

1. MARKETING

Television's annual holiday advertising blitz looks a little bit different this year. It includes a dose of reality.

**2. ENTERTAINMENT**

'Monster Hunt' was pulled from movie screens in China after a line of dialogue was deemed offensive.

**3. SPORTS**

Gregg Williams lost his job after his widely reviled defensive call probably cost the Jets their first victory.

TECH | ECONOMY | MEDIA | FINANCE

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Business

The New York Times

A shaky economy, historic joblessness, a worsening global pandemic, and a deal making heyday unseen since the dot-com bubble. What gives?



Why Tech Is in a Start-Up Frenzy

VIRUS FALLOUT | COMPANIES

The Newest Travel Amenity? Virus-Scrubbed Air on Land and Sea

By ELAINE GLUSAC

When the coronavirus first hit, hotels quickly adopted enhanced cleaning polices, including germ-killing electrostatic spraying and ultraviolet light exposure in guest rooms and public areas.

But as research on virus spread has shifted focus from surface contact to airborne transmission, some hotels and cruise ships are scrubbing the very air travelers breathe with a variety of air filtration and treatment systems.

"The best amenity that any hotel could provide under those circumstances is safety, especially in the air," said Carlos Sarmiento, the general manager of the Hotel Paso del Norte in El Paso, Texas. The 1912 vintage hotel recently reopened after a four-year renovation that included installing a new air purification system called Plasma Air that emits charged ions intended to neutralize the virus and make particles easier to filter out.

With the new air-scrubbing campaigns, hotels are following airlines, many of which have hospital-grade, high-efficiency particulate air (HEPA) filters that are said to be over 99 percent effective in capturing tiny virus particles, including the coronavirus.

Hotels and cruise ships can more easily ensure social distancing than airplanes, but, given the recent research on the importance of enhanced air filtration, some are adding air-cleaning dimensions to their heating, ventilation and air conditioning (HVAC) systems, which already aim to remove dust, smoke, odors and allergens.

How air is purified

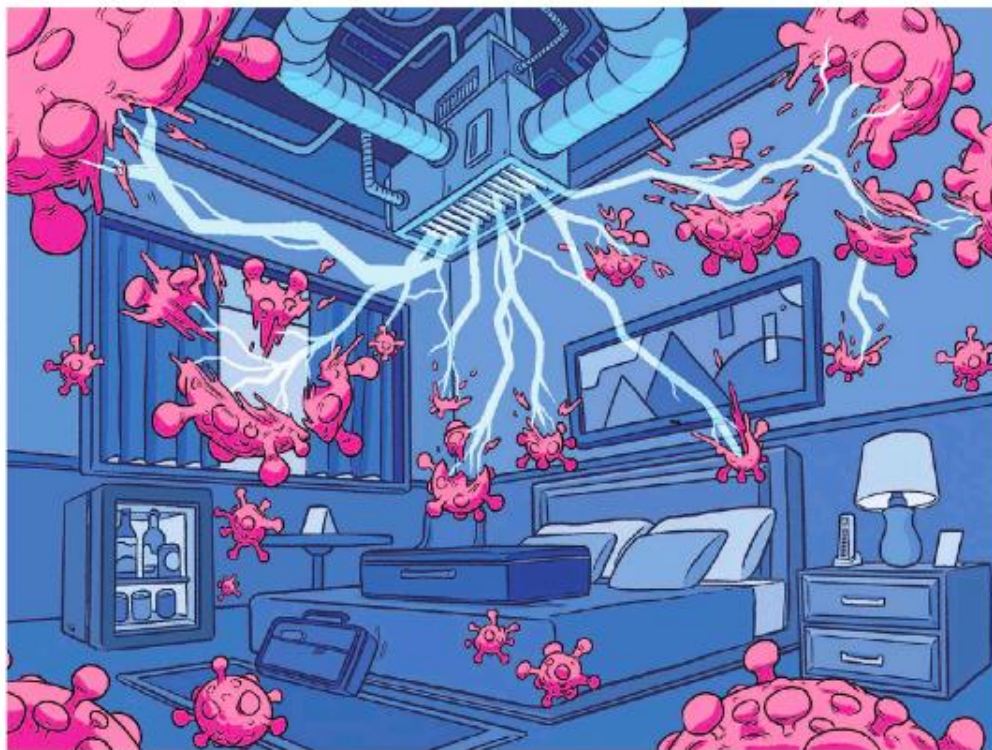
Researchers, including those at Tulane University in New Orleans, have found that the tiny aerosol particles of SARS-CoV-2 that are emitted when someone with the virus speaks or breathes can remain in the air for up to 16 hours.

Along with social distancing, mask wearing is the first line of defense against breathing contaminated air indoors, said Dr. Philip M. Terno Jr., a professor of microbiology and pathology at New York University School of Medicine, who has consulted with HVAC companies.

"HVAC systems are of great significance in reducing the amount of airborne particles since this virus can be spread in an airborne fashion," he added, calling the tiniest aerosols "the most dangerous."

There are several ways to remove these particles, he explained, including fresh-air ventilation, which dilutes the pathogens.

Air cleaning technologies include bipolar ionization systems, which, according to their manufacturers, send charged ions out



TOM GIBELLO

on air currents that damage the surface of the virus and inactivate it. They may also bind with the virus aerosols, causing them to fall or be more easily filtered out.

