

2018.12.12.

2<sup>nd</sup> Asia pacific disaster resilience workshop



Hand Cranked Portable

**UVC-LED Sterilizer**

People who share light

ShareLight



# ShareLight

Using appropriate technology with Light,  
help people who live in remote and disaster areas.

**Lighting**



**Safe water**



**Warm chair**



# Motivation of UVC-LED sterilizer



Sep. 2017, from East Timor

**700,000,000** people still drink seriously contaminated water.

**1400** people die everyday due to waterborne diseases.

# Goals to Pursue

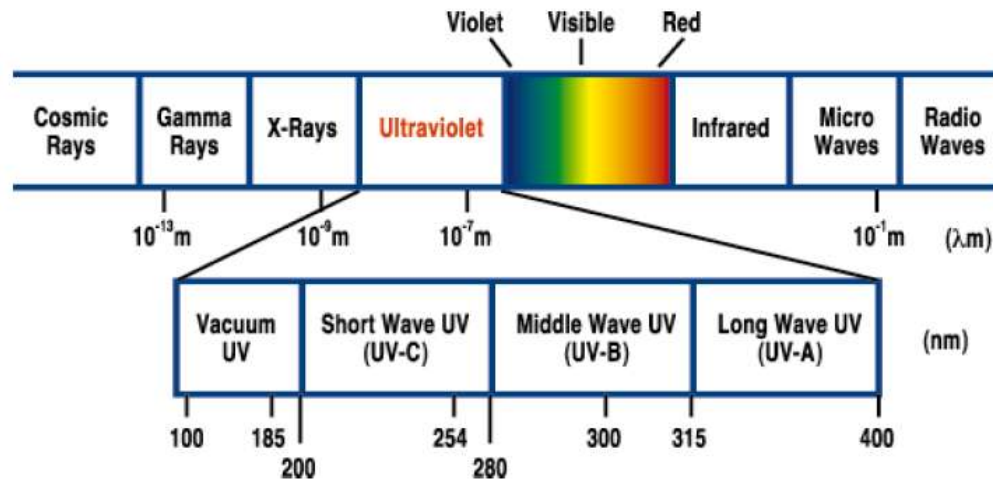
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- ✓ **Do not need Electricity**
- ✓ **Do not need Consuming parts**
- ✓ **Sterilize Germs in short time**
- ✓ **Should be durable and safe to use**

# What is UVC Light?

## UV IN THE LIGHT SPECTRUM

*From 2018 Yole report*



### UVC (200 - 280nm):

Also known as shortwave UV or deep UV; includes germicidal UV (253.7nm wavelength) used for air, water, and surface purification. Unintentional overexposure causes transient redness and eye irritation, but does NOT cause skin cancer or cataracts.

