



Current problems in the European standardization and its influence on the exposure monitoring

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Activity of the Public Foundation

Department for Analysis and Information — its main task is collection, procession and distribution of occupational safety information, organizing special courses, and publication of periodicals. Acts as the national centre of ILO/CIS

Department of Risk Analysis — its main task is assessment of technological risks at the workplace, managing safety audits at different workplaces

Testing Laboratory for Working Environment — its main task is identification and determination of harmful agents in the work environment, i.e.

- exposure monitoring of organic and inorganic gases and vapours, as well as solid particles, *excluded* fibrous particles, e.g. asbestos
- measurement of noise level and determination of noise exposure
- measurement of indoor lighting and climate parameters (temperature, humidity and air movement)
- determination of electrostatic charging and electromagnetic fields.

For the above investigations the laboratory is accredited by the National Accreditation Board by the standard MSZ EN ISO/IEC 17025:2001.

On the basis of the above-mentioned activity (mainly of the exposure monitoring) the Laboratory is also engaged in the assessment of chemical risks at the workplaces — in cooperation with occupational health experts.

There are a lot of international standards concerning the measurement of the above mentioned parameters, *excluded* that of the airborne pollutants, i.e. exposure monitoring.

So the presentation focuses solely on the *exposure monitoring*.

Current problem

Assessment of the exposure of employees has crucial importance in the risk analysis, above all in the assessment of the chemical risks.

In the course of the exposure monitoring several requirements have to be taken into consideration. The average concentration as well as the peak concentration, and — in case of risk assessment — the relation between the technological processes and exposure should also be determined. The monitoring can be carried out in several various ways.

The greatest problem arises when the “technology” is divided in several short periods, and the used chemicals are also various. This is characteristic of laboratory work, especially of research laboratory work. The investigations should be designed and carried out in testing, quality control and research laboratories in such a manner that the exposure concentration of the various (possibly extremely hazardous) chemicals could be followed during the short, different operations.

In fact, the investigation could be divided into three, more or less separated phases

. These are the investigation (sampling) strategy, the investigation (sampling and analytical) methods and the evaluation (legislation, limit values). We think it advisable to standardize all of these phases in order to gain comparable results. So the result of the risk analyses will also be comparable.

Sampling strategy

The determinant phase is the sampling strategy; its most important elements are the sampling frequency, the duration of the single samplings, as well as the criteria of the recurrence of the investigation. All these are to be properly selected.

There are several methods with more or less similar efficiency, but we do not know about any research result demonstrating the equivalency of the different existing strategies.

Our laboratory has developed and is applying a well-functioning strategy; however we do not have any knowledge about the comparability of the results gained by this strategy. The reason is: there is no common, generally accepted sampling strategy.

Sampling and analytical methods

The mostly recommended method for sampling is the personal one. It offers the best approximation to the real exposure of the workers.

The results of the exposure assessment are less affected by analytical methods, however we have to calculate upon some difficulties arising from sensitivity, selectivity, etc. of the analytical method applied.

Evaluation

The simplest method for evaluation is to make a comparison between the measured values and the limit ones. The exposure concentration is acceptable when it is lower than the actual limit value (i.e. MAK, TLV, STEL or NOEL, NOAEL). Establishing the limit values is an expensive and time-consuming task, and the countries, — being able to do it — are following different policies in establishing limit values. It means that the limit values can vary from country to country. As a consequence, in order to receive comparable exposure data for comparable risk assessment the investigation should be accomplished by generally recognized standards. It applies with equal force to sampling strategy, investigation methods and legislation (limit values).

Our laboratory carries out the investigations mainly by national (MSZ), European (EN) and international (ISO) standards, however these do not cover the whole field of its activity, so non-European, OSHA and NIOSH standards should also be adopted. These are fully validated, reliable methods; the use of these is however more or less voluntary.

The distribution of the standards applied by our laboratory is as follows: 4 National, 3 EN, 3 ISO and 20 others (OSHA and NIOSH).

The Hungarian limit values are established in a Ministry Decree based partly on own research, partly on adoption of foreign limit values.

I think, our problem is now clear: in the European standardization less attention is paid to the standardization of exposure monitoring; less consideration is given to the standardization concerning workplace air or, in general, to hazardous substances.

There are only two Council Directives concerning the minimum safety and health requirements for the workplace.

There is no uniform, generally accepted and used sampling strategy, only the standard EN 689:1998 (adopted in Hungary as MSZ EN 689:1999) is giving some directives.

Only a few EN standards are dealing with sampling and analysis, whereas several standards involve *product requirements* in "workplace air" as well as in "air quality" category. No generally recognized limit values are established till now.

There is another field more or less neglected: the investigation methods for evaluating the workplace emission of hazardous chemicals are not yet developed, so it is very difficult to reveal the relation between emission and workplace concentration.

The accession of Hungary to the European Union could facilitate our participation in research projects focusing on this and on the above-mentioned questions.

Until now we could not become aware of the advantages of the membership in our professional field, we have had close connections with European Organizations, e.g. Sheffield Group, EUROSHNET, EUROGIP, Dublin Foundation, and with the OSH research institutes of several European countries.

As results of accession many tenders are open for Hungary, our institute can take part in some projects, but till now no one is related to the question of our narrow professional field.

Expectations

It seems to be necessary to put common work — common research project, if necessary — in action, to prepare the way for developing European standards concerning exposure monitoring and investigation of workplace emission. The standards should cover especially the following fields:

- sampling strategy, with special attention to the above mentioned problems: peak exposure, laboratory work, intermittent exposure, use of great variety of hazardous chemicals at the same workplace
- fully validated sampling and analytical methods, (recommending European products for sampling and analysis)
- generally recognized limit values
- connection between workplace emission and workplace concentration (in order to reveal the relations)

The European networks, e.g. EUROSHNET may take a prominent part in organizing this work.