

مركز أبوظبي للسلامة والصحة المهنية ABU DHABI OCCUPATIONAL SAFETY AND HEALTH CENTER

Abu Dhabi Occupational Safety and Health System Framework

(OSHAD-SF)

Code of Practice

CoP I.2 – Lead Exposure Management

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Important Note:

(Document Republished for Continued Implementation under Abu Dhabi Public Health Center)

(إعادة نشر الوثيقة لاستمرار التطبيق بإشراف مركز أبوظبى للصحة العامة)









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1. Introduction

- (a) This Code of Practice (CoP) applies to all employers within the Emirate of Abu Dhabi. This CoP is designed to incorporate requirements set by UAE and Abu Dhabi regulatory authorities. If requirements of this document conflict with requirements set by another regulatory authority, employers are required to follow the more stringent requirement.
- (b) This CoP establishes the requirements and control measures to ensure that the risks associated with the exposure to lead are minimized and that control measures are implemented in accordance with the hierarchy of controls and those control measures are taken to prevent injury, illness and disease to persons who might be exposed to risks arising from those activities.
- (c) It covers all worksites where person(s) could have an exposure to airborne lead at any level. Worksites include, but are not limited to construction, maintenance, manufacturing, recycling, surface preparation, sandblasting, and painting.



2. Training and Competency

- (a) Employers shall ensure that OSH training complies with the requirements of:
 - (i) OSHAD-SF Element 5 Training, Awareness and Competency;
 - (ii) OSHAD-SF Mechanism 7.0 OSH Professional Entity Registration; and
 - (iii) OSHAD-SF– Mechanism 8.0 OSH Practitioner Registration.
- (b) Employers that have person(s) working in areas where there is a potential for lead exposures shall provide training to those persons prior to their starting work in an area of potential exposure and annually thereafter on:
 - (i) how to read Safety Data Sheet (SDS) and the information that can be gained from a SDS;
 - (iv) health hazards associated with acute and chronic exposure to lead;
 - (v) signs and symptoms of acute and chronic lead exposure;
 - (vi) locations and any material used at the worksite that could contribute to a lead exposure;
 - (vii) warning signs and labels;
 - (viii) allowable exposure limits of lead exposure as set by OSHAD-SF Occupational Standards and Guideline Values;
 - (ix) work methods that shall be used to prevent lead exposure;
 - (x) personal protective equipment (PPE) requirements and maintenance procedures for the worksite, in compliance with OSHAD-SF – CoP 2.0 – Personal Protective Equipment;
 - (xi) use of hygiene facilities; and
 - (xii) requirements of employer's lead exposure control program and medical monitoring program, in compliance with OSHAD-SF CoP 5.0 Medical Surveillance.
- (c) Training shall be conducted in a manner and language that is appropriate to the persons receiving the training, as per OSHAD-SF Element 5 Training, Awareness and Competency.
- (d) Employers shall maintain a record of the required training that contains the following:
 - (i) name and ID number;
 - (ii) Emirates ID number of the employee;
 - (iii) subject(s) of training;
 - (iv) date(s) of training; and
 - (v) person providing the training;



3. Requirements

3.1 Roles and Responsibilities

3.1.1 Employer

- (a) Employers shall undertake their roles and responsibilities in accordance with the general requirements of OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation Section 3.2.5
- (b) Employers with worksites where lead is present or suspected to be present shall:
 - (i) ensure no person(s) is exposed to lead at concentrations greater than the requirements set by OSHAD-SF Occupational Standards and Guideline Values;
 - (ii) perform a risk assessment in accordance with OSHAD-SF Element 2 Risk Management to determine all work locations with the potential for lead exposure;
 - (iii) put control measures in place that will eliminate or reduce exposures to lead to levels as low as reasonably practicable (ALARP);
 - (iv) develop a written Lead Exposure Control and Medical Monitoring Program; and
 - (v) implement a process to review the worksite at a minimum annually to identify any changes in the worksite or new potential lead exposures.
- (c) Managers and Supervisors in areas where lead is present or suspected shall ensure the requirements of the employer's lead exposure control and medical monitoring program are followed.

3.1.2 Employees

- (a) Employees shall undertake their roles and responsibilities in accordance with the general requirements of OSHAD-SF – Element 1 – Roles, Responsibilities and Self-Regulation Section 3.2.7.
- (b) Employees shall report any activity or defect relating to lead exposure which they believe is reasonably practicable to endanger their safety or that of another person.
- (c) Employees shall use appropriate equipment or safety devices provided for working with lead by employers in accordance with any training or instruction received in the use of the work equipment or device concerned.

