Best Practice Guidelines

Air Filtration Technicians on Site

This guideline is provided courtesy of:

SoCal Filters Sales & Service
Servicing Southern California Since 2013

SoCal Filters and Service Inc.
7315 Adams Street
Paramount, CA 90723
424-216-5473
Info@socalfiltersinc.com
www.socalfiltersinc.com

NAFA® National Air Filtration Association

WWW.NAFAHQ.ORG

NAFA®
National Air
Filtration
Association

Table of Contents

Contributor Acknowledgement 3

About NAFA 4

NAFA Certifications 5

Purpose, Scope & Background 6

NAFA Best Practice Recommendations - Pre-Site Visit..... 7

NAFA Best Practice Recommendations - On-Site 8

Installation, Operation and Maintenance 10

Bibliography..... 13

Copyright & Usage 14

National Air Filtration Association (NAFA) Headquarters
1818 Parmenter Street, #300
Madison, WI 53562
www.nafahq.org

Best Practices for Air Filtration Technicians On Site

NAFA guidelines provide advice on achieving the cleanest air possible based on the design limits of existing HVAC equipment and with consideration of the impact on energy and the environment. Our guidelines are created and updated to collect and supplement existing information. However, we go beyond the "bare minimum," publishing best practices based on the experience and expertise of our membership, as well as current mandates and research provided by governmental and scientific communities.

For a more complete explanation of principles and techniques found in this guideline, visit www.nafahq.org to purchase the NAFA Guide to Air Filtration. If you have any questions or comments about this publication, please contact NAFA Headquarters.

A special thank you to the following member contributors:

Lead Author

Kevin Delahunt, CAFS
BGE Indoor Air Quality Solutions Ltd.

Contributors

Timothy Ahn, NCT
Clean & Science Co., Ltd.

Emily Bardach, CAE
National Air Filtration Association

Glen Bergman, CAFS
G & B Environmental, Inc.

Josh Brandl, CAFS
The Filter Shop

Randy Brannen, CAFS, NCT II
Quality Filters, Inc.

Dara Chhan, CAFS, NCT
TEX-AIR Filters

Michael Corbat, CAFS
Rensa Filtration

Julie Engelstad, CAFS
Camfil USA, Inc.

Keith Jordan, CAFS, NCT
Colorado Air Filter LLC

Paula Levasseur, CAFS
LMF Services LLC

Roberta MacGillivray, CAFS, NCT
BGE Indoor Air Quality Solutions Ltd.

Nitim Mohan, CAFS, NCT
Tristate Filter & HVAC Supplies, Inc.

Hunter Most, CAFS
AAF Flanders

James Parris, CAFS
Freudenberg Filtration Technologies Inc.

Jay Reese, CAFS
J & BR Associates, LLC.

Patrick Rosenthal, CAFS, NCT
TEX-AIR Filters

Tavatchai Satienrattanakul, CAFS
3V Engineering Solutions Co., Ltd.

Elijah Selzer
Pure Filtration Products, Inc.

Trevor Smith
BGE Indoor Air Quality Solutions Ltd.

Dan Strebeck, CAFS
Pure Filtration Products, Inc.

About Us

Our Mission:

The National Air Filtration Association (NAFA) mission is to be the global source for expertise, education & best practices in air filtration.

What can NAFA membership do for you?

NAFA brings together air filter and component manufacturers, sales and service companies, and HVAC and indoor air quality companies. By becoming a member, you can:

- Meet with industry thought leaders
- Strengthen your network
- Share best practices
- Receive up to date industry information
- Access professional development, certification and education

Be a part of something bigger

As a NAFA member, you are a part of a support system that shares the common goals of supporting industry growth and creating healthier communities. Following the coronavirus pandemic, we are more aware than ever of the important role that our members play in a well society. We know that our work is important to maintaining healthy, happy communities.

Benefits of Membership

As a member of NAFA, you'll have access to a host of benefits that offer networking, learning, and advertising opportunities. Here are just a few of our most popular benefits:

- Annual conferences and webinars
- Professional development programs (CAFS and NCT Level I & II certification)
- Air Media magazine
- Best practices guidelines
- Clean Air Award recognition program
- Library of resources, manuals, seminars, and training.
- NAFA advertising and sponsorship programs
- Exposure through NAFA social media and a listing on the NAFA website
- NAFA volunteer and leadership opportunities

...and more!

