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## Section 3. Noise

### § 1. General

#### Article 6.6. Definitions

In this Section the following terms have the following meaning:

- a. peak noise pressure ( $P_{\text{peak}}$ ): maximum value of the «C» frequency-weighted momentary noise pressure;
- b. daily exposure to noise ( $L_{\text{EX},8\text{h}}$ ) (dB(A) re. 20  $\mu\text{Pa}$ ): time-weighted average of the levels of exposure to noise on a nominal working day of eight hours as defined in the international ISO standard 1999:1990, point 3.6. This includes all noises present at work including impulse noises;
- c. weekly exposure to noise ( $L_{\text{EX},8\text{h}}$ ): time-weighted average of the daily levels of exposure to noise in a nominal week of five working days of eight hours as defined in the international ISO standard 1999:1990, point 3.6 (note 2).

### § 2. Provisions with regard to noise

#### Article 6.7. Detailed provisions for risk assessment and evaluation, assessment and measuring

1. In connection with the risk assessment and evaluation meant in Article 5 of the Act, the noise levels to which the employees are exposed, should be assessed and - if necessary - measured in order to determine where and to what extent the employees can be exposed to the harmful noise levels determined in Article 6.8.
2. In addition to Article 5 of the Act the assessment and the measuring must be carried out periodically by the experts mentioned in Article 13 of the Act or the experts or health and safety services mentioned in Articles 14 and 14a of the Act in accordance with a time schedule laid down in writing and must in any event be carried out again if there is a fundamental change in circumstances, if there are reasons to assume that the assessment or measuring carried out is inaccurate or when the results of the occupational health medical examination as meant in Article 6.10, first to third paragraph, give rise to it. With regard to the assessment of the measuring results the measuring uncertainties determined in accordance with the usual practice applied during measuring must be taken into account.

3. The methods and equipment used during the measurement should be in line with the respective circumstances. In particular, the characteristics of the noise to be measured, the duration of the exposure, the environmental factors and the characteristics of the measuring equipment should be concentrated on. The methods and devices used should be suitable in order to determine whether the harmful noise levels determined in Article 6.8, third, fourth, seventh, ninth and tenth paragraph have or have not been exceeded. When random checks are used, they must be representative of the personal exposure of an employee.
4. At the assessment meant in the first paragraph, the following are in any event to be concentrated on:
  - a. the level, nature and duration of the exposure including any exposure to impulse noise;
  - b. the action values determined in Article 6.8, third, fourth, seventh and ninth paragraph and the limit values for exposure determined in Article 6.8, tenth paragraph;
  - c. the possible consequences for the health and safety of the employees forming part of the specially sensitive risk group;
  - d. insofar as this is technically feasible, the possible consequences for the health and safety of the employees and the interaction between noise and work-related ototoxic substances and between noise and vibrations;
  - e. the possible indirect consequences for the health and safety of the employees of the interaction between noise and warning signals or other noises which should be monitored in order to reduce the risk of accidents;
  - f. the information about the noise emission supplied by the manufacturers of the work equipment;
  - g. the existence of alternative work equipment designed to reduce the noise emission;
  - h. the continuation of the exposure to noise outside normal working hours under the employer's responsibility;
  - i. relevant information derived from the occupational health medical examination as meant in Article 6.10, first to third paragraph, including published information insofar as this is possible;
  - j. the availability of individual ear protectors with sufficiently deadening effect.
5. The Works Council or the staff representation body or, failing these, the interested employees, should be given the opportunity to express their opinion on the manner of assessment and measurement.
6. The results of the assessments and measurements carried out under this Article should be recorded in a suitable form and retained so that it is possible to consult them at a later stage.
7. The results meant in the sixth paragraph and an explanation of them should be brought to the notice of the works council or the staff representation body or, failing these, to the interested employees.
8. The risk assessment and inventory meant in the first paragraph must be adequately documented and should state the measures taken pursuant to Articles 6.8, 6.9 and 6.11.

