

# Emergency Direct Breathing Scrubber

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<http://www.guernseysubmarine.com/>

<https://www.youtube.com/channel/UCqTD5CpS16YaXQBpgLdigvA>



## Overview

A direct "breath through" scrubber can be useful in an emergency and I have come up with a solution that works for me. This design uses an anesthesia scrubber cartridge, a flexible hose such as you would find on a SCUBA rebreather, and a respirator mask. Using spherical CO<sub>2</sub> absorbant makes breathing through the scrubber easy.

The photo on the title page should provide enough context to allow a similar device to be designed and fabricated even if the exact parts described herein cannot be obtained.

## Scrubber Cartridge

The cartridge I use is designed for an Aespire anesthesia machine, but there are other very similar ones that would work just the same. The suggested absorbant is called Spherasorb and I have found this spherical ball absorbant to be easier to breath through than other forms of absorbant. I purchased this CO<sub>2</sub> cartridge from a company called Intersurgical (see reference section for link to this product)



## Flexible Hose

Purchase a flexible hose of some sort for exhalation into the scrubber cartridge. I searched for "rebreather hose" and bought a few from ebay, using the one i liked best.



## Breathing Mask

I tried several but found the 3M 7502 to be the most comfortable and easy to adapt. You do NOT need the filter cartridges as the procedure is to fit the breathing hose to the exhale port on the mask. The filter ports act as the inlet and require no filters.



## **Assembly**

Fitting the tube to the mask is the most tricky bit. My hose had a plastic end which I heated and squashed into a flattened tube, then inserted into the exhale port of the mask. I bolted it secure with a couple of stainless bolts and sikaflexed it sealed. You need to make sure the fine rubber valves built into the mask are clear to move freely.

The other end of the breathing hose needs to fit to the inlet of the scrubber cartridge. Initially I simply drilled some holes in the green lid that it comes with and cable tied the hose to that. It worked really well as the green lid is designed to fit, so it acts as an adapter.

## **References**

Anesthesia CO2 Scrubber

<https://us.intersurgical.com/products/anesthesia/is-can-1kg-pre-filled-disposable-carbon-dioxide-absorber>

Flexible Hose

<https://www.google.co.uk/search?q=rebreather+hose>

Respirator Mask

<https://www.amazon.co.uk/3M-7502-Medium-Reusable-Half-Mask/dp/B00FYNN5J6>

Video showing complete setup – skip to 7:35

<https://www.youtube.com/watch?v=yyHIPgrN57Q>