

# Disinfection, sterilization and decontamination in Food industry

(based on novel innovative UV lasers by HyacinthLux Oy)

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Food industry, food stores, food and drinks preparation, cafes&restaurants, etc.

# Wet disinfection

- Liquid chemical germicide



- Heat sterilization



- Vapors and gases



# Chemical-free disinfection

UV-LED boxes



- Device disinfection<sup>1</sup>

UVless blue LEDs



- Disinfection of definite space<sup>2</sup>

UV lamps



- Definite space disinfection

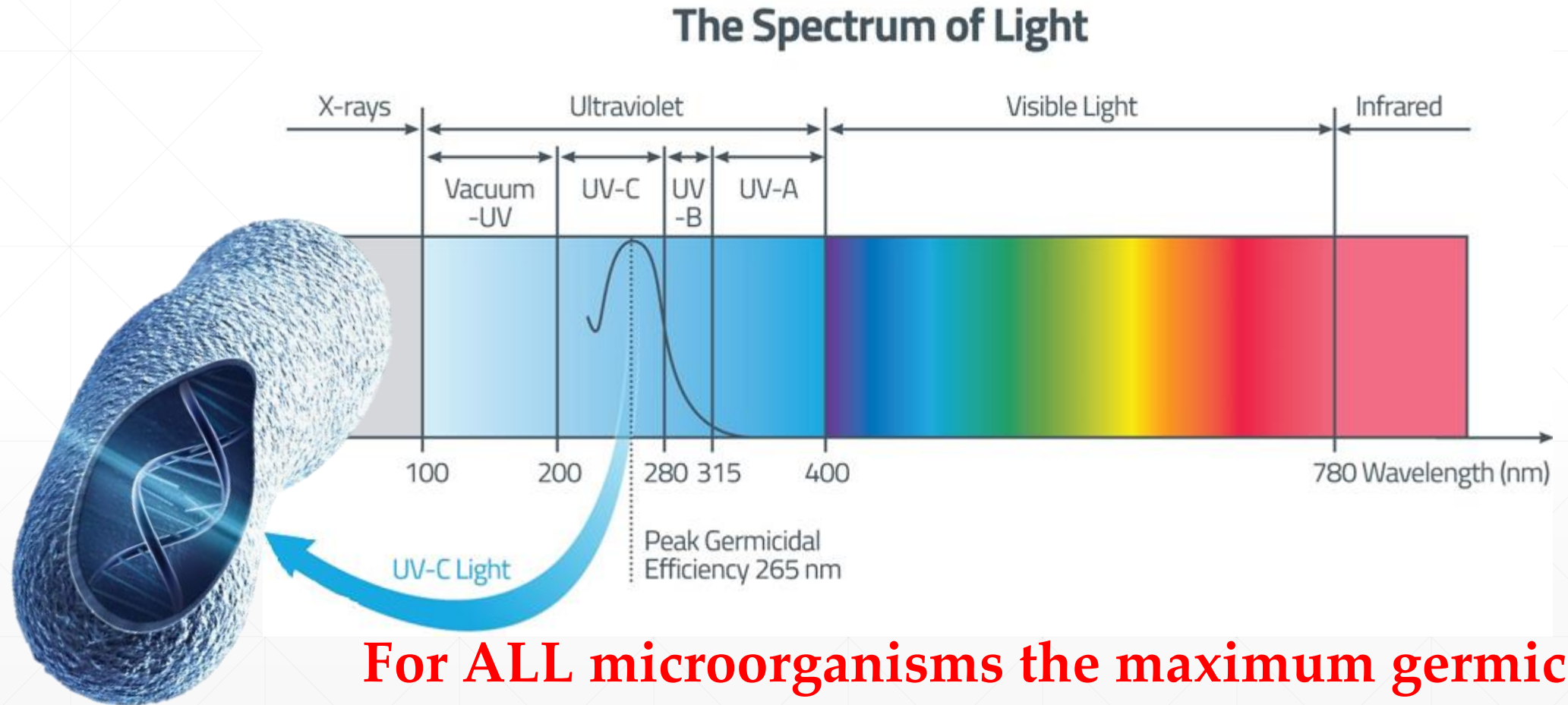
**NOVEL**

UV laser  
by HyacinthLux Oy



- **Device and equipment**
- **Surface and close volumes**
- **Long-distance disinfection**

