Republic of Latvia

Cabinet

Regulation No. 584

Adopted 13 October 2015

**Labour Protection Requirements for the Protection of Employees from Risks Arising from Electromagnetic Fields in the Working Environment**

*Issued pursuant to*

*Section 25, Clause 18 of the Labour Protection Law*

**I. General Provisions**

1. The Regulation prescribes the minimum labour protection requirements for the protection of employees from the risks arising from or which may arise from exposure to electromagnetic fields during working time (all known direct biophysical and indirect effects).

2. The following terms are used in the Regulation:

2.1. electromagnetic fields – static electric, static magnetic and time-varying electric, magnetic and electromagnetic fields with frequencies up to 300 GHz;

2.2. direct biophysical effects – effects in the human body directly arising from its presence in an electromagnetic field, including:

2.2.1. thermal effects – tissue heating through energy absorption from electromagnetic fields in the tissue;

2.2.2. non-thermal effects – the stimulation of muscles, nerves or sensory organs;

2.2.3. induced currents in the arms and legs;

2.3. indirect effects – effects arising from the presence of an object in an electromagnetic field which may become the cause of a safety or health hazard, such as:

2.3.1. interference with medical electronic equipment and devices, including cardiac pacemakers and other implants or medical devices worn on the body;

2.3.2. the projectile risk from ferromagnetic objects in static magnetic fields;

2.3.3. the initiation of electro-explosive devices (detonators);

2.3.4. fires and explosions resulting from the ignition of flammable materials by sparks arising from induced fields, contact currents or spark discharges;

2.3.5. contact currents;

2.4. exposure limit values (ELVs) – limits on exposure to the electromagnetic fields which are specified on the basis of the effect thereof on human health and by complying with which employees exposed to the effect of the electromagnetic fields are protected against the adverse health effects thereof. The limit values referred to in this Regulation cover only scientifically well-established links between short-term direct biophysical effects and exposure to electromagnetic fields. Within the meaning of this Regulation:

2.4.1. the exposure limit value related to health effects is the abovementioned limit values above which employees are likely to be exposed to harmful health effects (thermal heating or stimulation of nerve and muscle tissue);

2.4.2. the exposure limit value related to the effects on the sensory organs is the abovementioned limit values which may result in transient disturbed perceptions and minor changes in brain functions of employees;

2.5. exposure action values (AV) – levels of action determined to simplify the process of attesting compliance with the relevant exposure limit values or the taking of protective or preventive measures referred to in this Regulation. The exposure action values may be as follows:

2.5.1. with regard to electric fields – “low action value” and “high action value” means levels which relate to the specific protection or prevention measures specified in this Regulation;

2.5.2. with regard to magnetic fields – “low action value” which relates to the sensory effects of exposure limit values and “high action value” which relates to the effects on health of exposure limit values;

2.6. employees at particular risk – employees under 18 years of age, pregnant women, persons who have declared the use of active or passive implanted medical devices (cardiac pacemaker, metal prostheses), and also persons using medical devices (insulin pumps) worn on the body;

2.7. electric field strength (E) – a physical quantity with vector features. This is expressed in volts per metre (V/m). A distinction has to be made between the environmental electric field and the electric field present in the body (in situ) as a result of exposure to the environmental electric field;

2.8. induced currents in the arms and legs (IL) – is the current in amperes (A) in the arm or leg of a person exposed to electromagnetic fields in the frequency range from 10 MHz to 110 MHz as a result of contact with an object in an electromagnetic field or the flow of capacitive currents induced in the exposed body;

2.9. a contact current (IC ) is a current in amperes (A) that appears when a person comes into contact with an object in an electromagnetic field. A steady state contact current occurs when a an employee is in continuous contact with an object in an electromagnetic field. In the process of making such contact, a spark discharge may occur with associated transient currents;

2.10. electric charge (Q) is an appropriate quantity used for spark discharge. This is expressed in coulomb (C);

2.11. magnetic field strength (H) – a vector quantity that, together with the magnetic flux density, specifies a magnetic field at any point in space. This is expressed in amperes per metre (A/m).

