

COMMISSION OF THE EUROPEAN COMMUNITIES

COM(94) 284 final-SYN 449
Brussels, 08.07.1994

Amended proposal for a

COUNCIL DIRECTIVE

**on the minimum Health and Safety requirements regarding the exposure
of workers to the risks arising from physical agents.**

**Individual Directive in relation to Article 16
of Directive 89/391/EEC**

(presented by the Commission pursuant to Article 189 A (2)
of the EC-Treaty)

EXPLANATORY MEMORANDUM

Following the opinion of the European Parliament on a first reading on 20 April 1994, the Commission submits to the Council, in accordance with Article 189C of the Treaty on European Union, an amended proposal for a directive. There are two main kinds of amendment:

- one group of amendments provides useful additional detail and clarification of the initial proposal;
- a second group of amendments strengthens the proposal by enhancing the protection offered to the health and safety of workers.

The Commission's amended proposal retains the general structure and objectives of the initial proposal but extends and expands on certain provisions.

Of the 41 amendments adopted by the plenary session of the European Parliament, 31 have been accepted, 4 of these in part.

Six amendments have been refused because they sought to exclude audible acoustic fields (Annex I) from the scope of the proposal. The Commission has not accepted these amendments because they are contrary to the Commission's obligations under Article 10 of Directive 86/188/EEC, and under the European Parliament Resolution of 13 September 1990, which requires the Commission to put forward a proposal for a directive on the basis of Article 118A of the Treaty with regard to the risks arising from noise and vibration and other physical agents.

The Commission has also refused an amendment which imposes on it an obligation already fulfilled by the Commission in producing its annual report on the implementation of Community legislation.

Three amendments could not be accepted because their extremely binding nature would impose additional costs on employers yet not contribute to enhancing the health and safety of workers.

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THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 118A thereof,

Having regard to the proposal from the Commission, drawn up after consultation with the Advisory Committee on Safety, Hygiene and Health Protection at Work,

In cooperation with the European Parliament,

Having regard to the opinion of the Economic and Social Committee,

Whereas Article 118A of the Treaty provides that the Council shall adopt, by means of directives, minimum requirements for encouraging improvements, especially in the working environment, to guarantee a better level of protection of the health and safety of workers;

Whereas, under the terms of that Article, such directives are to avoid imposing administrative, financial and legal constraints in a way which would hold back the creation and development of small and medium-sized undertakings;

Whereas the communication from the Commission on its programme concerning safety, hygiene and health at work (1) provides for the adoption of measures to promote safety at work, particularly with a view to extending the scope of Council Directive 86/188/EEC of 12 May 1986 on the protection of workers from the risks related to exposure to noise at work (2) and the re-evaluation of the threshold values; whereas

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THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 118A thereof,

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the Council, in its resolution of 21 December 1987 on safety, hygiene and health at work (3) , took note of this;

Whereas the communication from the Commission (4) concerning its action programme relating to the implementation of the Community Charter of the Fundamental Social Rights of Workers (5) provides for the introduction of minimum health and safety requirements regarding the exposure of workers to the risks caused by physical agents; whereas in September 1990 the European Parliament adopted a resolution concerning this action programme (6) , inviting the Commission in particular to draw up a specific directive on the dangers connected with noise and vibration and any other physical agent at the workplace;

Whereas compliance with the minimum requirements designed to guarantee a better standard of health and safety at work as regards the protection of workers from risks arising from exposure to physical agents is intended not only to ensure the health and safety of each worker on an individual basis, but also to create a minimum basis of protection for all Community workers in order to avoid possible distortions of competition;

Whereas a single system of protection against all physical agents must be established at Community level; whereas such a system must limit itself to a definition, free of excessive detail, of the objectives, the principles and the fundamental values to be used, in order to enable Member States to apply the minimum requirements in an equivalent manner;

Whereas Directive 86/188/EEC made provision for the Council to re-examine, on a proposal from the Commission and with a view to reducing the risks concerned, both its scope ratione personae and various

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provisions, taking into account in particular progress made in scientific knowledge and technology; whereas substantial amendments consequently need to be made to that Directive pursuant to Article 118A of the Treaty;

Whereas steps should also be taken to introduce, at Community level, minimum health and safety requirements concerning the exposure of workers to all physical agents, with the exception of those covered by the EAEC Treaty;

Whereas the minimum requirements in this field should establish the general principles of protection and the objectives to be achieved, whilst leaving open the detailed rules translating the safety levels in operational terms, to be adopted in order to comply with the provisions of this Directive;

Whereas the level of exposure to physical agents can be more effectively reduced by incorporating preventive measures into the design of workstations and places of work and by selecting work equipment, procedures and methods so as to give priority to reducing the risks at source; whereas provisions relating to work equipment and methods thus contribute to the protection of the workers involved;

Whereas the current situation in the Member States does not always make it possible to prescribe an exposure value for physical agents below which they no longer present a health risk;

Whereas current scientific knowledge of the effects which exposure to physical agents may have on health is not sufficient to enable precise exposure levels covering all risks to health, especially as regards the effects of noise other than those of an auditory nature, to be set;

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Whereas employers are obliged to make adjustments in the light of technical progress and scientific knowledge regarding risks related to exposure to physical agents, with a view to improving the health and safety protection of workers;

Whereas, having regard to the wide variety of technical data available internationally in this field, additional documents may be drawn up with a view to consolidating and updating the minimum requirements,

Whereas this Directive is an individual Directive within the meaning of Article 16 (1) of Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the health and safety of workers at work (1); whereas the provisions of that Directive are therefore fully applicable to the exposure of workers to physical agents, without prejudice to more stringent and/or specific provisions contained in this Directive;

Whereas this Directive constitutes a practical step towards creating the social dimension of the internal market;

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- (1) OJ No C28, 3.2.1988, p.3.
 - (2) OJNo L137, 24.5.1986, p.28.
 - (3) OJ No C28, 3.2.1988, p.1.
 - (4) Commission document COM(89)568 final.
 - (5) Council document FN441/2/89, item II.
 - (6) OJNoC260, 15.10.1990, p.167
 - (1) OJ No L183, 29.6.1989, p.1.

