

The National Occupational Health and Safety Commission has declared a *National Standard for the Control of Inorganic Lead at Work*. It has also declared a *National Code of Practice for the Control and Safe Use of Inorganic Lead at Work*.

National standards declared by the National Commission under s.38(1) of the *National Occupational Health and Safety Commission Act 1985* (Cwlth) are documents which prescribe preventive action to avert occupational deaths, injuries and diseases. Most national standards deal with the elimination/reduction or management of specific workplace hazards.

National codes of practice declared by the National Commission under s.38(1) of the *National Occupational Health and Safety Commission Act* are documents prepared for the purpose of advising employers and employees of acceptable ways of achieving declared national standards.

The expectation of the Commonwealth Government and the National Commission is that national standards and national codes of practice will be suitable for adoption by Commonwealth, State and Territory governments. Such action will increase uniformity in the regulation of occupational health and safety throughout Australia and contribute to the enhanced efficiency of the Australian economy.

It should be noted that National Commission documents are instruments of an advisory character, except where a law, other than the *National Occupational Health and Safety Commission Act*, or an instrument made under such a law, makes them mandatory. The application of any National Commission document in any particular State or Territory is the prerogative of that State or Territory.

National Occupational Health and Safety Commission

**CONTROL OF
INORGANIC LEAD
AT WORK**

**National Standard
for the Control of
Inorganic Lead at Work
[NOHSC:1012(1994)]**

**National Code Of Practice
for the Control and Safe Use of
Inorganic Lead at Work
[NOHSC:2015(1994)]**

OCTOBER 1994

Australian Government Publishing Service
Canberra

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ISBN O 644 35265 5

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FOREWORD

The National Occupational Health and Safety Commission is a tripartite body established by the Commonwealth Government to develop, facilitate and implement a national occupational health and safety strategy.

This strategy includes standards development, the development of hazard-specific and industry-based preventive strategies, research, training, information collection and dissemination and the development of common approaches to occupational health and safety legislation.

The National Commission comprises representatives of the peak employee and employer bodies — the Australian Council of Trade Unions and the Australian Chamber of Commerce and Industry — as well as the Commonwealth, State and Territory governments.

Consistent with the National Commission's philosophy of consultation, tripartite standing committees have been established to deal with issues relating to standards development, research and the mining industry. Expert groups and reference groups may be established to provide advice to the standing committees on those issues with which the National Commission is concerned.

FOREWORD	iii
PREFACE	vii
NATIONAL STANDARD FOR THE CONTROL OF INORGANIC LEAD AT WORK	1
NATIONAL CODE OF PRACTICE FOR THE CONTROL AND SAFE USE OF INORGANIC LEAD AT WORK	31

PREFACE

Australia is the largest mine producer of lead in the Western world and is the largest exporter, accounting for about one quarter of the world's exports. More than half of the domestic consumption is used in the manufacture of electric storage batteries for automotive, industrial and lighting applications. Other substantial uses of lead are as chemical compounds for paints, stabilisers for plastics, in glasses and glazes, as rolled products for building construction, as metal alloys for solder and covering sheaths on power cables.

In terms of occupational exposure, the major routes of entry of inorganic lead into the body are inhalation and ingestion of dust and fumes during various production and manufacturing processes, termed 'lead processes' in this national standard and national code of practice. Although exposure to lead presents health risks for all people, it represents a serious health risk to the unborn child by way of elevated maternal blood lead levels because the toxic effects of lead on the developing embryo/foetus are reached at blood lead levels significantly lower than those for adults. For this reason, women have been traditionally excluded from employment in lead processes where exposure to lead, and hence its absorption, may occur.

With the introduction of the *Sex Discrimination Act 1984* (Cwlth), the *Human Rights and Equal Opportunity Commission Act 1986* (Cwlth), and State and Territory equal employment opportunity Acts, conflict resulted with those provisions in other pieces of legislation which prohibited the employment of women in various circumstances, and the statutory exclusion of women from employment in lead processes became no longer acceptable.

Employers' 'duty of care' obligations with regard to worker health and safety and their obligations under the Acts mentioned above, have to be discharged simultaneously. The ACCI emphasises that employers also have to discharge their common law 'duty of care' obligations to the unborn child.

In 1986 the ACTU and the ACCI agreed to a request that the National Commission develop a national lead standard. It was proposed that the standard should be designed to protect the health and safety of all workers in the lead industry and should address the exclusion of women from employment in lead processes. The National Commission established a tripartite working party to develop a draft national standard and national code of practice and to progress them through the Standards Development Standing Committee.

The *Proposed National Lead Control Standard and Draft National Code of Practice for the Control and Safe Use of Lead at Work* were released for public comment in 1990. In 1991 an Expert Review Group reviewed the public comment and recommended a final national standard and national code of practice to the National Commission. Before the revised national standard and national code of practice were considered by the National Commission, an application in the Federal Court challenged the extent to which the National Commission should consider sex discrimination legislation in setting a national occupational health and safety standard.

In November 1993 the Federal Court stated that if the National Commission came to the conclusion that certain standards or codes of practice are necessary to ensure the observance of proper occupational health and safety measures then it has a duty to say so. Therefore, the National Commission has a duty to indicate clearly the health effects for all workers who may be exposed to lead and set appropriate occupational health and safety standards. The Federal Court further stated that it could not be right that the National Commission is required to remain silent or to defer its statutory functions to the Human Rights and Equal Opportunity Commission or anybody else. Guidance was provided to the effect that if, in complying with National Commission occupational health and safety standards, employers may be in breach of the sex discrimination legislation, the standard should make it clear that employers may need to seek exemption from the relevant agency.

