



2600SEG230 LEAD EXPOSURE STANDARD

1.0 PURPOSE

The purpose of this standard is to protect employees against lead exposure hazards. High lead levels in the blood can cause chronic health problems such as injury to the nervous, blood, urinary, and reproductive systems.

2.0 BACKGROUND

This standard supersedes the safety policy and procedures in Appendix I, Chapter 790, of the former Panama Canal Commission Personnel Manual (PCPM).

3.0 SCOPE

This Standard shall apply to all Panama Canal Authority employees, contractors, and third parties in facilities, industrial shops and areas under PCA responsibility performing activities with lead.

4.0 LEGAL BASIS

This Standard is established pursuant to Agreement No. 12 of the Board of Directors of the Panama Canal Authority (ACP), Safety and Health Regulations, Chapter 1, Articles 1, 8, and 16; Panama Ministry of Health Executive Resolution No. 255 of December 18, 1996; Resolution 124 of March 20, 2001, issued by the General Bureau of Industrial Standards and Technology of the Panama Ministry of Commerce and Industries on "Hygiene and Safety Conditions for the Control of Atmospheric Pollution in Working Environments by Chemical Substances;" Technical Regulation DGNTI-COPANIT 43-2001; and Directive AD-2004-04 from the Administrator of the Panama Canal Authority.

5.0 DEFINITIONS

5.1 Lead-containing Substances: Substances with a content of lead of more than 0.1 mg/cm² or 0.06 % of solids in its sample.

5.2 Hazardous Lead Waste: Lead waste with a TCLP of more than 5 mg/liter.

5.3 Toxicity Characteristic Leaching Procedure (TCLP): A laboratory test designed to determine the potential of lead toxicity to contaminate underground water. This test is also used to determine the effectiveness of the treatment applied to lead waste.

6.0 GENERAL

6.1 WORK PRACTICES

6.1.1 Management shall request the Safety and Industrial Hygiene Unit (RSHH) to conduct a risk analysis for all operations and work where lead is handled.

6.1.2 Prior to removing all existing paint, the Division responsible for the project shall coordinate with RSHH any on site testing to determine lead content.

6.1.3 Management and contractors shall provide full personal protection equipment, including protective clothing, according to Standards 2600SEG205, 210, 213, and 215; and Standards 2600SEG106, 109 and 141 as applicable, as required by the RSHH. Also, see item 6.3.

6.1.4 The work area shall be prepared to contain any contamination and minimize the impact of lead on the environment and any future occupants. Where feasible, canvas or plastic



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sheeting shall be used to cover the ground, floor, furniture, equipment, and other items, as well as to facilitate the collection of the material loosened during removal. In the case of occupied buildings, RSHS shall be consulted regarding the preparation of the work area.

6.1.5 All engineering, administrative, and protection controls shall be used to maintain personal employee exposure levels below the permissible exposure limit established by RSHS.

6.1.6 At the beginning of every work shift, supervisors shall inspect all removal equipment, including vacuum cleaners, to ensure that they are in good working condition.

6.1.7 Prohibited Methods of Paint Removal

6.1.7.1 Paint removal by means of flame or torch heating is prohibited. Prior to cutting or welding any surface covered with lead paint, paint layers on a minimum of four inches on each side of the cutting line must be removed.

6.1.7.2 The use of sandblasters or power sanders is prohibited for the removal of paint without using venting systems for the on-site collection of paint dust to prevent its release into the environment.

6.1.7.3 Chemical paint removal with methylene chloride is prohibited.

6.1.7.4 Dry scraping is prohibited (except in limited areas).

6.1.7.5 Hydroblasting is prohibited.

6.1.8 Chemical paint stripping and wet scraping are the methods recommended for paint removal.

6.1.9 Personal Hygiene Facilities and Practices

6.1.9.1 The following personal hygiene facilities shall be provided at work sites:

(a) Locker Rooms: A clean area shall be provided where workers may keep their street clothes, as well as another separate area where they may remove and keep protective clothing and lead contaminated equipment.

(b) Showers: Showers shall be provided where workers may remove any accumulation of lead dust from their skin and hair prior to leaving the work site. The number of showers shall be provided as provided in Annex 1, Standard 2600SEG285, WORK SITE HOUSEKEEPING AND SANITATION STANDARD.