#### **Article 6.8. Measures to prevent or restrict the exposure**

1. In order to prevent or restrict the exposure to noise, technical or organisational measures must be taken such that the risks of exposure are removed at source or restricted to a minimum taking into account technical progress and the availability of measures.
2. In preventing or restricting the exposure meant in the first paragraph, the following are in any event taken into account:
  - a. alternative working methods resulting in less exposure to noise;
  - b. the choice of the right work equipment taking into account the work to be carried out, making the lowest possible noise including the possibility of letting the employees use work equipment which has the aim or the consequence of a restriction of the exposure to noise;
  - c. the design and organisation of the workstation and the workplace;
  - d. suitable information and effective instructions to teach the employees how to use work equipment properly in order to restrict the exposure to noise to a minimum;
  - e. technical measures to restrict noise;
    - i. restriction of the airborne noise, for instance by screening off, encasement or covering with sound-absorbing materials;

- ii. restriction of construction noises for instance by deadening or insulation;
  - f. suitable maintenance programmes for the work equipment, the workstation and the systems at the workstation;
  - g. the organisation of the activities with a view to a restriction of the noise:
    - i. restriction of the duration and intensity of the exposure;
    - ii. suitable work schedules with sufficient breaks.
3. If the daily exposure to noise exceeds 85 dB(A) or the peak noise pressure exceeds 140 Pa, on the basis of the assessment and measuring meant in Article 6.7, first paragraph, with due observance of the measures meant in the second paragraph, in connection with the plan of action meant in Article 5 of the Act, technical or organisational measures must be determined and implemented in order to restrict the exposure to a minimum.
  4. Workplaces where the daily exposure to noise can exceed 85 dB(A) or the peak noise pressure can exceed 140 Pa, should be clearly indicated by means of suitable signs and effectively demarcated. If this is technically feasible and it is justified by the risk of exposure, the access to these workplaces should be restricted.
  5. The exposure to noise in recreation rooms as meant in Article 3.20 and the night rooms as meant in Article 3.21 must be restricted to a level that is compatible with the function of the rooms and the circumstances in which they are used.
  6. The measures meant in the first to the fifth paragraph should be geared to the needs of the employees who are part of the specially sensitive risk groups.
  7. In cases where the daily exposure to noise exceeds 80 dB(A) or the peak noise pressure exceeds 112 Pa suitable individual properly made to measure ear protectors must be provided to the employees. The individual ear protectors must prevent the risk of hearing impairment or should reduce this risk to a minimum.
  8. The Works Council or the staff representation body or, failing these, the interested employees must be given the opportunity to express their opinion about the measures meant in the first to the fifth paragraph and about the choice of the individual ear protectors to be provided, as meant in the seventh paragraph.
  9. If the daily exposure to noise is at least 85 dB(A) or the peak noise pressure is at least 140 Pa, individual ear protectors must be worn by the employees.
  10. The daily exposure to noise, taking into account the deadening effect of the individual ear protectors worn by the employee, should in any event not exceed 87 dB(A) or the peak noise pressure should in any event not exceed 200 Pa.
  11. If despite all the measures meant in the first to the seventh and ninth paragraph it is established that the daily exposure to noise, taking into account the deadening effect of the individual ear protector worn by the employee, exceeds the limit values determined in the tenth paragraph, the following must take place:
    - a. measures should be taken immediately to reduce the exposure to a level below the limit values;
    - b. the causes of the excessive exposure must be determined; and
    - c. the measures meant in the first to the seventh and ninth paragraph must be adjusted to prevent a repeat.

### **Article 6.9. Weekly average**

In cases where the employees in connection with the performance of special tasks have to stay at a workplace where the daily exposure to noise per working day differs considerably and compliance with the obligations mentioned in Article 6.8, third, fourth, seventh, ninth, tenth and eleventh paragraph cannot reasonably be required, in the paragraphs of the Articles mentioned «the daily exposure to noise» should be read as «the weekly exposure to noise». In that case the weekly exposure, taking into account the

deadenning effect of the individual ear protectors worn by the employee, should not exceed 87 dB(A) and suitable measures should be taken to restrict the risk associated with these activities to a minimum.

#### **Article 6.10. Audiometric examination**

1. If it appears from the results of the assessment and measuring meant in Article 6.7, first paragraph, that an employee is running a health risk, this employee must be given the opportunity, in addition to Article 18 of the Act, to submit to an occupational health medical examination in the form of an audiometric examination.
2. Any employee submitted to a daily noise exposure of more than 85 dB(A) or peak noise pressure exceeding 140 Pa must be given the opportunity to submit periodically to an occupational health medical examination in the form of an audiometric examination.
3. Any employee submitted to a daily noise exposure of more than 80 dB(A) or peak noise pressure exceeding 112 Pa must be given the opportunity to submit periodically to an occupational health medical examination in the form of an audiometric examination if it appears from the assessment and measuring meant in Article 6.7, first paragraph, that there is a health risk.
4. The audiometric examination meant in the first to the third paragraph, must be focussed on an early diagnosis of any decline in hearing as a result of noise and to retaining the hearing.
5. The expert person meant in Article 2.14a, second paragraph, or the health and safety service must maintain a personal medical file for each employee who has submitted to an audiometric examination as meant in the first to the third paragraph, which includes a summary of the results of the audiometric examination meant in the first to the third paragraph.
6. The personal medical files must be retained in a form such that they can be consulted at a later stage with due observance of the medical professional secrecy.
7. Every employee is entitled to inspect his medical file.
8. A designated supervisor should receive on request a copy of the medical files meant in the fifth paragraph.

