

**Decree on the Limitation of Public Exposure to Non-Ionizing Radiation
(294/2002)
Ministry Of Social Affairs and Health in Finland**

Citations of the rationales considering ultraviolet radiation

CHAPTER 4. ULTRAVIOLET RADIATION

10 § General provisions

The radiation exposure caused by ultraviolet radiation (UVR) appliances shall be limited below a level where a short-term exposure does not cause acute harmful health effects and the adverse chronic health effects are minimized.

Even a short exposure to excessive UVR may cause acute skin damage (skin burns). The serious consequence of chronic exposure is the increase of skin cancer risk. Therefore it is required to limit the serious chronic effects to minimize unnecessary exposure as much as possible.

11 § Exposure limits to ultraviolet radiation

The effective radiant exposure of ultraviolet radiation to the skin in 24 hours shall not exceed 50 J/m² in the wavelength band 180 – 400 nm.

The effective radiant exposure of ultraviolet radiation to the eye in 24 hours shall not exceed 30 J/m² in the wavelength band 180 – 400 nm and the radiant exposure shall not exceed 10 kJ/m² in the wavelength band 315 – 400 nm.

When the skin is exposed to artificial ultraviolet radiation for cosmetic or similar purposes without a prescription by a medical doctor, the recommended value in section 1 can be exceeded provided that

- 1. a short-term exposure does not cause acute adverse effects as erythema;**
- 2. the effective radiant exposure of ultraviolet radiation to the skin does not exceed 5 kJ/m² in one year; and**
- 3. the effective irradiance of ultraviolet radiation to the skin does not exceed 0,15 W/m² determined separately in wavelengths shorter than 320 nm and in the wavelength band 320 – 400 nm, and the effective irradiance of both wavelength bands together does not exceed 0,3 W/m².**

Persons under 18 years of age should not be exposed to the ultraviolet radiation of sunbeds except cases where such treatment has been prescribed by a medical doctor.

The upper limits of ultraviolet radiation exposure are intended for restricting the exposure caused by UVR-appliances especially sunbeds. It is not convenient to pursue to restrict the solar exposure to the

population by issued limit values. In any case it is wise to avoid excessive UVR-exposure by seeking shade or wearing covering clothing, sunglasses, sunscreens and other personal protections.

The irradiance of sunbeds has been restricted so that the irradiance weighted by the sensitivity of the skin i.e., the effective irradiance, shall not exceed $0,3 \text{ W/m}^2$ in the total wavelength band of UVR and shall not exceed $0,15 \text{ W/m}^2$ in the UV-A and UV-B bands. This equals to the UV-type 3 appliance as defined in the standard EN 60335-2-27. In comparison, it can be noted that in the latitude of Helsinki the maximum effective solar irradiance is $0,15 \text{ W/m}^2$ and in the latitude of Athens $0,26 \text{ W/m}^2$. Thus the intensity of the UVR of a UV-type 3 appliance is of the same magnitude to which people are used to while sunbathing.

The aim of restricting the irradiance is to reduce skin burns which are a risk factor of melanoma, the most fatal skin cancer. In UV-type 3 appliances both UV-A and UV-B radiation affect to skin burns similar way to solar radiation. There is no sufficient knowledge of the most critical factors of initiation and promotion of melanoma for preferring certain kind of UVR spectra.

In the facilities where sunbeds are in use there shall be available adequate information about health hazards of UVR as presupposed in the standard EN 60335-2-27. Instructions for use shall help the user to figure out in how many and how long exposures the effective radiant exposure exceeds 5 kJ/m^2 in one year. In comparison, this limit value equals to sunbathing 50 minutes per day in 22 days at the latitude of Helsinki. At the latitude of Athens an equal exposure is achieved by daily sunbathing in 30 minutes.

Before the Decree the annual limit of 15 kJ/m^2 permitted more than 66 visits in sunbeds in one year. Restriction of the annual limit was prompted by the distinct statement by the Association of Dermatologists in Finland on the health hazards of sunbeds and also by evidences of trends to reduce the use of sunbeds by international recommendations and by national norms in several European countries. As an example, ICNIRP is preparing a statement for moderate use of sunbeds which is more restricting than the present recommendations.

