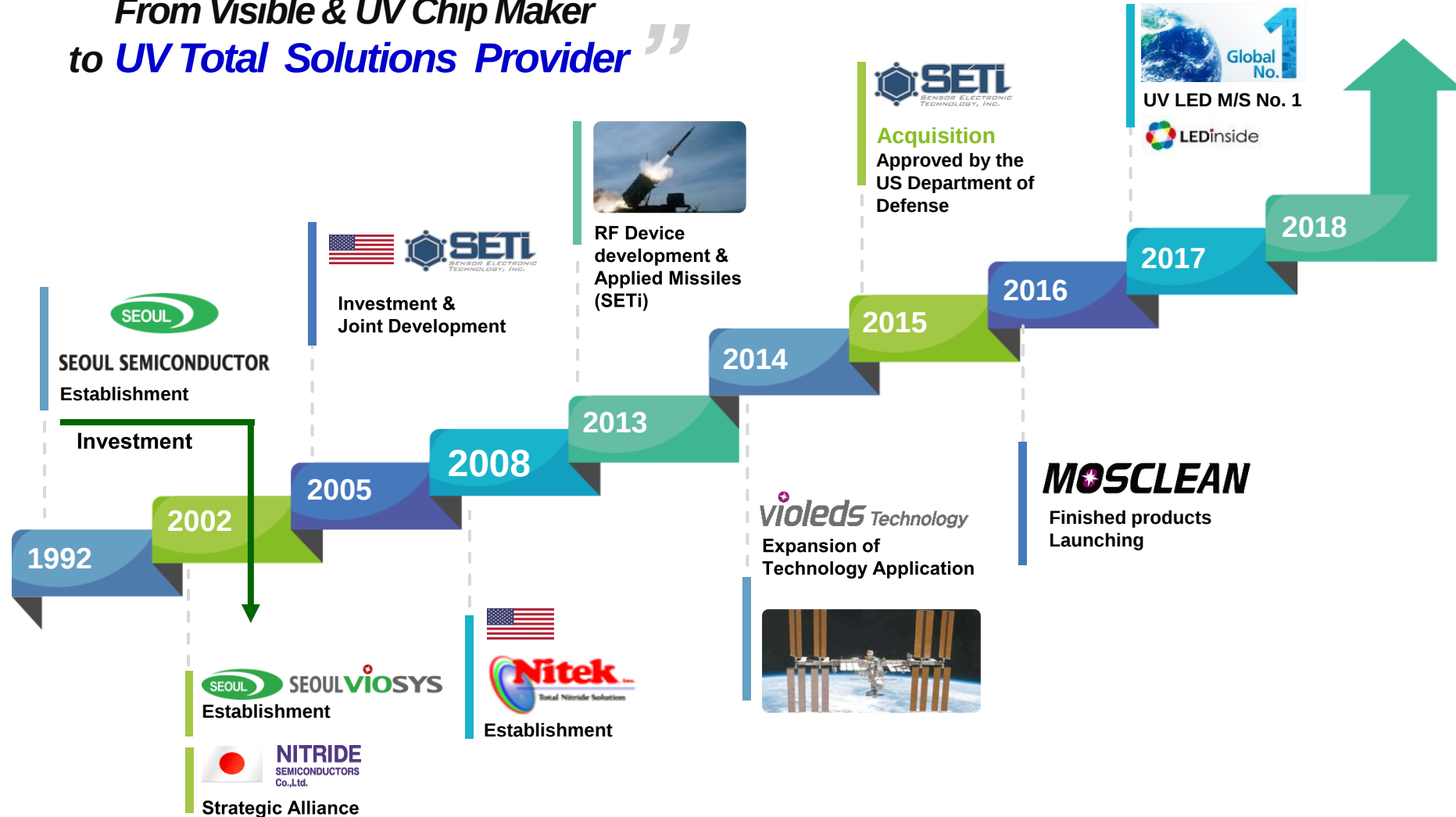
- Micro LED
- IR / VCSEL
- Sensor Module



UV Business History

Over 15 years investment & R&D for world top UV LED company

“
From Visible & UV Chip Maker
to **UV Total Solutions Provider**”



