

Indoor firing Ranges: Potential Lead Exposure

Failure to follow a few basic rules and precautions can result in exposure to airborne and settled lead dust at the firing range creating the potential for elevated blood lead levels in employees, instructors and customers.

Lead Hazards at the Range

- Airborne lead dust created by:

Shooters using ammunition with primers containing lead styphnate or lead bullets (and anyone spending time at the firing line) are exposed to lead fumes in the “gun smoke” that is released into the air when the gun is fired. Also exposure to lead dust can occur by friction from the lead slug against the gun barrel. This is especially true in ranges that have poor ventilation systems.

Improper range-cleaning methods disturbing settled dust. Workers are exposed to lead when they clean the range, clean guns, or empty the bullet trap. Dry sweeping of the range causes settled lead dust to become airborne. Workers who clean bullet traps by pouring or shoveling bullet debris into waste buckets are also exposed to high levels of airborne lead dust. Using vacuum cleaners that do not have and are not designed for a high-efficiency particulate air (HEPA) filter. HEPA filters are designed to remove minute lead particles from the air.

- Other high lead dust sources:

Bullet loading creates a fine dust that is very difficult to clean.

Melting lead to cast bullets produces a fume, which turns into tiny dust particles that can stay in the air for up to 10 hours. A person can easily breathe in this fine dust.

Lead dust can contaminate surfaces. Never load bullets or melt lead:

- In an unventilated area
- Inside the home
- Anywhere children may live or play.

Workers who eat, drink or smoke without washing up before meals and breaks can swallow lead dust that has settled on their hands, lunchroom surfaces, or food and drink.

Health Effects of Lead Exposure

Lead harms the brain, nerves, red blood cells, kidneys and reproductive systems of both men and women. Adults who are lead poisoned may feel tired, irritable or get aches and pains. They can also develop serious health problems without knowing it. Lead can build up in the body and stay there for years.

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Strategies for Preventing Lead Poisoning on the Job

Basic elements of a lead safety program for indoor firing ranges:

- **Try to reduce the use of lead-containing ammunition.** Recommend the use of jacketed ammunition, preferably with non-lead primers, to reduce airborne lead in the range.
- **Control exposure through ventilation.** Good ventilation can significantly reduce airborne lead levels at the firing line. Supplied air should move steadily across all shooting booths, carrying the gunsmoke away from the shooter's face and directly down the range where it is exhausted, filtered and discharged. General building ventilation is not adequate. A separate ventilation system exclusively for the range is recommended. Get professional advice on ventilation design.
- **Keep all work areas free from lead by regular cleaning.** Cleaning should be done using either a special toxic dust vacuum (HEPA vacuum) or by wet mopping. **Never dry sweep the range.**
- **Minimize airborne lead dust while cleaning the bullet trap.** Where possible, debris trays should be emptied *inside* closed plastic bags. Debris should be repeatedly misted with water during all shoveling operations. New bullet trap designs which do not require cleaning are best and also save time.
- **Train employees about lead safety.** All employees should receive training on how to work safely in lead exposure areas. Training increases employee awareness of health and safety conditions and provides them with information and skills to protect themselves on the job.
- **Provide employees with respirators.** Fit tested National Institute for Occupational Safety and Health (NIOSH) approved respirators with HEPA filters should be worn during all cleaning operations. Lead particles will pass through common paper dust mask.
- **Provide employees with protective clothing.** It is recommended that employees wear disposable coveralls, head covering (if not disposable, then they should be laundered separately at the range to prevent contaminating the home), and shoe coverings when cleaning the range and the bullet trap. **Employees should not wear work clothing or work shoes home.** Lead dust is carried on work clothes and shoes from the range to employees' homes and vehicles, putting their children and other household members at risk of lead poisoning.
- **Prohibit eating, drinking and smoking in the work areas.** Require employees to wash their hands, forearms and face before breaks, lunch, and at the end of their work shift.
- **Establish a program of periodic blood testing to monitor lead levels of all employees.**

For more information, contact Alaska Lead Poisoning Prevention, Environmental Public Health Program, Section of Epidemiology, 3601 C Street, Suite 540, Anchorage, Alaska 99524-0249. Phone 907/269-8000, fax 907/561-4672.