

Health monitoring

Guide for cadmium



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Introduction

This guide is intended to be read by a registered medical practitioner with experience in health monitoring who is engaged by person conducting a business or undertaking (PCBU) to carry out or supervise health monitoring. It provides practical guidance to registered medical practitioners about requirements under the work health and safety (WHS) laws for health monitoring.

This guide applies to all workplaces covered by the WHS Regulations where health monitoring is required.

How to use this guide

This guide includes references to the legal requirements under the WHS Act and WHS Regulations. These are included for convenience only and should not be relied on in place of the full text of the WHS Act or WHS Regulations.

The words 'must', 'requires' or 'mandatory' indicate a legal requirement exists that must be complied with. The word 'should' is used in this guide to indicate a recommended course of action, while 'may' is used to indicate an optional course of action.

This guide provides information for those registered medical practitioners engaged by a PCBU to carry out or supervise health monitoring for workers. This guidance should be read in conjunction with the following:

- *Health monitoring guide for registered medical practitioners*
- *Health monitoring guides for hazardous chemicals*
- *Health monitoring guide for workers*
- *Health monitoring guide for persons conducting business or undertakings (PCBUs).*

Health monitoring under the WHS Regulations

In certain circumstances, the model WHS Regulations place duties on a PCBU to provide health monitoring to workers. These requirements arise if the worker is carrying out work with hazardous chemicals including lead and asbestos. In addition, the work being carried out must be the kind of work specified in the WHS Regulations. A PCBU has the duty to determine if health monitoring is required.

The WHS Regulations prescribe that health monitoring is carried out by or supervised by a registered medical practitioner with experience in health monitoring.

Cadmium

Cadmium (CAS 7440-43-9) is a soft, silvery, ductile metal, chemically similar to zinc. Cadmium is ubiquitous and can be found wherever zinc is found, including food and soil.

The most common oxidation state of cadmium is Cd(II) and there are many cadmium compounds of varying solubility.

Work activities that may represent a high risk exposure

Under the Work Health and Safety (WHS) Regulations, cadmium and its compounds are listed as restricted hazardous chemicals and must not be used for abrasive blasting at concentrations greater than 0.1 per cent without authorisation from the relevant WHS regulator.

Cadmium is used in batteries, pigments, coatings and platings, as a plastic stabiliser and in photovoltaic devices. Examples of work activities involving cadmium and its compounds that require special attention include:

- processes like welding, soldering, oxy-cutting and smelting
- welding or oxy-cutting of cadmium alloy and cadmium plate
- the use of cadmium-silver alloys for silver soldering or brazing
- electroplating
- manufacture of cadmium alloys
- extraction of cadmium from mineral ore smelters
- opening containers and weighing out cadmium powders
- charging cadmium powders into process plant
- grinding, discharging and packaging cadmium powders
- working with nickel-cadmium batteries
- manufacture and handling of paints and plastics containing cadmium pigments and the recycling of these plastics, and
- textile production.

Sources of non-occupational exposure

The general population may be exposed to cadmium through food, for example, potatoes, grain cereal products and seafood.

The use of superphosphate fertiliser has resulted in the addition of cadmium to the soil in some agricultural areas. Plants take up and retain cadmium from soil; fish and shellfish take up and retain cadmium from water.

Tobacco, like other plants, takes up cadmium that is then inhaled in the smoke.

People in high traffic areas may have elevated levels of cadmium.

1. Health monitoring for cadmium under the WHS Regulations

Collection of demographic, medical and occupational history

Records of personal exposure

Physical examination with emphasis on the respiratory system

Standardised respiratory function tests including for example, FEV₁¹, FVC² and FEV₁/FVC³

Urinary cadmium and β₂-microglobulin

¹ Forced expiratory volume in one second

² Forced vital capacity

³ Tiffeneau index

Health advice, including counselling on the effect of smoking on cadmium exposure

Health monitoring under the WHS Regulations is applicable to cadmium and its inorganic compounds. Cadmium and its compounds are considered to have a similar hazard and toxicity profile.

In this guide, 'cadmium' is used to refer to cadmium and its compounds.

Health monitoring before starting work in a cadmium process

Health monitoring for cadmium may be required before the worker starts work so that changes to the worker's health can be detected.

Initial discussions about a health monitoring program should include:

- possible health effects from exposure to cadmium
- the effect of smoking on cadmium exposure
- how to recognise and report symptoms, and
- what is involved in the health monitoring program, for example the frequency of testing and the tests that may be needed.

