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**High-speed sterilization technique using dielectric barrier discharge plasmas in atmospheric humid air** M. MIYAMAE, Y. KIKUCHI, N. FUKUMOTO, M. NAGATA, University of Hyogo — The inactivation of *Bacillus atrophaeus* spores by a dielectric barrier discharge (DBD) plasma produced by an ac voltage application of 1 kHz in atmospheric humid air was investigated in order to develop low-temperature, low-cost and high-speed plasma sterilization technique. The biological indicators covered with a Tyvek sheet were set just outside the DBD plasma region, where the air temperature and humidity as a discharge gas were precisely controlled by an environmental test chamber. The results show that the inactivation of *Bacillus atrophaeus* spores was found to be dependent strongly on the humidity, and was completed within 15 min at a relative humidity of 90 % and a temperature of 30 °C. The treatment time for sterilization is shorter than those of conventional sterilization methods using ethylene oxide gas and dry heat treatment. It is considered that reactive species such as hydroxyl radicals that are effective for the inactivation of *Bacillus atrophaeus* spores could be produced by the DBD plasma in the humid air. Repetitive micro-pulsed discharge plasmas in the humid air will be applied for the sterilization experiment to enhance the sterilization efficiency.

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