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COVID-19 AND DIVING OPERATIONS

10 RECOMMENDATIONS ON RISK
PREVENTION AND MITIGATION

With the support of





This document provides some useful recommendations on risk prevention and mitigation procedures that diving operators may consider when national, regional or local authorities officially allow the reopening of diving activities. Directives issued by the respective administrative authorities (e.g. Coast Guard), should also be taken into account.

PLEASE NOTE

The epidemiological and regulatory situation is constantly evolving. As a result, this document may be subject to changes and updates.

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WHAT MEASURES SHOULD BE TAKEN FOR THE SAFETY OF CUSTOMERS AND STAFF?

- RECEPTION
- PHYSICAL DISTANCING
- CHANGING ROOMS
- PERSONAL HYGIENE
- USE OF PPE (PERSONAL PROTECTIVE EQUIPMENT)



WHAT MEASURES SHOULD BE TAKEN FOR THE SAFETY OF CUSTOMERS AND STAFF?



1.1 RECEPTION

Customers should be reminded not to enter the Dive Centre if they have symptoms related to COVID-19 infection. In addition, it is advisable to deny access to non-diving family members or friends accompanying the divers, in order to reduce assembly of people in the dive centre. The staff present on the premises should be limited to those strictly necessary to carry out activities. The prevention measures taken by the Centre should be displayed on public signs and made clearly visible. For further information, please refer to the **Template of Public Notice** (Attachment 1). 

It is recommended that you let customers fill out all registration forms online, before visiting the the Dive Centre. If this is not possible, please make sure that correct personal hygiene procedures are respected, before completing the forms (masks, gloves, alcohol wipes for all shared writing instruments, hand sanitiser, etc.). Regarding payment, it is preferable to use online methods (bank transfer, Paypal or similar) or credit cards, rather than using cash.

1.2 PHYSICAL DISTANCING

The [WHO](#) (World Health Organisation) recommends that people keep at least a **1 metre / 3 feet distance** from each other. This also applies to Dive Centre premises, including classrooms and changing rooms. In common areas, it may be useful to mark the appropriate distances on the floor, e.g. by using visible tape. In determining the correct distance, take into account the directions provided by local authorities, which may vary (e.g. 2m/6ft in [UK](#), [USA](#) and [Canada](#); 1.5m /5ft in [Australia](#)).

Wherever possible, e-learning or remote teaching should be preferred to reduce face to face time in a classroom.

1.3 CHANGING ROOMS

Changing rooms may be among the areas most subject to risk of infection. All customers' personal items, including clothing, towels and bathrobes should be stored in a way that avoids contact with common surfaces. If stored in lockers, they should be sanitised after each use. Alternatively, customers may be encouraged to store their items in special containers (bags, boxes, cases, etc.), kept on the floor or on benches, and well spaced from each other. If provided by the Dive Center, containers should be properly sanitised after each use.

1.4 PERSONAL HYGIENE

The new coronavirus (SARS-CoV-2) is a respiratory virus that spreads mainly through contact with droplets of infected people, for example when they sneeze, cough or blow their nose.

Correct personal hygiene measures include:

- ✓ Wash hands frequently, for at least 20 seconds.
- ✓ Keep physical distancing, avoid direct contact with other people.
- ✓ Avoid touching eyes, nose and mouth.
- ✓ Practice respiratory hygiene. This includes covering your mouth and nose with your bent elbow or tissue when you cough or sneeze.

Dive Centres should provide hand sanitising products or suitable facilities where washing hands as recommended.

1.5 USE OF PPE (Personal Protective Equipment)

MASKS

The [WHO](#) advises that masks should only be used if you are coughing or sneezing, or if you are taking care of a person with COVID-19. However, it is only prudent to require that everyone within the Dive Centre premises wear a mask. Follow instructions of local authorities, as well as your own best self-interest in this regard. Wearing masks is of particular importance to the Dive Centre staff, who spend more time in contact with customers.