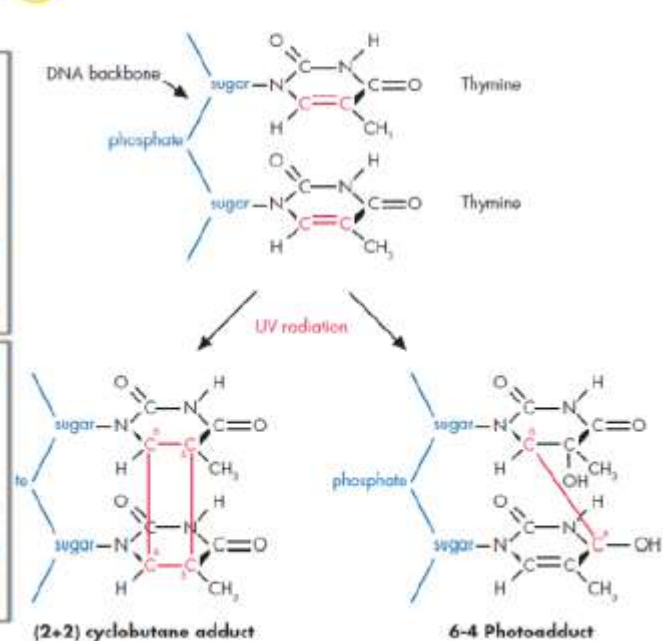
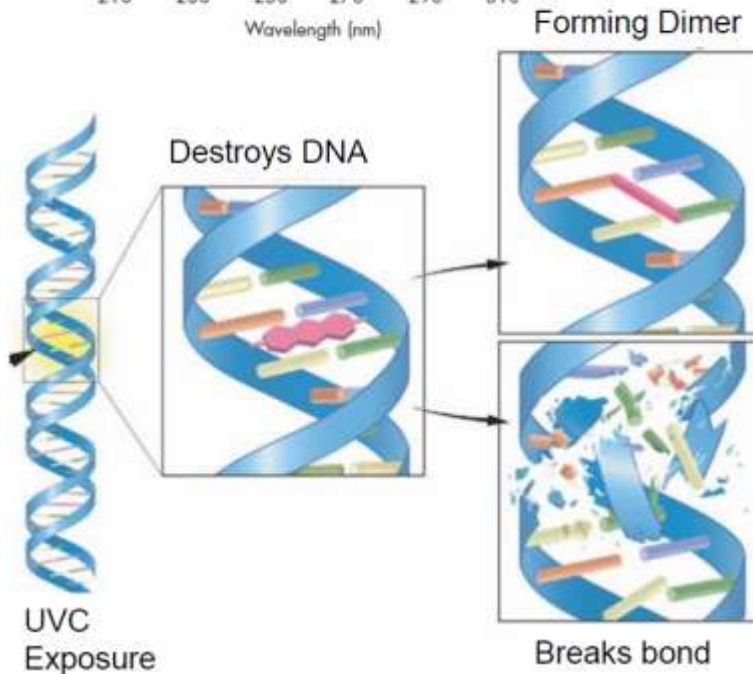
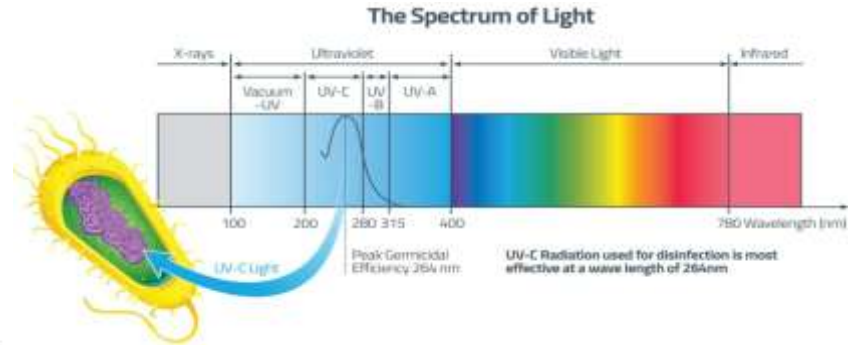
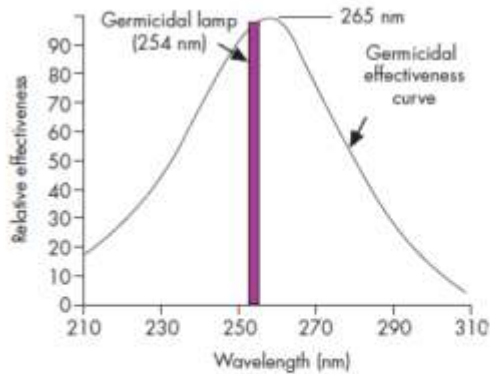
### UVB (280 - 315nm)

A small but dangerous amount of sunlight. Most solar UVB are absorbed by the diminishing atmospheric ozone layer. Prolonged exposure can be hazardous to human eyes and skin, but it has beneficial effects for vitamin D production and treatment of severe skin diseases.

### UVA (315 - 400nm)

Longwave UV, also known as "blacklight", represents the dominant UV in sunlight and is responsible for skin tanning. UVA is generally not harmful and can be used in medicine to treat certain skin diseases.