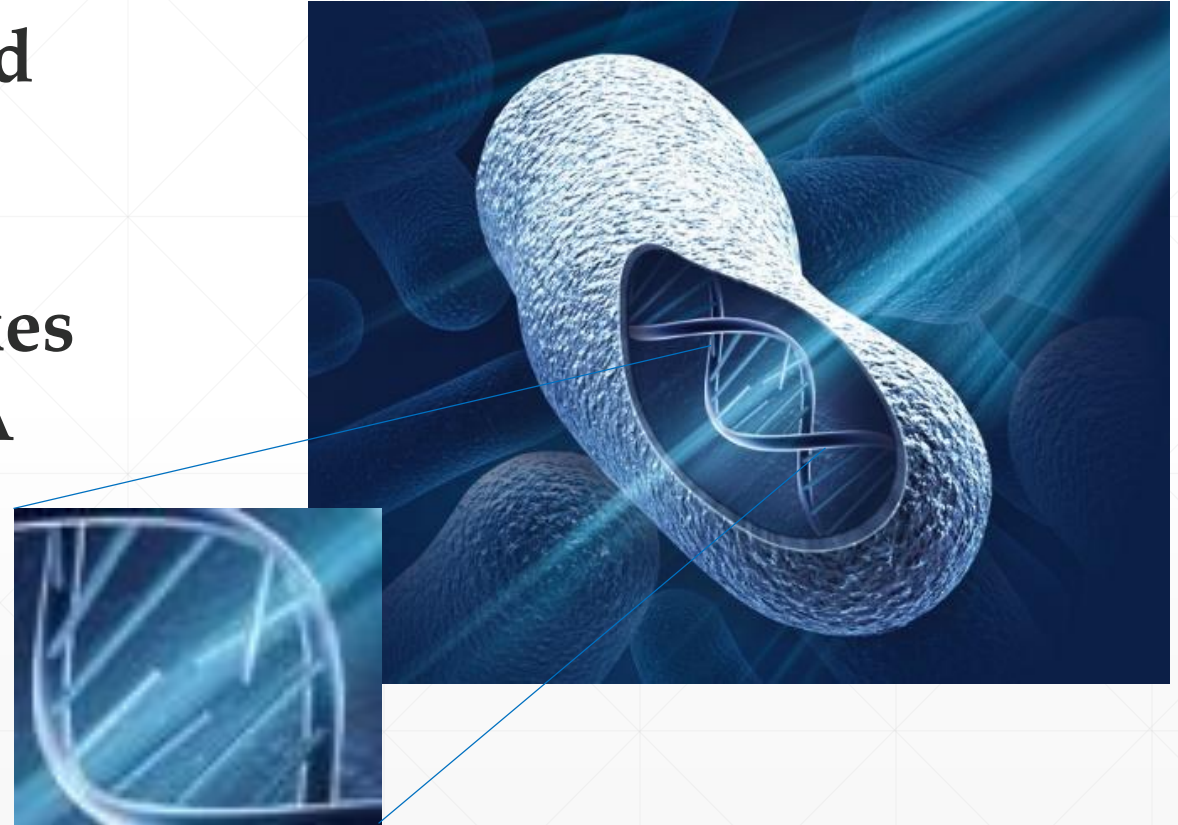
# Microorganisms sensitivity



**For ALL microorganisms the maximum germicidal sensitivity is at 265 nm = UV-C (not blue)**

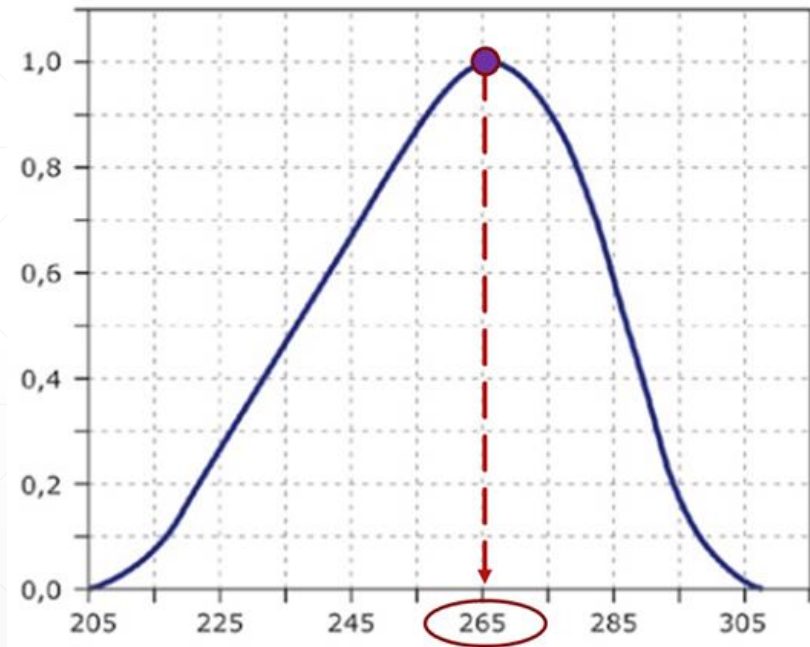
# How it works – UV-C disinfection?

- **photon absorption by DNA and RNA molecules**
- **photochemical reaction provokes dimerization of DNA and RNA bonds**
- **inhibits the ability of microorganisms to replicate**