Seoul Viosys (SVC) Value Proposition



violeds

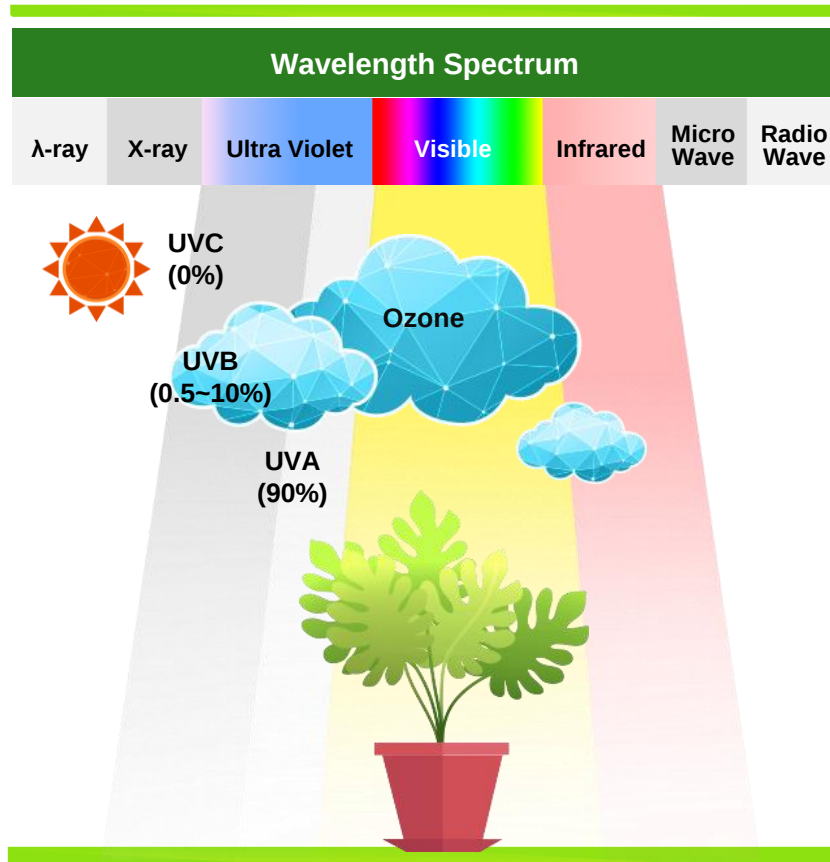
violeds Technology



UV Light & UV LED ?

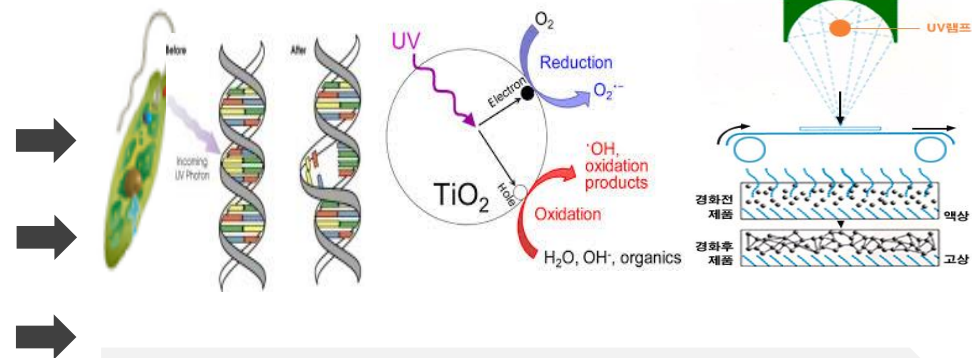
UV LED is Smart Functional Light

UV Light



UV Application

UVC	UVB	UVA
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- ✓ No Chemicals and Harmful reactant
- ✓ Energy Saving
- ✓ Available for various applications

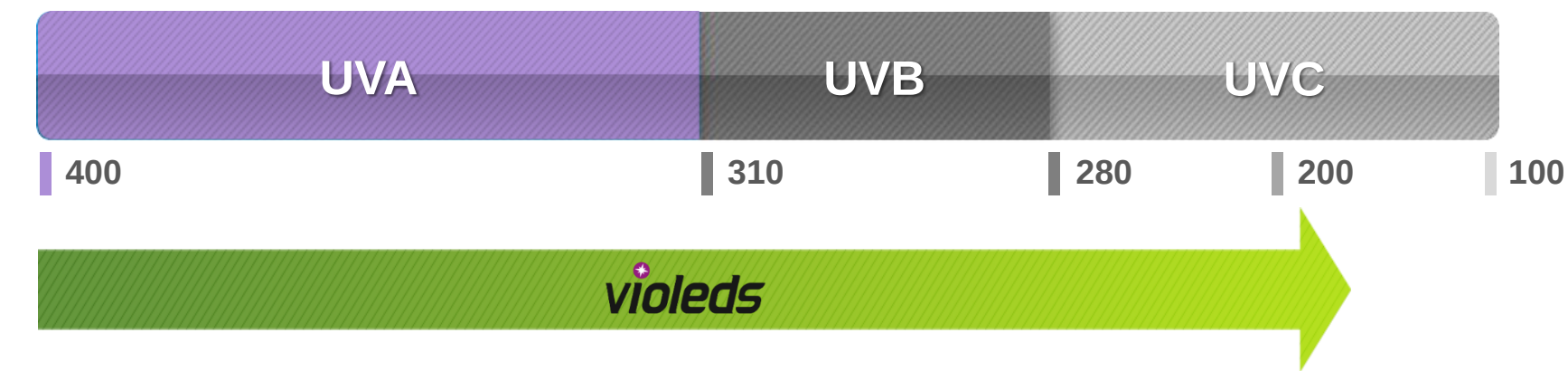
What is *violeds* technology ?

violeds technology eliminates the drawbacks of UV and is a technology optimized for clean environment and health