2.12. magnetic flux density (B) – a vector quantity resulting in a force that acts on moving charges. This is expressed in tesla (T). In free space and in biological materials, magnetic flux density and magnetic field strength can be interchanged using the magnetic field strength of H = 1 A/m is equivalent to a magnetic flux density of B = 4π 10–7 T (approximately 1.25 microtesla).

2.13. power density (S) – the quantity used for characterising very high frequencies where the depth of penetration of the radiation in the body is low. It is the radiant power incident perpendicular to a surface, divided by the area of the surface. It is expressed in watts per square metre (W/m2);

2.14. specific energy absorption (SA) – energy absorbed per unit mass of biological tissue. It is expressed in joule per kilogram (J/kg) and is used for establishing limits for effects from pulsed microwave radiation;

2.15. specific energy absorption rate (SAR), averaged over the whole body or over parts of the body – the rate at which energy is absorbed per unit mass of body tissue. It is expressed in watts per kilogram (W/kg). Whole-body SAR is a widely accepted quantity used for relating adverse thermal effects to radio frequency (RF) exposure. Besides the whole-body average SAR, local SAR values are necessary to evaluate and limit excessive energy deposition in small parts of the body resulting from special exposure conditions (for example, in cases where an employee is exposed to radio frequency in the low MHz range (for example, from dielectric heaters) or in the near field of an antenna.

3. The Regulation shall not apply to:

3.1. the suggested long-term effects of electromagnetic fields or to the risks arising from contact with live conductors;

3.2. cases where exposure is related to the installation, testing, use, development, maintenance or research of magnetic resonance imaging equipment related to patient health examinations provided that all of the following conditions are complied with:

3.2.1. the risk assessment carried out in accordance with Chapter III of this Regulation shows that the exposure limit values have been exceeded;

3.2.2. all technical and organisational measures for labour protection have been applied, taking into account the latest developments;

3.2.3. the exposure limit values have been exceeded due to justified circumstances;

3.2.4. the specific features of the workplace, equipment or working techniques have been taken into account;

3.2.5. the employer may certify that employees are protected against adverse effects on health and exposure to risks of the working environment, including ensuring that instructions for the use of equipment have been observed and working conditions are safe;

3.3. persons who are employed or performing services in military facilities of the National Armed Forces or are involved in military activities (including international level military exercises) if an equivalent or more specific defence system is implemented and risks to the working environment and adverse health effects have been eliminated.

4. An employer shall, in accordance with the requirements laid down in the Labour Protection Law, consult with employees or representatives of employees regarding the issues that are related to the risk arising from the electromagnetic field in the working environment and also enable the participation of employees in the solving of the relevant issues.

**II. Exposure Limit Values and Exposure Action Values**

5. The risk arising from or which may arise from the exposure of employees to electromagnetic fields at workplaces shall be characterised by the exposure limit values and action values specified in Annexes 1 and 2 to this Regulation.

6. The employer shall ensure that the exposure of employees to electromagnetic fields is limited to the level of the exposure limit value specified in Annex 1 to this Regulation in relation to non-thermal effects and to the level of the exposure limit value referred to in Annex 2 to this Regulation in relation to thermal effects.

7. If the exposure of employees to electromagnetic fields exceeds exposure limit values, the employer shall immediately take measures to avoid exposing employees to an elevated level of electromagnetic fields and to reduce exposure to the electromagnetic fields to the extent that it does not exceed exposure limit values.

8. If the exposure of employees to electromagnetic fields exceeds the exposure action values, the employer shall develop and implement a plan of labour protection measures in accordance with Paragraph 21 of this Regulation unless, in accordance with the risk assessment (including the measurements taken), it proves that the relevant exposure limit values have not been exceeded and that risks to the safety of employees can be excluded.

9. If it has been demonstrated that the exposure action values specified in Annexes 1 and 2 to this Regulation have not been exceeded, the employer shall be considered to be complying with the exposure limit values.

