

Abstract Submitted
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Design of experiments on a DC Steady State Atmospheric Pressure Plasma Sterilizer IGOR ALEXEFF, ARUN BALASUNDARAM, RAPINDER SAWHENY, University of Tennessee — Our Resistive Barrier Discharge has been demonstrated to be successful on *E. coli*, *Pseudomonas fluorescens* (5RL), spores and bacteriophages. It has been tested successfully in sterilizing pagers at the St. Jude Research Hospital in Memphis, TN. In this recent work, we evaluate three primary factors in the atmospheric pressure resistive barrier discharge, hydrogen peroxide, charged ions and air (oxygen). The experiment used Analysis of Variance (ANOVA) and regression analysis. The tests used 144 Petri Dishes and the bacteria used were *E. coli*. The hydrogen peroxide was used as a replacement for the water conductor on the resistive barrier discharge electrode. The charged ions were removed by a double charged wire mesh between the discharge and the Petri Dish. The air was displaced by a slow flow of nitrogen into the experimental area. The basic conclusions are that air, and charged ions are both extremely effective in killing bacteria. In addition, air and charged ions together strongly enhance each other. Hydrogen peroxide in our experiments did not enhance the kill rate.

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