

**Certification Standards****Biological Monitoring and Medical Surveillance****Introduction**

In most countries there is already legislation in place that lists the lead industries and business sectors that must maintain biological monitoring and medical surveillance and sets out the detailed requirements for the management of occupational lead exposure.

Where such legislation exists then the first requirement of Green Lead certification is that the company or organization complies fully with the prevailing national laws, regulations and codes of practice for the maintenance of biological monitoring and medical surveillance. In those instances where such legislation does exist the company or organization applying for Green Lead certification will supply the Green Lead Audit Team with a copy of the relevant legislation and written evidence of compliance at least three months before the certification audit.

In any event, the minimum requirements for Green Lead Certification is that biological monitoring and medical surveillance must be in place and operational for at least 12 months prior to the Green Lead Audit and is necessary in those places of work where employees or persons on the premises are exposed to lead in any form such that it may be ingested, inhaled or otherwise absorbed. The most common industrial processes which create lead dust, fume or vapor include:

- lead smelting, ULAB and scrap recovery, refining, alloying and casting
- lead-acid battery manufacture and breaking
- manufacturing lead compounds, including pigments and colors.
- working with metallic lead and alloys containing lead, e.g. soldering
- manufacturing leaded-glass and certain ceramics
- some painting of buildings; some spray-painting of vehicles
- hot cutting in demolition and dismantling operations
- Certain jewelry and badge enameling techniques

Where any national legislation requires lead in blood levels more stringent than the levels indicated below in the Green Lead Standard for either, action, suspension or medical removal, the levels defined in the national legislation will prevail. Similarly, sampling will be more frequent than the periods specified below for Green Lead Certification if national legislation dictates a shorter period between consecutive samples.

In addition, whereas the criteria for biological monitoring and medical surveillance for Green Lead certification is based on lead in blood, some countries also require additional testing for other indicators of lead absorption. In these cases, evidence of the additional sampling requirements will be a necessary part of the Green Lead Audit.

This Green Lead standard will also be subject to regular reviews to take account of new medical advice and changes in best practice, such as testing frequency.

This Green Lead standard also recognizes the confidentiality of the relationship between the medical officer/occupational nursing officer and the employee.

### **Blood lead sampling and analysis.**

#### **A. Frequency**

The owner or employer will make available to employees and any other person working on the site for more than one day, biological monitoring in the form of blood sampling according to the following schedule:

- a. At least every 6 months to each employee or person under contract to work at the site.
- b. At least every one month for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 µg/100 g of lead in blood for men and women of childbearing age who work in exposed areas. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/100 g of lead in blood.
- c. At least monthly during the first three months of employment, contractual work or during pregnancy.
- d. Monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.

#### **B. Follow-up blood sampling tests.**

Whenever the results of a blood test indicate that an employee's lead in blood level exceeds the numerical criterion for medical removal under either national legislation or paragraph A.b. of this section, the employer shall provide a second blood sampling test within two weeks after the date that the employee receives the results of the first blood sampling test. During the period between the first and follow-up blood test the employee's place of work will be inspected to ascertain if there are changes in the operation or shortcomings in the control measures that might have contributed to an increase in lead in blood levels.

C. Accuracy of lead in blood level sampling and analysis.

Lead in blood level sampling and analysis shall have an accuracy within plus or minus 15 percent or 6 µg/100 ml of the lead in blood, whichever is greater, and shall only be conducted by an accredited laboratory licensed by such bodies as the Center for Disease Control, United States Department of Health, Education and Welfare (CDC). An accredited laboratory, in the context of Green Lead certification, is one that has received a satisfactory grade in lead in blood proficiency testing from the CDC or equivalent body in the twelve months prior to the Green Lead Audit.

D. *Employee notification.*

- a. The employer shall arrange, and on occasions this will be through the medical officer, to notify in writing each employee of their lead in blood results within five working days/shifts.
- b. In addition, those employees whose lead in blood level exceeds 40 µg/100 g for men and are above a level that causes concern to the medical officer in the case of women of child bearing age, will also be advised in writing that their lead in blood level is above the standard for occupational exposure and that a second test must be taken within two weeks. The notice will also advise the employee that they must:
  - Have their respiratory equipment checked for fit, in the case of the neoprene type of respirator and efficiency in the case of the “airflow” helmet type of respirator.
  - Attend an interview with an occupational nursing officer familiar with the lead operations who will discuss personal control measures, such as washing hands prior to eating, smoking habits and any other activities outside work, such as demolition or hobbies using leaded materials, such as shooting, that might be a contributing factor in raising lead in blood levels.
- c. The employee must also be advised at this time that if the second test is above the standard for occupational exposure then action will be taken and the employee removed from working in a job where they are exposed to lead in any form such that it may be ingested, inhaled or otherwise absorbed.

The period of removal will be for a minimum of four weeks and at the end of the fourth week a sample of blood will be taken and analyzed.

