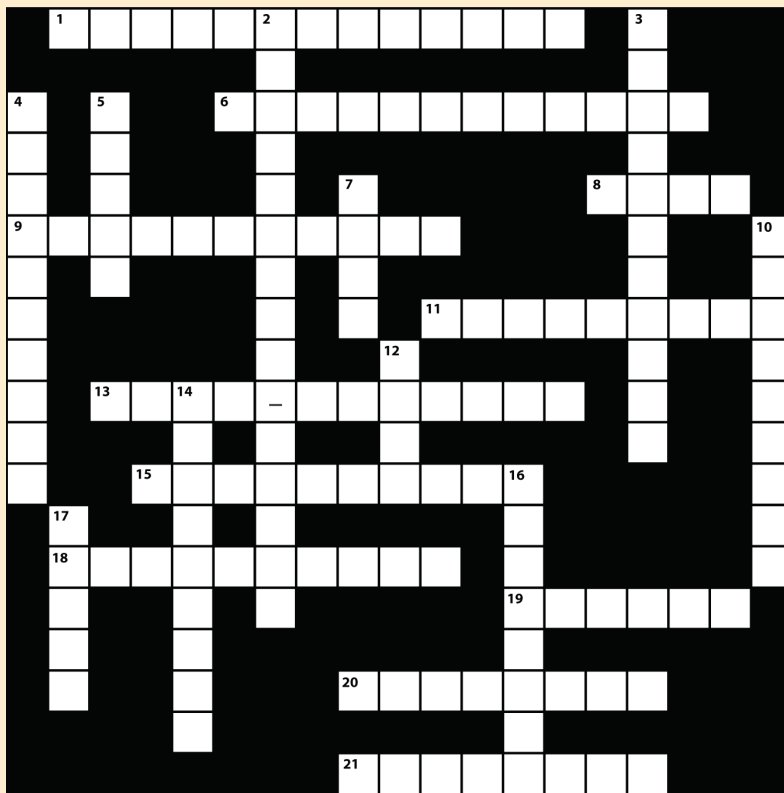


# Take the HVAC CHALLENGE™

BY STEVEN G. LIESCHEIDT, P.E., CSI-CCS, CCPR

## ▶ Air Cleaners For Particulate Contaminants



### ACROSS

- In this type of mechanism of particle collection, some particles may carry a natural charge and no power source may be required; however, in general, this type of filter uses a power source.
- A mechanism of particle collection wherein the particles follow the airstream close enough to a fiber that the particle contacts the fiber and remains there mainly because of van der Waals forces.
- High-efficiency particulate air filters.
- Another term for the fractional efficiency of a filter.
- In this mechanism of particle collection, the path of very small particles is not smooth but erratic and random with the airstream, producing an erratic path that brings the particles close enough to a media fiber to be captured.
- This defines the amount (capacity) of a particular type of dust that an air cleaner can hold when it operates at a specified airflow rate to some maximum resistance value.
- In this filter evaluation method, a standardized ASHRAE synthetic dust consist-

ing of a various particle sizes and types is fed into the test airstream to the air cleaner and the weight fraction of the dust removed is determined.

- This is a measure of the ability of the air cleaner to remove particles from an airstream.
- Mode of particulate larger than 2.5 mm in diameter.
- This type of filter is used mainly for air sampling and specialized small-scale applications where their particular characteristics compensate for their fragility, high resistance, and high cost.
- This type of ionizer uses the principle of particle charging but does not use a collection section.

### DOWN

- These may be used for a moving curtain viscous impingement type filter or a moving-curtain dry media roll-type filter.
- A diverse class of particulates of biological origin.
- Particles less than or equal to 5 mm in

diameter are called this type of particle because a large percentage of them may reach the alveolar region of the lungs.

- All high-voltage devices can produce this and it is toxic and damaging, not only to human lungs but to paper, rubber, and other materials.
- Mode of particulate smaller than 2.5 mm in diameter.
- This type of filter has fresh media introduced into the airstream as needed to maintain essentially constant resistance and consequently constant average efficiency.
- Ultra low-penetration air filters.
- A mechanism of particulate collection for the coarsest kind of filtration that strains particles through an opening smaller than the particle being removed.
- These types of filters are composed of electro-statically charged fibers.
- Minimum efficiency reporting values.

To brush up on the facts behind this month's clues, refer to Chapter 24 ("Air Cleaners for Particulate Contaminants") in the 2004 ASHRAE Handbook – Systems and Equipment.

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