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INDUSTRIAL HYGIENE



Lead

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This page provides topics, references and links related to lead hazard management across the U.S. Army.

Army Lead Program:

The Office of the Assistant Chief of Staff for Installation Management (ACSIM) maintains the  [U.S. Army Lead Program](#)  website. The site is a resource for Major Army Commands and installations for managing lead hazards in the Army.

Army IH supports the Army by providing policy and guidance to installations in two areas of concern for lead:

Occupational Exposures











Soldiers and Army Civilians may be exposed to lead from weapons emissions, industrial operations, systems maintenance, and leaded dust releases during the maintenance, renovation, repair, or demolition of Army facilities containing leaded paint.

Lead Hazard Management in Army Facilities

Lead hazard management regulations currently apply to Army family housing and other facilities regularly occupied by children under 6 years of age, including Child Development Centers.

The EPA plans to issue regulations that will apply to renovations to the exteriors of all public and commercial buildings.





Lead Information:

-  [EPA – Lead](#) 
-  [OSHA – Safety and Health Topics – Lead](#) 
-  [OSHA Fact Sheet – Lead](#) 
-  [CDC – Lead](#) 
-  [NIOSH – Lead](#) 

Federal Regulations and Guidance

EPA
EPA regulations apply in 10 states that do not have EPA-authorized state lead hazard management programs. The remaining states, the District of Columbia, and Puerto Rico have authorized programs.

Army installations in these areas must keep track of *all* regulations, and comply with the more stringent of the individual requirements among them. This is because (unlike asbestos) individual requirements under State lead programs may be either more or less stringent than the corresponding Federal regulations.

- [EPA regulations page](#) 
- [Points of Contact](#)  for each EPA region
- [Map of authorized state programs](#) 
- The [HUD Guidelines](#)  for the evaluation and control of lead-based paint hazards in housing form the minimum standard of care for the Army.
The HUD Guidelines are the one-volume reference for lead hazard management.


OSHA

General Industry

The OSHA lead regulation for general industry applies to Army industrial exposures and weapons emission exposures during training. It does not apply to construction, renovations, repair, abatement and related activities other than routine maintenance.

[OSHA Lead Page](#)  General industry 

[Chapter 29 CFR Part 1910.1025, Lead](#)  (General Industry)


[General Industry Lead Advisor](#)  Expert advisor software providing a framework to facilitate compliance


Construction

The OSHA Lead in Construction regulation applies to construction, renovations, repair, lead hazard abatement, and related activities other than routine maintenance.


[Lead - Construction Page](#) 


[Chapter 29 CFR Part 1926.62, Lead](#)  (Construction)

[Instruction CPL 02-02-058](#) , Subject: 29 CFR 1926.62, Lead Exposure in Construction; Interim Final Rule - Inspection and Compliance Procedures - Guidance on compliance requirements for OSHA inspectors

[Lead in Construction Advisor](#)  Expert advisor software that provides a framework to facilitate compliance

DoD and Army Lead Policies

[AR 40-5 Preventive Medicine](#)  addresses childhood lead poisoning prevention, part of the Community Health Program

[AR 608-10, Child Development Services](#)  includes Army policy concerning lead-based paint in child care facilities, including family child care homes, in paragraphs 5-48, 6-50, C-51, and C-212

[AR 200-1, Environmental Protection and Enhancement](#)  is the Army's environmental policy for lead

Medical Surveillance Program Management Tools

[6055.05-M - Occupational Medical Examinations Surveillance Manual](#) 




[Agency for Toxic Substances and Disease Registry - ToxFAQs for Lead](#) 


[APHC Model SOP Lead Medical Surveillance](#)

Indoor Firing Ranges

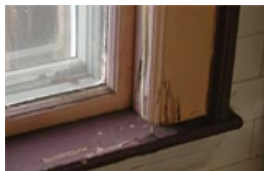
[DA Pam 385-63](#)  , Range Safety, Section 2-7 provides active Army requirements for control of lead exposures in indoor ranges.



