

HVAC UPGRADES
The Impact Of Filter
MERV Ratings
On Indoor Air Quality
& The Air Quality Index

By Travis Bown



Today's Agenda:

MERV Meaning

HVAC Jargon

Impacts of a Higher MERV Rating

Filter Study

Shelter In Place Strategies

MERV = Minimum Efficiency Reporting Value



MERV 5 to 8 Filter 3 – 10 Microns

MERV 9 to 12 Filter 1 – 3 Microns

MERV 13 to 16 Filter .3 – 1 Microns

HEPA



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Today's Focus:
MERV 8 VS MERV 11

HVAC DEFINITIONS:

AQI: AIR QUALITY INDEX

IAQ: INDOOR AIR QUALITY

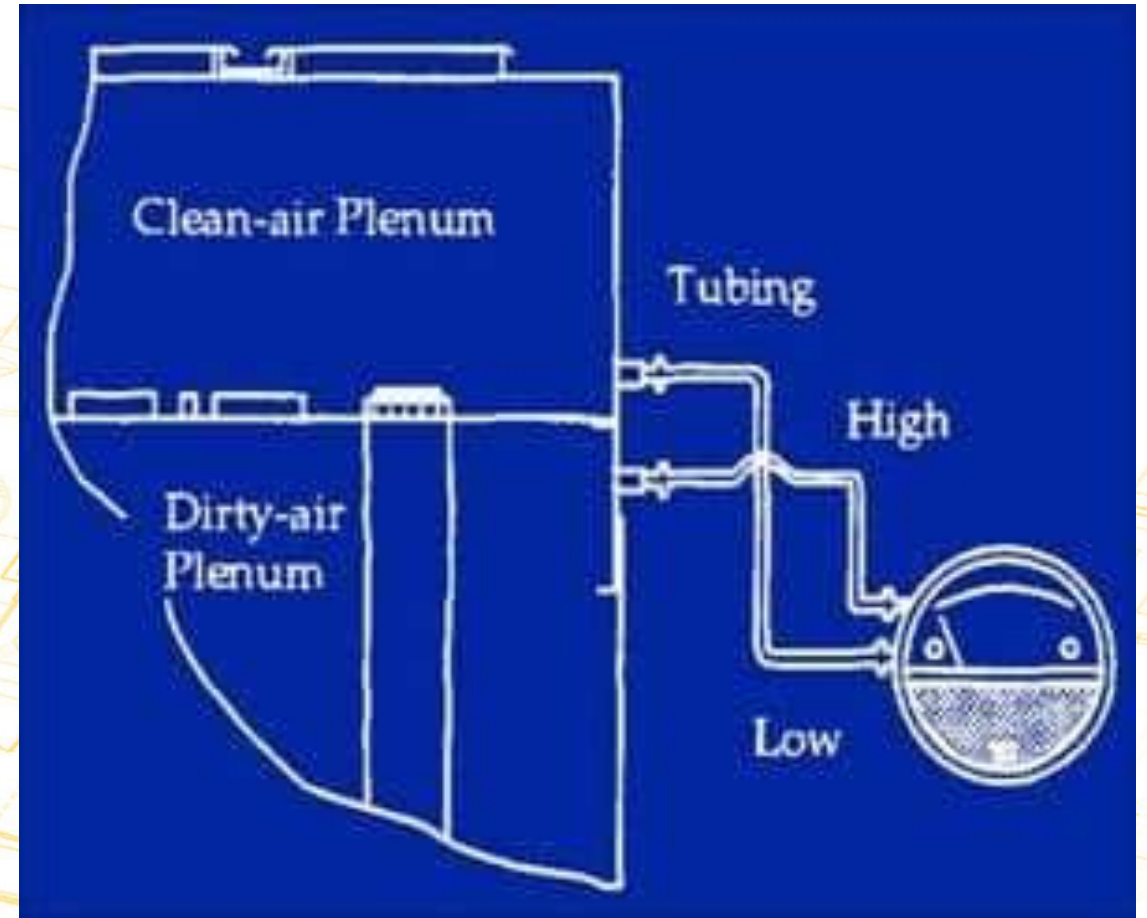
DP: DIFFERENTIAL PRESSURE

BAS: BUILDING AUTOMATION SYSTEM

EUI: ENERGY USE INTENSITY

PM 2.5: Particulate Matter ≤ 2.5 Micrometers

MERV Rating Impacts On HVAC Equip.



