

**ADVISORY NO. 8.1: PROCEDURES FOR DISMANTLING EXHAUST
 VENTILATION SYSTEM SUSPECTED OF
 CONTAMINATION WITH PERCHLORATES**

BACKGROUND

When misused, perchloric acid can be extremely dangerous. Heated above ambient temperatures, hot perchloric acid and its vapors can form highly flammable and explosive perchlorates when in contact with combustible materials, such as grease, oil, and most organic compounds. Perchlorates may explode upon heating, in contact with flames, by impact or friction, or may ignite spontaneously.

Laboratory fume hoods not specifically designed and dedicated for the use of perchloric acid vapors lack the wash-down systems necessary for the removal of the explosive perchlorate salts that form in exhaust system ductwork. Therefore, the utmost care must be taken when servicing, or dismantling laboratory exhaust systems contaminated with perchlorates.

EQUIPMENT

- full face shield
- long sleeve work shirt
- hard hat
- leather work gloves
- non-sparking tools
- wooden spatula
- high speed saw
- low pressure steam generating device

PROCEDURE

The following adopted procedures were established and successfully carried out by the University of Washington on a laboratory fume hood system confirmed of being contaminated with perchlorates:

- If a laboratory hood or exhaust system has been exposed to perchloric acid heated above ambient temperature, tests shall be conducted for explosive perchlorates before any inspection, cleaning, maintenance, or any other work is done on any part of the exhaust system or hood interior. Contact Environmental Health & Safety at 556-4968 for perchlorate determination.
- Decontamination and/or dismantling of the contaminated or suspect system should be done when occupancy is at a minimum.
- The entire system should be washed for 24 hours, just prior to dismantling or work by introducing a fine water spray within the hood, with the fan running. (A method must be devised to collect runoff and condensate). To reduce the quantity of water generated and to ensure contact of water with all contaminated surfaces, a steam-generating device can be used to supplement water cleaning. (A popping sound may be noticed if the surface of the contaminated system is not thoroughly wetted prior to introducing steam).
- Prior to removal the fan should be hosed down.
- Fan mounting bolts and connectors should be carefully removed, using non-sparking tools throughout.

- The fans should be immediately removed to the outside. As an added precaution the fans should be covered in a wet blanket before transport.
- Plate bolts should be evenly loosened to remove the plate without binding. If a fan puller is necessary, it should be non-sparking.
- All disassembled parts should be washed and cleaned. The gasket material contained on flanges should be scraped off with a wooden scraper.
- If dismantling of the ductwork or hood is required, all work should be done with non-sparking tools. The ducts and hood should be washed down again just prior to and during dismantling.
- Repeat all steps used for removal and cleaning of the fan for all contaminated duct work and hood housing.