

European Communities

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EUROPEAN PARLIAMENT

# Working Documents

1980 - 1981

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9 October 1980

DOCUMENT 1-453/80

## Report

drawn up on behalf of the Committee on the Environment, Public Health and Consumer Protection

**on the proposal from the Commission of the European Communities to the Council (Doc. 1-630/79) for a directive on the protection of workers from harmful exposure to metallic lead and its ionic compounds at work**

**Rapporteur: Mr W. NEWTON DUNN**



By letter of 20 December 1979 the President of the Council of the European Communities requested the European Parliament to deliver an opinion on the proposal from the Commission of the European Communities to the Council for a directive on the protection of workers from harmful exposure to metallic lead and its ionic compounds at work.

On 14 January 1980 the President of the European Parliament referred this proposal to the Committee on the Environment, Public Health and Consumer Protection.

On 25 January 1980 the Committee on the Environment, Public Health and Consumer Protection appointed Mr Newton Dunn rapporteur.

It considered the proposal at its meetings of 25 April 1980 and 23 June 1980 and adopted the motion for a resolution and the explanatory statement unanimously with 1 abstention at its meeting of 25 September 1980.

Present: Mr Collins, chairman; Mrs Weber, vice-chairman; Mr Newton Dunn, rapporteur; Mr Adam (deputizing for Mr O'Connell), Mr Ceravolo (deputizing for Mr Segre), Mr Combe, Mr Del Duca (deputizing for Mrs Maij-Weggen), Mr Ghergo, Mrs Krouwel-Vlam, Mrs Lentz-Cornette, Mr Mertens, Mr Muntingh, Mrs Roudy, Mrs Schleicher, Mrs Seibel-Emmerling, Mr Sherlock, Mrs Squarcialupi and Mr Verroken.

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The Committee on the Environment, Public Health and Consumer Protection hereby submits to the European Parliament the following motion for a resolution, together with explanatory statement

MOTION FOR A RESOLUTION

embodying the opinion of the European Parliament on the proposal from the Commission of the European Communities to the Council for a directive on the protection of workers from harmful exposure to metallic lead and its ionic compounds at work

The European Parliament,

- having regard to the proposal from the Commission of the European Communities to the Council<sup>1</sup>,
  - having been consulted by the Council (Doc. 1-630/79),
  - having, on 15 February 1980, already given its opinion on the framework directive concerning the protection of workers from harmful exposure to chemical, physical and biological agents at work<sup>2</sup>,
  - having regard to the report of the Committee on the Environment, Public Health and Consumer Protection (Doc. 1-453/80),
1. Warmly welcomes this proposal for a directive to protect workers from harmful exposure to lead;
  2. Regards the limit values proposed as only a first step towards the equal and fullest possible protection of men and women;
  3. Requests that, pending application of the directive, a provisional recommendation should be addressed to the Member States, asking them to extend protection forthwith to those categories of workers not yet covered by their respective laws;
  4. Requests the Commission to define more closely the function and rights of the 'appointed doctor' having regard to national regulations;
  5. Calls on the Commission to specify lead in air values in  $\mu\text{g}/\text{m}^3$  instead of  $\mu\text{g}/\text{Nm}^3$ ;

<sup>1</sup> OJ No. C 324, 28.12.1979, p.3

<sup>2</sup> OJ No. C 59, 10.3.1980, p. 73

6. Points out that the variations in measurements of lead concentrations which arise from present different methods and types of equipment throughout the Community are unacceptably broad and therefore recommends the Commission to undertake urgent studies so that comparable and accurate measurements may be taken in all the Member States as laid down in Articles 7 and 10 of the directive of 29 March 1977 on biological screening of the population for lead;
7. Approves the Commission's proposal, subject to the following recommended amendments pursuant to Article 149, second paragraph, of the EEC Treaty:

Proposal from the Commission of the European Communities  
to the Council for a directive on the protection of  
workers from harmful exposure to metallic lead and its  
ionic compounds at work

Preamble and recitals  
unchanged

Articles 1, 2 and 3 unchanged

Article 4

1. Member States shall ensure that all lead in air measurements are representative of worker exposure to airborne particles and/or aerosols containing lead as defined in Annex 2.
2. Where regular lead in air monitoring is to be carried out in compliance with Article 3(1) the frequency of such monitoring shall be at least once a year in each workzone as described in Annex 1 paragraph 3 where there is risk of lead absorption.
3. The technical specifications for the sampling of airborne particles and/or aerosols containing lead given in Annex 2 shall be elaborated in detail and may be adapted in the light of technical progress in accordance with the procedure set out in Article 10 of Directive .....