Click here to become a member today!

CAFS & NCT Certifications

Educate your team
Attract new customers
Be known as a leader in your industry

Now more than ever, customers seek professionals with the credentials for quality assurance and knowledge to ensure that their complex needs will be met. Addressing this concern, NAFA offers two certification programs to increase the level of education and professionalism in the industry.

The NAFA Certified Air Filter Specialist (CAFS) program

CAFS is the first education and certification program offering an extensive examination on the principles, methods and applications of air filtration. It differentiates professionals who have demonstrated a high level of professionalism and a thorough, up-to-date understanding of air filtration technology. The CAFS exam is pass/fail, and is based on the NAFA Guide to Air Filtration.

NAFA Certified Technician (NCT) Program

This open-book exam is based on the NAFA Installation, Operation, and Maintenance of Air Filtration Systems manual. This program was designed to increase the knowledge of technicians, facility managers, and building owners.

Both certifications are renewable on an annual basis pending successful completion of continued education requirements. While the exams are open to members and nonmembers alike, test fees are dramatically reduced for members. To find out more about the cost, study aids, test dates/locations, and requirements, visit the weblinks below.

CAFS information page

NCT information page

Purpose, Scope and Background

1 PURPOSE

This Best Practice provides comprehensive guidance for the inspection, servicing, replacement, and retrofitting of filtration products and systems to the diverse HVAC equipment found in today's built environment. It will benefit every company that services air filtration products enabling them to perform the work in a consistent, safe, healthy, and environmentally friendly manner. The end goal of providing this level of service will be the knowledge that the air being supplied to the building and occupants will be of the highest quality.

2 SCOPE

Consistent protocols for the servicing of air filtration products provide a measure of quality control thatwould not be possible without this guidance. Some of the items listed here are mandatory, such as dust masks, coveralls, gloves, and hard hat for example, while others can be considered job specific. It is NAFA's hope that every air filter service company will create their own service checklist using all, or some, of the guidance listed here.

This Best Practice has three components: pre site visit, on site visit and post site visit. All three are essential for exceeding customer's expectations and performing the work in a safe, healthy, and environmentally friendly manner.

3 BACKGROUND

The servicing of air filtration products is a dirty, labor intensive, and physically demanding job. Technicians performing this work require some level of training such as the NAFA Certified Technician (NCT) course offered by the National Air filtration Association (NAFA). An NCT trained technician will have a better understanding of the importance air filters play in supplying a safe and healthy environment for building occupants and the work that they perform is directly related to the quality of that air.

NAFA Best Practices Recommendations - Pre-Site Visit

1 ASSESS:

- Is a hazardous assessment required prior to site visit?
- Are any permits required for the shut-down of the equipment and access to the service area?
- Is the work area a confined space and do special precautions need to be considered?
- Is there adequate lighting in the unit to perform the work in a safe manner?
- Do you require supplemental lighting to complete the work?
- Are there special tool requirements such as a socket wrench, screwdriver etc.?
- Are the filters to be changed easily accessible and can the work be performed in a safe manner?
- Do you require a pull stick to remove the filters?
- Do you require a ladder to access the HVAC equipment to be serviced? Is the ladder fixed in place?
- Is an aerial work platform (AWP), such as a scissor or man lift, or scaffold required?
- Do you have the correct sizes and types of filters required to complete the change?

2 WHAT PPE IS REQUIRED FOR THE WORK?

- Hard Hat
- Gloves
- Dust masks, breathing apparatu
- Safety Glasses
- Hearing protection
- Steel toed boots
- Coveralls
- Fall protection

NAFA Best Practices Recommendations - On-Site

1 SAFETY:

- Check in with security.
- Contact operations personnel regarding permits and/or the shutting down of the equipment to be serviced.
- Avoid working with fans running. There are rare circumstances when this may happen. A hazard assessment needs to be performed before the work commences. The service technician has the final approval on whether it is safe to proceed.
- Lock-out/tag-out of equipment during shut-down using your own locks.
- Place the filters to be replaced close to the unit being serviced. For pre-filter replacement carefully remove the filters to limit particulate off-loading. Remove row by row from top to bottom. When replacing pad filters minimize the offloading of dirt by carefully rolling or folding the pads during removal.
- Place the spent filters immediately in a garbage bag and seal when filled.