A Chief Executive Officer's Working Group was convened to consider the Federal Court decision and revise the 1991 draft national standard and national code of practice accordingly. Members agreed on an approach with differentiation based on the different health effects and achievable blood lead levels for removal from and return to what are defined as 'lead-risk jobs'. Members also agreed on an approach for determining whether a person should work in a lead-risk job. These agreements have been reached while recognising that inorganic lead is a hazardous substance and that health effects have been reported at blood lead levels of or below 1.45 μ mol/L (30 μ g/dL). ACTU agreement to this document is based on the recognition that the national standard is leaning towards what is currently achievable rather than strictly health effects. As such, it is a clear objective of the national standard to progressively reduce lead exposure and blood lead levels over time. A review mechanism is contained within the national standard.

Employers who exclude women from lead-risk jobs in accordance with the national standard, may need to seek exemption from relevant sex discrimination legislation.

The National Commission recognises that situations can occur where, for occupational health and safety reasons, employees may be required to transfer from one work area to another. The issues of potential loss of income, income maintenance arrangements, job security and the application of legislation, such as workers' compensation Acts, are matters which need to be dealt with in the particular circumstances of the industry through normal industrial relations processes. They are not addressed in this publication as they are considered to be outside its scope.

In Australia, it is the role of the Commonwealth and State and Territory governments to implement legislation directed towards the effective control of risks arising from the use of inorganic lead in the workplace. The National Commission believes that it is of assistance in achieving a uniformity of approach to the assessment and control of such risks to recommend common essential requirements which may be adopted in State and Territory legislation or regulations. This document essentially provides the drafting instructions for Parliamentary Counsel in the Commonwealth and various State and Territory jurisdictions. Each jurisdiction will seek to give effect to the national standard in a manner which achieves consistency with definitions used in their principal occupational health and safety legislation and conforms to requirements set down in statute for the making of subordinate legislation.

Inorganic lead is a hazardous substance. Therefore, this publication is to be adopted, without limiting the generality of the provisions of the workplace hazardous substances regulatory package. There are six documents which comprise the workplace hazardous substances regulatory package. These are:

- *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)] (which is produced under the same cover as the national code of practice);
- *National Code of Practice for the Control of Workplace Hazardous Substances* [NOHSC:2007(1994)];
- *National Code of Practice for the Preparation of Material Safety Data Sheets* [NOHSC:2011(1994)];
- *National Code of Practice for the Labelling of Workplace Substances* [NOHSC:2012(1994)];
- *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)]; and
- *List of Designated Hazardous Substances* [NOHSC:10005(1994)].

These publications are supplemented by the following titles:

- *Guidance Note for the Assessment of Health Risks Arising from the Use of Hazardous Substances in the Workplace* [NOHSC:3017(1994)]; and
- *Guidance Note for the Control of Workplace Hazardous Substances in the Retail Sector* [NOHSC:3018(1994)].

Each of the above publications may be purchased separately through Commonwealth Government Bookshops.

**NATIONAL STANDARD
FOR THE CONTROL OF
INORGANIC LEAD AT WORK
[NOHSC:1012(1994)]**

1. CITATION	5
2. AUTHORISING PROVISION	14
3. REVOCATIONS	14
4. OBJECTIVES	14
5. REVISION OF OPERATION OF THE INORGANIC LEAD CONTROL STANDARD	6
6. SCOPE AND APPLICATION	15
7. INTERPRETATION	15
8. PROVISION OF INFORMATION—SUPPLIERS' DUTIES	19
Material Safety Data Sheets	19
Labels	19
Other Relevant Information	19
9. PROVISION OF INFORMATION—EMPLOYERS' DUTIES	19
Information for Job Applicants	19
Material Safety Data Sheets	19
Labels	19
Registers	20
10. INDUCTION AND TRAINING	20
11. ASSESSMENT	20
Lead-risk Job	12
12. CONTROL	21
Reduction of Exposure to Lead	21
Atmospheric Lead Levels	22
Containment of Lead Contamination	22
Cleaning and Prohibition of Some Cleaning Methods	22
Eating, Drinking and Smoking	22
Provision of Personal Protective Equipment	23
Respiratory Protective Equipment	23
13. ATMOSPHERIC MONITORING	23
Lead In Air—Level Requiring Review of Control Measures	24

14. EXCLUSION FROM WORKING IN A LEAD-RISK JOB	24
15. HEALTH SURVEILLANCE	24
Health Surveillance and Record Keeping	25
Authorised Medical Practitioner	25
Availability of Records	26
Biological Monitoring and Monitoring Frequency	26
Results of Biological Monitoring	27
Medical Examinations	27
Medical Removal	27
Return after Medical Removal	28
Right to Appeal	28
Medical Removal and Return Records	28
Blood Lead Level Requiring Review of Control Measures	29
16. RECORD KEEPING	29
17. EMPLOYEES' DUTIES	29
18. APPROVALS AND DETERMINATIONS	21
19. RELEVANT PUBLIC AUTHORITIES AND EMERGENCY SERVICES	30
SCHEDULES	
1. LEAD PROCESSES I	23
2. LEAD PROCESSES II	24
3. RESULTS OF BIOLOGICAL MONITORING	25
4. RESULTS OF MEDICAL EXAMINATION	28
APPENDIX	
1. CONVERSION TABLE FOR BLOOD LEAD LEVELS	28
REFERENCED DOCUMENTS	29

CITATION

- 1** This national standard may be cited as the *National Standard for the Control of Inorganic Lead at Work* [NOHSC:1012(1994)].

AUTHORISING PROVISION

- 2** This *National Standard for the Control of Inorganic Lead at Work* [NOHSC:1012(1994)] is declared under s.38(1) of the *National Occupational Health and Safety Commission Act 1985* (Cwlth).

REVOCATIONS

- 3** Any jurisdiction government wishing to adopt this national standard into their legislative system may wish to revoke any existing regulations that may be in conflict with this national standard.

