

Growing IAQ Problems with Wildfire Smoke

Modine Manufacturing Company



The Problem:

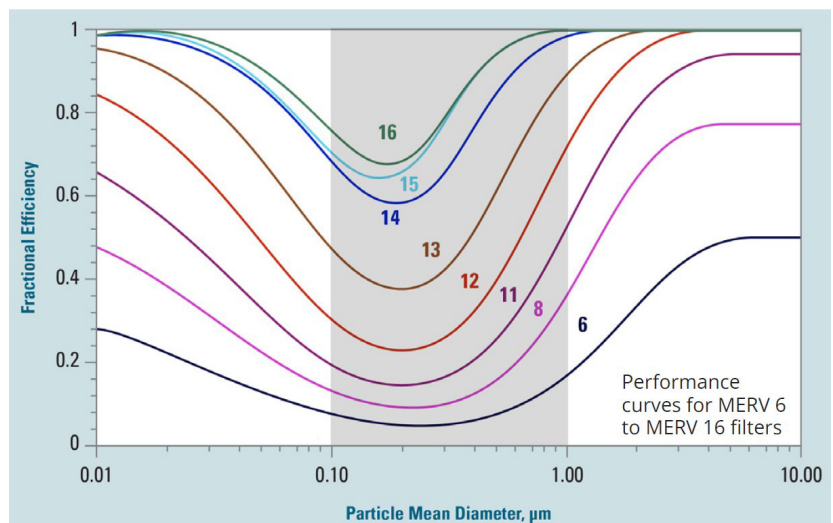
Wildfires burned nearly 7 million acres per year from 2000 to 2021, and continue to worsen. According to the EPA, studies show wildfire smoke is a complex mixture of gases and fine particles, often in the submicron range. The fine particles found in smoke are more likely to deeply penetrate the respiratory system and cause adverse health effects.

The Challenge:

Regardless of their MERV-rating, studies show filters have a weak spot in capturing certain airborne particles, including submicron particles from wildfire smoke (0.1 - 1.0 μm).

The Solution:

A multi-layered approach that includes adding Needlepoint Bipolar Ionization (NPBI™) to improve filter performance. Third-party testing shows that ionization improves filter performance, especially in the submicron range.



Source: W.J. Kowalski and W.P. Bahnfleth, "MERV Filter Models for Aerobiological Applications" (2002)



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NPBI™ + MERV 8 Filter*

- Average of 99.8% of submicron particles removed in 4 air changes versus 47.7% without NPBI
- On average, submicron particle removal efficiency comparable to HEPA filter performance**
- Removed PM1.0 twice as fast as a MERV 8 filter alone

* Filter labeled as a MERV 8, but tested as a MERV 10

** 98% versus 99.3% for HEPA

Test Background:

GPS sponsored testing was conducted at a third-party, A2LA accredited [ISO 17025] laboratory. Test reports and test parameters available upon request.

PRACTICAL REAL-WORLD BENEFITS FROM ADDING NPBI

Particles are removed faster

Being able to improve indoor air quickly and thoroughly matters. This includes hotels, schools, universities, airports, and office buildings where wildfire smoke can easily penetrate into the space.

- Studies show that on average adding NPBI increases the speed by which filters can remove airborne particles, like those found in wildfire smoke, from indoor spaces.

Easy to retrofit and cost-effective

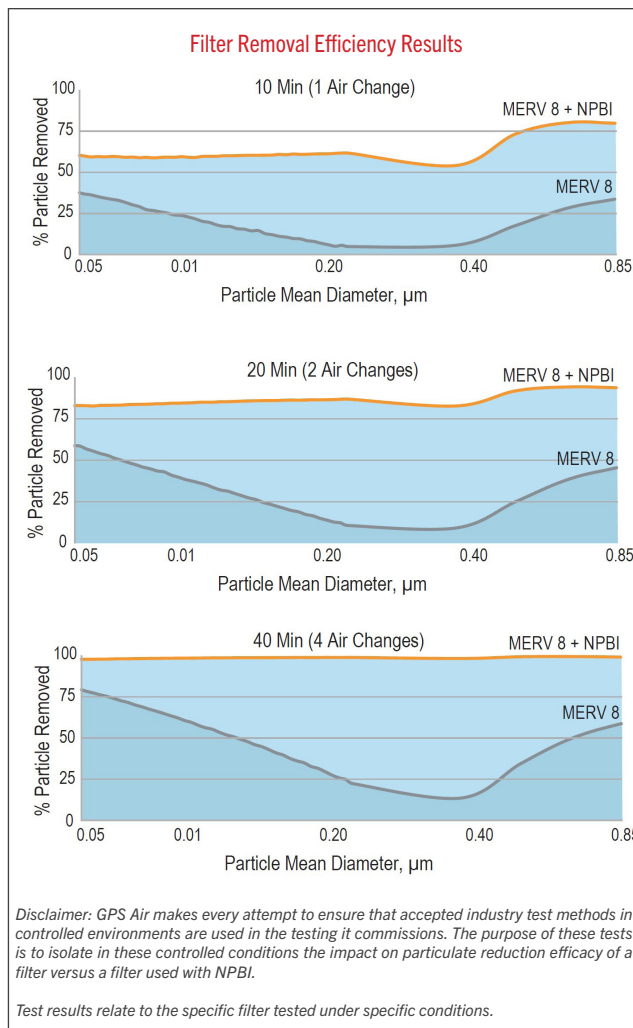
Adding a higher MERV rated filter may not be possible given the age and design of the buildings and the HVAC system.

- Using MERV 8 rated filters with NPBI within existing systems is a cost effective solution while providing improved particle capture.

Extends the life of the HVAC system and lowers operation costs

According to the U.S. Dept. of Energy, HVAC systems are the largest single source of energy consumption in buildings. Higher-rated air filters can increase the resistance to airflow and pressure loss across the filter. The HVAC systems must work harder, increasing energy costs and wear and tear.

- Adding NPBI can help improve the performance of existing air filters while not increasing airflow resistance, lowering energy costs, and extending the life cycle of the existing HVAC system.



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