10. The exposure to electromagnetic fields specified in Annexes 1 and 2 to this Regulation may exceed:

10.1. low action values for electric fields (Annex 1, Table 3, Clause 1) if:

10.1.1. it is justified by the practice or process, provided that the sensory effects exposure limit values are not exceeded (Annex 1, Table 2, Clause 2);

10.1.2. the health effects exposure limit values have not been exceeded (Annex 1, Table 2, Clause 1);

10.1.3. by using technical protective equipment and using personal protective equipment, excessive spark discharge and contact current have been avoided (Annex 1, Table 4, Clause 1);

10.1.4. information has been provided to employees regarding the situations referred to in Sub-paragraph 33.9 of this Regulation;

10.2. low action values for magnetic fields (Annex 1, Table 3, Clause 2) (also with regard to the head and body) during the working day if:

10.2.1. it is justified by the practice or process, provided that the sensory effects exposure limit values are not exceeded (Annex 1, Table 2, Clause 2);

10.2.2. the sensory effects exposure limit values have been exceeded only temporarily;

10.2.3. the health effects exposure limit values have not been exceeded (Annex 1, Table 2, Clause 1);

10.2.4. the temporary symptoms referred to in Sub-paragraph 30.1 of this Regulation are present and a risk assessment has been performed repeatedly and preventive measures have been reviewed;

10.2.5. information has been provided to the employees regarding the situations referred to in Sub-paragraph 33.9 of this Regulation;

10.3. sensory effects exposure limit values (Annex 1, Table 1) during the working day, if justified by the practice or process, provided that:

10.3.1. they are only exceeded temporarily;

10.3.2. the health effects exposure limit values have not been exceeded (Annex 1, Table 1);

10.3.3. special protection measures have been taken in accordance with Paragraph 29 of this Regulation;

10.3.4. a risk assessment has been performed repeatedly and preventive measures have been reviewed if there are temporary symptoms in accordance with Sub-paragraph 30.2 of this Regulation;

10.3.5. information has been provided to the employees regarding the situations referred to in Sub-paragraph 33.9 of this Regulation;

10.4. sensory effects exposure limit values (Annex 1, Table 2, Clause 2; Annex 2, Table 1, Clause 2) during the working day, if justified by the practice or process, provided that:

10.4.1. they are only exceeded temporarily;

10.4.2. the health effects exposure limit values (Annex 1, Table 2, Clause 1; Annex 2, Table 1, Clauses 1 and 3) are not exceeded;

10.4.3. a risk assessment has been performed repeatedly and preventive measures have been reviewed if there are transient symptoms referred to in Sub-paragraph 30.1 of this Regulation;

10.4.4. information has been provided to the employees regarding the situations referred to in Sub-paragraph 33.9 of this Regulation.

**III. Determination of Exposure to the Electromagnetic Field and Assessment of the Risk Caused**

11. The employer shall perform an inspection at all workplaces (after installation, adjustment and transfer of equipment into use), determining whether they contain sources of electromagnetic field radiation that could cause harm to the health of the employees.

12. If, in the inspection of workplaces and after consulting the technical documentation of the work facilities, the employer determines that a risk to the safety and health of the employees arises or may arise from the electromagnetic field, the employer shall ensure the assessment of the risk arising from the electromagnetic field.

13. If compliance with the exposure limit value cannot be reliably determined on the basis of easily accessible information, measurements or calculations of the electromagnetic field shall be made by taking into account the physical values characterising exposure to electromagnetic fields and emission levels determined by the manufacturer of work equipment where the requirements of the equipment are regulated.

14. If there is a source of electromagnetic field radiation in the workplace, the employer shall assess the risk arising from the electromagnetic field in accordance with the laws and regulations regarding the procedures for the performance of internal supervision of the working environment not less than once a year and also in the following cases:

14.1. if a new workplace has been created or significant changes in the working environment have taken place (for example, working processes, methods, work equipment are changing) which may increase the abovementioned risk;

14.2. the results of health examinations of the employees attest that health disorders of the employees have arisen from exposure to the electromagnetic field.

