

MÜLLER-BBM

More safety at the workplace



The workplace – healthy, safe, improving performance

Accidents at work? They do not have to happen. Company workplace safety reduces the risk of accidents and danger to health by an optimum design of the workplace. It is not only imperative to preserve workforce for ethical, but also for economical reasons: About 69 billion Euro of gross value added were lost in Germany in 2002 because employees were unfit for work for an average of 14.2 days.

The requirements on the workplace become more and more varied: It should not only guarantee safety and health of employees and visitors and avert danger, but should also create an environment which has a positive effect on the employees and thus increases motivation, performance and productivity.

Improvements at the workplace start with sensory perceptions, i.e. what the employees smell, hear and see. Therefore, the investigations focus on air quality, noise and quality of lighting, but can also be extended to the danger caused by electromagnetic fields. As experienced employees of the respective companies are very familiar with

their specific needs, it is beneficial to involve them in these investigations.

The legal basis are the labour protection laws or e.g. the German Health and Safety at Work Act and the directives 89/654/EEC and 92/58/EEC. According to these regulations, a comprehensive planning of workplace safety and a check on the effect of the respective measures is demanded of the expert for workplace safety.

A positive side effect: Measures for safety at the workplace do not only improve safety and protect health, but also increase and ensure efficiency and competitiveness of the respective company. This helps to create and preserve jobs.

Improving indoor air

Obviously, if office employees complain about indisposition (sick building disease, SBS) or odours, the indoor air should be investigated. However, even if the air does not give reason to doubt its quality, impurities may be present, since many pollutants cannot be directly perceived by human beings.

There are many possible reasons for air impurities that may cause discomfort. For example, a reason might be the new interior decoration, if the glue still gives off solvents. But there may also be "burdens of the past", i.e. pollutants from substances which are not used any longer, like PCB (polychlorinated biphenyls), certain wood preservatives or asbestos. Beside air pollution, unfavourable climatic parameters may also cause or increase discomfort.

In order to check the indoor air situation, we measure various pollutants as well as the room climate in accordance with the relevant national and international standards. Since for office workplaces other standards are valid than for industrial workplaces, different



Regulations for industrial workplace safety are not only valid at workplaces with an increased potential risk.



Individual-related check of the pollution level at the workplace ...

measurement procedures and evaluation criteria have to be applied and the appropriate standards have to be observed depending on the specific situation.

Müller-BBM can reliably detect and quantify air pollution at workplaces and assist you in finding suitable concepts to improve the situation, as necessary.



For assessing the indoor air quality, different standards have to be complied with in office workplaces and industrial workplaces.

Containment of hazardous substances



... e.g. at a joiner's workshop.

Today, we are surrounded by many chemical substances and mixtures of chemicals. Since some of them are hazardous to our health or even toxic, legislation has set up regulations for the protection of employees – for example the Labour Protection Laws, which require to minimize all dangers to employees in general.

In particular, the Ordinance on Hazardous Substances or the EC directives (e.g. 98/24/EC, 99/38/EC and 2003/18/EC) give the employer more responsibility in gathering information and assessing dangers. In order to find the right way of protection, the potential risk represented by substances encountered at work must be assessed. However, quite often it is not known exactly what hazardous substances employees are exposed to and what their concentration is. In this case, the following methods serve for determining the so-called exposure:

- Assessment on the basis of criteria, which are specific for the respective substances or procedures
- Assessment on the basis of information on substances and products (data sheets)
- Calculation by means of known data
- Measurements of pollutants in the workplace atmosphere

Müller-BBM's accredited measurement facility for hazardous substances has many years of competence in measuring hazardous substances in air and in analysing and evaluating the results. By means of annual interlaboratory tests and audits, we guarantee a continuous quality of our services. Our customers from all trades and industries trust in these services in the evaluation of exposure, which serves as an indispensable basis for risk assessment.

Noise control

Health, well-being and performance of individuals as well as safety at the workplace are affected by noise. A high exposure can lead to a work-related partial deafness, which is regarded as one of the most common industrial diseases. In Germany, up to six billion employees are exposed to strong and continuous noise.

Laws and international standards are the basis for noise measurements and noise control at the workplace. They provide the regulations and guidelines that are necessary to determine noise rating levels related to a certain location or person at the workplace in a standardized and comparable way, and, therefore, provide the basis for the assessment of noise at the workplace and the planning of noise control measures.

The most important standards in this context are the Labour Protection Law together with the Health and Safety at Work Act, the VDI guideline 2058 and the EC directives 89/654/EEC and 92/58/EEC. Even more stringent requirements for the exposure values defined in these regulations are put up by the EC directive "Noise protection of employees" 2003/10/EC.

Müller-BBM offers support and advice concerning the application of EC directives and national standards. The following services will help you to reduce the risks presented by high noise exposure step by step:

- Noise measurements at the workplace and at machines
- Determination and evaluation of acoustic parameters like average sound pressure level decrease and sound absorption coefficient in workrooms
- Prediction of noise in workrooms
- Determination of areas, where the exposure limit values or exposure action values are exceeded
- Elaboration of noise maps for workrooms, of noise source registers for workplaces and of noise reduction plans
- Elaboration of room-acoustical noise control measures to reduce noise exposure in work areas
- Advice regarding the selection of low-noise design machines (noise control technology)
- Detailed planning of noise control measures regarding machines, plants and workrooms
- Design of individual hearing protectors



Noise measurements at a hot saw in a rolling mill to work out a noise register.