HAS ADOPTED THIS DIRECTIVE:

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<p style="text-align: center;">Section I General provisions Article 1 Aim</p> <p>1. This Directive, which is the nth individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC, has as its aim the protection of workers against the risks to their health and safety, including the prevention of such risks, arising or likely to arise from exposure to physical agents.</p> <p>It lays down particular minimum requirements in this area.</p> <p>2. This Directive shall not apply to the health protection of workers against dangers arising from radiation covered by the Treaty establishing the European Atomic Energy Community.</p> <p>3. Directive 89/391/EEC shall apply fully to the whole area referred to in paragraph 1, without prejudice to more stringent and/or specific provisions contained in this Directive.</p> <p style="text-align: center;">Article 2 Definitions</p> <p>For the purposes of this Directive, the following terms shall have the meaning hereby assigned to them:</p> <p>1. <u>Physical agents</u></p> <ul style="list-style-type: none"> - audible acoustic fields; - vibrations, - electric or magnetic fields or combinations thereof with a frequency equal to or less than $3,10 \exp (15)$ Hz (wavelength of 100 nanometres or more). <p>2. <u>Levels :</u></p>	<p style="text-align: center;">- Exposure limit value : <u>The exposure value above which an unprotected person is exposed to unacceptable</u></p>

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- Ceiling level : the exposure value giving rise to risks for an unprotected person; exceeding this level is prohibited and must be prevented through the implementation of the provisions of this Directive,

- Threshold level : the value towards which implementation of this Directive should be geared,

- Action level : the value, situated between the threshold and ceiling levels, above which one or more of the specified measures must be undertaken.

These levels shall not take into account the effect of using any item of personal protective equipment within the meaning of Council Directive 89/656/EEC (2) .

3. Assessment : a qualitative operation and/or a quantitative guidelines measurement, as distinct from measurement, which is quantitative and requires the use of an appropriate methodology;

4. reference to the Annexes : any reference made by this Directive to the Annexes shall be restricted to the part which is specific to the physical agent in question.

**Article 3 Scope -
determination and assessment
of risks**

1. This Directive shall apply to activities in which workers are or are likely to be exposed to physical agents as a result of their work.

2. In the case of any activity referred to in paragraph 1,

risks. Exceeding this value is prohibited and must be prevented through the implementation of the provisions of this Directive.

Delete

Threshold level : the exposure value below which continuous and/or repetitive exposure has no adverse effect on health and safety of workers.

Action level : the value above which one or more of the measures specified in the relevant Annexes must be undertaken.

3. Assessment of the exposure level : a qualitative operation and/or a quantitative guidelines measurement, as distinct from measurement, which is quantitative and requires the use of an appropriate methodology;

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the employer shall carry out an assessment, as set out in Article 6 (3) of Directive 89/391/EEC, of the risks resulting from exposure.

3. Pursuant to the provisions of Article 9 of Directive 89/391/EEC, the employer shall give particular attention, when carrying out the assessment referred to in paragraph 2, to any effects concerning the health and safety of workers belonging to groups at particular risks, in order to ensure effective protection.

4. Under the conditions laid down in the relevant Annexes, certain activities shall be considered as presenting an increased risk. They must be declared to the authority responsible. Member States shall ensure that appropriate measures are taken in order to control the risks associated with these activities.

(2) OJNoL393, 30.12.1989, p.18.

Section II Obligations of employers

Article 4 Assessment and measurement

1. Under the conditions laid down in the relevant Annexes, each physical agent present at work shall be assessed and, when necessary, measured in order to identify the workers and workplaces referred to in this Directive and to determine the conditions under which the specific provisions of this Directive apply.

2. The assessment and

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3. Pursuant to the provisions of Article 9 of Directive 89/391/EEC, the employer shall give particular attention, when carrying out the assessment referred to in paragraph 2, to any effects concerning the health and safety of workers belonging to particularly sensitive risk groups, in order to ensure effective protection.

Measures concerning particularly sensitive risk groups shall be aimed exclusively at preventing exposure to risks.

Article 4 Assessment and measurement of the exposure level

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measurement referred to in paragraph 1 shall be competently planned and carried out at suitable intervals, taking particular account of the provisions of Article 7 of Directive 89/391/EEC concerning the necessary competent services or persons; these intervals shall be revised where there is reason to believe that they are incorrect or that a material change has taken place in the work.

The methods used may include sampling, which must be representative of the personal exposure of a worker to the physical agent in question.

The methods and apparatus used must be adapted to the particular characteristics of the physical agent to be measured, the length of exposure, ambient factors and the characteristics of the measuring apparatus.

They shall make it possible to determine the physical parameters used as hazard predictors (defined in the relevant Annexes) and to decide whether, in a given case, the values laid down in this Directive have been exceeded. The methods and apparatus may make use of parameters derived from those set out in the relevant Annexes, provided that the derived parameters guarantee fulfilment of the obligations set out in this subparagraph. For the purposes of applying this paragraph, the value measured shall be increased to account for inaccuracies in measurement as determined in accordance with metrological practice.

3. The data obtained pursuant to this Article shall be preserved in a suitable form so as to permit consultation at a later date.

Article 5 - Provisions aimed at avoiding or reducing exposure

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1. Taking account of technical progress and of the availability of measures to control the physical agent at source, the risks arising from exposure to the physical agent must be reduced to the lowest achievable level, with the aim of reducing exposure to below the threshold level referred to in the relevant Annex.

Reduction of these risks shall be on the basis of the general principles set out in Article 6 (2) of Directive 89/391/EEC.

2. Under the conditions laid down in the Annexes, the employer shall establish and implement a programme to reduce the risk referred to in paragraph 1 by means of technical and/or organizational measures.

3. Where measures implemented pursuant to this Directive do not permit exposure levels to be kept below the ceiling level:

(a) the employer shall immediately implement measures to reduce unavoidable risks to levels not exceeding those resulting from exposure of an unprotected person to this ceiling level including, in the last resort, prescribing the use of personal protective equipment; if the required reduction cannot be achieved, the provisions of Article 8 (3), (4) and (5) of Directive 89/391/EEC shall apply;

(b) the employer shall identify the reasons why the ceiling level has been exceeded and shall amend the programme of measures set out in paragraph 2 in order to avoid a repeat occurrence.

