



Dive Operations and COVID-19: PREPPING FOR RETURN



Message from the DAN Team

The recommendations that follow are meant to be treated as considerations for enabling businesses to resume operations as responsibly and safely as possible while acknowledging the realities of our industry.

No two dive businesses or operations are the same; each will have its own concerns. While we have attempted to provide useful information, we do not expect every business to adopt every measure. Rather, we encourage dive businesses to implement the measures they realistically can to promote the safety of staff, clients and the business itself.

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While many dive businesses may not be operating due to national and local lockdown orders, divers and dive business owners are eagerly anticipating a return to diving. It's not too early to prepare for the resumption of diving when restrictions are lifted. The following Q&As have been compiled from questions sent in by divers, dive professionals and dive business owners and are intended to help everyone get ready for a safe return to the water.

A few basic rules apply to everyone, including staff and customers, regardless of activity.

- ▶ Wash hands regularly and thoroughly with soap and water, for at least 20 seconds, or if unavailable use an alcohol-based hand sanitizer (unless working with compressed gas, especially oxygen-enriched gas).
- ▶ Maintain a social distance of at least 6 feet, and avoid direct contact with other people.
- ▶ Avoid touching your eyes, nose and mouth.
- ▶ Make sure you and the people around you follow good respiratory hygiene. Cough or sneeze into your elbow or a tissue and dispose of the tissue right away.
- ▶ The CDC recommends wearing a cloth face covering in public settings where other social distancing measures are difficult to maintain. Defer to local orders with regard to masks/face coverings to ensure compliance.



Protecting Staff and Customers

Q: How can I protect my staff from COVID-19?

A: For employees, the general COVID-19 safety recommendations, as published by the WHO and CDC, apply. The use of protective face masks, regular hand hygiene, and gloves (with proper training) can be considered when staff members are in direct contact with clients. Reducing the number of people in certain areas or designating areas for staff members only may also be useful. Compressors, equipment maintenance areas, rental equipment areas, offices and classrooms could be made temporarily off limits to customers (if they're not already) to limit virus transmission. Encourage customers to practice social distancing (use proper signage), and make sure they disinfect their equipment after use.

Q: How can I ensure that my customers will not get COVID-19 from my facility?

A: While you cannot fully guarantee this, you can certainly reduce the risk by enacting preventive measures, which include but are not limited to creating and enforcing strict disinfection procedures, preventing clients from gathering or sitting too close to each other, and most importantly, ensuring clients complete your health screening check before allowing them to attend a training session or dive. Clients with signs or symptoms should not be allowed to participate in any diving or related activities. Be sure to clearly post all disinfection policies to ensure that clients are aware before entering your business.

Q: Should I request something from my customers prior to their arrival?

A: It takes only one infected person to spread the virus. Client may not know they are infected, deny contact with an infected person, or assume that minor symptoms are not related to COVID-19. It is therefore important to ask if they have any indication of being unwell and encourage them to stay home or speak to a physician. You may want to consider refunding or rescheduling. You may also consider limiting visitors to only those who will be participating in diving or related activities.

Q: Will maintaining social distance between customers in my dive center prevent the spread of the virus?

A: Social distancing should be enforced, but is insufficient on its own to prevent the spread of COVID-19. Social distancing should reduce the spread of the virus between people, and the use of masks would reduce the risk further. Because customers might touch equipment or products, consider providing hand sanitizer or hand-washing facilities. You may also consider reducing the amount of stock in your shop area, as this would reduce the amount of disinfection necessary.

Q: Can I safely conduct classroom activities?

A: If your business is able to offer distance learning or e-learning, this is a good option for decreasing the risk of transmitting COVID-19 among customers and staff. If this is not an option, consider setting up the classroom to comply with social distancing requirements. Ask students to wear protective facemasks and wash their hands before and after classes. If equipment is used during class time, ensure it is always disinfected between students. Ensure that desks and chairs are disinfected each day or between classes of different students. Be sure to question potential visitors to your shop, including students, to ensure they do not have symptoms and have not come into contact with an infected person.

Q: Are there any areas of my dive shop which should be temporary closed or made unavailable to customers?

A: Changing rooms carry a heightened risk of contamination. Personal belongings of customers (including clothes) should be stored in such a way as to avoid contact with common surfaces. If stored in lockers, these must be sanitized after each use. To minimize the risk of contact, consider asking customers to store personal items in plastic bags. Bathrooms also warrant special attention and should be disinfected regularly. Showers could be temporarily closed, and clients encouraged to shower and rinse their gear at home.



Disinfection

Q: How should I manage disinfection operations at my dive shop?