OBJECTIVES

- 4** The objectives of this national standard are to:
 - (a)** minimise the risk of adverse health effects caused by lead exposure in the workplace by:
 - (i)** providing for assessment of the risk for all jobs in the workplace where there is exposure, or potential exposure, to lead and to determine whether the job is a lead-risk job,
 - (ii)** ensuring that employees with potential exposure to lead used in a work activity are provided with information, induction and training on the nature of hazards and means of assessing and controlling exposure to workplace lead and that employee representatives have access to this information,
 - (iii)** ensuring that employers provide certain equipment and facilities, and provide for the testing and monitoring at workplaces where lead processes are conducted, and
 - (iv)** ensuring that emergency services and other relevant public authorities have access to relevant information on lead;
 - (b)** ensure that an employer controls lead exposure at the source in workplaces where lead processes are conducted;
 - (c)** ensure that an employer provides for the health surveillance of employees who work in lead-risk jobs;
 - (d)** prescribe certain duties of prescribed persons at workplaces where lead processes are conducted;
 - (e)** prohibit certain activities at workplaces where lead processes are conducted;
 - (f)** ensure that information on lead exposures is available to public authorities (to be defined on a jurisdiction by jurisdiction basis);

- (g) ensure that this *National Standard for the Control of Inorganic Lead at Work* [NOHSC:1012(1994)] and *National Code of Practice for the Control and Safe Use of Inorganic Lead at Work* [NOHSC:2015(1994)] are reviewed within four years; and
- (h) progressively reduce lead exposure and blood lead levels to convert existing lead-risk jobs to non-lead-risk jobs.

REVISION OF OPERATION OF THE INORGANIC LEAD CONTROL STANDARD

- 5(1) This *National Standard for the Control of Inorganic Lead at Work* [NOHSC:1012(1994)] and *National Code of Practice for the Control and Safe Use of Inorganic Lead at Work* [NOHSC:2015(1994)] shall be reviewed within four years following declaration by the National Commission.
- (2) The review shall be carried out by the National Commission jointly with jurisdiction authorities administering lead regulations with a view to considering:
 - (a) the lead exposure standard;
 - (b) the medical removal and return levels;
 - (c) the blood lead level for defining a lead-risk job;
 - (d) progress in reducing lead exposure and blood lead levels to convert existing lead-risk jobs to non-lead-risk jobs; and
 - (e) other relevant issues.
- (3) The review shall be based on information on compliance and biological and atmospheric monitoring results collated by the jurisdiction authorised persons. It will take into account experience in achieving specified atmospheric lead and blood lead levels, advances in available technology, control measures and other relevant factors.
- (4) To enable the National Commission to revise this national standard, jurisdiction authorised persons shall maintain a register of workplaces where lead-risk jobs are carried out (to be defined on a jurisdiction by jurisdiction basis).
- (5) A future review period shall be specified at the time of review.

SCOPE AND APPLICATION

- 6(1) This national standard applies to occupational exposure to inorganic lead in all lead processes as defined in section 7.
- (2) This national standard does not apply to occupational exposure to organic lead compounds, specifically alkyl lead.

INTERPRETATION

- 7 In this national standard:

‘Atmospheric monitoring’ means determining the concentration of lead in air.

‘Atmospheric lead level’ means the concentration of lead in air expressed in milligrams per cubic metre (mg/m³).

‘Authorised medical practitioner’ means a medical practitioner who is registered in the jurisdiction and is approved by the authorised person under Section 18 to carry out health surveillance under this national standard.

‘Authorised person’ means the head of the department directly responsible to the Minister for the administration of this national standard (to be defined on a jurisdiction by jurisdiction basis).

‘Biological monitoring’ means determining the amount of lead in capillary or venous blood and related measurements as required.

‘Blood lead level’ means the concentration of lead in whole blood expressed in micromoles per litre (µmol/L) or micrograms per decilitre (µg/dL).

‘Capillary blood lead’ means the concentration of lead in capillary whole blood.

‘Confirmed blood lead’ means the concentration of lead in venous whole blood.

‘Container’ means anything in or by which hazardous substances are or have been wholly (or partly) cased, covered, enclosed, contained or packed, whether such a container is empty, or partially or completely full.

‘Emergency services’ shall be defined on a jurisdiction by jurisdiction basis with the intention of including all fire fighting services and organisations with functional jurisdiction for emergency response.

‘Employee’ means an individual who works under a contract of employment, apprenticeship or traineeship.

‘Employee representative’ means an employee member of a health and safety committee where established in the workplace, or a person elected to represent a group of employees on health and safety matters.

‘Employer’ means a corporation or an individual who employs persons under contract of employment, apprenticeship or traineeship.

Note: The definition of an employer includes the *self-employed* which means a person who works for gain, other than under a contract of employment, apprenticeship or traineeship whether or not that person employs others.

‘Exposure standard’ means an airborne concentration of a particular substance in a person's breathing zone as established by the National Occupational Health and Safety Commission's *Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment*¹ [NOHSC:1003(1991)] (as amended from time to time).

‘Hazard’ means an intrinsic capacity associated with an agent or process capable of causing harm.

‘Hazardous substance’ means a substance which:

- (a) is listed on the National Occupational Health and Safety Commission's *List of Designated Hazardous Substances* [NOHSC:10005(1994)]²; or
- (b) has been classified as a hazardous substance by the manufacturer or importer in accordance with the National Occupational Health and Safety Commission's *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)]³.

‘Health surveillance’ means the monitoring of individuals for the purpose of identifying changes in health status due to occupational exposure to lead. It includes biological monitoring and medical examination, but not atmospheric monitoring.

‘Inspector’ means an authorised officer of the department responsible for the administration of this national standard (to be defined on a jurisdiction by jurisdiction basis).

‘Inorganic lead’ means lead metal, inorganic lead compounds and lead salts of organic acids.

‘Label’ means a set of information on a container which identifies the substance in the container, identifies whether the substance is hazardous and provides basic information about the safe use and handling of the substance.

‘Lead process’ means any of the processes listed in Schedule 1 and Schedule 2, and includes any other process as determined by the authorised person under section 18 to be a Schedule 1 or Schedule 2 process.