4. Pursuant to the provisions of Article 15 of Directive 89/391/EEC, the employer shall adapt the measures referred to in this Article to the requirements of particularly

3. Where measures implemented pursuant to this Directive do not permit exposure levels to be kept below the exposure limit value:

(a) the employer shall immediately take all collective measures to reduce risks not avoidable by technological or organizational means to levels not exceeding those resulting from exposure of an unprotected person to this exposure limit value. Where this is not possible the employer shall prescribe the use of personal protective equipment. If the required reduction cannot be achieved, the provisions of Article 8(3) (4) and (5) of Directive 89/391/EEC shall apply;

(b) the employer shall identify the reasons why the exposure limit value has been exceeded and shall amend the programme of measures set out in paragraph 2 in order to avoid a repeat occurrence.

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<p>sensitive risk groups.</p> <p>Article 6 - Personal protection</p> <p>1. Pursuant to the provisions of Directive 89/656/EEC and under the conditions laid down in the relevant Annexes, personal protective equipment must be made available to workers and used by them in accordance with the provisions of point (a) of Article 5 (3) of this Directive and Article 13 (2) of Directive 89/391/EEC.</p> <p>2. For the purposes of this Directive, personal protective equipment shall be considered adequate if, when worn correctly, the resulting foreseeable risk is maintained at a level lower than that resulting from the exposure referred to in the relevant Annexes.</p> <p>3. The employer shall be responsible for checking the effectiveness of the measures taken in compliance with this Article.</p> <p>Article 7 - Worker information</p> <p>1. Without prejudice to Article 10 of Directive 89/391/EEC, workers must receive information concerning health and safety relating to exposure to physical agents at work; in particular, once exposure exceeds the threshold level they must be informed of the resulting potential risks.</p> <p>2. In accordance with the procedures laid down in the relevant Annexes, workers shall in addition be informed about:</p> <ul style="list-style-type: none"> - measures taken pursuant to this Directive, including where and when they apply; - the obligation to comply with protective and preventive measures, in accordance with national legislation; 	<p style="text-align: center;"><u>Delete</u></p> <p><u>2.</u> The employer shall be responsible for checking the effectiveness of the measures taken in compliance with this Article.</p>

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- the wearing of personal protective equipment and the role of health surveillance in accordance with Article 11.

3. The workers' representatives referred to in Article 3(c) of Directive 89/391/EEC, and the workers concerned, shall receive the results of assessments and measurements of the physical agent made pursuant to Article 4 of this Directive, together with explanations of the significance of those results. They shall also receive the programme of measures referred to in Article 5 (2) of this Directive and shall be informed without delay of the application of the provisions of Article 5 (3) thereof.

Article 8 - Access to risk areas

Under the conditions laid down in the relevant Annexes, workplaces where specific protective provisions apply shall be marked with appropriate signs. The areas in question must also be delimited and access to them must be restricted where the risk of exposure so justifies.

Article 9 Training of workers

Pursuant the provisions of Article 12 of Directive 89/391/EEC, and under the conditions laid down in the Annexes to this Directive, workers must receive training covering in particular the matters referred to in Article 7 (2) of this Directive.

Article 10 - Consultation and participation of workers

Consultation and participation of workers and/or of their representatives shall take place in accordance with Article 11 of Directive 89/391/EEC on the matters

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covered by this Directive,
including the Annexes
thereto.

SECTION III Miscellaneous
provisions

Article 11 Health
surveillance

1. The health surveillance referred to in Article 14 of Directive 89/391/EEC shall be carried out in accordance with the provisions of Article 6 (5) of the said Directive and under the conditions laid down in the Annexes to this Directive by or under the responsibility of a doctor, or by a specialist if the doctor considers this necessary.

2. This surveillance shall take account of the significance of the risk and shall have as its objective the prevention and early diagnosis of any ailment due to exposure to a physical agent. It must allow an assessment of the worker's suitability to occupy a position involving such exposure.

3. Workers whose activity involves the wearing of personal protective equipment or is referred to in Article 3 (4) shall receive systematic health surveillance. Where over-exposure is suspected, a medical examination must be offered to the worker(s) concerned within an appropriate period of time.

4. The results of health surveillance shall be preserved in an appropriate form enabling them to be consulted at a later date.

5. Member States shall take

3. Workers whose activity involves the wearing of personal protective equipment or is referred to in Article 3 (4) shall receive systematic health surveillance. Where exposure above the exposure limit value is suspected, a medical examination must be offered to the worker(s) concerned within an appropriate period of time.

4. The results of health surveillance shall be preserved in an appropriate form enabling them to be consulted at a later date. The worker concerned shall be given a copy on request of the results of their health surveillance.

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<p>the necessary measures with a view to the doctor and/or the medical authority responsible having, as part of health surveillance, access to the data referred to in Article 4 (3) and giving appropriate indications on any protective or preventive measures to be taken.</p> <p>Article 12 - Provisions relating to equipment and working methods</p> <p>1. The design of workplaces and work stations, the choice of work equipment and the choice of working and production methods referred to in Article 6 (2) (d) of Directive 89/391/EEC shall take into account any emission of physical agents which may result therefrom. Pursuant to the provisions of Article 3 of Directive 89/655/EEC (1), work equipment shall be chosen by taking into account its emissions, which must be compared with those from similar equipment.</p> <p>2. Member States shall take appropriate measures to ensure the health and safety of workers in order that:</p> <p>(a) for the purposes of conforming with the provisions of Article 6 (1) of Directive 89/655/EEC, and if the equipment used may cause exposure exceeding the action level referred to in the relevant Annex to this Directive for a worker using it, the employer:</p> <ul style="list-style-type: none"> - carries out or causes to be carried out, for each physical agent, the assessment described in Article 4 (1), if he has appropriate information provided by the manufacturer of the work equipment on the basis of Community Directives having as their objective the freedom of movement for work equipment; - carries out or causes to be carried out the necessary 	

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measurement(s) for each
physical agent;

(b) where work equipment is
subject to Community
provisions with the aim or
effect of limiting exposure
to a physical agent, that
item of work equipment be
made available to workers
whenever the type of activity
permits.

