



**ALCOCHEM**  
HYGIENE



## 1. Solar radiation

The existence of life on earth depends fundamentally on the solar radiation and in particular on the quantity of ultraviolet (UV) radiation that impacts on living species. The solar light emission spectrum corresponds to an ample range of wavelengths which we can also describe by their energetic equivalents, the short wavelength radiation being the most powerful. The sun emits ultraviolet radiation at ~100-400nm, visible light at ~400-700nm, close infrared at ~700-1000nm and distant infrared at 1000-10000nm.

## 2. Ultraviolet radiation

Ultraviolet radiation can be divided into three types according to their wavelengths and the distinct roles that they perform on the photochemical processes and on the human health.

### UV-A

It is the closest to visible light and the least energetic of UV-light - nevertheless it can cause significant damage on the long term, such as the aging of the skin.

Its wavelength varies between 400-320nm.

### UV-B

Reaches the earth debilitated by the ozone layer and is sensitive to climate conditions. It is also called biological UV - its wavelength varies between 320-280nm and it is harmful to living species. On human health it has short- and long-term negative effects. On short term it causes reddening and burning of the skin. On long term UVB causes skin cancer, damage to the eyes and impacts negatively on our immune system. UVB represents only 5% of the UV and 0.25% of all the solar radiation that reaches the surface of the earth.

### UV-C

UVC between 220-280nm is the most dangerous to life but fortunately it is completely absorbed by the ozone layer (O<sub>3</sub>) thus it causes no harm on earth. UVC radiation is used in water and air purification processes ...

### **3. Ultraviolet radiation index**

Ultraviolet radiation is measured and reflected in mW/cm<sup>2</sup> (corresponding to 0,000001 Watts power per each cm<sup>2</sup>). **The Dose** or application is measured and shown in Joules/cm<sup>2</sup> corresponding to the power (mW) per space (cm<sup>2</sup>) per exposure time (s).

#### **RESUMING**

*Ultraviolet radiation is measured and shown in mW/cm<sup>2</sup> (corresponding to 0,000001 Watts power per each cm<sup>2</sup>).*

*The Ultraviolet Dose (mJ/cm<sup>2</sup>) is the result of the radiation (mW/cm<sup>2</sup>) in relation to the exposure time (s).*

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### **UVC AIR PURIFYING EQUIPMENT - AETAIRE - AND ITS OPERATIONAL PARAMETERS**

To purify the air the AETAIRE-unit incorporates a ventilator to generate a certain air circulation towards and through the chamber or so-called reactor. The air is conducted through a HAFE/HEPA filter along the length of a UVC-lamp inside the chamber passing the ionizer at the top/exit part of the unit.

\*The electrostatic filter eliminates all solid air-borne particles such as dust, grease, smoke, pollen or smells etc. It is statically charged by the air passing through it ... causing friction.

\*The UVC lamp radiates the air passing through the interior of the chamber. The average radiation of the 60W PL-L UVC Tube is technically speaking 19W due to its intrinsic luminescence conversion ... the level of which in fluorescent tubes is at 30-35%.

The AETAIRE is operational on two speeds - at 25 or 50m<sup>3</sup>/h so the air circulation velocity inside the chamber is at 0.7 m/s (50 m<sup>3</sup>/h) or 0.35 m/s (a 25 m<sup>3</sup>/h) - producing radiation levels between 4,23 and 8,46 MJ/cm<sup>2</sup> (50 and 25 m<sup>3</sup>/h respectively).

Documental and public tests on exponential trails on sterilization of virus and bacterial clusters show results on effective exposition dose-values of 2.6 mJ/cm<sup>2</sup> for bacteria y adenovirus and 0.6 mJ/cm<sup>2</sup> for Coronavirus - view page 4 of the '[estudio radiación-uvc coronavirus](#)'.

Another annexed document '[news release mar2020](#)' page 2 shows effective results at exposition values of 0.61 mJ/cm<sup>2</sup> UVC radiation to eliminate Coronavirus and 1.9 mJ/cm<sup>2</sup> on the Flu virus.

#### **RESUMING**

***The UVC radiation level inside the chamber (reactor) in the AETAIRE unit is at minimum of 4.23 mJ/cm<sup>2</sup> (see technical datasheet) clearly surpassing the necessary values to control Coronavirus.***

\*The Ionizer generates some 8.500.000 negatively charged ions per cm<sup>3</sup> which neutralize existing positively charged air-borne atoms - positively charged ions such as dust inhabit pathogenic micro-organisms that are harmful to our health - hanging on to them and pulling them (heavier weight) downwards to the surface below or sucked back into the unit by the ventilator.