Administration of a standardised respiratory questionnaire and spirometry is recommended to establish baseline lung function.

As background levels of cadmium in the urine can be significant, it is advisable to perform urinalysis to assess baseline urinary cadmium and β_2 -microglobulin levels before starting work in a cadmium process.

Cadmium compounds may be sensitisers and previous work history with the chemical and symptoms of sensitisation should be investigated. Smoking status should also be noted.

During exposure to a cadmium process

2. Monitoring exposure to cadmium

Where workers are exposed, suspected of being exposed or are concerned about exposure to cadmium, the person conducting the business or undertaking (PCBU) has a duty to arrange a health monitoring appointment with a registered medical practitioner. For example, an appointment should be arranged following spills or loss of containment of cadmium resulting in excessive exposure to workers or when workers develop symptoms of cadmium exposure.

Cadmium is readily absorbed through the lungs (up to 50 per cent absorption) with the extent of absorption dependent on the particle size and solubility of the cadmium compound, deposition pattern in the respiratory tract and ventilation rate. Pulmonary absorption is the primary route of occupational exposure. Uptake from the gastrointestinal tract is considerably lower (up to seven per cent absorption) with higher absorption rates observed in people with some nutritional deficiencies.

Most absorbed cadmium is excreted very slowly due to significant accumulation in the kidneys and liver. The estimated half-lives of cadmium in the blood, kidneys and liver are 2–3 months, 10–30 years and 5–10 years, respectively. In blood, most of the cadmium is localised to the erythrocytes (approximately 90 per cent).

The main route of excretion of cadmium is via the urine. Renal tubular damage or dysfunction from cadmium or other aetiologies will result in a higher excretion rate of cadmium.

The following urinary tests should be included in the worker's health monitoring program for cadmium:

- a spot urine test for cadmium, and
- a urine β_2 -microglobulin test.

Where urinalysis for cadmium is carried out, the following value should be considered when assessing exposure to cadmium:

Biological exposure standard for cadmium⁴

Urinary cadmium:

5 $\mu\text{mol/mol}$ (5 $\mu\text{g/g}$) creatinine (7 $\mu\text{g/L}$)

The concentration of cadmium in urine is reflective of chronic exposure. As such, urine samples may be collected at any time. Care should be taken during sample collection to avoid contamination from air and exposed skin and clothing.

It may take weeks, months or years for steady-state to be reached in exposed workers. Urinalysis results in the first year of exposure should be considered with caution and comparison of results with the biological exposure standard may be inappropriate. However, if marked increases in cadmium levels are observed in sequential urinalysis results it may indicate a high or over-exposure situation and may warrant further tests, such as the assessment of blood cadmium levels or early markers of kidney dysfunction in the worker, or an examination of air monitoring results.

Urinary levels of cadmium in non-occupationally exposed individuals have been reported to be less than 1 $\mu\text{mol/mol}$ creatinine⁵ (less than 1 $\mu\text{g/g}$ creatinine or less than 1.4 $\mu\text{g/L}$ using a creatinine concentration of 1.4 g/L). This level can vary considerably between individuals, depending on age, smoking status and intake from the environment. Smoking can significantly contribute to urinary cadmium levels. Individuals who have a higher dietary intake of vegetables or shellfish may also have higher urinary cadmium levels.

The urinalysis results of workers with signs of kidney dysfunction should be considered with caution. Urinary cadmium levels in these workers will be higher than anticipated.

While the biological exposure standard is intended to be protective for cadmium-induced kidney damage, early signs of kidney dysfunction may be observed at urinary cadmium concentrations below the biological exposure standard. Therefore, it is recommended that urinary cadmium levels be applied in a health monitoring program that includes a test to identify early renal changes. The β_2 -microglobulin levels in urine should be examined in conjunction with cadmium levels.

Raised urine levels of β_2 -microglobulin is not specific to renal dysfunction induced by cadmium. The differential diagnosis includes renal disorders like diabetic nephropathy or excessive production in some cancers and autoimmune disorders.

A spot urine test for cadmium and urine β_2 -microglobulin should be carried out annually and compared against the worker's baseline levels measured at the start of the health monitoring program.

A medical examination should be carried out every two years and include:

- medical history and counselling on the additional cadmium burden from smoking

⁴ See [Chemical analysis branch handbook, 9th Edition, Workplace and biological monitoring exposure analysis, WorkCover NSW \(PDF 3.39MB\)](#) for more details

⁵ EU Scientific Committee on Occupational Exposure Limits (2017) SCOEL/OPIN/336: Cadmium and its inorganic compounds. Opinion from the Scientific Committee on Occupational Exposure Limits.