# How to UVC light kill Germs?



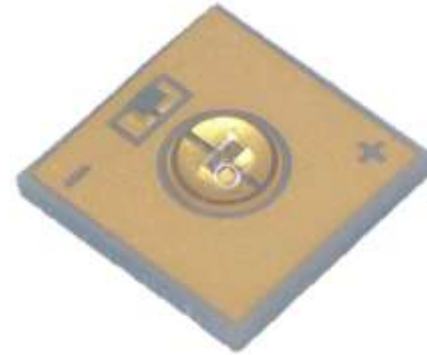
# How to make UVC light?

There is no UVC light on earth !



Low Pressure Mercury Lamp  
254nm UVC

- Safety issue(Mercury)
- Under environmental regulation
- Bulky and Fragile
- Life time issue
- Low cost



UVC-LED  
260nm ~ 280nm UVC

- No environmental issue
- Small size(3.5mm) & easy handling
- Long life time(semi permanent)
- High cost
- Under rapid technology progress

world first

# Hand cranked portable UVC-LED sterilizer, **PuriLight**



**UVC-LEDs module**

+

**Handy generator**

+

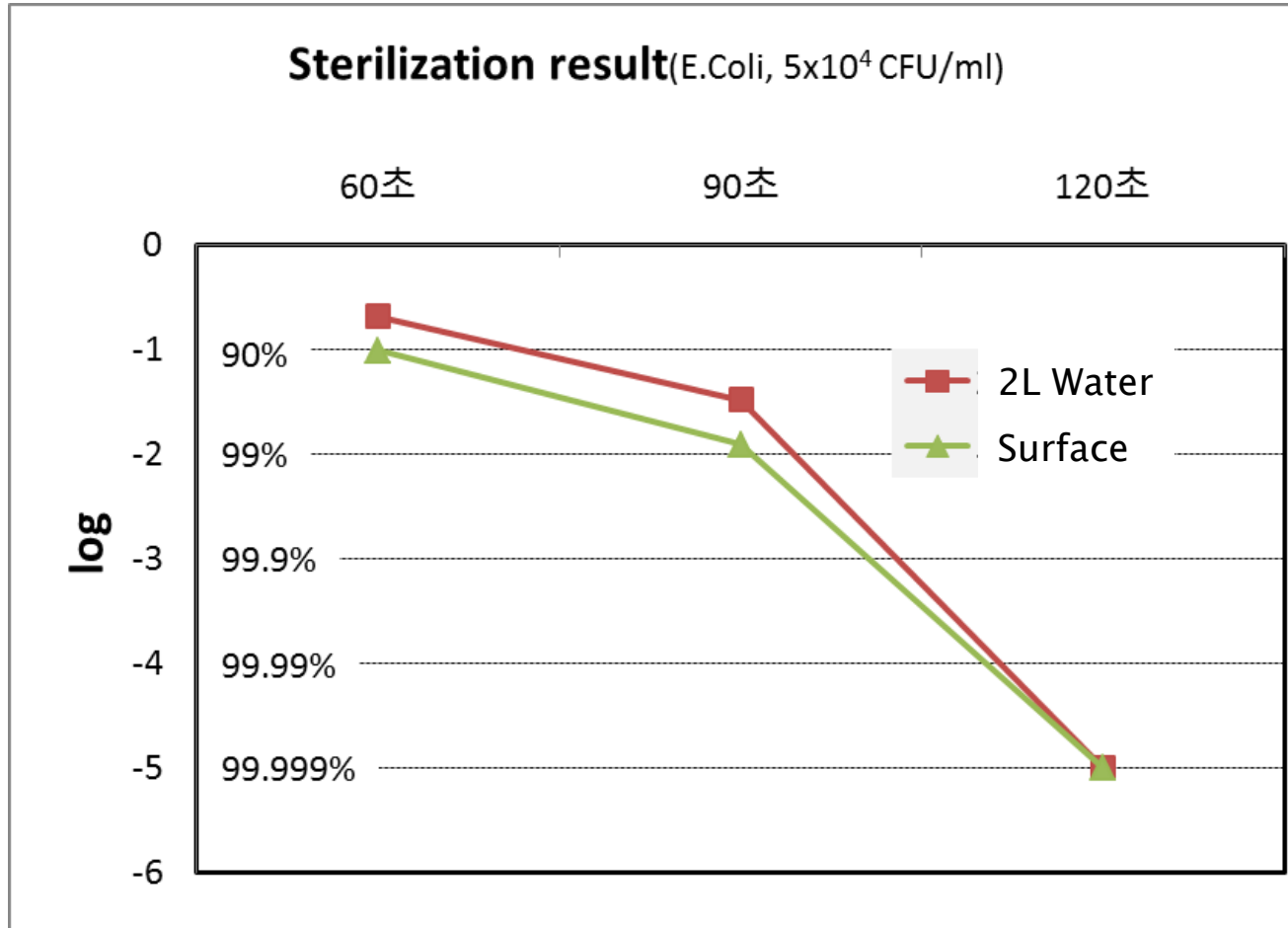
**Multi functional container**

- 1 USA patent application
- 4 Korean patents application

**ShareLight**



# Test result of sterilization



# Characteristics of the PuriLight™

- **10 UVC-LEDs (each 4mW) module**
  - powerful and uniform light distribution
- **4 inch Sapphire window**
  - high transparency and robust
- **20W handy generator**
  - stable power generation
- **Drawer type container**
  - convenient and easy to clean
  - 2L water at a time
- **Safe and easy operation**
  - magnetic sensor and waterproof circuit

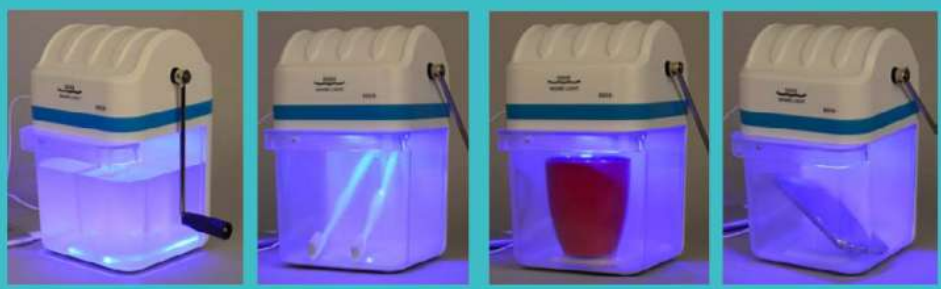
# Strength of PuriLight

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- **Anytime and Anyplace**
  - Do not need Electricity
  - Do not need any consumable parts
- **Sterilize both water and goods**
  - Improve personal hygiene
- **Long life time**
  - UVC LED is semi-permanent
- **Safe operation**
  - UVC light can not come out of water container
- **Lighting function**
  - Can use illumination light for emergency and reading

# Sterilizing mode Operation

- ✓ >99.9% in 2 mins
- ✓ 2L safe wafer



# Lighting mode Operation

✓ 2W lighting function



# Who needs PuriLight?

- **People who live in the drinking wafer problem areas**
  - No electricity infra or unstable area
- **People who are suffering from disasters**
  - Water and goods contamination with infra destruction
- **NGO staffs and relief activists**
  - Safe life in harsh environment
- **For all**
  - personal hygiene

**Filtered Water ???**

**Still need sterilization !!!**

# Our first plan with PuriLight



Area: **Mikese area, Tanzania**

Major drinking water : **Rainwater in reserve tank**

Problem: **seriously contaminated**

**250ea PuriLight distribution in Jan. 2019**

**Help more than 1000 people**



# Save Life with Light

Thank you

*KOICA CTS program is supporting this project*

ShareLight