Useful criteria and guidance for design, operation, and evaluation of indoor ranges are also provided in the [Navy Environmental Health Center Technical Manual 6290.99](#)  , Indoor Firing Ranges Industrial Hygiene Technical Guide, [National Guard Regulation 385-15](#)  , Safety: Policy and Responsibilities for Inspection, Evaluation and Operation of Army National Guard Indoor Firing Ranges, and [Air Force Engineering Technical Letter 11-18](#)  , Small Arms Range Design and Construction.

Guidance for decontamination of indoor ranges that will be used for other purposes is provided in National Guard Pam 420-15, [Facilities Engineering: Guidelines and Procedures for Rehabilitation and Conversion of Indoor Firing Ranges](#). 

Lead Hazard Management in Army Facilities



Army Policy: Lead-Based Paint (LBP) Versus Leaded Paints

Federal and state regulations focus on lead-based paint.

The Federal definition of LBP is 0.5% or more lead by weight or 1.0 mgs or more lead per square centimeter of surface; state definitions may vary.

The Army recognizes that this definition is not health based.

Intact LBP is not a hazard, while paint containing much less lead than LBP can create significant lead hazards in dust and soil when it deteriorates.

The Army emphasis is on any deteriorating paint containing lead, as well as lead hazards in dust and soil as defined by Federal or State programs.




Developing and Implementing a Lead Hazard Control Program



[AR 420-1 Army Facilities Management](#)  is the Army facilities policy for lead.

Each installation is required to develop and implement a lead hazard management program to evaluate and control lead hazards in pre-1978 Army family housing and other child-occupied facilities.

Lead hazards are to be managed in place whenever this is effective and more economical than abatement. Installations must follow Federal, State, and local regulations.

[Public Works Technical Bulletin \(PWTB\) 420-70-2](#)  Installation Lead Hazard Management provides guidance to installations for setting up a program to manage lead hazards in buildings.

Note: A new PWTB is expected to replace this one in CY 2015.

ASTM Manual 38,  [Lead Hazard Evaluation and Control in Buildings](#)  provides detailed guidance for developing and implementing a lead hazard management program.







Performing Lead Hazard Assessments Including Risk Assessments, Clearance Examinations and Lead-Based Paint Inspections

The Army discourages the use of LBP inspections because of the considerations discussed [above](#). LBP inspections should only be performed when regulations require them.

A lead hazard risk assessment is the best method for identifying actual lead hazards in dust and soil as well as in deteriorated paints. Clearance examinations ensure that cleanup after lead abatement removes any remaining dust lead hazard.

See HUD Guidelines Chapter 5 [Risk Assessment and Reevaluation](#) and Chapter 15 [Clearance](#). 



ASTM International has developed consensus standards for lead hazard assessments:


- ASTM  [E2115](#)  Standard Guide for Conducting Lead Hazard Assessments of Dwellings and of Other Child-Occupied Facilities
- ASTM  [E2255](#)  Standard Practice for Conducting Visual Assessments for Lead Hazards in Buildings]
- ASTM  [E2271](#)  Standard Practice for Clearance Examinations Following Lead Hazard Reduction Activities in Dwellings, and in Other Child-Occupied Facilities

Planning and Performing Lead Hazard Control Work

Lead hazards can usually be controlled by methods other than abatement.

Leaded paint is removed during projects such as whole-house renovations, or when lead hazards cannot be controlled by other methods.

ASTM  [E2252](#)  Standard Practice for Selection of Lead Hazard Reduction Methods for Identified Risks in Residential Housing or Child Occupied Facilities, provides useful guidance.







The HUD Guidelines [Chapter 11](#)  Interim Controls, provides information on methods to control lead hazards other than abating them.

[Chapter 12](#)  Abatement, provides information on abatement methods.

[Chapter 13](#)  Abatement by Encapsulation, provides information on encapsulation systems.

Some State regulations may require State approval of certain encapsulation products.

