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C-A OPERATIONS PROCEDURES MANUAL

9.5.9 Use of HEPA Vacuum Cleaners

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Approved: \_\_\_\_\_ *Signature on File* \_\_\_\_\_  
Collider-Accelerator Department Chairman Date

P. Bergh

## 9.5.9 Use of HEPA Vacuum Cleaners

### 1. Purpose

This procedure provides Collider Accelerator Department (C-A) personnel with instructions and requirements for the proper operation, storage, control, and maintenance of high efficiency particulate (HEPA)-filtered vacuum cleaners in C-A radiological and radioactive material areas.

### 2. Responsibilities

2.1 The C-A Maintenance Coordinator (or designee) is responsible for:

2.1.1 providing an annual inventory of HEPA vacuum cleaners to the Radiological Control Division (RCD) Representative,

2.1.2 providing a lockable storage area for all C-A HEPA vacuums,

2.1.3 maintaining an inventory of HEPA vacuum supplies.

2.2 The RCD Representative (or designee) is responsible for:

2.2.1 controlling the uses and maintenance of HEPA-filtered vacuums,

2.2.2 determining the need for a Radiation Work Permit (RWP) based upon the intended use of the vacuum,

2.2.3 scheduling annual HEPA filter efficiency tests.

2.3 C-A Radiological Control Technicians (RCTs) are responsible for:

2.3.1 surveying HEPA vacuums approved for use in radiological areas.

2.3.2 Providing support to C-A staff when changing out vacuum bags,

2.3.3 signing out/in HEPA vacuums from their locked storage area,

2.3.4 ensuring ports and hoses are properly sealed prior to sign-out.

2.4 The Safety and Health Services Division, Industrial Hygiene Group, is responsible for conducting and documenting annual HEPA filter efficiency tests.

2.5 HEPA-filtered vacuum users are responsible for:

2.5.1 the proper operation of the vacuum cleaner in accordance with manufacturer's instructions,

2.5.2 changing vacuum bags when full.

### **3. Prerequisites**

- 3.1 The C-A Maintenance Coordinator shall approve purchases of HEPA-filtered vacuums.
- 3.2 Newly purchased HEPA vacuums, intended for use in radiological areas, shall be certified by passing a HEPA filter efficiency test. Results of the test, including expiration date, shall be affixed to the vacuum.
- 3.3 As a minimum, personnel using HEPA vacuums shall have Radiation Worker I and Contamination Worker training.
- 3.4 The RCD Representative shall determine the need for a RWP based upon the intended use of HEPA vacuums.
- 3.5 HEPA filter efficiency tests are required annually, following vacuum maintenance, or after changeout of the HEPA filter. Efficiency tests are not required following pre-filter or vacuum bag changeout.

### **4. Precautions**

- 4.1 HEPA vacuums SHALL NOT be used in wet areas.
- 4.2 HEPA vacuums approved for use in radiological areas SHALL NOT be used for hazardous materials (e.g., lead, beryllium, and mercury).
- 4.3 All vacuum cleaners in the C-A HEPA vacuum cleaner program shall be equipped with both HEPA filters and pre-filters.
- 4.4 All HEPA vacuums shall be checked for proper sealing of ports and hoses prior to transport. Ports and hoses shall be sealed with duct tape, or shall have a taped cover to prevent the spread of contamination.
- 4.5 Vacuum bags shall be changed out when:
  - 4.5.1 vacuum is filled or fails to operate properly,
  - 4.5.2 exposure rate exceeds 0.5 mR/hr at 30 cm from the vacuum cleaner.
- 4.6 HEPA-filtered vacuums should be used to control the dispersion of radioactive particles generated by grinding, cutting, or drilling into radioactive materials.
- 4.7 When not signed out, C-A HEPA vacuums are to be stored and locked to prevent unauthorized use.

## 5. **Procedure**

### 5.1 Use of Approved HEPA-Filtered Vacuum Cleaners

**Note:**

Approved HEPA-filtered vacuum cleaners are those which have a current efficiency test label attached to the unit, have been issued from the HEPA vacuum storage area by an authorized individual, and the use of which is in accordance with the provisions of an approved RWP as appropriate.

- 5.1.1 C-A personnel who need to use a HEPA-filtered vacuum cleaner shall contact the RCD Representative, Maintenance Coordinator, or designee.
- 5.1.2 Upon reviewing the intended use of the HEPA vacuum, the RCD Representative will have the HEPA vacuum issued from the storage area by a RCT.
- 5.1.3 The RCT will complete the HEPA Vacuum Logbook noting the user's name, work group, date, and location of use.
- 5.1.4 The issuing RCT will check the HEPA vacuum to ensure its certification is valid, and that all ports and hoses are properly sealed.
- 5.1.5 When the task is completed, the user will notify the duty RCT, and have the HEPA vacuum returned to the storage location.
- 5.1.6 The duty RCT will complete the HEPA Vacuum Logbook noting the time and date the HEPA vacuum was returned.
- 5.1.7 The duty RCT will survey the HEPA vacuum and attach a yellow Radioactive Materials tag as appropriate. If the external exposure rate at 30 cm is greater than 0.5 mR/hr, the bag is to be changed out.

### 5.2 Cleaning/Emptying HEPA Vacuums

**Note:**

Continuous RCT coverage is required to change HEPA vacuum bags and filters.

- 5.2.1 Due to the potential for release of radioactive materials, only replace bags and filters in a posted Contamination Area.
- 5.2.2 Cover the work area floor with disposable plastic or equivalent.
- 5.2.3 Don PPE as per approved RWP.
- 5.2.4 Smear the exterior of the vacuum and evaluate with a frisker.
  - 5.2.4.1 If more than 100 cpm above background is detected, notify the RCD Representative, otherwise proceed to 5.2.5.
- 5.2.5 Survey the exterior of the vacuum with an RO-20 or equivalent survey meter. If the exposure rate at 30 cm is greater than 0.5 mR/hr, and the vacuum was not used on spent resin or metal shavings, a full-face air-purifying respirator with HEPA cartridge is required to replace the vacuum bag or filter.
- 5.2.6 Break the tape seal and carefully remove the upper half of the vacuum.
- 5.2.7 Remove the vacuum bag, and place it in a radioactive waste bag. Tape the bag shut, complete a yellow Radioactive Materials tag, and affix it to the bag. Reference the HEPA Vacuum Logbook to complete the "Material Description" section of the tag.
- 5.2.8 With the bag removed, smear the inside of the vacuum and check the smear with a frisker.
  - 5.2.8.1 If contamination is detected, decontaminate to less than 100 cpm above background using masslinn.
- 5.2.9 Install a new vacuum bag and close the unit. Replace the tape seal.
- 5.2.10 Check the disposable plastic for contamination.

## **6. Documentation**

- 6.1 An inventory of C-A HEPA vacuum cleaners approved for use in radiological and radioactive material areas shall be submitted to the RCD Representative by the Maintenance Coordinator annually in October.
- 6.2 C-A HEPA Vacuum Logbook

7. **References**

7.1 Brookhaven National Laboratory, Radiological Control Manual

8. **Attachments**

None