**MAGNEHELICS
QUICKLY IDENTIFY
DP**

Filter Study – MERV Impact on PM2.5

1st Component: Paired Sensors, 1 located inside and 1 outside at both locations referred to as Location A and Location B. Data was compared against the nearest air quality regulatory monitor.

2nd Component: A 3rd sensor, portable in nature was utilized in a 1 day study to collect PM2.5 variations between different rooms including those with sensors.

Mead School District's Decision Based on the WSDOH Pilot Project As Authored by Julie Fox

- 1. Upgrade all HVAC Equipment Utilizing MERV8 Filters to MERV11 By 09/2020**
- 2. Maintain the use of all MERV13 Filters at locations designed for use.**
- 3. Purchase a Portable PM2.5 Monitoring Device.**
- 4. Implement a Shelter In Place Program.**



Mead's Experience Utilizing A Portable PM2.5 Meter



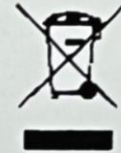
Model: PCE-PQC 13 US

Ch. Sizes: 0.5 – 10.0µm 3 channels

Power: 15V $\overline{\text{---}}$ 2.0A

Serial No: 4470

Mfg Date: September 2020



Complies with 21CFR Chapter 1, Subchapter J

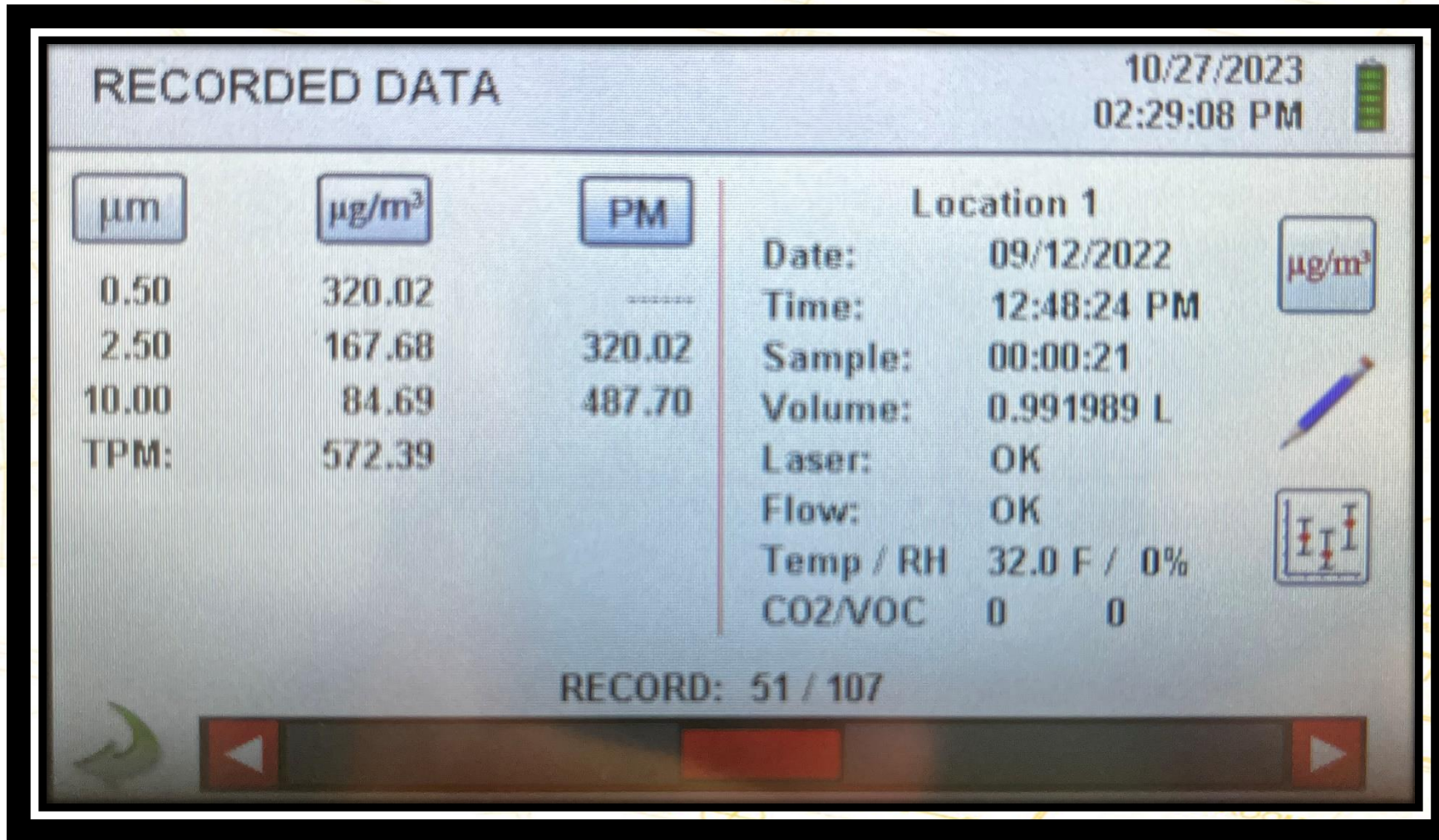
Contains FCC ID: W7OMRF24WG0MAMB

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Made in U.S.A.

AQI Score of 218 OR Very Unhealthy

<https://www.airnow.gov/aqi/aqi-calculator-concentration/>



MEAD SCHOOL DISTRICT



GLOBAL
DUSTSTORM / SMOKE



Dartford

Fairwood

Mea

SIP or Shelter In Place

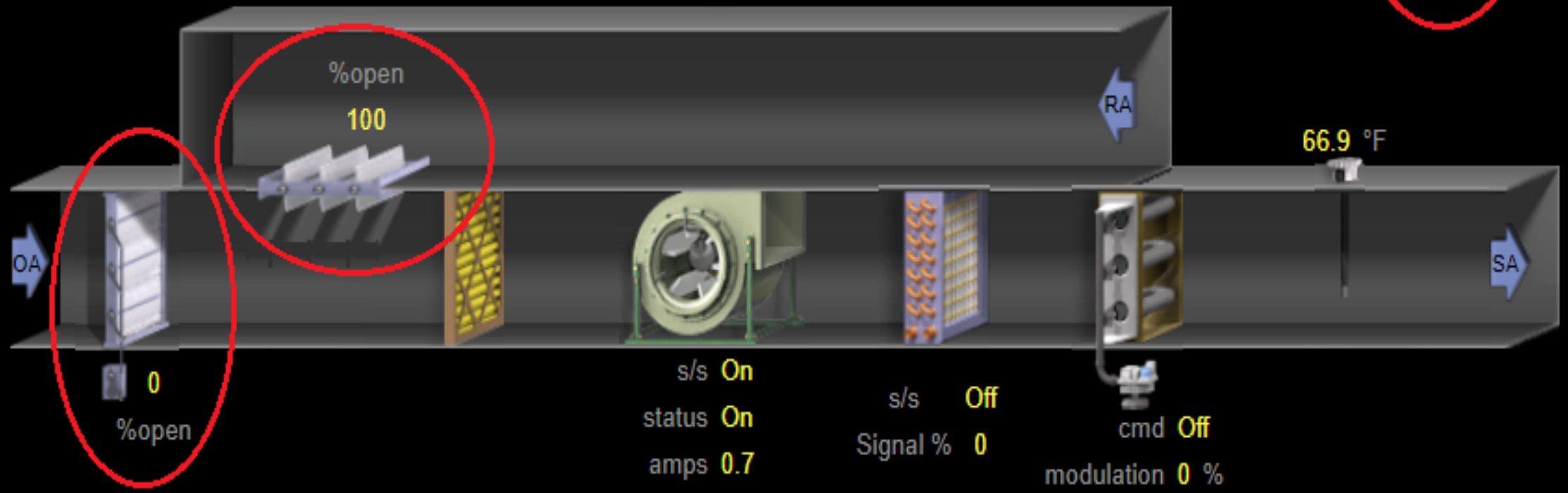




40.5 °F

HV 5

Shelter In Place



SIP RAMIFICATIONS

A District Wide SIP Was Utilized in the Fall of 2022

**Mead's Portable AQI Meter Was Used
To Determine Inside vs. Outside AQI Numbers**

**PM2.5 Quantities Were Dramatically Lower Inside
vs. Out HOWEVER CO2 PPM Eclipsed 2000PPM**

SIP 15

CONTROL MAXIMUM OUTSIDE
AIR DAMPER POSITION

CLASSROOM

CLASSROOM

CLASSROOM

MULTI-PURPOSE

KITCHEN



Special Thanks To:



Nancy P. Bernard DOH
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Sandy Phillips SRHD
Julie Awbrey RET.
Erik Dickson RET.





Q & A

QUESTION & ANSWER

