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## Comparison of Plasma Sporicide Using Different Power Sources in Atmospheric-Air

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Hao Wang, Liyang Zhang, Haiyun Luo \* and Xinxin Wang

Department of Electrical Engineering, Tsinghua University Beijing 100084, China

\*Email: lhy@tsinghua.edu.cn

The sterilization of spores (sporicide) is a stubborn problem, since the firm exterior and dipicolinic acid (DPA) provide remarkable resistance of spores. Conventional methods, such as heat, UV, chemical sporicide, are usually hard to achieve sterilization effect. We used DBD pulsed plasma in air at atmospheric pressure to treat the *Bacillus subtilis* spores on biological indicator. The results suggest that the plasma treatment could achieve sterilization within 70s. To research the main factors of plasma sporicide, we compare the killing effects with plasmas produced by a pulse power source and an AC power source, and the result indicates that the pulse power source works far better. The transmission electron microscope (TEM) of two experiment groups show that the spore surfaces are more severely damaged in pulse power source. Analyzing the breakdown voltage and the spectrum, we infer that the higher electron field and higher electron energy by pulse power source are the key factors to destroy the exterior and DPA of bacteria spore and then kill protoplasm. This experiment prove that the pulse power source plasma is a better choice to sterilize the spores. This work is supported by the National Key Research and Development Program under contract 2017YFC1200404.

**Authors:** Dr WANG, Hao (Tsinghua University); Dr ZHANG, Liyang (Tsinghua University); Prof. LUO, Haiyun (Tsinghua University); Prof. WANG, Xinxin (Tsinghua University)

**Presenter:** Dr WANG, Hao (Tsinghua University)

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