

Firing Range

Controlling Contaminant Levels

By law, contaminant levels within an indoor firing range facility must be controlled.

- Lead must be limited to a level of 50 ug/m³ averaged over an 8-hour period
- Carbon monoxide must be controlled to 50 ppm
- Surveys from the National Institute for Occupational Safety and Health (NIOSH) indicate that the majority of indoor firing ranges operate with air contamination levels far exceeding acceptable standards



Contaminant Risk

Indoor firing ranges produce large quantities of airborne pollutants, including lead and noxious gases. The most significant potential source of airborne lead at the firing line is caused by the hot flames of burning gunpowder acting on the exposed lead base of a projectile. The metallic lead in the projectile can also become airborne lead particles through heat from friction between the bore of the firearm and an unjacketed lead projectile. Downrange, lead may become airborne from splatter caused by projectiles hitting backstops, floors, walls, or baffles.

In addition, maintenance and/or repair of the backstop or other range equipment may cause settled lead dust to become airborne. Improper cleaning of a range may also cause lead dust to become airborne. Ranges that allow lead dust to accumulate have increased lead exposure risks, since the accumulated dust can become airborne from muzzle blast and/or shooter movement. Concentrations can easily exceed safe levels of exposure to workers and shooters, and failure to comply with the Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health (NIOSH) regulations can result in significant fines for range owners.

Regulations and Standards

While by law OSHA regulations only apply to employees, every indoor range, including club ranges, can use them as an important reference. OSHA has a comprehensive lead regulation (29 CFR 1910.1025). Failure to comply with the requirements of the Lead Standard could result in fines to range owners, in addition to jeopardizing the health and well-being of those exposed to the contaminated air.

Signs and Symptoms of Lead Poisoning

Lead can enter the body by being inhaled or swallowed. Lead can be inhaled when lead dust or fumes are released into the air. When lead enters the bloodstream, it circulates throughout the body. Early signs and symptoms of lead poisoning include:

- Fatigue
- Sleeplessness
- Metallic "Taste"
- Headaches
- Nervousness
- Irritability
- Uneasy Stomach
- Poor Appetite
- Reproductive Problems

Source: OSHA Regulations (Standards-29 CFR) Part 1910 Occupational Safety & Health Standards

Firing Range

Optimize Your Environment

The primary purpose of an air filtration system in these facilities is to prevent the buildup of toxic gases (CO₂, CO, NO) and particulates, including lead and other discharge products. The benefits of proper air filtration include:

- Elimination of dangerous air contaminants, resulting in improved quality of life for employees and users alike
- Compliance with EPA and OSHA regulations
- Reduced liability from lawsuits resulting from employee health problems
- Reduced employee absenteeism and disability
- Improved fire range capability

A thorough air filter audit of your HVAC Systems is the first step that AAF Flanders takes in order to provide you with professional guidance and analysis for cost savings and risk reduction. By conducting this audit, we will be able to understand your current state and then utilize TCO Diagnostic®, an advanced analytical software tool, to identify how you can improve air quality, energy savings, and operational flexibility while reducing total cost of ownership.



Air Cleaning for Indoor Firing Ranges

AAF Flanders can help mitigate the risks associated with airborne pollutants and fumes that are created by the firing process.

- Meeting compliance standards for OSHA regulations pertaining to lead exposure
- Removing dangerous airborne contaminants and improving air quality, health, and comfort of employees and customers
- Mitigating potential consequences and hazards attributed to toxic elements generated within firing ranges

Filtration Solutions

Pleated Filters

The AAF Flanders pleated filters line provides the industry's broadest selection of high performance, high capacity filters, including specialty and standard capacity options. Pleated filters can be used as prefilters to protect and extend the life of higher efficiency, more expensive final filters. In many applications, they are the only filter used in an HVAC system.



MEGApleat® M8
(see page 118)

Box Filters

These rigid, extended surface filters are ideal for use in all high efficiency applications. The supported pleat filters provide strength and integrity in high flow, turbulent, and variable airflow conditions. These filters are designed to remove airborne biological contaminants in critical areas.

HEPA/ULPA Filters

HEPA filters are the most efficient air filters commercially available. They are used in cleanroom and other applications requiring ultra-clean air—semiconductor, electronics, pharmaceutical manufacturing, food processing, hospitals, and labs. AAF Flanders HEPA filters are individually tested before shipment to ensure they meet rated efficiency and resistance. AAF Flanders HEPA and ULPA filters are available in a variety of efficiencies—from 99.97% tested on .3 µm particles to 99.9995% and higher tested on .1 to .2 µm particles. All filters are available scan-tested.



AstroCel® III
(see page 163)

Gas-Phase Products

AAF Flanders has assumed an industry leading position with the development of its innovative SAAF product line designed to reduce or eliminate harmful gaseous contaminants. In combination with our expertise in airborne particulate filtration, SAAF products and solutions allow us to develop unique and effective total filtration solutions to protect people, processes, and equipment.