Occupational Health and Safety Requirements in Working Environment Affected by Artificial Optical Radiation, Maximum Levels of Artificial Optical Radiation and Procedure for Measuring Radiation[1]

Regulation no. 47 of 8 April 2010 of the Government of the Republic

This regulation is established on the basis of subsections 3 (4) and 6 (6) of the Occupational Health and Safety Act.

Chapter 1

GENERAL PROVISIONS

§ 1. Scope of application

This Regulation provides the obligations of the employer in avoiding or reducing health hazards caused by artificial optical radiation (hereinafter optical radiation) in the working environment, the maximum levels of optical radiation and the procedure for measuring radiation.

§ 2. Definitions

The following definitions are used in the Regulation:

1) *optical radiation* – electromagnetic radiation with a wavelength from 100 nm to 1 mm. The spectrum of optical radiation is divided into ultraviolet radiation, visible light and infrared radiation;

2) *ultraviolet radiation* – optical radiation with a wavelength value from 100 nm to 400 nm. Ultraviolet radiation is divided into: UV-A (315–400 nm), UV-B (280–315 nm) and UV-C (100–280 nm);

3) *visible light* – optical radiation with a wavelength from 380 nm to 780 nm;

4) *infrared radiation* – optical radiation with a wavelength from 780 nm to 1 mm. Infrared radiation is divided into: IR-A (780-1400 nm), IR-B (1400-3000 nm) and IR-C (3000 nm –1 mm);

5) *laser (light amplification by stimulated emission of radiation)* – a device that can be used to create or amplify electromagnetic radiation in the wavelength range of optical radiation by controlled stimulated emission;

6) *laser radiation* – optical radiation originating from a laser;

7) *non-coherent radiation* – optical radiation that is not laser radiation;

8) *maximum levels of exposure* – maximum levels of exposure to optical radiation based on effects on health identified by research and biological considerations. Conformity to the said maximum levels ensures that workers who are exposed to artificial sources of optical radiation are protected from harmful effects on health;

9) *radiation intensity (E) or power density* – power of the radiation per area unit, expressed by watts per square meter (W m^{-2});

10) *exposure to radiation (H)* – time integral of radiation intensity that is expressed in joules per square meter (J m^{-2});

11) *radiation density (L)* – radiation flow or output power per solid angle unit and area unit, expressed by watts per square meter and steradian (W m^{-2} sr^{-1});

12) *level (of optical radiation)* – average total power of optical radiation that workers are exposed to.

§ 3. Maximum levels of optical radiation in working environment

(1) The maximum levels of non-coherent radiation originating from sources of optical radiation that have an effect on workers are provided in Appendix 1.

(2) The maximum levels of exposure to laser radiation that has an effect on workers are provided in Appendix 2.

Chapter 2

OBLIGATIONS OF THE EMPLOYER

§ 4. Risk assessment of working environment

(1) The employer is obliged to identify the sources of optical radiation in the working environment.

(2) The employer shall assess and, if necessary, measure or calculate the level of exposure to optical radiation in order to determine and implement necessary measures to limit the exposure according to the applicable maximum levels if workers are exposed to optical radiation.

(3) In the course of the risk assessment, special concern has to be given to:

1) the duration, level and wavelength of radiation in case of exposure to optical radiation;

2) the maximum levels of exposure provided in Appendices 1 and 2;

3) technical data and suggestions for installing, marking and using of equipment given by the manufacturers or suppliers of sources of optical radiation and work equipment related to them;

4) the efficiency of the safety precautions being implemented;

5) the health and safety of workers belonging to risk groups (above all minors, pregnant women);

6) the interaction of photosensitive chemicals and optical radiation that may be hazardous to the health of workers;

7) possible indirect effects such as temporary dazzle, explosion or fire;

8) the results of medical examinations of workers;

9) the possibility of workers being exposed to several sources of optical radiation;

10) the relevant standards of the International Electrotechnical Commission (IEC) regarding lasers and all artificial sources that may cause similar harm as a laser of class 3b or 4.

(4) The information and technical data presented by the manufacturer or supplier of the source of optical radiation or work equipment related to it shall be taken into account when assessing the health hazards of workers if the device is covered by relevant directives of the Community.

§ 5. Reduction of health hazards

(1) The risks arising from exposure to optical radiation shall be eliminated at their source location or reduced to the possible minimum pursuant to the principles of preventive action provided in § 12^1 of the Occupational Health and Safety Act.

