PURCHASING, MAINTAINING, AND USING HEPA FILTERS	Identifier: MCP-2746 Revision*: 7 Page: **1** of 8

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1. INTRODUCTION

1.1 Purpose

High-efficiency particulate air (HEPA) filters (see def.) and HEPA filter systems are used to provide a safe and healthful working environment by minimizing the release of particulate contaminants such as carcinogens, infectious agents, radioisotopes, or highly toxic materials. This procedure provides instructions for implementing requirements pertaining to HEPA filters. It addresses applicable requirements from 40 Code of Federal Regulations (CFR) 61, Subpart H; Department of Energy (DOE) Orders 440.1A; American National Standard Institute (ANSI) N510 and DOE Standard 3020-2005.

1.2 Scope and Applicability

This document identifies the applicable attributes for purchasing, maintaining, testing and using HEPA filters. HEPA filters used in other applications are identified according to their use (pre-filter, roughing filter, special filter, etc.)

This document applies to all personnel purchasing, maintaining, and using HEPA filters in facilities at the Idaho Cleanup Project (ICP), and town facilities.

2. RESPONSIBILITIES

None

3. PREREQUISITES

None

4. INSTRUCTIONS

4.1 HEPA Filter System Oversight

4.1.1 HEPA Filter Equipment/System Custodian (ESC): Maintain the following system information:

A. HEPA filter system manufacturer and model number (to include the number and types of filters in the system)

B. Filter model numbers

C. Bag model number for bag-in/bag-out systems

D. Installation date of the filters

E. Hazardous agents in the system air stream

F. Areas and equipment being serviced by the system

G. Performance parameters of the system, such as; airflow rate, differential pressure ranges, and radiation levels.

4.1.2 HEPA Filter ESC: Ensure the following steps are completed.

4.1.2.1 Track HEPA filter system test due dates.

4.1.2.2 Consult facility or system requirements to determine frequency and need for in-place testing.

NOTE: *Not all HEPA filters are on an annual test schedule. The frequency and need for in-place testing is based on facility or system requirements*.

4.1.2.3 Ensure HEPA filter systems in use have been in place tested. Systems are tested after installation, modification, repair and periodically, (annually [see def.] at a minimum) in accordance with facility or system requirements.

4.1.2.4 If filter system needs to be tested, then perform the following steps.

4.1.2.4.1 Initiate work order as specified in STD-101, "Integrated Work Control Process," or MCP-3562, "Hazard Identification, Analysis, and Control of Operational Activities, as appropriate."

4.1.3 HEPA Filter ESC: Ensure safe operation of HEPA filter system.

4.1.3.1 Determine corrective action and inform system owner, system engineer, and HEPA filter test personnel of:

A. Any suspected problems with the filter system

B. High differential pressure of 5 in. water or greater

C. Reduction in differential pressure indicating system breach

D. Airflow restrictions

E. Any changes/modifications made to the filter system

F. Occurrence of fire in or an off-normal chemical release into the ventilation exhaust, which may impair HEPA filtration or efficiency.

NOTE: *HEPA filters that have exceeded their shelf life may be used on a case-by-case basis if they meet recommendations of Engineering Design File (EDF) 4629 "Use of HEPA filters with an Expired Shelf Life," particularly Section VII. Part C.*

4.1.3.2 System Engineer, SSC Engineer, etc: IF HEPA filters must be used with an expired shelf life,
THEN perform the following:

4.1.3.2.1 Approve the specific use of HEPA filter with an expired shelf life.

4.1.3.2.2 Document the specific use (NCR, Work Order, EDF, etc.) that includes approvals from engineers responsible for the system.

4.1.3.2.3 Ensure that HEPA filter(s) and filter seals(s) are visually inspected for defects or degradation, and a satisfactory aerosol efficiency test is performed after installation.

4.1.3.3 Confirm that replacement or new HEPA filters installed into a system have been stored according to Step 4.2.4, the shelf life has not been exceeded, and filters have been tested at a DOE Filter Test Facility (FTF), if necessary.

NOTE: *Only the filters that meet the specifications of DOE-3020-2005 are required to be tested at the DOE FTF. Filters that do not meet specifications of DOE STD-3020-2005 such as portable vacuum filters, encapsulated filters, in-line instrument protection filters, etc., are factory certified upon construction.*

NOTE: *HEPA filtered vacuums and portable air-handling equipment used in Radiological Areas are used in accordance to MCP-90.*

4.1.3.4 Perform in place tests on filters received such as HEPA filters used in portable vacuums, encapsulated filters etc, upon installation.