A: Disinfection operations should be added to existing standard operating procedures. These procedures should follow local, state and federal guidelines on disinfection, and staff should be trained thoroughly in disinfection protocols. Identify high-touch surfaces in your operation, and ensure these are disinfected regularly. These include but are not limited to bathrooms, countertops, door handles and other surfaces staff and guests may touch often.

When using any disinfectant, be sure to follow the manufacturer's instructions for use. Follow this with a thorough rinse in fresh water, and allow the equipment to dry completely before use. For more information about choosing a disinfectant, go to [Disinfection of Scuba Equipment and COVID-19](#).

Note that alcohol-based hand sanitizers are incompatible with compressed gas, especially oxygen-enriched gas.

If alcohol-based hand sanitizers are used before filling cylinders, ensure hands are completely dry and all alcohol has evaporated. Equipment should be disinfected, especially when it comes into contact with the face, eyes or mouth. This includes but is not limited to:

- ▶ Second stage regulator mouthpiece and internal surfaces
- ▶ Snorkel
- ▶ BCD oral inflator
- ▶ Mask

When using any disinfectant, be sure to follow the manufacturer's instructions for use. Follow this with a thorough rinse in fresh water and allow the equipment to dry completely before use. For more information on choosing a disinfectant, go to [Disinfection of Scuba Equipment and COVID-19](#).

Q: Which surfaces should I disinfect in the dive center?

A: The CDC recommends disinfection of all frequently touched surfaces. In a dive shop these may include but are not limited to door handles, bathrooms, countertops, card-reading machines, fill stations, equipment workbenches, communal tools and computer keyboards and mice. When using any disinfectant, be sure to follow the manufacturer's instructions for use.

Q: Which disinfectant should we use, and how should it be used?

A: The choice of disinfectant is up to you; however, you should use a product that has been proven to work against the virus that causes COVID-19. The EPA's "List N" is made up of disinfectants that will kill the virus. Any disinfectant should be used according to manufacturer's directions, as both concentration and contact time differ from product to product.

Q: How long should I soak equipment in disinfectant to effectively kill the new coronavirus?

A: This is entirely dependent upon which disinfectant solution you choose. For more information about selecting a disinfectant, see [Disinfection of Scuba Equipment and COVID-19](#).

Q: Is 70% alcohol an effective disinfectant for scuba equipment?

A: According to the World Health Organization, a solution of 70% alcohol with a contact time of 1 minute would inactivate the new coronavirus, meaning that the surface must stay wet for this amount of time. However, alcohol can degrade some types of rubber and plastic with repeated use, so to ensure you do not compromise the integrity of your equipment we recommend contacting the manufacturer for guidance. In addition, please be aware when using alcohol near any source of heat, flame or sparks or compressed gas (especially oxygen-enriched gas), that it is highly volatile and flammable, presenting a significant risk of fire and explosion.

Q: Can I use heat or hot water to disinfect equipment?

A: Theoretically, heat is an efficient way to kill the new coronavirus. However, we are unaware of any studies that have been conducted on the survivability of the virus on scuba equipment. Using heat may not be the best method of disinfecting in terms of time-effectiveness. Some studies have shown that a temperature of between 140-155 degrees Fahrenheit (60-68 degrees Celsius) will inactivate the virus after 30-60 minutes. It does not seem feasible to keep scuba equipment at this high temperature for this amount of time for a few reasons — one being that it could damage or distort some parts and another being that you would have to use a specifically designed hot water bath or constantly monitor and adjust your heating mechanism to maintain a constant water temperature for that duration.

It should be noted that quite a few studies have been conducted to determine temperatures that will kill the new coronavirus. The temperatures specified previously were selected as they are on the lower end of the spectrum tested, and they closely match with the generally accepted disinfection method in the scientific community: 60 degrees Celsius for almost one hour.



Infection Control: Limiting the Spread

Q: How long does the coronavirus survive on various materials and surfaces?

A: Research on SARS-CoV-2, the virus that causes COVID-19, is still developing, forcing experts to apply knowledge about similar viruses for answers. The human coronavirus 229E was found to survive for 2-6 days on plastic, 5 days on steel, glass, PVC, silicone, Teflon™ and ceramic, up to 8 hours on latex, and 2-8 hours on aluminum. The SARS-CoV-1 virus was found to survive up to 9 days on plastic, 5 days on metal, 4-5 days on paper, and 4 days on wood and glass. Studies of SARS-CoV-2 have found that it can survive for 2-3 days on plastic and steel, 24 hours on cardboard, up to 4 hours on copper and up to 3 hours in aerosols (from a cough or sneeze). Little data exists on the survivability of SARS-CoV-2 on fabrics. Disinfection — in conjunction with additional practices such as social distancing — remains a vital part of reducing the risk of viral transmission between divers using rental equipment. For more information, go to [COVID 19: Surface Survival Times](#).

