

AVM: True Anti-Viral Mask

Active Electrostatic Nano-Ag Molecular Sieve filtration

Features

- ◆ British technology developed in response to the 2002/2003 SARs outbreak, specifically for protection against coronaviruses
- ◆ Low breathing resistance
- ◆ Silicone oro-nasal for comfortable gas seal over full shift, multi-day use
- ◆ Four layer filtration: FFP3 plus three layer electrostatic macroporous molecular sieve
- ◆ Molecular sieve pores traps virions
- ◆ Nano-Ag coating 3nm on sieve destroys the virions entrapped in the molecular pores
- ◆ Clear indication of when electrostatic system is operating, by blue LED
- ◆ Powered by AA cell with jack socket
- ◆ Optional internal microphone provides output to speaker unit to avoid muffling speech
- ◆ Replaceable filter capsule
- ◆ Easily sterilised
- ◆ Gentle appearance for clinical use.
- ◆ Designed, built & tested in the UK



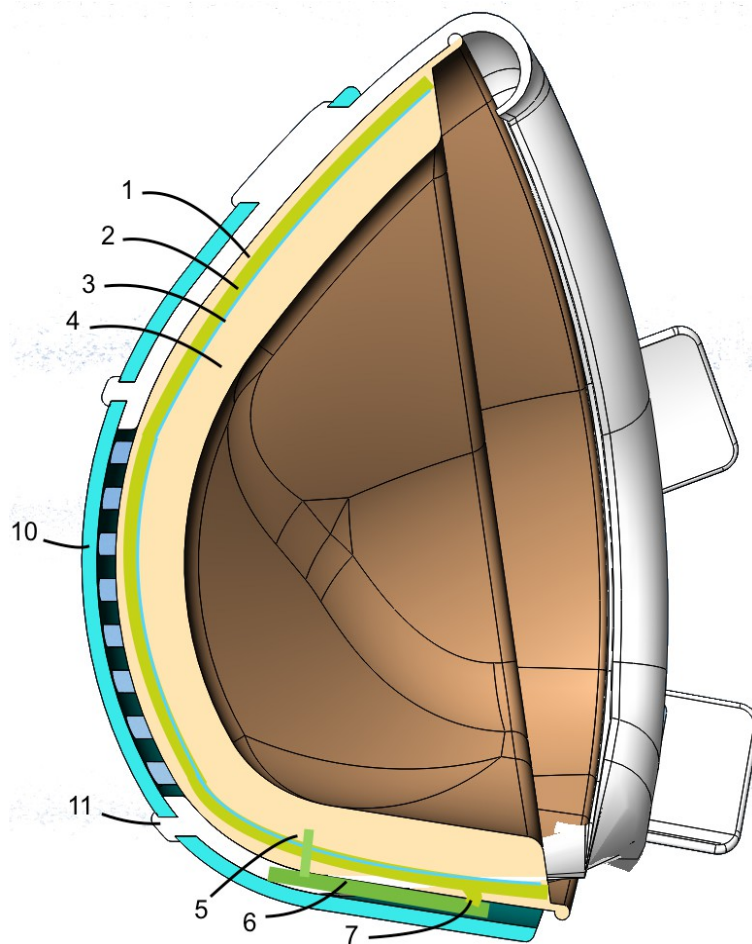
Description

The AVM was developed over a 7 year period following the 2002/3 SARS outbreak, specifically to filter virus particles (virions) in the range 60nm to 180nm without the increase in work of breathing associated with conventional ultra-fine filtration. Designed and engineering in Scotland, the technology then lay idle until the 2019 SARS-COV-2 pandemic, and is now being retooled for manufacture in the UK.

The AVM is the first mask suitable for a clinical or public setting, to provide efficient filtration of virions. It achieves this with a four layer filter, fitted as a replacement module in a mask shell comprising a nylon outer shell and a soft silicone inner. Soft silicone oro-nasal with wide elasticated straps minimise pressure on the face, while allowing the mask to be cleaned and sterilised.

The 30V – 36V electrostatic charge is generated by a circuit board within the mask, powered by an external AA cell to keep the mask light and comfortable. The circuit board is available with a microphone and signal conditioning circuit, for use with an optional speaker module: this removes distortion from the voice, avoiding muffling the wearer's speech.

The straps and other fittings are non-allergenic and are designed to minimise the pressure on the skin of the wearer, and avoid fungal and bacterial growth. Sterilisation is by immersion in DuPont Virkon solution.



Left: A cross section through the AVM showing the filter layers:

1. Surgical mask grade filtration outer layer, with large surface area. The outer shell allows gas to travel over the whole surface of the filter, which is folded for the maximum surface area.
2. Nano-Ag coated FFP3 electrostatic pre-charge layer, which charges the virions to 30 million volts per meter by bringing them within a micron of a 30V +ve source, safe for handling and use.
3. Insulating filter layer, large pores to avoid clogging
4. A 7mm thick Nano-Ag coated molecular sieve at -ve potential. The positively charged virions are attracted onto the surface of the negatively charged sieve, for them to be trapped in the molecular cages which are up to 230nm in diameter.

A 3nm thick finely dispersed silver coating (Nano-Ag) on the sieve causes the virion to be destroyed after a period of contact.

The outer shell (10) and soft silicone oro-nasal (11) provide full shift comfort, even with multi-day use. Snap connections (5) and (7) to the electrostatic generator (6) allow the filter pads to be replaced quickly and easily at the start of each shift.

Technical Information

Filtration: FFP3 at PM2.5, and 60nm - 180nm

Size: 90 x 126 x 80mm

Weight: 54grams

Shelf Life: Unopened, 7 years. Once opened filter has a shelf life of 3 months.

Duration: 7 days from Alkaline AA cell (rechargeable cells available)

Certifications: CE PPE Directive 2016/425, , Medical Device Regulation 2017/645 pending

Ordering Information

Model Description

AVM-x/m: Anti-viral mask, battery unit with 40cm of coiled wire with 2.5mm jack socket, user instructions, replaceable filters. -x idesignates no microphone, -m designates with microphone and speaker unit. Speaker unit described in separate datasheet (AVMSPK)

AVM-sieve Replacement filter module comprising molecular sieve and electrostatic filters.

AVM-frontfilter Replacement of front filter only.

Patents pending.