

Domestic effective virus cleaning

Jaakko wood-based | 3/16/2020 | Article

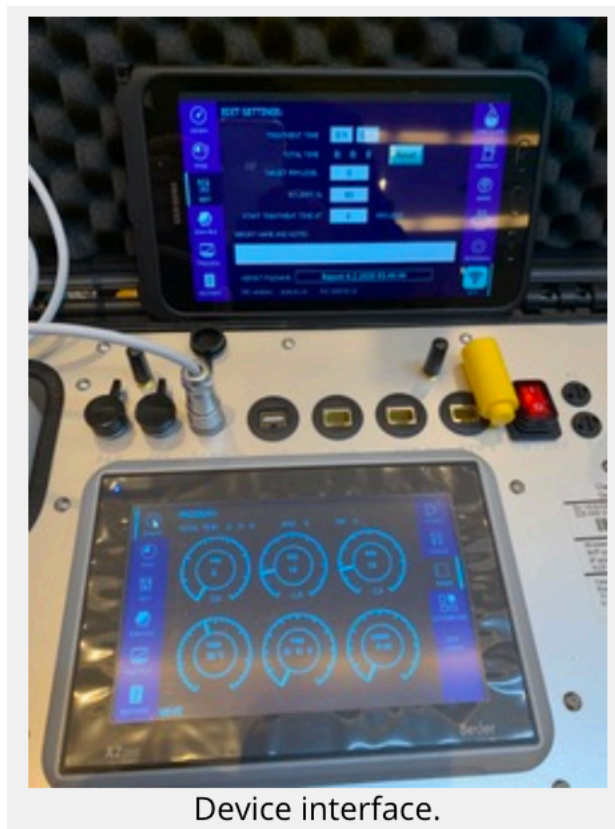


Most of us know about hydrogen peroxide (H_2O_2) as a wound cleanse or a secret to blonde hair color - a bleach, but fewer have heard of its use as a gas for decontamination and sterilization.

However, gaseous hydrogen peroxide (Vaporized Hydrogen Peroxide - VHP) has been used for decades, particularly for the decontamination of hospitals, laboratories, aircraft and various equipment and vehicles. As a gas, it does not damage surfaces or electronic devices, but it spreads evenly to the area being treated, and already very low concentrations cause 6-log (99.9999%) damage to microbes. The method works against bacteria, viruses, molds and even spores. In the United States, the CDC considers the hydrogen peroxide gas (VHP) as the only method, e.g. to neutralize anthrax. A little alloying can also destroy all known chemical and biological warfare agents. The use of the method has in the past been limited by the large size and high cost of the devices and by the relatively poor efficiency. In addition, the gasification of hydrogen peroxide is technically very challenging,

Founded in Finland in 2016, CLEAMIX OY has developed a completely new way of producing large quantities of hydrogen peroxide gas (VHP) with a device that combines very good efficiency with small size and weight. While competitors' equipment weighs 70-227 kg, the CLEAMIX device fits in a suitcase size, weighs 9.5 kg and produces 4-20 times more gas than any of the competitors on the market, with over 90% efficiency. Several devices can be networked with one another and there is no practical upper limit to the size of the space to be handled, although the actual applications are rarely individual spaces larger than a thousand cubic meters.

Originally, product development began with the need for the Air Force to decontaminate airplanes exposed to chemical warfare agents. However, no marketable and effective device was found in the market, as the method is known per se and had been the subject of much research. VTT was involved in the research, and so the founders of CLEAMIX, who had another water treatment project with the same team, started thinking about the problem from scratch. The result was a completely new solution, with a very compact device that produced a product that exceeded the expectations many times over. 24 patents have been applied, half of them international. Alongside CLEAMIX's product development efforts, many other innovative innovations have emerged. The CLEAMIX device uses Vaisala's new Peroxcap sensor technology, which allows real-time saturation control. In practice, this means that CLEAMIX devices can be used with utmost care in all environments and conditions, with no accidental condensation on surfaces. Condensation of hydrogen peroxide could lead to material damage and this has limited the applicability of earlier solutions at low temperatures or high relative humidity.



FIGHTING CORONA

According to **Panu Wilskan**, Managing Director, CLEAMIX, its products have been sold especially in the Asian market, the coronavirus epidemic has boosted sales. Both the Defense Forces Research Center and NATO have tested the use of chemical weapons to neutralize and, for example, VX nerve gas, sarin and mustard gas were 100% complete. South Korea's Office of Infectious Disease (KCDC) uses equipment to decontaminate its BSL3 laboratories, CLEAMIX was involved in the first use in February and the results were excellent. The company expects significant additional sales to Korea this year, and openings have been made to several countries in the region, Indonesia and China. The lack of THL (Finnish Institute for Health and Welfare) guidelines in Finland has slowed down the implementation in hospitals and public places. (in other parts of the world the method has been the standard for at least the last 20 years.) The CLEAMIX equipment is used by the Defense Logistics Department to kill mold from tents and other equipment, and the handling of crisis management material in both the target countries and during transportation is discussed. CLEAMIX cooperates closely with VTT, among others. According to VTT, the device can also "stitch" a very problematic *C. Auris* fungus, which has caused a lot of headaches, especially in the US and England. Something about the performance of the device is that in the 36 cubic meter test room, the anthrax control dies in 17 minutes and in the 10 cubic meter test room in 11 minutes from start.

In practice, the device is introduced into a workable space which is sealed. For example, a hospital room is decontaminated by first closing or obscuring the air conditioning, then placing the unit in a central location, bringing in a couple of standard desk / oor fans to ensure even gas distribution and closing windows and doors. The tightness of the doors can be ensured by sealing the openings in the frames. The program is set up and run remotely on a tablet computer, processing takes one to two hours depending on the circumstances. After cleaning, the gas evacuation is accelerated by a device called a catalyst converter, which is started at the end of the treatment. Once the concentration has dropped to a safe level, the room can be restored. The result is 6-log (one millionth) decontamination when aerosols commonly used in hospitals have virtually no true biocidal effect. Typical total processing time is 1.5 - 4h depending on the circumstances. The method is particularly well suited for the treatment of vehicle cabins, aircraft interiors and, for example, ship cabins. If the entire vehicle or, for example, a fighter jet is handled from the outside, the tent or container to which the object is to be moved is usually used.

The unit is also suitable for killing molds from furniture, clothing, surfaces and ventilation ducts. This will provide relief for exposed individuals for 2-3 weeks, but CLEAMIX emphasizes that gassing is not a panacea for low-rise houses without repairing structural damage to the building.

CLEAMIX will be launching customized models in the near future, and partners are coming to market for example. laboratory cabinets, washing and drying machines, and insulators incorporating CLEAMIX decontamination technology.

CLEAMIX's production facility is located in Kuopio and the equipment is entirely domestic. In Finland, the device is sold to authorities, for example. Finnprotec Oy in Espoo and IntLog in Säkylä.

For more information about the device and its manufacturer, visit www.CLEAMIX.com

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