

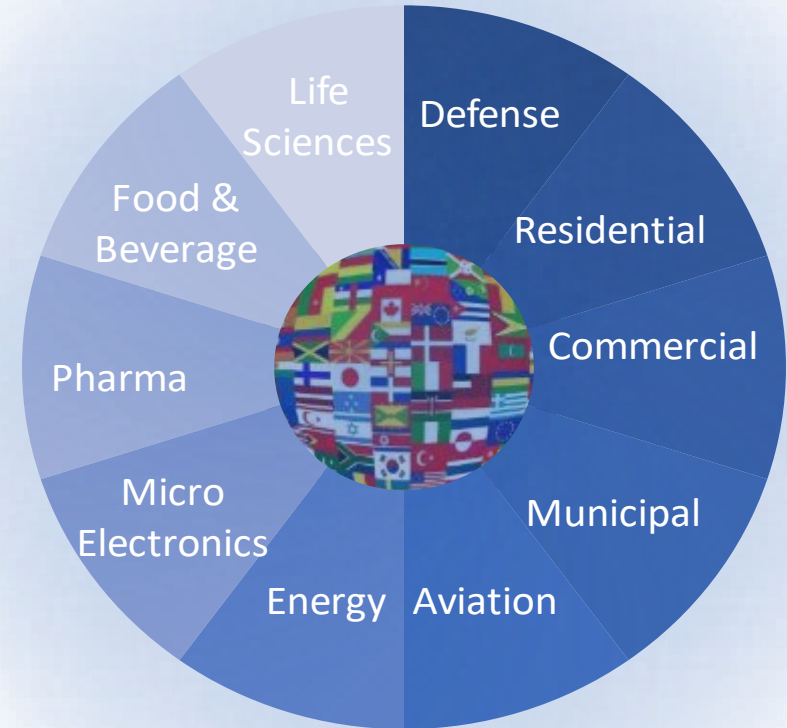
International Ultraviolet Association (IUVA)

- Founded in 1999
- IUVA is a not-for-profit, educational association
- Members: utilities, regulators, academicians, consulting engineers, manufacturers, and other interested professionals
- Members in 36 U.S. states and over 30 countries

Our Mission

- Provide a forum for the discussion of scientific and technical issues relating to the use of UV
- Develop a common voice for users & suppliers UV technologies
- Develop rational terms, units and nomenclature in UV technology
- Encourage research into the advancement of UV technologies
- Promote adoption of rational environmental regulations that consider the use of UV

UV Applications



COVID19 Specific Response

<https://iuva.org/IUVA-Fact-Sheet-on-UV-Disinfection-for-COVID-19>



The screenshot shows the IUVA website with a navigation bar at the top. The main banner features a blue background with a virus illustration and the text "CORONAVIRUS / COVID-19" and "IUVA UV Disinfection for COVID-19". Below the banner is a purple bar with the text "Advancing the sciences, engineering & applications of ultraviolet technologies to enhance the quality of human life & to protect the environment." The "IUVA COVID-19 FAQ" section is highlighted, showing a dropdown menu with the question "What is the UVC dose for killing or disabling the COVID-19 virus?". The answer states that because the virus is new, specific dosage values are not yet known, but comparable viruses require 10-20 mJ/cm² of direct UVC light at 254nm. To compensate, researchers are applying dosages of 1,000 - 3,000 mJ/cm² to ensure 99.9% deactivation. A link to "CDC's recently published guidelines" is provided. The "MENU" section lists "IUVA COVID-19 FAQ", "Fact Sheet on UV Disinfection for COVID-19", "Advice for the selection and operation of equipment for the UV disinfection of air and surfaces", and "Discouraging the Use of UV Light on the Human Body". The "WHITE PAPERS" section lists "UV 101: Overview of Ultraviolet Disinfection" and "SARS-CoV-2 UV Dose-Response Behavior".

IUVA COVID-19 FAQ

▼ What is the UVC dose for killing or disabling the COVID-19 virus?