(2) If, as a result of risk assessment, it becomes evident that the level of optical radiation in the working environment may exceed maximum limits, the employer is obliged to compose and implement an activity plan of technical and work organisation-related measures in order to reduce exposure to radiation. In the course of composing of the activity plan, special concern has to be given to:

1) using other work methods that avoid or reduce the health hazards caused by optical radiation;

2) using existent replacement devices in order to reduce the optical radiation exposure level;

3) technical measures for reducing optical radiation, using blocking, shielding or other devices that protect the health if necessary;

4) creating maintenance programmes for work equipment, workrooms and places of work;

5) design and layout of the workrooms and places of work;

6) limiting the duration of exposure and the level of radiation;

7) accessibility of relevant personal protective equipment, especially eye protection (protective goggles);

8) suggestions given by the manufacturers or suppliers of the sources of optical radiation and related work equipment when installing, indicating and using them.

(3) The employer is obliged to indicate work equipment used by workers and workrooms and danger zones where workers may be exposed to a level of optical radiation that exceeds the maximum level of exposure with relevant danger warning signs according to Regulation "Requirements for Usage of Safety Signs in Places of Work" established pursuant to subsection 4 (4) of the Occupational Health and Safety Act. The employer shall restrict access to danger zones if it is technically doable and justified due to risk of exposure.

(4) Workers' exposure to optical radiation shall not exceed maximum limits. If maximum limits of exposure are exceeded regardless of the implemented measures, the employer shall immediately ascertain the reasons for exceeding the maximum limits and improve the protection and prevention measures in order to avoid further excess of the maximum limits.

(5) The employer shall take into account the needs of workers belonging to risk groups when implementing the measures specified in subsection 2.

§ 6. Instruction and training of workers

The employer shall provide that the workers and the working environment representative of the company who are exposed to optical radiation get relevant instruction and training, which has to cover, above all, the following:

1) the harmful effect on health of optical radiation;

2) early discovery and notification of damage to health related to optical radiation;

3) the necessity of medical examination of workers and the procedure of carrying it out;

4) measures implemented to avoid or reduce health hazards arising from optical radiation in the place of work;

5) the meaning of danger warning signs used in the place of work, danger zones and restrictions on access;

6) results of measuring or calculating of the level of exposure to optical radiation as compared to the maximum limits;

7) safe working measures for using work equipment, especially laser devices, in order to minimise health hazards caused by optical radiation;

8) valid use of personal protective equipment.

§ 7. Medical examination of workers

(1) The purpose of medical examinations is to prevent and promptly identify damage to health of workers related to expose to optical radiation, especially damage to eyes and skin.

(2) The employer shall ensure that all workers exposed to optical radiation have passed a medical examination pursuant to the procedure established by clause 13 (1) 7) of the Occupational Health and Safety Act.

(3) The medical examination specified in subsection 2 shall also be carried out if a disease or health disorder is discovered when a worker consults a family physician and the physician presumes that it was caused by exposure to optical radiation at work.

(4) The employer shall review the risk assessment of the working environment and the measures being implemented to reduce the risk and, if necessary, assign the worker to another work or place of work where there is no risk of continued exposure to radiation, taking into account the suggestions of an occupational health doctor, if damage to health of a worker resulting from exposure to optical radiation is discovered during the medical examination.

(5) If damage to health of a worker resulting from exposure to optical radiation is discovered during the medical examination, other workers working in similar conditions shall pass the medical examination as well.

Chapter 3

MEASURING OPTICAL RADIATION

§ 8. Measuring optical radiation

(1) The methodology of measuring or calculating optical radiation shall follow the standards of the International Electrotechnical Commission (IEC) in case of laser radiation and the suggestions of the International Commission on Lumination (CIE) and the European Committee for Standardisation (CEN) in case of non-coherent radiation.

(2) In the case of exposure to optical radiation in a situation that is not covered by the standards or suggestions specified in subsection 1, national or international instructions based on scientific proof may be used for measuring or calculating.

(3) The measurements or calculations specified in subsection 1 shall be performed by competent measurers for the purposes of the Metrology Act.

(4) The results of measurement in case of measuring optical radiation shall be observable in a certified manner for the purposes of the Metrology Act.

(5) When assessing the conformity of the level of optical radiation, the measured level shall be deemed to be satisfactory to the requirements of the Regulation, if the sum of the result of measurement and extended measurement uncertainty is smaller than or equal to the maximum limit whereas the extended measurement uncertainty shall be assessed with at least 95% reliability.

(6) The employer shall maintain measurement or calculation reports along with the results of the risk assessment.

Chapter 4

IMPLEMENTATION

§ 9. Entry into force of Regulation

The Regulation shall enter into force on 1 May 2010.

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[1] Directive 2006/25/EC of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual Directive within the meaning of Article 16(1) of Directive 89/391/EC) (OJEC L 114, 27.04.2006, pages 38-59) and the Non-Binding Guide to the Artificial Optical Radiation Directive 2006/25/EC.