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Small Arms Range Ventilation Standards

Carey's Heating & Air Conditioning, Inc. has designed and built hundreds of small arms range ventilation systems since 1995. There are three main purposes for properly ventilating a small arms range.

1. The primary purpose for the ventilation of an indoor firing range is to remove contaminates created during the firing of a weapon from the respiratory zone of the occupants. Exploding primers containing lead styphnate and friction from the lead slug against the gun barrel create airborne lead. There is also carbon monoxide as well as other contaminates created during the firing of a weapon.
2. The second and equally important reason for the properly designed and installed ventilation and control system is to keep the range at a negative pressure to the surrounding base building space. Contaminates created on a small arms range need to be contained in the range space. This will prevent the ingestion of contaminates as well as keeping the surfaces free of contaminates in non-range spaces of the base building.
3. The final purpose is to remove the smoke from the range for properly seeing the targets.

The following is a summary of the EPA, NIOSH and OSHA standards as they apply to small arms range ventilation:

EPA:

TITLE 40--PROTECTION OF ENVIRONMENT CHAPTER I--ENVIRONMENTAL PROTECTION AGENCY PART 50--NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS--
Table of Contents Sec. 50.12 National primary and secondary ambient air quality standards for lead. National primary and secondary ambient air quality standards for lead and its compounds, measured as elemental lead by a reference method based on appendix G to this part, or by an equivalent method, are: 0.15 micrograms per cubic meter, maximum arithmetic mean averaged over a calendar quarter. (Secs. 109, 301(a) Clean Air Act as amended (42 U.S.C. 7409, 7601(a)))

NIOSH and OSHA:

Established by NIOSH, the performance intent for firing range ventilation systems shall meet all the requirements outlined as recommendations and design considerations in HEW publication no. (NIOSH) 76-130, dated December, 1975, entitled "Lead Exposure Design Considerations for Indoor Firing Ranges". This design standard prefers an air flow velocity of 75 feet per minute average on the empty range. This design has consistently provided for the compliance within the established federal standards for airborne inorganic lead concentration limits.

When properly executed, lead concentrations are consistently maintained below the action level of 30 micrograms per cubic meter (30ug/m³) in an area where the limit shall not exceed 50 micrograms of lead per cubic meter (50ug/m³) of air over a time weighted average of eight hours as measured at the respiration zone of the shooters and the range officer when firing from the firing booths per OSHA 29 CFR. 1910.1025 and 1926.62.