Q: Is COVID-19 transmissible through water? If so, does the risk vary based on type of water, i.e. swimming pools, open fresh/saltwater and rinse tanks? Will adding a disinfectant to the water be sufficient to inactivate the virus? What about adding regular hand soap to the rinse tank water?

A: Currently it is not known whether the new coronavirus can be transmitted in a rinse tank with communal equipment, however studies on other coronaviruses have shown that they survive well in surface water such as lakes and rivers. With this research in mind it would be prudent to assume that the virus will survive in a rinse tank and, although diluted, could remain infectious. According to the CDC the virus would be inactivated in a properly treated swimming pool, however rinsing equipment in a swimming pool is not an acceptable method of disinfection. A disinfectant solution must be used according to the manufacturer's directions, and these usually include specific dilution requirements and a statement instructing the user to thoroughly rinse the disinfected item and allow it to dry. Therefore, a disinfectant solution should be mixed and used separately from the freshwater rinse tank. Best

practice in this case would be to have divers disinfect equipment before rinsing to avoid contamination of the rinse water. Hand soap is not a viable option for disinfecting. The U.S. Environmental Protection Agency (EPA) has a list of disinfectants that will kill the virus called “List N”; a disinfectant should be chosen from this list or from among registered disinfectants from other local governing bodies.

Q: Would the use of protective gloves reduce the likelihood of contaminating materials and surfaces?

A: The use of protective gloves will only protect the hands of the person who is wearing them. They do not protect the environment or other people. While they might be useful for people handling items, they would not protect items from becoming contaminated if the virus is present on the outside of the gloves. Hand hygiene and frequent disinfection of high-touch surfaces is effective in limiting virus transmission.

Q: Should I require staff and divers to use an alcohol-based hand sanitizer before filling cylinders or connecting their regulators or rebreathers to the cylinders?

A: The use of alcohol-based hand sanitizers is recommended only when soap and water is not available. Alcohol-based substances should not come into contact with some equipment, including cylinders and fill whips that are used with any compressed gas but especially oxygen-enriched gas. This would increase the risk of fire and explosion due to the high volatility of alcohol and its ability to ignite at relatively low temperatures.

Q: If I close my dive center at 8:00pm and reopen the next morning at 8:00am, would this be enough time for the virus present on surfaces and floors to become inactive?

A: Studies suggest that the new coronavirus may remain active on surfaces for as little time as a few hours or as much as 9 days. This may vary under different conditions (e.g., type of surface, temperature and humidity). Studies have also revealed that it is possible to render the virus ineffective through simple disinfection procedures with easily obtainable products. This should be done before you leave in the evening.



Equipment and Operations

Q: Can rental equipment still be rented and used?

A: You can continue to rent equipment, but you should take additional care, including but not limited to the following:

- ▶ Restrict access to the rental area: Bring the rented equipment out to the client.
- ▶ Disinfect returned rental equipment thoroughly according to directions on the selected disinfectant. This should include second stage regulators, BCDs, wetsuits, snorkels and masks. Rinse thoroughly with fresh water and allow to dry before renting them out again.
- ▶ Maintain a separate area for returned rental equipment to avoid contamination of equipment that has already been disinfected.
- ▶ Instruct clients not to touch the cylinder valve outlet or regulator inlet when assembling and disassembling their scuba unit. Alternatively, consider providing divers with a pre-assembled rental set and instruct them to not disassemble the set after the dive. As long as your staff work with clean hands or gloves, this will prevent contamination of the cylinder valve outlet and first stage regulator inlet.
- ▶ Instruct staff that handle used rental equipment how to properly disinfect the materials and protect themselves.
- ▶ If a client dives with you for several days, label the rental equipment so that client always gets the same equipment. The other listed recommendations still apply.

Q: Should an individual mouthpiece be used for every client who rents a regulator?

A: If you wish to provide each diver with their own mouthpiece this will reduce some of the risk of contamination. However, exhaled air will enter the second stage and potentially contaminate the inside of the regulator. If not properly disinfected, this could cause infection of the next person to use the regulator. Proper disinfection should be used in addition to providing individual mouthpieces.

**Q: Can the coronavirus survive inside the bladder of a BCD?
What are DAN's recommendations for oral inflation?**

A: It is not known if the virus will survive inside the bladder of a BCD. Oral inflation of BCDs may increase the risk of contaminating the inside of the bladder. If possible, consider taking rental BCDs that have been orally inflated out of service for the predicted survival time of the virus. This would reduce the risk of transmission between divers. It may also be prudent to consider mitigation measures for the release of air from the BCD (if it has been orally inflated), as the virus could theoretically be aerosolized with any water vapor that leaves the BCD as you deflate it to descend.

