

# PRESS RELEASE

## 新闻稿

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

重新**安装**的浮潜面罩如何拯救生命：

**“COVID 救生面罩”和“空气波保护器”**

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.

由于 COVID-19 病毒的流行，全球范围内医疗专业人员的个人防护材料短缺。荷兰由麻醉学家、大学和一个公司联合体开发了两种新的可重复使用的口罩，供护理和治疗 COVID-19 患者的医务人员使用，所有这些都是非营利的基础上提供支持的。

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.

这些设计可能有助于解决全球口罩短缺的问题，提高医护人员的安全性，特别是在插管和重症监护过程中，感染风险最高

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

两个面罩都使用独特的 3D 打印连接器将流行的浮潜面罩链接到过滤系统。

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.

COVID 救生面罩使用麻醉设备中使用的高性能过滤器，为短时间使用创建一个低成本、易于使用的系统。

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

**空气波保护器**解决方案使用工业风扇和过滤装置来创建个人防护装置，以延长使用时间。

## **COVID Lifesaver Mask**

### **COVID 救生面罩**

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.

将一种流行的全脸浮潜面罩与麻醉设备和呼吸机中使用的高性能过滤器相结合，就有可能为医护人员开发一种比常用的 FFP2 面罩更安全、可重复使用的面罩。使用的麻醉过滤器已经被证实有能力阻止 99.999% 的病毒和细菌。这个原型已经进行了临床试验，以排除二氧化碳中毒的可能性。进一步的测试正在进行中。

## **Air-Wave Protector**

### **空气波保护器**

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.

空气波保护器是同一个浮潜面罩的组合，该浮潜面罩通过一个定制的 3D 打印连接器连接到一个医用级过滤器和一个用于焊接行业的用于个人保护的气泵。空气泵在面罩中产生正压力，有可能减少空气泄漏，促进呼吸。初步测试表明，该方案比常用的 FFP2 掩模提供了更好的保护。

## **Safety and comfort**

### **安全与舒适**

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.

一组医疗专业人员测试了两种解决方案中使用的浮潜面罩，发现效果良好。戴上眼镜，戴上口罩，就可以与病人和同事交流。可重复使用的口罩可使用现成的清洁方法进行去污。

## **Availability**

### 可用性

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.

这些解决方案的设计是“开源”的，这意味着它们可以自由复制并用于支持世界各地的医疗专业人员。由 TU Delft 创建的 3D 打印连接器的设计将通过“thingiverse.com”提供，这是一个共享 3D 打印设计的全球网站。

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.

虽然解决方案的某些方面仍在开发中，测试仍在继续，但这些小组决定广泛分享他们的设计和进展。荷兰皇家壳牌公司（Royal Dutch Shell）已经开始在阿姆斯特丹的技术中心印刷 COVID 救生连接器，并提供充分合作，为正在开发的解决方案做出贡献。

## **How it started**

### 怎么开始

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

COVID 救生面罩和空气波保护器的历史是一个独特的故事，在危机时期，它体现

了独创性和协作性。这项非营利性的计划将不同的团体（麻醉师、大学、公司和志愿者）聚集在一起，他们有相似的想法来帮助医疗专业人员对抗 COVID-19。他们怀着惊人的热情，在很短的时间内共同开发解决方案

## **Collaboration**

### **协作**

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

“COVID 救生面罩”和“空气波保护器”正由一个支持网络开发，该网络包括

- A independent group of anaesthesiologists working in Haaglanden Medisch Centrum (HMC), The Netherlands
- 在荷兰哈格兰登医学中心（HMC）工作的一个独立的麻醉学家小组
- Delft University of Technology
- 德尔夫特理工大学
- Royal Dutch Shell
- 荷兰皇家壳牌
- 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
- Air-wave.org 是一个非盈利组织，由达门造船厂、蓝橙浪、redgrass 和 VFA 解决方案公司发起，由一个大型国际专家组和创新公司提供支持

## **FURTHER INFORMATION**

### **进一步信息**

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

COVID 救生面罩 : [www.COVIDlifesavermask.com](http://www.COVIDlifesavermask.com)

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

空气波保护器:[www.air-wave.org](http://www.air-wave.org)

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

3D 打印连接器 3D 打印设计可在相应的网站上找到。

**Medical spokesperson COVID Lifesaver Mask:**

医疗发言人 COVID 救生面罩：

Sara Galli, MD, anaesthesiologist

Sara Galli, 医学博士, 麻醉师

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**Technical spokesperson COVID Lifesaver Mask:**

技术发言人 COVID 救生面罩：

Nino Van der Wilk, MD, anaesthesiologist

Nino Van der Wilk, 医学博士, 麻醉师

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**Medical spokesperson Air-Wave Protector:**

医疗发言人空气波保护器：

Menno Vergeer, MD, PhD

Menno Verger, 医学博士

[air.wave.org@gmail.com](mailto:air.wave.org@gmail.com)

**Technical spokesperson Air-Wave Protector:**

技术发言人空气波保护器：

Tim Lodder, AFNI

蒂姆·洛德, 阿夫尼

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**Media for download**

供下载资料

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

有关解决方案的照片、图像和视频可以在相应的网站上找到

**Disclaimers**

免责声明

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.

对于 COVID 救生面罩和 3D 打印连接器：设计团队已尽最大努力确保浮潜面罩和 HME 过滤器之间的紧密配合。目前的设计已经进行了 3D 打印（主要是在 Ultimaker 打印机上），并成功地进行了多次测试。由于 3D 打印机在打印精度上可能有微小的偏差，因此在个别情况下拟合可能不完美。因此，在使用之前，应检查每个打印部件是否适合。如果印刷件有松装或其他缺陷，则不应使用。请注意，当前的设计可以通过两种方式安装到浮潜面罩上（前后旋转）。用户应确保安装时尽可能紧密。将尽快更新设计以解决此问题。定期查看网站以获取更新：[www.covidlifesavermask.com](http://www.covidlifesavermask.com)。有关 3D 打印机设置的其他说明，请访问

[Thingiverse:https://www.Thingiverse.com/thing:4236194](https://www.Thingiverse.com/thing:4236194) 更新和新设计一经准备和测试，将立即上传到此处。

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.

对于空气波保护器：发起者活跃在工业和医疗领域。由于缺乏口罩在医疗保健方面，他们已经联合调查了现有的防护措施行业内的解决方案可以提供另一种解决方案。在此基础上，发起人将一组 PAPR 滤波器组合在一起，PAPR 滤波器通过三维打印连接器。发起者已经自己测试了系统，并确信它会有用的。但是，该系统没有经过测试或认证，也没有任何（安全）标准。发起者们已经努力迅速想出一个好的解决方案，但不能保证。任何想要保证或确定的人都必须由授权的测试机构对系统进行测试和标准化。