What is the UVC dose for killing or disabling the COVID-19 virus?

Because the COVID-19 virus (SARS-CoV-2) is so new, the scientific community doesn't yet have a specific deactivation dosage. However, we know the dosage values for comparable viruses in the same SARS virus family are 10-20 mJ/cm² using direct UVC light at a wavelength of 254nm; this dosage will achieve 99.9% disinfection (i.e., inactivation) under controlled lab conditions. In real-life, the virus is often hidden or shaded from direct UVC light, reducing UVC's effectiveness. To compensate, researchers are applying dosages of 1,000 - 3,000 mJ/cm² to ensure 99.9% deactivation, the current CDC disinfection goal ([see CDC's recently published guidelines online](#)).

CDC's recently published guidelines

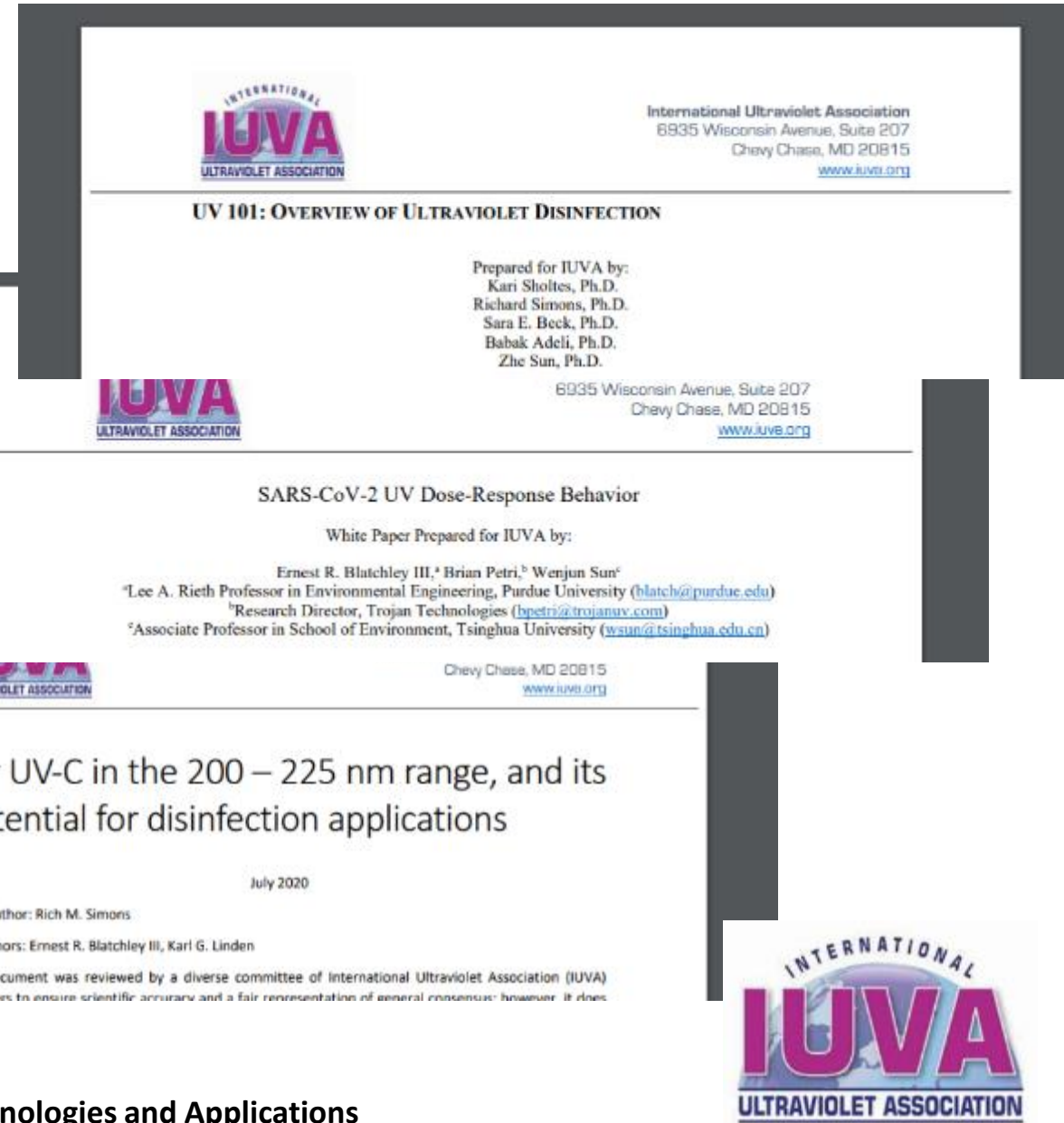
► Can we use tanning beds to decontaminate PPE?