In terms of disinfecting the BCD, the best practice may be to thoroughly disinfect the outside of the BCD and avoid oral inflation after disinfection. Recommendations for disinfecting the bladder of the BCD are unclear. The use of disinfectant solutions should always be followed by a rinse with fresh water to remove the active ingredient. This helps avoid inhalation or ingestion of the disinfectant and prevents the active ingredient from damaging equipment over time. It is unclear whether remnants of disinfectant solutions inside the BCD bladder would affect the health of a diver through inhalation or ingestion or would cause damage to the bladder material.

Q: What should I do when a client wants to try on a mask or other equipment?

A: Any mask or other equipment handled by clients should be properly disinfected, rinsed with fresh, clean water, and allowed to dry. In the case of masks specifically, alcohol or other disinfectant wipes could be used for disinfecting. It is recommended that wetsuits not be available to try on. However, if this is really necessary, they should be removed from sales stock following fitting and stored for nine days to allow the virus to die naturally.

**Q: If I run my compressor, is there a chance that the compressed air inside my cylinders could be contaminated?
Can the new coronavirus get into my filled cylinders?**

A: The new coronavirus is small enough to theoretically enter the compressor without being caught by the filters. The compressor will heat the air up to well above 150°F after each stage of compression. In addition, during each stage, the peak, instantaneous temperature

due to near adiabatic heating that occurs during compression, can be at least 360°F (182°C) inside the cylinder, irrespective of whether the compressor is cold or warm. This will therefore occur multiple times. These temperatures are hot enough to eliminate infectivity. Therefore, no live virus should enter a scuba cylinder during filling. It can, however, enter a cylinder if the fill whip or cylinder valve is contaminated, such as by being touched by an infected person. For this reason, it is important to practice hand washing and disinfection of high-touch areas including cylinders and fill stations. For more information, see the “Heat” section of our article [Disinfection of Scuba Equipment and COVID-19](#).

Q: What actions should I consider during dive boat operations to prevent possible COVID-19 transmission?

A: This situation is one in which the risk of transmission will be high due to the limited space and proximity of people. At a minimum, consider the following suggestions. Note that these recommendations are for day boat operations; liveaboard operations are outside the scope of this answer.

- ▶ Consider reducing the number of divers per boat to better respect social distancing, and discourage any non-diving passengers.
- ▶ Any materials not needed for the dive operations or for safety reasons should not be taken on board.
- ▶ Have all equipment on board before you start boarding the divers.
- ▶ Have scuba units assembled before divers board.
- ▶ Consider protecting masks, snorkels and second stages/mouth-pieces by securing them in such a way as to limit contact/exposure.
- ▶ Boarding procedures should be organized to respect social distancing at all times.
- ▶ Pre-dive mask rinse buckets should not be used. Anti-fog should be used, but spitting in masks should be discouraged or disallowed (especially for rental masks). Consider having divers supply their own masks instead of providing rentals.
- ▶ Encourage regular hand hygiene by staff, especially when handling customers' equipment.

- ▶ Social distancing is important to prevent the spread of a virus, but one should keep in mind that on a moving boat or in the wind, the virus may travel a longer distance. The use of protective masks will reduce the risk of contamination, but the virus can be present on any surface on board.
- ▶ Advise everyone on board to avoid touching anything unnecessarily and to avoid touching their face.
- ▶ Remind divers not to share equipment or even let their equipment touch.
- ▶ Maintain social distancing while divers enter the water, and ensure that divers do not crowd together on the surface without a compelling reason to do so.
- ▶ Encourage divers to maintain at least 6 feet of distance when clearing their nose, sinuses or throat at the surface or after a dive.
- ▶ Maintain social distancing when divers get back on board.
- ▶ In general, customers should be responsible for assembling their own equipment. If crew members handle customers' equipment, they should practice hand hygiene before and after handling each customers' gear.
- ▶ Encourage divers to handle only their own equipment.

If you would like to learn more as you prepare for resumption of diving activities when local regulations permit, keep an eye on [DAN.org/COVID-19](https://dan.org/COVID-19) for more comprehensive recommendations to help you prepare.

Dive safety is a responsibility shared by divers and dive operators. It assumes that healthy divers protect themselves, ill divers do not dive, and divers who were in close contact with COVID-19 patients stay self-quarantined for 14 days. In return, dive operators should implement anti-microbial control at the dive site, follow current local rules that may limit gathering, screen their staff and put in place reasonable social distancing measures.

As social activities resume, people with an increased risk of severe COVID-19, should remain at heightened alert regarding social participation and travel for as long as the pandemic is not eradicated.



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