- physical examination, and
- respiratory function tests.

Other health monitoring methods

Monitoring cadmium in urine is the most widely used biological exposure monitoring method for this element. However, the following method has also been used:

- blood cadmium levels

As with urinary cadmium levels, blood cadmium levels are influenced by current exposure and total body burden. If there is a low to moderate total body burden of cadmium, blood cadmium levels can reflect exposure over the past 3–6 months and may be more suitable for monitoring cadmium exposure in the first year of exposure than monitoring urinary cadmium levels.

If blood cadmium levels are monitored, the following value can be used as a guide:

Blood cadmium levels:

5 µg/L

Blood sampling time is not critical. Care should be taken during sample collection to avoid contamination from the air and exposed skin and clothing.

Blood cadmium levels in non-occupationally exposed people have been reported to be less than 1 µg/L⁶. However, blood cadmium levels can be affected by age, intake from the environment and most significantly, smoking. Blood cadmium levels in smokers can approach or exceed the guidance value above.

Other potential biomarkers for cadmium-induced renal tubular damage include:

- retinol binding protein (RBP)
- human complex-forming glycoprotein (α_1 -microglobulin), and
- N-acetyl- β -D-glucosaminidase (NAG).

None of these markers are specific for cadmium-induced tubular damage.

RBP is more stable in urine than β_2 -microglobulin and appears to be of approximately equal sensitivity and specificity.

α_1 -Microglobulin is also more stable than β_2 -microglobulin in urine at room temperature and low urinary pH values.

Urinary NAG levels have been shown to correlate well with urinary cadmium levels in occupationally and environmentally exposed subjects. NAG levels can correlate better with urinary cadmium levels than β_2 -microglobulin at low cadmium exposures (for example urinary cadmium levels less than 10 µg/g creatinine).

Workplace exposure standard

The workplace exposure standard for cadmium and compounds (as Cd) is:

- eight hour time weighted average (TWA) of 0.01 mg/m³.

A physical examination and urinary testing may be indicated if the results of air monitoring indicate frequent or potentially high exposure (half of the TWA or above).

Removal from work

Where a medical examination indicates the worker is displaying symptoms of exposure to cadmium or where results of biological monitoring indicate exposure that may cause

⁶ DFG (2017) List of MAK and BAT Values.

adverse health effects, the registered medical practitioner should consider recommending the worker be removed from cadmium-related work.

When removal from cadmium-related work is indicated the registered medical practitioner must provide the PCBU with the following recommendations:

- the worker should be removed from work with cadmium, and
- the PCBU should review control measures and carry out recommended remedial action, if necessary.

As smoking may significantly contribute to urinary cadmium levels, it may be difficult to attribute the source of cadmium exposure in a worker who smokes solely to workplace exposure. In these circumstances, the above recommendations should still be made. Examination of air monitoring results would be included in the review of control measures, and may help ascertain the contribution of the workplace to overall cadmium exposure.

The worker must be informed of the results of health monitoring.

Return to work

Should a worker be removed from cadmium-related work, they must not return until the registered medical practitioner has:

- assessed them as medically fit, and
- made a recommendation to the PCBU that the worker can return to remediated cadmium-related work.

This assessment should take into consideration the clinical condition of the worker, the worker's urinary cadmium levels and remediation of the circumstances that led to the symptoms if possible.

At termination of work in a cadmium process

3. Final medical examination

A urine sample should be collected on the last day of the worker's final shift, and a final medical examination should be carried out at the same time or as soon as possible thereafter. Emphasis should be placed on the kidneys and respiratory system and any other organs or systems that were indicated during the health monitoring program.

Workers with health conditions or continuing symptoms due to cadmium exposure (including a history of raised β_2 -microglobulin) should be advised to seek continuing medical examinations as organised by the registered medical practitioner supervising the health monitoring program.

A health monitoring report from the registered medical practitioner should be provided to the PCBU as soon as practicable after the completion of the monitoring program, and at regular intervals for longer term or ongoing health monitoring processes. The report must include:

- the name and date of birth of the worker
- the name and registration number of the registered medical practitioner
- the name and address of the PCBU who commissioned the health monitoring
- the date of the health monitoring
- any test results that indicate whether or not the worker has been exposed to a hazardous chemical
- any advice that test results indicate that the worker may have contracted an injury, illness or disease as a result of carrying out the work that triggered the requirement for health monitoring

- any recommendation that the PCBU or undertaking take remedial measures, including whether the worker can continue to carry out the type of work that triggered the requirement for health monitoring, and
- whether medical counselling is required for the worker in relation to the work that triggered the requirement for health monitoring.