MENU

- IUVA COVID-19 FAQ
- Fact Sheet on UV Disinfection for COVID-19
- Advice for the selection and operation of equipment for the UV disinfection of air and surfaces
- Discouraging the Use of UV Light on the Human Body

WHITE PAPERS

- UV 101: Overview of Ultraviolet Disinfection
- SARS-CoV-2 UV Dose-Response Behavior



The screenshot shows the IUVA Fact Sheet on UV Disinfection for COVID-19. The header includes the IUVA logo and the text "International Ultraviolet Association" and "6935 Wisconsin Avenue, Suite 207 Chevy Chase, MD 20815 www.iuva.org". The title is "UV 101: OVERVIEW OF ULTRAVIOLET DISINFECTION". The authors are listed as "Prepared for IUVA by: Kari Sholtes, Ph.D., Richard Simons, Ph.D., Sara E. Beck, Ph.D., Babak Adeli, Ph.D., Zhe Sun, Ph.D." and "6935 Wisconsin Avenue, Suite 207 Chevy Chase, MD 20815 www.iuva.org". The main title is "SARS-CoV-2 UV Dose-Response Behavior" and the subtitle is "White Paper Prepared for IUVA by: Ernest R. Blatchley III,^a Brian Petri,^b Wenjun Sun^c". The authors' affiliations are listed: ^aLee A. Rieth Professor in Environmental Engineering, Purdue University (blatch@purdue.edu), ^bResearch Director, Trojan Technologies (bpetri@trojanuv.com), and ^cAssociate Professor in School of Environment, Tsinghua University (wsun@tsinghua.edu.cn). The location "Chevy Chase, MD 20815" and website "www.iuva.org" are also listed. The main title is "Far UV-C in the 200 – 225 nm range, and its potential for disinfection applications". The date is "July 2020". The lead author is "Rich M. Simons" and the co-authors are "Ernest R. Blatchley III, Karl G. Linden". The text states "This document was reviewed by a diverse committee of International Ultraviolet Association (IUVA) members to ensure scientific accuracy and a fair representation of general consensus; however, it does not". The IUVA logo is at the bottom right.

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INTERNATIONAL
ULTRAVIOLET ASSOCIATION

International Ultraviolet Association
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^bResearch Director, Trojan Technologies (bpetri@trojanuv.com)
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Far UV-C in the 200 – 225 nm range, and its potential for disinfection applications

