



DESERT BREEZE

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Air Filters

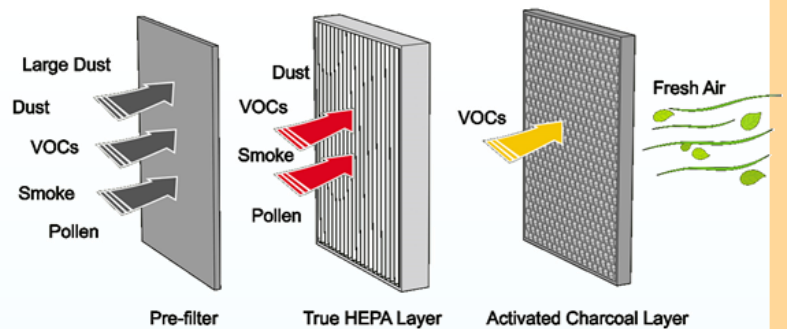
Most of us use air filters in our daily lives, and many may not know the way they protect us every day. Most of us know about the air conditioning filter in our homes (if we have a central air conditioning unit), the engine air filter in our car, the cabin air filter in our car (if so equipped), and the building air conditioning air filters (if the building has central air conditioning). Just to name a few. There are also numerous air filters at cement plants, concrete batch plants, automotive refinishers, and mineral processing plants (like U.S. Borax).

Some of the first air filters were used to protect the equipment using air, like engine air filters and air conditioning units. For engines, unfiltered air would enter the combustion chamber and cause premature wear in the cylinder walls and pistons. Similarly, unfiltered air passing through air condition units would create dust build-up and cause bearing failure. Now, air filters are used to protect us from the harmful effects of the air we breathe. Decades ago, many cement plants were not equipped with air filters. Telephone and power lines in Tehachapi would be caked with layers of cement dust that would increase the diameter of the telephone/power line two-fold; however, that is in the past. Modern facilities use numerous air filtration units to keep dust from their facility from entering into the atmosphere.

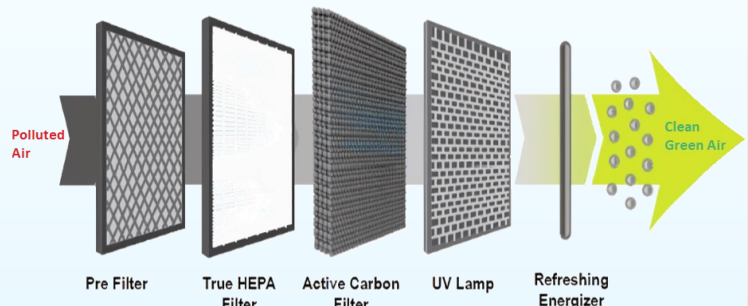
Now, use of another air filtration unit is increasing: the in-home air filtration unit. These units are used to clean the in-home air. These units can clean particulate matter, odors, and bacteria, depending on the type and efficiency of the unit. Many units are equipped with a HEPA (high efficiency particulate air) filter to capture small dust particles. These units are effective,

but they need to be properly sized. If a unit is too small for the area being cleaned, it will be ineffective.

Below is an example of the design for your standard in-home air filter:



Below is an example of a design for a high-efficient air filtration system:



The use of air filters is just one way to reduce particulate matter in the air we breathe. Fire season is approaching, therefore, to help residences in Eastern Kern, the Eastern Kern Air Pollution Control District (District) is supplying cooling centers with air filtration units. We expect these units to reduce smoke effects when wildfires are active. Please contact us if your cooling center needs an air filtration unit.