Article 5

1. Member States shall ensure that workers are subject to health (clinical and biological) surveillance by an appointed doctor. This surveillance shall start prior to the beginning of the exposure. The frequency of the clinical surveillance shall be at least once a year for the duration of exposure. The biological surveillance shall include measurements of the biological indicators lead in blood (PbB) and delta aminolaevulinic acid in urine (ALAU) and shall be carried out at least every six months; it shall take into account not only the magnitude of the exposure but also the individual worker's susceptibility to lead.

Article 4

1. unchanged
2. Where regular lead in air monitoring is to be carried out in compliance with Article 3(1) the frequency of such monitoring shall be quarterly in each workzone as described in Annex 1 paragraph 3 where there is risk of lead absorption, the timing of such monitoring to be stipulated in relation to the process when environmental lead is likely to be at a maximum.
3. unchanged

Article 5

1. Member States shall ensure that workers are subject to health (clinical and biological) surveillance by an appointed doctor, and this shall be paid for by their employer. This surveillance shall start prior to the beginning of the exposure. The frequency of the clinical surveillance shall be at least once a year for the duration of the exposure. The biological surveillance shall include measurements of either the biological indicators lead in blood (PbB) or delta aminolaevulinic acid in urine (ALAU) and shall be carried out at least every six months; it shall take into account not only the magnitude of the exposure but also the individual worker's susceptibility to lead.

<sup>1</sup> For full text see OJ No. C 324, 28.12.1979, p. 3

2. Provided that the results are equivalent to the results of PbB and ALAU measurements, and that they ensure the same protection of the workers, other biological indicators may be used.
3. Without prejudice to national provisions, and the specific requirements of individual workers, guidelines for the clinical surveillance and for the aspects of the biological surveillance other than those established in paragraph 1 shall be established in accordance with the procedure set out in Article 10 of Directive .....

Article 6

Member States shall, from the entry into force of the laws, regulations and administrative provisions referred to in Article 20, ensure that the following limit values are applied as guidelines:

- lead in air value of  $150 \mu\text{g}/\text{Nm}^3$  of air, time weighted average over 40 hours per week;
- biological values for workers, with the exception of workers of child bearing capacity:
  - individual PbB levels,  $70 \mu\text{g}$  Pb/100 ml blood,
  - individual ALAU levels, 15 mg/litre urine.

Article 7 unchanged

Article 8

Member States shall ensure that with effect from 1 January 1985:

- (a) the lead in air limit value of  $100 \mu\text{g}/\text{Nm}^3$  of air, time weighted average over 40 hours per week, shall apply.

2. Provided that the results are equivalent to the results of PbB and ALAU measurements, and that they ensure the same protection of the workers, other biological indicators may be used. The blood lead level shall always predominate if there is conflict or contradiction in other findings.

3. unchanged

Article 6

Member States shall from the entry into force of the laws, regulations and administrative provisions referred to in Article 20, ensure that the following limit values are applied as guidelines:

- lead in air value of  $150 \mu\text{g}/\text{Nm}^3$  of air, time weighted average over 40 hours per week, related to an individual worker or to a specific workplace;
- unchanged
- unchanged
- unchanged

Article 8

Member States shall ensure that with effect from 1 January 1985:

- (a) the lead in air limit value of  $100 \mu\text{g}/\text{Nm}^3$  of air, time weighted average over 40 hours per week, shall apply, related to an individual worker or to a specific workplace.

(b) the following biological limit values for workers, with the exception of workers of child bearing capacity, shall apply:

- individual PbB levels, 60 µg Pb/100 ml blood,
- individual ALAU levels, 12 mg/litre urine.