July 2020

Lead author: Rich M. Simons

Co-authors: Ernest R. Blatchley III, Karl G. Linden

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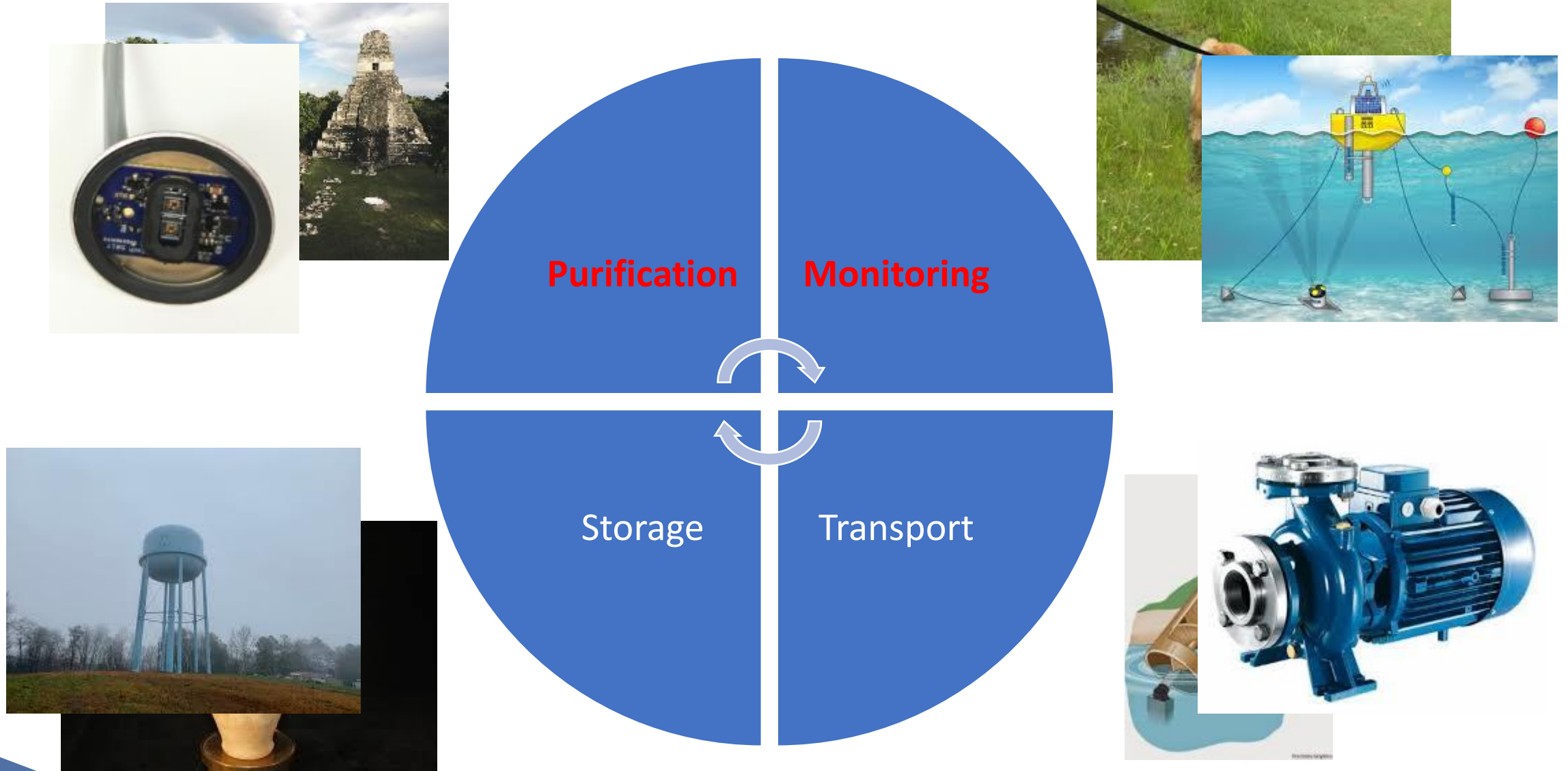
Light-Sources: More than Just a Wavelength

EPIC Online Technology Meeting
Water Quality Monitoring and Purification
In Cooperation with IUVA