‘Lead-risk job’ means a work activity or a sequence of activities at specified workstations within the workplace, in which the blood lead level of the employee might reasonably be expected to rise, or does rise, above 1.45 µmol/L (30 µg/dL) or the removal level as set out in subsection 15(24), whichever is the lower.

‘Material Safety Data Sheet (MSDS)’ means a document that describes the properties and uses of a substance, that is, identity, chemical and physical properties, health hazard information, precautions for use and safe handling information.

‘May’ means that a provision is optional.

‘Medical removal’ means a protective, preventive health mechanism integrated with the health surveillance provisions, which include biological monitoring. It provides temporary removals from further lead exposure for employees discovered through health surveillance to be at risk of sustaining material impairment to health from continued exposure.

‘Monitoring’ means to survey regularly all measures which are used to control lead exposure in the workplace. This includes the monitoring of atmospheric lead, but does not include biological monitoring which is an element of health surveillance.

‘National Code of Practice for the Control and Safe Use of Inorganic Lead at Work’ means a document declared by the National Occupational Health and Safety Commission pursuant to Part VI of the *National Occupational Health and Safety Commission Act 1985* (Cwlth) prepared for the purpose of advising employers and employees of an acceptable way of achieving the declared *National Standard for the Control of Inorganic Lead at Work* [NOHSC:1012(1994)].

‘Practicable’ means ‘practicable’ in Victoria, Queensland, Western Australia and the Northern Territory, ‘reasonably practicable’ in New South Wales, South Australia, Australian Capital Territory and Commonwealth jurisdiction, and ‘a reasonable precaution’ in Tasmania.

‘Record’ means a collection of information in a permanent form. It may take one of many forms, for example a written report or a computerised database. For the purpose of this national standard records include assessment reports, results of monitoring, documentation of induction and training programs and results of health surveillance, and registers.

‘Register’ means a listing of all lead-containing hazardous substances which are used or produced in the workplace and the available Material Safety Data Sheets for lead-containing hazardous substances used in the workplace.

‘Relevant public authorities’ means those public authorities whose functional responsibilities extend to occupational health and safety. It is expected that these will be defined on a jurisdiction by jurisdiction basis.

‘Removal level’ means a confirmed blood lead concentration at which an employee shall be transferred from a lead-risk job to a job which is not a lead-risk job.

‘Return level’ means a confirmed blood lead concentration at which an employee removed from a lead-risk job to a job that is not a lead-risk job, can be considered by an authorised medical practitioner for return to a lead-risk job.

‘Risk’ means the likelihood that lead will cause harm in the circumstance of its use.

‘Shall’ means that a requirement is mandatory.

‘Should’ means a recommendation.

‘Supplier’ means an importer, manufacturer, wholesaler or distributor of workplace substances but excludes a retailer.

‘Toxic effect’ means the property of an agent producing damage to an organism. This usually refers to functional (systemic) damage but may be developmental in respect of tissue and skeleton in the case of the embryo. The damage may be permanent or transient.

‘Use’ means the production, handling, storage, transport or disposal of lead in the workplace.

‘Workplace’ means any place, including any aircraft, ship or vehicle, where a person works, or is likely to work, and includes any place where a person goes while at work.

‘Workstation’ means a defined and identifiable area of a workplace within which a specific task or operation is performed.

PROVISION OF INFORMATION — SUPPLIERS' DUTIES

The duties of this section are included without limiting the generality of the provisions of the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)]⁴.

Material Safety Data Sheets

- 8(1)** Manufacturers, importers and suppliers shall produce and/or provide Material Safety Data Sheet for all hazardous substances containing lead which they supply.

Labels

- (2)** Suppliers shall ensure that all containers of substances containing lead supplied for use at work are appropriately labelled.

Other Relevant Information

- (3)** A supplier shall provide to an employer upon request:
- (a)** the relevant summary reports⁵ produced under the *Industrial Chemicals (Notification and Assessment) Act 1989* (Cwlth) that have been prepared; and
 - (b)** any other relevant information, in addition to that contained in the Material Safety Data Sheet, which will assist in the safe use of lead.

PROVISION OF INFORMATION—EMPLOYERS' DUTIES

The duties of this section are included without limiting the generality of the provisions of the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)]⁴.

Information for Job Applicants

- 9(1)** An employer shall provide each applicant who applies for employment in lead processes with information about the health risks and toxic effects associated with lead exposure and the need for, and content of, health surveillance.

Material Safety Data Sheets

- (2)** An employer shall ensure that Material Safety Data Sheet are obtained from the supplier on the first supply of lead-containing hazardous substances to the workplace. An employer shall ensure that Material Safety Data Sheet provided by the supplier are available for all hazardous substances containing lead used in the workplace and are readily accessible to employees with potential for exposure to lead.

Labels

- (3)** An employer shall ensure that:
- (a)** all containers of lead-containing hazardous substances used at work, including those delivered to and those produced within the workplace, are appropriately labelled; and
 - (b)** no person removes, defaces, modifies or alters a correct label of a lead-containing hazardous substance used at work.

Registers

- (4) An employer shall ensure that:
- (a) a register is kept and maintained for all lead-containing hazardous substances used in the workplace for as long as the lead processes are used;
 - (b) the register contains, as a minimum, the Material Safety Data Sheet for all these hazardous substances, and will be a record for the purpose of this national standard; and
 - (c) the register is accessible to all employees with the potential for exposure to lead.

INDUCTION AND TRAINING

- 10(1)** An employer shall provide, to each employee who is likely to be exposed to lead, induction prior to commencing work and, at least annually after that, information and training on:
- (a) the potential health risk and toxic effects associated with lead exposure;
 - (b) the control measures used to minimise the risk to health and safety;
 - (c) the correct use of methods used to minimise the contamination of employees, other employees and the workplace by lead;
 - (d) the correct care and use of personal protective equipment; and
 - (e) the need for, and details of, a health surveillance program.
- (2) The medical consultation element of health surveillance shall provide an opportunity for individual counselling in relation to the health effects of lead.
- (3) The induction and training provided shall be commensurate with the risk identified by the assessment process and be provided in a manner appropriate to the employees in the workplace, in particular, those employees of non-English speaking backgrounds.
- (4) The employer shall give particular attention to induction, training and control measures for those employees who, because their removal levels are lower than the maximum blood lead level defined for a lead-risk job, are at higher risk.
- (5) The employer shall record all induction and training undertaken. This will be a record for the purposes of this national standard.

