Drägerwerk AG & Co. KGaA, 23542 Lübeck

Infection Prevention Measures on our WaterLock 2 May 2020

Dear valued customer,

Dräger uses the WaterLock 2 (6872130) and the Infinity ID WaterLock 2 (6872020) on a variety of anesthesia workstations and gas measurement systems for protection of the patient and device. In the following text both variants will be referred to as WaterLock 2.

The WaterLock 2 is equipped with a purpose-made membrane technology, which protects the relevant system against condensate, aerosols and microorganisms from the patient. The key components are **two hydrophobic, microporous membranes** made of **Polytetrafluorethylene** (PTFE). These membranes separate condensate and microorganisms physical-geometrical out of the air flow.

The separated (and contaminated) condensate can be removed by using a standard syringe on the port at the back of the WaterLock 2. That allows the WaterLock 2 to be used for 4 weeks.

To prove the infection prevention measures we tested our WaterLock 2 **in independent laboratories**.

In 2015 the German consulting center for hospital epidemiology and infection control (BZH GmbH in Hamburg, Germany) performed extensive testing.

For this testing, spores of Bacillus atrophaeus ATCC 9372 were used.
The B. atrophaeus is widespread, nonpathogenic and sporulating – it has a high chemical and thermal resistance. **The spores are smaller than the most relevant bacteria and fungi in human medicine**. [i].
For this test the test spore was diluted to a working suspension with $1x10^8$ CFU/mL.

In the test setup a patient gas monitor "Vamos" with a flow rate of 200ml/min was used. A gas sample line and a WaterLock 2 were connected upstream.
For 23 days, over a period of four weeks, a variety of single runs between 7.5 and 14 hours (median 9.63hrs) were performed.

Drägerwerk AG & Co. KGaA
Moislinger Allee 53-55
23558 Lübeck, Germany
Tel. +49 451 882-0
Fax +49 451 882-2080
info@draeger.com
www.draeger.com

During that test series the membrane of the WaterLock 2 was exposed to a calculated value of 4.64 x 10^9 CFU test spores.

In the downstream technology (Vamos) no evidence of the test spore was found in any of the 23 performed tests.

So the WaterLock 2 was used in a practical use case for 4 weeks and during that period it was exposed to a high microbiological contamination.
The WaterLock 2 showed a **full separating capability** over a period of 4 weeks for all relevant bacteria and fungi[ii].

Dräger Waterlock 2 Virus Filtration Efficacy (VFE) test at Nelson Labs (April, 2020):

The WaterLock 2 recently underwent testing at Nelson Labs, in Salt Lake City, Utah. While Nelson Labs was unable to perform "COVID specific" testing, they **found the WaterLock 2 to have a VFE of 99.99981%.**

About the Nelson Labs test:
Nelson Labs didn't use COVID-19 virus for the virus challenge test mainly due to safety and liability reasons and the lack of an adequate assay sensitivity.
Instead, a specific bacteriophage as appropriate microbiological model was used. These bacteriophage are very similar in size and morphology with COVID-19 and other virus like HIV and SARS-CoV-2 and has a detection limit of nearly one single virus particle.

As human pathogenic viruses, exposed from infected and damaged cells, don't come in a raw form but with necrotic tissue, mucus, blood or other body fluids a passage through the hydrophobic filter membrane of the WaterLock 2 is not possible[iii].

Sincerely,

Patrick Bönig
Product Management
Business Unit Hospital Consumables & Accessories
Medical Division

---

[i] Marquis, R.E.; Gerhardt P. 2001. Bacterial Endospores – John Wiley&Sons.
[ii] Martensen; Modified membrane of the watertrap WaterLock 2– Deutsches Beratungszentrum für Hygiene; 2015.
[iii] Solbach, Mecke: Keimabscheidung durch den WaterLock™ Institut für Medizinische Mikrobiologie und Hygiene der Medizinischen Universität zu Lübeck; 1999.