

Procedure archived as lead work shifted entirely to Argonne Central Shops or outside vendors. 10/3/22

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Machining Lead in LOM Shops

Changes made in this revision:

- No changes made to this procedure since its last review

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Policy

To provide a safe work environment at the APS, the APS has adopted the following site-specific implementation of the ANL lead handling ESH requirements.

All lead machining in LOM shops shall be done in accordance with [LMS-PROC-201](#) – Safe Handling of Lead.

Lead machining can only take place in APS-approved areas. Not all LOM machine shops allow lead machining. The APS approved LOM shops are listed below.

Any person who wishes to machine lead will do so at the discretion of the Shop Coordinator.

1 RESPONSIBILITIES

1.1 Any person seeking to machine lead in a LOM shop must:

- Provide the Shop Coordinator with a record of completion of:
(ESH 170 OSHA Lead Standard Orientation)
<https://apps.inside.anl.gov/que/public/item/WBT/ESH170/splash>
- Receive authorization to machine lead from the Shop Coordinator.
- Notify the Shop Coordinator before starting each lead machining project.
- Ensure that work is done in a safe manner to prevent excessive exposure to lead and lead compounds.
- Follow ANL requirements for safe work practices and use of protective equipment.
- Ensure that all lead-bearing dust and debris are removed when work is completed.
- Consider ergonomics and weight implications when movement of lead materials is a work factor.

Additionally, if the work might produce airborne lead levels in excess of the OSHA action level ($30 \mu\text{g}/\text{m}^3$), any person seeking to machine lead in a LOM shop must:

- Provide the Shop Coordinator with a record of completion of:
(ESH 171 Lead Hazards and Controls)
<https://apps.inside.anl.gov/que/public/item/WBT/ESH171/splash>
<https://apps.inside.anl.gov/que/public/item/WBT/ESH171RF/splash>
- Shall notify the Shop Coordinator and an APS ESH Coordinator.

1.2 An APS ESH Coordinator

An APS ESH Coordinator must:

- Work with any worker who has identified that there is a potential for the work producing airborne lead exposures that exceed the OSHA action level to ensure that ANL ESH requirements (e.g., informing the ANL Medical Department and Argonne Industrial Hygiene of the work, arrange for any biological monitoring, arrange for Argonne Industrial Hygiene exposure assessments, etc.) are met.
- Provide Shop Coordinators with the results of Argonne Industrial Hygiene exposure assessments.

1.3 Shop Coordinator

The Shop Coordinator must:

- Confirm that plans and safeguards are in place to prevent excessive exposure to lead and lead compounds.
- Oversee lead machining work for compliance with ANL requirements for safe work practices and use of protective equipment, including respirators.
- Attach a copy of OSHA lead training certification to the LOM Shop Authorized Operator Certification Form.
- Post and/or inform shop users of the results of **LOM machine shop** Argonne Industrial Hygiene monitoring, exposure controls needed, and actions planned to correct excessive exposure conditions.
- Review the results from the monitoring to confirm that lead work is being performed in designated lead work areas and mitigate contamination as needed.
- Ensure that lead is stored, inventory and usage reported, and waste disposed of according to OSHA and EPA requirements.
- Ensure that proper labeling and posting are provided for lead-containing materials, per [LMS-PROC-201](#)
- Check box on the LOM Shop Authorized Operator Certification Form that states the Authorized Operator meets all requirements for machining lead.

1.4 Oversight

APS/ANL may perform unscheduled wipe sampling of affected areas to ensure that lead levels do not exceed the following clearance criterion. There are no specific OSHA standards for surface lead contamination. However, the General Industry Lead Standard [29 CFR 1910.1025 (h) (1)] and Lead Exposure in Construction Standard [29 CFR 1926.62 (h) (1)] require surfaces to be maintained as free as practicable of lead accumulation. The APS clearance criterion is 200 $\mu\text{g}/\text{ft}^2$.

