

Abstract Submitted
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**Dual frequency
diffuse dielectric barrier discharge in atmospheric-pressure air-like gas
mixture for thin film deposition** YAUGE LIU, FOM Institute DIFFER, SER-
GUEI STAROSTIN, FUJIFILM Manufacturing Europe B.V., STEFAN WELZEL,
M. C. M. VAN DE SANDEN, HINDRIK DE VRIES, FOM Institute DIFFER, FOM
INSTITUTE-DIFFER TEAM, EINDHOVEN UNIVERSITY OF TECHNOLOGY
TEAM, FUJIFILM MANUFACTURING EUROPE B.V. TEAM — A dual fre-
quency (DF) diffuse discharge was obtained in an atmospheric-pressure dielectric
barrier discharge reactor in air-like gas mixtures. By adding a radio frequency (RF)
voltage to a low frequency (LF) voltage, we aim to increase the plasma power density.
In this study, the discussion is mainly focused on the discharge characteristics and
the thin film deposition. According to the spatio-temporal emission, the discharge
shows a glow-like structure with both LF and DF voltages. By fitting the spectral
lines of the second positive system of N_2 , the gas temperature was estimated which
does not obviously increase with the extra RF signal. Moreover, SiO_2 -like film was
deposited from TEOS using the DF power supply. Thin film properties such as sur-
face morphology, microstructure and stoichiometry were analyzed by AFM, FTIR
and XPS, respectively. Because of the higher plasma power density, the DF power
supply can be an efficient approach to improve the properties and to increase the
throughput of the thin film deposition.

Yaoge Liu
FOM Institute DIFFER

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