
Welding Fume Extractor Filter Replacement and Airflow Check

1.0 Objective & Intent

This SOP defines the safety protocols for replacing filters on welding fume extractors and performing an airflow check to ensure the system operates at designed capture velocity. The primary goal is to protect workers from exposure to welding fumes containing hexavalent chromium, manganese, and other hazardous particulates, in compliance with WorkSafeBC OHS Regulation Part 5 (Chemical Agents) and Part 8 (Personal Protective Equipment). Failure to maintain proper filtration can lead to overexposure, respiratory illness, and regulatory penalties.

2.0 Operational Scope

This procedure applies to all maintenance personnel and welders responsible for the upkeep of portable and fixed welding fume extractors in the cabinet and millwork manufacturing facility. It covers all extractor models equipped with HEPA and/or pre-filters used in welding booths, assembly areas, and maintenance zones. This SOP does not cover central dust collection systems or non-welding ventilation equipment.

3.0 Hazard Identification & Mandatory PPE

- Welding fume inhalation: Hexavalent chromium, manganese, nickel oxides – carcinogenic and neurotoxic.
- Filter dust exposure: Fine metal dust and particulates that can become airborne during filter removal.
- Pinch points: Filter housing clamps, latches, and internal moving parts.
- Electrical shock: Contact with live wiring or capacitors inside the extractor unit.
- Heavy lifting: Filters can weigh up to 20 kg – risk of back strain or crush injury.
- CSA-Approved Steel Toed Boots
- N95 or P100 half-face respirator (minimum) – full-face if airborne dust is visible
- Safety glasses with side shields or welding goggles
- Cut-resistant gloves (ANSI A4 or higher) for handling filter media
- Disposable coveralls or apron to prevent dust contamination of clothing

4.0 Required Safety Equipment & Tools

- Lockout/Tagout (LOTO) Kit with personal lock and hasp
- Voltage tester or multimeter (CAT III rated)
- Replacement HEPA and pre-filters (manufacturer-specified)
- Anemometer or airflow hood (calibrated) for velocity measurement
- Heavy-duty plastic bags for used filter disposal
- Duct tape or sealing tape for bag closure
- Shop vacuum with HEPA filter for cleanup
- Non-sparking tools (e.g., brass or plastic) for opening clamps
- Lifting straps or second person for heavy filter handling

5.0 Step-by-Step Safety Procedure

1. Notify all welders and personnel in the area that the fume extractor will be shut down for filter replacement. Post a temporary sign on the unit: 'OUT OF SERVICE – MAINTENANCE IN PROGRESS'.
2. Isolate the extractor from all energy sources: unplug the unit or disconnect at the breaker panel. Apply a personal lock and tag on the disconnect switch or plug. Verify zero energy state by attempting to start the unit (it must not power on).
3. Don all required PPE as listed in Section 3.0. Ensure respirator is fit-tested and seal-checked before proceeding.
4. Open the filter access door or housing using non-sparking tools. Carefully remove the pre-filter (if present) and place it directly into a heavy-duty plastic bag. Seal the bag immediately with tape to prevent dust release.
5. Remove the main HEPA filter by gripping the frame (not the media). Slide it out slowly to avoid disturbing captured dust. Place it into a second plastic bag and seal. If the filter is heavy, use lifting straps or request assistance to prevent back injury.
6. Inspect the filter housing interior for dust accumulation, damage, or debris. Use a HEPA-filtered shop vacuum to clean the interior surfaces. Do not use compressed air, as it will aerosolize hazardous dust.
7. Install the new HEPA filter by sliding it into the housing with the airflow arrow pointing toward the fan. Secure it according to the manufacturer's instructions. Install a new pre-filter if applicable. Close and latch the access door.
8. Remove the LOTO lock and tag, reconnect power, and start the extractor. Allow it to run for 2 minutes to stabilize airflow. Using an anemometer, measure the capture velocity at the extraction nozzle or hood. The reading must meet the manufacturer's minimum specification (typically 100-150 ft/min for welding fume). If below spec, check for duct blockages or fan issues.
9. Document the filter replacement date, new filter serial numbers, and airflow reading on the maintenance log attached to the unit. Remove the 'OUT OF SERVICE' sign and notify welders that the extractor is back in service.
10. Dispose of the sealed used filter bags in the designated hazardous waste container. Wash hands and face thoroughly after completing the procedure.

Regulatory Disclaimer: This document is a generic safety template provided for educational and informational purposes only. It does not constitute professional engineering, legal, or regulatory compliance advice. The end-user assumes all liability for validating all safety protocols against specific machinery manufacturer manuals and local occupational health and safety regulations (e.g., WorkSafeBC, CSA standards) before deployment.