

Calculation of air-borne dangerous substances contamination

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In the field of occupational safety, it is often necessary under prescribed risk assessment regulations to collect and establish information on the exposure of staff to chemical substances. While the use of models and computer programmes has already established itself in emission and catastrophe protection, and in the assessment of hazards from chemical substances, work safety specialists have so far had little faith in the calculation procedures when used to establish the degree of exposure. In Europe (and especially here in Germany in the form of the TRGS 402 regulations) “reliable calculation procedures” have been defined for many years as calculation methods for the determination of air-borne hazardous substances contamination, although they have very rarely been applied, since the quality of the calculation procedures was very difficult for outsiders to assess.

The ‘Berufsgenossenschaft für Gesundheitsdienst und Wohlfahrtspflege (BGW)’ and the ‘Berufsgenossenschaftliches Institut für Arbeitsschutz (BIA)’, institutions of the German system of statutory accident insurance and prevention, have therefore, over recent years, collated the knowledge of calculation procedures in the area of work analysis, and published this in the form of a comprehensive report. A pragmatic calculation procedure has thereby been developed (Differentiated Exposure Analysis - DEA), in order to allow practical calculation of harmful materials concentrations and personal exposure.

A PC calculation programme is now available, which helps work safety specialists to use this calculation procedure conveniently and document it professionally.

The programme (Fig.1) is suitable for the assessment of exposure, the evaluation of the effects of protective measures at the workplace and the training of employees and persons responsible for safety at work.

The calculation programme has been produced as macro-programming on the basis of MS Excel 2000, and allows the user to create individual exposure scenarios, whose parameters can be easily varied and documented (Fig.2). The programme is designed so that available knowledge, e.g. from measurement programmes, can be linked to the calculation model and thereby also applied to other workplaces.



Fig. 1 CD-ROM with the calculation procedure for Differentiated Exposure Analysis (DEA)

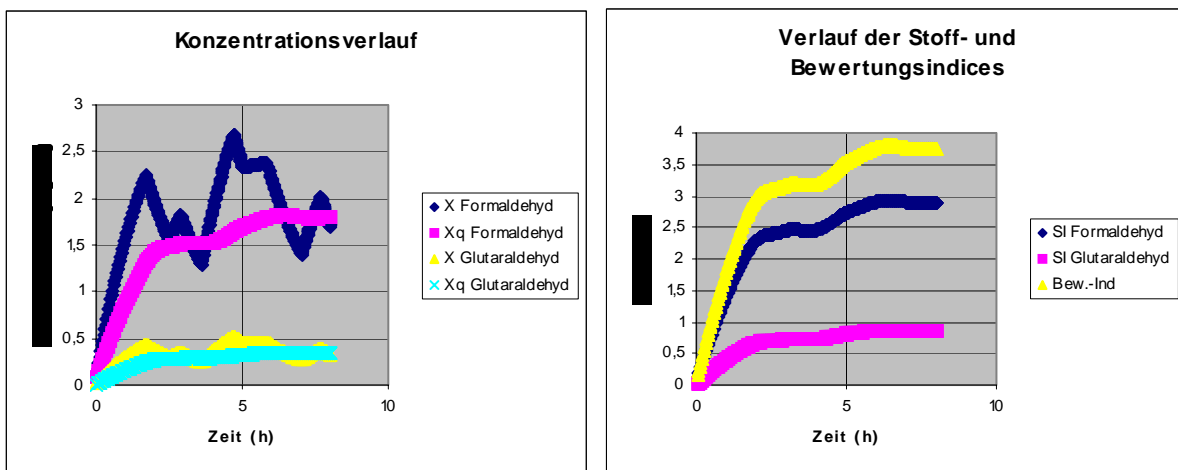


Fig. 2 Diagrammatic results of the calculation programme using the example of disinfection work in a room with disinfection agents containing aldehyde. The parameter settings and the exact calculation results are documented in tabular form.

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