Technology Application of violeds

violeds Technology expands from Industry application to Bio application



Industry	Home Appliance	Bio
Black Light (Forensic, Entertainment, counterfeit)	Mosquito Control	Medical NEW
Exposure (PCB)	Tanning Surface/Air Disinfection	Bio NEW
Curing (Adhesive/Coating/Ink/Nail)	Photocatalytic Purification Water Disinfection	Agriculture

violet **Products**



Chip / PKG

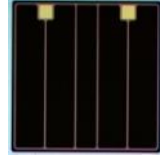
✓ Chip



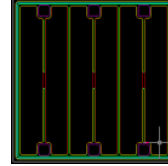
UV 700
series



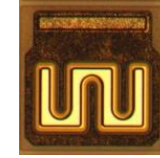
UV 1000
series



UV 1400
series



UV 1730
series



D4545
series



DY9560
series

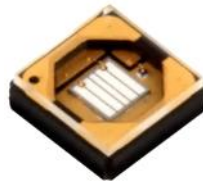
✓ PKG



AAP series
1chip



AAP series
4chip



CA series
Flat



CA series
Dome



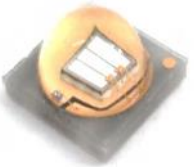
AAP series
1chip



AAP series
4chip



CA series
Flat



Z5 series



nZ5 series

UVA/B

UVC

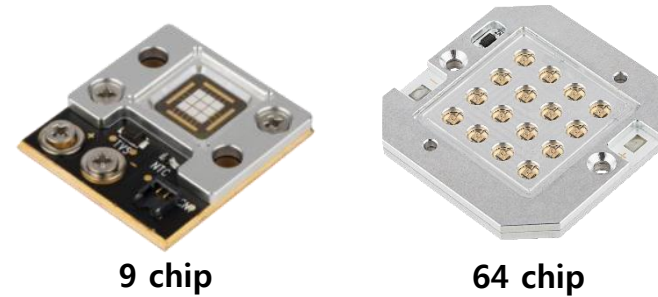
※ If you want to know more information, please check the SVC homepage (<http://www.seoulviosys.com>)

Lamp / COB / Sensor

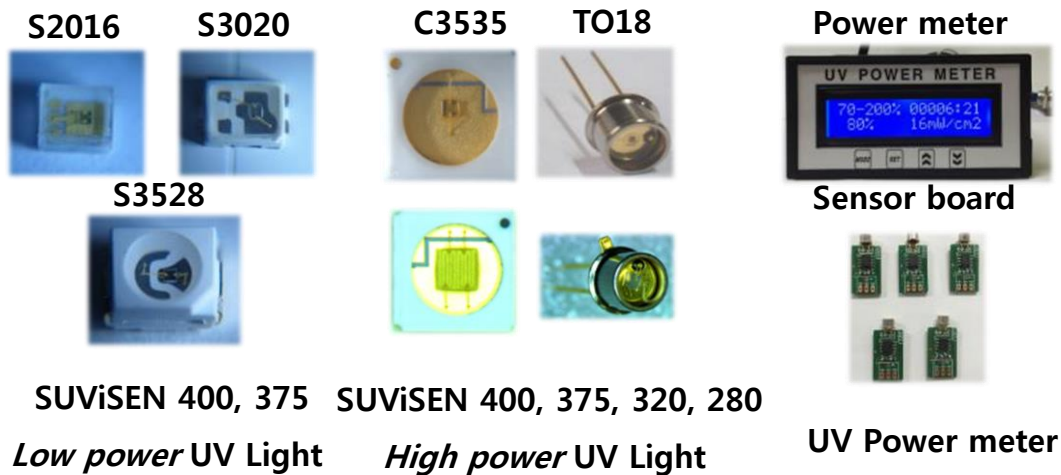
✓ Lamp



✓ COB



✓ Industrial UV Sensor



✓ Index UV Sensor



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Module

✓ Standard Module

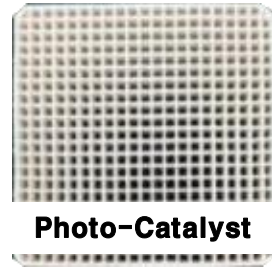
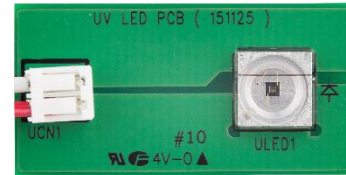
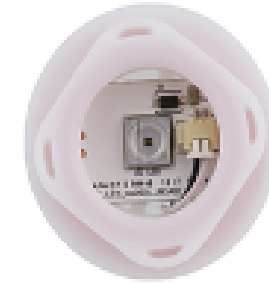