If 25% of samples exceed the clearance criterion, recleaning may be required. If the average concentration is below the clearance criterion, the area is deemed to be clean. If a few samples significantly exceed the clearance criterion, spot cleaning is recommended.

In addition, APS/ANL will perform annual wipe sampling of LOM machine shops to ensure lead levels meet the clearance criterion.

Machining Lead in LOM Shops

Procedure

1 INTRODUCTION

1.1 Purpose

To provide a safe work environment at the APS, the APS has adopted the following site-specific procedure for the implementation of the ANL lead handling ESH requirements.

1.2 Scope

This procedure applies to all machining of lead in LOM shops at the APS.

The specifics of lead handling are included by reference to the APS Lead Handling: Procedure ([APS 1201511](#)).

1.3 Applicability

This procedure is to be followed for any machining of lead in an APS LOM shop.

1.4 Hazard Controls

See most recent version of "Machining Lead in LOM Shops (APS_1000047)" ([WCD # 23419](#)).

2 PREPARATION - PREREQUISITE ACTIONS

No one is allowed to use a user shop for any machining activities until they have been authorized to do so according to the requirements of APS Policies and Procedures. The user candidate shall read User P&P Machining Lead in LOM Shops. To earn authorization, candidates must receive an LOM Shop Orientation from the Shop Coordinator and they must pass machine-specific examinations.

2.1 PPE

The Floor Coordinator can arrange a meeting with the AES-ESH Coordinator to determine protective clothing and respirator requirements for the project.

2.2 Air Monitoring

If there is the potential that a worker might be exposed to airborne lead levels exceeding the OSHA action level ($30 \mu\text{g}/\text{m}^3$) air monitoring requirements must be determined in consultation with an APS ESH Coordinator, and any required air monitoring must be arranged prior to the start of the lead machining.

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2.3 Warning Sign

If exposures are expected to exceed the permissible exposure limit (PEL) of 50 $\mu\text{g}/\text{m}^3$ of air, the work area must be isolated and posted prior to the starting of the machining:

DANGER

LEAD

MAY DAMAGE FERTILITY OR THE UNBORN CHILD

CAUSES DAMAGE TO THE CENTRAL NERVOUS
SYSTEM

DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

The Shop Coordinator must post signs at the entrances to all lead work areas as required by the OSHA Lead Standard.

2.4 Ventilation and Vacuum Cleaners

If a local exhaust ventilation system is used to capture welding or cutting fumes, the system shall be equipped with a tapered pickup hood. The hood must be positioned close to the source of fume generation and repositioned as necessary to maintain capture efficiency.

Portable tools including, but not limited to, grinders, needle scalers, sanders, and saws must be equipped with local exhaust ventilation accessories and attached to a HEPA-filtered exhaust system or HEPA vacuum cleaner.

All HEPA-filter equipped air handling units, including vacuum cleaners, must be inspected by Argonne Industrial Hygiene. HEPA-filtered units and vacuum cleaners must pass a challenge aerosol test documenting acceptable filter performance. Such tests must be performed prior to first use on site and after HEPA filter replacement.

All HEPA-filtered vacuum cleaners must be tagged with a dated test tag when tested. A HEPA-filtered vacuum cleaner must not be used if the test tag is not present or if it has been more than one year since the unit was tested. Testing can be arranged through the Floor Coordinator.

The HEPA vacuum will be labeled FOR LEAD USE ONLY. Non-HEPA vacuums found in shops should be labeled for nontoxic or nonradioactive use. **Labels are available from the AES ESH Coordinator.**

3 ACCEPTANCE CRITERIA

The responsible Shop Coordinator must approve any lead machining in their LOM shop.

An AES ESH Coordinator must approve monitoring and mitigation plans for machining that may exceed OSHA action levels.

4 PROCEDURE ACTION STEPS - PERFORMANCE

[If a person is already authorized to perform lead machining in a LOM shop, skip to section 4.2.]

