

Abstract Submitted
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Transfer Chamber for DBD Surface Treatment and Analysis¹ JESSICA FAUST, SOPHIA GERSHMAN, RYAN DANIELS, Princeton Plasma Physics Laboratory — Materials that are hydrophobic, smooth, and have low surface tension lead to poor adhesion for printing and coating. Surface modification using atmospheric pressure dielectric barrier discharge (DBD) improves adhesion by activating the surface, increasing its roughness and functionalizing. We have constructed and tested a DBD discharge system that uses a 15kV, 800-1350Hz pulsed dc source and a mixture of gasses at 300-600Torr. Treated surfaces are studied using X-ray photoelectron spectroscopy, Auger electron spectroscopy, and other methods that require high vacuum environment. We designed a portable transfer chamber to move the sample from the atmospheric pressure treatment chamber to a high vacuum surface analysis chamber with minimal interaction with the environment. The transfer chamber was designed to meet the specific requirements of each system; a bellows drive and sample holder to manually move the sample into the transfer chamber; the ability to fill with pure nitrogen gas to prevent contamination of the sample surface; constructed to withstand a range of pressures from 300 to 10^{-8} Torr; the ability to connect compatibly with each system. Proper surface characterization of the sample is crucial to designing an effective treatment system.

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