15. Measurements and calculations of electromagnetic fields shall be planned and carried out by taking into account the requirements of this Regulation:

15.1. by authorities competent in labour protection;

15.2. by a laboratory which is accredited by a State accreditation authority in conformity with the laws and regulations regarding the assessment, accreditation and supervision of conformity assessment authorities or by an accreditation authority of another European Union Member State;

15.3. by specialists competent in labour protection;

15.4. by appropriately trained senior labour protection specialists (the profession standard PS 0100 Senior Labour Protection Specialist);

15.5. by persons with a qualification appropriate for the performance of the measurements.

16. An employer shall, in assessing the risk of the working environment, pay particular attention to the following factors:

16.1. the frequency, level, duration and type of exposure to the electromagnetic field and also the distribution into the body and working premises of the employees;

16.2. the exposure limit values and exposure action values referred to in Annexes 1 and 2 to this Regulation;

16.3. the effect of the electromagnetic field on the safety and health of the employees who belong to a particularly sensitive risk category;

16.4. the indirect effects of the electromagnetic field, including:

16.4.1. failures in the operation of electronic medical equipment and devices (also cardiac pacemakers and other implanted devices);

16.4.2. the risk of receiving a mechanical blow from ferromagnetic objects in the static magnetic fields whose magnetic flux density is greater than 3 mT;

16.4.3. the initiation of electro-explosive devices (detonators);

16.4.4. the risk of fires and explosions which may arise from the ignition of flammable materials by sparks arising from induced fields, contact currents or spark discharges;

16.5. the existence of such work equipment designed to reduce the levels of exposure to electromagnetic fields;

16.6. the information which is obtained when performing health examinations of the employees;

16.7. the existence of multiple sources of exposure to radiation of the electromagnetic field;

16.8. simultaneous exposure to multiple frequency fields;

16.9. any direct biophysical impact;

16.10. information provided by the equipment manufacturer;

16.11. other health and safety-related matters.

17. An employer shall document and store all the results of the assessment of the risk arising from the electromagnetic field and measurement results for 10 years. After the specified period of time they shall be transferred for storage in the archive.

18. If the workplace is publicly available to visitors, the employer shall not perform an additional assessment, measurement or calculation of the risk arising from the electromagnetic field in accordance with the requirements laid down in this Regulation if they have been performed in accordance with European Union legislation regarding restrictions on exposure to electromagnetic fields to the general public and also if the restrictions provided for the employees have been complied with and risks to the health and safety of employees have been excluded.

**IV. Prevention or Reduction of the Risk Arising from the Electromagnetic Field**

19. The employer shall, according to the risk assessment, implement the measures necessary to avoid or reduce to the minimum the risks arising from the electromagnetic field (the lowest practical level) on the basis of technical options and using the latest means for the control of the risk source arising from the electromagnetic field.

20. If the exposure action values referred to in Annexes 1 and 2 to this Regulation have been exceeded at the workplace in accordance with the risk assessment and if the assessment of the electromagnetic field does not prove that the relevant exposure limit values have not been exceeded and the risks to the health and safety of the employees have been excluded, the employer shall draw up and implement a plan of labour protection measures.

21. The plan of labour protection measures shall include the following technical and organisational measures:

21.1. other working methods that are related to less exposure to the electromagnetic field shall be used;

21.2. working equipment with lower intensity electromagnetic fields shall be selected;

21.3. technical measures for the reduction of emission of the electromagnetic fields shall be taken by installing, where necessary, interlocks, shielding or similar health protection devices;

21.4. appropriate servicing and maintenance of the layout of the workplace and working equipment shall be ensured;

21.5. the design and layout of workplaces shall be optimised;

21.6. the duration and intensity of the exposure to electromagnetic fields shall be limited;

21.7. the availability of adequate personal protective equipment shall be ensured;

21.8. suitable border and access control measures (safety signs, floor markings, barriers) shall be ensured;

21.9. if there is exposure to electrical fields, measures and procedures for the control of spark discharge and contact strips shall be ensured by using technical means and by training the employees.