Article 9

1. Where the limit values laid down in Article 8 cannot be achieved by 1 January 1985, the Commission may, on a properly reasoned request from a Member State, extend this time limit until 1 January 1989 in respect of certain industrial activities of categories of workers.
2. In this case the following limit values shall apply with effect from 1 January 1985:
  - lead in air limit value of 150 µg/Nm<sup>3</sup> of air, time weighted average over 40 hours per week,
  - biological limit values for workers, with the exception of workers of child bearing capacity:
    - individual PbB levels, 70 µg/Pb/100 ml blood,
    - individual ALAU levels, 15 mg/litre urine.
3. A list of industrial activities to which the provisions of this Article may apply is given for guidance purposes in Annex 3.

Article 10 and 11 unchanged

Article 12

Member States shall ensure, where either of the individual biological limit values (PbB/ALAU) of Articles 8 or 9 is confirmed as having been exceeded, that the necessary steps are immediately taken to ascertain the reasons for this excess and to eliminate them; the amount by which these limits have been exceeded shall determine the type of measures to be taken and their urgency; such measures shall include, where

(b) unchanged

Article 9

1. unchanged
2. In this case the following limit values shall apply with effect from 1 January 1985:
  - lead in air limit value of 150 µg/Nm<sup>3</sup> of air, time weighted average over 40 hours per week, related to an individual worker or to a specific workplace.
  - unchanged
  - unchanged
  - unchanged
3. unchanged
4. In all cases where derogations from the above are being considered, the workers concerned shall be fully informed of the circumstances and their consent shall be a condition of the derogation.

Article 12

Member States shall ensure, where either of the individual biological limit values (PbB/ALAU) of Articles 8 or 9 is confirmed as having been exceeded, that the necessary steps are immediately taken to ascertain the reasons for this excess and to eliminate them; the amount by which these limits have been exceeded shall determine the type of measures to be taken and their urgency; such measures shall include, where deemed

necessary, the immediate removal of the worker concerned from exposure to lead. After these measures have been taken no worker may continue to be exposed to lead if either of the individual biological limit values of Articles 8 and 9 continues to be exceeded.

2. No worker shall continue to be exposed to the risk of absorption of lead at work where the appointed doctor advises against such further exposure.

Article 3

1. Where the lead in air limit values as laid down in Articles 8 or 9 are likely to be exceeded at work warning signs requiring the wearing of suitable respiratory protective equipment shall be posted and such equipment shall be provided, and checked for efficiency of operation at regular intervals.
2. Areas where such warning signs are posted may not constitute permanent working places requiring the continuous wearing of respiratory protective equipment.
3. In the case of incidents in operation likely to lead to significant increases in exposure to lead, workers shall be immediately warned as to the need to use suitable respiratory protective equipment.

Article 14

1. In areas where there is a risk of absorption of lead at work as defined in Annex 1, eating, drinking and smoking shall be prohibited; such areas shall be posted accordingly.

necessary by the person medically responsible, the immediate removal of the individual worker concerned from exposure to lead. After these measures have been taken, no affected worker may continue to be exposed to lead if either of the individual biological limit values of Articles 8 or 9 continues to be exceeded.

2. unchanged

Article 13

1. Where the lead in air limit values to be established pursuant to Article 6 are likely to be exceeded at work despite the technical measures taken to adjust the plant of the undertaking, warning signs requiring the wearing of suitable respiratory protective equipment shall be posted and such equipment shall be provided and checked for efficiency of operation at regular intervals.
2. Areas where such warning signs are posted may not constitute permanent working places requiring the continuous wearing of respiratory protective equipment. Lengthy but unavoidable operations, such as maintenance, cleaning, building, and demolition shall be permitted provided proper protective equipment is worn.
3. In the case of incidents in operation likely to lead to significant increases in exposure to lead, the workers concerned shall be removed from the radius of action of the lead. In addition, workers whose assistance is absolutely essential to prevent the operational incident from having further damaging effects shall be immediately warned of the obligation to use suitable protective equipment.

