

# Parametric investigation of a N<sub>2</sub> flowing post discharge source for decontamination of the inner surface of the small diameter tubes

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Non thermal plasma technologies have recently been receiving attention as an alternative technology for surface decontamination of thermally sensitive medical materials [1]. This work focuses on an atmospheric pressure nitrogen corona discharge in a point-to-point geometry [2]. The nitrogen post-discharge was flowing in a 650 mm quartz tube (8 mm inner diameter). Contaminated samples (*E. Coli* suspended in a 20% LB/distilled water solution) were deposited onto the inner surface of the tube, 100 mm (Sample up) and 630 mm (Sample down) away from the source. Bacteria exposure and spectroscopic measurements (for estimation of nitrogen atoms density) were made simultaneously with a 20 L.min<sup>-1</sup> flow for pure nitrogen and nitrogen with controlled traces of oxygen. Thermal effects were also estimated. Direct CFU counts were made for the two deposit locations for increasing exposure time. As presented in the survival curve (survivors vs. exposure time), for a 30min treatment time, a 6 log reduction of survivors was obtained for up samples whereas less than a 2 log reduction was observed for down samples. Correlation between active species density along the post-discharge and the decontamination efficiency will be discussed.

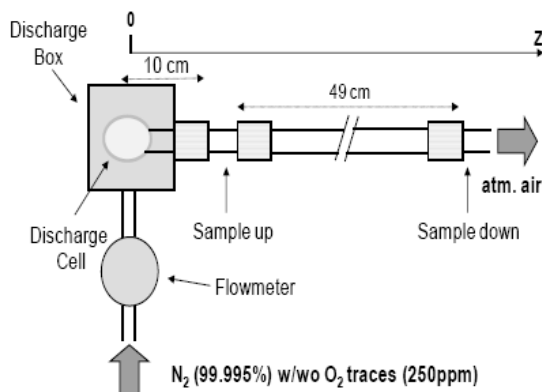


Figure 1: *Experimental Setup*

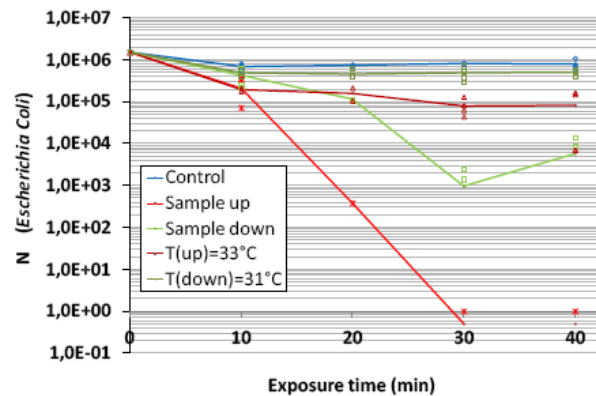


Figure 2: *Survival Curve*

## References

- [1] Moreau M., *et al.* *Biotechnology Advances* (2008), **26**, 610–617.
- [2] Pointu A-M. *et al.* *Plasma Process. Polym.* (2008), **5**, 559-568.