

Existing standards for testing gas phase air cleaners

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SUMMARY

Many test methods exist for evaluating gaseous-contaminant filtration media, and a few for evaluating functional filters and other devices. These test methods are designed primarily for use in product quality control and to rank products. Designers of filtration devices and HVAC (Heating, Ventilating and Air-Conditioning) systems engineers, however, need test data that allows calculation of device performance under actual operating conditions. End users need data to determine system maintenance costs. We call such tests design parameter tests. The nature of the three test groups are as follows:

- Quality control tests are generally simple and inexpensive, presumably run on each media or component lot.
- Product differentiation tests are also relatively simple, involving feeding of specific contaminants in airstreams passing through devices or media samples, and measuring the contaminant removal efficiency. These tests are usually run at product market introduction, to provide some (limited) performance data for clients. They may also be used later to confirm manufacturers' data.
- Design parameter tests are much more demanding. To be fully informative, they require lengthy feed of a range of contaminants at low concentrations. High-sensitivity gas contaminant detectors may be required to obtain data for a useful array of contaminants at concentrations met in actual applications. Such tests are normally performed during the development of a new product. They are rarely published by suppliers.

A rational test procedure for gaseous contaminant removal devices should include the effects of multiple contaminants, relative humidity, and purging with clean air.

A critical review of performance prediction concepts should allow definition of tests and reliable performance calculations and computer codes. These predictions must be verified for a wide range of contaminants and operating conditions to assure usefulness in system design calculations.

We present some current test methods for gas phase air cleaners together with some typical output data.

KEYWORDS

Gas phase air cleaner; test method; ventilation air gaseous pollutant; ISO 10121 series; ASHRAE 145 series.