Photo-Catalyst

**Air Deodorization
& Sterilization**



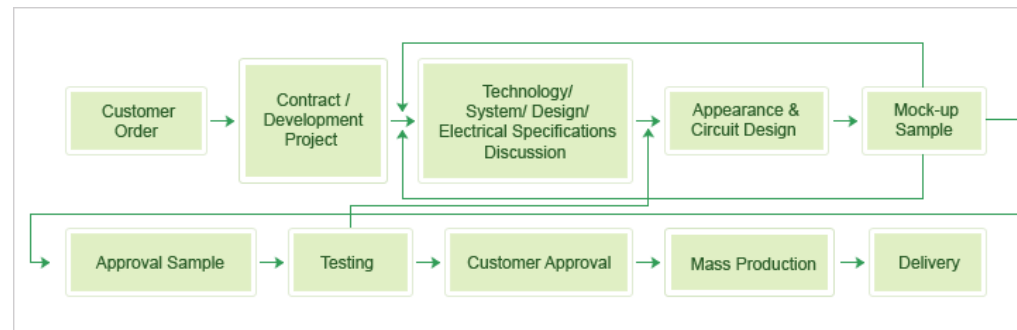
**Surface
Sterilization**



**Water
Sterilization**

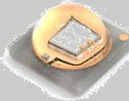
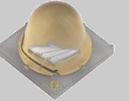
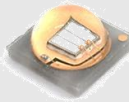
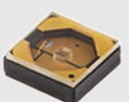
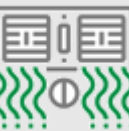
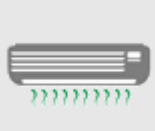
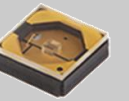
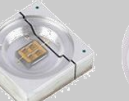
✓ Customized Module

Seoul Viosys provides exclusive technologies for a customized module at competitive price with total UV LED solution based on the vertical systematization throughout the entire production process of UV LED

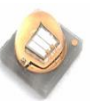
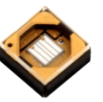
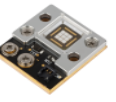


※ If you want to know more information, please check the SVC homepage (<http://www.seoulviosys.com>)

SVC Product Positioning by Major Market

Market	SVC Product	Application
Curing 365nm, 385nm, 395nm, 405nm	 [Z5 PKG]  [NZ5 PKG]  [CA PKG]  [NCOB-9chip]	 [Printing]  [Adhesive]  [(PCB) Exposure]  [Nail Curing]
Air Purification/Deodorization 365nm with Photocatalytic Filter	 [Z5 PKG]  [CA PKG]  [AAP PKG -1chip]  [Photocatalytic Filters]	 [Air Purifier]  [Air Purifying system]  [Automotive HVAC]  [Refrigerator]  [Air Conditioner]
Sterilization (Water/Surface) 275nm	 [CA PKG]  [AAP PKG -1chip]  [AAP PKG -4chip]  [Module (Waterproof)]	 [Water Purifier]  [Bidet]  [Surface Disinfection]  [Humidifier]  [Ice Maker]

SVC Products for UV-A Applications

Application / Product		Wave length (nm)								
			Z5	nZ5	AAP	CA Dome	CA Flat	NUV COB	Lamp	Module
Product Coverage (nm)			365-405	365-405	365-405	365-405	365-405	365-405	365	365
Curing	[Printing] 	385 - 405	●	●	●	●	●	●		
	[Adhesive] 	365	●	●	●	●	●	●		
	[Exposure] 	385 - 405	●	●	●		●	●		
	[Nail Curing] 	405	●							
Air Purification/Deodorizing	[Air Purifier] 	365	●		●		●			●
	[Air Purifying System] 	365	●		●		●			●
	[Automotive HVAC] 	365	●		●		●			●
	[Refrigerator] 	365	●		●		●			●
	[Air Conditioner] 	365	●		●		●			●
Insect Attraction	[Insect Trap] 	365	●		●		●		●	

SVC Products for UV-B and UV-C Applications

Product Application		Wave length (nm)					
			AAP	CA Flat	TO39	DUV COB	Module
Product Coverage (nm)			275, 310, 340	275, 285, 295, 310	255, 265, 275, 285	310	275
Sterilizing	[Bidet] 	275	●	●			●
	[Cutting Board] 	275	●	●			●
	[Air Purifi] 	275	●	●			●
	[Water Purifier] 	275	●	●			●
	[Humidifi] 	275	●	●			●
	[Ice Make] 	275	●	●			●
Medical	[Skin Care] 	310, 340	●			●	
Horticulture	[Plant Growth] 	285		●			