Potential health effects following exposure to cadmium

4. Route of occupational exposure

The primary route of cadmium exposure is via inhalation

5. Target organ/effect

The target organs and potential effects of cadmium exposure include:

Table 1 Target organs and potential effects of cadmium exposure

| Target organ | Effect |
|--------------------------|--|
| Respiratory tract | <ul style="list-style-type: none"> • Irritation • Pneumonitis • Pulmonary oedema • Metal fume fever • Chronic obstructive airways disease |
| Kidney | <ul style="list-style-type: none"> • Proximal renal tubular dysfunction • Proteinuria • Renal calculi |
| Bones | <ul style="list-style-type: none"> • Osteomalacia and osteoporosis • Increased incidence of fractures • Hyperphosphaturia • Decreased 1-hydroxylation of 25-hydroxy vitamin D in tubular cells |
| Liver | <ul style="list-style-type: none"> • Elevation of hepatic enzymes |

6. Acute effects

Cadmium is a respiratory irritant with initial symptoms of inhalational exposure including irritation of the throat and mucosa and cough. Exposure can then be followed by ‘metal fume fever’; a flu-like illness with symptoms of:

- metallic taste in the mouth
- headache
- fever and chills
- muscle aches
- chest tightness and cough
- sweating
- conjunctivitis
- rhinitis, and
- impaired sense of smell.

The symptoms occur within three to 10 hours of exposure and may resolve within 24 to 48 hours. However, from eight hours to seven days post-exposure, advanced pulmonary response symptoms may occur including:

- severe dyspnoea and wheezing
- chest pain and precordial constriction
- persistent cough
- weakness and malaise
- anorexia
- nausea
- diarrhoea
- nocturia
- abdominal pain
- haemoptysis, or
- prostration.

Acute cadmium poisoning has been reported among workers after exposure to the intensely irritating fume of heated cadmium. Symptoms are delayed for several hours to days and include:

- severe tracheobronchitis
- pneumonitis, or
- pulmonary oedema.

High exposures can be fatal and those who survive have permanent impaired lung function after a single exposure.

The mortality rate for the acute pulmonary disease is about 20 per cent. Average airborne concentrations responsible for fatal cases have been estimated at 50 mg/m³ for a period of approximately one hour. Relatively mild cases of inhalational exposure have symptoms that resemble metal fume fever.

7. Chronic effects

Long-term work-related exposure to cadmium has caused severe chronic effects, predominantly in the lungs and kidneys.

Cadmium accumulates primarily in the kidneys. Kidney effects are described as tubular dysfunction; commonly, the proximal renal tubules are affected, resulting in urinary excretion of low molecular weight proteins such as β_2 -microglobulin. Increased excretions are predictive of an acceleration of age-related decline of the glomerular filtration rate.

Cadmium-induced tubular proteinuria is irreversible, and continued exposure may lead to glomerular damage with decreased glomerular filtration rate. There have been reports of kidney damage in cadmium-exposed individuals whose urinary cadmium levels were less than the biological exposure standard.

Very high exposure to cadmium is known to be associated with osteoporosis, osteomalacia and increased fractures.

Lung changes are primarily characterised by chronic obstructive airway disease. Early minor changes in ventilatory function tests may progress with continued cadmium exposure to respiratory insufficiency.

8. Carcinogenicity

Most cadmium compounds have been classified as Category 1B carcinogens according to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) as they are presumed to cause cancer in humans.

There is some evidence long-term work-related exposure to cadmium may contribute to the development of lung cancer.

For further information on specific cadmium compounds, refer to Safe Work Australia's Hazardous Chemical Information system or the relevant safety data sheet.

9. GHS classification

Different cadmium compounds may have different health hazard classifications. The specific cadmium compound to which a worker is exposed will need to be reviewed to ensure appropriate identification of the health hazards. The relevant classification can be located on the safety data sheet of the product the worker is using.

Source documents

Agency for Toxic Substances and Disease Registry, [Case Studies in Environmental Medicine: Cadmium Toxicity](#).

Agency for Toxic Substances and Disease Registry; [Toxic Substances Portal - Cadmium](#).

American Conference of Governmental Industrial Hygienists (ACGIH) (2017) Documentation of the Threshold Limit Values and Biological Exposure Indices, Cadmium and inorganic compounds, 7th edition, Cincinnati.