NOTE: *Filters received such as in-line instrument protection filters or others where in-place testing is not feasible shall be visually inspected for defects or damage before installation. Reliance on manufacturers design, construction and recommendations for use takes the place of the in-place test.*

4.1.3.5 Visually inspect filters such as in-line instrument protection filters or others where in-place testing is not feasible for defects or damage before installation.

4.2 HEPA Filter Equipment Procurement and Storage

NOTE: *This includes codes and standards along with testing requirements.*

4.2.1 HEPA Filter ESC: Before purchasing HEPA filters and HEPA-filtered systems, identify engineering and environmental safety, health, and quality requirements.

4.2.2 Ensure that all requisitions for HEPA filters and filtered equipment are reviewed by the INL HEPA Filter/Ventilation Group for accuracy and proper application per MCP-1185 "M*aterial Acquisitions*" requirements. All HEPA filters used in vacuums and portable air-handling equipment shall meet, as a minimum, the test criteria established in MIL-STD-282 or equivalent.

4.2.3 Property Management Personnel HEPA Filter ESC; Ensure that HEPA filters are stored:

A. in original packaging to prevent exposure to ultraviolet rays and possible damage to media or seals

B. in weather tight enclosure (or equivalent)

C. in an environmentally controlled area with temperature ranges from 40 to 140°F, and away from ozone depleting sources

D. no more than three filters high.

E. well drained paved floor (or equivalent)

F. placed on a pallet or shoring to permit air circulation.

4.2.4 Property Management Personnel/ESC: Ensure that the oldest stock of HEPA filters on hand is issued first.

4.2.5 Ensure that HEPA filters that have reached the end of their shelf life are stored separately so they are not issued without authorization.

NOTE: *The reorder date should consider material lead times, so that sufficient HEPA filters with good shelf life are ready for issue.*

4.3 HEPA Filter Testing

4.3.1 HEPA Filter Testing Supervisor: Verify personnel performing in-place HEPA filter testing are trained and certified to the appropriate level (see Appendix A, Certification Requirements for HEPA Filter In-Place Testing).

4.3.2 HEPA Filter Test Personnel (HFTP): Perform in-place HEPA filter test per TPR-5054, "HEPA Filter In-Place Testing."

4.4 Filter Change Out

4.4.1 HEPA Filter ESC: Confirm that HEPA filters are installed and changed in accordance with approved procedures or work control documents.

4.4.2 HEPA Filter ESC: Update system information with new filter installation date.

4.5 Design and Modification of HEPA Filter Systems

4.5.1 HEPA Filter ESC: Ensure new designs/modifications are reviewed and approved by system owner, system engineer, and HFTP during the design phase to make sure the HEPA filter system can be in-placed tested.

5. RECORDS

All records are identified in TPR-5054

NOTE: *MCP-557, "Records Management," the INL Records Schedule Matrix, and associated record types list(s) provide current information on the storage, turnover, and retention requirements for these records.*

6. DEFINITIONS

Annually. Twelve (12) months ±1 month for purposes of the ICP Radiological Control Manual.

High-efficiency particulate air filter. Throwaway extended pleated medium dry-tape filter with the following characteristics:

A. Rigid casing enclosing the full depth of the pleats

B. Minimum particle removal efficiency of 99.97% for monodispersed particles with a diameter of essentially 0.3 micrometer

C. Maximum pressure drop of 1.0 or 1.3 in. water gauge (depending on capacity) when clean and operated at its rated airflow capacity.

In-place filter test. An in-place leak test performed periodically to establish the current condition of the HEPA filter system with respect to bypass, degradation, proper installation, and damage to the filter.

