HVAC System

According to [www.petro.com](http://www.petro.com), HVAC refers to heating, ventilation, and air conditioning. This pertains to the system of how to transfer fresh air from the outside and deliver it inside a room all the while increasing the comfort of the individuals inside the room using mechanical ventilation to cover the gaps and possibly change its temperature.

Germicidal UV Basics

According to Jones et al, UV light is classified into four wavelength ranges:

* Vacuum UV - 100-200 nm
* UV-C - 200-280 nm
* UV-B - 280-315 nm
* UV-A - 315-400 nm

Wavelengths ranging from 100 nm to 280 nm are proven to be germicidal and at 253.7 nm, which is commonly referred as 'UV-C', the UV wavelength changes the structure of DNA and RNA of all life forms that is able to produce cells. Bacteria and viruses can absorb UV-C energy at different rates but all of them are still non-resistant when exposed to an appropriate dose.

HVAC System with UV-C

Aside from just delivering fresh air from the outside to inside, the system also disinfects the air using UV-C or Ultraviolet C lights. According to Daniel Jones and Michael Ivanovich, UV-C energy is proven to destroy airborne and surface-bound microbes, including chickenpox, measles, mumps, tuberculosis (TB), and cold viruses.

During the 1940s, hospitals began using UV-C to destroy drug-resistant superbugs which made them more interested in UV-C and tried to integrate them into other disinfectants like HVAC systems. They began experimenting with UV-C and its behavior towards different types of microbes along with SARS CoV2 and have found successful results on their inactivation.

UV-C Reflective Factor

According to Jones et al, surface irradiation is the most common type of germicidal UV-system. This system can eradicate up to 30 percent of airborne pathogens on the first wave of ultraviolet. According to the article, depending on the surface material used, the effectivity of UV-C increases. These materials and their corresponding efficiency rates are as follows:

* Stainless Steel – 1.40
* Galvanized Steel – 1.50
* Aluminum Steel – 1.75

Such materials reflect the light in such a way that the intensity of the light increases and can be said the same as well for the use of UV-C lights. This is proven and is used practically in HVAC systems to disinfect ventilations.

https://www.petro.com/resource-center/what-is-hvac

<https://www.amca.org/educate/articles-and-technical-papers/amca-inmotion-articles/uv-c-for-hvac-air-and-surface-disinfection-2.html>

https://insights.regencylighting.com/germicidal-uv-hvac-systems