

# UV-C-lamps: could something that kills bacteria and viruses also harm you?

## → WHAT IS UV-C?



UV-C defines the ultraviolet radiation within the wavelength range of 280 to 100 nanometres. Most people have heard of the dangers of UV-A (400 - 315

nm) and UV-B (315 - 280 nm) exposure from the sun or from sunbeds. UV-C is also produced by the sun, but it is the shortest of the ultraviolet wavelengths and is almost entirely filtered out by the atmosphere before reaching the earth's surface. Therefore, people have little or no natural exposure to it, and that's a good thing. The shorter the wavelength, the more impact ultraviolet radiation could have on human health.

## → WHY IS UV-C USED IN LAMPS?

Artificially-produced UV-C has been used successfully as a germicide and bactericide for decades. It can kill or disable the growth of micro-organisms like bacteria, viruses and other pathogens, and it provides a chemical-free alternative to other disinfection methods, like using chlorine. Due to its effectiveness and advantages, UV-C is being used for an increasing range of applications. It is used, for example, for disinfection in wastewater treatment plants, laboratories, air-conditioning systems and even pools and aquariums as well as in various stages of food and beverage industrial processes. UV-C is also used in medical and hospital

settings to sterilise instruments, work surfaces and the air.

Usually, mercury-vapor lamps are used for generating germicidal UV-C. Technological advances have now made it possible to have UV-C light emitting diodes (LEDs) as well, which has led to an even larger number of applications, including in medical devices.

## → WHAT'S THE CONCERN ABOUT UV-C LAMPS?

Although most of appliances using UV-C lamps are sealed systems that prevent exposure, devices that may directly expose consumers to UV-C radiation are increasingly placed on the market. With a greater range of applications - like the small solar cells developed for individual use to disinfect drinking water in developing countries - comes a greater risk of accidental exposure or misuse. Several incidents of skin or eye damage resulting from accidents have been reported, which prompted the European Commission to ask the Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) to conduct a risk assessment.

## → ARE UV-C LAMPS SAFE?

UV-C lamps have been used for many decades with only a few known incidents caused by accidental exposure or misuse. Their use has safeguarded human health by sanitising water, air and surfaces and preventing people from contamination. However, the SCHEER cannot reach a conclusion on their safety because there

are only few studies on exposure to humans under normal conditions of use. There is also insufficient data on long-term exposure to UV-C from lamps. UV-C, like the other wavelengths of ultraviolet light, is considered to be carcinogenic to humans, but there is not enough data to conduct a quantitative cancer risk assessment of exposure from UV-C lamps.

## → MORE RESEARCH IS NEEDED

As stated, more studies are needed on exposure to UV-C under normal conditions and on long-term exposure and health effects, such as cancer. More research should also be conducted on another concern connected with the use of UV-C lamps, namely the fact that at wavelengths shorter than 250 nanometres, they produce ozone, which is emitted out into the environment.

This factsheet is based on the Opinion of the independent Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) on «Biological effects of UVC radiation relevant to health with particular reference to UVC lamps».

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This opinion is available at:  
[https://ec.europa.eu/health/scientific\\_committees/scheer/opinions\\_en](https://ec.europa.eu/health/scientific_committees/scheer/opinions_en)