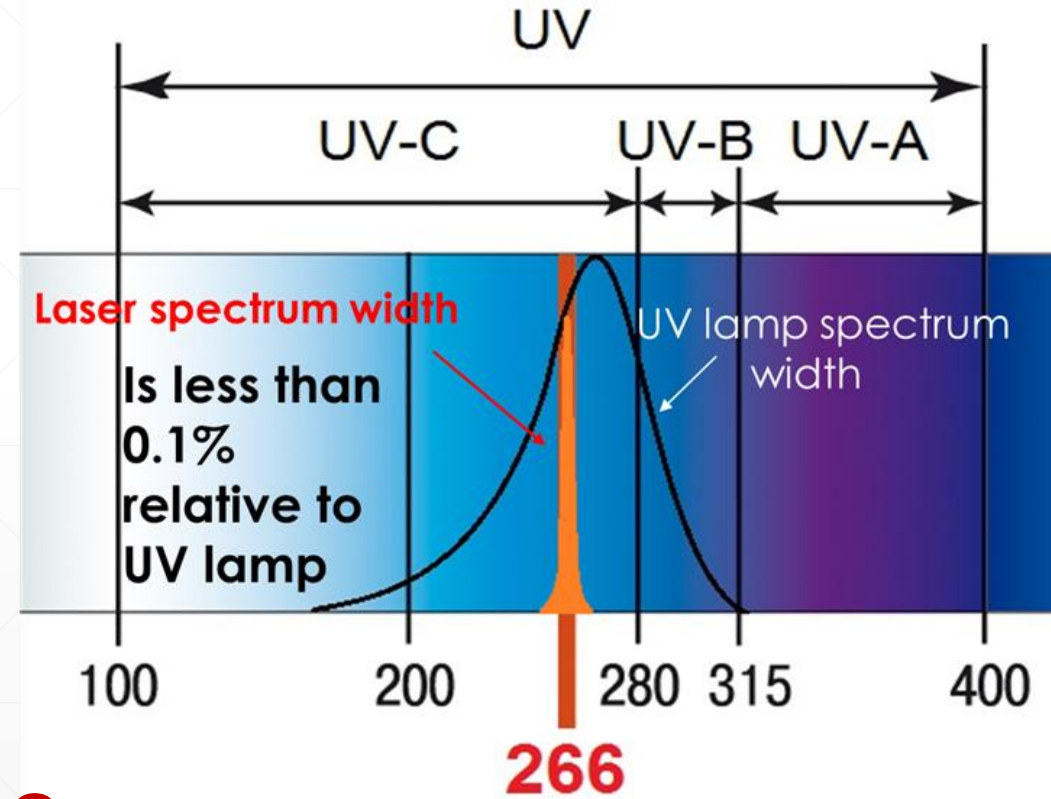


# HyacinthLux UV laser *vs.* UV lamp

## Bacteria kill spectrum



## UV lamp & laser spectrum



HyacinthLux UV laser is **1000×** more efficient than UV lamp

# HyacinthLux UV laser vs. UV lamp (cont.)

UV lamp



UV laser