Article 14

1. unchanged

2. Special areas shall be identified where these activities can be carried out.

Article 15

1. In areas where there is a risk of absorption of lead at work as defined in Annex 1, workers shall be provided, in order to limit this absorption and taking into account the physico-chemical properties of the lead compounds handled, in particular with working or protective clothing and gloves.
2. Separate locker facilities shall be provided for the working or protective clothing and for street clothes.
3. Adequate washing facilities including showers shall be provided.
4. In order to avoid the spread of pollution by lead outside the workplace the working or protective clothing shall remain within the workplace; it may however be laundered in special facilities outside the workplace.

2. Special areas shall be identified where these activities can be carried out. In undertakings where a large amount of heat is generated drinking water or other beverages shall be made available by the employer in such a manner as to prevent contamination from vapour, smoke, aerosols or dust particles containing lead.

Article 15

1. In areas where there is a risk of absorption of lead at work as defined in Annex 1, in addition to the measures to limit emissions from the plant of the undertaking, workers shall be provided, in order to limit this absorption and taking into account the physico-chemical properties of the lead compounds handled, in particular with working or protective clothing and gloves, head covering and footwear.
2. unchanged
3. Adequate washing facilities including hot showers shall be provided during working hours.
4. In order to avoid the spread of pollution by lead outside the workplace the working or protective clothing shall remain within the workplace; it may however be laundered in special facilities outside the workplace, but may never be taken to workers' homes.  
Should no special laundry exist in the plant for the washing of working clothes, this work shall be contracted out to a specialized firm which must be advised in writing and in advance of the risks involved so that identical precautions may be taken for its employees as for the workers working with lead.
5. Any areas where lead is liable to be present shall be kept properly clean. Working, changing, washing and canteen areas must be entirely separate from areas in which lead is handled.

Article 16

1. Member States shall ensure that workers exposed to a risk of absorption of lead at work and their representatives are informed of:
  - the potential risks to their health due to lead exposure
  - the precautions to be taken
  - the importance of complying with the technical and medical requirements.
  
2. Female workers shall, in particular, be informed of the potential health risk presented by lead exposure during the early months of pregnancy.

Article 17

1. Member States shall ensure that employers and workers as well as their representatives at work shall have access to the data relating to:
  - lead in air monitoring,
  - biological monitoring (group values), and their interpretation.
  
2. Where the results exceed the limit values laid down in Articles 8 or 9, the employers and the workers concerned and their representatives at work shall be informed immediately. The workers and their representatives at work shall be consulted on the corrective measures to be taken.
  
3. The individual shall be informed regularly of the results of the biological measurements carried out upon him under the surveillance of the appointed doctor, and of the interpretation placed on these results.

6. Storage facilities shall be provided for the protection of food and other refreshments from exposure to substances or preparations containing lead, e.g. in the form of vapour, smoke, aerosols or dust particles.

Article 16

1. unchanged
  
2. Female workers shall be informed of the health risk to unborn children, consequent upon exposure to lead, prior to and throughout pregnancy.

Article 17

1. unchanged
  
2. unchanged
  
3. Member States shall ensure that information and documentation regarding the health effects of lead, the significance of the lead in the air and biological test limit values, and the technical preventive measures and hygiene requirements prepared specifically at national and/or Community level, are made available to workers exposed to a risk of absorption of lead at work.

4. Member States shall ensure that information and documentation regarding the health effects of lead, the significance of the lead in air and biological limit values, and the technical preventive measures and hygiene requirements prepared specifically at the national and/or community levels, are made available to workers exposed to a risk of absorption of lead at work.

4. has become Article 17(3)

Article 18 unchanged

Article 19

1. At least once a year the Commission shall convene a meeting of representatives of the Governments of Member States to examine any practical problems, including quality assurance programmes and request for exemptions which may arise following the implementation of this Directive.

1. unchanged

1a. In the same way the Commission shall also consult with representatives of the workers.

2. On the basis of the information collected, the Commission shall report regularly to the Council.

2. unchanged

Articles 20 and 21 unchanged

ANNEX 1

Assessment of risk of absorption of lead at work (Article 2(2))

Second paragraph (list of activities): Add 1. Shipbreaking  
2. Demolition involving burning of lead paint

ANNEXES 2, 3 and 4 unchanged

## B

EXPLANATORY STATEMENT

1. This proposal for a Directive on Lead at Work falls within the Framework Directive, which the European Parliament has already considered in 1980. Lead at work is the third detailed area which is being covered within the framework.
2. Lead is toxic to the human body. The body can cleanse itself of lead slowly - the biological half life is long - but chronic exposure tends to cause lead to accumulate in the body. Lead is an insidious poison, so the Environment Committee feels its use should be reduced in future as much as possible.
3. A tabular summary of the present state of protective legislation in each Member State follows; the detailed history and state of national legislation is given in the annex to this report.

