

# **PRESS RELEASE**

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--- For immediate release ---

## **How a re-fitted snorkel mask can save lives: The “COVID Lifesaver Mask” and the “Air-Wave Protector”**

There is a worldwide shortage of personal protective materials for healthcare professionals due to the COVID-19 pandemic. Two new reusable face masks for medical staff who are caring for and treating COVID-19 patients have been developed in the Netherlands by teams of anaesthesiologists, universities and a consortium of companies, all supporting on a not-for-profit basis.

These designs may help solve the global shortage of face masks and improve safety for healthcare professionals, especially during intubation and intensive care procedures where the risk of infection is highest.

Both masks use a unique 3D printed connector to link a popular snorkel mask to a filter system.

The COVID Lifesaver Mask uses a high-performance filter used in anaesthetic equipment to create a low-cost, easy to use system for short duration use.

The Air-Wave Protector solution uses an industrial fan & filter unit to create a personal protection unit for use of longer duration.

### **COVID Lifesaver Mask**

Combining a popular full-face snorkel mask with a high-performance filter used in anaesthetic equipment and ventilators made it possible to develop a reusable face mask for healthcare workers that is safer than the commonly used FFP2 mask. The anaesthetic filter used has already been validated to have a capacity to block 99,999% of viruses and bacteria. This prototype has undergone clinical testing to rule out carbon dioxide intoxication. Further testing is ongoing.

### **Air-Wave Protector**

The Air-Wave Protector is a combination of the same snorkel mask connected with a custom 3D printed connector to a medical-grade filter and an air pump used in the welding industry for personal protection. The air pump creates a positive pressure in the mask, potentially reducing air leakage and promoting the ease of breathing. Preliminary testing indicates that the solution provides better protection than the commonly used FFP2 masks.

## **Safety and comfort**

A team of healthcare professionals tested the snorkel mask used in both solutions and found it to work well. Glasses can be worn and the mask allows for communication with patients and co-workers. The reusable mask can be decontaminated using readily available cleaning methods.

## **Availability**

The designs of the solutions are “open-source” which means they can be freely copied and used to support healthcare professionals worldwide. The design of the 3D-printed connectors created by the TU Delft will be available through “thingiverse.com”, a global website to share 3D print designs.

While some aspects of the solutions are still in development and testing continues, the groups have decided to share their designs and progress widely. Royal Dutch Shell has already started printing COVID Lifesaver connectors in its Technology Center in Amsterdam and offered its full cooperation to contribute to the solutions that are being developed.

## **How it started**

The history of the COVID Lifesaver Mask and Air-Wave Protector is a unique story of ingenuity and collaboration in times of crisis. The not-for-profit initiative has brought together different groups (anaesthesiologists, universities, companies and volunteers) who had similar ideas to help healthcare professionals battle COVID-19. With amazing passion, they have come together to develop solutions in a short period of time.

## **Collaboration**

The “COVID Lifesaver Mask” and “Air-Wave Protector” are being developed by a support network, consisting of

- A independent group of anaesthesiologists working in Haaglanden Medisch Centrum (HMC), The Netherlands
- Delft University of Technology
- Royal Dutch Shell
- Air-wave.org, a not-for-profit group initiated by Damen Shipyards, Blue Orange Wave, Redgrasp and VFA Solutions with support of a large international group of specialists and innovative companies

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## FURTHER INFORMATION

COVID Lifesaver Mask: [www.COVIDlifesavermask.com](http://www.COVIDlifesavermask.com)

Air-Wave Protector: [www.air-wave.org](http://www.air-wave.org)

The 3D-printed connector 3D print design can be found on the respective websites.

### **Medical spokesperson COVID Lifesaver Mask:**

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## **Media for download**

Photos, images and videos about the solutions can be found on the respective websites.

## **Disclaimers**

For COVID Lifesaver Mask and the 3D-printed connectors: The design team have done their utmost to ensure a tight fit between the snorkel mask and the HME filter. The current design has been 3D-printed (mostly on Ultimaker printers) and tested successfully multiple times. Since 3D printers can have small deviations in print accuracy, the fit may be imperfect in individual cases. Therefore, every printed part should be checked for individual fit before use. If the printed part has a loose fit or any other defect, it should not be used. Note that the current design can be mounted in two ways to the snorkel mask (front-back rotation). Users should make sure they mount it with the tightest possible fit. An update on the design will be available as soon as possible to solve this issue. Check the website regularly for updates: [www.covidlifesavermask.com](http://www.covidlifesavermask.com). Other instructions related to 3D printer settings, can be found

on Thingiverse: <https://www.thingiverse.com/thing:4236194> Updates and new designs will be uploaded here as soon as they are ready and have been tested.

For Air-Wave Protector: Initiators are active in industry and healthcare. Due to the scarcity of mouth masks in healthcare, they have jointly investigated whether existing protection solutions within the industry can offer an alternative solution. On this basis, the initiators have put together a set, consisting of a PAPR filter that is connected to a snorkel mask via a 3-d printed connector. Initiators have tested the system themselves and are confident that it will work. However, the system has not been tested or certified and does not have any (safety) standards. Initiators have made an effort to come up with a good solution quickly, but cannot give any guarantee on this. Anyone who wants a guarantee or certainty must have the system tested and standardised by an authorised testing institute.