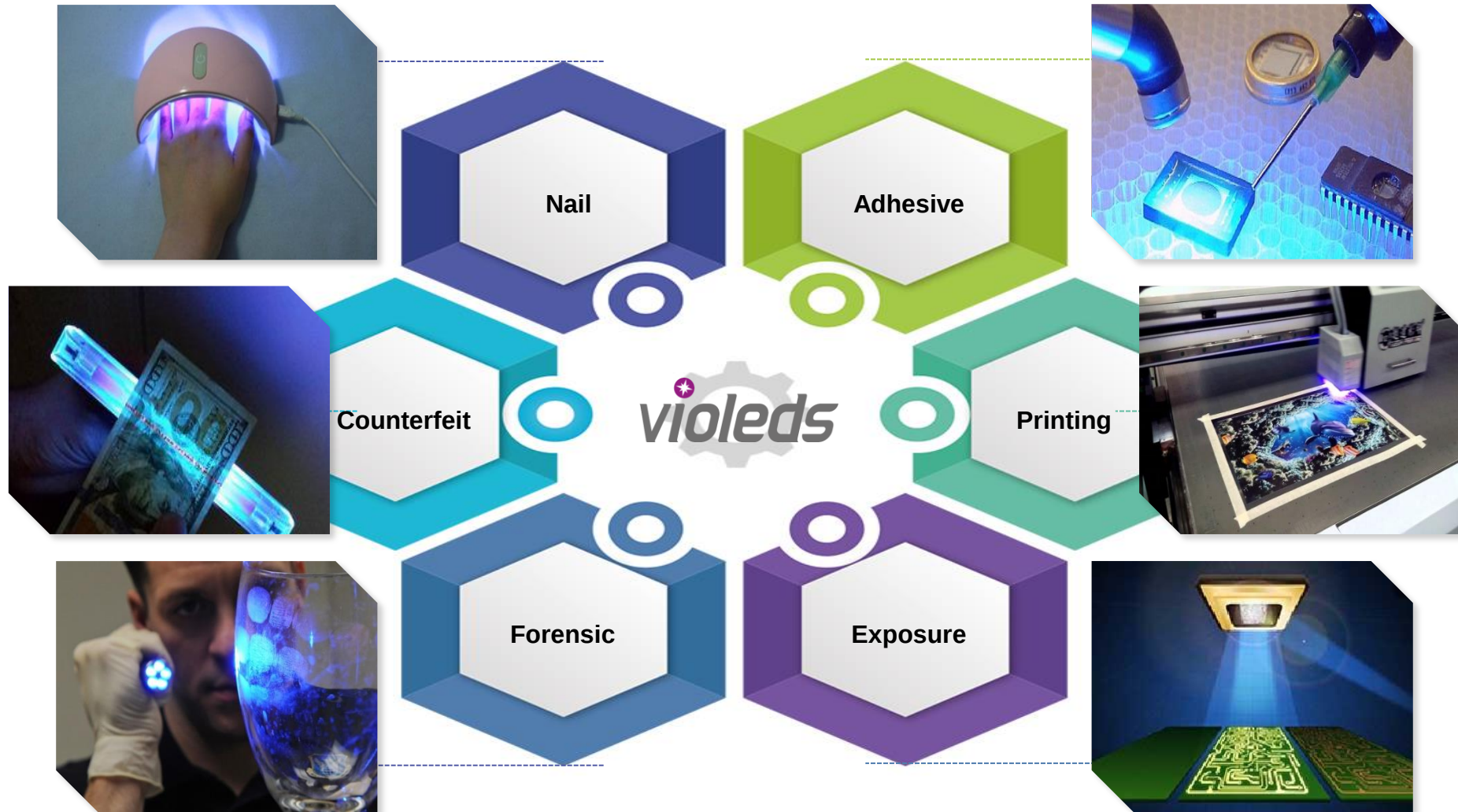
UV Finished Products

Insect Trap	Indoor			Travel	Semi-outdoor	Outdoor		Indoor
	IH1	IH2	IP2	IP1	IS1	IW1	IG1	IF1
								
	Insect Trap & Deodorization	Standard	Compact	Portable	Standard	Water Resistance	Water Resistance Wide range	Fly Trap
Air Purifier	Automotive				Indoor			
	AC1		AC2		AS1			
								
	Deodorization, Air Disinfection		Deodorization, Air Disinfection, USB Charging		Deodorization, Air Disinfection			
Sterilizer	SS1				SM1			
								