The restriction of the annual limit is based on undisputable scientific evidences of the health hazards of UVR. Still, it is clear that in the case of individuals the compliance with the limits depends on the attitude of the sunbed user. It is not sensible or desirable to extend the official supervision to the individual use of sunbeds. The new limit is a distinct point of reference in the development of the safety information which in the long run is expected to promote conscience of the health hazards of UVR and thus affect to attitudes and habits which guide the use of sunbeds. The new Decree also clarifies the base of official supervision. Example, practically significant is the requirement that in the facilities where sunbeds are in use there shall be visible available safety information as described in the standard EN 60335-2-27 and any material promoting the use of sunbeds (advertisements, brochures) shall be relevant. Supervision has brought out facilities where the main content of the user information is a claim that sunbeds promote health. Health hazards are not mentioned or they are touched shortly.

Epidemiological studies have shown that UVR exposure in childhood and adolescence increases the risk of melanoma. For that reason a principled provision has been included in the Decree that persons under 18 years of age should not be exposed to the ultraviolet radiation of sunbeds except cases where such treatment has been prescribed by a medical doctor. The aim of the provision is to inhibit offering sunbed services to adolescents under 18 years of age and also to increase the awareness of the youth of the health hazards of UVR exposure. The provision is a normative recommendation and

it guides to safe use but it does not include any judicial sanction. An alternative was to issue strict ban by a law, but so far such a strong regulation is not appropriate.

The daily limits (50 J/m² and 30 J/m²) issued in the Decree are applied to UVR exposure in other purposes than tanning, like exposure caused by illuminators. The limits for exposure to the eye are the same as in the present ICNIRP recommendation.

12 § Reference to standard

In addition to what in this chapter is issued, the use of sunbeds shall be arranged so that the requirements presented in the standard EN 60335-2-27 will be fulfilled. If other than UV type 3 sunbed is used for the purpose mentioned in the clause 3 of 11§, the treatment shall be performed under the supervision of a professional with an expertise in UV phototherapy.

The technical supervision of sunbeds used for tanning purposes by STUK (Radiation and Nuclear Safety Authority) has been based on the European standard EN 60335-2-27, which is derived from the low voltage directive (LVD). In this standard the classification of sunbeds is based on the effective irradiances.

It is required that the appliance used for tanning purposes shall be in accordance with the UV type 3 appliance as described in the standard. In addition, it is issued that the circumstances at the tanning facility (adjustable timers, protective goggles, warnings, safety instructions, information on health hazards of UV radiation etc.) shall comply with the requirements of the standard. The reference to standard is added directly in the Decree to clarify the rationales and to enhance transparency. The latest edition of standard is applied.

Consequently, the requirement of UV type 3 appliance will be applied further in unsupervised use and also in cases when the care of sunbeds and guidance of customers is done by a person with no skill for use of UV radiation. Typical facilities are gyms, swimming halls and beauty parlours. As such the Decree does not forbid tanning with an other appliance than an UV type 3 appliance, but in such cases the exposures shall be done under the supervision of a professional with expertise in UV phototherapy. This kind of professionals is defined in the Act (559/1994) or in the Decree (564/1994) on the professionals in health care. Examples of professionals are a medical doctor, a nurse or a person having occupational basic education of health care and who is equal with a medical doctor or a nurse. The term “treatment” is used in the Decree to advise that a professional with expertise in UV phototherapy shall attend personally every tanning exposure. In the response of a professional it is to ensure safety of the exposure. The safety of the exposure is affected by the skin type of a customer, skin sensitivity to UV radiation and also if the customer is already tanned. The professional shall check the settings of the device and supervise that exposure is performed as it was meant.

This Decree does not apply to the use of UVR appliances in medical treatments or examinations. It also does not restrict treatments of skin disease patients at home.