ASTM International has developed consensus standards for encapsulants:

- ASTM  [E1796](#)  Standard Guide for Selection and Use of Liquid Coating Encapsulation Products for Leaded Paint in Buildings
- ASTM  [E1795](#)  Standard Specification for Non-Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings
- ASTM  [E1797](#)  Standard Specification for Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings

Proper cleaning of leaded dust after lead hazard controls are implemented is essential.

The HUD Guidelines [Chapter 14](#)  Cleaning throughout Hazard Controls, provides the necessary standard of care.

Planning and Performing Renovations and Repairs That Disturb Leaded Paint

EPA regulations apply to renovations and repairs that disturb LBP.

As discussed [above](#), disturbing any paint containing lead, whether or not it is LBP, can create significant dust lead hazards.

Installations should consider extending the EPA requirements to cover any such situation.

Providing Information to Occupants of Army Family Housing

Installations must inform all new tenants of Army family housing what is known about lead-based paint and lead-based paint hazards in their units.

The requirements are listed in:  [Lead; Requirements for Disclosure of Known Lead-Based Paint and Lead-Based Paint Hazards in Housing; Final Rule](#)  . (HUD 24 CFR Part 35 & EPA 40 CFR Part 745).


A summary of the rule is at:  [Residential Lead-Based Paint Program](#)  .

[Protect Your Family from Lead in Your Home](#)  (EPA Pamphlet 747-K-12-001) must be provided as part of the information package.

Installations and contractors must also provide information to the present tenants of housing units where renovations will disturb lead-based paint.

The requirements are listed on the EPA  [Renovation, Repair, and Painting](#)  website.

[Renovate Right: Important Lead Hazard Information for Families, Child Care Providers, and Schools](#)  (EPA Pamphlet 740-K-10-001) must be provided as part of the information package.

[HUD 24 CFR Part 35](#)  Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Final Rule, specifies notification procedures for prospective purchasers of Army housing.

Disposing of Lead-Contaminated Waste



EPA considers lead-contaminated waste from residential buildings (including both Army family housing and barracks) to be household waste rather than hazardous waste.

States may not concur with this view, so check with State regulators before assuming this is the case.

Otherwise, it is necessary to determine if wastes from lead hazard control activities are hazardous waste based on their lead content as determined by a toxicity characteristic leaching procedure (TCLP) analysis.


Samples submitted for TCLP analysis should be representative of all of the building components.

The protocol for taking samples should allow the determination to be made before the job begins.




ASTM  [E1908](#)  Standard Guide for Sample Selection of Debris waste from a Building Renovation or Lead Abatement Project for Toxicity Characteristic Leaching Procedure (TCLP) testing for Leachable Lead (Pb), is a suitable protocol.

Note: wastes from paint stripping may be determined to be hazardous wastes based on toxicity or corrosivity, regardless of the TCLP results for Lead.

Guidance for the Disposal of Lead on Army Real Property


[HUD 24 CFR Part 35](#)  Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Final Rule, lists the requirements for lead abatement for the sale of Army real property.


Lead Hazard Management Program Evaluation

The  [Environmental Performance Assessment Systems \(EPAS\)](#)  mandated in [AR 200-1, Environmental Protection and Enhancement](#)  uses evaluation protocols that are updated quarterly.


Lead Analyzing and Sampling

Laboratory Qualifications

Laboratories performing lead air monitoring analyses should be accredited by the [American Industrial Hygiene Association \(AIHA\) Laboratory Accreditation Programs, LLC](#) , Industrial Hygiene Laboratory Accreditation Program (IHLAP) for metals analyses. **(Non-government resource)**

Dust wipe samples collected to support occupational lead compliance (for example, to verify the effectiveness of housekeeping procedures) should be analyzed by a [laboratory recognized by the National Lead Laboratory Accreditation Program](#)  (NLLAP).

The [APHC's Laboratory Sciences](#) is accredited by IHLAP and recognized by NLLAP.