However, some experts are skeptical, pointing to evidence that these systems may introduce ozone or particles that are dangerous if inhaled. ASHRAE, a professional society of air-conditioning, heating and refrigerating engineers, notes that the technology is still "emerging" and lacks "scientifically-rigorous, peer-reviewed studies." The bipolar ionization company AtmosAir Solutions provided results of tests performed by the independent Microchem Laboratory, which evaluates sanitizing products, that found the technology reduced the presence of coronavirus by more than 99 percent within 30 minutes of exposure.

"We talk about it as nature's cleaning device," said Kevin DeVin, the chief executive of WellAir, which sells the bipolar ionization system Plasma Air installed at the Hotel Paso del Norte. He noted that air at high elevations in the mountains that "smells clean" has higher amounts of ions.

Some anti-viral HVAC systems feature germicidal ultraviolet light in the ductwork (the Food and Drug Administration states

that ultraviolet-C lamps have been shown to inactivate the virus). Such a system was installed at The Distillery Inn in Carbondale, Colo., and includes a three-hour disinfection cycle between guests.

Systems often use a combination of these technologies with efficient air filters that remove contaminants. Filters with Minimum Efficiency Reporting Values (MERV) of 13 or higher are best at capturing the coronavirus, according to the Environmental Protection Agency.

According to its website, the agency "recommends increasing ventilation with outdoor air and air filtration as important components of a larger strategy that includes social distancing, wearing cloth face coverings or masks, surface cleaning and disinfecting, handwashing, and other precautions."

"In a transient environment, like a hotel, motel or dormitory, you don't know who was there before you and what their health was," said Wes Davis, the director of technical services with the Air Conditioning Contractors of America, a trade association, adding that good housekeeping is a top priority in such places. "As for the other items like ultraviolet exposure or ionization, every little

bit helps, but I'm not quite sure any of them is the perfect solution. It's more like a concert."

From property-wide to portable

Throughout the summer, the Madison Beach Hotel, part of Hilton's Curio Collection of hotels, in Madison, Conn., used its outdoor spaces for dining and even holding meetings in tents. But with the approach of cold weather, HVAC contractors installed an air purification system that uses UV light and ionized hydrogen peroxide in most public areas of the hotel, including the indoor restaurant and meeting rooms. Spa treatment rooms each have their own portable air purification systems.

"We wanted to create an environment that was as safe as possible," said John Mathers, the hotel's general manager, adding that each guest room has its own closed HVAC system that doesn't mingle with others and thus doesn't require extra purifying. "The air being recirculated in your room is your air."

But many hotels are bringing units into the guest rooms for extra assurance. In Rhode Island, rooms at the Weekapaug Inn and Ocean House hotel, both run by Ocean House Management, have Molekule air purifiers that destroy pollutants and viruses at a

rate above 99 percent, according to the independent testing group Aerosol Research and Engineering Laboratories.

Larger units were recently added to restaurants and public spaces, and the portable units have become a top seller, starting at around \$500, in Ocean House's gift shop.

Decisions about installing air purification systems tend to happen at the property or ownership level, rather than the brand level. But Hilton has AtmosAir's bipolar ionization air purification systems in its Five Feet to Fitness rooms, more than 100 guest rooms across 35 hotels that double as mini gyms with weights, indoor cycles and meditation chairs.

Many hotels have long offered allergy-free or wellness rooms to travelers that feature heightened purification systems. Pure Wellness has its Pure Room technology that claims to eliminate viruses, bacteria and fungi, including air filters effective enough to trap the coronavirus, in over 10,000 rooms worldwide.

Attempting to breathe easy on cruise ships

The 112-passenger SeaDream I from the SeaDream Yacht Club took many precautions — including pre-embarkation Covid-19

testing, electrostatic fogging of public areas and UV light sterilization after nightly shutdown — before it launched its winter season from Barbados on Nov. 7, and still a passenger got the virus within days of departure, cutting the trip short. Eventually nine infections were diagnosed and the line canceled future 2020 sailings. (The cruise line did not respond to a requests for comment on whether any improvement had been made to the ship's ventilation system.)

SeaDream's failed cruise exemplifies the challenges the entire industry faces. Some health experts think that upgraded air filtration could help. Adopting systems that are "aimed at reducing occupant exposure to infectious droplets/aerosols," and upgrading HVAC systems with MERV 13 filters were among 74 critical recommendations to ship lines made by the Healthy Sail Panel, a group of public health experts assembled by Royal Caribbean Group and Norwegian Cruise Line Holdings in September.

The Centers for Disease Control and Prevention maintains that ships remain vulnerable to spreading infection based on population density and the inability of crew in particular to maintain social distance in their workspaces and living quarters. Still, cruising is expected to resume in U.S. waters for ships carrying 250 or more passengers and crew in the first half of 2021, pending certification under the C.D.C.'s Framework for Conditional Sailing Order, which spells out minimum standards for social distancing, face coverings and hand hygiene, but does not mention air circulation systems.

Despite the C.D.C.'s lack of emphasis on air filtration, some cruise companies are upgrading their ventilation systems, in addition to designating quarantine areas and reconfiguring dining rooms.

Norwegian Cruise Line, for example, has announced its ships will use HEPA filters. And Princess Cruises has said it will upgrade its ships' HVAC systems to MERV 13 filters, refresh the air in cabins and public spaces every five to six minutes, and install HEPA filters in areas such as medical centers and isolation rooms.

The new Virgin Voyages cruise line, whose launch has been delayed by the pandemic, confirmed it had installed AtmosAir bipolar ionization systems on its inaugural ship, the roughly 2,700-passenger Scarlet Lady, and a second ship coming in 2021.

"This was a multimillion-dollar investment and based on our research and growing understanding of the virus, was an important step to sailing safely," wrote Tom McAlpin, the chief executive of Virgin Voyages, in an email.