Article 13 - Extension of
exposure, interference,
indirect effects

1. Under the conditions laid
down in the relevant Annexes,
Member States shall take
appropriate measures to:

(a) control the harmful
effects resulting from the
exposure of workers to the
physical agent in question
when such exposure extends
beyond working hours for
reasons related to the work;

(b) restrict, pursuant to
the provisions of Article 6
(3) of Directive 89/391/EEC,
the physical agent in
question to values below
those laid down by this
Directive whenever this is
necessary for the protection
of health and safety.

2. When a physical agent
present during work involves
a risk for workers not
arising from exposure to that
agent, this risk must be
controlled without prejudice
to the provisions of this
Directive pursuant to the
provisions of Article 5 (1)
of Directive 89/391/EEC.

Article 14 - Derogations

1. Member States may grant
exemptions, but only under
the conditions laid down in
the relevant Annexes, from
certain provisions of this
Directive where, under
particular circumstances,
their application may
increase the overall risk to

2. When a physical agent
involves an indirect risk for
workers due to its
interference with equipment
or substances present at the
work place, this risk must be
controlled without prejudice
to the provisions of this
Directive pursuant to the
provisions of Article 6(3) of
Directive 89/391/EEC.

1. Member States may grant
derogations, but only under
the conditions laid down in
the relevant Annexes.

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the health and safety of workers and where this risk cannot be reduced by other means.

2. The exemptions referred to in paragraph 1 shall be granted following consultation with the two sides of industry and in accordance with Article 10. They must be subject to conditions guaranteeing, with due account taken for particular circumstances, the minimization of risks arising therefrom. They shall be subject to periodic review and shall be revoked as soon as possible.

Article 15 - Additional documents

With a view to the practical application of this Directive, and in so far as appropriate standards for the health and safety of workers do not exist, additional documents shall be drawn up in accordance with the procedure set out in Article 17 of Directive 89/391/EEC, with particular reference to the harmonisation of basic technical concepts.

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2. The derogations referred to in paragraph 1 shall be granted following consultation with the two sides of industry and in accordance with Article 10. They must be subject to conditions guaranteeing, with due account taken for particular circumstances, the minimization of risks arising therefrom. They shall be subject to periodic review and shall be revoked as soon as possible.

3. Member States shall forward to the Commission every two years a survey of the derogations referred to in paragraph 1 with the precise circumstances and reasons which have led to their being granted.

With a view to the practical application of this Directive, and in so far as appropriate technical standards for the health and safety of workers do not exist, technical committees shall be established in accordance with the procedure set out in Article 17 of Directive 89/391/EEC, and charged with drawing up additional documents to define the procedures for applying this Directive including the harmonisation of basic technical concepts.

1. Where the state of knowledge permits, the Council shall, acting on a proposal from the Commission, extend the scope of this Directive by means of supplementary annexes to include physical agents other than those referred to in article 2

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Amendments to the provisions and technical data in the Annexes shall be laid down in accordance with the procedure set out in Article 17 of Directive 89/391/EEC with regard to:

- the adoption of directives in the field of technical harmonization and standardization with regard to the design, building, manufacture or construction of work equipment and/or workplaces;
- technical progress, changes in international rules or specifications and new findings relating to the effects of physical agents on health.

Article 17 - Repeal

Directive 86/188/EEC is repealed with effect from the date set out in the first subparagraph of Article 18 (1).

References to the repealed Directive shall be understood as referring to this Directive and shall be read according to the table of equivalence set out in Annex V.

Article 18 - Final provisions

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 31 December 1995. They shall immediately inform the Commission thereof.

When Member States adopt these provisions, these shall contain a reference to this Directive or shall be accompanied by such reference at the time of their official publication. The procedure for such reference shall be adopted by Member States.

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2. Amendments to the provisions and technical data in the Annexes shall be laid down in accordance with the procedure set out in Article 17 of Directive 89/391/EEC with regard to:

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2. Member States shall communicate to the Commission the texts of the provisions of national law which they adopt or have already adopted in the field covered by this Directive.

3. Member States shall report to the Commission every five years on the practical implementation of the provisions of this Directive, indicating the points of view of both sides of industry.

On the basis of these reports, the Commission shall inform the European Parliament, the Council, the Economic and Social Committee and the Advisory Committee on Safety, Hygiene and Health Protection at Work.

Article 19

This Directive is addressed to the Member States.

(1) OJ No L393, 30.12.1989,
p.13.

ANNEX 1 : noise

1. Risk

This Annex refers to the risk to health and safety resulting from exposure to noise, and in particular the risk to hearing and the risk of accidents. The physical parameters used to predict danger are the risk of accidents. The physical parameters used to predict danger are as follows:

- peak acoustic pressure P_{max}
: maximum value, in pascals,
of the "C"-weighted
instantaneous sound pressure;

- daily sound exposure $L_{EX,8h}$
: standardized sound exposure
level for a reference
duration equal to a nominal

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eight-hour day as defined by international standard ISO 1999 : 1990; all noises present at work, whatever their time characteristics, are to be included when determining exposure.

2. Levels

The threshold level is established at LEX,8h = 75 dB(A); ceiling levels are established at LEX,8h = 90 dB(A) and at Pmax = 200 Pa (1) .

Intermediate action levels are established at :

- LEX,8h = 80 dB(A) and/or Pmax = 112 Pa for:

- informing workers likely to be exposed to these levels (Article 7 (2));

- supplying personal protective equipment to workers who request it (Article 6 (1));

- LEX,8h = 85 dB(A) and/or Pmax = 112 Pa for:

- training in the implementation of measures taken pursuant to this Directive (Article 9), for the benefit of workers likely to be exposed to these levels;

- providing information on the noise produced by work equipment likely to give rise to such exposure where it relates to a reference duration of eight hours (Article 12 (2) (a));

- the programme of technical and/or work organization measures aimed at reducing exposure (Article 5 (2));

- LEX,8h = 90 dB(A) and/or Pmax = 200 Pa for the delimiting of areas where workers are likely to be exposed to these levels and for the restriction of access (Article 8);

The threshold level is established at LEX,8h = 75 dB(A); exposure limit values are established at LEX,8h = 90 dB(A) and at Pmax = 200 Pa (1)

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Pursuant to the provisions of this Section, it shall be considered that the daily sound exposure of a worker is likely to reach a given value ($LEX,8h = X \text{ dB(A)}$) when the ambient noise at his workplace represented by the continuous equivalent acoustic pressure level over a period of some minutes reaches this numerical value ($LA_{eq,T} = X \text{ dB(A)}$).

