

## STERILIZATION AND SURFACE DECONTAMINATION BY A NOVEL VHF-CCP

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The application of low pressure plasma discharges for sterilization of medical instruments is an upcoming alternative to common sterilization methods, due to the variety of drawbacks, e.g. high temperature, toxic chemical agents, or the inability to sterilize and remove pathogenic material, commonly used methods are associated with. Plasma sterilization offers a highly effective, low temperature sterilization and decontamination process with a reduced process time.

The capabilities of plasma treatment have been demonstrated in several laboratory setups<sup>1-3</sup>. Based on these experiences, a novel setup has been developed. It is realized as capacitively coupled plasma discharge powered by an oscillator power source in the variable frequency range between 76 and 80 MHz. The setup is designed to meet industrial needs. The discharge chamber is shaped like a drawer and composed of PEEK, a high-performance plastic. This leads to an easy handling sterilization process uncomplicated for application.

Optical emission spectroscopy was performed to obtain detailed information about the plasma parameters and to optimize the plasma for sterilization purpose. Microbiological tests as well as protein removal tests are going to be presented.

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2. K. Stapelmann, O. Kylián, B. Denis and F. Rossi, "On the application of inductively coupled plasma discharges sustained in an Ar/O<sub>2</sub>/N<sub>2</sub> ternary mixture for sterilization and decontamination of medical instruments", *Journal of Physics D: Applied Physics* **41** (2008), p. 192005.
3. O. Kylián, K. Stapelmann and F. Rossi, "Sterilization and decontamination of medical instruments by low pressure plasma discharges: application of ternary mixtures", 35<sup>th</sup> IEEE International Conference on Plasma Science, June 15 - 19, 2008, p. 208