3.2 Planning and Assessment

- (a) Employers shall evaluate each site or operation to determine if lead exposure hazards are present and the workplace shall be assessed using risk management practices as required by OSHAD-SF Element 2 Risk Management.
- (b) The risk assessment shall follow the hierarchy of controls as described within section 3.2(e) of this CoP.
- (c) Where lead exposure hazards are present, procedures shall be developed, documented and utilized for the control of those lead exposure hazards.



- (d) Employers shall ensure:
 - (i) assessment of the various risks and establishment of systems of work which are safe to other person(s), contractors and the public;
 - (ii) that effective procedures and control measures are in place, and are implemented in order to manage lead exposure activities;
 - (iii) that the management of lead exposure requirements for any relevant contracted works are included in the Pre-Tender Health and Safety Plan in accordance with OSHAD-SF – Element 3 – Contractor Management, and
 - (iv) that associated safe systems of work, and site rules are included in the Safety and Health Construction Management Plan (OSH-CMP) in the case of the Building and Construction Sector in accordance with OSHAD-SF – CoP 53.0 – OSH Management During "Construction Work".
- (e) Hierarchy of Control:

When undertaking a risk assessment for tasks that have the potential for lead exposure, the following hierarchy of controls shall be adopted:

- (i) **Avoid:** ensure that no work is done that will expose person(s) to a lead hazard if it is safe and reasonably practicable to do so;
- (ii) Prevent lead exposures: where it is not reasonably practicable to avoid performing work that has the potential to expose person(s) to lead, employers shall ensure that appropriate control measures are in place to prevent persons from being exposed to lead; and
- (iii) Minimize the exposures to lead to levels below the Permissible Exposure Limit (PEL): employers shall ensure that where it is not reasonably practicable to prevent exposures to lead that control measures are implemented to reduce the exposures to a level below the PEL.

3.3 Lead Exposure Control and Medical Monitoring Program

- (a) At a minimum, the lead exposure control and medical surveillance programs shall address the following:
 - (i) identification of person(s) who are exposed to 50% of the PEL as set by the OSHAD-SF– Occupational Standards and Guideline Values;
 - (ii) person(s) exposed to lead levels at or greater than 50% of the PEL shall be placed in the lead exposure control and medical surveillance program;
 - (iii) exposure monitoring program to comply with OSHAD-SF CoP 5.0 Medical Surveillance;
 - (iv) person(s) notification of exposure monitoring results;
 - (v) methods of compliance to ensure no person(s) is exposed to lead above the requirements set in OSHAD-SF Occupational Standards and Guideline Values;
 - (vi) PPE to include respiratory protection and work clothing;
 - (vii) control measures and housekeeping;
 - (viii) hygiene facilities and practices;



- (ix) medical surveillance to include identifying a physician that has knowledge and experience working with lead exposure cases;
- (x) medical removal protection;
- (xi) person(s) information and training;
- (xii) record keeping; and
- (xiii) procedure to review the lead exposure control program annually to ensure compliance with requirements.
- (b) The lead exposure control and medical surveillance program shall be reviewed, and if required updated, when there are changes at the worksite that could affect exposures to lead.
- (c) The lead exposure control and medical surveillance program shall be reviewed at a minimum annually to identify any changes needed to work practices, changes in the worksite, or new potential lead exposures.

3.4 Exposure Monitoring

- (a) For the purposes of this section, person(s) exposure is that exposure which would occur if the person(s) was not using any respirator or other PPE.
- (b) For the purposes of this section, Action Level is any lead concentration above 50% of the requirements set in OSHAD-SF – Occupational Standards and Guideline Values, but below the PEL.
- (c) Employers shall ensure samples are taken and analyzed in accordance with an internationally recognized sampling method using the appropriate method and sampling strategy. (e.g. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods or Methods for the Determination of Hazardous Materials Lead and Inorganic Compounds of Lead in Air published by the Health and Safety Executive.) Personnel taking samples shall be trained and competent in the appropriate methods for sampling in accordance with the method and sampling strategy used.
- (d) Employers shall collect full shift personal samples including at least one sample for each shift for each job classification in each work area. Full shift personal samples shall be representative of the monitored person(s) regular, daily exposure to lead.
- (e) Monitoring for initial determination of lead exposures may be limited to a representative sample of the exposed person(s) who employers reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.
- (f) Where an initial determination shows the possibility of any person(s) exposure at or above the Action Level for lead, employers shall conduct monitoring which is representative of the exposure for each person(s) in the workplace who is exposed to lead.
- (g) If initial monitoring reveals person(s) exposure to be below the Action Level for lead, the measurements need not be repeated unless there is a change in worksite conditions that could affect person(s) exposure to lead.
- (h) If the initial determination or subsequent monitoring reveals person(s) exposure to be at or above the Action Level for lead, but below the PEL employers shall repeat monitoring in



accordance with Section 3.4 (c) and (d) of this CoP at least every 6 months. Employers shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the Action Level at which time the employer may discontinue monitoring for that person(s) unless there is a change in worksite conditions that could affect person(s) exposure to lead.