Prohibition (P) or Restriction (R) of  
Exposure to Lead of Special Groups of Workers

	B	DK	D	F	IRL	I	LUX	NL	UK
Young workers	R		R(18)	R	R+P		R		
Young Males below 16			P(16) all			P			
Young Females below 18						P			
Women	R				R+P		R		
Women of child- bearing capacity									R (PbB40)
Women below 45 years			P (PbB40)						
Pregnant women	P								P

4. This proposal for a directive excludes the co-valent compounds of lead, of which the principal would be substances such as tetra-ethyl lead, which is a petrol additive. A separate directive for this problem is planned by the Commission.
5. In the Committee for the Environment, Public Health and Consumer Protection, there are strong feelings about the dangers of discrimination against women. Some members take the view that to set different levels of lead exposure for male and female workers amounts to discrimination against females. These members believe that exposure limits should be the same for both sexes. Against this opinion are the members who believe that the accepted evidence that lead crosses the placental barrier and can permanently damage the unborn child means that there is a biological difference between men and women which must be recognised.
6. There has been one scientific report that lead can affect male spermatazoa, but this evidence is isolated at present because no other research has produced the same conclusion. Members of the Committee would welcome further research into this very important subject.
7. Members of the Committee are concerned that protective clothing must never be taken to workers' homes. In the past, there have been examples of husbands bringing home contaminated work clothes, which have in turn contaminated their wives and have subsequently lead to damaged fetuses.
8. Many members of the Committee are concerned about the lack of reliable testing methods and equipment for lead contamination in workers. Unless further improvements are made in the art of measurement, Members are very concerned that this important proposal from the Commission may be rendered ineffective because the results of testing vary too widely.

Belgium

Work with lead is covered by the 'Règlement général pour la Protection du Travail'. These general rules concerning the washing facilities, the work-clothes, the pre-employment and regular medical examinations, the control of workplace atmosphere, the individual protection means, the labelling of toxic agents, the information of workers, and the protection of young and pregnant workers, apply in all the cases where lead compounds are handled.

A series of articles in this General Regulation specify special measures applicable to the production of lead and lead compounds such as the ventilation of the workplace, the transport of lead residues, the cleaning of the workshop and specific measures for the manufacture of lead white.

Regarding lead in air limit values and monitoring, it is foreseen that regular monitoring shall take place. The Threshold Limit Value is set at  $150 \mu\text{g}/\text{m}^3$ . The works doctor and the health and safety committee may require the employer to carry out additional measurements. Temporary removal from exposure to lead should take place when PbB exceeds  $60 \mu\text{g}/100 \text{ ml}$ .

By decree of December 1968 women workers shall not be exposed to lead oxide and sulphate paints if more than 2% lead by weight. The same provisions apply to workers under 18.

The same decree prohibits the exposure of pregnant workers to the potentially harmful effects of lead, with the exception of soldering work.

Denmark

In application of the Working Environment Act of 1975 (Act. No. 681 of 23.12.75) regulations concerning lead are in preparation which will supersede the old regulations.

An exposure limit of  $100 \mu\text{g}/\text{m}^3$  (lead in air levels) is already enforced by the Labour Inspectors, while it is considered advisable for workers with a blood lead level (PbB) of  $60 \mu\text{g}/100 \text{ ml}$  to be removed from exposure.

Extensive provisions exist for the information of workers with respect to the dangers of lead but there are no special provisions for women.

## Federal Republic of Germany

Regulations regarding lead are contained in the TRgA (Technische Regeln für gefährliche Arbeitsstoffe) 505 of March 1976. These regulations cover the technical and hygiene protective measures, medical supervision and prohibitions and also cover thirteen different lead activities.