9 November 2020



Water Quality & Purification



Lamp Technology

Deuterium

Xenon

Mercury-Vapor
LP & MP

LED



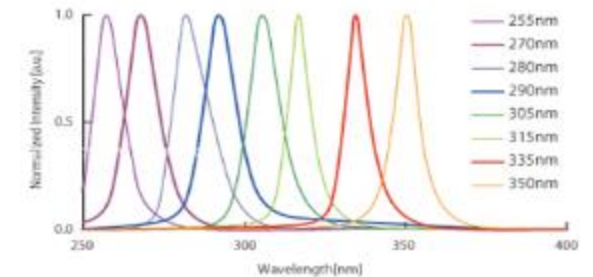
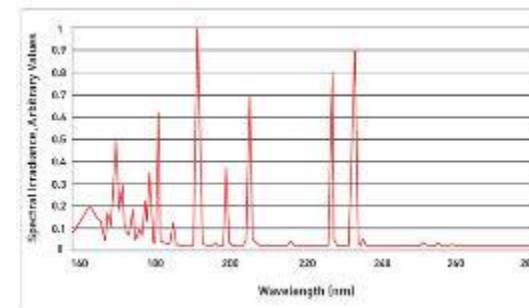
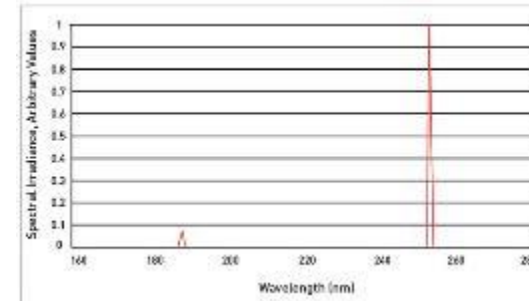
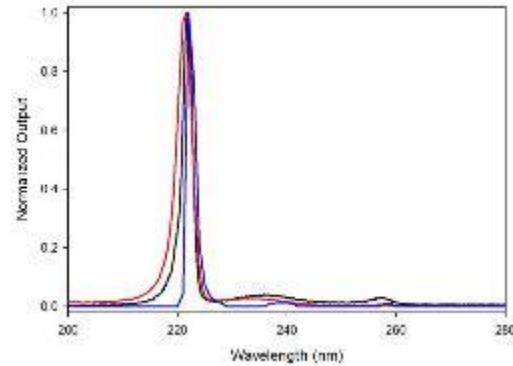
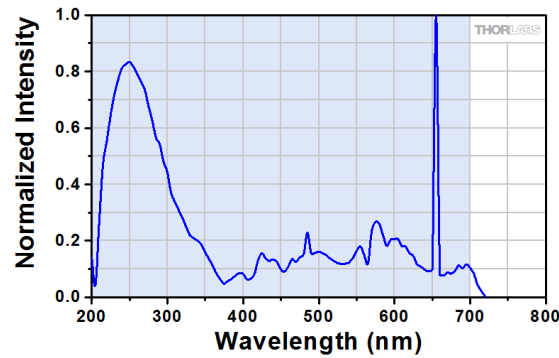
Lamp Technology