3. Activities with increased risk

The provisions of Article 3 (4) shall apply to activities in which workers are subjected to a personal daily exposure greater than $LEX,8h = 105 \text{ dB(A)}$ and/or to a peak acoustic pressure greater than $P_{max} = 600 \text{ Pa}$.

4. Individual protectors
(Article 6)

Where daily sound exposure exceeds $LEX,8h = 90 \text{ dB(A)}$ and/or where peak acoustic pressure exceeds $P_{max} = 200 \text{ Pa}$, individual protectors must be used.

The protectors must maintain the foreseeable residual risk to hearing at a level lower than that resulting from exposure where $LEX,8h = 85 \text{ dB(A)}$ or $P_{max} = 200 \text{ Pa}$.

5. Health surveillance
(Article 11)

The worker whose daily sound exposure exceeds $LEX,8h = 80 \text{ dB(A)}$ shall have the right to a surveillance of hearing function, with the objectives of providing early diagnosis of any loss of hearing due to noise and of preserving hearing function.

6. Extension of exposure

The provisions of Article 13 (1) (a) shall apply in

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particular where, owing to the nature of the activity, a worker benefits from the use of rest facilities supervised by the employer; noise in these facilities must be reduced to a level compatible with their purpose and conditions of use (capability of reduction to 60 dB (A) during sleep).

7. Interference

The provisions of Article 13 (1) (b) shall apply in particular where the type of activity requires particular vigilance.

8. Derogations

1. In the case of workplaces where daily noise exposure varies markedly from one working day to the next, Member States may, in applying the provisions of the Directive, use a weekly average of daily sound exposures in place of daily sound exposure (reference duration equal to a nominal week of five eight-hour days) but only on condition that adequate monitoring shows that this weekly average complies with the numerical value laid down in these provisions.

2. For workers performing special operations, Member States may grant derogations from the obligation to use personal protective equipment (Article 5 (3) (a)) where such use would increase the overall risk referred to in Article 14 (1).

(1) 140 dB in relation to
20 μ Pa.

**ANNEX 2 Mechanical
Vibration**

**A. Hand - Transmitted
Vibration**

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1. Risk

This Annex refers to the risk to health and safety resulting from exposure to vibration transmitted to hand-arm : vascular, bone and joint, neurological or muscle disorders.

The quantity used as a predictor of the hazard is the daily hand-transmitted vibration exposure $A(8)$ as defined by BS 6842 : 1987 using for $a_{h,w}(t)$ (in its Section 4.1) the vector sum (root sum square) of the weighted root mean square accelerations determined in orthogonal coordinates with the frequency weighting defined by that standard. However, if an axis produces a weighted value which is less than 50% of the maximum value determined at the same point but in another axis, it can be neglected.

2. Values

The threshold level is established at $A(8) = 1 \text{ m.s}^{-2}$.

Subject to the provisions of article 13, the ceiling level is established at $A(8) = 5 \text{ m.s}^{-2}$.

The action level is established at

$A(8) = 2,5 \text{ m.s}^{-2}$ for :

- providing the information mentioned in Article 7 (2), to the workers likely to be exposed to this level,

- training in the implementation of measures taken pursuant to this Directive (Article 9), for the benefit of workers likely to be exposed to this level ;

- providing information on the vibration produced by work equipment likely to give rise to such exposure during a reference duration of eight

The exposure limit value is
established at $A(8) = 5 \text{ m.s}^{-2}$

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<p>hours (Article 12 (2) (a)) ;</p> <p>- the programme of technical and/or work organization measures aimed at reducing exposure (Article 5 (2))</p> <p>For applying the provisions of this Section, it is considered that A(8) is likely to reach $2,5 \text{ m.s}^{-2}$ when the work equipment used transmits to the hand-arm system a short term (a few minutes) equivalent acceleration equal to that numerical value.</p> <p>3. Hazardous activities (Article 3)</p> <p>The provisions of Article 3 (4) apply to activities requiring the use of work equipment which transmits to the hand-arm system a short-term (a few minutes) equivalent acceleration equal to or greater than 20 m.s^{-2}</p> <p>4. Measurement and evaluation (Article 4)</p> <p>In the case of devices which need to be held by both hands, measurement shall be made on each hand. The hazard is expressed by the highest energy equivalent acceleration, and information for the other hand will be given.</p> <p>Where the level of vibration cannot be reliably quantified, the likelihood of exposure above the action level must be evaluated (observation of working practices and information on the equipment used) in order to judge the risks involved. If an exposure above the action level cannot be ruled out, the corresponding preventive measures must be implemented.</p> <p>5. Reduction of the risk (Article 5)</p> <p>(a) As long as adequate and</p>	<p>3. <u>Activities with increased risk</u> (Article 3).</p>

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<p>practical personal protective equipment is not available, the provisions aimed at reducing the exposure shall be complemented by measures reducing the hazard arising from such exposure.</p> <p>(b) Where the activity involves the use of work equipment which transmits to the hand-arm system a short-term (a few minutes) equivalent acceleration exceeding 10 m.s^{-2}, increased efforts shall be made to reduce the hazard, with priority to the use of low-vibration equipment and processes, including the revision of product design and work practice.</p> <p>Pending their effective implementation the duration of continuous exposure shall be reduced.</p> <p>(c) The Commission and the Member States will ensure a dynamic and coordinated application of the provisions of this Section.</p> <p>6. Individual protectors</p> <p>No adequate personal protective equipment against vibration is presently available ; when it becomes available, it shall be used.</p> <p>7. Information and training (Articles 7 and 9)</p> <p>Information and training of workers shall include at least :</p> <ul style="list-style-type: none"> - why and how to detect and report signs of injury, - safe working practices to minimise exposure to vibration, - measures reducing the resulting risk. <p>8. Health surveillance</p>	