22. Upon implementing labour protection measures to avoid or reduce the risk arising from an electromagnetic field, the employer shall adapt those measures for the protection of employees in a specific risk category.

23. The employer shall develop and implement a plan of measures which shall include technical and organisational measures for the prevention of risks for employees belonging to a specific risk category and for the prevention of risks which may arise from the indirect effects referred to in Sub-paragraph 16.4 of this Regulation.

24. On the basis of the risk assessment of electromagnetic fields in workplaces where employees may be exposed to electromagnetic fields that exceed the exposure action values, the employer shall place appropriate safety signs in accordance with the laws and regulations regarding labour protection requirements for the use of safety signs.

25. If there is a risk to technically exceed the exposure limit values at the workplace, the employer shall limit access to the danger zone specified in the risk assessment.

26. If access to hazardous areas is adequately restricted for other reasons and the employees are aware of the risks arising from the electromagnetic fields, safety signs and access restrictions in respect of the electromagnetic fields may not be used.

27. It is prohibited to expose the employees to exposure to electromagnetic fields that exceed exposure limit values, except in the cases referred to in Paragraph 10 of this Regulation.

28. If Sub-paragraph 10.1 of this Regulation is applicable, the training and informing of the employees shall be performed in accordance with Paragraph 33 of this Regulation and technical protective equipment (the grounding of equipment, the equipotential bonding between the employees and the equipment) and personal protective equipment (the use of insulating shoes, gloves and protective clothing) shall be used.

29. If Sub-paragraph 10.3 of this Regulation is applicable, specific protection measures shall be carried out, for example, to provide for movement restrictions by reducing the volume and speed of movements in the working environment.

30. If Paragraph 10 of this Regulation is applicable and the employee reports transient symptoms, the employer shall review and, if necessary, update the risk assessment and also take preventive measures. Transient symptoms may include:

30.1. sensory perceptions and effects in the functioning of the brain evoked by time varying magnetic fields;

30.2. static magnetic field effects – vertigo and nausea.

31. In assessing and reducing the risk arising from the electromagnetic fields, the employer shall meet the general labour protection principles specified in the Labour Protection Law.

32. If, after the measures carried out by the employer for the reduction of the risk, the exposure limit values have still been exceeded the employer shall:

32.1. carry out measures without delay in order not to allow the exposure of the employees to such electromagnetic field and to reduce the effect thereof so far that it does not exceed the exposure limit values;

32.2. analyse and determine the reasons due to which the effect of the electromagnetic field exceeds the permissible exposure limit values;

32.3. carry out modifications to the facilities or amendments to the labour protection measures in order to prevent the permissible exposure limit values being exceeded. Amendments to labour protection measures shall be documented and stored in a traceable manner so that, if necessary, the impact thereof on the protection of the employees and compliance with laws and regulations may be analysed.

33. The employer shall ensure that the employees who are exposed to the risks arising from the electromagnetic field at the workplace and the representatives of such employees are duly trained and receive information in a comprehensible manner regarding:

33.1. the effect of the electromagnetic field and the possible risk to the safety and health of the employees;

33.2. the labour protection measures which reduce the effect of the risk arising from the electromagnetic field on the safety and health of the employees to the minimum;

33.3. the exposure limit values and action values of the electromagnetic field, the potential risk associated with them and the preventive measures carried out;

33.4. the results obtained in the assessments, measurements or calculations of the level of exposure to the electromagnetic fields which are performed in accordance with Chapter III of this Regulation;

33.5. the symptoms of the health disorders arising from exposure to the electromagnetic field, the significance of the timely detection of health disorders and the action if health disorders have occurred;

33.6. the circumstances in which the employees have the right to health surveillance and the significance thereof;

33.7. the safe working methods and also the correct and safe use of the work equipment in order to avoid the risk arising from the electromagnetic field;

33.8. the possible indirect effects of exposure to the electromagnetic field;

3.9. the possibility of transient symptoms and sensations associated with the central and peripheral nervous system;

33.10. employees who correspond to a specific risk category.