ASSESSMENT

The provisions of this section are included without limiting the generality of the provisions of the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)]⁴.

- 11(1)** An employer shall ensure that a suitable and sufficient assessment is made of the risks to health created by work involving potential exposure to lead.

Lead-risk Job

- (2) An employer shall assess whether a job is a lead-risk job prior to work commencing in such a job. A lead-risk job is a job in which the blood lead level of the employee might reasonably be expected to rise above 1.45 $\mu\text{mol/L}$ (30 $\mu\text{g/dL}$) or the removal level as set out in subsection 15(24), whichever is the lower.
- (3) An employer shall notify the authorised person where a workplace is one at which a lead-risk job(s) is carried out.
- (4) An employer shall assess the exposure to lead of employees engaged in lead-risk jobs, including estimation of the atmospheric lead level:
 - (a) within six months of this national standard being enacted in jurisdiction lead regulations, and thereafter at intervals of not longer than twelve months;
 - (b) as soon as practicable following significant change in the use or composition of lead-containing materials used in that job or a significant change in an existing lead process;
 - (c) when required to do so by an inspector; and
 - (d) at the commencement of a new lead process and again within four weeks after the commencement of that process.
- (5) An employer shall provide all employees with potential for exposure to lead and the employee representative of each designated work group or workplace with the aggregate results of the assessments made under this national standard as soon as the results become available.
- (6) The assessment report shall be a record for the purposes of this national standard.
- (7) If assessment indicates that a job is not a lead-risk job, subsection 12(4)(a) no longer applies. Where there are jobs in a lead process area which are assessed as not being lead-risk jobs, an employer shall develop and implement a plan to ensure that these jobs do not become lead-risk jobs. These jobs shall be assessed at least every five years.

CONTROL

The provisions of this section are included without limiting the generality of the provisions of the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)]⁴.

Reduction of Exposure to Lead

- 12(1)** When an assessment under section 11 indicates that it is necessary, the employer shall ensure that the exposure of employees to lead is either prevented or, where that is not practicable, adequately controlled so as to minimise risks to health.
- (2) Employers shall ensure that all engineering control measures, safe work practices and personal protective equipment are effectively maintained.

- (3) An employer shall use the results of the assessment to develop an ongoing workplace improvement plan which shall be used to progressively reduce lead exposure and blood lead levels to convert existing lead-risk jobs to non-lead-risk jobs. This plan shall be developed in consultation with employees and employee representatives and contain specific aims, targets and performance criteria.

Atmospheric Lead Levels

- (4) Without in any way limiting the generality of subsection 12(1), an employer shall:
 - (a) ensure that the level of lead in air likely to be inhaled by employees does not exceed the exposure standard* calculated as a time-weighted average concentration over a normal eight-hour working day (as listed in the National Commission's *Exposure Standards for Atmospheric Contaminants in the Occupational Environment*, [NOHSC:1003(1991)]¹, as amended from time to time); or
 - (b) if it is not practicable to achieve that level:
 - (i) provide each employee with suitable respiratory protective equipment, and
 - (ii) post appropriate warning signs indicating the need to wear respiratory protection in the lead process area.

Containment of Lead Contamination

- (5) An employer shall, as far as is practicable, ensure that contamination by lead is confined to the area where the lead process is carried out and that lead contamination of the surrounding environment does not occur.

Cleaning and Prohibition of Some Cleaning Methods

- (6) An employer shall ensure that the lead process area is kept as clean as practicable.
- (7) An employer shall ensure that compressed air, compressed gas or dry sweeping cleaning methods are not used in lead process areas.
- (8) An employee shall not use compressed air, compressed gas or dry sweeping cleaning methods in lead process areas.

Eating, Drinking and Smoking

- (9) An employer shall ensure that an employee does not eat, drink, chew gum, smoke or carry smoking materials in any lead process area.
- (10) An employer shall provide employees with an eating and drinking area which, as far as is practicable, cannot be contaminated with lead.
- (11) An employer shall ensure that employees remove lead contaminated clothing and equipment and wash their hands and faces before entering the area provided for eating and drinking.

* Currently 0.15 mg/m³ at the time of printing.

- (12) This subsection does not prevent an employer from providing drinking facilities in areas other than the eating and drinking area, so long as those facilities, as far as is practicable, cannot be contaminated by lead.

Provision of Personal Protective Equipment

- (13) An employer shall:
- (a) provide protective clothing and equipment to protect employees from lead contamination;
 - (b) ensure that protective equipment and clothing and equipment is clean and maintained in functional order; and
 - (c) provide and maintain in good working order adequate changing rooms, washing, showering and toilet facilities appropriate to the lead process carried out.
- (14) An employee shall:
- (a) wear protective clothing and use protective equipment provided by an employer in the manner in which it is designed to be worn or used;
 - (b) use the facilities provided according to subsection 12(13)(c) in the manner for which they are designed to be used; and
 - (c) inform an employer immediately on discovering any defect in the protective clothing or equipment which could result in unacceptable exposure to lead.
- (15) Subsection 12(13) applies to clothing and equipment provided pursuant to subsections 12(4)(b)(i) and 12(13) and to any other clothing and equipment provided by an employer to protect an employee from exposure to, or contamination by, lead.
- (16) The employer shall provide for the laundering of protective clothing. Lead contaminated work clothing shall not be taken away from the workplace by an employee.

Respiratory Protective Equipment

- (17) The respiratory equipment provided by an employer pursuant to subsection 12(4)(b)(i) shall:
- (a) be kept clean and maintained in functional order; and
 - (b) when clean and maintained properly, protect against inhalation of fumes or airborne dust from lead.