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<p>(Article 11)</p> <p>Workers exposed to hand-arm vibration exceeding $A(8) = 2,5 \text{ m.s}^{-2}$ are entitled to a health surveillance which aims at early detection of a vibration syndrome, and requires routine examinations.</p> <p>Workers using work equipment referred to in Section 6b must be offered such a health surveillance.</p> <p>9. Work equipment (Article 12)</p> <p>The information referred to in Article 12 (2) (a) must include marking of the equipment which transmits to the hand-arm system a short-term (a few minutes) equivalent acceleration equal to or greater than 20 m.s^{-2}.</p> <p>10. Interference (Article 13)</p> <p>The provisions of Article 13 (1) (b) shall apply in particular where the vibration interferes with the proper handling of controls or reading of indicators.</p> <p>11. Indirect risks (Article 13)</p> <p>The provisions of Article 13 (2) shall apply in particular when the vibration interferes with the stability of structures or the good holding of joints.</p> <p>12. Derogations (Article 14)</p> <p>(a) During a period of five years with effect from the date set out in Article 18, Member States may grant derogations from Article 5 (3) (workers leaving workplaces where exposure remains excessive) where the state of the art does not allow the respect of the</p>	<p>Workers exposed to hand-arm vibration exceeding $A(8) = 2,5 \text{ m.s}^{-2}$ <u>shall have the right to regular health surveillance aimed</u> at early detection of a vibration syndrome, and requires routine examinations.</p> <p>The provisions of Article 13 <u>paragraph 2</u> shall apply in particular where the vibration interferes with the proper handling of controls or reading of indicators.</p> <p>(a) During a period of five years with effect from the date set out in Article 18, Member States may grant derogations from Article 5 (3) (workers leaving workplaces where exposure remains excessive) where the state of the art does not allow the respect of</p>

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ceiling level.

(b) The Commission and the Member States will ensure a dynamic and coordinated application of the provisions of this Section.

B. Whole - Body Vibration

1. Risk

This part of Annex II refers to the risk to health and safety resulting from exposure to vibration transmitted to the whole body: low-back morbidity and trauma of the spine, as well as severe discomfort.

The quantity used as a predictor of the hazard is the daily whole-body vibration exposure $A(8)$ determined as in part A, using for $a_{h,w}(t)$ the vector sum (root sum square) of the values of $1,4 a_{wx}$, $1,4 a_{wy}$, a_{wz} where a_{wx} , a_{wy} , a_{wz} are the weighted root-mean square accelerations in the orthogonal axes X, Y, Z respectively as defined in ISO 2631. However, any term of the vector sum which is less than 66% of the highest one can be neglected.

2. Values

The threshold level is established at $A(8) = 0,25$ $m.s^{-4}$.

Subject to the provisions of article 13, the ceiling level is established at $A(8) = 0,7$ $m.s^{-2}$.

The action level is established at $A(8) = 0,5$ $m.s^{-2}$ for :

- providing the information mentioned in Article 7(2) to the workers likely to be exposed to this level ;

- training in the implementation of measures

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the exposure limit value .

The exposure limit value is established at $A(8) = 0,7$ $m.s^{-2}$.

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taken pursuant to this Directive (Article 9), for the benefit of workers likely to be exposed to this level;

- providing information on the vibration produced by work equipment likely to give rise to such exposure during a reference duration of eight hours (Article 12 (2) (a)) ;

- the programme of technical and/or work organization measures aimed at reducing exposure (Article 5 (2)).

Where whole-body exposure involves shocks or other vibration at high magnitudes during low durations, the corresponding action level is established as the hazard due to exposure during a period of one hour to a constant amplitude of $1,25 \text{ m.s}^{-2}$.

For applying the provisions of this section, it is considered that A(8) is likely to reach $0,5 \text{ m.s}^{-2}$ when the work equipment used transmits to the whole body a short term (a few minutes) equivalent acceleration equal to that numerical value.

3. Hazardous activities
(Article 3)

The provisions of Article 3 (4) apply to activities which result in a whole-body exposure equal to or greater than $A(8) = 1,25 \text{ m.s}^{-2}$.

4. Measurement and evaluation
(Article 4)

Where the level of vibration cannot be reliably quantified, the likelihood of exposure above the action levels must be evaluated (observation of working practices and information on the equipment used) in order to judge the risks involved. If an exposure above the action levels cannot be ruled out, the corresponding preventive measures must be implemented.

3. Activities with increased risk (Article 3)

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<p>5. Reduction of the risk (Article 5)</p> <p>(a) As long as adequate and practical personal protective equipment is not available, the provisions aimed at reducing the exposure shall be complemented by measures reducing the hazard arising from such exposure.</p> <p>(b) The Commission and the Member States will ensure a dynamic and coordinated application of the provisions of this Section.</p> <p>6. Individual protectors</p> <p>No adequate personal protective equipment against vibration is presently available.</p> <p>7. Information and training (Articles 7 and 9)</p> <p>Information and training of workers shall include at least :</p> <ul style="list-style-type: none"> - why and how to detect and report signs of injury, - safe working practices to minimise exposure to vibration, - measures reducing the resulting risk. <p>8. Health surveillance (Article 11)</p> <p>Workers exposed to whole-body vibration exceeding $A(8) = 0,5 \text{ m.s}^{-2}$ are entitled to a health surveillance which aims at early detection of health impairment due to whole body vibration and requires routine examinations.</p> <p>9. Extension of exposure (Article 13)</p> <p>The provisions of Article 13 (1) (a) shall apply in particular where, owing to the nature of the activity, a</p>	<p>Workers exposed to whole-body vibration exceeding $A(8) = 0,5 \text{ m.s}^{-2}$ <u>shall have the right to regular health surveillance aimed</u> at early detection of health impairment due to whole body vibration and requires routine examinations.</p>