	Multi-purpose sterilizer				Large container, wireless charging and voice alarm			

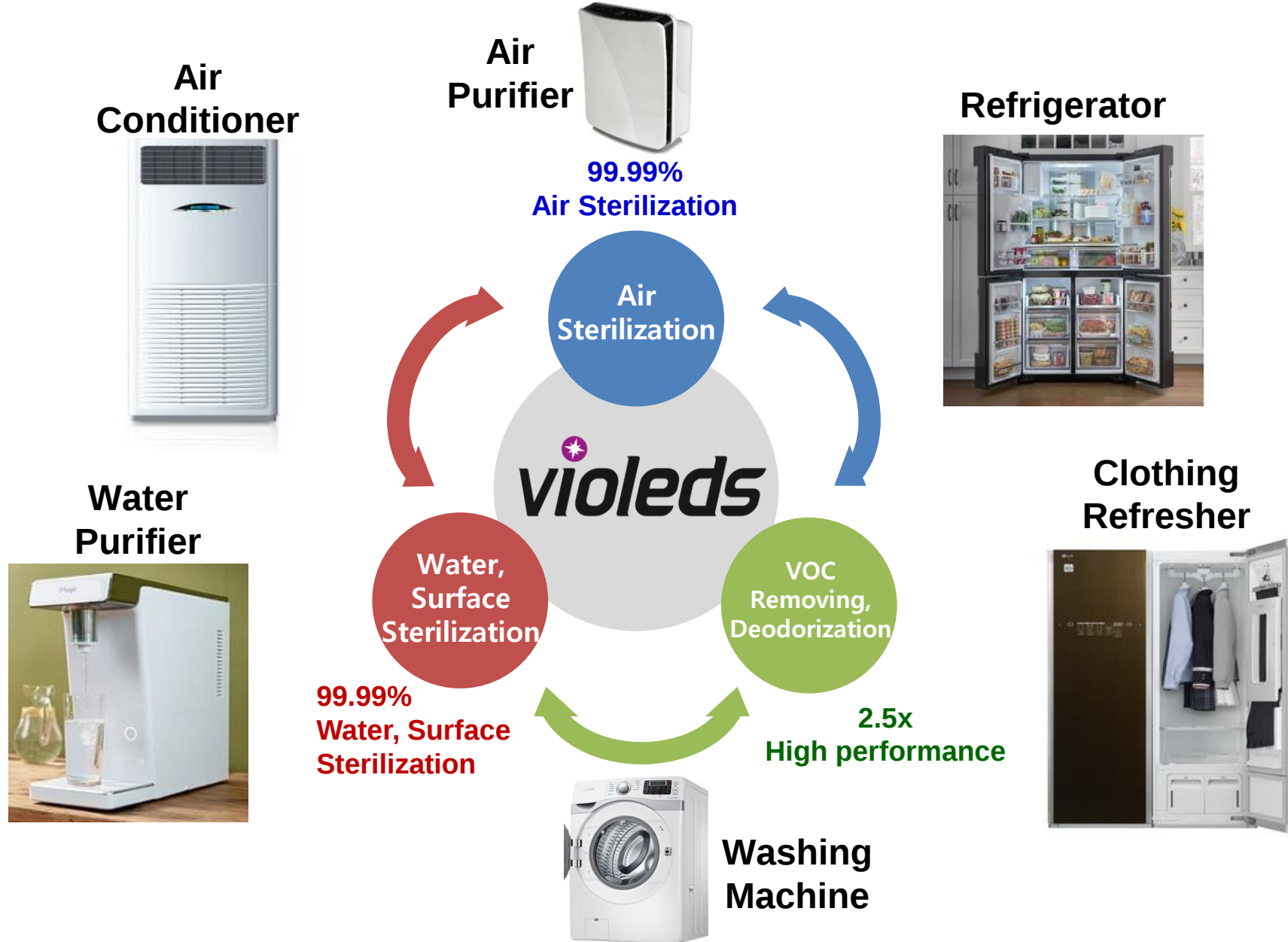
violeds ***Total Solution*** ***For UV LED***



Total Solutions for Industrial Applications

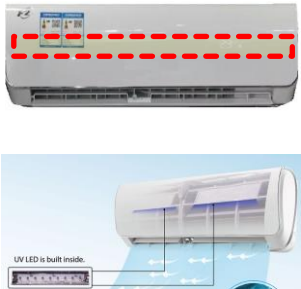
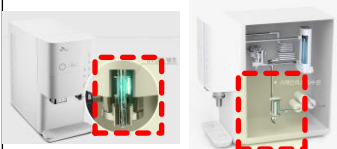


Total Solutions for Home appliances



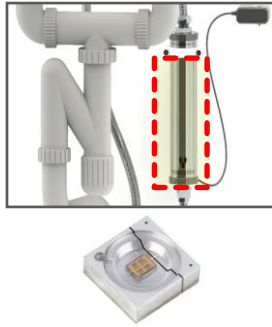
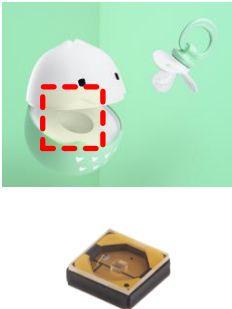
Applied products

Air purification and Sterilization module by violeds technology applied to world wide home appliance products