2 UPON COMPLETION:

- Brush and vacuum frames and plenum upstream and downstream of the filter bank if access is available.
- Install new pre-filters of the same size and efficiency.
- Remove all tags and locks if applicable.

3 RESTART UNIT:

- Remove all garbage to disposal bins or remove from site.
- For secondary replacement, follow the pre-filter replacement procedure with the following additions:
- Carefully remove the secondary filters limiting particulate off-loading row by row from top to bottom.
- Place spent secondary filters in bags or back in the original box, seal box, and remove for disposal.
- Before installing new secondary filters brush and vacuum filter frames and plenum upstream and downstream of the filter bank if access is available.

NAFA Best Practices Recommendations - On-Site

RESTART UNIT (CONTINUED):

- Inspect filter bank for overall structural integrity and bypass possibilities with special attention to filter and door gaskets as well as spacers.
- Inspect clips and filter hardware making note of any deficiencies. Replace/repair as needed.
- Install new secondary filters of the same size and efficiency.
- Remove all tags and locks if applicable. Restart unit.
- Validate system efficiency.
- Sign and date service card/maintenance record if one is at the unit.
- If the service card is unavailable replacement date should be recorded on the filter.
- Sign off work permit if required.
- Complete all necessary paperwork.
- Notify Operations staff upon completion of the work.
- Remove all garbage to disposal bins or remove from site.

Installation, Operation & Maintenance

The following identifies some of the more important factors to consider when installing, operating and maintaining an HVAC Filtration system. As a supplement to manufacturers' guidelines, see NAFA's Installation, Operation and Maintenance of Air Filtration Systems manual or consult a NAFA CAFS.

Installation of Filters & System Integrity

Maintaining integrity of the filter system is vital for the efficacy of the HVAC system and imperative for air filtration performance as unfiltered air by-pass is a key contributor to poor IAQ.

A positively sealed filtration system will prevent unfiltered air bypass, maintain system pressure, and provide consistent filtration system efficiency. After each filter installation, the system must be checked to ensure that there are no possible leaks ord around the filters. This includes filter frames, fastening devices, caulking and gaskets.

NAFA recommends having a NAFA Certified Air Filtration Specialist (CAFS) inspect the installation for system integrity at least annually.

When changing or modifying the model or design of a filter system consult the manufacturer's specifications of the air handling system. Consideration must be given for:

- Size
- Fit
- Media area
- Airflow rate
- Initial and final pressure drop of the new filter system

Maintenance

A preventive maintenance program should include a monthly inspection of the filtration system. Use the following checklist as a starting point:

_____ Filters
_____ Filter hardware
_____ Fastening devices
_____ Caulking
_____ Gaskets
_____ Ductwork

Removing and replacing damaged or defective filters, filter hardware, gaskets, and duct insulation will keep unfiltered air from bypassing the filter system. Keeping the coils and blower clean and free from dirt and debris will improve airflow, increase system efficiency, reduce electrical consumption, and maintain overall design performance. Scheduled filter maintenance will keep the HVAC system working efficiently with clean, conditioned air and a reduction in contaminant levels.

Additional information regarding maintenance of HVAC and filter systems may be found in the ANSI/ASHRAE/ACCA Standard 180, "Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems."

Installation, Operation & Maintenance (continued)

Monitoring of Airflow and Pressure Drop

As a filter loads with contaminants the resistance to air flow through the filter increases. This increase is referred to as "pressure drop" or "differential pressure."

As an example, in a draw-through system, as the filters load and the resistance increases, the fan pressure is lower on the downstream side. Hence the pressure "drop" downstream of the filters.