(c) Washbasins: The number of washbasins to be provided shall be in accordance with Appendix A, Standard 2600SEG285, WORK SITE HOUSEKEEPING AND SANITATION STANDARD. Every washbasin shall be equipped with water, soap, and clean towels, paper towels, or any other means for employee hand drying.

(d) Dining Rooms: Dining rooms shall be provided where workers may take their meals. Supervisors shall ensure that these areas are kept clean and free from lead contamination.

6.1.9.2 Supervisors shall direct, coordinate, and ensure that employees follow good personal hygiene practices, such as:



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(a) Remove all personal protection equipment and wash hands and face prior to eating, drinking, or leaving the work site.

(b) Do not consume or store foods, drinks, or tobacco in lead-contaminated areas.

(c) Do not apply makeup in lead-contaminated areas.

6.1.9.3 Supervisors shall ensure that employees do not leave the work site still wearing contaminated clothing. After using them, disposable coveralls shall be cut up at various locations to prevent them from being reused, and must be discarded in plastic bags labeled as hazardous waste. When employees wear fabric coveralls or any other type of reusable protective clothing, management shall provide the means for washing them.

6.1.10 Housekeeping

All work areas shall be kept free from any accumulation of lead dust. Dust on equipment, edges, floors, and other surfaces shall be cleaned to prevent air currents from carrying them to other places. Periodic housekeeping of the area shall be scheduled.

6.1.10.2 A final cleanup shall be done after the work has been completed, and it shall be ensured that no paint waste remains in the work areas.

6.1.10.3 All equipment, machinery, and work areas shall be decontaminated upon completion of the project.

6.1.10.4 High efficiency particulate air filter (HEPA) vacuum cleaners shall be used whenever a vacuum cleaner is required. Wet sweeping and brushing shall be used only when the use of a vacuum cleaner is not effective. The use of compressed air for cleanup is prohibited.

6.1.11 Signs and Labels. Signs and labels warning of the need to use respirators as required (see Standard 2600SEG121 Shape and Color of Signs and Barricades) shall be posted at various points of access to the work area. Work areas shall also be marked as follows:

Warning
Lead Work Area
Poison
Do not smoke or eat
Access without proper authorization prohibited

6.1.12 A competent person shall be assigned on site to ensure that employees follow good work and personal hygiene practices. In addition, the competent person shall frequently and regularly inspect work sites, materials, and equipment. All inspections shall be documented. The competent person shall be authorized to take corrective action as soon as necessary, and shall possess the knowledge necessary to anticipate and recognize lead hazards.

6.1.13 Prior to start working with lead, a plan shall be submitted that meets, as a minimum, the requirements listed in the Lead Work Health Plan (see Annex).

6.2 PERSONAL EXPOSURE MONITORING



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6.2.1 Supervisors shall coordinate with RSHH the evaluation of the environmental conditions at work sites in order to determine lead exposure levels, the periodicity of environmental monitoring, and the need to use respiratory protection.

6.2.2 On the basis of an analysis of the evaluations, RSHH shall refer employees to the Health, Wellness and Labor Welfare Unit (RHSS) for evaluation of the lead levels in their blood.

6.3 RESPIRATORY PROTECTION

6.3.1 Any employee working with materials containing lead shall undergo a qualitative or quantitative respirator fit test and lung capacity evaluation (spirometry); in addition, the proper respirator shall be provided (HEPA or air line, depending on the activity), which shall be used as required by the work operations.

6.3.2 Supervisors and authorized contractor representatives shall consult RSHH for the selection of the appropriate respirator type.

6.3.3 Supervisors and authorized contractor representatives shall be responsible for enforcing compliance with Respiratory Protection Standard [2600SEG205](#).

6.4 WASTE

6.4.1 Management and contractors shall design their operations so they generate the least amount of lead waste. The methods to achieve this shall be included in the Lead Work Health Plan (see Annex).

6.4.2 Whenever the waste treatment requires the use of a binder, it must be approved by RSHH prior to its use.

6.4.3 Paint or demolition waste containing lead shall be considered hazardous waste and treated with a binder (phosphate method or similar). Any water used at sanitary facilities (showers, washbasins, washing machines, among other) for decontamination and during lead removal shall also be considered as lead waste. Treatment with binders shall be tested by means of toxicity characteristic leaching procedures (TCLP).