Which masks should you wear? There are primarily three types of appropriate protective masks, and the choice depends on their use:

- ✓ **Medical masks** reduce the possibility that an infected person ejects droplets, but do not protect the person wearing them. They only offer a degree of protection if everyone in a given environment wears them.
- ✓ FFP2, KN95 and FFP3 **filter masks** are effective personal protective equipment and, if correctly fitted, protect both others and the person wearing them, as they block up to 99% of infected particles.
- ✓ Please note: some FFP2, KN95 and FFP3 masks have a **valve** on the front, which is not a filter but only facilitates exhalation. These only protect the wearer, but would not protect others from what is exhaled. Their use in diving centres is therefore not recommended.

Before putting on the mask, hands should be sanitised. The mask should not be touched while wearing it. It should be removed from the back and eventually disposed of in closed containers.

For more details, see the infographic **How to Put on, Use, Take off and Dispose of a Protective Mask** (Attachment 2) 

1.5 USE OF PPE (Personal Protective Equipment)

GLOVES

Single-use gloves (e.g. latex gloves) only protect the hands of the person wearing them while handling materials, equipment, etc. However they do not protect other people and the surrounding environment from contamination.

Before using, check their integrity. While in use, disinfect them regularly. After use, they should be removed and disposed of in closed containers, avoiding skin contact with the outside of the gloves. For more details, please refer to the infographic **Practical Guide for the Correct Use of Single-Use Gloves** (Attachment 3). 

PLEASE NOTE

Single-use gloves often imply a false sense of security, and people tend to contaminate much more surfaces and perform hand hygiene more rarely when they wear them. As a result, they should be changed regularly, and good hand hygiene should be performed while wearing them and after doffing.



HOW SHOULD DISINFECTION OPERATIONS BE MANAGED?

- SURFACES
- DIVING EQUIPMENT



HOW SHOULD DISINFECTION OPERATIONS BE MANAGED?



Studies of other coronaviruses have shown their infectivity can be reduced by heat, UV light and alkaline or acidic conditions. Because of this, surfaces can be disinfected using household cleaning products.

2.1 SURFACES

It is not clear how long the virus can survive on surfaces. According to the [WHO](#), preliminary information suggest that it may persist for a few hours or up to several days, depending on type of surface, temperature or humidity of the environment. It is therefore necessary to clean all surfaces and disinfect them frequently, especially those that could be touched by several people: door and window handles, light switches, taps, keypads, etc. It may be practical to create a list of all spaces and surfaces to be disinfected.

Among the products that are useful to eliminate the virus there are both alcohol-based disinfectants with an **alcohol** percentage (ethanol/ethyl alcohol) of 70%, and products with **sodium hypochlorite** as the primary agent (such as bleach).

The percentage of sodium hypochlorite capable of eliminating the virus without causing irritation to the respiratory system is **0.1%** for most surfaces. For toilets (WC, shower, washbasins) a higher percentage can be used: **0.5%**.

PLEASE NOTE

Particular care is required when using alcohol-based disinfectants, including hydroalcoholic hand solutions. A small percentage of alcohol, a highly volatile and flammable substance even at relatively low temperatures, can cause fire or explosion. Avoid direct or indirect contact with equipment, cylinders and filling hoses used for oxygen-enriched air. Wherever possible, it is preferable to use simple soap and water to clean hands.

Also, please consider that both ethanol/ethyl alcohol and sodium hypochlorite can damage surfaces, and should be tested prior to use for each individual item or surface.

The Dive Centre premises must be disinfected daily. Common areas such as changing rooms should be disinfected whenever used by different people. For general information on cleaning and disinfection, please consult the resources made available by the [WHO](#) as well.