- (i) If the initial monitoring reveals that person(s) exposure is above the PEL employers shall repeat monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least 7 days apart, are below the PEL but at or above the Action Level at which time the employer shall repeat monitoring for that person(s) at the frequency specified in paragraph 3.4(h) of this CoP, unless there is a change in worksite conditions that could affect person(s) exposure to lead.
- (j) Employers shall use a method of monitoring and analysis which has an accuracy (to a confidence level of 95%) of not less than plus or minus 20 percent for airborne concentrations of lead equal to or greater than Action Level.
- (k) Employers shall maintain a record of the exposure monitoring sampling strategies, analytical results, analysis of the data, and suggested corrective actions. Employers shall ensure that a professional with expertise in performing exposure monitoring (e.g. Certified Industrial Hygienist from the American Board of Industrial Hygiene, Certified Occupational Hygienist from the Australian Institute of Occupational Hygiene, Faculty of Occupational Hygiene from the British Occupational Hygiene Society, Registered Occupational Hygienist from the Canadian Registration Board of Occupational Hygienists, or similar accreditation organization), reviews and approves all exposure monitoring data and associated reports. The professional reviewing the laboratory analysis does not have to be a direct employee of the employer (e.g. consultant, laboratory performing the analysis, etc.).

3.5 Person(s) Notification

- (a) Employers shall, within 15 working days after the receipt of the results of any monitoring performed under this section, notify each affected person(s) of these results either individually in writing or by posting the results in an appropriate location that is accessible to affected person(s). Correspondence shall be in a language and method that is understood fully by the affected person(s).
- (b) Whenever the results indicate that the representative person(s) exposure, without regard to respirators, exceeds the PEL, employers shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit. The written notice shall be in a language and method that is understood by the affected person(s).

3.6 Methods of Compliance

(a) Where any person(s) is exposed to lead above the PEL for more than 30 days per year, employers shall implement engineering and work practice control measures (including administrative control measures) to reduce person(s) exposure to lead below the PEL, except to the extent that the employer can demonstrate that such control measures are not reasonably practicable. Wherever the engineering and work practice control measures which can be instituted are not sufficient to reduce person(s) exposure to or below the PEL, the employer shall nonetheless use them to reduce exposures to the as low as reasonably practicable level.



- (b) Where any person(s) is exposed to lead above the PEL, but for 30 days or less per year, employers shall implement engineering control measures to reduce exposures to 200 ug/m³, but thereafter shall implement any combination of engineering, work practice (including administrative control measures), and respiratory control measures to reduce and maintain person(s) exposure to lead to or below the PEL.
- (c) Where engineering and work practice control measures do not reduce person(s) exposure to or below the PEL, employers shall supplement these control measures with respirators in accordance with OSHAD-SF CoP 2.0 Personal Protective Equipment.

3.7 Personal Protective Equipment

- (a) Employers shall provide respiratory protection in accordance with OSHAD-SF CoP 2.0 Personal Protective Equipment.
- (b) Employers shall provide person(s) with full face-piece respirators instead of half mask respirators for protection against lead aerosols that cause eye or skin irritation at the use concentrations.
- (c) If a person(s) is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, employers shall provide at no cost to the person(s) and assure that the person(s) uses appropriate protective work clothing and equipment such as, but not limited to:
 - (i) coveralls or similar full-body work clothing;
 - (ii) gloves, hats, and shoes or disposable shoe coverlets; and
 - (iii) face-shields, vented goggles, or other appropriate protective equipment which complies with OSHAD-SF CoP 2.0 Personal Protective Equipment.
- (d) Employers shall provide for the cleaning, laundering, or disposal of protective clothing and equipment.
- (e) Employers shall assure that contaminated clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container which prevents dispersion of lead outside the container.
- (f) Employers shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.
- (g) Containers containing lead contaminated Clothing and PPE that will be laundered shall be labelled as: "CAUTION: CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. DISPOSE OF LEAD CONTAMNIATED WASH WATER IN ACCORDANCE WITH CENTER FOR WASTE MANAGEMENT – ABU DHABI REQUIRMENTS".
- (h) Containers containing lead contaminated Clothing and PPE that will be sent for disposal shall be labelled as: "CAUTION: CLOTHING AND EQUIPMENT CONTAMINATED WITH LEAD. DISPOSE OF ITEMS IN ACCORDANCE WITH CENTER FOR WASTE MANAGEMENT – ABU DHABI REQUIRMENTS".
- (i) Employers shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.



