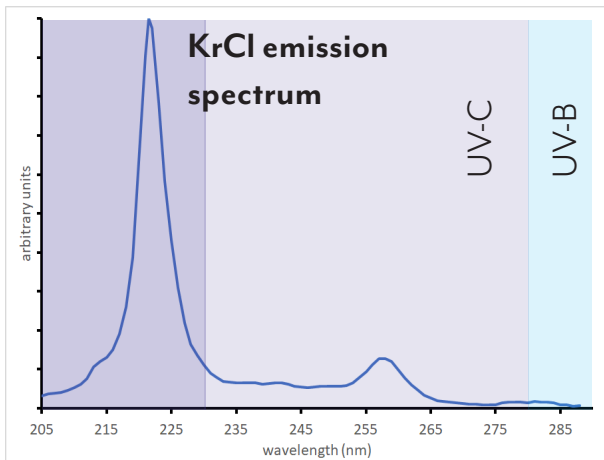




Far UV-C Lamp

The Krypton Chloride excimer lamp has been investigated as a way to kill viruses and bacteria without significantly harming larger cells. (1-3) The KrCl emission spectrum is dominated by the 222 nm line, but that's not all it emits!

In order to minimize damage to human cells, the wavelengths higher than 230 nm should be blocked. (1-3)

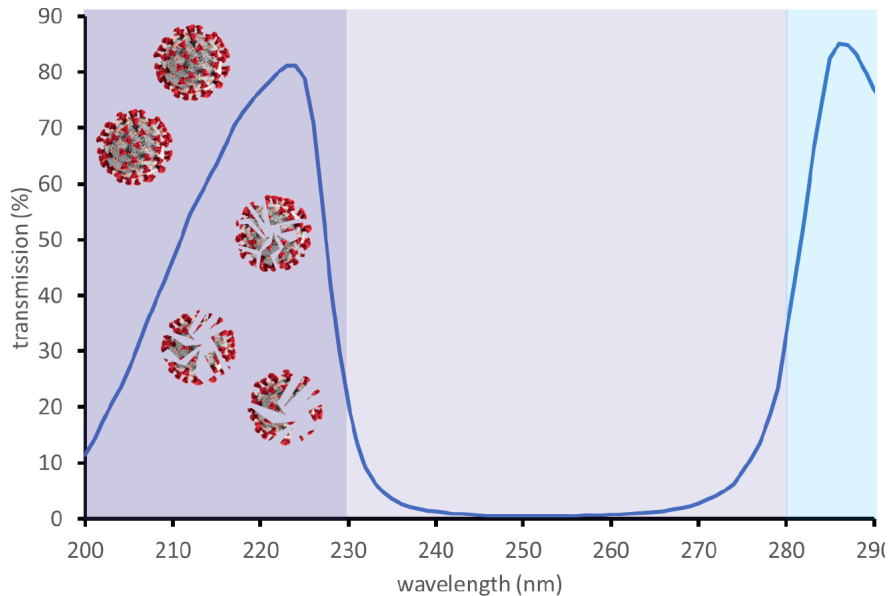


KrCl emits light throughout the UV-C and into the UV-B region of the spectrum.

Why Omega Optical?

- A leader in thin-film optics since 1969
- Over 30,000 filter designs
- Don't pay for specifications you don't need
- Volume production capacity- thousands parts per month

Omega Short-Pass Filter



Blocks harmful UV-C wavelengths, especially the peak at ~260 nm

Factors to Consider

- **Minimize angles-of-incidence-** Filter performance depends on at what angle the light hits the filter. For the best blocking and steepest cutoff edge, the optical angle range should be +/- 10 degrees.
- **Block only required wavelength ranges-** If your lamp doesn't emit at that wavelength, don't block it!

Many other UV-C light sources are being studied for sterilization applications.

Contact us for your custom filter solution!

ISO 9001:2015 CERTIFIED • ITAR REGISTERED • MADE IN THE USA



How does it work?

DNA absorbs maximally at about 260 nm, which would cause the most damage to a cell or organism. However, studies have shown that only below about 230 nm is recommended for sterilization in the presence of people and animals. Why?

1. Size-

- Viruses diameter is 20-200 nanometers
- Cells in a person or animal are 20-200 microns (1000 times bigger than a virus)

2. Internal structure-

- In viruses, the DNA is very close to the surface.
- In human cells, DNA is localized in the nucleus in the cell's interior and wrapped around a protein scaffold. These and other proteins in the cell absorb the UV-C light before it can reach the DNA and do damage.

Working with Omega

Start early- Discuss filters early in the design phase so all factors are considered

Design- We provide spectral models of the filters we are going to make before any decisions (or parts) have been made

Iterate- Discuss and refine the filter designs

Prototype- Small lots are provided for proof-of-concept and pre-production runs

Iterate- Refine the design if needed

Full-production runs in volume- you are in full-production of your new instrument! Omega can produce thousands of parts per week.

References

1. M. Buonanno, et al. "Germicidal efficacy and mammalian skin safety of 222 nm UV-light" Radiat Res 2017 Apr; 187(4):483-491. doi: 10.1667/RR0010CC.1
2. T. Fukue, et al. "Exploratory clinical trial on the safety and bactericidal effect of 222-nm ultraviolet C irradiation in healthy humans" PLoS One 2020 Aug 12;15(8):e0235948. doi: 10.1371/journal.pone.0235948
3. H. Kitagawa, et al. "Effectiveness of 222-nm ultraviolet light on disinfecting SARS-CoV-2 surface contamination", American Journal of Infection Control 2021, 49 (3) : 299-301. doi:10.1016/j.ajic.2020.08.022.

ISO 9001:2015 CERTIFIED • ITAR REGISTERED • MADE IN THE USA