ATMOSPHERIC MONITORING

- 13(1) Where an assessment indicates that atmospheric monitoring is needed, the employer shall undertake monitoring of the atmospheric lead concentration in the workplace and, when appropriate, in the breathing zone of individual employees.

- (2) An employer shall ensure that:
 - (a) the results of atmospheric monitoring are recorded. The results shall be a record for the purposes of this national standard;
 - (b) the records of personal monitoring are available to the individual to whom the monitoring relates; and
 - (c) the aggregate records of atmospheric monitoring are available to employees and employee representatives and to the relevant public authority administering this national standard (to be determined on a jurisdiction by jurisdiction basis).

Lead In Air—Level Requiring Review of Control Measures

- (3) Where results of atmospheric monitoring indicate that the atmospheric lead concentration is at or above the value of the exposure standard, control measures shall be reviewed.

EXCLUSION FROM WORKING IN A LEAD-RISK JOB*

14(1) Criteria for exclusion from working in a lead-risk job are:

- (a) personal medical condition;
 - (b) pregnancy; or
 - (c) breast feeding.
- (2) These exclusions do *not* apply to non-lead-risk jobs.
 - (3) When considering whether a person should work in a particular lead-risk job, the employer shall take into account the following:
 - (a) medical history;
 - (b) relevant factors identified by reference to health effects associated with exposure to lead;
 - (c) the removal level, as set out in subsection 15(24), applicable to the person; and
 - (d) the blood lead level of an employee which might reasonably be expected when working in a particular lead-risk job.

HEALTH SURVEILLANCE

- 15(1)** An employer shall provide a health surveillance program for employees who are to commence work in lead-risk jobs.
- (2) An employer shall provide a health surveillance program for employees who have been identified in the assessment process as working in lead-risk jobs.

* Reference should also be made to the information relevant to this Section which is provided in the Preface, p.p. vii-ix.

- (3) Health surveillance shall be performed under the supervision of an authorised medical practitioner, to be chosen following consultation between employers and employees and employee representatives.
- (4) An employer shall provide for the required health surveillance at no cost to the employees and at a reasonable time and place.

Health Surveillance and Record Keeping

- (5) An employer shall establish and maintain accurate records for each employee subject to health surveillance. The record shall include:
 - (a) the name, sex, date of birth and description of the duties of the employee;
 - (b) a copy of the authorised medical practitioner's signed reports and results of biological monitoring; and
 - (c) results of any atmospheric lead monitoring relevant to that employee.
- (6) An employer shall ensure that health surveillance results obtained are retained as confidential records for the purposes of this national standard, and shall be maintained for 30 years from the date of last entry.
- (7) Employees shall have access to their own health surveillance records during their employment and on ceasing employment.

Authorised Medical Practitioner

- (8) An employer shall engage the services of an authorised medical practitioner.
- (9) An authorised medical practitioner carrying out health surveillance under this national standard shall:
 - (a) take a medical and occupational history and perform medical examinations relevant to the effects of lead;
 - (b) arrange, as required, biological monitoring of employees in lead-risk jobs;
 - (c) arrange, as required, for appropriate laboratory and other tests;
 - (d) complete the certification as per Schedule 4:
 - (e) forward, as soon as practicable, a copy of the completed certificate to:
 - (i) the employer;
 - (ii) the employee examined; and
 - (iii) the authorised person.

- (f) arrange for the results of the medical examination and of the biological monitoring to be explained to the employee examined and for the employee to be counselled on the meaning and significance of the results; and
 - (g) forward to the employer reports and results for the purposes of subsection 15(5)(b).
- (10) When an authorised medical practitioner ceases to practise, all medical records in his or her possession obtained as a result of health surveillance should be offered to the relevant public authority.

Availability of Records

- (11) An employer shall make available all records required to be maintained to the authorised medical practitioner engaged to undertake health surveillance.
- (12) An employer and the authorised medical practitioner shall make available on request all records required to be maintained to the authorised person (to be defined on a jurisdiction by jurisdiction basis).
- (13) The informed written consent of the employee shall be obtained before his or her individual medical records (obtained as a result of health surveillance) are provided by the authorised medical practitioner or the employer to a third party, except to the authorised person.
- (14) Where an employer who holds records in accordance with this national standard ceases to trade, an employer shall notify the relevant public authority in writing and offer those records to the authority (to be determined on a jurisdiction by jurisdiction basis).

Biological Monitoring and Monitoring Frequency

- (15) Biological monitoring consists of the measurement of lead in whole blood or packed red cells, sampled as capillary or venous blood as appropriate, and related measurements as required. Formulae for converting red blood cell lead measurements to whole blood lead measurements are given in Appendix 1.
- (16) Confirmed blood lead levels shall be used for medical removal and return purposes.
- (17) The employer shall provide for biological monitoring of an employee who commences work in a lead-risk job within the first month of being engaged, again two months later and once more six months from the commencement of work in a lead-risk job.
- (18) The frequency of further biological monitoring shall be determined by the latest results (*see* Appendix 1) and shall be at least:
- (a) once every six months if the most recent blood lead level is less than:

*1.45 $\mu\text{mol/L}$ (30 $\mu\text{g/dL}$) - for males and females not of reproductive capacity,
1.45 $\mu\text{mol/L}$ (30 $\mu\text{g/dL}$) - for males of reproductive capacity;*

- (b) once every three months if the most recent blood lead level is:
- 1.45-1.88 $\mu\text{mol/L}$ (30-39 $\mu\text{g/dL}$) - for males and females not of reproductive capacity,*
1.45-1.88 $\mu\text{mol/L}$ (30-39 $\mu\text{g/dL}$) - for males of reproductive capacity,
less than 0.48 $\mu\text{mol/L}$ (10 $\mu\text{g/dL}$) - for females of reproductive capacity;
 and
- (c) at least once every six weeks if the most recent blood lead level is at or above:
- 1.93 $\mu\text{mol/L}$ (40 $\mu\text{g/dL}$) - for males and females not of reproductive capacity,*
1.93 $\mu\text{mol/L}$ (40 $\mu\text{g/dL}$) - for males of reproductive capacity,
0.48 $\mu\text{mol/L}$ (10 $\mu\text{g/dL}$) - for females of reproductive capacity.
- (19) On application from the employer, the authorised person may vary the required frequency of biological monitoring if the results of assessments of exposure and past biological monitoring results indicate that exposure to lead is minimal in that lead process.
- (20) The employer shall ensure that biological monitoring results obtained are retained as a confidential record for the purposes of this national standard.