2.2 DIVING EQUIPMENT

INTRODUCTION

There are still no specific tests carried out regarding the survival of SARS-CoV-2 virus on diving equipment especially where it has penetration cavities or threaded sections. It is therefore imperative that diving equipment is disinfected after use in order to neutralise the virus. Some products, such as quaternary ammonium compounds, are effective and highly compatible with typical diving equipment materials (rubber, neoprene, plastics, metal, etc.), however difficult to source or harmful for the marine environment. Other products, such as bleach (sodium hypochlorite), are easier to find and cheaper, but must be used in accordance with the guidelines for COVID-19. There are also other products (EW80, Virkon S etc.), commonly used by divers, that have been proven to be effective against the virus.

In the United States, the EPA (Environmental Protection Agency) provides a [list](#) of disinfectants effective against the SARS-CoV-2 virus. In Europe, the ECDC (European Centre for Disease Prevention and Control) has published some [guidelines](#).

Regardless of the active ingredients chosen or the method of disinfection, it is of the utmost importance that its effectiveness against the new coronavirus is proven.

SODIUM HYPOCHLORITE

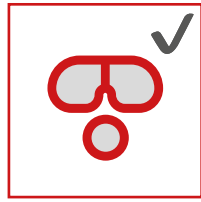
Common **bleach**, marketed under different brands and with variable percentages (5-10%) of its active ingredient, **sodium hypochlorite**, is among the products able to neutralise the virus. It is important to read the product label carefully, check the percentage of active ingredient, and dilute it in water in the right measure. Recent scientific studies (1) suggest a **1:50** dilution of bleach containing **5%** of sodium hypochlorite (concentration of **0.1%** or **1,000 ppm** of active ingredient), with complete immersion of the objects for at least **5 minutes**.

Here's a practical example of how to dilute the product in water, to obtain **5 litres** of solution containing **0.1%** of active ingredient:

- ✓ 5% sodium hypochlorite bleach // 100 ml of product in 4900 ml of water, or
- ✓ 10% sodium hypochlorite bleach // 50 ml of product in 4950 ml of water

Precautions:

- ✓ Perform disinfection operations wearing gloves, mask and eye protection.
- ✓ Mix solutions in well ventilated areas.
- ✓ Prepare solutions using cold water, as hot water damages the active ingredient.
- ✓ Never mix bleach with other products or chemicals.
- ✓ Avoid splashes during cleaning.
- ✓ Rinse with fresh water and allow to dry before use.



WHAT IS THE BEST WAY TO MANAGE INFECTION CONTROL OF RENTAL EQUIPMENT?

- RECOMMENDATIONS
- SHOULD SECOND STAGE MOUTHPIECES BE REPLACED AFTER EACH USE?



WHAT IS THE BEST WAY TO MANAGE INFECTION CONTROL OF RENTAL EQUIPMENT?



3.1 RECOMMENDATIONS

Equipment rental should be handled with particular care, especially considering the responsibility of Dive Centre owners in case of possible contamination. Here are some recommendations:

- ✓ Rental equipment should be disinfected as indicated, after each use, paying particular attention to regulators, BCDs, snorkels and masks.
- ✓ Rental masks need to be fit-tested by each diver before use, which implies disinfection after each test. Customers may be encouraged to bring at least their own mask.
- ✓ Keep areas for returned rental equipment separate from areas where disinfected equipment is stored.
- ✓ Customers should be prevented from entering the area where disinfected equipment is stored. Bring the gear out to customers.
- ✓ Transport rental equipment in individual containers, marked with customer's name, and remember to disinfect these after use.
- ✓ Once disinfected, handle the equipment safely, e.g. by storing masks, regulators and snorkels in closed bags, to be removed before use.
- ✓ Instruct customers not to touch the cylinder valve outlet or regulator inlet when assembling and disassembling their scuba unit.

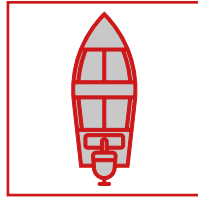
3.2 SHOULD SECOND STAGE MOUTHPIECES BE REPLACED AFTER EACH USE?

Although perceived by customers as a synonym of special care and good service, replacing mouthpieces may not be enough to prevent contamination. An infected user would not only contaminate the mouthpiece, but the entire second stage unit. This is why it is necessary to disinfect regulators as described above, even if mouthpiece is replaced.