Deuterium

Xenon

Mercury-Vapor
LP & MP

LED

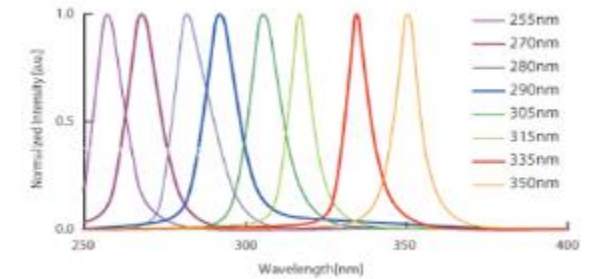
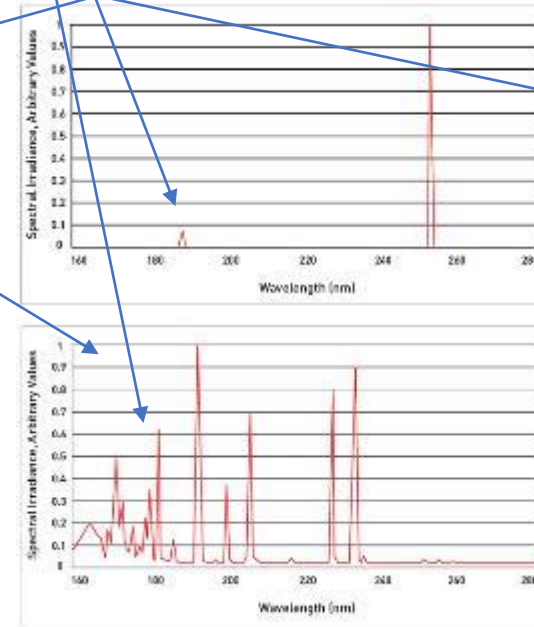
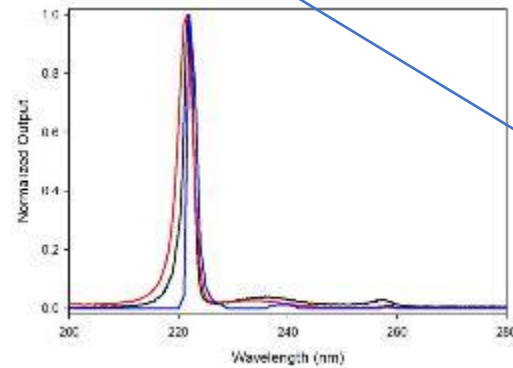
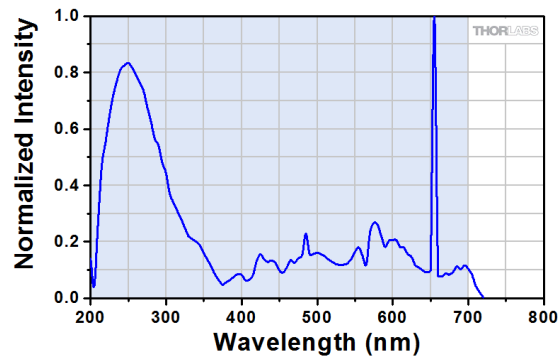


