

Plasma in the Case of Biological Disaster

Joint project MoPlasDekon presents mobile plasma disinfector to protect against biological hazards in infected areas

The three-year MoPlasDekon (Mobile Plasma Decontamination) project funded by the German Federal Ministry of Education and Research (BMBF) as part of its *Research for Civil Security* program came to an end in August 2019. At the end of July, project partners Plasmatrete GmbH from Steinhagen, the Fraunhofer Institute for Process Engineering and Packaging (IVV) in Freising and m-u-t GmbH, Wedel, joined forces with associated partner the Bavarian Red Cross (BRK) to present the mobile plasma disinfector developed in this research project for use in biological emergencies.

During the project period, the joint partners received expert advice from associated project partners working in the field: The Analytical Task Force (ATF B) of the Essen Fire Service, the Bavarian Red Cross (BRK) in Munich, the Robert Koch Institute (RKI) in Berlin and supplier Inhag-Zelte-und-Zubehör in Schluechtern. In 2016 the partners had teamed up within the framework of the Federal Ministry of Education and Research initiated program Research for Civil Security to

the research project MoPlasDekon with the aim of replacing the conventional chemical decontamination of contaminated surfaces by means of an environmentally friendly, easier to use and faster acting method of disinfection.

When rescue workers in epidemic areas remove their plastic protective suits at the end of an operation, they are highly endangered by pathogens that adhere to these suits. The interiors of contaminated ambulances must also be cleaned of bacteria, fungi and viruses. These objects are generally decontaminated with wet chemicals that are harmful to health and the environment.

For the environmentally friendly defense against biological dangers in epidemic areas, the MoPlasDekon partners developed and tested a novel decontamination system based on the generation of DBD plasma (Dielectric Barrier Discharge). For the first time, the device is mobile and can be operated with a built-in lithium ion battery in the event of a power failure. The system should make it possible in the future to disinfect

contaminated objects anywhere in the world without the use of aggressive chemicals.

With the new plasma technology, dangerous pathogens can be dryly and quickly eliminated on the surfaces of various materials (such as plastics, metal or glass) without danger to the environment and health. The new system only requires electrical energy and air as process gas. Protective suits for emergency services are disinfected just as effectively as the interiors of entire ambulances. In addition to the mobile plasma unit, an innovative gas sensor technology has been developed with which the effectiveness of plasma treatment against pathogenic pathogens can be tested on site.

The next step is the further development of the demonstrator to series production readiness. The doors are open for investors interested in the industrial end product. They will find something promising: The first mobile high-tech plasma system monitored by gas sensors that is capable of eliminating dangerous pathogens on objects in an environmentally friendly way at any place in the world where a catastrophe occurs, independent of mains power supply - quickly, safely and completely free of chemicals.

About Plasmatrete

Plasmatrete is one of the leading international companies in the development of atmospheric plasma technologies and systems for the pretreatment of material surfaces. The Openair Plasma® nozzle technology is used worldwide in automated and continuous production processes in used in almost all areas of industry. The Plasmatrete Group has technology centers in Germany (headquarters), the USA, Canada, China and Japan and is represented in more than 30 countries.

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Dr. Alexander Knospe (front, middle), Head of Innovation Management at Plasmatrete and MoPlasDekon joint coordinator, presents the mobile plasma disinfector together with his Plasmatrete colleagues Prof. Dr. Thomas Schmitt-John (left) and Sebastian Guist (right). In the background: ambulance of the BRK (Image: Plasmatrete)