4.1 Authorization to Machine Lead

- 4.1.2 The user candidate will supply the Shop Coordinator with copies of his/her OSHA lead training certification and medical monitoring certification.
- 4.1.3 The Shop Coordinator will attach these forms to the LOM Shop Authorized Operator Certification Form.
- 4.1.4 The Shop Coordinator will check the line on the “LOM Shop Authorized Operator Certification Form” that states that the candidate is now authorized to machine lead.
- 4.1.5 The Shop Coordinator will update the LOM Shop Access List to reflect that the new Authorized Operator can machine lead.
- 4.1.6 The Shop Coordinator will submit a copy of these forms to the Floor Coordinator.
- 4.1.7 Floor Coordinator will keep a copy on file, send a copy to the AES ESH Coordinator, and send a copy to the User Office. The User Office will update the Authorized Operator’s TMS profile.

4.2 Machining Lead

- 4.2.1 The person seeking to machine lead will inform the Shop Coordinator before starting each lead machining project.
- 4.2.2 The Shop Coordinator will review the plans and may authorize the work to proceed
- 4.2.3 All PPE is donned.
- 4.2.4 **APS Lead Handling ([APS 1201511](#)) is to be used for the safe handling of lead. (SAFETY NOTE: Remove gloves prior to operating rotating machine tools. Secure lead items with clamps rather than using hands to hold in place.)**
- 4.2.5 Surfaces such as workbenches, floors, and equipment must be kept clean of lead accumulation. (Compressed air or dry sweeping shall not be used to clean lead-contaminated surfaces.)
- 4.2.6 Washing of hands and contaminated skin is needed after contact with lead and before eating, drinking, smoking, applying cosmetics, or chewing gum.
- 4.2.7 Wet methods and /or HEPA-filter-equipped vacuum cleaners shall be used to clean lead contaminated surfaces.

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- 4.2.8 The Shop Coordinator and the Authorized Operator shall ensure that all lead-bearing dust and debris are removed when lead work is complete.
- 4.2.9 **Excess lead materials and cuttings** will be **stored** in containers labeled for lead scrap located in the LOM Shop.
- 4.2.10 **Lead waste must be placed in containers designated as hazardous waste and the containers need to be placed in a satellite waste accumulation area (SWAA).**
- 4.2.11 Chemical inventories must be updated. Materials tracked in the ANL Chemical Management System will be reported automatically. Items used but not tracked in the ANL Chemical Ordering, Reporting, and Attributes Library (cutting and using lead sheet, for example) must be tracked separately by the Shop Coordinator and Authorized Operators.

5 CLOSEOUT - POST PERFORMANCE ACTIVITY

The EPA requires an annual report on the amount of lead and leaded compounds manipulated by coring, drilling, cutting, and machining. This is reported by entering information on the Toxic Release Inventory form posted in each shop.

In order to comply with DOE requests, APS must show how much lead and leaded component material is machined. A log sheet with entries that track the amount of lead and leaded components machined will be available in the LOM Shop.

6 REFERENCES - SOURCE REQUIREMENTS

29CFR1910.1025 OSHA Lead Standard, General Industry
29CFR1926.62 OSHA Lead Standard, Construction
Safe Handling of Lead – [LMS-PROC-201](#)
APS Lead Handling ([APS_1201511](#))

7 APPENDIX A - LOM SHOPS APPROVED FOR MACHINING LEAD (15 FEBRUARY 2017):

- 1. 432 C LOM Shop
- 2. 433 C LOM Shop
- 3. 434 C LOM Shop

8 FEEDBACK AND IMPROVEMENT

If you are using this procedure and have comments or suggested improvements for it, please go to the [APS Policies and Procedures Comment Form](#)* to submit your input to a

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Procedure Administrator. If you are reviewing this procedure in workflow, your input must be entered in the comment box when you approve or reject the procedure.

Instructions for execution-time modifications to a policy/procedure can be found in the following document: Field Modification of APS Policy/Procedure ([APS_1408152](#)).

* <https://www.aps.anl.gov/Document-Central/APS-Policies-and-Procedures-Comment-Form>

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