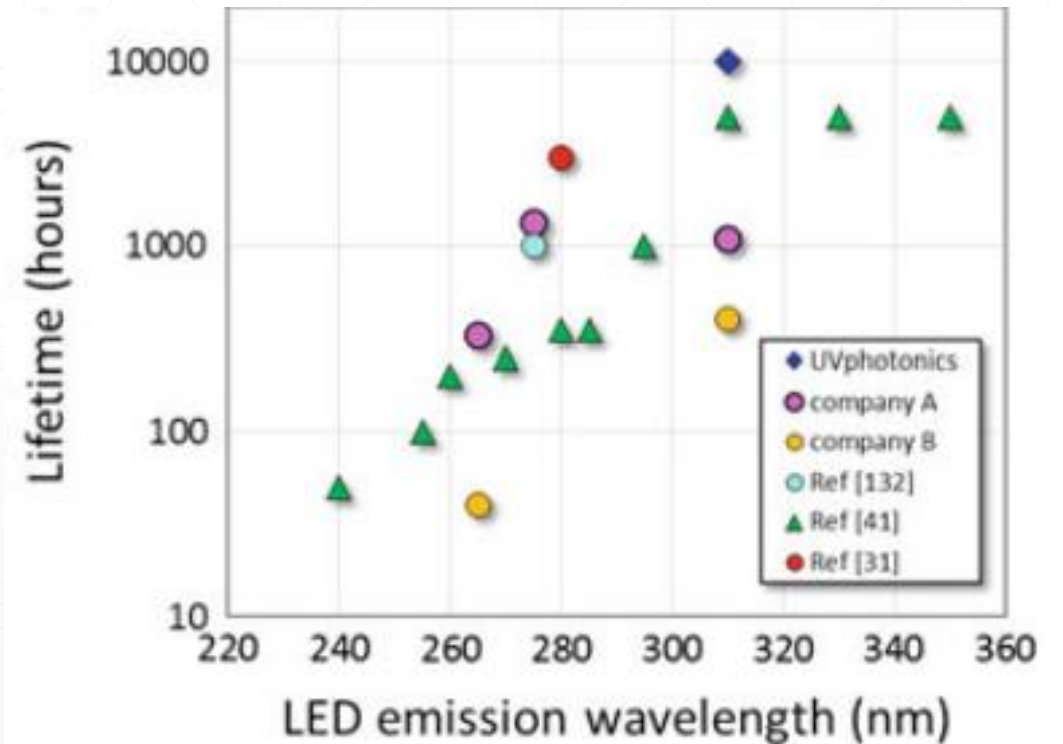
Efficiency	Life time	Sterilization time	Safety	Flexibility
Low	Short 2k hours	Long >300 sec per cm <sup>2</sup>	Burns to eyes and skin	Area needs to be unoccupied
High	Long >10k hours (up to 100k hour)	Short <1 sec per cm <sup>2</sup>	Safe	Any area