APPENDIX *General rationale considering ultraviolet radiation***2.3 ULTRAVIOLET RADIATION**

The safety philosophy of ultraviolet radiation is not directly comparable with safety aspects of other kind of non-ionizing radiation. First, the most important source of UVR is a part of the nature, all the people are exposed to the solar UVR. Second, the tan induced by UVR (natural or artificial) is considered to be aesthetically pleasing and this emphasises the need for objective information about the health hazards of UVR. Third, reasonable amounts of solar UVR has also beneficial health effects and this must be taken account in the information and education.

The health risks of excessive UVR are clear and undeniable. These risks are even accentuated in our country by the fact that the Nordic skin type is more sensitive to UVR induced hazards than typical European skin type. The most fatal health hazard of UVR is skin cancer. It is estimated that UVR causes 700 cases of melanoma and squamous cell carcinomas and 50 – 100 of them are lethal. Major parts of these cancers are induced by excessive sun bathing.

Use of sunbeds for tanning increases the UVR dose and the risk of cancer in the case of individuals. The UVR dose of sunbeds is quite modest, ca. 1% of the solar UVR, if we consider the whole population because most people do not use sunbeds. In the case of individuals the UVR dose caused by sunbeds can be considerable: An average sunbed user increases her or his annual UVR dose by 13 % and an enthusiastic user may even triple her or his annual UVR dose.

Careless use of sunbeds may also cause acute health hazards, mildest of them are sunburns and erythema. These acute effects increase the risk of long term hazards like skin cancer. There have been cases where the user of sunbeds has suffered severe burns with long recovering time. The reason for these cases has been recklessly done service: The UV-lamps have been replaced with lamps with far too intense UVR output or the attenuating filters have been removed.

Use of too intense UV-lamps can be inhibited by setting distinct limits for the UVR exposure in the new Decree. Criteria for appliances can be derived from these limits and these criteria are applied in the supervision of sunbeds. These criteria allow making an intervention if a sunbed is equipped with lamps with too intense UVR exposure.

Sunbeds are included in electrical appliances subjected to the Low Voltage Directive. Requirements of the Directive will be fulfilled, if the device is in accordance with the European Standard EN 60335-2-27 (Safety of household and similar electrical appliances – Particular requirements for appliances for skin exposure to ultraviolet and infrared radiation). The Standard classifies sunbeds by UVR spectrum into four different types, but it does not clearly point out the acceptability of different types to consumer use. However, there is a note in the Standard that national health authorities may have additional requirements. In the countries in which national additional requirements have been stated there has been accepted only sunbeds belonging to certain UV types. Sunbeds have been usually UV type 3.

In this context it is good to take into account Article 30 of the Treaty of Rome which provides a principle, for instance, on general justification for national export, import and transit restrictions, and to Article 152 of the Treaty of Rome where paragraph 1 states that determination and implementation of all Community policies and operations shall ensure protection of a high standard for human

health. There have been stated national requirements for sunbeds at least in Sweden, France and Spain and in countries outside of EU, like Norway.

Especially children and adolescents shall be protected from unnecessary UVR exposures as EUROSkin has recommended. EUROSkin is a European society which is focused in research and prevention of skin cancer. On the other hand a certain amount of natural UVR, especially for children and young adolescents, is recommendable because UVR changes pre-stage of vitamin D in skin to active hormone which contributes to the formation of bone and which enhances bone's strength. Recently published dissertation (Outila T. The effect of vitamin D status on calcium and bone metabolism. University of Helsinki 2001) makes this point of view particularly relevant. In this dissertation it came out that supply of vitamin D in the population level in Finland is not sufficient. Under these circumstances actions by authorities to reduce UVR exposures should not interpret as a signal how children and adolescents should protect them from sunlight in the summertime. It is further desirable that children and adolescents are interested in exercise outside in the summertime, but it is good to obey moderation in sunbathing and avoid skin burns. Special care must be taken when a child's or adolescent's skin is very sensitive to burn.