**V. Health Examination of Employees**

34. If the employee is subject to the effect of risk arising from the electromagnetic field which exceeds the exposure action values or if the employee reports adverse or unintended health effects of the electromagnetic field, the employer shall ensure health surveillance in accordance with the laws and regulations regarding mandatory health examinations so as to detect as soon as possible health disorders arising from the electromagnetic field and to ensure good quality health protection of the employees.

35. The employer shall ensure the availability of the risk assessment results to a general practitioner and an occupational physician who performs the health examination of the employee.

36. Information to the employees and the employer regarding the results of health examinations, the necessary treatment and additional investigation of the state of health of the employees shall be provided by medical practitioners and medical treatment institutions in accordance with the procedures laid down in the laws and regulations governing the field of health care.

37. The employer shall take into account the results of the health examinations upon planning and determining the labour protection measures for the prevention of the risk arising from the electromagnetic field or reduction thereof to a permissible level.

38. The employer shall systematically document the results of the health examinations of the employees. Upon a justified request of a competent authority or the State Labour Inspectorate, the employer shall issue copies of the results of the health examinations.

39. The employer shall keep all results of health examinations of the employees in an appropriate manner for a period of 10 years in conformity with the requirements of confidentiality. After the specified period of time they shall be transferred for storage in the archive.

40. Each employee has the right to become acquainted with the content of his or her health examination card upon appropriate request.

**VI. Closing Provision**

41. The Regulation shall come into force on 1 July 2016.

**Informative Reference to European Union Directive**

The Regulation contains legal norms arising from Directive 2013/35/EU of the European Parliament and of the Council of 26 June 2013 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (20th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) and repealing Directive 2004/40/EC.

Prime Minister Laimdota Straujuma

Minister for Welfare Uldis Augulis

**Annex 1**

Cabinet Regulation No. 584

13 October 2015

**Exposure Limit Values and Action Values in the Frequency Range from 0 Hz to 10 MHz**

**(Non-thermal Effect)**

**I. Exposure Limit Values (ELVs)**

1. Exposure limit values below 1 Hz are limits for a static magnetic field which is not affected by the tissue of the body (Table 1).

2. Exposure limit values for external magnetic flux density from 0 Hz to 1 Hz (Table 1):

2.1. sensory effects exposure limit values in normal working conditions related to vertigo and other physiological effects related to disturbance of the human balance organ resulting mainly from moving in a static magnetic field;

2.2. health effects in controlled working conditions applicable on a temporary basis during the working day, if justified by the practice or relevant process, provided that preventive measures have been implemented and the informing of the employees has been carried out.

Table 1

**Exposure Limit Values for External Magnetic Flux Density (B0) from 0 Hz to 1 Hz**

|  |  |
| --- | --- |
| **1.** | **Sensory effects ELVs\*** |
| 1.1. | normal working conditions | 2 T |
| 1.2. | localised exposure of the arms and legs | 8 T |
| **2.** | **Health effects ELVs\*\*** |
| 2.1. | controlled working conditions | 8 T |

Notes.

1. \*Sensory effects ELVs – the largest of the internal electric field peak values when viewing the field anywhere in the head of the employee.

2. \*\*Health effects ELVs – the largest of the internal electric field peak values when viewing the field anywhere in the body of the employee.

3. The exposure limit values for frequencies in the range from 1 Hz to 10 MHz are limits for the electric fields induced in the body from exposure to time-varying electric and magnetic fields (Table 2, Clause 1).

4. Health effects exposure limit values for the intensity of the internal electrical field in the frequency range from 1 Hz to 10 MHz (Table 2, Clause 1) refer to the electrical stimulation of tissues of the peripheral and central nervous system in the body, including the head.

5. Sensory effects exposure limit values for the intensity of the internal electrical field in the frequency range from 1 Hz to 400 Hz (Table 2, Clause 2) refer to the effects of the electrical field on the brain, retinal phosphenes and minor transitory changes in some brain functions.