#### **Article 6.10a. Measures taken on hearing impairment**

1. If at an audiometric examination as meant in Article 6.10, first to third paragraph, a demonstrable hearing impairment of an employee has been determined, the expert person meant in Article 2.14a, second paragraph, or a specialist if required by the expert, should assess whether the damage is probably the result of exposure to noise at work.
2. If it is determined that the hearing impairment is caused by exposure to noise at work:
  - a. the assessment and measuring meant in Article 6.7, first paragraph, will be carried out again;
  - b. the measures to prevent or restrict the exposure meant in Article 6.8 must be reviewed;
  - c. in taking the measures to prevent or restrict the exposure as meant in Article 6.8, including providing other work without exposure risk, the advice of the expert meant in Article 2.14a, second paragraph, or the designated supervisor should be taken into account; and
  - d. every employee who is exposed in a similar manner should be given the opportunity to submit in the meantime to an occupational health medical examination in the form of an audiometric examination.

#### **Article 6.11. Information and instruction**

Suitable information and effective instructions should be given to employees exposed to a daily exposure to noise of at least 80 dB(A) and a peak noise pressure of at least 112 Pa with regard to the following:

- a. the nature and risks resulting from exposure to noise;

- b. the measures taken, as meant in Article 6.8, to prevent the risks meant under a or to restrict them to a minimum;
- c. the action values meant in Article 6.8, third, fourth, seventh and ninth paragraph and the limit values meant in Article 6.8, tenth paragraph;
- d. the results of the assessment and measuring of the noise levels to which the employees are exposed as meant in Article 6.7, first and second paragraph, and an explanation of the meaning and associated risks, if any;
- e. the correct use of individual ear protectors;
- f. how signs of hearing impairment can be detected and notified;
- g. the circumstances in which employees are entitled to an occupational health medical examination and the aim of this examination; and
- h. safe working methods to restrict exposure to noise to a minimum.

### **Section 3a. Vibrations**

#### **§ 1. General**

##### **Article 6.11a. Definitions, limit values and action values**

1. In this Section the following terms have the following meaning:
  - a. Directive: Directive No. 2002/44/EC of the European Parliament and the Council of the European Union of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration) (OJ EC L 177);
  - b. hand-arm vibrations: mechanical vibrations which when transmitted to the hand-arm system of humans, entail a health and safety risk for the employees in particular vascular, bone or joint, nerve or muscle disorders;
  - c. body vibrations: mechanical vibrations which when transmitted to the whole body, entail a health and safety risk for the employees in particular disorders in the lower back and damage to the spine;
2. For the hand-arm vibrations:
  - a. the limit value for daily exposure, converted to a standard reference period of eight hours, is determined at  $5\text{m/s}^2$ ;
  - b. the action value for daily exposure, converted to a standard reference period of eight hours, is determined at  $2.5\text{m/s}^2$ ;
3. For body vibrations:
  - a. the limit value for daily exposure, converted to a standard reference period of eight hours, is determined at  $1.15\text{ m/s}^2$ ;
  - b. the action value for daily exposure, converted to a standard reference period of eight hours, is determined at  $0.5\text{ m/s}^2$ ;

#### **§ 2. Provisions with regard to vibrations**

##### **Article 6.11b. Detailed provisions for risk assessment and evaluation, assessment and measuring**

1. In connection with the risk assessment and evaluation meant in Article 5 of the Act, the mechanical vibration levels to which the employee is exposed, must be assessed and if necessary measured.
2. The assessment and measuring must be planned with due care and carried out at suitable intervals.
3. The assessment and measuring for hand-arm vibrations must be carried out in accordance with points 1 and 2 of part A and for body vibrations in accordance with points 1 and 2 of part B of the Annex of the Directive.
4. The results of the measuring must be retained in a suitable form so that they can be consulted at a

later stage.

5. The assessment should at least include the following aspects:
  - a. the level, nature and duration of the exposure including any exposure to periodic vibrations or repeated shocks;
  - b. the limit values and action values for the exposure determined, as meant in Article 6.11a, second and third paragraph;
  - c. possible consequences for the health and safety of employees with an increased risk;
  - d. possible indirect consequences for the safety of employees caused by the interaction between mechanical vibrations and the workplace or other work equipment;
  - e. the information supplied by manufacturers of the work equipment;
  - f. the existence of replacement material which is designed to reduce the levels of exposure to mechanical vibrations;
  - g. continuation of the exposure to body vibrations outside normal working hours under the employer's responsibility;
  - h. special working conditions such as working at low temperatures;
  - i. relevant information obtained via occupational health medical examinations meant in Article 6.11e, including published information insofar as this is possible.
6. The assessment should regularly be reviewed, in any event if changed circumstances or results of the occupational health medical examinations meant in Article 6.11e give rise to it.

