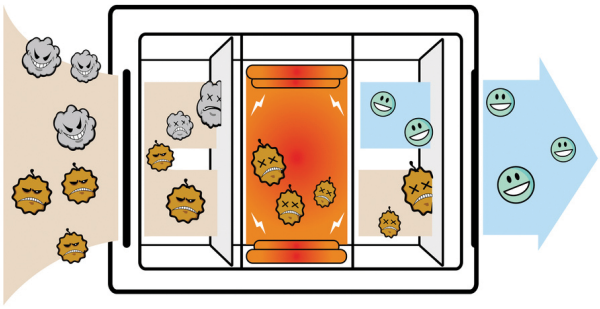
Performance Verification of Indoor Air Purification/Filtration Products

Increased attention to occupant health and comfort is a driving force in the market for air filtration and purification products as a means of improving indoor air quality (IAQ). Organizations focused on optimizing the energy efficiency of buildings and the well-being of occupants (such as the US Green Building Council, ASHRAE and the International WELL Building Institute) are shining a spotlight on how these products can influence IAQ, making the evaluation of product performance all that more imperative.

A wide range of air cleaning technologies are available on the marketplace, and proving their effectiveness is extremely important. GrayWolf meters are broadly utilized for demonstrating the merit of an extensive range of devices.



The US EPA claims the three main approaches to obtaining better indoor air quality are, in order of effectiveness, source control, outdoor air ventilation and air cleaning. **Source control** is the most effective, and is achieved by choosing products, furnishings and building materials that are low-emitting or free of potentially harmful pollutants. Source control also includes reducing or removing pollutant sources through good housekeeping and personal hygiene practices, as well as performing preventive maintenance on HVAC systems. The second most effective approach is **outdoor air ventilation**, accomplished with exhaust fans, increasing the outdoor air flow through mechanical systems, or opening windows, when possible, to dilute indoor air pollutants with "fresh" outdoor air. The third approach is **air cleaning**, or utilizing products which may consist of air filters, electronic particle air cleaners, ionizers, gas absorbing materials or other related products. Air cleaners, whether portable or fixed, work to reduce the presence of total volatile organic compounds (TVOCs), particulates, specific gases and odors. This third approach may be essential when the outdoor "dilution" air is high in pollutants and desirable when indoor air pollution sources are excessive.

[1]https://www.epa.gov/indoor-air-quality-iaq/ozone-generators-are-sold-air-cleaners September 2017.

There are 3 distinct, relevant applications where GrayWolf meters are frequently used:

- Research, design and development evaluations by air cleaning product manufacturers.
- Manufacturers' sales force product demonstrations to prospective clients (often to show "before and after" results).
- Product customers (typically commercial, industrial, institutional clients) verifying the ongoing effectiveness of the products that they have employed.

MFG. PRODUCT DESIGN EVALUATION

During the R&D and design phase of an air cleaning product, verifying the efficacy of the technology is of upmost importance. GrayWolf offers real-time instruments which can accurately monitor and data-log TVOC concentrations, particle counts, air velocity, differential pressure and many specific toxic gases (including carbon monoxide, ozone, ammonia and low-level formaldehyde). Measuring in real-time provides valuable data for evaluating the performance of the product. It can also reduce and, in some cases, even eliminate the need for the more expensive and time-consuming process of having air samples sent out for laboratory analysis. This also reduces manufacturer's downtime in between testing of new designs during the R&D phase.

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SALES FORCE PRODUCT DEMOS

Demonstrating the effectiveness of air cleaning products to a potential customer is an extremely powerful sales tool. GrayWolf's handheld, portable meters can be used to reliably measure before and after concentrations of pollutants. This allows the prospect to see the efficiency of the air cleaner in real-time, by observing the reduction or elimination of pollutants first-hand, or via tabular and graphic evidence easily supplied as with a follow-up report after the demonstration. Specific notations can denote when the air cleaner was turned on or off, when the new filter was installed, etc.

CUSTOMER PRODUCT PERFORMANCE VERIFICATION

After air cleaners are purchased, GrayWolf meters allow the end user to ensure that the product is effective over time. In some cases, air cleaners may need to be reapplied (e.g. VOC absorbing paints), or have replacement hardware (e.g. air filters). Not only will the GrayWolf meter be able to determine the effectiveness of the air cleaner, but it can also be used for general IAQ, green building, industrial hygiene and HVAC applications.

EXAMPLE PRODUCTS

A variety of air cleaning product manufacturers and end users utilize GrayWolf meters. One example is companies that manufacture sprays which, when combined with light, eliminate irritating airborne particulates, including many VOCs. After a prescribed amount of time a second application of the spray is required. Determining when the next application is necessary can be identified with the GrayWolf equipment by the end customer or the company applying the spray. These companies implement their technologies in hospitality, facility management, auto and transport, healthcare, and agriculture markets.

GrayWolf meters are also used by companies with technology that ionizes the air by creating positive and negative ions that lead to particle reduction. The ionization causes the airborne particles to stick together through ionic bonding and results in lower concentrations of particulates and VOCs. Such units are used in arenas, schools, casinos, retail, airports, residential, and hospitals.

There are other companies that implement GrayWolf meters for testing units with an ultraviolet light to disinfect and purify air. These units have applications for museums, clean rooms, food processing, and pharmaceutical facilities where particulate, TVOCs, and low-level formaldehyde are of special interest.

GrayWolf AdvancedSense® Meter with IQ-610 Probe

Another specific application is manufacturing products that target air pollutants that negatively impact human embryonic development. By combining activated carbon filters to remove VOCs and aldehydes, with HEPA filters to remove particulate matter, units can be used in in-vitro fertilization (IVF) labs, hospitals, stem cell laboratories, schools, and for newborns to improve the air quality. In extremely sensitive environments, being able to continuously monitor TVOCs, formaldehyde, and particulates is not only important at the time of sale, but throughout the unit's lifetime. There is an added benefit of using the GrayWolf equipment for measuring the humidity and CO_2 in IVF chambers. GrayWolf also offers photo ionization detectors (PIDs) specifically designed for higher humidity environments when measuring TVOCs in this application.

Having GrayWolf meters available at any or all three stages; R&D, sales demonstrations, and customers' product performance verification over time ultimately saves time, money, and leads to better air quality.

Visit GrayWolfSensing.com,
e-mail SalesTeam@GrayWolfSensing.com,
or call 1-203-402-0477 for more information.