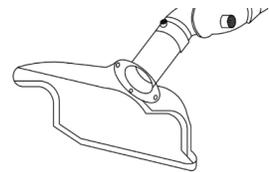




Isoflurane Exposure Control Operational Guidelines

- I. Use exposure control alternatives (in order of decreasing effectiveness):
 - a) Open induction chamber within, and exhaust the nose cone into, lab chemical fume hood (and not in recirculating biosafety cabinet).
 - b) Ensure **active** scavenging (using a pump or vacuum) through activated charcoal canisters (e.g., house vacuum, VetEquip V-1 Tabletop with Active Scavenging), from induction chamber and nose cone.
 - c) Position snorkel (e.g., Nederman FX2-75) with rectangular hood (e.g., Nederman Combi hood) 3-6 inches – (i) with one edge on the benchtop to the side or behind or (ii) above – the nose cone and induction chamber.
 - (i) Typically connected to facility exhaust; or
 - (ii) Could be standalone unit (e.g., FilterMate Exhauster) equipped with integrated activated charcoal filter (replaced per manufacturer's specifications, e.g., every 6 months).
 - d) Consider downdraft table or plastic enclosure ("doghouse") connected to facility exhaust or fan with charcoal filtration.
- II. Maintain the effectiveness of the systems:
 - a) Weigh charcoal canister before first and every use. **Discard in regular trash** when it gains 50 grams (or manufacturer's specification).
 - b) Do not block canister exhaust holes (e.g., if holes located on flat end, place canister on side).
 - c) Confirm that the Isoflurane vaporizer is calibrated every year.



Note: For more insights into setting up and safely using isoflurane, take the [Waste Anesthetic Gas Training](#) on Harvard Training Portal.



Isoflurane Exposure Control Device* Sourcing Information

If process conducted outside of a chemical fume hood or ducted biosafety cabinet, the following are:

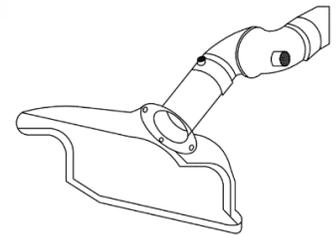
A. Minimum components of an active scavenging system:

1. An activated charcoal canister:
 - a. [F/Air](#); or
 - b. VetEquip [VaporGuard](#); etc.
2. An active exhaust flow:
 - a. House Vacuum – with [F/Air canister¹, holder](#), and tubing to attach to house vacuum system, and either:
 - i. flowmeter/[rotameter²](#) with [adapters](#); or
 - ii. [scavenging interface valve and kit³](#);
 - b. VetEquip [Scavenger Cube](#); or
 - c. Harvard Bioscience [MiniVac](#); etc.



B. For another measure of exposure control: use

- snorkel(s)/extraction arm(s) (e.g., [Nederman FX2-75](#)) with rectangular hood (e.g., Nederman [Combi hood](#)) positioned 3-6 inches – (i) above; (ii) angled 45° slightly behind; or (iii) with one edge on benchtop to side of – nose cone and induction chamber:
- a. Typically connected to facility exhaust; or
 - b. Could alternatively be standalone unit (e.g., [FilterMate Exhauster](#)) equipped with integrated activated charcoal filter (replaced per manufacturer's specifications, e.g., every 6 months).



¹ To protect maintenance personnel working near vacuum pumps in mechanical rooms.

² To manually adjust exhaust flow slightly (5-10%) above isoflurane/oxygen flowrate to maintain concentration of isoflurane within nose cone and induction chamber and resulting level of sedation.

³ To automatically adjust the flow to prevent the test animal from inhaling what it exhales as well as ensure that the vacuum system doesn't extract too much isoflurane from the nose cone.

* Use the example equipment noted here, or equivalents. Examples of possible suppliers:

- Harvard Bioscience ([F/Air canister & holder #75-0345](#), and MiniVac distributor) 774-270-2047 or cjohnson@harvardapparatus.com
- Colonial Medical (VetEquip VaporGuard, Scavenger Cube and FilterMate Exhauster distributor) 888-446-8427 or susan@colmedsupply.com (ask for Harvard pricing)
- ACFM Corp (Nederman authorized distributor and ventilation contractor) 978-534-5942 or davidacfm@comcast.net