3.8 Housekeeping

- (a) Surfaces shall be maintained as free as reasonably practicable of accumulations of lead by use of wet cleaning methods or a vacuum that meets the requirements of Section 3.8(c) of this CoP.
- (b) Floors and other surfaces where lead accumulates shall not be cleaned by use of compressed air, dry sweeping, or other methods that could cause the lead to become airborne.
- (c) When vacuuming methods are selected, the vacuums shall be used and emptied in a manner which minimized the re-entry of lead into the work place. Vacuums shall be equipped with High Efficiency Particulate Air (HEPA) filters to prevent lead re-entry into the work place.
- (d) Lead contaminated debris, waste, filters, and wash water shall be disposed in accordance with applicable hazardous waste regulations and OSHAD-SF COP 54.0 Waste Management.
- (e) All equipment (HEPA vacuums, scrapers, screwdrivers, etc.) shall be cleaned at the end of each day's work and when work is completed prior to leaving the work area.

3.9 Hygiene Facilities and Practices

- (a) Employers shall ensure that in areas where person(s) are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in clean areas like designated change rooms, lunchrooms, and showers.
- (b) Employers shall provide sanitary shower facilities for person(s) who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators. Employers shall require person(s) to shower at the end of the work shift.
- (c) Employers shall ensure that person(s) who are required to shower do not leave the workplace wearing any clothing or equipment worn during the work shift.
- (d) Employers shall provide lunchroom facilities with hand washing facilities (including soap and disposable towels) for person(s) who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.
- (e) Employers shall post signs in the lunchroom facilities reminding person(s) to wash their hands and face before they eat, drink, smoke, or apply cosmetics. Signs shall be in appropriate language(s) of person(s) using the facility.
- (f) Employers shall ensure that person(s) do not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, down draft booth, or other cleaning method.



3.10 Medical Surveillance

- (a) Employers shall institute a medical surveillance program for all person(s) who are or may be exposed above the action level for more than 30 days per year, as per OSHAD-SF- CoP 5.0 – Medical Surveillance.
- (b) Employers shall ensure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.
- (c) Employers shall conduct baseline medical monitoring for new person(s). Baseline medical monitoring will help employers with early detection of increases in the person(s) blood lead levels and identify any person(s) that has been exposed to lead from a previous employer.
- (d) Employers shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin (ZPP) levels to each person(s) as per the requirements of this document on the following schedule:
 - (i) every six months if blood lead levels are below 40 ug/100 g of whole blood;
 - (ii) every two months for each person(s) whose last blood sampling indicated a blood lead level at or above 40 ug/100 g of whole blood; and
 - (iii) at a minimum monthly during the removal period of each person(s) removed from exposure to lead due to an elevated blood lead level.
- (e) Whenever the results of a blood lead level test indicate that a person(s) blood lead level exceeds the numerical criterion for medical removal under Section 3.12 of this document, employers shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.
- (f) Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a confidence level of 95 per cent) within plus or minus 15 per cent or 6 ug/100 ml, whichever is greater, and shall be conducted by a licensed laboratory which has received a satisfactory grade in blood lead proficiency testing from an accrediting organization in the prior twelve months and if in the Emirate of Abu Dhabi from the Emirates Authority for Standardization and Metrology (ESMA).
- (g) Within five working days after the receipt of biological monitoring results, employers shall notify in writing each person(s) whose blood lead level exceeds 40 ug/100 g. Notification shall be made in a language and method understood by the person(s).