Table 2

**Exposure Limit Values for Internal Electric Field Strength at Different Frequency Ranges**

|  |  |  |
| --- | --- | --- |
| No. | Frequency range | ELV (maximum value) |
| **1.** | **Health effects ELVs for internal electric field strength in the frequency range from 1 Hz to 10 MHz** |
| 1.1. | 1 Hz ≤ f\* < 3 kHz | 1.1 V/m |
| 1.2. | 3 kHz ≤ f ≤ 10 MHz | 3.8 × 10-4f V/m |
| **2.** | **Sensory effects ELVs for internal electric field strength in the frequency range from 1 Hz to 400 Hz** |
| 2.1. | 1 Hz ≤ f < 10 Hz | 0.7/f V/m |
| 2.2. | 10 Hz ≤ f < 25 Hz | 0.07/f V/m |
| 2.3. | 25 Hz ≤ f ≤ 400 Hz | 0.0028/f V/m |

Note. \* The letter f is the frequency expressed in hertz (Hz).

**II. Exposure Action Values (AV)**

Table 3

**Action Values for Exposure to Electric and Magnetic Fields in a Range from 1 Hz to 10 MHz**

|  |  |
| --- | --- |
| **1.** | **AV for exposure to electric fields** |
| No. | Frequency range | Electric field low intensity AV (E) [V/m] (RMS) | Electric field high intensity AV (E) [V/m] (RMS) |
| 1.1. | 1 ≤ f\* < 25 Hz | 2.0 × 104 | 2.0 × 104 |
| 1.2. | 25 ≤ f < 50 Hz | 5.0 × 105/f | 2.0 × 104 |
| 1.3. | 50 Hz ≤ f < 1.64 kHz | 5.0 × 105/f | 1.0 × 106/f |
| 1.4. | 1.64 ≤ f < 3 kHz | 5.0 × 105/f | 6.1 × 102 |
| 1.5. | 3 kHz ≤ f ≤ 10 MHz | 1.7 × 102 | 6.1 × 102 |
| **2.** | **AV for exposure to magnetic fields** |
| No. | Frequency range | Magnetic flux density (low AV) [μT] (EV) | Magnetic flux density (high AV) [μT] (EV) | Magnetic flux density AV for the effects of localised magnetic field on arms and legs [μT] (EV) |
| 2.1. | 1 ≤ f < 8 Hz | 2.0 × 105/f2 | 3.0 × 105/f | 9.0 × 105/f |
| 2.2. | 8 ≤ f < 25 Hz | 2.5 × 104/f | 3.0 × 105/f | 9.0 × 105/f |
| 2.3. | 25 ≤ f < 300 Hz | 1.0 × 103 | 3.0 × 105/f | 9.0 × 105/f |
| 2.4. | 300 Hz ≤ f < 3 kHz | 3.0 × 105/f | 3.0 × 105/f | 9.0 × 105/f |

Note. \* The letter f is the frequency expressed in hertz (Hz).

Table 4

**Action Values for Contact Current and Magnetic Flux Density**

|  |  |
| --- | --- |
| **1.** | **AV for contact current IC** |
| No. | Frequency | AV (Ic) for steady state contact current [mA] (ELV) |
| 1.1. | up to 2.5 kHz | 1.0 |
| 1.2. | 2.5 ≤ f\* < 100 kHz | 0.4 f |
| 1.3. | 100 kHz ≤ f ≤ 10 000 kHz | 40 |
| **2.** | **AV for magnetic flux density of static magnetic fields** |
| No. | Hazards | DV (B0) |
| 2.1. | Interference with active implanted devices, for example, cardiac pacemakers | 0.5 mT |
| 2.2. | Attraction and projectile risk in the fringe field of high field strength sources (> 100 mT) | 3 mT |

Note. \* The letter f is the frequency expressed in hertz (Hz).

Minister for Welfare Uldis Augulis

**Annex 2**

Cabinet Regulation No. 584

13 October 2015

**Action Limit Values and Action Values in the Frequency Range from 100 kHz to 300 GHz**

**(Thermal Effect)**

**I. Exposure Limit Values (ELVs)**

1. Exposure limit values for health effects (frequencies above 6 GHz (Table 1, Clause 1)) are limits to the power density of an electromagnetic wave reflecting on the body surface.

