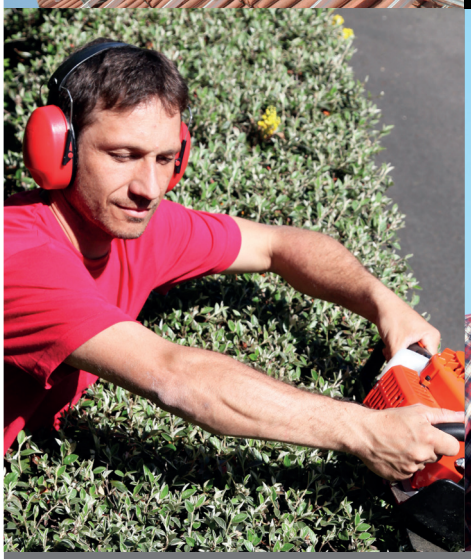

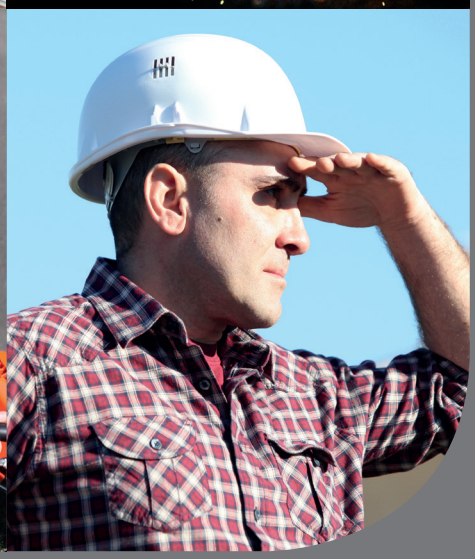

Compendium

UV Protection at Work

- Basics
- Vulnerable Persons
- Protection Possibilities
- UV Protection Products In General
- Legislation

PGP

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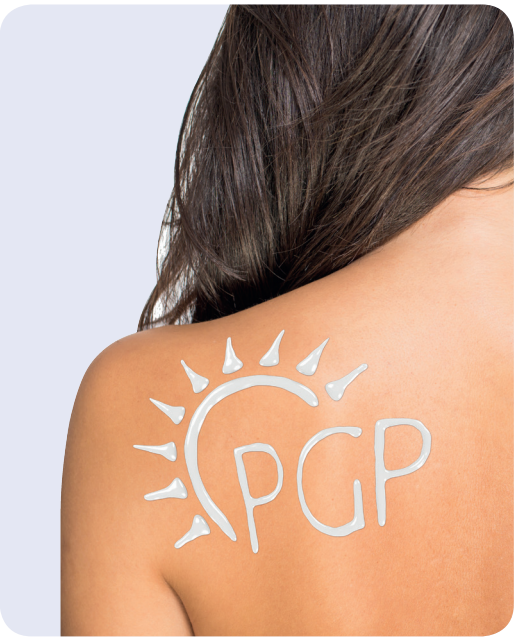


Photodamage to the Skin

Ultraviolet radiation (= UV radiation) from a natural source (sun) as well as from an artificial source (e.g. welding light) may give rise to strong and lasting skin damages. We all know typical damages, such as sunburn and sunstroke, to be painful but yet, we underestimate them as temporary symptoms. If the skin is exposed to intensive UV radiation for too long, premature skin ageing and several severe diseases will probably occur:

- Skin Cancer
- Eye Damages (cataract, snow blindness)

UV Light

Sunlight contains UV light in the wave range of 200-400 nm and therefore, it is not perceptible for human beings. UV light is divided into three sections:

- UVA (320-400 nm)
- UVB (290-320 nm)
- UVC (200-290 nm)

The strength of the radiation is dependent on the respective position of the sun and the respective reflection (= scattered light in the envrionment). Therefore, 50% of the whole daily dose of UV light are absorbed between 11:00 AM and 01:00 PM. The radiation level of reflection light is especially underestimated: snow reflects up to 100%, white sand up to 80% and both intensify UV exposure distinctly.

Skin Types – Individual Self-Protection

The amount of UV radiation that leads to skin redness is called minimal erythema dose (MED; unit: J/m). The tolerance against sunlight strongly depends on the so-called skin type, a categorization according to the skin‘s sensitivity degree towards UV radiation and its pre-tanning or rather its degree of skin tanning at all.

How much sun light does the skin tolerate?

