

1) What is Ultraviolet (UV) light?

UV light is invisible to the human eye. It is part of the electromagnetic spectrum that lies beyond the purple range of the visible spectrum. UV light spectrum is classified into three wavelength ranges:

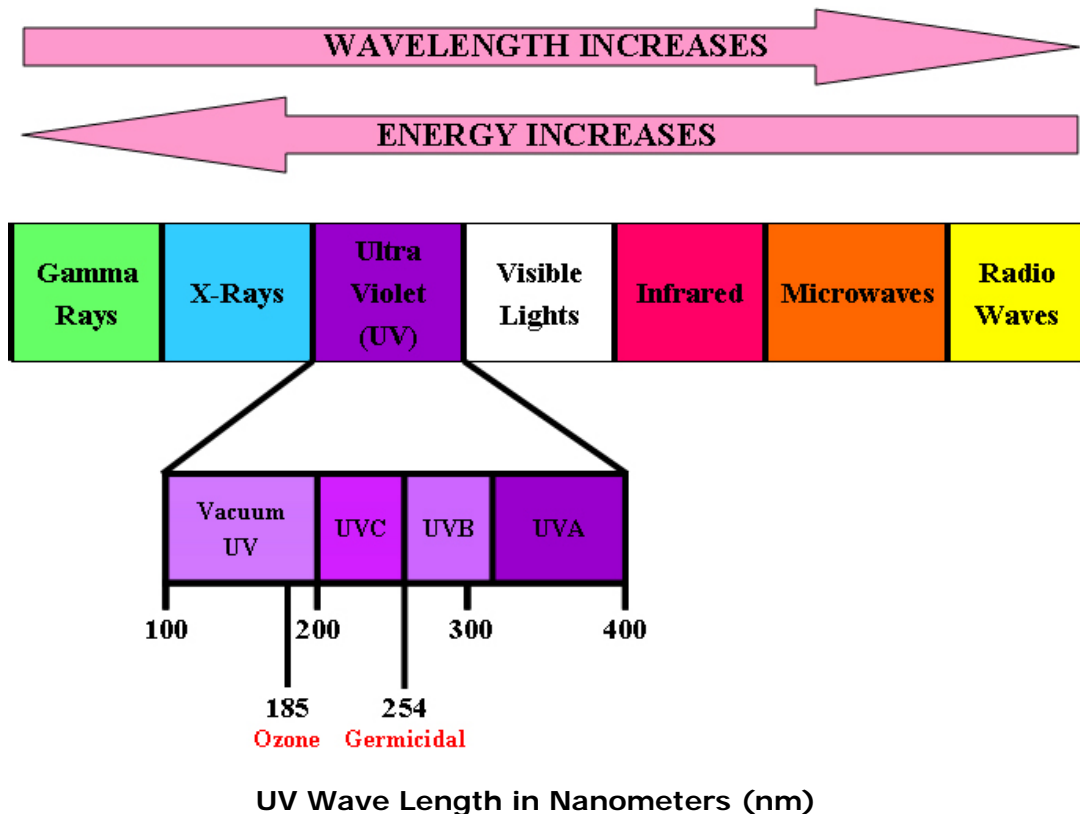
- **UV-C (Germicidal Short Wave)** **from 100 nanometers (nm) to 280 nm**
- **UV-B (Germicidal Middle Wave)** from 280 nm to 315 nm
- **UV-A (Long Wave)** from 315 nm to 400 nm

**** Remarks: $1 \text{ nm} = 10^{-9} \text{ m}$**

UV-C is used to destroy bacteria, mold, viruses and other biological contaminants in the air, in liquids, or on surfaces. **UV-V** (100nm – 185nm), or Vacuum UV is produced by ultraviolet lamps which produce ozone and employed in disinfection and ozone destruction applications. This occurs because UV-V light reacts with oxygen to break it into atomic oxygen, a highly unstable atom that combines with regular oxygen atoms to form O_3 (ozone) which oxidizes organic materials.

UV-B is in the middle wavelength of the ultraviolet spectrum and has been used to treat skin diseases.

UV-A is the source of suntanned skin. With its relatively longer wavelength, it can penetrate the atmosphere. Applications included tanning beds and treatment of skin diseases plus insect lights.

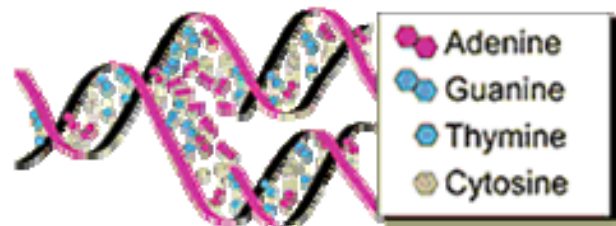


2) How do germicidal UV lights work?

UV-C light is germicidal light and our remote cloth hanger set contains **2 germicidal UV lights**. UV germicidal irradiation is produced by low-pressure mercury lamps similar to fluorescent lamps without a phosphor and with a quartz bulb. It is a short wave low pressure mercury vapor lights that produces UV wavelengths which are lethal to microorganisms. Approximately 95% of the UV energy emitted is at the mercury resonance line of 254 nm. This wavelength is in the region of maximum germicidal effectiveness and is highly lethal to virus, bacteria, fungi and mold spores. Therefore, the air that passes through the covered area is exposed to the germicidal UV light and the genetic material of the microorganism is deactivated, which is to prevent them from reproducing and renders them harmless. In fact, when the organism tries to replicate, it dies.



DNA-Based Airborne Contaminants



Destroying of Microorganism DNA

3) What are the beneficial uses of germicidal UV?

UV technology is a non-chemical approach to disinfection. In this method of disinfection, nothing is added which makes this process simple, inexpensive and requires very low maintenance. It can reduce or eliminate the DNA-based airborne contaminants like allergens, pathogens and toxins and emit about 95% of their light at 254 nm which coincides very well with one of the two peaks of germicidal effectiveness curve. E.g. Effectiveness for UV absorption by DNA. One of these peaks is at about 265 nm and the other is at about 185 nm.