2. Exposure limit values for sensory effects (frequencies ranging from 0.3 GHz to 6 GHz (Table 1, Clause 2)) are limits for energy absorbed by low weight of tissues in the head as a result of exposure to electromagnetic fields.

3. Exposure limit values for health effects (frequencies ranging from 100 kHz to 6 GHz (Table 1, Clause 3)) are limits to the energy and power generated by exposure to electrical and magnetic fields absorbed by a single unit of body tissue mass.

Table 1

**Exposure Limit Values in Various Ranges of Electromagnetic Fields**

|  |  |
| --- | --- |
| **1.** | **Health effects ELVs where the range of exposure to electromagnetic fields is from 6 GHz to 300 GHz** |
| No. | Frequency range | ELVs related to power density |
| 1.1. | 6 GHz ≤ f\* ≤ 300 GHz | 50 W/m |
| **2.** | **Sensory effects ELVs where the range of exposure to electromagnetic fields is from 0.3 to 6 GHz** |
| No. | Frequency range | Localised specific energy absorption (SA)\*\* |
| 2.1. | 0.3 ≤ f ≤ 6 GHz | 10 mJ/kg |
| **3.** | **Health effects ELVs for exposure to electromagnetic fields from 100 kHz to 6 GHz** |
| No. | ELV | SAR values averaged\*\*\* over any six-minute period |
| 3.1. | ELVs related to whole body heat stress expressed as averaged SAR in the body | 0.4 W/kg |
| 3.2. | ELVs related to localised heat stress in head and trunk expressed as localised SAR in the body | 10 W/kg |
| 3.3. | ELVs related to localised heat stress in the arms and legs expressed as localised SAR in the arms and legs | 20 W/kg |

Notes.

1. \* The letter f is the frequency expressed in hertz (Hz).

2. \*\* The mass used for the calculation of the localised SAR indicator shall be 10 g of body tissues.

3. \*\*\* The mass used for the calculation of the localised SAR indicator shall be 10 g of contiguous body tissues.

**II. Exposure Action Values (AV)**

Table 2

**Action Values where the Electric and Magnetic Field Exposure Range is from 100 kHz to 300 GHz**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Frequency range | Electric field strength AV (E)\*\* [V/m] (AV) | Magnetic flux density AV (B)\*\*[μT] (AV) | Power density AV (S) (W/m2) |
| 1. | 100 kHz ≤ f\* < 1 MHz | 6.1 × 102 | 2.0 × 106/f | – |
| 2. | 1 ≤ f < 10 MHz | 6.1 × 108/f | 2.0 × 106/f | – |
| 3. | 10 ≤ f < 400 MHz | 61 | 0.2 | – |
| 4. | 400 MHz ≤ f < 2 GHz | 3 × 10–3f½ | 1.0 × 10–5f½ | – |
| 5. | 2 ≤ f < 6 GHz | 1.4 × 102 | 4.5 × 10-1 | – |
| 6. | 6 ≤ f ≤ 300 GHz | 1.4 × 102 | 4.5 × 10-1 | 50 |

Notes.

1. \* The letter f is the frequency expressed in hertz (Hz).

2. \*\* [AV (E)]2 and [AV (B)]2 are to be averaged over a six-minute period. For RF pulses the peak power density averaged over the pulse width shall not exceed 1 000 times the respective AV (S) value.

Table 3

**Action Values for Steady State Contact Current and Induced Arm and Leg Current**

|  |  |  |  |
| --- | --- | --- | --- |
| No. | Frequency range | Steady state contact current AV (IC) [mA] (AV) | Induced arm and leg current AV (IL)\*\* [mA] (AV) |
| 1. | 100 kHz ≤ f < 10 MHz | 40 | – |
| 2. | 10 MHz ≤ f ≤ 110 MHz | 40 | 100 |

Notes.

1. \* The letter f is the frequency expressed in hertz (Hz).

2. \*\* [AV (IL)]2 are to be averaged over a six-minute period.

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