HOW SHOULD RINSING OF CUSTOMER-OWNED DIVE EQUIPMENT BE CARRIED OUT?

It is recommended not to use common tubs to rinse equipment after a dive. If the Dive Centre does not have appropriate facilities to allow individual rinsing with running water, customer-owned equipment should be rinsed elsewhere. If the Dive Centre provides an area to customers for the drying of their equipment, enough spacing between sets should be provided for. Always remind customers to disinfect their equipment as soon as possible after use.



WHAT PROTECTIVE MEASURES SHOULD BE TAKEN ON DIVING BOATS AND RIBS?

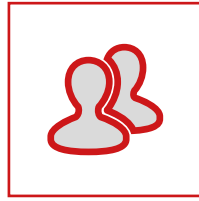


WHAT PROTECTIVE MEASURES SHOULD BE TAKEN ON DIVING BOATS AND RIBS?



Dive boat operations should be handled with extreme care: where people come into closer contact with each other the risk of infection increases significantly. Always follow indications provided by the competent authorities. Here are some general recommendations:

- ✓ Ensure that physical distancing (see point #1 above) is respected also when on board.
- ✓ Avoid taking any unnecessary material on board that is not needed for safety reasons or underwater operations.
- ✓ Load the equipment on board when it's already assembled.
- ✓ Staff handling materials and equipment should wear gloves and a protective mask.
- ✓ Ensure that masks, snorkels and second stages of preassembled equipment are protected, e.g. protecting them with bags to be removed only before use.
- ✓ Do not use buckets to rinse masks: rinse them in open water instead. Discourage the use of saliva to defog masks: preferably use defogging products.
- ✓ Even when distancing rules are respected, while the boat is moving and due to the effect of the wind, droplets may travel a longer distance. It is therefore advisable that all passengers wear a protective mask. Remind them not to touch other people's equipment.
- ✓ Make sure you have hand sanitisers available on board.
- ✓ Make sure distancing rules are respected also when divers enter and exit the water. Respecting distance on surface may be difficult in the presence of current: the use of tag lines or lines secured to a floating buoy, with spacing indicated with tape or colour bands may assist in maintaining the appropriate distances.



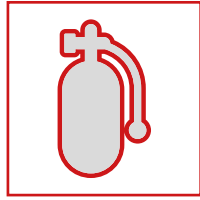
HOW CAN BUDDY CHECKS AND GAS SHARING BE MANAGED SAFELY?

Distancing rules should be respected also in relation to the following operations:

- Buddy Checks: divers should be reminded to avoid touching other divers' equipment, especially those parts that come into close contact with the diver's face and mouth. A visual buddy check should be carried out, with self-demonstration and verbal confirmation.
- Gas sharing: both in case of emergency and when performing drills, it is recommended to use an alternative gas source and avoid donating the regulator from which the diver is breathing.

PLEASE NOTE

Guidelines provided by dive training agencies on these subjects may vary. Make sure you know and respect the latest guidelines issued by your training agency.



HOW CAN CYLINDER REFILLS BE MANAGED SAFELY?

- GAS COMPRESSORS AND REFILLING PROCEDURES
- GAS REFILL AREAS



HOW CAN CYLINDER REFILLS BE MANAGED SAFELY?



7.1 GAS COMPRESSORS AND REFILLING PROCEDURES

Theoretically, the virus could enter the compressor through the air inlet, as the inlet filter is not able to block smaller droplets. The breathing air filters after the compression will also not provide assurance that small particles will be caught. It is therefore essential that the inlet to the compressor is located in a safe place to avoid any contamination. It has been shown that the virus is sensitive to high temperatures. When warm, a compressor can generate a gas temperature of more than 120°C, and in addition to this, very high temperatures are reached at the peak for compression, well above the virus resistance threshold (2). It is therefore unlikely that a virus can remain active after passing through the compressor.