6.4.3.1 If TCLP test results are negative for lead, the waste shall be disposed of as non hazardous waste.

6.4.3.2 If TCLP test results are positive for lead, the waste shall be treated again with the binder until negative results are obtained.

6.4.4 Architectural and structural components (joists, columns, windows, doors) may be disposed of by wrapping them in polyethylene sheeting, and burying them in landfill pits. Architectural components may only be marketed after lead has been removed. RSHH shall take the pertinent measurements to determine the lead concentration in architectural or structural components prior to approving their final disposal.

6.4.5 The Sales and Disposal of Excess Goods Unit (FAAD) shall recycle or sell the metal lead parts that are discarded.

6.4.6 All lead waste shall be identified as hazardous waste.

6.5 MEDICAL SURVEILLANCE



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6.5.1 Workers who may be exposed to lead levels exceeding permissible levels shall be evaluated by RHSS, as recommended by RSHS.

6.5.2 Contractor employees in any PCA project or unit who have not been evaluated by RSHS shall undergo testing for lead levels in their blood at the beginning of the project and every two months during the first six months. Blood tests may be performed thereafter every six months if no abnormal level is detected during the first six months. In the case of projects shorter than two months, the blood testing shall be performed at the beginning, middle, and end of the project. The blood lead level tests shall be done at no cost to the employee.

6.5.3 Follow-up Procedures: If the level of lead in the blood (Pb) of a worker shows 40 microgram or more per each deciliter (dL) or 100 gr. of blood, the worker's supervisor shall be informed in order that the worker may be temporarily removed from any work site where he may be exposed to lead, and an additional evaluation shall be provided and monitored by RHSS.

6.5.4 RHSS or the Procurement, Warehousing and Inventory Division (FAA) shall inform RSHS when blood lead levels exceed 40 micrograms per blood deciliter.

6.5.5 If it is detected that an employee has a medical condition that may worsen if he continues to be exposed to lead, the employee shall be removed from the work area. In such circumstances, the Division shall make every effort to reassign the employee to another position or work area.

6.6 TRAINING

6.6.1 Employees and supervisors working with lead may receive orientation on lead toxicity (with emphasis on its effects on the reproductive system, fetuses, and children), respiratory protection (its purpose, use, and limitations), the risks associated with the activity they perform, good work practices, engineering controls, personal hygiene, working environment monitoring, the need for a medical evaluation, and access to records and evaluations. Such orientation shall be provided by industrial hygienists or any other competent health staff. Supervisors may request this training to the Supervisor of RSHS, the Industrial Hygienist assigned to the area where the work will be performed, or the Industrial and Safety Training Unit (RHSI). Contractor shall provide training for their own employees.

6.7 RECORDKEEPING AND ACCESS TO DATA

6.7.1 Records shall be kept at RHSS and shall be accessible to employees according to the pertinent PCA regulations.

7.0 RESPONSIBILITIES

The responsibilities for ensuring compliance with this Standard are described in the Occupational Health and Safety Management Standard 2600SEG101.

8.0 INQUIRIES

Any information or clarification of the content or application of this standard may be requested in writing to RSHS.

9.0 EXCEPTIONS



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Any deviations or temporary exceptions to compliance with this standard may be requested in writing to RSHS.

10.0 TERM

This standard shall remain in force until revised or amended.

11.0 REFERENCES

- 11.1 Record Retention Tables, Records Management Section, PCA.
- 11.2 Respiratory Protection Safety Standard (2600SEG205).
- 11.3 Materials Safety Data Sheet (MSDS) Standard (2600SEG201).
- 11.4 Protective Clothing Standard (2600SEG213).
- 11.5 Hearing Conservation Standard (2600SEG215)
- 11.6 Worksite Housekeeping Standard (2600SEG285)
- 11.7 Atmospheric Electric Activity Work Safety Standard (Electrical Thunderstorms) (2600SEG106).
- 11.8 Fall Protection Standard (2600SEG109).
- 11.9 Scaffolding Safety Standard (2600SEG141).