*By: Glen Stephens,
Air Pollution Control Officer*

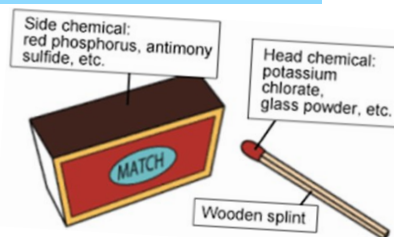
Pollutant of the Quarter: Phosphorus

Did you know? Phosphorus is one of the most abundant minerals in the human body, second only to calcium. Phosphorus is a naturally occurring mineral found in many foods and plays multiple roles in the development of living things. However, exposure to large quantities of phosphorus compounds can be toxic to human health. Many industrial sources are capable of emitting phosphorus compounds into the environment resulting in toxic emissions. Elemental phosphorus is extremely toxic and can be found as white phosphorus and red phosphorus, with white phosphorus being the most toxic of the two. However, because it is highly reactive, phosphorus is never found as a free element on Earth and therefore, is also reduced in toxicity to the population at large. Nonetheless, elemental phosphorus along with other phosphorus compounds are classified by the California Air Resources Board (CARB) as substances for which emission quantification is required to properly evaluate health risk to the population at large.

Why does the District care about phosphorus? In humans, phosphates or compounds containing phosphate ions play a key element in bones, teeth, and cell membranes. In the industrial sector, the vast majority of phosphorus compounds mined are consumed as fertilizers. Phosphate is needed to replace the phosphorus that plants remove from the soil. However, as stated before, high exposure to phosphorus compounds and/or elemental white phosphorus is considered toxic and can result in acute and chronic health effects. Some stationary industrial sources, including phosphate manufacturers, are capable of emitting phosphorus compounds into the environment. Additionally, according to the Environmental Protection Agency (EPA), white phosphorus can also be emitted from the following industrial sectors: pyrotechnics, explosives, smoke bombs, semiconductors, electroluminescent coatings, and rodenticides. White phosphorus is extremely toxic to humans, while other forms of phosphorus

are much less toxic. Acute (short-term) oral exposure to high levels of white phosphorus in humans can lead to mild gastrointestinal effects or severe effects on the kidneys, liver and central nervous system (CNS). Inhalation exposure from phosphorus smoke has resulted in respiratory tract irritation and coughing in humans. Chronic (long-term) exposure to white phosphorus vapors in humans results in necrosis of the jaw, termed "phossy jaw." However, EPA has classified white phosphorus as a Group D substance; not classifiable as to human carcinogenicity.

Due to the associated acute and chronic risk of phosphorus, the EPA has listed phosphorus as a Hazardous Air Pollutant (HAP). Similarly, CARB has listed phosphorus and some phosphorus compounds as substances for which emissions must be quantified and reported through the Assemble Bill (AB) 2588 Air Toxics "Hot spots" program. The District has been mandated to assess HAP emissions including phosphorus emissions from regulated industrial sources within our jurisdiction through the AB 2588 program. For more information on AB 2588 see December 2018 Desert Breeze article on cancer and air pollution.



Exposure Levels: The California Occupational Safety and Health Administration (Cal OSHA) has established permissible exposure limit (PELs) for six phosphorus compounds including the following: phosphoric acid, yellow phosphorus, phosphorus oxychloride, phosphorus pentachloride, phosphorus pentasulfide, and phosphorus trichloride. The PEL for yellow phosphorus which is white phosphorus that contains impurities is 0.1 mg/m^3 .

White or yellow phosphorus is either a yellow or colorless, volatile crystalline solid that darkens when exposed to light and ignites in air to form white fumes and greenish light. White phosphorus has a garlic-like odor. Fortunately, due to its high reactivity, phosphorus compounds are not found far from the source of emissions. Therefore, health effects to the population at large are expected to be minimal.

**By: Miguel Sandoval,
Air Quality Engineer**



Allied troops making a night attack as a white phosphorus bomb explodes nearby, Gondrecourt, France, August 15, 1918. U.S. Signal Corps/Library of Congress, Washington, D.C. (photo no. 32460/25123)

Wildfire Safety & Cooling Centers

As summer approaches, there poses an increased risk of wildfires, and individuals overheating due to high temperatures. A contributing factor to the frequency of wildfires and heat effects is the current ongoing drought. In 2021 a total of 8,835 fires were recorded, resulting in 2,568,948 acres being burned, and in August 2020 the hottest recorded temperatures were recorded in California. According to a Los Angeles Times investigation between 2010 and 2019, some 599 deaths were certified as having occurred due to heat exposure. Here are a few tips to protect yourself from wildfires and heat exposure.