The risk however exists when it comes to handling cylinder valves and refill hoses, through the possibility of contamination by infected operators. It is therefore important that all those carrying out refilling operations follow correct hygiene procedures and always wear the recommended PPE (masks, gloves).

7.2 GAS REFILL AREAS

Personal hygiene and physical distancing procedures should also be observed in gas refill areas. Only authorised people should be allowed to be in the immediate vicinity of compressors, the filling station, and the storage area for filled cylinders.

PLEASE NOTE

Particular care is required when using alcohol-based disinfectants, including hydroalcoholic hand solutions. A small percentage of alcohol, a highly volatile and flammable substance even at relatively low temperatures, can cause fire or explosion. Avoid direct or indirect contact with equipment, cylinders and filling hoses used for oxygen-enriched air. Wherever possible, it is preferable to use simple soap and water to clean hands.



FIRST AID AND CPR: HOW SHOULD AN EMERGENCY BE MANAGED?

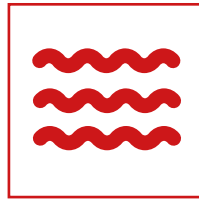


FIRST AID AND CPR: HOW SHOULD AN EMERGENCY BE MANAGED?



Here are some useful recommendations on how to intervene, whilst protecting both victim and rescuer from potential infections:

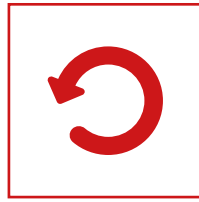
- ✓ Ensure that the rescuer, the victim and all other people on site are safe.
- ✓ Ensure that all PPE is being worn and that protective barriers are used.
- ✓ Evaluate consciousness by shaking or stimulating the victim without approaching the face.
- ✓ Determine if the victim is breathing by simply observing chest movements. The rescuer's face should not come close to the victim's face.
- ✓ If the victim is unconscious and not breathing, alert Emergency Medical Services (EMS) describing the situation, and start chest compressions without rescue breaths/ventilations.
- ✓ Use an Automated External Defibrillator (AED), if available.
- ✓ Continue with rescue operations until the victim has resumed normal breathing, the rescuer is exhausted or EMS arrive.
- ✓ Once rescue activities are completed or the victim handed over to EMS, properly remove PPE and dispose of these according to local instructions. Wash hands carefully. Medical devices used on the victim should be disinfected after use, if possible, or disposed of following correct procedures.



CAN THE VIRUS SURVIVE IN WATER?

Research is still ongoing, and it is not clear how long the SARS-CoV-2 virus can survive in water. Studies on the SARS-CoV-1 virus (2003 epidemic) have shown that it remained infectious for long periods on the surface (lakes, rivers, wetlands, etc.). It appears that sea water is not able to neutralise the virus. In properly chlorinated or bromated pools and hot tubs, the CDC (Center for Disease Control) specifies that SARS-CoV-2 would be inactivated after a period of time (3).

According to current evidence, it is therefore recommended that care is taken both when in the water and out of the water. This includes respecting distancing rules and properly washing and disinfecting equipment.



WHAT OPERATING PROCEDURES AND EMERGENCY ACTION PLAN APPLY DURING THIS PANDEMIC?

The Dive Centre should update its Standard Operating Procedures, taking into account the recommendations provided in this document, together with other national rules and regulations. In particular, Emergency Action Plans for suspected infection, infected staff or customers and crew, as applicable, should include specific instructions to maintain infection control and commence with immediate isolation of suspected infected persons.