[Blood Lead Laboratories](#)  is the OSHA list of laboratories approved for blood lead analysis. The OSHA lead standards (general industry and construction) require employers to provide biological monitoring for workers exposed to airborne lead above the action level. Monitoring must be provided for lead and zinc protoporphyrin (or free erythrocyte protoporphyrin) in blood. The employer is required to have these analyses performed by a laboratory that meets accuracy requirements specified by OSHA.



Methods - General

USAPHC [Technical Guide 141](#), Industrial Hygiene Air Sampling and Bulk Sampling Instructions

Lead in Air Methods

NIOSH Method [7082](#) , Lead by FAAS


NIOSH Method [7105](#) , Lead by GFAAS


NIOSH Method [7300](#) , Elements by ICP


NIOSH Method [7303](#) , Elements by ICP


NIOSH Method [7702](#) , Lead by Field Portable XRF Screening method for air filters



[OSHA Sampling and Analytical Methods](#)  provides five standard analytical methods.

ASTM [E1979](#) , Standard Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

ASTM [D6785](#) , Standard Test Method for Determination of Lead in Workplace Air Using Flame or Graphite Furnace Atomic Absorption Spectrometry

ASTM [E1613](#) , Standard Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques



ASTM [D7439](#) , Standard Test Method for Determination of Elements in Airborne Particulate Matter by Inductively Coupled Plasma–Mass Spectrometry



ASTM  [D7035](#)  , Standard Test Method for Determination of Metals and Metalloids in Airborne Particulate Matter by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES)






Lead in Surface Dust

Methods



ASTM  [D7659](#)  , Standard Guide for Strategies for Surface Sampling of Metals and Metalloids for Worker Protection

ASTM  [E1792](#)  , Standard Specification for Wipe Sampling Materials for Lead in Surface Dust – Commercially available, individually wrapped, pre-wetted wipes with minimal background lead content. *Always consult your lab when selecting the brand!*

ASTM  [E1728](#)  , Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination


ASTM  [D7144](#)  , Standard Practice for Collection of Surface Dust by Micro-vacuum Sampling for Subsequent Metals Determination – For fabrics and other rough or porous surfaces where wipe sampling would not be effective. Results cannot be correlated with wipe sampling results.

ASTM  [E1644](#)  , Standard Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead

ASTM  [E1979](#)  , Standard Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead



NIOSH Method [9102](#)  , Elements on Wipes (ICP-AES)

NIOSH Method [7082](#)  , Lead by FAAS for micro-vacuum samples

NIOSH Method [7105](#)  , Lead by GFAAS for micro-vacuum samples



NIOSH Method [7300](#)  , Elements by ICP for micro-vacuum samples



NIOSH Method [7303](#)  , Elements by ICP for micro-vacuum samples

ASTM  [E1613](#)  , Standard Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques

Lead in Paint Methods

ASTM  [E1729](#)  , Standard Practice for Field Collection of Dried Paint Samples for Subsequent Lead Determination



ASTM  [E1645](#)  , Standard Practice for Preparation of Dried Paint Samples by Hotplate or Microwave Digestion for Subsequent Lead Analysis



ASTM  [E1979](#)  , Standard Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

Lead in Soil Methods

ASTM  [E1727](#)  , Standard Practice for Field Collection of Soil Samples for Subsequent Lead Determination

ASTM  [E1726](#)  , Standard Practice for Preparation of Soil Samples by Hotplate Digestion for Subsequent Lead Analysis

ASTM  [E1979](#)  , Standard Practice for Ultrasonic Extraction of Paint, Dust, Soil, and Air Samples for Subsequent Determination of Lead

ASTM  [E1613](#)  , Standard Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques

Lead in Paint and Other Coatings (for 1926.62 compliance) Testing

Portable X-ray fluorescence (XRF) instruments and chemical spot test kits cannot be used to rule out the presence of lead for compliance purposes. Positive results do confirm its presence without the need for laboratory testing.

See the following OSHA letters of interpretation:



[Acceptability of rhodizonate-based spot test kits for determining the presence or absence of lead in paint coatings](#)  .



[Using X-ray fluorescence for analysis of lead in paint and applicability of other agencies' lead levels](#)  .