On the basis of biological indicators it is considered that there is significant lead exposure when in more than 5% of the workers the following levels are exceeded:

Blood lead	60 µg/100 ml
ALAU	15 mg/l (Davis method)
CPJ	500 µg/l

Technical measures such as ventilation have to be taken when the MAC values are approached. These have recently been reduced from 200 to 100 µg/m<sup>3</sup>.

Young persons under 18 can only be employed under certain conditions, while the employment of young persons under 16 exposed to lead is prohibited.

Women under 45 years are not to work under circumstances which may give rise to blood lead levels in excess of 40 µg/100 ml.

Pre-employment medical examinations are required followed by examinations at least once a year which have to include basiphilic counts and haemoglobin determinations.

## France

Most of the regulations regarding lead exposure date back to decrees of 1948 in application of the 'Code du Travail'.

The decree of 11.12.1948 and its application regulation sets a limitative list of 13 activities which are considered as potential sources of lead exposure. In this decree it is also indicated that activities likely to give rise to lead vapour or dust must be carried out in the open air or in well-ventilated rooms.

The manual handling of oxides and other lead compounds without protective apparatus is prohibited, while lead oxide and sulphate paints are only to be handled as pastes.

Individual protection and hygiene measures are laid down such as the wearing of respirators for certain jobs, the availability of work-clothes and showers, and the prohibition of eating or smoking.

A complex but complete procedure is foreseen for the information of workers with respect to the dangers presented by lead: information by posters, information by the employer and information by the works doctor.

A list of 6 activities is established for which employment of workers under 18 is prohibited.

The 1948 decree also established the principle of pre-employment and regular medical examinations as well as the keeping of exposure records.

A decree of March 1977 adds the determination of ALAU to this medical examination. Continued exposure to lead is unacceptable for ALAU values in excess of 30 mg/litre.

#### Ireland

A large number of Statutory Instruments for the protection of workers exposed to lead were enacted in 1976 based on the Factories Act of 1955. At the same time the Mines (General) Regulations of 1975 have special provisions regarding lead.

The Regulations enacted in 1976 covered a number of regulations dating as far back as 1907 for paints and colours, 1908 for vitreous enamelling and 1911 for lead smelting and manufacturing.

They cover the following areas: lead smelting; manufacture of lead compounds; electric accumulators; tinning of metal, hollow ware, iron drums and harness furniture; vitreous enamelling; pottery, manufacture of paints and colours; india rubber; heading of yarn.

A special regulation regarding lead processes is directed at the employment of women and young persons. It covers special requirements for women and young persons when their exposure to lead is not otherwise prohibited. It specifies in particular that medical examinations shall take place once a month and that individual health records shall be kept.

Among the special features of the above regulations one may mention:

- the prohibition of employment of young persons and women (smelting, electric accumulators, lead processes, paints and colours);
- the specification of the air space volume per worker and type of work (manufacturing lead compounds and vitreous enamelling);
- the need for the effective separation of processes when they are likely to lead to exposure (electric accumulators);
- the establishment of health registers (paints and colours);
- the need for monthly medical examinations and the possibility for the appointed doctor to order suspension from exposure to lead (manufacturing of lead compounds).

### Italy

Compulsory Accident and Disease Prevention Insurance has existed since 1929 for all workers exposed to lead. By Presidential Decree of March 1956 pre-employment and regular medical examinations are compulsory for workers involved in 19 activities concerned with lead. The requirements of the medical examination are not specified and the periodicity varies from 3 to 6 months. 15 activities were prohibited for young men under 16 and young girls under 18 by Presidential Decree of January 1976.

At present there are no nationally compulsory air or biological limit values; however the Law on Health Reform of 1978 foresees the establishment of such limits. Often limits now exist by contractual agreement.

### Luxembourg

The first references to occupational lead exposure are made in the law of March 1928 and the application regulations of March 1932 and the ratification of the International Labour Conference Conventions and in particular of the Convention concerning the use of lead-white in paint.

These regulations contain provisions on the special handling of lead-white and on the information of the workers. Exposure of young people under 18 and of women to such paints is prohibited.

Furthermore, the law of October 1969 concerning the protection of children and young workers extends the prohibitions for young persons under 18 to work with lead when there is a danger of inhaling toxic quantities of lead.

