

# AIR QUALITY CONTROL

*The most effective ways to achieve better onboard ventilation*

By Doug Thompson

**W**e expect air to be free, plentiful, and trustworthy enough to draw deep into our lungs. But COVID-19 has given air a bad reputation. While air on board boats is likely devoid of viruses (unless a fellow passenger is sick), there could be spores, molds, and fungus you definitely do not want floating around.

Clearing the decks and interior spaces of such contaminants depends on your budget and vessel size. Small boats with a cabin belowdecks can pop open a couple of portholes and let the fresh breeze flow. Boats 50 feet and longer with multiple cabins need to think in terms of advanced filtration and ventilation. If mold is present, no matter what size vessel, removal and remediation is required.

Here is a look at several ways to achieve a healthier environment on board your boat.

## Open Windows

Yes, it's an oldie, but it's a goodie. Having fresh air blow through, whether your boat is large or small, lets stale air out. Opening doors and hatches throughout the boat recirculates air.

"Bringing in clean, fresh air, continuously exchanging air in the cabin, will help reduce mold growth, and that's huge," explains Ben Haynes, Dometic product manager marine division HVACR (Heating Ventilation Air Conditioning and Refrigeration). "What happens is all the cold air from the upper decks falls into the lower decks on larger boats, which makes it nice and cool. But that also makes it a breeding ground for mold if you don't keep the humidity at a comfortable level and recirculate air."



IQAir HealthPro Series

Bringing fresh air into boats with a salon is trickier because there may not be windows or even portholes to open. Those boats need a system with input and exhaust to constantly recirculate the air.

## Stand-alone Air Filters

Using a stand-alone air filter is proven to be an effective way to rid a cabin of odors, control humidity, and recirculate air.

Sorting through the jargon of HEPA (High Efficiency Particulate Air) and HEPA-type filters can be difficult for the consumer. One highly rated stand-alone we found was the IQAir HealthPro Series (\$799). These units use HyperHEPA filtration technology for airborne particle removal.

Reportedly, its filtration effectively filters 99.5 percent of harmful, ultra-fine pollution particles down to 0.003 microns in size. The company says this is 100 times smaller than what is achieved with ordinary air filtration technology and 10 times smaller than a virus.

"We strongly recommend the installation of marine-grade indoor air purifiers," says Gus Alegre, owner of Bluestar Marine in Fort Lauderdale, who specializes in yacht indoor air-quality solutions. "Having a set of these devices on board would substantially help to prevent the formation of mold spores, viruses, debris, allergens, and volatile organic compounds (VOCs), among other contaminants that could compromise the vessel's ventilation and create adverse health effects for people on board."

## Install an In-Duct Air Purification System

Dometic's in-duct Breathe Easy air purifier system (\$650 uninstalled) works within the ductwork of a boat's air-conditioning system. Using Photocatalytic Nano-Mesh technology with ultraviolet (UV) light, the Breathe Easy reduces microbiological contaminants, VOCs, and unpleasant odors from the air.

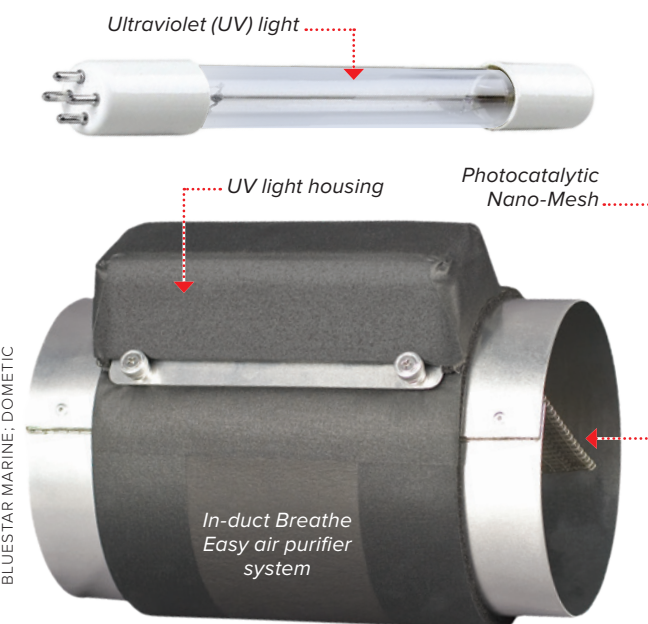
"The in-duct Breathe Easy fits all different sizes of ducts and is simple to install," says Haynes. "You just need access to your duct; you cut out the space for the unit and insert it into the ducting."

