

## Comparison LED UV-C - LED BIOVITAE®

The difference about UVC-LEDs and BIOVITAE® are relevant enough to make them not comparable. However, in the following table we show the substantial differences between the two technologies:

FEATURES	UVC-LEDs	BIOVITAE®
<b>Frequency peaks</b>	<b>from 222 nm to 254 nm</b>	<b>From 400 nm to 420 nm</b>
<b>Action</b>	The action of UVC radiation is expressed on the genetic material and consists in the creation of dimers that prevent cellular duplication.	BIOVITAE® works on the metabolism through the stimulation of the porphyrins which, in turn, accentuate the production of ROS inside the cell. The hyper-production of H <sub>2</sub> O <sub>2</sub> caused by ROS, physically destroys the cell membrane and, therefore, the bacterial cell.
<b>Effectiveness</b>	They are effective only in particular environmental conditions, such as constant temperature at 28 °C and total absence of light.	It is effective in all environmental conditions.
<b>Damage produced on microorganisms</b>	The damage produced by UV-C radiation stops the cellular duplication, but it is reversible in two situations: in the dark and in the light. The induced damage remains permanent only if the radiated energy reaches certain levels.	The damage created by BIOVITAE is irreversible because the damage of the plasma membrane or of the nuclear membrane is not compatible with the life of the bacteria and can't be repaired.
<b>Collateral damage on materials</b>	Make any plastic tool yellowish, especially the white ones.	BIOVITAE does not alter the aesthetics of materials.
<b>Collateral damage on food</b>	Cause loss of nutritional and organoleptic characteristics	BIOVITAE does not cause any change in the properties of food
<b>Collateral damage on humans</b>	Prolonged exposure to UV rays can cause skin cancers	It does not cause any damage even in case of prolonged and continuous exposure
<b>Collateral damage to the environment</b>	In the presence of oxygen: <ul style="list-style-type: none"> <li>• produce ozone (toxic gas);</li> <li>• in small doses, UV radiation spawns smell of freshly cut hay.</li> <li>• in large doses, it spawns smell of garlic.</li> </ul>	BIOVITAE does not produce any emission of substances or odours.
<b>Barriers</b>	They cannot go through any transparent material, neither glass nor polycarbonate.	They go through every transparent or slightly opaque material.
<b>Lifespan</b>	Max 12.000 hours, but after 5.000 hours they start to downgrade up to 50%.	Up to <b>30,000</b> hours, and there is no sensitive downgrade throughout the entire life span.