terraplasma
replacing chemicals. *the sustainable way.*

Effective against multi-resistant pathogens, viruses, bacteria and fungi

# Aerosol-assisted cold plasma technology from terraplasma for disinfecting surfaces reaches an important milestone

**Garching near Munich, June 18, 2024 - Cold atmospheric plasma (in short: Cold Plasma) is already proving its effectiveness in the treatment of chronic and acute wounds through a contact-free and chemical-free reduction of microorganisms. Viruses, fungi, bacteria, including multi-resistant pathogens (MRE), are destroyed efficiently and sustainably by Cold Plasma. It therefore made sense to extend this active principle to other areas of application, such as the disinfection of objects and surfaces. With a prototype called "tpTop", a handy and mobile Cold Plasma decontamination device, it was now possible to deactivate up to 99.9% of microorganisms within a treatment of just a few seconds. This will open new possible applications in the future, such as the quick and sustainable disinfection of all types of surfaces.**

## Chemical-free disinfection of surfaces is a major challenge

Cold Plasma has a germ-reducing effect - without any chemicals, heat, radiation or UV - and is therefore particularly suitable for sensitive objects that cannot be freed from microorganisms using the conventional methods mentioned above. In addition, Cold Plasma is created in a sustainable and natural cycle and is generated from normal ambient air with the targeted addition of some energy. As soon as the energy supply is stopped, the Cold Plasma transforms back into normal room air and leaves no waste behind. Since physical mechanisms of action are also used against microorganisms (the microorganisms are literally "drilled" by the Cold Plasma - see press photos), there is no resistance to the increasingly dangerous MDROs such as the well-known ESKAPE germs. This includes

- Vancomycin-resistant ***E****nterococci* (VRE)

- Methicillin-resistant ***S****taphylococcus aureus* (MRSA)

- Carbapenem-resistant ***K****lebsiella pneumoniae*

- ***A****cinetobacter baumannii*

- ***P****seudomonas aeruginosa*

- **E**nterobacterales (extended spectrum beta-lactamase formers/ESBL)

## Aerosol acts as a "booster" for the disinfection performance

As an invisible gas, Cold Plasma gets into even the smallest cracks of an object or surface to be decontaminated - unlike UV, for example, there are no shadows whatsoever. However, this unstable gas evaporates quite quickly and is therefore most effective when used in a closed treatment room such as a mobile object disinfection device such as the CBC PlasmaEgg from Kimetec. By using a water-based aerosol (a very fine water mist) in addition to the Cold Plasma, terraplasma was now able to significantly accelerate the decontamination process. It previously took several minutes to deactivate 99.9% of the microorganisms but this result is now achieved in a few

seconds. The aerosol enables significantly more efficient distribution and targeted application of the so-called “reactive species” (active substances) of the Cold Plasma to the areas to be disinfected. This speeds up the process overall and is therefore very suitable for quickly and efficiently disinfecting surfaces in seconds.

## Partners wanted for the further development of this universally applicable rapid disinfection

By using the “tpTop” prototype, terraplasma was able to successfully test and test a concept for the first time about how Cold Plasma can also be used to disinfect (irregular) surfaces within a very short time. The promising results motivate the terraplasma team to continue testing this topic and to develop an optimized setup for disinfection - preferably with a partner company with experience in the areas of cleaning and hygiene, because terraplasma's technology can be used due to its compact design and low power consumption can be used as a supplementary technology in various cleaning devices, such as vacuum cleaner robots or floor cleaning machines.

About terraplasma

Founded in 2011 as a spin-off of the Max Planck Society, terraplasma GmbH (https:// www.terraplasma.com) based in Garching near Munich offers innovative solutions and technologies for the development of Cold Plasma products in areas where bacteria, fungi, viruses, spores, allergens and odor molecules need to be inactivated efficiently and sustainably or where harmful molecules cause problems. Cold Plasmas are partially ionized gases that can replace conventional chemicals or other technologies such as UV, heat or radiation in an increasing number of applications due to their high efficacy.

With its tried-and-tested basic technologies, terraplasma cooperates with well-known companies in the fields of medical technology, hygiene, water treatment, odor management, air purification, cosmetics and surface modification, among others. It is terraplasma's goal to work with these industrial partners to further develop and market its environmentally friendly Cold Plasma solutions in line with demand. A young team that works with a lot of creativity and sophistication, extensive know-how in the fields of cold plasma research and technology as well as numerous patents support the GreenTech company on its path to success.

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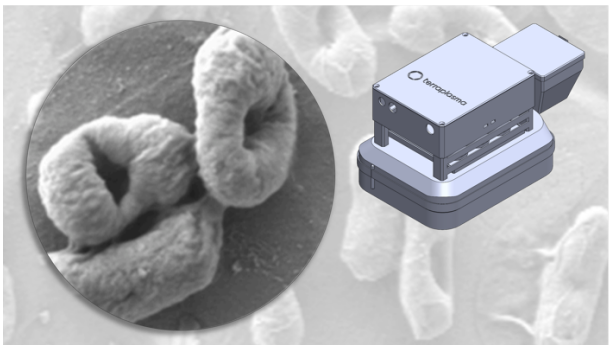
Press picture 1: Surface disinfection with Cold Plasma



Press picture 2:  Surface disinfection with Cold Plasma