Wildfire Safety Tips:

- ◆ Follow hazard reduction protocols by reducing the dry fuels (wood, grass, paper, etc.) around homes and businesses.
- ◆ Be aware of potential hazards such as power lines being too close to trees and other flammable brush. If you see such power lines, report the location to your local utility company; For Southern California residents call 1-800-611-1911, Pacific Gas & Electric customers call 1-800-743-5000.
- ◆ Develop an evacuation plan for getting out during a wildfire and be sure everyone in your home or business is familiar with the plan.
- ◆ Maintain at least half a tank of fuel in your vehicle in case of emergencies.
- ◆ Reduce your exposure, if you can, by buying a tight fit respirator mask and keep it with you in high-risk fire areas.
- ◆ Choose a room that can be closed off from the outside air, to reduce the exposure of smoke during a fire.

- ◆ If you have central air conditioning, use high efficiency filters to capture fine particles coming from the smoke.
- ◆ Check Air Quality websites such as www.airnow.gov and www.kernair.org for the air quality in your area. If the air quality is poor to very unhealthy stay indoors if possible.

Heat Exposure Safety & Cooling Centers:

- ◆ Locate a Cooling Center near you. Cooling Centers are scheduled to open on May 15, 2022. To find a Cooling Center in Kern County go to: kerncounty.com/government/park/facilities/cooling-centers. Some of the Cooling Center locations for the District:
Tehachapi Senior Center (661-822-5412)
Tehachapi Valley Recreation Center (661-822-3228)
Rosamond Community Water/Sewer (661-822-9066)
- ◆ Check in with elderly individuals or people with disabilities who may need assistance getting to a Cooling Center or may not have adequate cooling in their homes.
- ◆ Drink lots of water, and make sure your pets or livestock have plenty of water too.
- ◆ Do not leave children, the elderly or pets in a vehicle unattended.
- ◆ Avoid the sun during the hottest parts of the day, between 11am and 2pm.

As the weather starts getting hotter these are only a few tips to help to protect yourself and neighbors during the summer.

By: David Arokiasamy, Air Quality Specialist

New District Staff Member

The District would like to welcome Heather Handy as its newest Air Quality Specialist. Heather is rooted in Bakersfield and began her collegiate career at Bakersfield College. She transferred to California State University Bakersfield and graduated with a B.S. in Chemistry with a concentration in Occupational Safety and Health Management. After earning her B.S. degree, Heather was employed as a Report Writer and Data Collection Technician by Safety Management Systems. In this position, she worked with the asbestos results and dust data collected during The Department of Water Resources Oroville Field Division Spillway Reconstruction Project. Thereafter, Heather expanded her role to Industrial Hygiene Technician and Certified Site Surveillance Technician which allowed her to conduct asbestos, lead, Naturally Occurring Radioactive Material, National Emission Standards for Hazardous Air Pollutants, and Waste Characterization Surveys. These roles allowed Heather to fulfill her passion to protect sensitive receptors and employees who had the potential to be directly impacted by hazardous exposures. Heather is excited about joining the District team and the opportunity to ensure air pollutants do not pose a nuisance or significant public health threat in the community.

Board of Directors

Michael Davies, Chairman (Councilman, Tehachapi)
Zack Scrivner, Vice-Chair (KC 2nd District Supervisor)
Phillip Peters (KC 1st District Supervisor)
Kyle Blades (Councilman, Ridgecrest)
Jim Creighton (Councilman, California City)

Board of Directors usually meet once every two months starting in January at the District's Board Room, 414 W. Tehachapi Blvd., Suite D, in Tehachapi. The Meeting Agenda can be located on the District website www.kernair.org, under the "Board" tab.

Air Pollution Control Officer

Glen E. Stephens, P.E.

Hearing Board Members

Doris Lora
Chris Ellis
Benjamin Dewell
Brett Moseley
One Vacancy—Accepting applications from Eastern Kern residents



For news updates and other information, please visit the Eastern Kern APCD website at www.kernair.org

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