Results of Biological Monitoring

- (21) An employer shall send the biological monitoring results to the authorised person at intervals not exceeding six months. The biological monitoring results shall contain as a minimum the information in Schedule 3.
- (22) An employer shall ensure that the employee is provided with his or her own biological monitoring results, as soon as practicable.

Medical Examinations

- (23) The employer shall arrange for each employee who:
- (a) will work in a lead-risk job to be examined by an authorised medical practitioner prior to commencing work and on every occasion in the first six months of employment when biological monitoring is carried out; and
- (b) is working in a lead-risk job to be examined by an authorised medical practitioner as early as possible.

Medical Removal

- (24) If the results of biological monitoring reveal that the confirmed blood lead level is at or above:
- 2.41 $\mu\text{mol/L}$ (50 $\mu\text{g/dL}$) - for males and females not of reproductive capacity,*
2.41 $\mu\text{mol/L}$ (50 $\mu\text{g/dL}$) - for males of reproductive capacity,
0.97 $\mu\text{mol/L}$ (20 $\mu\text{g/dL}$) - for females of reproductive capacity,
0.72 $\mu\text{mol/L}$ (15 $\mu\text{g/dL}$) - for females who are pregnant or breast feeding,

or the employer or employee considers that an excessive exposure to lead has occurred, the employer shall:

- (a) immediately remove the employee from the lead-risk job to a job that is not a lead-risk job;
- (b) arrange for the employee to have a medical examination by an authorised medical practitioner within seven days; and
- (c) provide the authorised medical practitioner with a copy of the form in Schedule 4 with Part A filled in, signed and dated by the employer.

(25) If an employee advises the employer that she is pregnant or is breast feeding, the employer shall immediately remove the employee from the lead-risk job to a job that is not a lead-risk job.

Return after Medical Removal

(26) An employer shall arrange for an employee who has been removed from a lead-risk job on the basis of health surveillance to be examined by an authorised medical practitioner and to be certified for suitability to return to a lead-risk job.

(27) An employer shall ensure that the employee does not return to a lead-risk job until:

- (a) the confirmed blood lead level is less than:
 - 1.93 µmol/L (40µg/dL) - for males and females not of reproductive capacity,*
 - 1.93 µmol/L (40µg/dL) - for males of reproductive capacity,*
 - 0.48 µmol/L (10µg/dL) - for females of reproductive capacity, including females who have ceased their pregnancy and are not breast feeding;* and
- (b) the employee is certified as fit to return to a lead-risk job by the authorised medical practitioner.

Right to Appeal

(28) Where an employee or employer is not satisfied with a decision of an authorised medical practitioner to exclude an employee from working in a lead-risk job, to remove an employee from a lead-risk job or to authorise return to a lead-risk job, the employee or employer may apply in writing to the authorised person within 28 days for a review of the decision.

Medical Removal and Return Records

(29) An employer shall establish and maintain an accurate record for each employee subject to medical removal and return as the result of health surveillance action. The record shall include:

- (a) the name, sex and date of birth of the employee;
- (b) the date on each occasion that the employee was removed from a lead-risk job and the blood lead level reached, as well as the corresponding date on which the employee was returned to a lead-risk job; and

- (c) a brief description of how each removal was, or is, being accomplished.

Blood Lead Level Requiring Review of Control Measures

- (30) If the results of biological monitoring show that the employee's blood lead level is at or above:

*1.93 $\mu\text{mol/L}$ (40 $\mu\text{g/dL}$) - for males and females not of reproductive capacity,
1.93 $\mu\text{mol/L}$ (40 $\mu\text{g/dL}$) - for males of reproductive capacity,
0.72 $\mu\text{mol/L}$ (15 $\mu\text{g/dL}$) - for females of reproductive capacity,*

on three consecutive occasions; or at or above:

*2.41 $\mu\text{mol/L}$ (50 $\mu\text{g/dL}$) - for males and females not of reproductive capacity,
2.41 $\mu\text{mol/L}$ (50 $\mu\text{g/dL}$) - for males of reproductive capacity,
0.97 $\mu\text{mol/L}$ (20 $\mu\text{g/dL}$) - for females of reproductive capacity,*

on a single occasion;

an employer shall take action to identify and assess the source of lead exposure and control that lead exposure.

RECORD KEEPING

- 16(1)** An employer shall maintain, as a record, in a suitable form:

- (a) assessment reports indicating a need for atmospheric monitoring and/or health surveillance and the results of each employee's assessment for 30 years from the date of the last entry;
- (b) assessment reports not indicating a need for atmospheric monitoring and/or health surveillance for at least five years from the date of the last entry; and
- (c) each employee's removal and return records for the duration of employment and 30 years from the date of last entry.

- (2) All other records which are required by this national standard, including the records of training, shall be maintained and kept by an employer in a suitable form for at least five years from the date of last entry.

- (3) Where an employer who holds records in accordance with this national standard ceases to trade, an employer shall provide these records to the relevant public authority.

EMPLOYEES' DUTIES

The duties of this section are included without limiting the generality of the provisions of the *National Model Regulations for the Control of Workplace Hazardous Substances* [NOHSC:1005(1994)]⁴

- 17(1)** Employees shall comply, to the extent that they are capable, with all activities carried out in accordance with the provisions of this national standard.

- (2) Employees who are to commence work in lead-risk jobs or who work in lead-risk jobs shall present themselves for health surveillance as required.

