

Focus on IFA's work

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Hazard presented by UV radiation: collection of exposure data

Problem

Ultraviolet (UV) radiation is capable of causing skin cancer. It was therefore classified by the International Agency for Research on Cancer (IARC) as a Class 1 carcinogen as early as 1992.

Many people working outdoors are exposed to solar UV radiation and are therefore at risk. Awareness of this hazard among workers is poor, and there is a dearth of robust data on the actual exposure associated with specific tasks. Although some occupations, such as those in the construction sector, are clearly the focus of discussion, facts on the radiation exposure associated with discrete tasks within the occupations are still lacking.

For this reason, the IFA has been conducting a major measurement campaign in co-operation with the accident insurance institutions. The campaign, which has been running for two years, has the purpose of creating a task-related exposure matrix. The new GENESIS-UV measurement system is being used for this purpose.

Activities

In the course of a major field measurement campaign, 300 test subjects working in a number of areas of activity have been and continue to be equipped each year with the GENESIS-UV measurement system. The test subjects wear a dosimeter for the duration of each working day from 7:30 am to 5:30 pm during one year from 1 April to 31 October.



Vineyard workers during the measurement campaign, wearing the GENESIS-UV electronic data logger/dosimeter

The data are recorded at intervals of one second and transmitted to the IFA weekly over the Internet or by mobile communications. Examples of the tasks studied are:

- Occupations in the construction sector
- Occupations in the agricultural sector
- Dock work, logistics
- Childcare professionals
- Seafaring employees, airport work

Over 100 occupations have been studied since the measurement campaign began in 2014.

Results and Application

The measurement results are currently being analysed. They will then be made available, including in the form of a task-exposure matrix, for the processing of cases of reported occupational disease (Germany: number 5103 in the legal list of occupational diseases). The data are also to serve as a basis for the development of safety concepts and prevention measures. During development of a prevention concept, hazardous tasks are identified and guides for risk assessment produced. In this context, detailed task-specific proposals for prevention measures are also conceivable that are supported by daily forecasts of the possible UV radiation. This would enable the workers to choose from a range of protective measures before beginning work. By the same token, the employer could plan the work better by giving consideration to the anticipated UV radiation.

Meteorological aspects are also taken into account during interpretation of the data. Daily, highly localized weather forecasts with the greatest possible detail are obtained in order for the radiation measured at the person to be compared to the total solar radiation (global radiation). This provides conclusive information on the proportion of the global radiation that has been absorbed by the individual. Linking of weather-related prevention measures to person-specific information is particularly important for the selective use of preventive measures.

Area of Application

Companies with employees conducting work outdoors

Additional Information

- Wittlich, M.: Technische Information zur Ermittlung in Berufskrankheiten(BK-)fällen vor dem Hintergrund der neuen Berufskrankheit mit der BK-Nr. 5103 „Plattenepithelkarzinome oder multiple aktinische Keratosen der Haut durch natürliche UV-Strahlung“, Issue 09.2015 www.dguv.de/webcode/m352118
- Wittlich, M.: UV-Strahlung im Freien – Gefährdungen bei der Arbeit. Technische Sicherheit 5 (2015) No 7/8, pp. 51-54
- Prävention von Gesundheitsschäden durch solare Exposition. Policy paper issued by Deutsche Gesetzliche Unfallversicherung (DGUV) 2015, www.dguv.de/webcode/m773383
- Hautkrebs durch arbeitsbedingte UV-Strahlung; Arbeitshilfen der Deutschen Gesetzlichen Unfallversicherung, available for download at: www.dguv.de/webcode/d649737
- Information on the GENESIS measurement system can be obtained from the GENESIS-UV team on +49 2241 231-2525.

Expert Assistance

IFA, Division 4: Ergonomics – Physical environmental factors

Literature Requests

IFA, Central Division