Training and Certification Requirements

Installation personnel and contractors must be trained and certified to perform lead hazard evaluation or abatement work.

They must meet any applicable State training, certification, and licensing requirements.


EPA's own training and certification requirements apply in states that do not have their own regulations.

The EPA  [Evaluating and Eliminating Lead-Based Paint Hazards](#)  web page discusses the requirements.



EPA 40 CFR Part 745



[Lead-Based Paint Poisoning Prevention in Certain Residential Structures](#).  Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities; Certification Requirements and Work Practice Standards for Individuals and Firms; Amendment ensures individuals conducting lead-based paint activities in target housing and child-occupied facilities are properly trained and certified. Also, training programs are accredited and activities are conducted according to reliable, effective, and safe work practice standards.

Other Articles

[8-Step DoD IH Exposure Assessment Model](#)

[Army Asbestos and Lead Programs](#)

Army Asbestos Program provides references, information and links about controlling and eliminating asbestos within the U.S. Army.

[Army IH News & Regulatory Summary](#)

This page includes links to the Army Industrial Hygiene News & Regulatory Summary.

DOEHRS-IH

Defense Occupational Environmental Health Readiness System-Industrial Hygiene (DOEHRS-IH) reports occupational & environmental health readiness and actively tracks air, water, soil, & environmental hazards for the DoD Military Health System.

IH Metrics

Industrial hygiene metrics are extracted from DOEHRS-IH data and feed two separate Army metrics systems.

[more/less](#)

Related Programs and Contacts

[Ergonomics Program](#)

The APHC ergonomics program provides installation-level ergonomics services, training and consultation for the US Army.

[Health Hazard Assessment](#)

Information pertaining to the health hazard assessment program.

[Health Risk Communication](#)

The Health Risk Communication Division (HRCDD) offers a variety of training & consultation services to facilitate effective dialogue with stakeholder audiences regarding health risk associated with environmental, deployment, occupational, or other hazards.

[Industrial Hygiene Field Services](#)

The industrial hygiene field services program assists military leaders, facility managers, and occupational health and safety personnel in anticipation, recognition, evaluation and control of occupational and environmental health hazards.

[Industrial Hygiene Program Management](#)

The Industrial Hygiene and Medical Safety Management program has a multi-faceted mission that provides expert services in industrial hygiene and medical safety management.

[more/less](#)

Related Training

[Army IH Defense Occupational Health Readiness-Industrial Hygiene Initial Course - Online and Classroom](#)

ENROLL AT <https://aiph-dohs.ellc.learn.army.mil> -MANDATORY for all Army GS0690 and GS0640 staff

[Army Noise Measurement & Assessment - Blackboard](#)

ENROLL AT [HTTPS://AIPH-DOHS.ELLC.LEARN.ARMY.MIL](https://aiph-dohs.ellc.learn.army.mil) -how to conduct measurements to evaluate exposure to noise, and how to discuss noise evaluation methods.

[Basic Epidemiology for Industrial Hygienists - Blackboard](#)

ENROLL AT [HTTPS://AIPH-DOHS.ELLC.LEARN.ARMY.MIL](https://aiph-dohs.ellc.learn.army.mil) -introduction to epidemiology and describe how IH data supports occupational epidemiology.

[Basic Industrial Hygiene Course \(via AMEDD Center & School San Antonio, TX\) - Classroom](#)

REGISTRATION IS THROUGH AMEDD CENTER & SCHOOL ONLY FY16: 14-25 Mar, and 8-19 Aug. This course provides opportunity to establish a working knowledge of IH equipment, and to a lesser extent, control of occupational health hazards.

[Basic Industrial Hygiene Sampling - Blackboard](#)

ENROLL AT [HTTPS://AIPH-DOHS.ELLC.LEARN.ARMY.MIL](https://aiph-dohs.ellc.learn.army.mil) -knowledge of the advantages and disadvantages of using all types of direct reading and other air sampling instruments for collection of full-shift, task-based and grab samples.

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