Buchet, J.P., Lauwerys, R., Roels, H., Bernard, A., Bruaux, P., Claeys, F., Ducoffre, G., De Plaen, P., Staessen, J., Amery, A., Lijnen, P., Thijs, L., Rondia, D., Sartor, F., Saint Remy, A. and Nick, L. (1990) Renal effects of cadmium body burden of the general population, *Lancet* 336: 699-702.

Centers for Disease Control and Prevention; National Biomonitoring Program; Biomonitoring Summary; [Cadmium](#).

DFG (2017) List of MAK and BAT Values.

[Chemical analysis branch handbook, 9th Edition, Workplace and biological monitoring exposure analysis](#), WorkCover NSW (PDF 3.39MB).

EU Scientific Committee on Occupational Exposure Limits (2017) SCOEL/OPIN/336: Cadmium and its inorganic compounds. Opinion from the Scientific Committee on Occupational Exposure Limits.

Health and Safety Executive (United Kingdom) (1995) *Cadmium: Health and Safety Precautions*, Guidance Note EH 1, Health and Safety Executive, London.

Health and Safety Laboratory (UK) (2013) Guidance on Laboratory Techniques in Occupational Medicine (13th edition).

International Programme on Chemical Safety (1992) *Environmental Health Criteria 134: Cadmium*, International Programme on Chemical Safety, World Health Organization, Geneva.

Jarup, L. (2002) Cadmium overload and toxicity, *Nephrology Dialysis Transplantation* 17 (supplement 2): 35-39.

Lauwerys, R., Bernard, A., Buchet, J. P., Roels, H., Bruaux, P., Claeys, F. et al. (1991). Does Environmental Exposure to Cadmium Represent a Health Risk? Conclusions from the Cadmibel Study. *Acta Clinica Belgica*, 46(4): 219-225.

Lauwerys, R.R. and Hoet, P. (2001) *Industrial Chemical Exposure Guidelines for Biological Monitoring*, 3rd Ed, Lewis Publishers, Boca Raton.

Medical Research Council Committee on Research into Chronic Bronchitis (1986) *MRC Questionnaire on Respiratory Symptoms*, Medical Research Council.

Respiratory Disease Committee of the International Union Against Tuberculosis (1986) *IUAT Bronchial Symptoms Questionnaire*, International Union Against Tuberculosis.

Cadmium

Safe Work Australia (2013); [Workplace Exposure Standards for Airborne Contaminants](#) (PDF 873KB).

Safe Work Australia; [Hazardous Chemicals Information System](#).



Health monitoring report

Cadmium

This form contains confidential information and must not be disclosed to another person except in accordance with the Work Health and Safety Regulations or with consent of the worker

Health monitoring report – Cadmium

This health monitoring report is a confidential health record and must not be disclosed to another person except in accordance with the Work Health and Safety Regulations or with the consent of the worker.

There are two sections. Complete both sections and all questions as applicable.

Section 1 A copy of this section should be forwarded to the person conducting the business or undertaking (PCBU) who has engaged your services.

Section 2 may contain confidential health information. Information that is required to be given to the PCBU should be summarised in Section 1.

Section 1 – A copy of this section to be provided to the PCBU

Person conducting a business or undertaking

Company/organisation name: Click here to enter text.

Site address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.

Site Tel: Click here to enter text.

Site Fax: Click here to enter text.

Contact Name: Click here to enter text.

Other businesses or undertakings engaging the worker (include a separate section for each PCBU)

N/A

Company/organisation name: Click here to enter text.

Site address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.

Site Tel: Click here to enter text.

Site Fax: Click here to enter text.

Contact Name: Click here to enter text.

Worker details (tick all relevant boxes)

Surname: Click here to enter text.

Given names: Click here to enter text.

Date of birth: Click here to enter a date.

Sex: Male Female

Address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.

Current job: Click here to enter text.

Tel (H): Click here to enter text.

Mob: Click here to enter text.

Date started employment: Click here to enter a date.

