

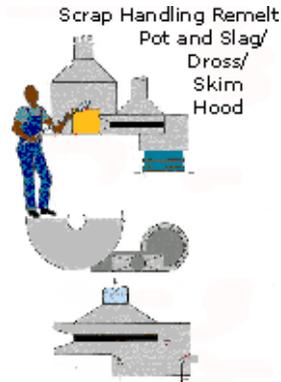
Lead Battery Manufacturing

Safety and Health
Topics Page

Battery Repair and Reclaim

Battery repair operations repair and salvage defective batteries. Reclaim operations involve recycling scrap grids, plates, and straps.

- [Battery Repair](#)
- [Reclaim](#)



[View larger image of scrap pot and dross hood diagram](#)

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**Battery Repair and
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Battery Repair and Reclaim > Battery Repair

Defective batteries are repaired and salvaged. The plate groups are tested and reused when possible. Groups are removed by sawing or cutting the covers off the battery, breaking or burning the intercell connectors, and removing the groups.

The major source of lead exposure in the battery repair process comes from lead oxide which can become easily airborne.

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Battery Repair

Potential Sources of Exposure

- While removing plates, the operator, if not careful, may spill oxide out of the battery case, bang the dry plates together or against the case causing contaminants to become airborne.
- High levels of lead fumes are generated when flames are put in contact with lead.
- Moving groups in and out of battery cases may cause a bellows effect. The bellows effect will release lead particulates at the workstation.
- Contamination may occur from improper storage of battery parts.



Figure 1
Keep areas vacuumed

Possible Engineering Controls

- Provide local slot or downdraft ventilation at work stations.
- Put a vacuum drop at workstations used for battery repair and salvage.
- Use local exhaust ventilation on torch.
 - ▶ Post burning, portable tool exhaust
- Provide ventilation in areas for storage of tools, plates, and supplies.
- Use air-propane or air-MAP gas instead of air-acetylene flame for torches.
- Use a laminar flow (supplied-air) island.

Possible Work Practice Controls

- Make sure ventilation is working properly around sawing areas.
- Keep area vacuumed.
- Clean up oxide spills immediately (see Figure 1).
- Use a ventilated scrap barrel for disposal of elements.
 - ▶ Scrap handling, barrel/drum exhaust hood

- Place, do not throw, elements into the scrap barrel.
- Cover barrel with plastic before moving.
- Open the container and disassemble it in a ventilated work area.
- Use caution while removing plates from the battery case.
- Remove plates cautiously to prevent a bellows effect.
 - If a bellows effect occurs, vacuum up particulates immediately with a central vacuum system or HEPA vacuum.
- Do not store materials on active work surfaces; they may interfere with ventilation.
- Provide adequate PPE, a change of clothes, and shower rooms (see [OSHA Lead Requirements for PPE, Housekeeping, and Hygiene Facilities](#)).

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Reclaim operations involve recycling scrap grids, plates, and straps. In any plant, reclaim operations must be isolated from the rest of the plant. Two different processes are used: dry reclaim and wet reclaim.

In dry reclaim the scrap material is re-melted in a lead pot, dross is removed, and lead ingots poured.

Wet reclaim operations involve preliminarily separating the paste from the plates and concentrating the paste before reprocessing the materials by re-melting and pouring ingots. Note: Wet lead should never be added to a heated lead pot.

The major source of lead exposure in the reclaim process comes from lead oxide which can become easily airborne.



Bag house and stack for plant vacuum and dust collection system

- o [Dry Reclaim](#)
- o [Wet Reclaim](#)

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Dry Reclaim

Potential Sources of Exposure

- o When barrels are dumped, or spilled, leaded material may become airborne.
- o Handling any leaded materials may contaminate clothing or result in airborne exposure.
- o During transportation, materials may spill or come in contact with employees.
- o Oxide spills may contaminate equipment and barrels.
- o Lead pots may emit high levels of lead fume and operators may be exposed during dumping and drossing.
- o The handling of material or dross may cause lead fume emissions and expose the operator.
- o Pig pouring may increase exposure to the operator if the area is not ventilated.



Figure 1
Water wash-down



Figure 2
Exhaust for transfer point

Possible Engineering Controls

- Use ventilated conveying systems, ventilated barrel dumper, or front end loader instead of loading the melting pot manually.
- Use automatic equipment for drossing.
- Use exhaust ventilation for the melting pots, drossing operations, and ingot casting operations.
- Isolate reclaim operations from other plant operations.
- Provide exhaust ventilated scrap barrels at workstations.
▶ [Scrap handling, re-melt pot plus slag/dross/skim hood](#)
- Exhaust all transfer points (see Figure 2) and reclaim processes (that is, manual transfer to conveyor, storage hopper, and barrel dumper).



Figure 3
Keep floors clean



Figure 4
Manual drossing

Possible Work Practice Controls

- Ensure ventilation is working properly.
- Cover all containers of scrap material being transported.
▶ [Scrap handling, barrel/drum exhaust hood](#)
- Ensure that all scrap is dry before dumping it into a melting pot.
- Vacuum all spills immediately using a central vacuum system or a HEPA vacuum.
- Keep the area clean.
- Use dust suppression techniques including keeping floors wet, using dust suppression compounds, or vacuuming.
- Clean all drums after dumping.
- Avoid splashing lead during pouring.
- If a torch is used in cleaning up splashed lead, use local exhaust ventilation to avoid breathing fumes.
- Keep water away from the melt pot to minimize the potential for an explosion caused by water being trapped under molten metal.
- Use long handled tools when possible.
- Provide adequate PPE, a change of clothes, and shower rooms (see [OSHA Lead Requirements for PPE, Housekeeping, and Hygiene Facilities](#)).

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Wet Reclaim

Potential Sources of Exposure

- Splashes of oxide on floors and equipment may dry and become airborne.
- Handling leaded material increases risk of exposure.
- During the transport of lead oxide material, lead particles may become airborne.
- Paste spills dry and may become airborne.
- Dumping dried lead oxide and dross causes lead pot emissions.
- Handling dross may increase the operator's exposure to lead fumes.
- Pig pouring may increase the operator's exposure to lead.



Figure 5
Exhaust melting pot

Possible Engineering Controls

- Use ventilated conveying systems, ventilated barrel dumper, or front end loader instead of loading the melting pot manually (see Figure 5).
 - Use automated equipment for drossing
 - Exhaust ingot casting operations
 - Exhaust all transfer points (see Figure 3) and reclaim processes such as manual transfer to conveyor, storage hopper, and barrel dumper
 - Cover and exhaust all moving equipment that comes in contact with wet or dry paste
 - Isolate the reclaim operations from other plant operations
 - Provide screening or curtains to contain splatter
 - Provide exhaust ventilated scrap barrels at workstations
- ▶ [Scrap handling, re-melt pot plus slag/dross/skim hood](#)

Possible Work Practice Controls

- Work practice controls are the same as those in [Dry Reclaim](#).
- Ensure that all scrap is dry before dumping into a melting pot
 - Dross formed from melting mixed alloys containing Ca, Al, As, and Sb may form hazardous gases such as arsine and stibine if the dross becomes wet.

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