# Comment on UV LED

UV LEDs working in

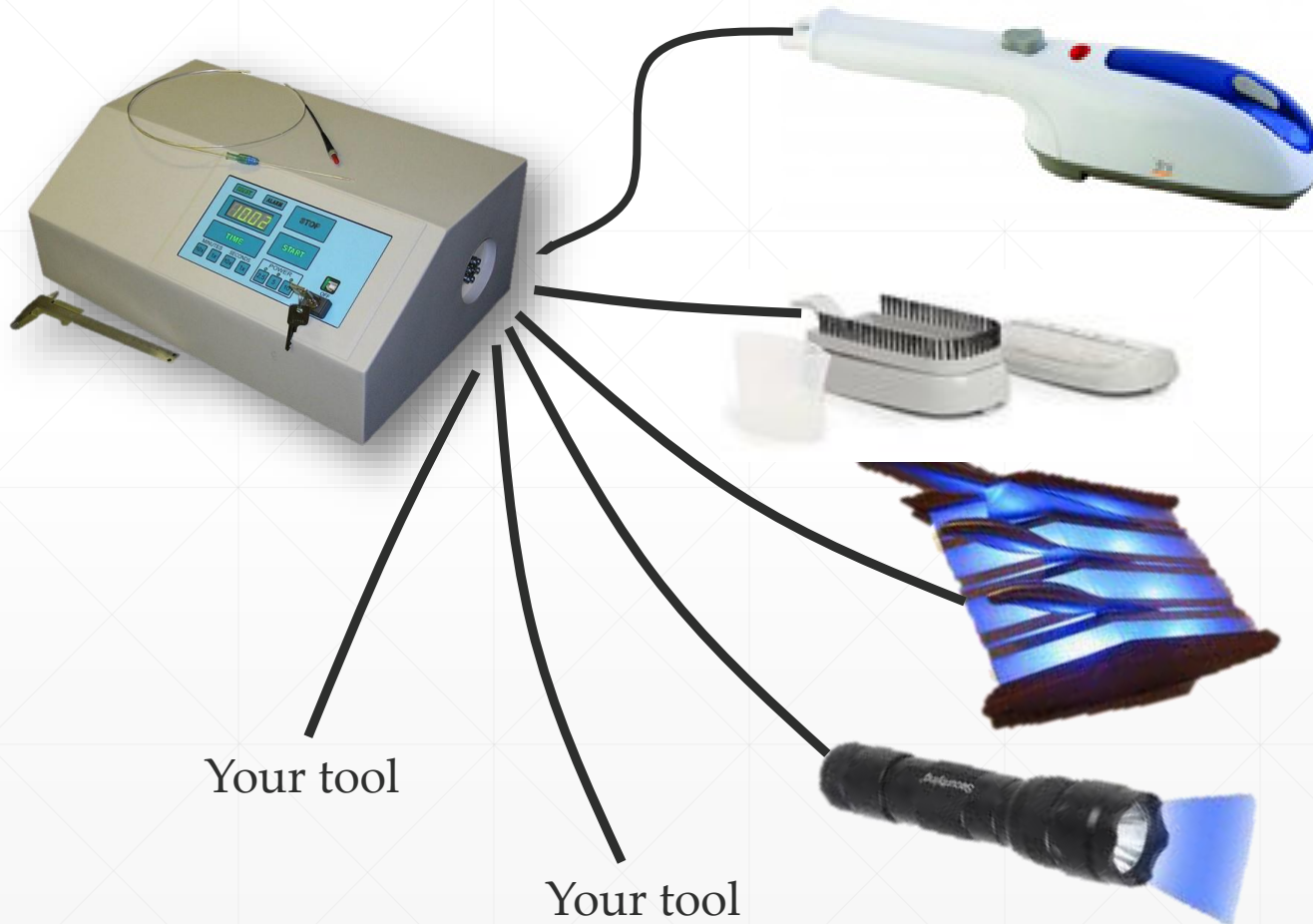
- UV-C (B) region have short life time (only 100-500 hours) without degradation
- UV-A region have not sterilization effect and can only be used as a (decorative) design solution for rooms

Reference: M. Kneissl and J. Rass (eds.), III-Nitride Ultraviolet Emitters, **Springer Series in Materials Science 227, 2016**





# HyacinthLux UV-C Laser is multifunctional: any ending tool



## Disinfecting

- Devices and equipment;
- Surface and close volumes;
- Long-distance disinfection (room corners, inside cracks and splits).

## Other advantages

- Hermetic and stable to outward forces;
- Long life-time (up to 100k hours)

# HyacinthLux Oy

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