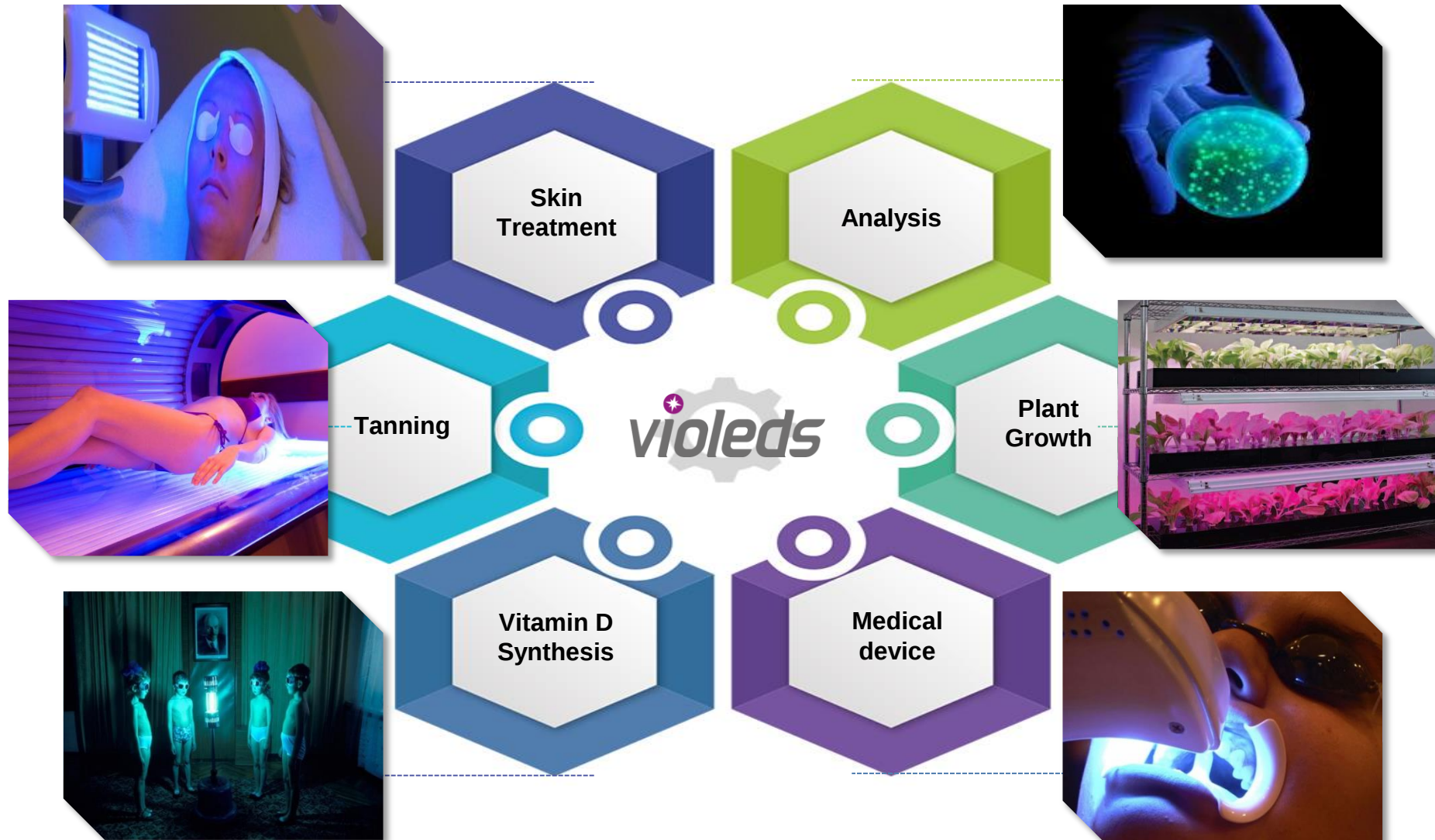
Refrigerator	Air Conditioner	Air Purifier	Water Purifier	Water dispenser
Air Deodorization Module (A Company, EU) 	Air Sterilization Module (T Company, TW) 	Air Purification Module (M Company, US) 	Pipe Sterilization Module (S Company, KR) 	Nozzle Sterilization Module (S Company, KR) 
Air Deodorization Module (V Company, EU) 	Air Sterilization Module (H Company, CN) 	Air Purification Module (D Company, KR) 	Nozzle Sterilization Module (S Company, KR) 	Nozzle Sterilization Module (W Company, KR) 

Applied products

Air purification and Sterilization module by violeds technology applied to world wide home appliance products

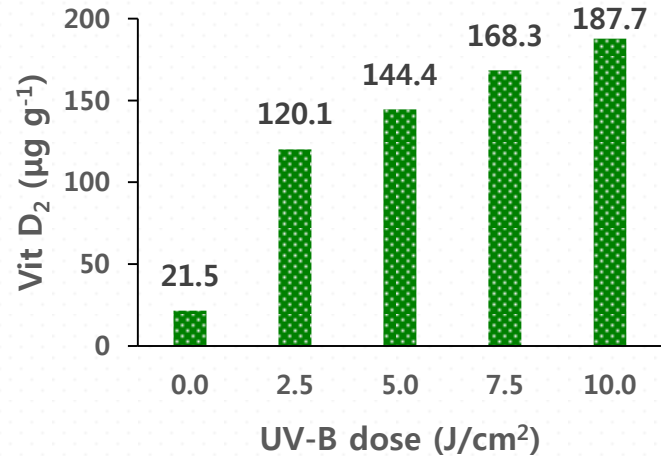
Ice Maker	Humidifier	Sterilization		
Water Sterilization Module (F Company, US)	Water Sterilization Module (P Company, KR)	Toy box Sterilization (J Company, KR)	Baby Bottle Sterilization (C Company, KR)	Water purification system of Sterilization Module (W Company, SE)
				
Water Sterilization Module (S Company, KR)	Water Sterilization Module (S Company, KR)	Dish washer Sterilization (S Company, KR)	Nipple Sterilization (J Company, KR)	Cutting board disinfector UV PKG (P Company, KR)
				