7. REFERENCES

ANSI/ASME AG-1-2003, "Code on Nuclear Air and Gas Treatment"

ASME/ANSI N510-1989-reaffirmed 1995, "Testing of Nuclear Air Treatment Systems"

40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon From Department of Energy Facilities;" Section 92, standard

41 CFR 101, "Federal Property Management Regulations"

DOE-STD-3020-2005, "DOE Standard-Specification for HEPA Filters Used by DOE Contractors"

DOE Order 5480.4, "Environmental Protection, Safety, and Health Protection Standards"

DOE HDBK-1169-2003, "DOE Handbook-Nuclear Air Cleaning Handbook"

EDF-4629, "Use of HEPA Filters with an Expired Shelf Life"

ICP Radiological Control Manual

MCP-1185 "Material Acquisitions"

MCP-90 "Use of Vacuum Cleaners and Portable Air Handling Equipment in Radiological Areas"

8. APPENDIXES

Appendix A, Certification Requirements for HEPA Filter In-Place Testing

Appendix B, Procedure Basis

Appendix A

Certification Requirements for HEPA Filter In-Place Testing

Level	Testing Activities That May Be Performed	Minimum Training/Experience
Level I	Trainees may be used in data-taking assignments and for equipment operation provided they are instructed and closely supervised by a qualified Level II or Level III individual participating in the test.	High school diploma or equivalent with no prior experience.
Level II	Level II personnel are (a) capable of and experienced in performing the required in-place tests at the sites to be tested; (b) familiar with the tools and equipment to be employed and proficient in their use; and (c) capable of determining that the measuring and test equipment is in correct calibration, is in proper condition for use, and is performing in accordance with approved testing procedures.	(a) High school diploma, attendance at structured courses covering topics relevant to in-place HEPA filter testing, PLUS 25 weeks of comprehensive in-place testing experience within a 5 year period under the direct supervision of a qualified Level II or III individual, or (b) Completion of college level work equivalent to a 2 year associate degrees in an appropriate field of science, technology, or engineering; PLUS 15 weeks of comprehensive in-place testing experience within a 5 year period under the direct supervision of a qualified Level II or III individual, or (c) Completion of college level work equivalent to a 4 year baccalaureate degree in an appropriate field of science, technology, or engineering; and, supplemental education to include, as a minimum, satisfactory completion of formal courses, or workshop programs, on the theory and practice of in-place testing, PLUS 10 weeks of comprehensive in-place testing experience within a 5 year period under the direct supervision of a qualified Level II or III individual.
Level III	Level III personnel posses all the capabilities of a Level II tester and are capable of (a) planning tests; (b) arranging tests, including preparation and setup of related equipment; (c) supervising, or maintain surveillance over the test; (d) supervising, and attesting to qualifications of lower level personnel; (3) reporting test results; and (f) explaining the reasons when compliance cannot be demonstrated and making appropriate recommendations for remedial action. Only Level III personnel are qualified to plan test programs, evaluate test results, and certify test reports.	(a) Twenty weeks of satisfactory performance within a 5 year period as a qualified Level II, PLUS additional special education to include, as a minimum, formal courses on the theory and practice of in-place testing, ventilation design and measurements, industrial safety, quality assurance, and other relevant topics, or (b) Forty weeks of satisfactory performance within a 5 year period as a Level II, PLUS verifiable evidence of acquisition of an equivalent level of knowledge contained in the courses in (a) above.

NOTES: *(1) The education and experience requirements for Level II or equivalent combination of the two may be used to evaluate personnel seeking Level II qualification.*

(2) The minimum education and experience criteria for Levels II and III are not absolute. Alternate qualifying factors include (a) demonstrated capability through previous performance and (b) reduction in experience requirements in recognition of qualification and experience in allied testing area.

Appendix B

Procedure Basis

Step	Basis	Source	Citation
1.1	*High-efficiency particulate air (HEPA) filters* (see def.) and HEPA filter systems are used to provide a safe and healthful working environment by minimizing the release of particulate contaminants such as carcinogens, infectious agents, radioisotopes, or highly toxic materials.	PRD-183	311.2
4.1.2 4.2.5	Confirm HEPA filter systems in use have been in place tested.	PRD-183	464.3
4.1.3	Ensure safe operation of HEPA filter system.	PRD-183	464.1
4.2.2	Ensure that all requisitions for HEPA filters and filtered equipment are reviewed by the INL HEPA Filter/Ventilation Group for accuracy and proper application.	PRD-183	464.2
4.3.1	Verify personnel performing in-place HEPA filter testing are trained and certified to the appropriate level (see Appendix A, Certification Requirements for HEPA Filter In-Place Testing).	PRD-183	611
4.3.2	Perform in-place HEPA filter test per TPR-5054, “HEPA Filter In-Place Testing.”	PRD-183	464.3
4.5.1	Ensure new designs/modifications are reviewed and approved by system owner, system engineer, and HFTP during the design phase to make sure the HEPA filter system can be in-placed tested.	PRD-183	464.3