Application

Measurement

Ozone / Oxidation

Disinfection

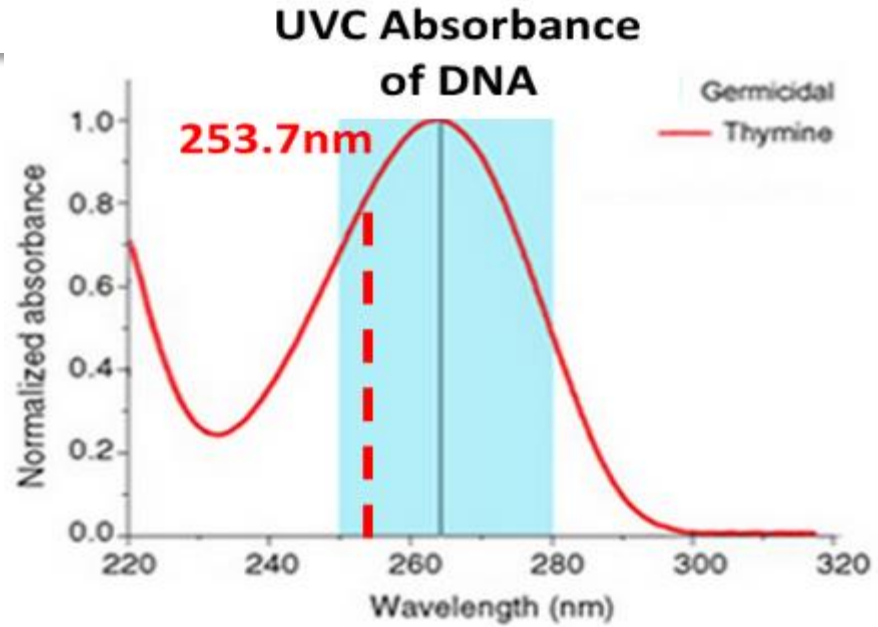
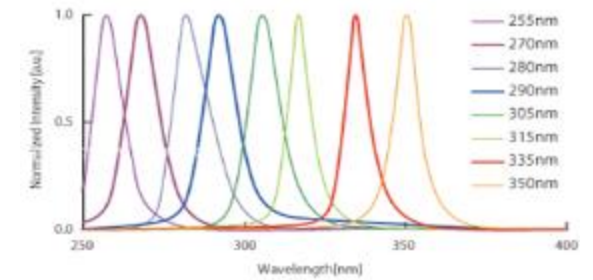
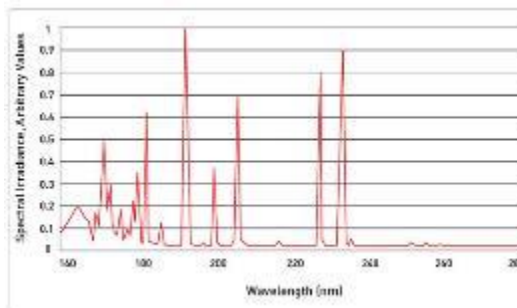
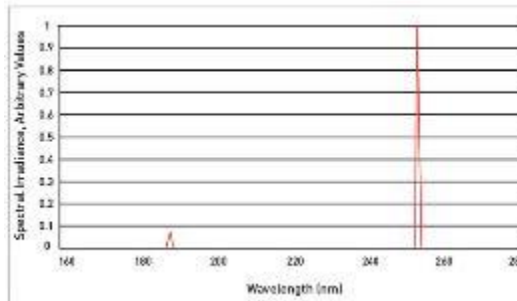
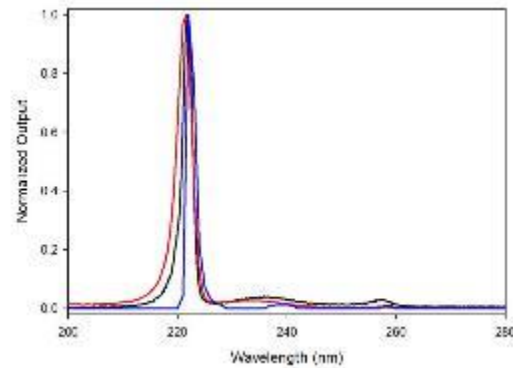
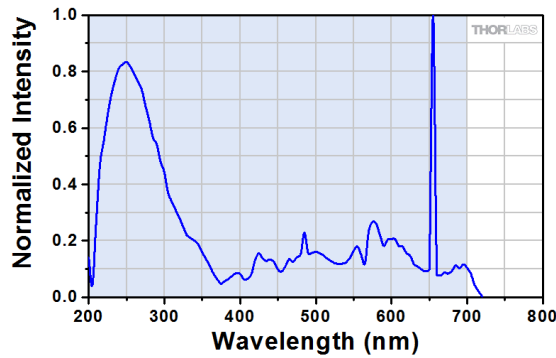