Biological contaminants like VOCs, mold spores, bacteria, and viruses pass through the air-conditioning duct and into the air purifier system. UV light directly affects the DNA of a living organism, e.g., mold, mildew, bacteria, virus, and disrupts the DNA of the organism which then renders the organism inert. It also activates the titanium-dioxide catalyst on the surface of the nano-mesh structure.

The molecules of pollutants and odors that come in contact with the photocatalytic nano-mesh structure are reconfigured into nontoxic elements. Vortex action maximizes air contact with the catalytic surface. Dometic says that cleaner, healthier air exits the photocatalytic air purifier.

It's also possible to add the same photocatalytic light air purification operation to chilled-water air-conditioning systems on large yachts.

"Our chilled-water air handlers already have the UV-light system available as an option," adds Haynes. "When we are working with customers on new builds, we always offer this. On some yachts that have our systems, it can be added because the space for the UV-light filter is already there. It just needs to be installed."



BLUESTAR MARINE; DOMETIC



Electrostatic disinfectant can be safely sprayed around the interior of the boat, including on clothing and furniture.

## Electrostatic Disinfectants

There is still a lot more to learn about the COVID-19 virus and the modes of transmission in yachts. Bluestar Marine offers different solutions according to the severity of the situation and ranges from surface disinfection with electrostatic technology to air sanitation treatments, such as Air-Plasma Ionization and Hydroxyl-Blast Generators. These safely kill the COVID-19 virus in the air which offers a helpful solution in controlling outbreaks.

"Every time a COVID-19 disinfection has been conducted, we provide a Certificate of Disinfection," says Alegre. "We also provide disposable table signs which indicate the areas that have been treated."

Electrostatic technology is paired with an EPA-approved disinfectant solution that is nontoxic and 100 percent biodegradable. It is safely sprayed around the boat's interior including electronics and sensitive materials. Before and after a trip or a booked charter, the yacht can be professionally disinfected and sanitized.

## Mold Remediation

Just like a land-based building, mold can grow within the walls of a boat. Lack of circulation combined with a wet environment makes it possible for mold to grow.

"You must get rid of the mold first before you install a new air circulation system," says Haynes. "Once you remove the mold, then you put in the measures to keep it from coming back."

Inspections, regular maintenance, and remediation are crucial to maintaining a healthy environment. Bluestar Marine's cleaning and sanitizing fees range from \$5,000 and

## Refit, Restoration, and Design

### AIR QUALITY CONTROL (CONTINUED)



Routine mold inspection and quick removal is crucial to maintain a healthy environment.

up for boats 50 to 60 feet. For larger yachts, cleaning and sanitizing fees are \$10,000 and higher.

“The truth is that mold can be found almost everywhere,” says Alegre. “What makes a negative impact on marine vessels is complex construction, limited airflow, and lack of access for proper maintenance. Add high exposure to humidity, moisture, and wide temperature differentials, and it is the

perfect breeding ground for mold growth and other indoor air pollution problems.”

Bluestar recommends a preventative mold checkup every 12 to 18 months with the knowledge that boat mold generally grows in areas that make visual identification extremely hard. Book a professional assessment if there is a musty odor present and/or something shows signs of mold exposure even though there’s no visible evidence of mold growth.

#### Buy New with Advanced Air Filtration

Azimut Yachts chose a system patented by NASA to renew and sanitize the air on board its yachts. Called MMVS, the system will be fitted to new models built by Azimut Yachts starting with the Magellano 25 Metri launching this year.

Azimut and Italian company BCool Engineering began work on this system long before the pandemic; however, BCool is studying how the system behaves in regard to the virus.

For the MMVS to operate, a dedicated space is required on board the yacht. Azimut Yachts will extend the option to include MMVS in new projects and eventually to other models in the builder’s production range.