Total Solutions for Bio applications

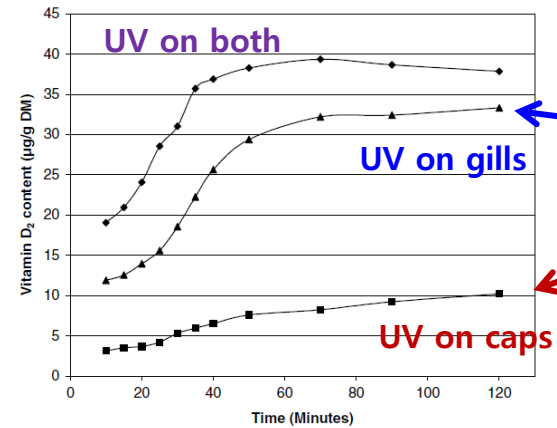


UV-B Boosts Vitamin D in Mushrooms

UV-B increases Vit D in mushrooms
(several to thousand times)



UV on gills is more effective than on caps
in Vit D boosting



In the US:

UV-treated mushrooms are
Generally Recognized as
Safe (GRAS) by FDA



Walmart, US

In Europe:

UV-treated mushrooms are
allowed in the market by
European Commission
(EC)



Banken Champignons b.v.,
The Netherlands

UV-B Enhances Commercial Value of Cannabis

Cannabis

- Its growth and medical and recreational use are legalized in more and more countries including US, Canada and many in Europe

THC (Δ^9 -tetrahydrocannabinol)

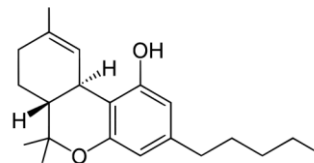
- Best known biologically active compound in Cannabis
- Highly concentrated in glandular trichome

UV-B treatment on Cannabis

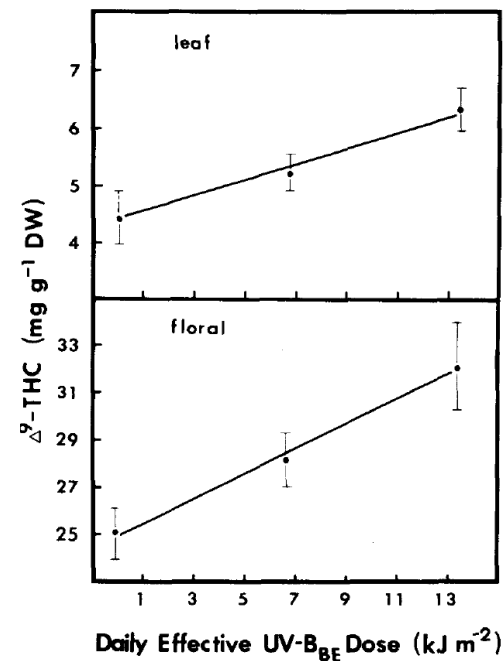
- Increases concentration of Δ^9 -THC in leaves and flowers of Cannabis
- Increases the number of glandular trichomes increased



Cannabis



THC



THC in Cannabis increases by UV-B treatment in the dose-dependent manner



The number of glandular trichomes, saps of essential oil on leaves and the reservoir of THC in Cannabis (green arrows in the picture), increases by UV-B treatment

MARKETING THRUST

- WE ARE #1
- HIGHEST MANUFACTURING CAPACITY
- TRUSTED ENGINEERING
- CUSTOMER PROTECTION



INCREASE BRAND AWARENESS

CONFERENCES—SPEAKING ENGAGEMENTS AS EXPERTS

- Strategies in Light
 - <https://www.strategiesinlight.com/index.html>
 - *UV LEDs from Niche to Mainstream*
- BIG Ideas –RadTech
 - <http://bigideasconference.com/>
 - Focuses on UV technologies
 - *UV LEDs for Food Safety and Quality*
- LED Horticulture Conference

INCREASE BRAND AWARENESS

EXHIBITION

- Strategies in Light—co-booth with SSC LT?
- LightFair—co-booth with SSC LT?
- BIG Ideas –RadTech—SVC standalone booth
- RadTech Winter Annual Meeting—SVC standalone booth
- LED Horticulture Conference—co-booth with SSC LT?

INCREASE BRAND AWARENESS

ADVERTISING & MEMBERSHIPS

- International Ultra Violet Association (IUVA)
 - Need membership
 - Quarterly white papers/opinions
- Water Conditioning & Purification Magazine (WC&P)
 - Article on progress of UV LEDs and Water Reactor design
- LEDs Magazine
- LEDinside
- Grower's Network

INCREASE BRAND AWARENESS

DISTY PARTNERS

- Future Electronics / Future Lighting Solutions
 - WEBINARS / TRAINING SESSIONS
 - FUTURE MARKETING PROGRAMS
- DigiKey
 - WEBINARS / TRAINING SESSIONS
 - DK MARKETING PROGRAMS