Employment in cadmium risk work (tick all relevant boxes) (information provided by the PCBU)

New to cadmium work

This form contains confidential information and must not be disclosed to another person except in accordance with the Work Health and Safety Regulations or with consent of the worker

- New worker but not new to cadmium work
- Current worker continuing in cadmium work

Worked with cadmium since: [Click here to enter a date.](#)

Risk assessment completed: Yes No

Work environment assessment (tick all relevant boxes)
(information provided by the PCBU)

Date of assessment: [Click here to enter a date.](#)

- Smoker
- Ex-smoker
- Non-smoker

Cadmium industry/use

- Welding/Fabrication
- Electroplating
- Cadmium Manufacture/Extraction
- Battery Construction/Disposal
- Plastics/Paints
- Textile Industry
- Other (specify): [Click here to enter text.](#)

Other chemicals the worker may be exposed to: [Click here to enter text.](#)

Controls

| | | |
|---|---|-----------------------------|
| Wear gloves | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Wear eye protection | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Respirator use | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Respirator type | Click here to enter text. | |
| Local exhaust ventilation | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Overalls/work clothing | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Laundering by employer | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Wash basins and showers (with hot and cold water) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Other please specify | | |

Health monitoring results

Biological monitoring results

Include/attach test results that indicate whether or not the worker has been exposed

| Date | Tests performed | Recommended action or comment |
|---|---|---|
| Click here to enter text. | Click here to enter text. | Click here to enter text. |
| Click here to enter text. | Click here to enter text. | Click here to enter text. |
| Click here to enter text. | Click here to enter text. | Click here to enter text. |
| Click here to enter text. | Click here to enter text. | Click here to enter text. |

This form contains confidential information and must not be disclosed to another person except in accordance with the Work Health and Safety Regulations or with consent of the worker

Comments about health monitoring results (for example any early indications or diagnosis of injury, illness or disease): [Click here to enter text.](#)

Recommendations (by registered medical practitioner) (tick all relevant boxes)

Further/additional health monitoring for worker

- This is the final health monitoring report
- Repeat health assessment in [Click here to enter text.](#) month(s) / [Click here to enter text.](#) week(s)
- Counselling required
- Medical examination by registered medical practitioner. On [Click here to enter a date.](#)
- Referred to Medical Specialist (respiratory/dermatology/other). On [Click here to enter a date.](#)

Recommendations to PCBU

- The worker is suitable for work with cadmium
- Review workplace controls
- The worker should be removed from work with cadmium. On [Click here to enter a date.](#)
- The worker is fit to resume work. On [Click here to enter a date.](#)
- Biological monitoring results indicate unacceptably high exposure levels

Specialist's name: [Click here to enter text.](#)

Additional comments or recommendations: [Click here to enter text.](#)

Registered medical practitioner (responsible for supervising health monitoring)

Name: [Click here to enter text.](#)

Signature:

Date: [Click here to enter a date.](#)

Tel: [Click here to enter text.](#)

Fax: [Click here to enter text.](#)

Registration Number: [Click here to enter text.](#)

Medical Practice: [Click here to enter text.](#)

Address: [Click here to enter text.](#)

Suburb: [Click here to enter text.](#)

Postcode: [Click here to enter text.](#)

This form contains confidential information and must not be disclosed to another person except in accordance with the Work Health and Safety Regulations or with consent of the worker

Section 2 – This section to be retained by the registered medical practitioner

Person conducting a business or undertaking

Company/organisation name: Click here to enter text.

Site address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.

Site Tel: Click here to enter text.

Site Fax: Click here to enter text.

Contact Name: Click here to enter text.

Other businesses or undertakings engaging the worker

N/A

Company/organisation name: Click here to enter text.

Site address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.

Site Tel: Click here to enter text.

Site Fax: Click here to enter text.

Contact Name: Click here to enter text.

Worker details (tick all relevant boxes)

Surname: Click here to enter text.

Given names: Click here to enter text.

Date of birth: Click here to enter a date.

Sex: Male Female Pregnant/breastfeeding

Address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.

Current job: Click here to enter text.

Tel (H): Click here to enter text.

Mob: Click here to enter text.

Date started employment: Click here to enter a date.

Type of cadmium used (if known; please specify): Click here to enter text.

Past employment and exposure details (tick all relevant boxes)

Have you ever worked in any of the following jobs?

If you answered 'yes' to any of the questions, please advise if you experienced any symptoms such as cough or wheeze or asthma when working.

| | | | Comments (all 'yes' answers) |
|---|-----------------------------|------------------------------|------------------------------|
| Welding or oxy-cutting of cadmium alloy and cadmium plate | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Using cadmium-silver alloys for silver soldering or brazing | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Electroplating | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |

This form contains confidential information and must not be disclosed to another person except in accordance with the Work Health and Safety Regulations or with consent of the worker

| | | | Comments (all 'yes' answers) |
|---|-----------------------------|------------------------------|------------------------------|
| Manufacture of cadmium alloys | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Extraction of cadmium from mineral ore smelters | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Charging cadmium powders into process plant | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Grinding, discharging and packaging cadmium powders | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Working with nickel-cadmium batteries | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Manufacture and handling of paints and plastics containing cadmium pigments and the recycling of these plastics | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Textile production | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Other (please specify) | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |

General health questionnaire (tick all relevant boxes)

| | | | Comments (all 'yes' answers) |
|---|-----------------------------|------------------------------|------------------------------|
| Did you suffer any incapacity lasting two weeks or longer in the last two years | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Have you ever had any operations or accidents or been hospitalised for any reason | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Are you currently being treated by a doctor or other health professional for any illness or injury | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Are you currently receiving any medical treatment or taking any medications. Please detail. | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Do you currently smoke | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Do you practice personal hygiene at work, for example nail biting, frequency of hand washing, eating or smoking, clean shaven, shower and change into clean clothes at end of shift | <input type="checkbox"/> No | <input type="checkbox"/> Yes | |

Specific health questions (tick all relevant boxes)

| Do you have or have you ever had: | | | Comments (all 'yes' answers) |
|---|-----------------------------|------------------------------|------------------------------|
| Shortness of breath on exertion | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Wheezing, bronchitis or asthma now or in the past | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |

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| Do you have or have you ever had: | | | Comments (all 'yes' answers) |
|--|-----------------------------|------------------------------|------------------------------|
| Any other lung or respiratory conditions (emphysema, pneumonia or sinusitis) | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Allergies, hay fever, or allergic bronchitis | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Does anyone in your immediate family (blood relatives only) have asthma, hay fever or eczema | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Liver disease (including alcohol related or other hepatitis) | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Severe stomach pain or peptic ulcers | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Vomiting or passing blood | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Kidney or bladder disease | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Any form of cancer | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Fractured or broken bones | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Any other significant health conditions | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |

Registered medical practitioner to provide comments for any 'Yes' responses (reference Question number):

Click here to enter text.

Respiratory questionnaire (tick all relevant boxes)

| | Yes | No | Details |
|-------------------------|--------------------------|--------------------------|---|
| Cough and phlegm | | | |
| 1 | <input type="checkbox"/> | <input type="checkbox"/> | Do you usually cough first thing in the morning Click here to enter text. |
| 2 | <input type="checkbox"/> | <input type="checkbox"/> | Do you usually cough during the day or at night Click here to enter text. |
| If no go to Q9 | | | |
| 3 | <input type="checkbox"/> | <input type="checkbox"/> | Do you cough like this on most days for as much as three months of the year Click here to enter text. |
| 4 | <input type="checkbox"/> | <input type="checkbox"/> | Do you usually bring up phlegm from your chest first thing in the morning Click here to enter text. |
| 5 | <input type="checkbox"/> | <input type="checkbox"/> | Do you usually bring up phlegm from your chest at any other time of the day or night Click here to enter text. |
| If no go to Q9 | | | |

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| | | Yes | No | Details |
|--|---|--------------------------|--------------------------|--|
| 6 | Do you bring up phlegm like this on most days for as much as three months each year | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| 7 | In the past three years have you had a period of increased cough and phlegm lasting for three weeks or more | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| 8 | If Yes, have you had more than one such period | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| Breathlessness | | | | |
| 9 | Do you get short of breath when hurrying on level ground or walking up a slight hill | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| If no go to Q13 | | | | |
| 10 | Do you get short of breath walking with other people of your own age on level ground | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| 11 | Do you have to stop for breath when walking at your own pace on level ground | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| 12 | Have you at any time in the last 12 months been woken at night by an attack of shortness of breath | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| Wheezing and chest tightness | | | | |
| 13 | Have you had attacks of wheezing or whistling in your chest at any time in the last 12 months | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| 14 | Have you ever had attacks of shortness of breath with wheezing | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| 15 | If Yes, was your breathing absolutely normal between attacks | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| Smoking | | | | |
| 16 | Do you or did you smoke more than one cigarette/day; a cigar/week; two oz. pipe tobacco/month) | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| If no proceed to <i>General health assessment</i> | | | | |
| 17 | Do (did) you inhale smoke | <input type="checkbox"/> | <input type="checkbox"/> | If yes, indicate: <input type="checkbox"/> Slightly <input type="checkbox"/> Moderately <input type="checkbox"/> Deeply |