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<p>worker benefits from the use of rest facilities supervised by the employer ; whole-body vibration in these facilities must be reduced to a level compatible with their purpose and conditions of use, except in cases of "force majeure".</p> <p>10. Interference (Article 13)</p> <p>The provisions of Article 13 (1) (b) shall apply in particular where the vibration interferes with the proper handling of controls or reading of indicators.</p> <p>11. Indirect risks (Article 13)</p> <p>The provisions of Article 13 (2) shall apply in particular when the vibration interferes with the stability of structures or the good holding of joints.</p> <p>12. Derogations (Article 14)</p> <p>(a) During a period of five years with effect from the date set out in Article 18, Member States may grant derogations from Article 5 (3) (workers leaving workplaces where exposure remain excessive) where the state of the art does not allow the respect of the ceiling levels.</p> <p>(b) The Commission and the Member States will ensure a dynamic and coordinated application of the provisions of this Section.</p> <p>ANNEX 3 : Optical radiation</p> <p>1. Risk</p> <p>This Annex refers to the risk to the eye and to the skin, resulting from exposure to optical radiation (wavelength from 100 nm to 1 mm).</p>	<p>The provisions of Article 13 <u>paragraph 2</u> shall apply in particular where the vibration interferes with the proper handling of controls or reading of indicators.</p> <p>(a) During a period of five years with effect from the date set out in Article 18, Member States may grant derogations from Article 5 (3) (workers leaving workplaces where exposure remain excessive) where the state of the art does not allow the respect of the <u>exposure limit values</u> .</p>

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<p>The exposure of the target (eye or skin) to such radiation during a working day is used as a predictor of the hazard ; it is expressed, according to the case, in one of the following units :</p> <ul style="list-style-type: none"> - watt per square meter, - joule per square meter, - watt per square meter and per steradian, - joule per square meter and per steradian. <p>2. Values (1)</p> <p>The ceiling levels are established at the threshold Level Values mentioned in A.C.G.I.H. 1992 - 1993, pp 100 to 112 and 124 to 127.</p> <p>The threshold levels are established for man-made sources at half the ceiling levels.</p> <p>Action levels are established at :</p> <ul style="list-style-type: none"> - half the ceiling levels for : - providing the information mentioned in Article 7 (2) to the workers likely to be exposed to these levels, - training in the implementation of measures taken pursuant to this Directive (Article 9), - making personal protective equipment available (Article 6 (1)); - providing information on the optical radiation produced by work equipment likely to give rise to such exposure during a reference duration of eight hours (Article 12 (2) (a)) ; - the ceiling levels for : - the delimiting of areas 	<p>The <u>exposure limit values</u> are established at the threshold Level Values mentioned in A.C.G.I.H. 1992 - 1993, pp 100 to 112 and 124 to 127.</p> <p>The threshold levels are established for man-made sources at half the <u>exposure limit values</u> .</p> <ul style="list-style-type: none"> - half the <u>exposure limit values</u> for : - the <u>exposure limit values</u> for :

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and the restriction of access (Article 8) in the case of man-made sources,

- the programme of technical and/or work organization measures aimed at reducing exposure (Article 5 (2)).

3. Hazardous activities

The provisions of Article 3 (4) apply to activities in which the exposure leads to a hazard equivalent to that due to a laser of class 3 B (according to IEC Publication 825, 1990).

The operators of such sources must be trained (Article 9) and their competence must be checked.

4. Personal protection (Article 6)

Personal protective equipment must be used by workers who are likely to be exposed to optical radiation exceeding the ceiling levels.

As far as exposure of the skin is concerned clothing may be considered as personal protective equipment in so far as it meets the protection objectives.

5. Health Surveillance (Article 11)

Workers exposed to optical radiation exceeding $\frac{1}{4}$ the ceiling levels are entitled to a health surveillance which includes an eye check and aims at diagnosing any impairment by optical radiation and at preserving the vision.

6. Equipment (Article 12)

3. Activities with increased risk

Personal protective equipment must be used by workers who are likely to be exposed to optical radiation exceeding the exposure limit values.

Workers exposed to optical radiation exceeding $\frac{1}{4}$ the exposure limit values shall have the right to regular health surveillance which includes an eye check and aims at diagnosing any impairment by optical radiation and at preserving the vision.

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Any laser used at work must be labelled with its classification according to IEC Publication 825, 1990.

Any man-made source likely to cause damage similar to that of a laser of class 3 B or 4 must also be labelled accordingly.

7. Interference
(Article 13)

The provisions of Article 13 (1) (b) shall apply where dazzling by light sources may interfere with complete safety of the activity.

8. Indirect effects
(Article 13)

The provisions of Article 13 (2) shall apply where the optical radiation is likely to cause fire or to produce hazardous substances by decomposing or interfering with materials present.

9. Derogations
(Article 14)

Member States may grant derogations from Article 5 (3) for workers performing outdoors operations in the absence of man-made sources of optical radiations ; they will therefore consider the local climatic conditions as well as the sensitivity of the interested population to such exposure (e.g. solar).

(1) The wording of the 'values' Section will be amended as soon as sufficient progress has been made with technical standardization.

ANNEX 4 : Fields and waves

1. Risk

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The provision of Article 13 paragraph 2 shall apply where dazzling by light sources may interfere with complete safety of the activity.

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This Annex refers to the risk to the health and safety due to the effects of electric fields and currents in the human body, as well as of absorption of energy, resulting from exposure to static and time-varying electric and magnetic fields with frequencies up to 300 GHz (1) .

The quantities used as predictors of the hazard are :

- the current density, expressed in the unit ampere per square metre,
- the current passing through any one foot or hand in contact with a conducting object, expressed in the unit ampere,
- the specific absorption rate (SAR) of electromagnetic energy, expressed in the unit watt per kilogram,
- the specific absorption (SA) of electromagnetic energy, expressed in the unit joule per kilogram.

Quantities which can be obtained directly by means of a measuring instrument are used to specify action levels :

- the magnetic field strength H, expressed in the unit ampere per metre,
- the magnetic flux density B, expressed in the unit tesla,
- the electric field strength E, expressed in the unit volt per metre,
- the power (surface)

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This Annex refers to the risk to the health and safety due to the effects of electric fields and currents in the human body, as well as of absorption of energy, resulting from exposure to static and time-varying electric and magnetic fields with frequencies up to 300 GHz (1) .