For anyone building a new yacht with advanced filtration, several factors must be considered.

BLUESTAR MARINE

“First, we would recommend conducting an accurate sizing of the HVAC system needed,” says Alegre. “Calculate the boat’s expected air volume and required air-conditioning capacity taking into consideration the interior length, interior height and width of each and every particular area/cabin. Don’t just base these calculations on square footage per deck.”

Once you have determined the number of air-conditioning units and their location, a well-designed vessel should have sufficient space to conduct proper maintenance of the systems. “We firmly believe that maintenance coming from a hygiene perspective (not only mechanical) positively affects the efficiency and life cycle of the air-conditioning/ventilation system,” Alegre says. “This is crucial to avoid the presence of bacteria, viruses, mold spores, allergens, and other air contaminants.”

It’s also important to make sure every unit has an open-return air path as well as the appropriate number of exhaust vents and intake vents for the system to remain with good circulation.

“Another key point for good ventilation on a new build would be to make sure the airflow is not compromised by air ducts that are lengthy or bent,” Alegre explains. “There also needs to be the correct size of discharge grilles, preferably removable to allow access for cleaning. Regarding ductwork, we always recommend insulated, antimicrobial air ducts to inhibit the growth and spreading of various bacteria, mold, and mildew.”

#### AIR QUALITY CHECKLIST

- ▶ Change air-conditioning filters every month. Use only Minimum Efficiency Reporting Value (MERV)-rated filters, and make sure it is the appropriate size replacement.
- ▶ Keep humidity levels lower than 65 percent at all times.
- ▶ Check for visual signs of water damage on overhead and wall panels, woodwork, flooring, etc. Regularly inspect for water leaks and excessive moisture areas.
- ▶ Check the air vents and grilles. Look for debris or mold within the supply plenum. Check for condensation and be aware of musty odors while inspecting the vents.
- ▶ If possible, check the ductwork. Look for white or black spots that may represent mold growth as well as for any signs of dirt or debris. Avoid wet ductwork.
- ▶ Check air-conditioning drain pipes regularly to avoid excess water. Use drain-pan tablets that will help maintain condensate flow and prevent drain pan overflow.
- ▶ Check the fan blower of the air-conditioning unit. If the blower motor is in disrepair, sounds odd, or vibrates, call a professional to possibly have it replaced.
- ▶ Document maintenance procedures performed on an appropriate checklist.

## THE SPORT RIB REDEFINED

#### DURABILITY AND LUXURY COMBINED

The next generation of Highfield has arrived. The new Sport line brings you 11 new RIB models from 10’ to 26’ that redefine the perfect RIB. High-end luxury features combined with a durable high performance aluminum hull give you the best of both worlds that only Highfield can deliver. The new Sport line from Highfield has everything you need. **Dare to explore.**

**HIGHFIELD**  
DARE TO EXPLORE



SP360 11'10" SP460 15'1" SP520 17'1" SP560 18'1" SP650 21'4" SP800 26'3"  
highfieldboats.com

## Upgrade Your Shade

with a SURESHADE® TELESCOPING BOAT SHADE



TELESCOPING  
FRAMEWORK



AUTOMATED  
OR MANUAL



MARINE  
GRADE



CAMBERED  
COMPONENTS



SUNBRELLA  
FABRIC



VERSATILE  
INSTALLATIONS

CHOOSE THE BOAT SHADE SYSTEM USED BY 60+ TOP BOAT BRANDS

**SURESHADE**  
EXTENDING THE EXPERIENCE  
A Lippert Components Company

#### Get Improved Sun Protection & Comfort – Aft or Bow

- Install on T-top, hardtop, tower or arch with specialized mounting brackets
- Custom fit widths & available camber to match size and curves of your boat
- Manual pull-out shades up to 9 ft
- Automated shades up to 12 ft
- Sunbrella® marine canvas (in color of choice)
- 3 year warranty

© 2020 Lippert Components Inc. dba SureShade

SEND US AN INQUIRY AT [www.SureShade.com](http://www.SureShade.com) or call 877-333-8323