Acoustic comfort

A high noise level at the workplace affects verbal communication in multi-person and open-plan offices, even if that does not mean any risk to health. Therefore, it is the aim to reduce noise to the lowest possible level.

Acoustic parameters like sound propagation, average sound level decrease per doubling distance (sound propagation curve) and reverberation time are relevant for the acoustic quality of a workplace and can be determined by measurements. Müller-BBM gives advice and assists you in formulating noise reduction targets and in determining and dimensioning technical and constructive measures for noise control.

A constructive meeting atmosphere can be endorsed significantly by means of a noise absorbing ceiling.



Electromagnetic fields

The German accident prevention regulation "Electromagnetic Fields" (BGV B11) and the EC directive 2004/40/EC define the permissible exposure at the workplace. According to these regulations, it's the employer's duty to mark affected areas, to elaborate operating instructions, to provide individual protective equipment and to instruct the employees. In particular, it states the permissible field strength values depending on frequency ranges and time of exposure.

Employees exposed to high field strengths are, for example:

- Workers in power stations and transformer stations
- Workers in aluminium smelteries and at induction furnaces
- Arc welders and workers in the vicinity of welding equipment
- Workers at radar units and radio/television towers
- Locomotive drivers and workers in the immediate vicinity of large electric motors
- Medical staff in the vicinity of magnetic resonance imaging and diathermy equipment

Müller-BBM supports and assists you in implementing the legal requirements. Our test laboratory is accredited in accordance with the international standard ISO/IEC 17025. We carry out field strength measurements in the whole frequency range (0 Hz up to 40 GHz), determine areas of increased exposure and high risk areas and advise you, if control measures are required.

High-frequency noise in the vicinity of mobile telephone transmitters is currently a hotly debated topic.



Arc welding also generates electromagnetic fields, which can represent a risk to health.



Medical staff in the vicinity of magnetic resonance imaging and diathermy is exposed to electromagnetic fields of high strengths.



Better visibility

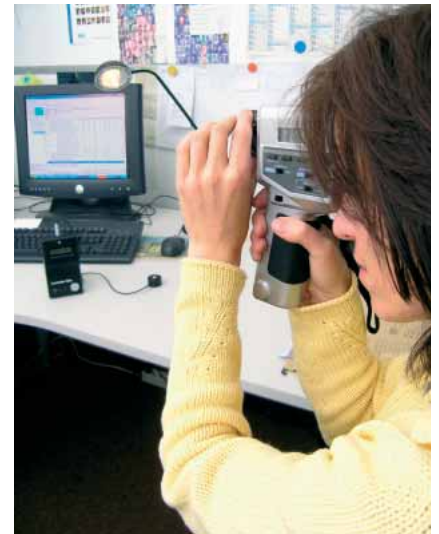
An essential factor for the well-being, efficiency and safety of the employees is a good lighting at the workplace. It increases the comfort of vision, improves the quality of work and prevents fatigue. Employees take more pleasure in their work and are better motivated.

Depending on the respective task, eye sight, comfort of vision or general visual impression are top priority in the quality of lighting. Especially important from the point-of-view of workplace safety is the eye sight: Reliable contrast vision, high visual acuity and quick perception. This is valid for workplaces inside as well as outside, for example on traffic routes, at checkpoints or control stations.

A good lighting is a legally specified element of workplace safety. Accordingly, national and international laws, directives and regula-

tions on accident prevention and health and safety at work demand that lighting systems are checked before taking them into operation, whenever modifications are made, and otherwise triennially. To ensure a constant high quality of these checks, the "Safety Regulation for Artificial Lighting at the Workplace" (BGR 131) requires that lighting systems have to be checked by an expert.

As such experts, we carry out measurements at lighting systems in a competent and experienced way and evaluate the lighting properties and the lighting quality in accordance with all relevant regulations.



Measurements of lighting at the workplace for an optimum quality and balance between brightness of the monitor and ambient light.

Müller-BBM is one of the leading German societies of consulting engineers offering expertise with regard to buildings, environment and technology.

On the basis of more than 40 years of experience, we presently provide interdisciplinary engineering services in these areas for planners, manufacturers, operators and authorities.

We plan, test and consult in Germany and abroad. Our reports and expert's opinions are objective, neutral and independent.

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Accredited test laboratories

Our test laboratories are accredited according to the international standard DIN EN ISO/IEC 17025 and conduct noise and vibration measurements as well as air pollution control and electromagnetic compatibility measurements.

Accredited by the Deutsche Kalibrierdienst (DKD) as a calibration laboratory for sound and vibration measurement devices.

Quality management

Müller-BBM has a quality management system which includes all our business areas at all our offices. The system is based on the international standard ISO 9001 and was certified by the Deutsche Gesellschaft zur Zertifizierung von Qualitätsmanagementsystemen, DQS GmbH.