This Annex does not cover the potential carcinogenic effects due to exposure to time varying electric and magnetic fields for which there is no scientific evidence establishing a causal relationship or providing a basis for risk assessment.

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density P in free-space and far-field conditions, expressed in the unit watt per square metre.

2. Values

The ceiling levels are established as follows (all conditions to be satisfied) :

- the values of Table 1 for:
- the induced current density in head and trunk,
- the contact current averaged over a period of one second ; the peak value may not exceed 10 times the average value,
- the average over the whole body, as well as the local peaks in the limbs and in the head and trunk, of the SAR averaged over any six minute period,
- a SA of 10 m J.kg-1 due to a pulse of less than 30- ms duration of microwaves at frequencies above 300 MHz.

As regards mobile radio equipment, the particularities of conditions of use and the rapidity of technological changes require that the ceiling levels be determined following further consideration.

The threshold levels are established at 1/5 the ceiling levels.

Action levels are established at :

- the values of table 2 for :
- providing the information mentioned in Article 7 (2) to workers likely to be exposed to these levels,
- training in the implementation of measures

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The exposure limit values are established as follows (all conditions to be satisfied) :

Delete

The threshold levels are established at 1/5 the exposure limit values .

- 1/2 the values of table 2 for :

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<p>taken pursuant to this Directive (Article 9),</p> <ul style="list-style-type: none"> - providing personal protective equipment (Article 6 (1)), - providing information on the fields and waves produced by work equipment likely to result in such values (Article 12 (2)(a)), - 1,6 times the values of H, B or E in table 2 for : - the programme of technical and/or work organization measures aimed at reducing exposure (Article 5 (2)), - the delimiting of areas and the restriction of access (Article 8), - training of the operators (Article 9) and checking of their competence. <p>3. Hazardous activities</p> <p>The provisions of Article 3 (4) apply to activities requiring the use of work equipment which exposes workers to fields exceeding three times the values of H, B or E in table 2.</p> <p>4. Measurement (Article 4)</p> <p>Body current densities, SAR and SA are, for practical purposes, estimated from measured derived quantities (e.g: electric and magnetic field strengths) which must reflect realistic exposure situations.</p> <p>The Commission and the Member States will ensure the coordinated definition of a suitable metrology.</p> <p>5. Reduction of exposure; personal protection</p>	<ul style="list-style-type: none"> - <u>the values of H, B or E in table 2 for :</u> <p>3. <u>Activities with increased risk</u></p> <p>The provisions of Article 3 (4) apply to activities requiring the use of work equipment which exposes workers to fields exceeding <u>1,6</u> times the values of H, B or E in table 2.</p>

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<p>(Articles 5 and 6)</p> <p>Personal protective equipment must be used by workers who are likely to be exposed to electric fields in which the ceiling levels would be exceeded.</p> <p>There is no adequate and practical way to shield against magnetic field exposure.</p> <p>6. Information of workers (Article 7 (2))</p> <p>Workers exposed to an electric field above 5 kVm-1 must be informed that apparently harmless perception effects on the surface of the body may occur.</p> <p>7. Work Equipment (Article 12)</p> <p>The information referred to in Article 12 (2) (a) must include marking of the equipment likely to produce fields exceeding three times the values of H, B or E in table 2.</p> <p>8. Indirect risks (Article 13)</p> <p>The provisions of Article 13 (2) shall apply in particular where electromagnetic fields are likely to result in fire or explosion due to induced currents or voltages, e.g. when structures are electrically charged, or when using electroexplosive devices.</p> <p>-----</p> <p>(1) Hazards resulting from contact with live conductors are not covered by this Annex.</p>	<p>Personal protective equipment must be used by workers who are likely to be exposed to electric fields in which the <u>exposure limit values</u> would be exceeded.</p> <p>The information referred to in Article 12 (2) (a) must include marking of the equipment likely to produce fields exceeding <u>1,6</u> times the values of H, B or E in table 2.</p>

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Table 1 - Ceiling Levels

Frequency	Induced current density in head and trunk [Am ⁻² (1)]	Contact current [mA] (1)	Whole body average [W/kg] (1)	SAR	
				Local peak in the head [W/kg] (1)	Local peak in the head and trunk [W/kg] (1)
0-1 Hz	0.04	1.3	(2)	(2)	(2)
1-4 Hz	$4 \times 10^{-6} f$	1.5	(2)	(2)	(2)
4-10 kHz	0.010	1.5	(2)	(2)	(2)
10-100 kHz	0.100	1.3	(2)	(2)	(2)
100-1000 kHz	0.100	0.2	(2)	(2)	(2)
1000-10 MHz	0.100	50	0.4	2	1
10-100 MHz	(2)	50	0.4	2	1
100-300 GHz	(2)	(2)	0.4	2	1

- (1) f in kHz
- (2) not relevant at these frequencies

Table 1 - Exposure Limit Values

Table 2 - Action Levels

Freq	H [A/m ²] (1)	B [mT] (1)	E [V/m] (2)	P [mW/kg] (3)
0-1 Hz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	(2)
1-4 Hz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	(2)
4-10 kHz	16 x 10 ⁻²	20 x 10 ⁻²	0.33 x 10 ²	(2)
10-100 kHz	16 x 10 ⁻²	20 x 10 ⁻²	0.33 x 10 ²	(2)
100-1000 kHz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	(2)
1000-10 MHz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	(2)
10-100 MHz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	(2)
100-300 GHz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	(2)
10-100 MHz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	2.2 x 10 ⁻²
100-300 GHz	1.6 x 10 ⁻²	2 x 10 ⁻²	0.33 x 10 ²	2.2 x 10 ⁻²

- (1) f in kHz
- (2) At frequencies of 10 MHz or greater, the value of H may be increased to that calculated from the formula $H = (E_m / 377) + 1.6 (377 H)^2 P$. Where E_m is the measured electric field strength [V/m], H and P are the values in the table at the frequency considered
- (3) not relevant at these frequencies

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ISSN 0254-1475

COM(94) 284 final

DOCUMENTS

EN

04 05

Catalogue number : CB-CO-94-300-EN-C

ISBN 92-77-71327-5

Office for Official Publications of the European Communities
L-2985 Luxembourg