- (3) Employees shall report promptly to their employer any matters of which they are aware that may affect the employer's compliance with the provisions of this national standard.
- (4) An employee knowingly pregnant or breast feeding shall advise the employer as soon as practicable.

APPROVALS AND DETERMINATIONS

18(1) The authorised person may:

- (a) approve in writing, legally qualified medical practitioners familiar with the health effects of lead and lead processes to carry out health surveillance under this national standard; and
 - (b) determine processes to be Schedule 1 lead processes or Schedule 2 lead processes.
- (2) An inspector may require an employer to make an assessment of the exposure to lead of employees engaged in lead processes at any time.

RELEVANT PUBLIC AUTHORITIES AND EMERGENCY SERVICES

19(1) An employer shall ensure that all relevant records on lead which are required under this national standard are available to relevant public authorities and emergency services.

(2) The authorised person in each jurisdiction shall:

- (a) establish and maintain a jurisdiction register of all workplaces where lead-risk jobs are carried out;
- (b) ensure that information is collected from workplaces identified in the jurisdiction register of workplaces where lead-risk jobs are carried out, regarding compliance, and biological and atmospheric monitoring results;
- (c) ensure that a review of this national standard is initiated based on information outlined in subsection 19(2)(b), taking account of:
 - (i) experience in achieving specified atmospheric lead and blood lead levels,
 - (ii) advances in available technology,
 - (iii) control measures, and
 - (iv) other relevant factors.

This review shall take place within four years from the operative date of this national standard as specified in section 5.

LEAD PROCESSES I

- (a)** Any work which exposes a person to lead dust in air or lead fumes arising from the manufacture or handling of dry lead compounds, except galena (lead sulphide) when its character or composition remains unchanged.
- (b)** Any work in connection with the manufacture, assembly, handling or repair of, or parts of, electric accumulators (batteries) which involves the manipulation of dry lead compounds, pasting or casting of lead.
- (c)** Breaking up or dismantling of lead accumulators and the sorting, packing and handling of plates or other parts containing lead removed or recovered from those accumulators.
- (d)** Spraying with molten lead or alloys containing greater than five per cent by weight of lead.
- (e)** Melting or casting of lead alloys containing greater than five per cent by weight of lead in which the temperature of the molten material exceeds 450°C.
- (f)** Recovery of lead from its ores, oxides or other compounds by a thermal reduction process.
- (g)** Dry machine grinding, discing, buffing or cutting by power tools lead or alloy containing greater than five per cent by weight of lead.
- (h)** Machine sanding or buffing of surfaces coated with paint containing greater than one per cent by dry weight of lead.
- (i)** Any process whereby electric arc, oxy-acetylene, oxy gas, plasma arc or a flame is applied, for the purposes of welding, cutting or cleaning, to the surface of any metal which is coated with lead or paint containing greater than one per cent by dry weight of lead.
- (j)** Radiator repairs where exposure to lead dust or fume may occur.
- (k)** Fire assay where lead is used.

LEAD PROCESSES II

- (a)** Melting of lead or alloy containing greater than 50 per cent lead by weight where the exposed surface area of the molten material is less than 0.1m² and the temperature of the molten material does not exceed 450°C.
- (b)** Hand grinding and finishing of lead or alloy containing greater than 50 per cent by weight of lead.
- (c)** Spray painting with lead paint containing greater than one per cent by dry weight of lead.
- (d)** Working with galena (lead sulphide) when its character or composition remains unchanged.
- (e)** Working in any lead process not listed in Schedule 1.

RESULTS OF MEDICAL EXAMINATION

PART A: To be filled in by an employer and supplied to the authorised medical practitioner before a medical examination.

Full name of employee:

Date of birth:

Sex:

Process engaged in:

Length of time employed in the above process:

Name of employer:

Signed (employer)

Date:

PART B: To be certified and signed by the authorised medical practitioner at the time of the medical examination.

Date blood sample taken:

Blood sample taken:

Venous

Capillary

Results of Tests

Blood lead level

µmol/L

(µg/dL)

Other biological tests (specify):

Results:

Date of tests:

Performed by:

Certification

I hereby certify that I have examined the person whose name appears above in Part A and that in my opinion this employee:

- (a) on medical grounds is not suitable to work in a lead-risk job
- (b) has excessive lead absorption and shall not work in any lead-risk job
- (c) shows symptoms and/or signs of clinical lead poisoning and is fit/unfit to work in a non-lead-risk job

(d) is fit to return to work in a lead-risk job

(e) is fit to continue work in a lead-risk job

Comments

Signed

Date

19

Name: (Authorised Medical Practitioner)

CONVERSION TABLE FOR BLOOD LEAD LEVELS

To convert $\mu\text{mol Pb/L}$ in the red blood cell component of blood to $\mu\text{g Pb/dL}$ whole blood, multiply by 20.7×0.42 for females and 20.7×0.45 for males.

REFERENCED DOCUMENTS

1. National Occupational Health and Safety Commission, 'Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment' [NOHSC:1003(1991)], in *Exposure Standards for Atmospheric Contaminants in the Occupational Environment*, Australian Government Publishing Service, Canberra, 1991.
2. National Occupational Health and Safety Commission, *List of Designated Hazardous Substances* [NOHSC:10005(1994)], Australian Government Publishing Service, Canberra, 1994.
3. National Occupational Health and Safety Commission, *Approved Criteria for Classifying Hazardous Substances* [NOHSC:1008(1994)], Australian Government Publishing Service, Canberra, 1994.
4. National Occupational Health and Safety Commission, 'National Model Regulations for the Control of Workplace Hazardous Substances' [NOHSC:1005(1994)], in *Control of Workplace Hazardous Substances: National Model Regulations and National Code of Practice*, Australian Government Publishing Service, Canberra, 1994.
5. Summary reports are published in the *Chemical Gazette*, which is produced each month and can be purchased through Commonwealth Government Bookshops.