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| | Yes | No | Details |
|------------------------|--------------------------|--------------------------|---------------------------|
| 18 | | | Click here to enter text. |
| 19 | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| If no go to Q24 | | | |
| 20 | | | Click here to enter text. |
| 21 | | | Click here to enter text. |
| 22 | | | Click here to enter text. |
| 23 | | | Click here to enter text. |
| 24 | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. |
| If no go to Q27 | | | |
| 25 | | | Click here to enter text. |
| 26 | <input type="checkbox"/> | <input type="checkbox"/> | |
| 27 | <input type="checkbox"/> | <input type="checkbox"/> | |
| If no go to Q29 | | | |
| 28 | | | Click here to enter text. |
| 29 | <input type="checkbox"/> | <input type="checkbox"/> | |
| If no go to Q31 | | | |
| 30 | | | Click here to enter text. |
| 31 | <input type="checkbox"/> | <input type="checkbox"/> | |
| 32 | | | Click here to enter text. |

Registered medical practitioner to provide comments for any 'Yes' responses (reference Question number):

Click here to enter text.

General health assessment (if applicable)

Height: Click here to enter text. cm

Weight: Click here to enter text. kg

BP: Click here to enter text. / Click here to enter text. mmHg

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Urinalysis

Blood: Normal Abnormal

Protein: [Click here to enter text.](#)

Sugar: [Click here to enter text.](#)

Referred for further testing

No Yes

| Cardiovascular system | | | Medical comments (for all yes/abnormal) |
|---|---------------------------------|-----------------------------------|---|
| Blood pressure | <input type="checkbox"/> Normal | <input type="checkbox"/> Abnormal | Click here to enter text. |
| Heart rate | <input type="checkbox"/> Normal | <input type="checkbox"/> Abnormal | Click here to enter text. |
| Heart sounds | <input type="checkbox"/> Normal | <input type="checkbox"/> Abnormal | Click here to enter text. |
| Murmurs present | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Evidence of cardiac failure/oedema | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |
| Respiratory system | | | |
| Breathing normal and regular in character | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Click here to enter text. |
| Auscultation normal | <input type="checkbox"/> Yes | <input type="checkbox"/> No | Click here to enter text. |
| Signs of past/present respiratory disease | <input type="checkbox"/> No | <input type="checkbox"/> Yes | Click here to enter text. |

Spirometry

At least three technically acceptable manoeuvres should be obtained with the highest and second highest FEV₁ and FVC within 0.15 L (within 0.100 L for those with an FVC of equal to or less than 1.0 L)⁷. Use best result for FEV₁ and FVC, even if from different tests.

| | Actual | Predicted | % Predicted | |
|-------------------------------|---|---|---|---|
| FEV₁ | Click here to enter text. L/min | Click here to enter text. L/min | Click here to enter text. % | Click here to enter text. |
| FVC | Click here to enter text. L/min | Click here to enter text. L/min | Click here to enter text. % | Click here to enter text. |
| FEV₁/FVC | Click here to enter text. L/min | Click here to enter text. L/min | Click here to enter text. % | Click here to enter text. |
| | Yes | No | | |
| Spirometry quality acceptable | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. | |
| Spirometry normal | <input type="checkbox"/> | <input type="checkbox"/> | Click here to enter text. | |

Biological monitoring results

Include/attach at least the previous two test results (if available)

| Date | Tests performed | Recommended action or comment |
|---|---|---|
| Click here to enter a date. | Click here to enter text. | Click here to enter text. |

⁷ Miller MR, Hankinson J, et al, 'Standardisation of spirometry', Series 'ATS/ERS Task Force: Standardisation of Lung Function Testing', Brusasco V, Crapo R, Viegi G (eds), Number 2 in this series, Eur Respir J, vol. 26, pp 319-338, 2005. <http://www.thoracic.org/statements/resources/pfet/PFT2.pdf>.

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| Date | Tests performed | Recommended action or comment |
|-----------------------------|---------------------------|--------------------------------------|
| Click here to enter a date. | Click here to enter text. | Click here to enter text. |
| Click here to enter a date. | Click here to enter text. | Click here to enter text. |
| Click here to enter a date. | Click here to enter text. | Click here to enter text. |

Other medical history, family medical history, current medication, comments, tests or recommendations (use separate sheet if necessary)

Click here to enter text.

Registered medical practitioner (responsible for supervising health monitoring)

Name: Click here to enter text.

Signature:

Date: Click here to enter a date.

Tel: Click here to enter text.

Fax: Click here to enter text.

Registration Number: Click here to enter text.

Medical Practice: Click here to enter text.

Address: Click here to enter text.

Suburb: Click here to enter text.

Postcode: Click here to enter text.