

California Air Resources Board: No-Go on Ozone

By Jonathan Miller

Ozone has been recognized as a lung irritant and health hazard for years. But with recent scientific study showing just how badly the gas can affect a person's health, one state has taken the unprecedented step of banning ozone-emitting air purifiers from its marketplace.

On Sept. 28, the California Air Resources Board banned such air purifiers, saying "studies have found they can worsen conditions such as asthma that marketers claim they help to prevent," according to the Los Angeles Times. Additionally, in a press release, CARB noted that "some air cleaning devices, called ozone generators, have been shown to produce indoor ozone concentrations several times higher than the state's outdoor air quality standard" of 0.070 ppm over an eight-hour period, 0.090 ppm in a one-hour period.

CARB was directed by the California Assembly to "develop and adopt a regulation to limit ozone exposure emitted from indoor air cleaning devices in order to protect public health" by Dec. 31, 2008 in a 2006 bill signed into law by Governor Arnold Schwarzenegger. On Sept. 27 of this year, CARB unanimously approved a limit to ozone emission from indoor air purifiers to 0.050 ppm.

The regulation, slated to take effect in 2009, will require testing by a nationally recognized testing laboratory and certification by CARB itself. Any ozone emission above the regulated amount is grounds for banishment from the California market. Fines for selling after that point begin at \$1,000 a day. Exemptions will only be allowed for industrial and commercial uses of ozone generators and only if people are not present. Production must stop by 2010.

CARB chair Mary Nichols called it "a landmark decision."

"People with respiratory problems need to be protected from ozone," Nichols stated in a press release. "Consumers ... bought these devices hoping to reduce suffering for themselves or a loved one, only to make the situation worse."

As former California Assemblywoman Fran Pavley, who sponsored the original bill directing CARB to regulate air purifiers, said, "There are reports of ozone being generated in someone's living room ... at levels equivalent to having a Stage 1 smog alert."

Despite claims from manufacturers that ozone can reduce levels of indoor air pollutants and reduces odors, CARB found the gas would in fact react with various chemicals to create ultra-fine particles and formaldehyde, as well as "irritate nasal passages and [degrade] one's sense of smell, thereby masking the smell rather than eliminating it." Further, although ozone can be effective in killing airborne microbes, it can only do so "at concentrations roughly 100 times greater than the amount allowed by this regulation."

Michael T. Kleinman, professor of environmental medicine at the University of California at Irvine, told CARB he supports the board's action. "Ozone is associated with human deaths ... [and] can cause changes such as fibrosis-like stiffening of the lung. In my opinion, the use of an ozone-generating device as an indoor air cleaner is dangerous, especially if occupants already have lung or heart diseases, or are elderly."

CARB's regulation also requires air cleaners to pass an electrical safety test and carry a specified label to guide consumers.

Ozone: Also Damages Immune Systems

As if to further California's case, research published just days after CARB's decision demonstrated further cause for concern over ozone exposure. According to a study performed by scientists at Duke University Medical Center, high levels of ozone can lead to serious immunodeficiency.

Published in the Oct. 1 "Journal of Immunology," the study used mice to demonstrate the effects of ozone on lung tissue. The mice were exposed to ozone levels unhealthy to humans, then to aerosolized, active E. coli bacteria.

The gas damaged and inflamed the mice's lungs, allowing the bacteria to successfully invade and destroyed vital immune-system cells, allowing the bacteria to spread.

Additionally, ozone-exposed mice were found to have lower levels of immune-system cells in their blood.

Pulmonologist John Hollingsworth, the study's lead author, told CBC News, "Small amounts of inhaled foreign material can be relatively harmless, since they stimulate an appropriate innate immune response that protects the lungs. ... [But in greater concentrations,] it appears that ozone causes the innate immune system to overreact, killing key immune cells, and possibly making the lung more susceptible to subsequent invaders, such as bacteria."

As pointed out by Kathleen Sullivan of the American Lung Association, "The people that are most prone to buy air cleaners are those who already suffer from damaged lungs."