This drop or differential can be measured with a pressure sensing device such as a manometer or magnehelic gauge. All HVAC units should have a pressure-sensing device installed to accurately monitor the pressure drop across the filter bank. In extreme temperature conditions, a magnehelic gauge is recommended over a manometer. When a filter has exceeded its useful life based on pressure drop or Life Cycle Costing, it should be replaced. Leaving a filter in service after this point may increase operational and energy costs and could damage the HVAC system.

Most molecular filters, over time, will not increase in pressure drop. Some particulate media, when impregnated with sorbent, could increase in pressure drop. This is not indicative of the service life of the sorbent. Service life of a molecular filter is a function of types and concentration of contaminants and filter design. Most manufacturers offer testing services to determine remaining filter service life. It is important to note that as the media life decreases, so does the efficiency of the molecular filter. Molecular filters are often recommended for change out before media is 100% spent.

Filter Service

The servicing of filtration products is a dirty business. It is best practice that service technicians have a safe work environment and use the correct personal protective equipment (PPE). Outer layer clothing should be weather appropriate in line with the climatic conditions. PPE includes:

- Eye protection
- Masks
- Gloves
- Coveralls
- Safety Boots
- Hearing Protection
- Hard Hat

In addition, service technicians should have a good working knowledge of:

- HVAC systems
- Ladder safety
- Confined space entry
- Risk management
- Shut down procedures
- Lock-out procedures

The use of specialized procurement devices (pictured above) should be used for safely adding, and removing product from difficult access points, such as a roof.

Installation, Operation & Maintenance (continued)

Training

The servicing of air filtration products is becoming more technical and requires specialized skills. It is for this reason that NAFA introduced the Certified Technician (NCT) Program in 1999 to increase expertise and professionalism to the air filtration industry. The NCT enables facility managers and building owners the opportunity to certify their employees on all aspects of filtration service and Indoor Air Quality.

For additional information visit the NAFA website: www.nafahq.org or contact a local NAFA member.

Disposal

Particulate filters should be disposed of in a careful and safe manner. Spent carbon in molecular filters may sometimes be returned to the manufacturer for reactivation. NAFA recommends that technicians performing the work be certified to NAFA Certified Technicians (NCT) standards.

You care about your residents and employees.
You care about the environment and your community.
You care about the fiscal health of your institution.
Indoor air quality matters.

COSTS OF POOR AIR QUALITY
Lost productivity
Decreased Health
Increased absenteeism
Increased Equipment Maintenance/Replacement
Increased Energy

BENEFITS OF IMPROVED AIR QUALITY
Reduced absenteeism
Increased productivity
Improved health, wellness and satisfaction

Bibliography

Installation, Operation, and Maintenance of Air Filtration Systems, National Air Filtration Association Sheet Metal Air Conditioning Contractors National Association (SMACNA) publication, "IAQ Guidelines for Occupied Buildings Under Construction" 601 N. Fairfax Street, Suite 250, Alexandria, VA 22314

NAFA Guide to Air Filtration, 5th edition, 2014

Copyright & Usage

As a global source for expertise, education & best practices in air filtration, we provide these guidelines with one important goal in mind: To support best practices and ensure the cleanest air possible for our employees, our customers, and our community. While the information provided is the property of NAFA and is protected by copyright and intellectual property laws, we strongly encourage the use and dissemination of this information - in print or electronically - to those within our industry.

These guidelines were created through the hard work and care of experts in the industry... your peers. By reading these guidelines you agree not to reproduce, broadcast, or otherwise distribute the information within these guidelines for commercial purposes without the prior written consent of NAFA. If such permissions are granted, you also agree to include in any printed/electronic uses the phrase, "Used with permission of The National Air Filtration Association®."

Disclaimer

The information contained in this guideline is intended for reference purposes only. NAFA has used its best efforts to assure the accuracy of information and industry practices. NAFA encourages the user to work with a NAFA Certified Air Filter Specialist (CAFS), to ensure that these guidelines address user specific equipment and facility needs. Issues regarding health information, including COVID- 19, may be superseded by new developments in the field of industrial hygiene or by new information revealed by experts in science/ medicine. Users are therefore advised to regard these recommendations as general guidelines and to determine whether new information is available.

Send questions to: nafa@nafahq.org