	Skin Type I	Skin Type II	Skin Type III	Skin Type IV
Characteristics	very light skin, light blonde or red hair	light skin, blonde hair	light brown skin, dark blonde hair	brown skin, black hair
Skin Reaction	always red, never tanned	often red, slight tanning	moderately tanned, redness uncommon	tanned quickly, never red
Self-Protection Time	5 to 10 minutes	10 to 20 minutes	20 to 30 minutes	40 minutes

UV Index as Indication

The danger caused by UV radiation is measurable and it is recorded as the “global solar UV index“. This maximum value of UV exposure at lunchtime (unit: 0-20; often 0-8 in Central Europe) can be used as forecast for the daily organization of occupational safety, e.g. for planning the daily routine.

UV Index 1, UV Index 2	UV Index 3, UV Index 4, UV Index 5, UV Index 6, UV Index 7	UV Index 8, UV Index 9, UV Index 10, UV Index 11
Low	Medium / High	Very high / Extreme
No protection required	Protection required	Special protection required
Riskless stay outside possible.	Seek shadow, wear a t-shirt, apply a sun protection product and wear a hat during lunchtime.	If possible, do not stay outside during lunchtime! Seek shadow under all circumstances!! T-shirt, suncream and hat are desperately needed.

Vulnerable Persons

Persons endangered by sunlight are the ones who work outside and all other persons who are unprotectedly exposed to sunlight due to their occupation. The following groups are affected:

- builders / road construction workers
- farmers / foresters
- gardeners / landscapers
- mountain guides / ski instructors
- sailors
- postmen
- chimney sweepers
- pool attendants

Exposure times - often decades-long - are essential for damage occurrence and for the subsequent approval of an occupational disease. UV-intensive light during lunchtime, altitude and reflecting surroundings (e.g. snow) increase the risk and have to be considered in the risk assessment for the respective occupation.

Of course, certain risks hide in some indoor occupations such as electro welding. Precautionary measures have to be implemented as well.

Protection Possibilities

Easy and immediate protection is provided by :

- headgear (baseball caps / peaked caps)
- shirts
- sun protection product for uncovered skin
- sunglasses

Additionally, the following options should be examined with regard to their feasability:

- shifting working hours (not during lunchtime)
- considering the UV index
- building up awnings
- work rotation

UV Protection Products

UV protection products are more than simple creams from one's leisure time. Indeed, they are effective occupational safety measures for UV-loaded areas. In standardized tests, their efficiency is ascertained with the help of the sun protection factor (SPF) in order to facilitate choosing Personal Protective Equipment (PSA) in the form of skin protection products. The product's SPF refers to the protective effect against UVB radiation. In contrast to unprotected skin, it indicates how much longer a person with protected skin can stay in the sunlight before a sunburn occurs. However, the SPF should not be used to expose oneself to avoidable UV exposure. The underlying self-protection time is too vague to exploit the borderlines of the alleged time of protection as protection products with a high SPF do not filter UVB radiation completely: SPF 20 filters approximately 95 % of UVB radiation only and even SPF 50 filters approximately 98 % only. The skin's redness is effectively prolonged, but skin aging and tumor development can be negatively influenced either way.

A spray facilitates the application.

SPF values > 30 are not uncommon any longer and are available in the form of a spray as well as a in the form of a cream.

Experts recommend:
If the UV index is 3 or higher, protective measures need to be taken for the employees.

The Right Application of UV Protection Products

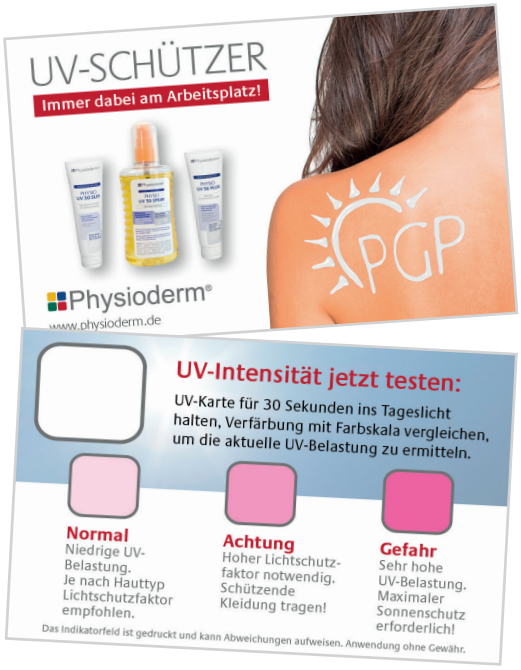
The efficiency of UV protection products fundamentally depends on how consequently and how generously they are applied. In practice, even products with a very high SPF and high water resistance loose their effect due to rubbing, sweating and other influences and have to be reapplied from time to time.

Protection cards can be helpful in order to assess the local UV exposure as they show the current exposure.

PGP provides these protection cards on request.

Legislation

In the occupational field, there are limit values for the wxposure of UV radiation which are recommendey by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). In order to be able to better assess the danger of UV radiation and to adjust protective measures, have a look at the so-called local UV index.



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