Finally the law of April 1979 on dangerous establishments, which includes a number of activities involving lead, lays down special rules and prior authorizations for such establishments.

### The Netherlands

Many of the regulations concerning the safety of workers with respect to lead are based on the Safety Act of 1934.

The Decree of November 1938 sets provisions relating to the design of working areas and to the provision of working clothes. For a number of activities involving lead there are provisions concerning:

- the height of the working areas and the cubic volume of air available to each worker,
- changing-rooms, canteens and washing facilities.

The Decrees of 1934 and 1939 introduce a number of elements of the International Labour Conference Convention on white-lead into Dutch law. These elements relate to: clothing, personal protection equipment, eating and drinking, use of enclosed spaces, the production and dispersal of dusts during dry-rubbing, chipping and scraping off of lead-based paints, washing facilities and cleaning equipment, labelling of lead products and obligations on employees to observe certain regulations.

For certain of these manufacturing processes or conditions of use the Works Inspectorate may lay down requirements in respect of the time during which workers may remain on the premises.

By Decree of November 1974 plants in which lead-based pigments or lead accumulators are manufactured are obliged to maintain their own medical service.

Since the start of the seventies the Works Inspectorate has applied a MAC value of  $150 \mu\text{g}/\text{m}^3$  as a guideline for the assessment of the quality of air at the workplace. The Works Inspectorate has the power to make this value legally binding. At present the National MAC Commission is revising the MAC value for lead.

Biological indicators and limit values have been applied in medical examinations. Until recently blood lead values below  $60 \mu\text{g}/100 \text{ ml}$  were considered satisfactory. Other biological parameters include ZPP (Zinc protoporphyrin) and haemoglobin.

## United Kingdom

The oldest regulations concerning the protection of workers with respect to exposure to lead are the File-Cutting by Hand Regulations of 1903 followed by the Paints and Colours Regulations of 1907.

Much of these regulations and the lead legislation made under the Factories Act of 1961 are considered by the UK Government to have become inadequate because:

- they cover a limited range of lead industries and processes,
- they neglect certain fundamental hygiene control principles such as biological and environmental monitoring,
- in parts they are obsolete and difficult to enforce.

In 1978 the Health and Safety Commission issued a Consultative Document on Control of Lead at Work (including Draft Regulations and Draft Approved Code of Practice) which is intended to represent one set of comprehensive but concise lead regulations and replace 17 regulations and orders under the Factories Act of 1961.

The draft regulation, which also covers where possible self-employed persons, provides for:

- the assessment of lead work (to determine the degree of lead exposure),
- the duty of employers to persons at work who are not his employees (the same as to his own employees),
- the provision of information, instruction and training by the employer,
- the provision of material, plant and process control by the employer to adequately control the exposure of his employees otherwise than by the wearing of respiratory protective equipment,
- the provision of respiratory equipment and protective clothing,
- the provision of facilities for personal hygiene,
- the provision of facilities not contaminated by lead for eating and drinking, smoking, and the prohibition of these activities at work,
- the employer to secure the cleanliness with respect to lead of all the premises ensuring that the methods used shall not create a risk from lead to the cleaners,

- the duty to avoid spread of contamination by lead from the workplace,
- the duty of the employer to carry out air monitoring,
- the biological monitoring and medical surveillance,
- the keeping of adequate records of air monitoring, medical surveillance and biological tests.

It must be pointed out that these draft regulations stress equally air monitoring and biological monitoring. For air monitoring a hygiene standard of  $150 \mu\text{g}/\text{m}^3$  is proposed.

For biological monitoring it is proposed that a worker be suspended from exposure to lead if his blood lead values exceed  $80 \mu\text{g}/100 \text{ ml}$ . Below these levels the frequency of the medical examinations will depend on the blood lead levels: every 12 months if PbB below 40, to every 3 months for PbB between 60 and 80.

In order to safeguard the developing foetus from lead:

- a pregnant women should be suspended from lead work,
- a woman of child-bearing capacity should not be employed in lead work when her blood lead concentration exceeds, or is likely to exceed,  $40 \mu\text{g}/100 \text{ ml}$ .