3.11 Medical Examinations and Consultations

- (a) Employers shall make available medical examinations and consultations to each person(s) covered under Section 3.10 of this document using the following schedule:
 - (i) prior to assignment for each person(s) being assigned for the first time to an area in which airborne concentrations of lead are at or above the action level;
 - (ii) as soon as reasonably practicable, upon notification by a person(s) either that the person(s) has developed signs or symptoms commonly associated with lead intoxication, that the person(s) desires medical advice concerning the effects of current or past exposure to lead on the person(s) ability to procreate a healthy child, or that the person(s) has demonstrated difficulty in breathing during a respirator fitting test or during use;



- (iii) at least annually for each person(s) for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood lead level at or above 40ug/100g; and
- (iv) as medically appropriate for each person(s) either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.
- (b) Employers shall ensure that all medical examinations and procedures are performed by or under the supervision of a licensed physician (by HAAD).
- (c) Medical examinations shall include:
 - detailed work history and a medical history, with particular attention to past lead exposure (occupational and non-occupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;
 - thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status shall be evaluated if respiratory protection shall be used;
 - (iii) blood pressure;
 - (iv) blood sample and analysis which determines blood lead level, haemoglobin and hematocrit determinations, red cell indices, examination of peripheral smear morphology, zinc protoporphyrin, blood urea nitrogen, and serum creatinine;
 - (v) routine urinalysis with microscopic examination; and
 - (vi) any other laboratory or other test which the examining physician deems required by sound medical practice.
- (d) Employers shall obtain a copy of a written medical opinion and keep it in the person(s) file. A copy shall also be provided to the person(s).

3.12 Medical Removal Protection

- (a) Employers shall remove a person(s) from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to Section 3.11 of this CoP indicates that the person(s) blood lead level is at or above 60 ug/100 g of whole blood.
- (b) Employers shall remove a person(s) from work having an exposure to lead at or above the action level on each occasion that the average of the last three blood sampling tests conducted pursuant to Section 3.11 of this CoP (or the average of all blood sampling tests conducted over the previous six (6) months, whichever is longer) indicates that the person(s) blood lead level is at or above 50 ug/100 g of whole blood; provided, however, that a person(s) need not be removed if the last blood sampling test indicates a blood lead level at or below 40 ug/100 g of whole blood.
- (c) Employers shall remove a person(s) from work having an exposure to lead at or above the action level on each occasion that a final medical determination results in a medical finding, determination, or opinion that the person(s) has a detected medical condition which places the person(s) at increased risk of material impairment to health from exposure to lead.



(d) Person(s) who have been medically removed due to lead exposure shall be rehabilitated in compliance with OSHAD-SF – CoP 10.0 – Rehabilitation and Return to Work.

3.13 Signage

(a) Employers shall post the following warning signs in each work area where the Action Level is exceeded. Signs shall be in the language of person(s) working in the area and in accordance with OSHAD-SF – CoP 17.0 – Safety Signage and Signals.

"WARNING LEAD WORK AREA POISON NO SMOKING OR EATING"



4. Record Keeping

- (a) Exposure monitoring, medical surveillance, examination and consultation records shall be kept for a minimum of term of employment plus 30 years, as per OSHAD-SF Element 9 Compliance and Management Review and OSHAD-SF 5.0 Medical Surveillance.
- (b) All compliance and training records shall be kept for a minimum of five (5) years, as per *AD* OSHAD-SF Element 9 Compliance and Management Review.



5. References

- OSHAD-SF Element 1 Roles, Responsibilities and Self-Regulation
- OSHAD-SF Element 2 Risk Management
- OSHAD-SF Element 9 Compliance and Management Review
- OSHAD-SF- CoP 2.0 Personal Protective Equipment
- OSHAD-SF CoP 5.0 Medical Surveillance
- OSHAD-SF CoP 10.0 Rehabilitation and Return to Work
- OSHAD-SF CoP 17.0 Safety Signage and Signals
- OSHAD-SF CoP 53.0 OSH Management during "Construction Work
- National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods
- NIOSH Workplace Safety & Health Topics Lead, <u>http://www.cdc.gov/niosh/topics/lead/</u>
- Methods for the Determination of Hazardous Substances Lead and inorganic compounds of lead in air published by the Health and Safety Executive
- United States Occupational Safety and Health Administration (OSHA) 29 CFR 1910.1025
- OSHA Safety and Health Topics Lead, <u>http://www.osha.gov/SLTC/lead/index.html</u>
- Control of Lead at Work (Third Edition), Health and Safety Executive
- Industrial Hygiene Lead, SAIF Corporation, <u>http://www.saif.com/_files/safetyhealthguides/ss-412.pdf</u>



6. Document Amendment Record

Version	Revision Date	Description of Amendment	Page/s Affected
2.0	Feb 2012	First Issue	N/A
	1 st July 2016	Change of Logo	All
		Change from AD EHS Center to OSHAD	Throughout
3.0		Change of document title: AD EHSMS RF to OSHAD-SF	Throughout
		Acknowledgements deleted	2/3
		Preface Deleted	4
	2 nd July 2017	Clause 2(d) added	4
3.1		Minor editorial changes throughout the document without changing requirements.	Throughout

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