If the employee's lead in blood level is below 40 µg/100 g of lead in blood for men and at a level that is determined by the medical officer to be safe for women of child bearing age, then a second sample will be taken 7 days after the first sample and if this result is also below 40 µg/100 g of lead in blood for men and at a satisfactory level for women of child bearing age, then the employee can return to normal duties.

However, if the sample of blood taken four weeks after the initial removal is above 40 µg/100 g of lead in blood for men and is still a cause for concern to the medical officer in the case of women of child bearing age, then the employee will remain suspended from normal duties and confined to work where they are not exposed to lead.

This regime of removal and testing will continue until two consecutive blood samples and analyses indicate a blood lead level below 40 µg/100 g of lead in blood for men and level deemed safe by the medical officer for women of child bearing age, or for a maximum period of eighteen months whichever is the sooner.

- d. Employees removed from normal duties under the terms of the Green Lead standard outlined in paragraphs D. b. and D.c. above, will retain their full wages and benefits for the duration of their removal provided they comply with the sampling requirements and have their respirators inspected.

#### *E. Medical examinations and consultations*

##### *E.i Frequency.*

The employer shall make available medical examinations and consultations to every employee covered under the Green Lead standard following this schedule:

- a. At least annually for each employee who has had a lead in blood result in the preceding 12 months at or above 40 µ g/100 g of lead in blood for men and all women of child bearing age;
- b. Prior to assignment for each employee assigned for the first time to an area in which the airborne concentrations of lead exceed the prevailing statutory limits for exposure without wearing respiratory equipment at all times. These areas will be enclosed or encapsulated parts of the process where manual activities are not the norm and entry is restricted for maintenance only. Such areas will typically be, inside baghouses or filter plants, oxide storage silos, inside brick lined furnaces.

- c. As soon as possible, upon notification by an employee or their supervisor that an employee has developed signs or symptoms commonly associated with lead intoxication, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use;
- d. As soon as possible, upon notification by an employee that they are pregnant.
- e. As medically appropriate, for a period approaching eighteen months, especially for purposes of protecting reproductive function of employees.

#### E.ii Content.

Medical examinations shall include the following elements:

- a. A detailed work record and medical history, with particular attention to past levels of lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and any past gastrointestinal, hematological, renal, cardiovascular, reproductive and neurological problems;
- b. A thorough physical examination, with particular attention to teeth, gums, hematological, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection is being or will be used in the next twelve months;
- c. A blood pressure measurement;
- d. A blood sample and analysis which determines:
  - Lead in blood level;
  - Hemoglobin and red cell indices.
  - Any laboratory or other test which the examining physician deems necessary by sound medical practice.

When the results of all the tests are available, the appointed medical officer will interview the employee and explain the significance of the results. Where the results indicate that there is or might be a lead exposure issue, the employee will be advised of the necessary action to take to resolve the real or potential problem. The outcome of the interview will be confirmed in writing to the employee.

The immediate supervisor will be advised if there are operational consequences arising from the results of the medical examination.

All other aspects of the medical examination will be strictly confidential.

E.iii Second medical opinion.

- a. The employer shall notify an employee of the right to seek a second medical opinion after each occasion that a company or government appointed physician conducts a medical examination or consultation in pursuit of the biological monitoring and medical surveillance program.
- b. If the employee decides to seek a second opinion, they must inform the employer and the appointed medical officer.
- c. In the event that the conclusions, determinations or recommendations of the second doctor differ from those of the appointed medical officer, then the employer and the employee will secure conditions to permit the two doctors to resolve any differences in medical opinion, even if that means engaging or seeking advice from a third doctor.

F. Medical Removal Protection

a. *Medical Removal Protection – Former Job Status*

At the end of medical removal or suspension from normal duties, the employer must return the employee to his or her former job status, although not necessarily the job the employee was undertaking prior to the removal. At the same time, there must be an end to any special protective measures provided to the employee, and any limitations placed upon the employee, consistent with the medical findings, determinations, or recommendations of any of the doctors who may have reviewed the employee's health status, with one exception. The exception is when an employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

b. *Medical Removal Protection - Protection of employment benefits;*

The employer shall provide to an employee up to eighteen months of medical removal protection benefits, that is, earnings, seniority and other employment rights and benefits, such as pension and sickness provisions, to which the employee was eligible at the time of removal.

- c. *Medical Removal Protection - Employees whose lead in blood levels do not adequately decline within 18 months of removal.*

The employer shall take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within a period of past eighteen (18) months of removal:

- The employer shall make available to the employee a medical examination to obtain a final medical determination with respect to the employee's lead in blood levels and the prospects for a return to normal duties;
  - If the employee is deemed in a suitable condition to return to normal duties, then the provisions set out in F.a. will apply.
  - If the final medical determination is that the employee is incapable of ever safely returning to his or her former job then the employer is no longer bound to maintain the employee's earnings and other benefits. However, the employer is bound to offer the employee useful and gainful employment within the organization.
  - If the employee declines any offer of alternative employment made by the employer under the terms outlined in the paragraph above, then the employee can opt to leave employment with full severance pay as set out in the employment contract.

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