

DRAFT

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)

Request for a scientific opinion: Biological effects of UV-C radiation relevant to health with particular reference to UV-C lamps¹

1. Background

UV-C light is now used in a large range of technological applications. It is used, for example, for disinfection in water and air treatment, but also in food -industry processes and in the air-conditioning of buildings. In such cases, the systems are usually designed and built in such a way that UV-C light cannot escape (employing protective housings) and therefore there are no direct hazards for users. Servicing, maintenance and repair personnel must be instructed accordingly in the handling and use of UV-C light, and the employer is required to provide personal protective equipment for them. Another requirement is that the UV-C light source automatically shuts down when the protective housing is opened during operation.

However, the market surveillance authorities from Member States are observing the increasing use of UV-C light in products for consumers and in appliances with which consumers come into contact. For example, UV-C light is used in electrical pond filters, in electrical discharge insect control systems ("bug zappers"), in the brush attachments of electrical vacuum cleaners, in special lamps used for local disinfection and in aquariums.

Taking into account the need to protect the health and safety of users of such devices, we would like to have a better understanding of risks associated to UV-C radiation coming from lamps.

A. Scientific Background

The relevant literature² indicates that UV-C light can present a risk for the human eye and human skin. This risk depends on a range of factors, for example, radiation intensity and duration (energy), which makes it difficult to undertake an assessment.

¹ Lamp means a light emitting appliance (enclosure) like bulb, tube, etc.

² <http://peschl-ultraviolet.com/deutsch/ueber-uv/sicherheitshinweise/sicherheitshinweise.html>

<http://www.sterilair.com/de/kompetenz/kompetenz/wirkung-uv.html>

<http://de.wikipedia.org/wiki/Ultraviolettstrahlung>

http://www.focus.de/gesundheit/ratgeber/haut/tid-9716/solarium-die-wirkung-der-uva-uvb-und-uvc-strahlen_aid_297108.html

http://www.oxytec-ag.com/www/index.php?locale=de&page=technologie_grundlagen_uv-c-entkeimung

It has been reported that the electrical discharge insect control systems used, for example, in the hotel and catering sector, have caused skin burns to consumers. This concerned the use of electrical discharge insect control systems with two UV-C tubes, each with an output of 15 W. Consumers are often unable to recognise the risks and take the adequate precautions against emitted UV-C light.

UV-C lamps can also be sold separately, for example, with a TL socket, PL socket or G23 socket up to an output of 55 W. The possibility of lamps being sold with even higher outputs cannot be excluded either. Moreover, the replacement lamps also fit into lamp sockets for ordinary lamps, such as desk lamps and other household lamps. Inadvertent and inappropriate use of UV-C lamps cannot therefore be excluded. UV-C lamps are often not labelled in such a way that does not guarantee users in individual cases to be aware of the risks, if any. The main purpose of UV-C lamps is normally not to produce light for human lighting needs. Their aim in these cases is instead disinfection or attracting insects.

B. Legal & Enforcement Background

At EU level, a legal framework exists that aims at minimising the risks posed by UV-C lamps themselves. The placing on the market of UV-C lamps is regulated by Directive 2006/95/EC³ on electrical equipment designed for use in certain voltage limits. This Directive falls under the responsibility of Directorate General for Growth. Directive 2001/95/EC⁴ on General Product Safety applies, whenever the Low Voltage Directive is not applicable, requiring that products intended for consumers or likely to be used by them, including in the context of a service, must be safe (throughout the lifetime of the product). The General Product Safety Directive falls under the responsibility of Directorate General for Justice. Member States authorities responsible for the enforcement of these Directives have the obligation to carry out controls to ensure compliance by relevant economic operators.

The European harmonised standards are voluntary, but if applied they provide presumption of conformity with the safety objectives of the Directive 2006/95/EC. However, the relevant applicable product standards do not seem to fully address the associated safety considerations in the case of UV-C lamps, for example in standard EN 60335-2-109⁵ for UV-C pond filters. The pond filter is designed in such a way that no UV-C light can escape from it, if it has been properly installed. But repair sets and replacement luminaires, which can also be operated outside the pond filter and without any screening, are also available for such appliances. The repair sets are generally ready-wired for connection and can be operated in this state without any further safety precautions. The standard applicable to such pond filters excludes the aforementioned products from its scope of application with the result that no safety requirements are foreseen by the standard.

³ Directive 2006/95/EC on the harmonisation of the laws of Member States relating to electrical equipment designed for use within certain voltage limits, OJ L 374, 27.12.2006, p. 10. As of 20 April 2016, it will be replaced by Directive 2014/35/EU (OJ L 96, 29.03.2014, p. 357).

⁴ Directive 2001/95/EC of the European Parliament and of the Council of 3 December 2001 on General Product Safety, OJ No L 11 of 15 January 2002.

⁵ EN 60335-2-109: Household and similar electrical appliances – Safety – Part 2-109: Particular requirements for UV radiation water treatment appliances.

2. Terms of reference

In view of the incidents⁶ due to the UV-C lamps, the SCENIHR is asked to assess the safety risks associated with the use of UV-C lamps and to provide an answer to the following questions:

1. What are the potential effects on human eyes and skin, if these organs are exposed to UV-C radiation of varying wavelength, intensity and duration?
2. Is there a wavelength-dependent safety threshold with regard to UV-C intensity and/or energy (dose) which could prevent from adverse health effects to the human eyes and/or skin?
3. Are there other safety aspects that should be considered together with/ instead of any possible wavelength-dependent safety threshold?

Deadline: March 2016

⁶ Some Member States have indicated accidents due to UV-C lamps e.g. in Spain 2 insect killers installed in a public restaurant in a sport centre provoked an outbreak of an actinic conjunctivitis due to the UV-C lamps included in the insect killers.