#### **Article 6.11c. Preventing or restricting harmful vibrations**

1. If the action values meant in Article 6.11a, second paragraph under b, and the third paragraph under b, are or can be exceeded, with due observance of Article 3, first paragraph under b, of the Act, attention should be given to the following points in the risk assessment and evaluation meant in Article 5 of the Act and in the associated plan of action:
  - a. alternative working methods reducing the necessity of exposure to mechanical vibrations;
  - b. the choice of the right work equipment, properly ergonomically designed and causing the least possible vibrations taking into account the work to be carried out;
  - c. providing aids to prevent the risk of damage to health as a result of vibrations;
  - d. suitable maintenance programmes for the work equipment, the workplace and the systems at the workplace;
  - e. the design and lay-out of the workplace;
  - f. adequate information and instructions to the employees so that they use the work equipment safely and correctly such that the exposure to mechanical vibrations is as low as possible;
  - g. restriction of the duration and intensity of the exposure;
  - h. suitable work schedules with sufficient breaks;
  - i. providing clothing protecting the exposed employees against cold and damp.
2. Employees should not be exposed to vibrations above the limit value for exposure meant in Article 6.11a, second paragraph under a, and third paragraph under a.
3. If nevertheless the limit value has been exceeded:
  - a. measures should immediately be taken to reduce the exposure to below the limit value for exposure;
  - b. the cause of exceeding the limit value must be investigated;
  - c. the protection and prevention measures must be adjusted to prevent the limit value being exceeded again.
4. The employer must tailor the measures to the needs of the high-risk employees.

#### **Article 6.11d. Information and instruction**

Suitable information and effective instructions should be given to employees who are exposed to risks in connection with mechanical vibrations at work about the following:

- a. measures taken to remove or restrict to a minimum the risks in connection with mechanical vibrations;
- b. the limit values and action values for exposure;
- c. the results of the assessments and measuring of mechanical vibrations carried out in accordance with Article 6.11b and the damage to health which the work equipment used may cause;
- d. the use of the method for detecting and reporting symptoms of damage to health;
- e. the circumstances in which the employees are entitled to an occupational health medical examination;
- f. safe working methods to restrict exposure to mechanical vibrations to a minimum.

#### **Article 6.11e. Occupational health medical examination with regard to vibrations**

1. Any employee who is entrusted with activities for the first time which as appears from the assessment meant in Article 6.11b, first paragraph, might cause hazards to health and safety, should as an addition to Article 18 of the Act be given the opportunity to submit to an occupational health medical examination before commencing the work.
2. If the employee is found to have a disorder which could be the result of exposure to mechanical vibrations, employees who have been exposed in a similar way to mechanical vibrations should in the meantime be given the opportunity to submit to an occupational health medical examination.
3. The occupational health medical examination can be re-taken at the request of the employer or the employee involved. The results of the re-taken examination replace the previous one.
4. If an employee is found to have a demonstrable illness or harmful effect to health as a result of exposure to mechanical vibrations, he must be informed by the expert as meant in Article 2.14a, second paragraph, or the health and safety service about the manner in which he is given the opportunity after the termination of the exposure to submit to an occupational health medical examination.

### **Section 4. Radiation**

#### **Article 6.12. Appliances**

1. Appliances which may radiate harmful, non-ionising electromagnetic radiation should consist of sound materials, be properly constructed and be in a good condition.
2. The appliances meant in the first paragraph should be situated in such a space and also fitted out, installed or screened off in such a manner that during their operation any damage to health will be prevented as much as possible.
3. If during the operation of an appliance as meant in the first paragraph, the hazard of damage to health cannot be prevented or not entirely despite compliance with the provisions meant in paragraph one and two, measures should be taken such that the damage to health is prevented as much as possible.
4. If the measures meant in the third paragraph cannot or cannot sufficiently prevent damage to health, personal protective equipment should be made available.
5. The personal protective equipment should be used by the employees during their work.
6. Levels can be determined by Ministerial Order above which for the purposes of this Article this radiation is deemed to be harmful.
7. This Article does not apply to appliances that can emit optical radiation, within the meaning of Section 4a of this Chapter.

#### **Section 4a. Artificial optical radiation**