Application

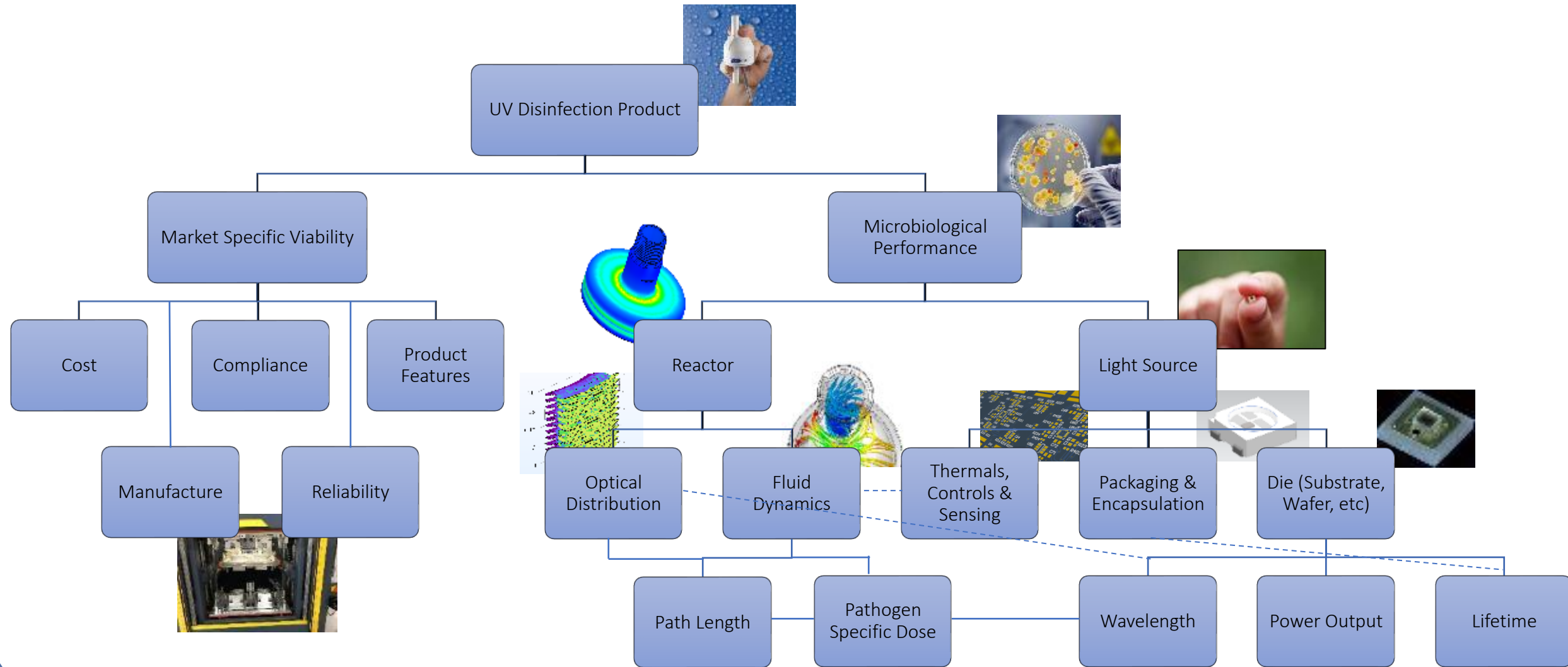
Disinfection

Selection made based on multiple factors

- Wavelength
- Cost
- Lifetime
- Efficiency
- Footprint
- Output power



More than Wavelength - Key Design Criteria



AquiSense Product Platform Overview

Stand-alone

- PearlAqua
- PearlAqua Deca
- PearlSurface



OEM Integration

- PearlAqua Micro
- Custom Variants



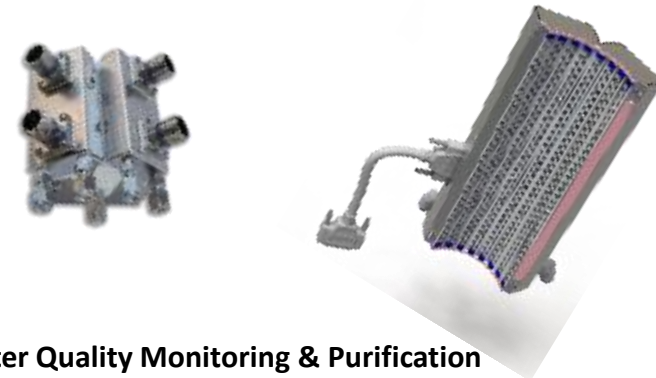
Research Products

- PearlBeam
- Others; LabMicro, Thin-Film



Special Projects

- Space, Aviation, Automotive, Oil & Gas, Microelectronics, Medical, etc



New Major Supply Contract

Company:	Mitsubishi Electric Corp
Product:	Eco Cute Heat Pump
Application:	Water Reuse
Contract Start:	August 2020
UV Product:	AquiSense PearlAqua Micro
Criteria:	Price, Performance, Quality, Volume