REFERENCES

- 1
 - Use of disinfectants: alcohol and bleach. Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Infections in Health Care [Internet]. Available from <https://www.ncbi.nlm.nih.gov/books/NBK214356/>
 - Kampf G, Todt D, Pfaender S, Steinmann E. Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents. Journal of Hospital Infection. 2020Mar;104(3):246–51.
 - Lai MYY, Cheng PKC, Lim WWL. Survival of Severe Acute Respiratory Syndrome Coronavirus. Clinical Infectious Diseases [Internet]. 2005Oct1;41(7):e67–e71. Available from: <https://academic-oup-com.proxyiub.uits.iu.edu/cid/article/41/7/e67/310340>
- 2
 - Chan KH, Peiris JSM, Lam SY, Poon LLM, Yuen KY, Seto WH. The Effects of Temperature and Relative Humidity on the Viability of the SARS Coronavirus. Advances in Virology. 2011Oct1;2011:1–7.
 - First data on stability and resistance of SARS coronavirus compiled by members of WHO laboratory network [Internet]. World Health Organization. World Health Organization; 2015 [cited 2020Mar27]. Available from: https://www.who.int/csr/sars/survival_2003_05_04/en/
 - Duan SM, Zhao XS, Wen RF, Huang JJ, Pi GH, Zhang SX, et al. Stability of SARS coronavirus in human specimens and environment and its sensitivity to heating and UV irradiation. Biomedical and Environmental Sciences [Internet]. 2003Sep;16:246–55. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/14631830>
- 3
 - Casanova L, Rutala WA, Weber DJ, Sobsey MD. Survival of surrogate coronaviruses in water. Water Research. 2009;43(7):1893–8.
 - Municipal Water and COVID-19 [Internet]. Centers for Disease Control and Prevention. Centers for Disease Control and Prevention; 2020 [cited 2020Mar26]. Available from: <https://www.cdc.gov/coronavirus/2019-ncov/php/water.html>



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COVID-19

PREVENTION MEASURES

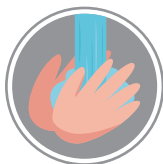
1. Public access to the Dive Centre is limited to diving customers only. Accompanying family members or friends are not allowed to enter the Dive Center.
2. Do not enter the Dive Centre premises if you have any of the following symptoms, which could be related to a COVID-19 infection:
 - ✓ Fever
 - ✓ Cough
 - ✓ Tiredness or muscle pain
 - ✓ Difficulty breathing
 - ✓ Sore throat
 - ✓ Lung infections
 - ✓ Headache
 - ✓ Loss of taste
 - ✓ Diarrhoea
3. If you have traveled in the last two weeks and or if you have been in contact with people affected or potentially affected by COVID-19, please contact health authorities or your treating physician before going to the Dive Centre.
4. In order to avoid crowding inside the Dive Centre, access is subject to maintaining at least a one-metre distance from each other.
5. Entering the Dive Center may be limited to a specified number of people at any one time.

HOW TO PUT ON, USE, TAKE OFF AND DISPOSE OF A PROTECTIVE MASK



1

Before putting on a mask,
**clean hands with alcohol-based
hand rub or soap and water**



2

Cover mouth and nose with
**mask and make sure there are no gaps
between your face and the mask**



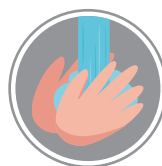
3

Avoid touching the mask while using it;
if you do, clean your hands with alcohol-based
hand rub or soap and water



4

To remove the mask: **remove it from behind** (do not touch the front of mask);
discard immediately in a closed bin;
clean hands with alcohol-based hand rub or soap and water



GUIDELINES ON SINGLE-USE PROTECTIVE GLOVES



BEFORE WEARING PROTECTIVE GLOVES

1

Remove any jewellery, and make sure nails don't damage gloves



2

Clean hands with alcohol-based hand rub or soap and water



3

Choose the proper glove size for you



4

Replace if damaged, dirty or sweaty



HOW TO SAFELY REMOVE GLOVES

1

Pinch and hold the outside of the glove near the wrist area



2

Peel downwards, turning the glove inside-out and holding it with the gloved hand



3

With your ungloved hand, slide two fingers under the wrist of the remaining glove, and peel downwards



4

Turn the glove inside-out, leaving the first glove inside the second



5

Dispose of the gloves in a closed bin



6

Clean hands with alcohol-based hand rub or soap and water

